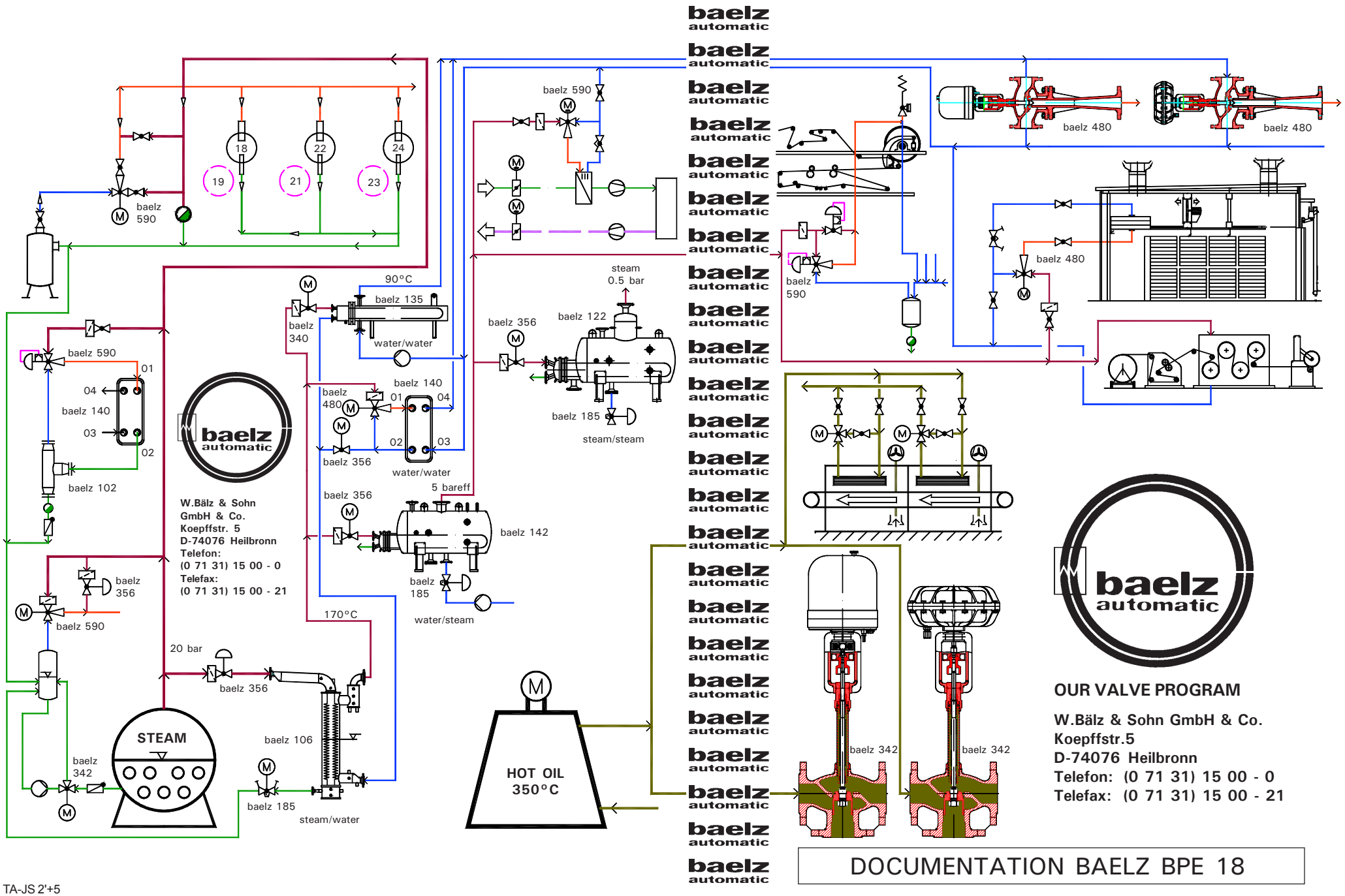
baelz automatic
baelz 590
18
19
22
21
24
23
baelz 590
90°C
baelz 135
baelz 340
water/water
baelz 590
01
04
baelz 140
03
02
baelz 102
baelz 140
baelz 480
01
04
02
03
baelz 356
water/water
baelz 356
5 bareff
baelz 142
baelz 185
water/steam
baelz 356
baelz 590
20 bar
baelz 356
170°C
baelz 106
STEAM
baelz 342
baelz 185
steam/water
HOT OIL
350°C
baelz 356
baelz 122
steam
0.5 bar
baelz 185
steam/steam
baelz 590
baelz 480
baelz 480
baelz 480
baelz 342
baelz 342
W.Bälz & Sohn
GmbH & Co.
Koepffstr. 5
D-74076 Heilbronn
Telefon:
(0 71 31) 15 00 - 0
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(0 71 31) 15 00 - 21
OUR VALVE PROGRAM
W.Bälz & Sohn GmbH & Co.
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Telefon: (0 71 31) 15 00 - 0
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DOCUMENTATION BAELZ BPE 18
TA-JS 2'+5

Bälz-electrodyn - control valves and control actuators

Summary

Bälz-electrodyn - control valves and control actuators

1. The Baelz control valve family of motorized, pneumatic and automotive control valves

All baelz control valves have 3 main components:

- the specific valve body with a mobile trim, flanged ends or externally threaded; balanced or unbalanced single seated.
- an actuator: electric motorized actuator, pneumatic operated diaphragm actuator, or self acting diaphragm actuator.
- a yoke with a coupling to fit the valve spindle to the actuator spindle.

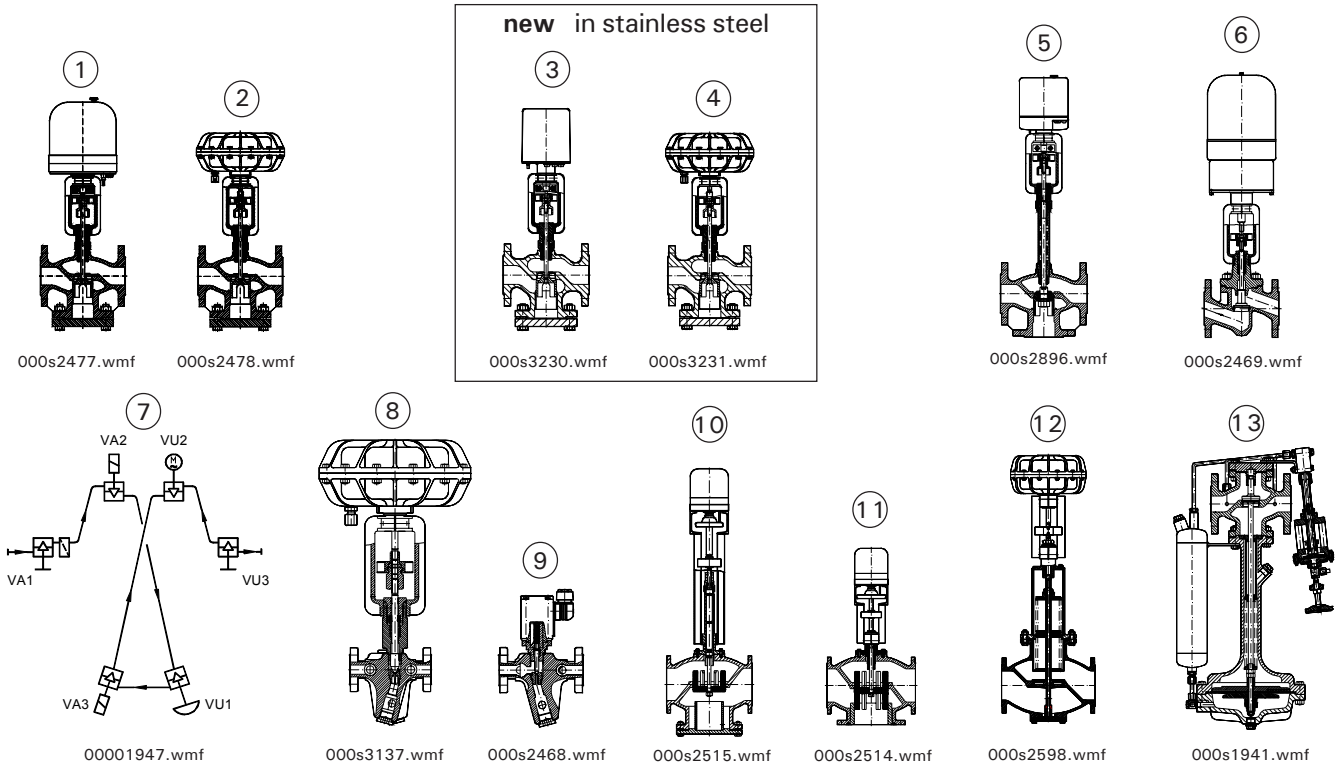


Fig. 1 Bälz-electrodyn - hi-tec control valves

1:	340-B-373-E40	motorized 2-way valve for steam
2:	340-B-373-P21	pneumatic 2-way valve for steam
3:	340-ES-373-E07	motorized 2-way valve for steam
4:	340-ES-373-P21	pneumatic 2-way valve for steam
5:	342-BK-SS-373-E02	motorized 3-way valve with bellows for hot oil 350°C
6:	356-373-E11-D	motorized 2-way valve for steam with spring return actuator
7:	185 schematic	flow through microvalve baelz 185
8:	185-373-P21	microflow - multipurpose pneumatic 2-way valve
9:	185-266st	microflow - multipurpose solenoid 2-way valve
10:	340-BBK-SS-373-E60	motorized 2-way valve > ND 150 with bellows
11:	347-BB-373-E60	electric 3-way valve > ND 150
12:	346-EMB-373-P31	balanced pneumatic steam valve > ND 150
13:	192-206r-265st	pilot - operated self acting multi purpose valve for steam

Baelz supplies with very short delivery times control valves for the following ND and NP:

NP	6	16	25	40	63	100	160	ASA 150	ASA 300 (ISO 50)
ND min.	15	15	15	15	15	15	15	15	15
ND max.	125	300	300	300	125	125	125	125	125

Those valves can be supplied in different materials and with one of the following leakage classes according to EN 1349; II (0,5% Kvs); III (0,1% Kvs); IV (0,01% Kvs), IV-S1 (0,0005% Kvs).

Bälz-electrodyn - control valves and control actuators

1.1 Summary of control valves and ejectors

motorized and pneumatically actuated metallic seated 2-way valves in baelz numerical order				
	type / ND	**designation**	**NP**	**material**
3.1	**185/15 + 25**	microflow valve with incorporated strainer and up to 2 isolating valves	16, 40	1.4021
3.2	**192/15-125**	multipurpose valve for steam; pressure reduction + emergency shut - down	16 40	GJS-400-18-LT *1 GP240GH *2
3.3	**334/½"- 1½"**	threaded red bronze valve	16/25	Rg 5
3.4	**340-B/15-125** **340-BB/150-300**	universal valve 3-way body with flange on 3rd-way (B)	6, 16, 25 40	GJS-400-18-LT *1 GP240GH *2
3.5	**340-ES-AS** **340-ES-MS**	stainless steel valve with 3-way body with flange on 3rd-way (B)	16, 25, 40	1.4313
3.6	**340-BK-SS/15-125** **340-BBK-SS/150-300**	idem, with bellows for hot oil	16, 25 40	GJS-400-18-LT *1 GP240GH *2
3.7	**340-B-EM/50-125** **340-BB-EM/150-300**	balanced valve for liquids, max. 225°C	16, 25 40	GJS-400-18-LT *1 GP240GH *2
3.8	**340-B-EMF/65-125** **340-BB-EMF/150-300**	balanced valve for steam; max. 260°C	16, 25 40	GJS-400-18-LT *1 GP240GH *2
3.9	**344-VA/32-150**	stainless steel body	16, 25, 40	1.4408 / 1.4571
	344-EM-VA/50-125	balanced stainless steel body	16, 25, 40	1.4408 / 1.4571
3.10	**346-EMB/40-150**	balanced valve for steam	16, 25 40	GJS-400-18-LT *1 GP240GH *2
3.11	**346-22/65-125**	2-way valve with spindle Ø 22 mm	16, 25 40	GJS-400-18-LT *1 GP240GH *2
3.12	**356/15-65**	2-way valve	16, 40	C 22.8 / 1.4571
3.13	**356-K-SS/15-65**	idem, with bellows for hot oil	16, 40	C 22.8 / 1.4571
3.14	**358-K/15-65** **359-K/15-65**	high pressure valve	63, 100 63, 100	13CrMo44 C 22.8
3.15	**359-ASA**	2-way valve	ANSI 150, ANSI 300	A 216
3.16	**360-EM-C/50-200** **360-EM-CC/50-200**	balanced valve with fixed cage and piston guided plug	40, 63, 100, 160	GP240GH *2 G17CrMo5-5
motorized and pneumatically actuated metallic seated 3-way valves in baelz numerical order				
	type / ND	**designation**	**NP**	**material**
4.1	**335/½"-1½"**	threaded red bronze valves	16/25	Rg 5
4.2	**342-B/15-125**	universal valve 3rd-way not tight	6, 16, 25 40	GJS-400-18-LT *1 GP240GH *2
	347-B/15-125 **347-BB/150-300**	idem, but 3rd-way tight	16, 25 40	GJS-400-18-LT *1 GP240GH *2
4.3	**342-BK-SS/15-125** **347-BK-SS/15-125** **347-BBK-SS/150-300**	idem, with bellows for hot oil	16, 25 40	GJS-400-18-LT *1 GP240GH *2
4.4	**347-B-EM/50-300**	balanced valve for liquids, max. 225°C	16, 25 40	GJS-400-18-LT *1 GP240GH *2
4.5	**347-ES-AS** **347-ES-MS**	stainless steel valve, 3rd-way tight	16, 25, 40	1.4313
4.6	**353/15-25** **354/32-125**	stainless steel body	16, 25 16, 25	1.4571 1.4408 / 1.4571
motorized and pneumatically actuated ejectors				
	type / ND	**designation**	**NP**	**material**
5.1	**471, 475**	water/water ejectors, threaded ends	16, 25	Rg 5
5.2	**480**	flanged water/water ejectors	16, 25 40	GJS-400-18-LT *1 GP240GH *2
5.3	**585, 586**	steam-water mixing ejectors	16, 25	GJS-400-18-LT *1 1.4408 / Rg 5
5.4	**590**	steam/steam ejectors	16, 25 40	GJS-400-18-LT *1 GP240GH *2
5.5	**591**	steam conditioner, desuperheater	16, 25 40	GJS-400-18-LT *1 GP240GH *2

*1 (GGG 40.3)
*2 (GS-C25)

Bälz-electrodyn - control valves and control actuators

1.2 Summary of Kvs values of baelz control valves

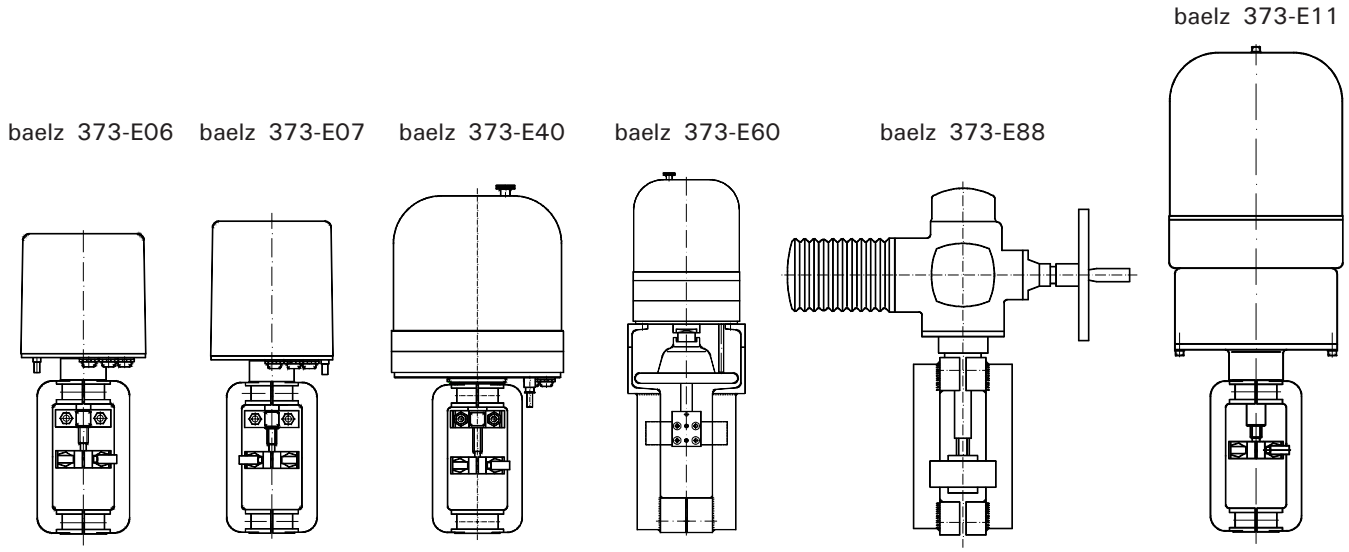
DN	185	192	334 335	340	340-EM 347-EM	340-EMF	342 347	344 344-EM	346 -EMB	346-22	353 354	356	358 359	360-EM-C 360-EM-CC
15	0,025 0,04 0,10 0,12 0,16 0,3 0,6 1,0 1,2 1,4	5 LK 1,3 LK 2,0 LK 2,5	3,5	1 2 3 5,6 LK 1,6 LK 2,0 LK 2,5	-	-	1 2 3 5,6 LK 2,5	-	-	-	2 3 5,6	1,0 2,0 3,8 LK 1,6 LK 2,0 LK 2,5	3,8 LK 1,6 LK 2,0 LK 2,5	-
20	-	6 LK 2,5 LK 3,2	5	1,6 2,5 6,3 LK 2,5 LK 3,2 LK 4,0	-	-	1,6 2,5 6,3 LK 4	-	-	-	6,3	2,0 4,0 6,5 LK 2,5 LK 3,2 LK 4,0	6,5 LK 2,5 LK 3,2 LK 4,0	-
25	5 3 2 1,4	8 LK 4	9	3,2 5 9 LK 4,0 LK 5,0 LK 6,3	-	-	3,2 5 9 LK 6,3	-	-	-	9	4,0 6,5 9,3 LK 4 LK 5 LK 6,3	9,3 LK 4,0 LK 5,0 LK 6,3	-
32	-	15 LK 6,3 LK 10	16	4 8 16 LK 6,3 LK 10 LK 12,5	-	-	4 8 16 LK 12,5	15	-	-	16	7 10 14 LK 6,3 LK 10 LK 12,5	14 LK 6,3 LK 10 LK 12,5	-
40	-	24 LK 10 LK 16	22	6,3 12,5 25 LK 10 LK 16 LK 20	-	-	6,3 12,5 25 LK 20	25	20 LK 20	-	25	10 14 23 LK 10 LK 16 LK 20	23 LK 10 LK 16 LK 20	-
50	-	35 LK 16 LK 25	-	10 20 36 LK 16 LK 25 LK 32	36	-	10 20 36 LK 32	39	36 LK 36	-	36	15 23 40 LK 16 LK 25 LK 32	40 LK 16 LK 25 LK 32	36
65	-	70 LK 16 LK 25 LK 40	-	16 32 63 LK 25 LK 40 LK 50	63	63	16 32 63 LK 50	63	50 LK 50	63 LK 25 LK 40 LK 50	63	23 38 63 LK 25 LK 40 LK 50	63 LK 25 LK 40 LK 50	60
80	-	105 LK 40 LK 50 LK 63	-	25 50 105 LK 40 LK 63 LK 80	105	105	25 50 105 LK 80	92	63 LK 63	105 LK 40 LK 63 LK 80	105	-	105	80
100	-	135 LK 40 LK 80 LK 100	-	40 80 130 LK 63 LK 80 LK 100	130	130	40 80 130 LK 100	136	90 LK 90	130 LK 63 LK 80 LK 100	130	-	130	130
125	-	200 LK 100 LK 130 LK 160	-	63 130 200 LK 100 LK 130	200	200	63 130 200 LK 130	215	100 LK 100	200 LK 100 LK 130	200	-	200	150
150	-	-	-	360 LK 130 LK 200 LK 250	360	360	360 LK 250	315	200 LK 200	-	-	-	-	200
200	-	-	-	580 LK 320	580	580	580 LK 320	-	-	-	-	-	-	300
250	-	-	-	960 LK 580	960	960	960 LK 580	-	-	-	-	-	-	-
300	-	-	-	1340 LK 960	1340	1340	1340 LK 960	-	-	-	-	-	-	-

LK = cage plug

Bälz-electrodyn - control valves and control actuators

1.3 Summary of linear electric and pneumatic actuators 373-E and 373-P

baelz 373-EXX XX: 06, 07, 40, 60, 88			baelz 373-EXX XX: 11, 13	baelz 373-PXX XX: 21, 22, 31, 32, 41		
standard motorized actuators that remain in their position in case of power failure for open - stop - close or 4 - 20 mA or on - off operation			spring return motorized actuators that either close or open in case of power failure; only for valves ND 15 - ND 125 with yoke S21	pneumatic actuators air - to - open or air - to - close for max. 6 bar air signal pressure; for strokes up to 66 mm		
type	thrust	stroke speed	type, trust, stroke speed	type	diaph. surface	thrust
373-E06	2000 N	6 mm / min.	baelz 373-E11 / E13-D	373-P21	240 cm^2	1020 - 7590 N
373-E07	2000 N	6 + 18 mm / min.	2000 N, 6 + 17 mm / min.	373-P22	240 cm^2	1846 - 3692 N
373-E40	4000 N	20 mm / min.	baelz 373-E11 / E13-Z	373-P31	620 cm^2	2480 - 10560 N
373-E60	9000 N	18 mm / min.	2000 N, 6 + 17 mm / min.	373-P32	620 cm^2	2201 - 8115 N
373-E88	10000 N	22 mm / min.		373-P41	1250 cm^2	3765 - 31920 N



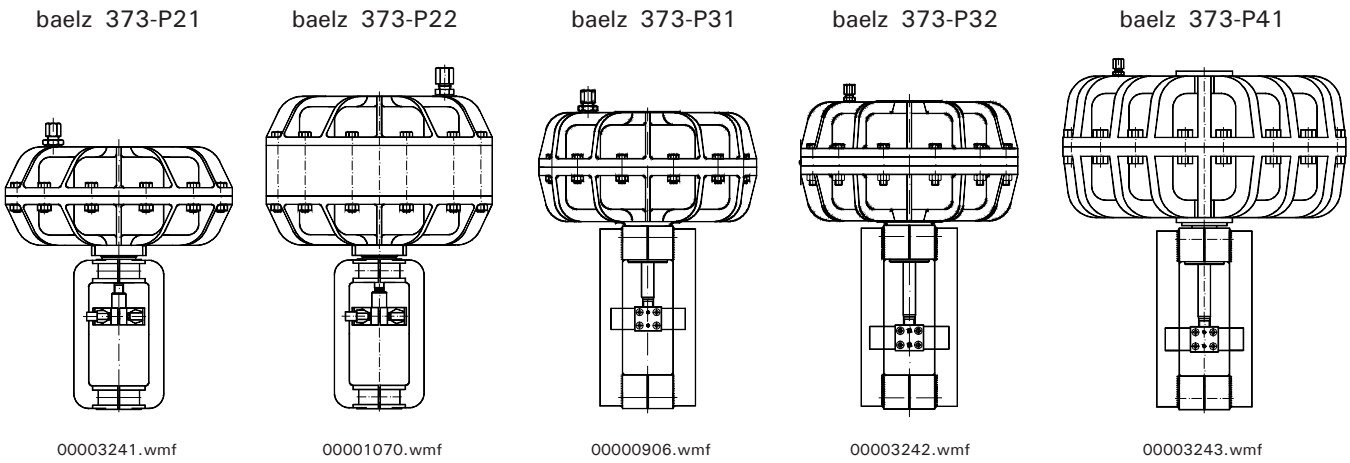


Fig. 2 electric + pneumatic baelz actuators

Bälz-electrodyn - control valves and control actuators

1.4 Max. differential pressure against which the actuator closes the valve

Electric actuators

Non-balanced valves, plug closing against flow, 3-way valves as mixing valves
baelz 334, 335, 340/347-B/BB, 342-B, 340/347-BK/BBK, 342-BK, 340/347-BK-SS/BBK-SS, 342-BK-SS, 340/342/347-ES, 344, 346-22, 353, 354, 356, 356-K, 356-K-SS, 358-K, 359-K, 359-ASA

The corresponding nominal diameters see our Price List "Arbeits- und Preisbuch" and the working sheets.
The differential pressures below are reduced by the nominal pressure of the casing in case of: NP casing < diff. pressure.

	baelz type 373-	Thrust N	ND 15	20	25	32	Δ pmax bar g 40	50	65	80	100	125	Values in brackets (...) for type 346-22 150	200	250	300
Plug closing against the flow	E02- 10-	1 000	25	25	16	10	6,3	4	2,4	1,5	1	0,6				
	E06- 20-	2 000	40	40	32	20	12	8	4,8	3	2	1,2				
	E07- 20-	2 000	40	40	35	20	12	8	4,6	2,9	1,7	1				
	E11- 20-	2 000	40	40	35	20	12	8	4,6	2,9	1,7	1				
	E40- 40-	4 000	40	40	40	40	27	16	10	6,9	4,4	2,8	1,7			
	E60- 90-	9 000					(40)	(40)	(25)	(16)	(10)	(6,6)	4,3	2,4	1,5	1
	E88- 100-	10 000						40	28	18	11	7,4	5	2,7	1,7	1,1
		13 000						40	37	24	15	9,8	6,7	3,7	2,3	1,5
		16 000						40	40	30	19	12	8,4	4,6	2,9	2
	E88- 300-	30 000								(40)	(36)	(23)	15,3	9	5,8	3,9
		35 000											18,9	10,5	6,7	4,6
		40 000											21,7	12,1	7,7	5,3

Balanced valves for fluids baelz 340/347-B-EM, 344-EM, 3-way valves as mixing valves

	baelz type 373-	Thrust N	ND 40	50	65	Δ pmax bar g 80	100	125	150	200	250	300
Plug closing against the flow	E02- 10-	1 000	18	12	7,2	4,5	3	1,8				
	E06- 20-	2 000	36	24	14	9	6	3,6				
	E07- 20-	2 000	36	24	14	9	6	3,6				
	E11- 20-	2 000	36	24	14	9	6	3,6				
	E40- 40-	4 000	40	40	30	20	13	8	5			
	E60- 90-	9 000							13	7	4,5	3
	E88- 100-	10 000							40	24,9	18,6	7,3
		13 000							40	34	26	10,5
		16 000							40	40	33	13
	E88- 300-	30 000							40	40	40	28
		35 000							40	40	40	40
		40 000										

Balanced valves for steam baelz 346-EMB

	baelz type 373-	Thrust N	ND 40	50	65	Δ pmax bar g 80	100	125	150			
Plug closing against the flow	E06- 20-	2 000	40	20,4	11	10,4	4,4	2,1				
	E07- 20-	2 000	40	20,4	11	10,4	4,4	2,1				
	E11- 20-	2 000	40	20,4	11	10,4	4,4	2,1				
	E40- 40-	4 000	40	40	32	32	17	10				
	E88- 300-	30 000							31,4			
		35 000							40			
		40 000							40			

3-way valves as diverting valves baelz 335, 342/347-B, 342/347-BK, 342/347-BK-SS, 347-BB, 347-BBK, 347-BBK-SS

	baelz type 373-	Thrust N	ND 15	20	25	32	Δ pmax bar g 40	50	65	80	100	125	150	200	250	300
Plug closing with the flow	E02- 10-	1 000	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,5				
	E06- 20-	2 000	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6				
	E07- 20-	2 000	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6				
	E11- 20-	2 000	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6				
	E40- 40-	4 000	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6				
	E60- 90-	9 000											0,6	0,4	0,2	0,1
	E88- 100-	10 000											1	0,6	0,6	0,6
	E88- 300-	30 000											1	0,6	0,6	0,6

For actuator **baelz E88**: Please indicate exactly in case of order:

baelz 373	E88-100 10.000N	**- Torque**	**adjusted at**	**16**	**Nm**
baelz 373	E88-100 13.000N	**- Torque**	**adjusted at**	**21**	**Nm**
baelz 373	E88-100 16.000N	**- Torque**	**adjusted at**	**26**	**Nm**
baelz 373	E88-300 30.000N	**- Torque**	**adjusted at**	**72**	**Nm**
baelz 373	E88-300 35.000N	**- Torque**	**adjusted at**	**84**	**Nm**
baelz 373	E88-300 40.000N	**- Torque**	**adjusted at**	**96**	**Nm**

Bälz-electrodyn - control valves and control actuators

Non-balanced valves, plug closing against flow, 3-way valves as mixing valves

Pneumatic actuators **baelz 334, 340-B/BB, 340-BK/BBK, 340-BK-SS/BBK-SS, 340-ES, 344, 346-22, 356, 356-K, 356-K-SS, 358-K, 359-K, 359-ASA**

The corresponding nominal diameters see our Price List "Arbeits- und Preisbuch" and the working sheets.

The differential pressures below are reduced by the nominal pressure of the casing in case of: NP casing < diff. pressure.

2-way valves normally closed **(OPG)** — Plug closing against the flow

baelz 373-	Spring force N	control air pressure bar	ND / Δ pmax bar g 15	20	25	32	40	50	65	80	100	125	Values in brackets (...) for type 346-22 150	200	250	300
P21- 3	1 020	1,2	29	29	16	9,9	6,3	4,6	2,7	1,8	1	0,6				
P21- 6	2 040	3	40	40	35	21	13,5	8,9	5,2	3,4	2,2	1,4				
P21- 12	3 390	6	40	40	40	36	23	14	8	5	3,5	2,1				
P21- 18	4 030	6	40	40	40	40	27	18	10	7	4,5	2,8				
P21- V6	7 590	6	40	40	40	40	40	34	20	13	8	5				
P31- 3	2 480 / (4223)	1,2					(27)	(17)	(9,6)	(6,1)	(3,6)	(2,1)	1,1			
P31- 6	4 960 / (8446)	3					(57)	(35)	(21)	(13)	(8,5)	(5,5)	2,4			
P31- 18	10 560 / (18120)	6					(120)	(80)	(40)	(30)	(19)	(12)	5,3			
P41- 3	3 765	1,2											2,4	1	0,6	0,4
P41- 6	7 530	3					(103)	(65)	(38)	(25)	(15)	(10)	5	2	1,3	0,9
P41- V6	31 920	6					(290)	(186)	(110)	(65)	(45)	(29)	17	8,5	5,2	3,6

baelz 334, 340-B/BB, 340-BK/BBK, 340-BK-SS/BBK-SS, 340-ES, 344, 356, 356-K, 356-K-SS, 358-K, 359-K, 359-ASA

2-way valves normally open **(OPO)** — Plug closing against the flow

baelz 373-	Spring force N	control air pressure bar	ND / Δ pmax bar g 15	20	25	32	40	50	65	80	100	125	150	200	250	300
P21- 3	1 020	1,2	7	7	4,5	2,8	1,8	1,1	0,6	0,4	-	-				
		3	40	40	40	40	31	19	12	8	5	3				
		6	40	40	40	40	40	40	30	20	12	8				
P21- 6	2 040	3	40	40	35	21	14	8	5,3	3,5	2,2	1,4				
		6	40	40	40	40	40	39	24	16	10	6				
P31- 3	2 480	1,2											0,6			
		3											6			
		6											14,8			
P31- 6	4 960	3											3			
		6											12			
P41- 3	3 765	1,2											1,2	0,7	0,4	0,3
		3											12	6,8	4,3	3
		6											30	17	11	7,5
P41- 6	7 530	3												5	3	2
		6												15	10	6

3-way mixing valves baelz 335, 342/347-B/BK/BK-SS, 347-BB/BBK/BBK-SS, 342/347-ES, 353, 354

baelz 373-	Spring force N	control air pressure bar	ND / Δ pmax bar g 15	20	25	32	40	50	65	80	100	125	150	200	250	300
P21- 3	1 020	1,2	7	7	4,5	2,8	1,8	1,1	0,6	0,4	0,3	0,2				
P21- 6	2 040	3	40	40	35	21	13,5	8	5	3,4	2,2	1,4				
P21- 12	3 390	6	40	40	40	36	23	14	8	5	3,5	2,1				
P21- 18	4 030	6	40	40	40	40	27	18	10	7	4,5	2,8				
P21- V6	7 590	6	40	40	29	18	11,5	7	4,3	2,8	1,8	1,2				
P31- 3	2 480	1,2											0,6			
P31- 6	4 960	3											2,3			
P31- 18	10 560	6											5			
P41- 3	3 765	1,2											2,4	1	0,65	0,45
P41- 6	7 530	3											4,8	2	1,3	0,9
P41- V6	31 920	6											8,2	3,5	2,3	1,6

3-way diverting valves baelz 335, 342/347-B/BK/BKSS, 347-BB/BBK/BBK-SS

all		**1,2-6**	All diverting valves can only be used at a differential pressure up to 0,6 bar. If you need a diverting valve with differential pressure > 0,6 bar, the actuator has to be supplied with a attenuation tank.

Bälz-electrodyn - control valves and control actuators

Balanced valves for fluids baelz 340-B-EM, 344-EM, 340-BB-EM

Pneumatic actuators

The corresponding nominal diameters see our Price List "Arbeits- und Preisbuch" and the working sheets.

2-way valves normally closed **(OPG)**

	baelz 373-	Spring force N	control air pressure bar	ND / Δpmax bar g 40	50	65	80	100	125	150	200	250	300
	P21- 3	1 020	1,2	18	13	7	5	3	1,8				
	P21- 6	2 040	3	39	24	15	9	6	4				
Plug	P21- 12	3 390	6	40	40	22	14	10	6				
closing	P21- 18	4 030	6	40	40	27	19	12	8				
against	P21- V6	7 590	6	40	40	40	36	22	13				
the flow	P31- 3	2 480	1,2							3,3			
	P31- 6	4 960	3							7			
	P31- 18	10 560	6							15			
	P41- 3	3 765	1,2							7,2	3	1,8	1,2
	P41- 6	7 530	3							15	6	3,9	2,7
	P41- V6	31 920	6							40	30	19	13

3-way diverting valves and 3-way mixing valves baelz 347-B-EM, 347-BB-EM

	baelz 373-	Spring force N	control air pressure bar	ND / Δpmax bar g 40	50	65	80	100	125	150	200	250	300
	P21- 3	1 020	1,2	4	2,5	1,7	1	0,7	0,5				
	P21- 6	2 040	3	32	20	12	8	5	3				
	P21- 12	3 390	6	40	35	21	14	9	4,8				
	P31- 3	2 480	1,2							3,3			
	P31- 6	4 960	3							7			
	P31- 18	10 560	6							15			
	P41- 3	3 765	1,2							7,2	3	1,8	1,2
	P41- 6	7 530	3							15	6	3,9	2,7
	P41- V6	31 920	6							40	30	19	13

Balanced valves for steam baelz 346-EMB

	baelz 373-	Spring force N	control air pressure bar	ND / Δpmax bar g 40	50	65	80	100	125	150
Plug	P21- 6	2 040	3	40	21	11,5	10,8	4,6	2,3	
closing	P21- 12	3 390	6	40	40	25,7	25,7	13	7,9	
against	P21- 18	4 030	6	40	40	32	32	17	10,6	
the flow	P21- V6	7 590	6	40	40	40	40	40	25,7	
	P41- V6	31 920	6							39

The same or even smaller pmax. from ND 65 to ND 80 result from the construction of the balancing surface of the valves ND 65.
The construction of the valves ND 65 does not allow an equal balance as with ND 80.
This difference in balance becomes much apparent with actuators with small thrusts; with higher thrusts, this influence fails.
The balancing bellow can only be moved with a proportionally high force. Therefore, the actuators P31... to P41-6 are not suitable.
Electric actuators analogous.

Bälz-electrodyn - control valves and control actuators

1.5 Code for model types

control valves and ejectors

baelz - □□□□□ - □□□ - □□ - ND □□□ NP □□ □□□

(1) (2) (3) (4) (5) (6)

(1)	baelz type:	- 185, 192, 334 or 340 ...
(2)	B or BB	- universal valve, max. 240°C
	K, BK or BBK	- with cooling tube, max. 350°C
	ES	- stainless steel valve
	VA	- stainless steel valve
	EMB or EMF	- balanced valve for steam
	EM	- balanced valve for liquids
	ASA	- ANSI valve
	22	- valve with spindle Ø 22 mm
(3)	SS	- with bellows for hot oil
	EM	- balanced valve for liquids
	VA	- stainless steel valve
	C or CC	- balanced valve with fixed cage and piston guided plug
(4)	ND	- nominal diameter
(5)	NP	- nominal pressure
(6)	Kvs	- Kvs values
	LK	- cage plug

motorized actuator

baelz 373 - E □□- □- □□□ - □□ - □□□□ - (5) - (6)

(1) (1a) (2) (3) (4)

(1)	baelz type:	- E02, E06, E07, E11, E13, E40, E60, E88
(1a)	D	- only for E11, without power pushing
	Z	- only for E11, without power drawing
(2)		- thrust x 100 in N (20 x 100 = 2000 N thrust)
(3)		- positioning velocity in mm / min.
(4)	type of yoke	- S21, S31, S41 - S31C for valve with cooling tube S41C for valve with coolling tube
(5)		- accessories (2EZ, Fg, 2 EZ - Fg)
(6)		- voltage / frequency (230, 115 or 24 V / 50 or 60 Hz)

pneumatic actuator

baelz 373 - P □□□ - □□ - □□ - □□□□ - □□□ - (6) - (7)

(1) (2) (3) (4) (5)

(1)	baelz type:	- P21, P22, P31, P32 or P41
	P21L, P22L	- bigger spindle Ø
(2)	V6	- quantity of springs (3, 6, 12 or 18) - with enforced springs
(3)	Fo	- spring above (above diaphragm)
	Fu	- spring below (below diaphragm)
(4)	type of yoke	- S21, S31, S41 - S31C for valve with cooling tube - S41C for valve with cooling tube
(5)	H21 or H31	- manuel override (not for V6)
(6)		- stroke in mm
(7)		- accessories (1PEZA, 1PEZZ, 2PEZAZ, Ex, INI, GFg)

Bälz-electrodyn - control valves and control actuators

2. Applications of industrial valves

2.1 Steam - side control applications

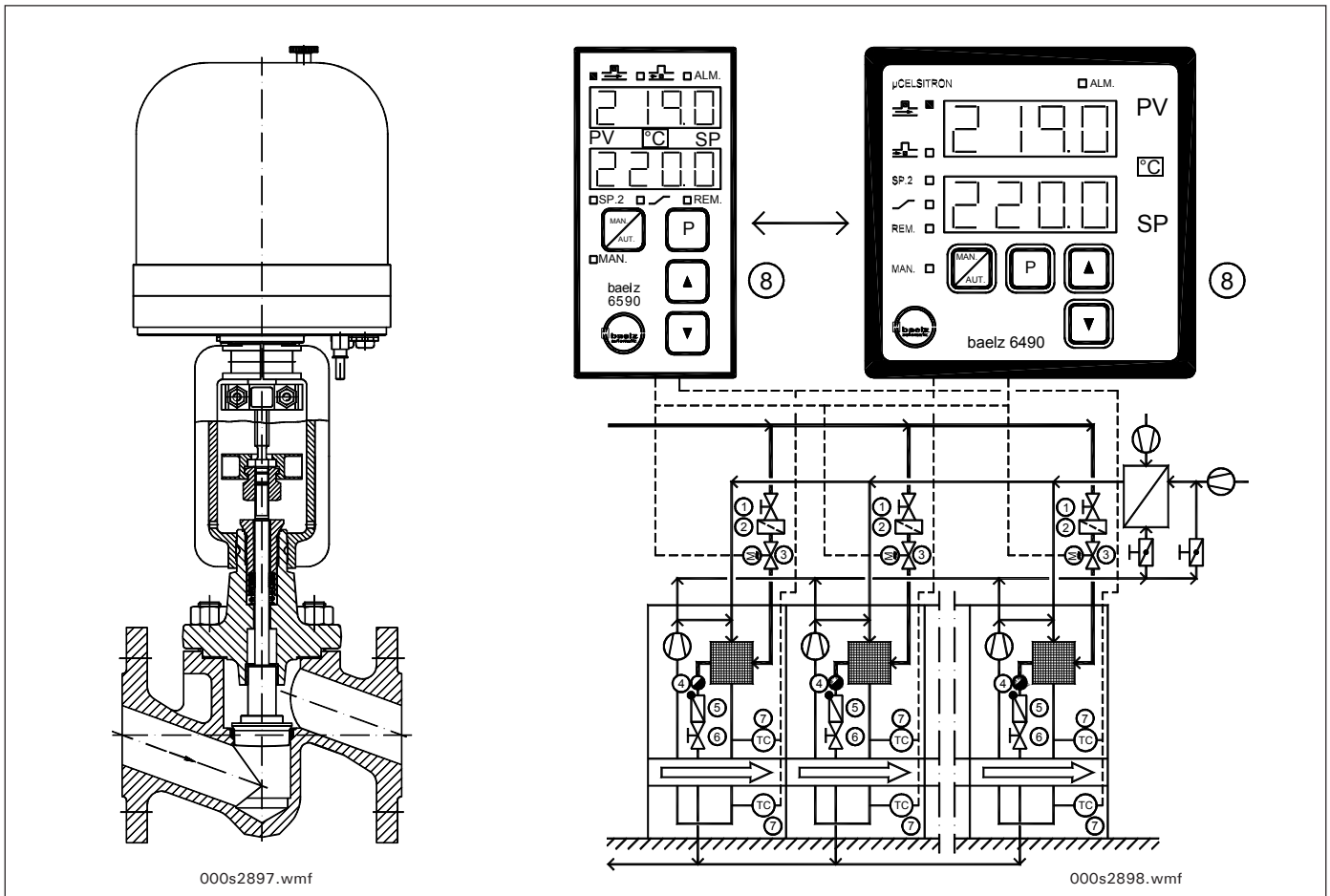


Fig. 3 steam - side control valves baelz 356 on a textile dryer / stenter with baelz controllers 6490 / 6590

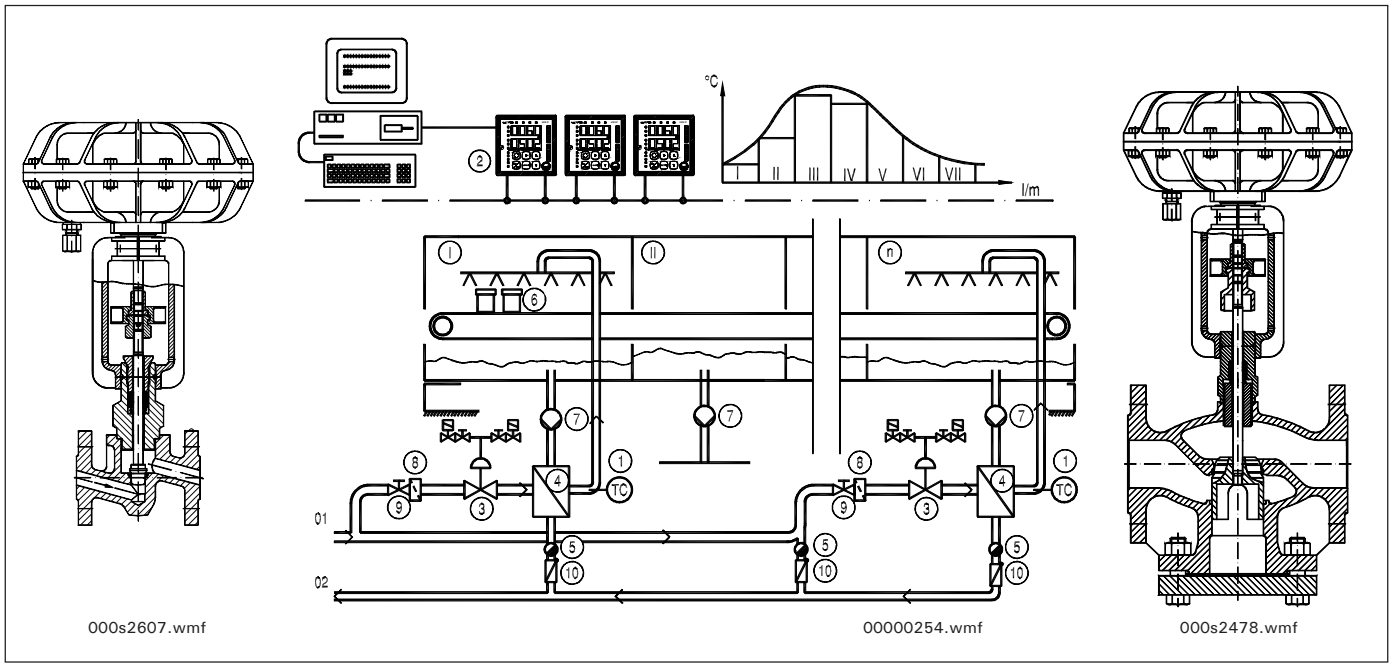


Fig. 4 steam - side control valves on a tunnel pasteurizer, left hand baelz 356, right hand baelz 340

Bälz-electrodyn - control valves and control actuators

2.2 Condensate outlet control applications

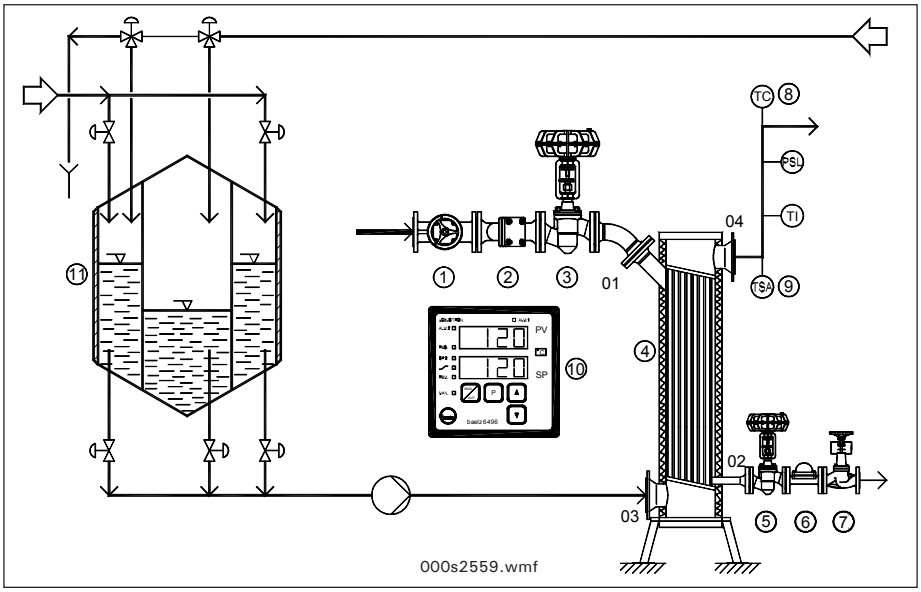


Fig. 5
condensate outlet control of a steam / water heat-exchanger for CIP use in food industry

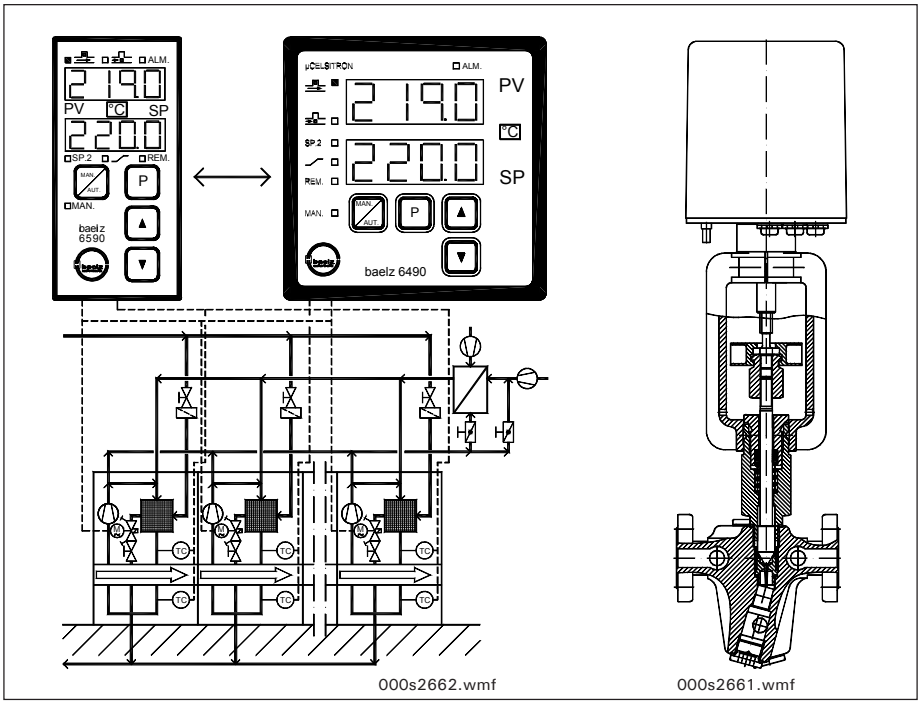


Fig. 6
condensate outlet control of steam heated air heaters on a dryer / stenter with baelz 185

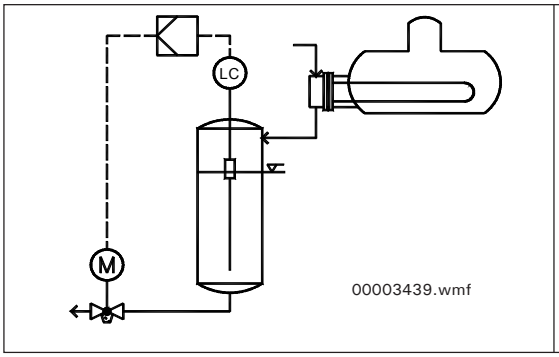


Fig. 7 electronic steam trap; level control

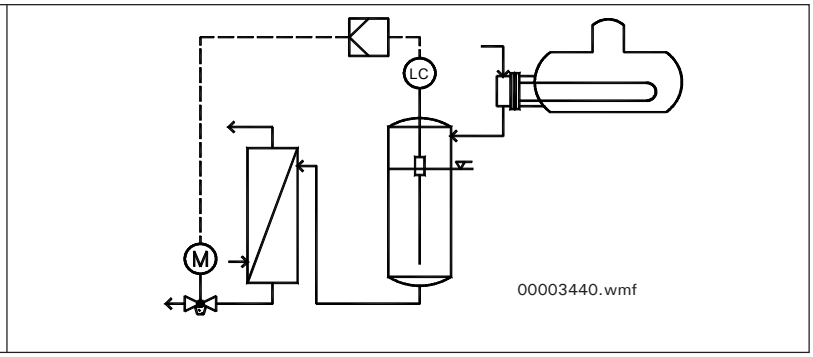
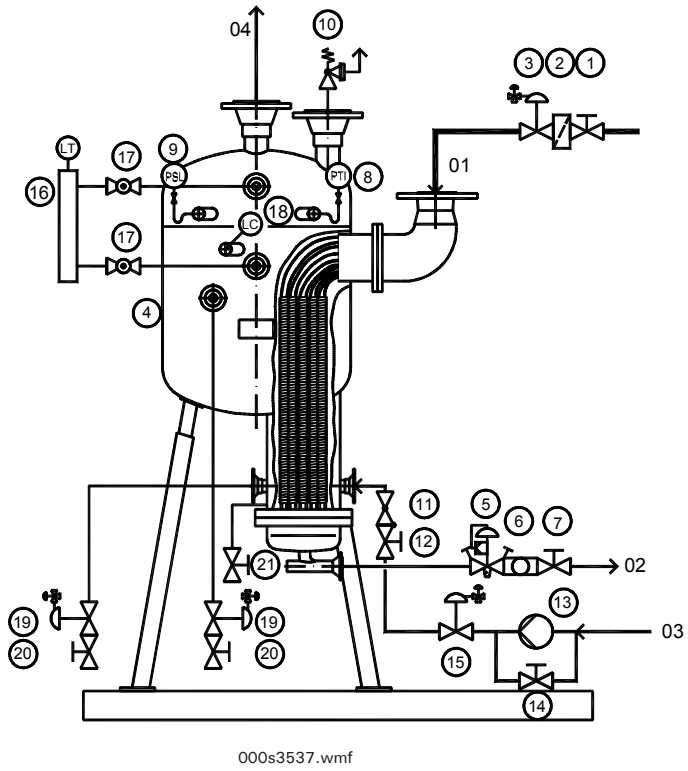


Fig. 8 electronic steam trap with condensate cooler; level control

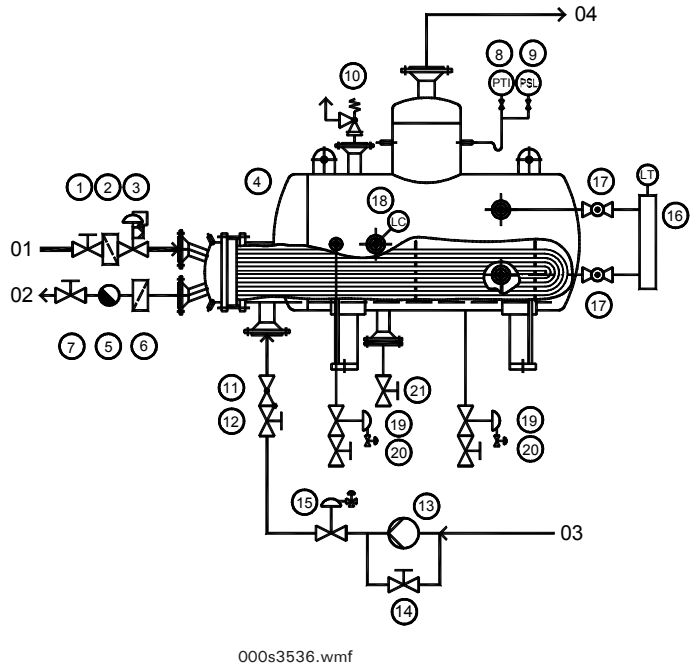
Bälz-electrodyn - control valves and control actuators



000s3537.wmf

Fig. 9
vertical condensate outlet controlled steam generator

Part list:
1 manual valve baelz 700.... ND .... NP ....
2 strainer baelz 70200 ND .... NP ....
3 emergency stop valve with electric or pneumatic actuator baelz 356-373- ..... ND .... NP ....
4 vertical steam generator baelz 120 capacity ..... kg/h; pressure ..... bar g
5 pressure control valve with electric or pneumatic actuator baelz 185-373- ..... ND 15 NP 16/25/40
6 condensate flow controller baelz 70315 ND .... NP ....
7 manual valve baelz 700.... ND .... NP ....
8 pressure transmitter baelz 828
9 safety pressure switch baelz 835/5
10 safety valve baelz 70340 or 70340-VA ND .... NP ....
11 check valve baelz 70084-VA ND .... NP .....
12 manual valve baelz 700.... ND .... NP ....
13 feedwater pump baelz 740- ..... ; ..... m³/h; ..... mWH; 230 or 400 V, 50 Hz
14 Qmin valve baelz 185-VA-260st ND 15 NP 40
15 level control valve with electric or pneumatic actuator baelz 356-373- ..... ND .... NP ....
16 level transmitter baelz 1771-K-450-i-ZMU-2BGU/ME 450 mm
17 hand ball valve baelz 70170-VA ND 20 NP 16
18 conductivity sensor baelz 1750-5-330 and conductivity relay baelz 1753-2
19 Deconcentration and mud blow down valve baelz 185-VA-266st-VA and baelz 356-MS-373-P21-270-M ND .... NP ....
20 manual valve baelz 700.... ND .... NP ....
21 manual valve baelz 700.... ND .... NP ....
22 mud blow-down timer baelz 456-2
23 pressure controller baelz 6490/6496
24 level controller baelz 6490/6496



000s3536.wmf

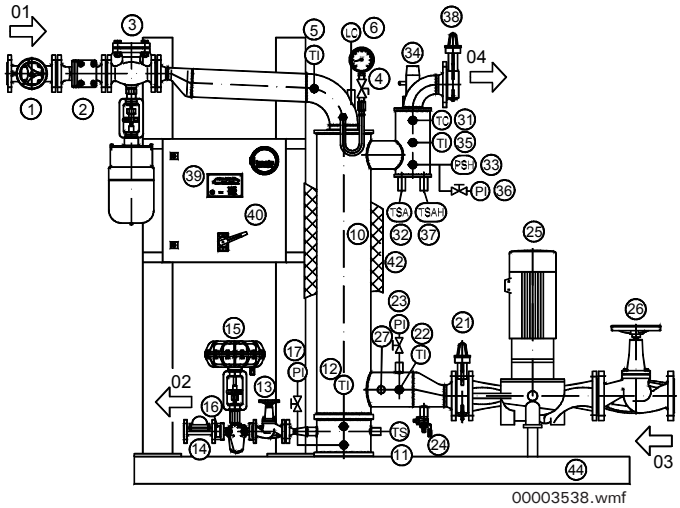
Fig. 10
horizontal steam, hot oil or hot water heated steam generator

Part list:
1 manual valve baelz 700.... ND .... NP ....
2 strainer baelz 70200 ND .... NP ....
3 pressure control valve with electric or pneumatic actuator baelz 356-373- ..... ND .... NP ....
4 horizontal U-tube steam generator baelz 122/142 capacity ..... kg/h; pressure ..... bar g
5 steam trap baelz 70310 ND .... NP ....
6 strainer baelz 70200 ND .... NP ....
7 manual valve baelz 700.... ND .... NP ....
8 pressure transmitter baelz 828
9 safety pressure switch baelz 835/5
10 safety valve baelz 70340 or 70340-VA ND .... NP ....
11 check valve baelz 70084-VA ND .... NP .....
12 manual valve baelz 700.... ND .... NP ....
13 feedwater pump baelz 740- ..... ; ..... m³/h; ..... mWH; 230 or 400 V, 50 Hz
14 Qmin valve baelz 185-VA-260st ND 15 NP 40
15 level control valve with electric or pneumatic actuator baelz 356-373- ..... ND .... NP ....
16 level transmitter baelz 1771-K-450-i-ZMU-2BGU/ME 450 mm
17 hand ball valve baelz 70170-VA ND 20 NP 16
18 conductivity sensor baelz 1750-5-330 and conductivity relay baelz 1753-2
19 Deconcentration and mud blow down valve baelz 185-VA-266st-VA and baelz 356-MS-373-P21-270-M ND .... NP ....
20 manual valve baelz 700.... ND .... NP ....
21 manual valve baelz 700.... ND .... NP ....
22 mud blow-down timer baelz 456-2
23 pressure controller baelz 6490/6496
24 level controller baelz 6490/6496

Bälz-electrodyn - control valves and control actuators

Fig. 11 with spiral tube type

baelz 106



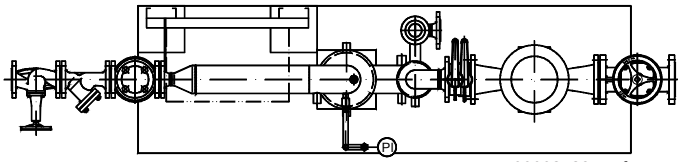
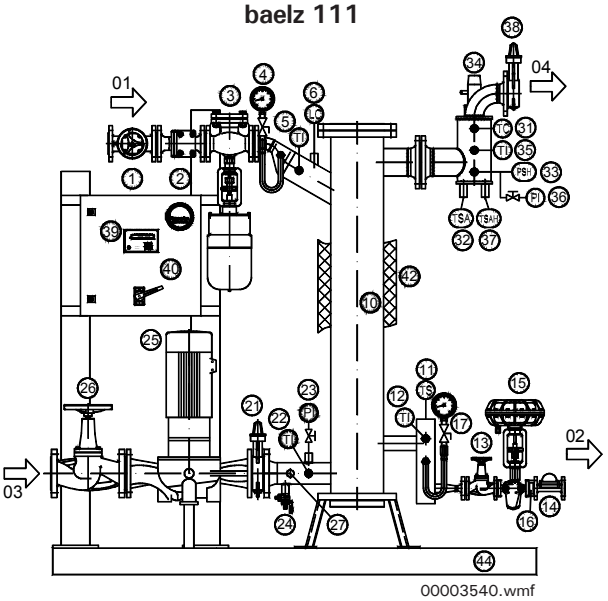


Fig. 12 with straight tube type

baelz 111



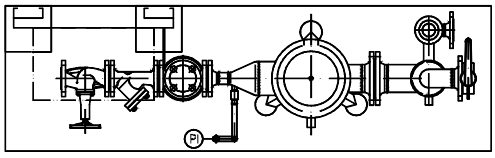
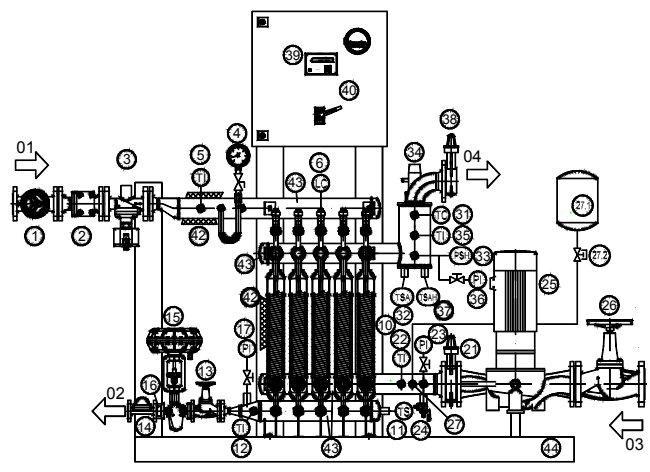


Fig. 13 with copper module

baelz 147



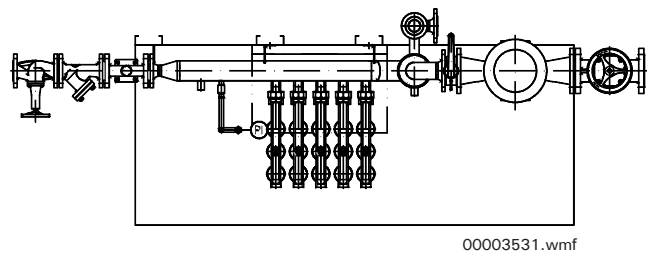
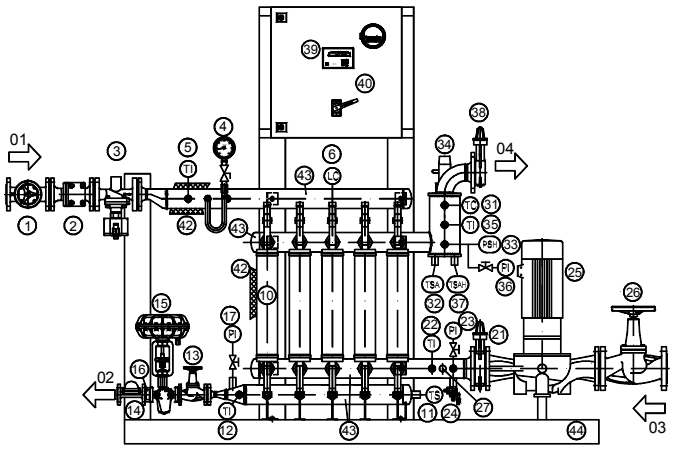
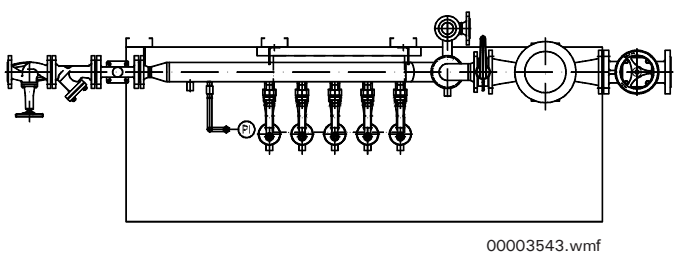


Fig. 14 with stainless steel module

baelz 150





Bälz-electrodyn - control valves and control actuators

3. Short presentation of all 16 available 2-way control valves from baelz 185 to baelz 360

3.1 Valve serie baelz 185 and baelz 185-VA (completely in stainless steel) ND 15 + ND 25 NP 40

185-E07-3.JPG

Fig. 15 baelz 185 with 373-E07-260st

185-P21-88-2EZ.JPG

Fig. 16 baelz 185 with 373-P21-88-2EZ

The microflow multipurpose control valve covers the following features:

- body in stainless steel with steel plugs (standard) or SS plugs
- incorporated strainer
- possibility to provide 2 manual isolating valve pilots
- can be used as (Fig. 19):
  - hand valve
  - motorized valve
  - pneumatic valve
  - solenoid valve
- available with 10 different Kvs-values in ND 15: 0,025 / 0,04 / 0,1 / 0,12 / 0,16 / 0,3 / 0,6 / 1 / 1,2 / 1,4

Bälz-electrodyn - control valves and control actuators

Checklist:
ND: 15 + 25
NP: 16 / 25 / 40
standard body:
steel + stainless steel
special body:
completely stainless steel
temperatures:
min.: -10°C
max.: +240°C
speciality: incorporated strainer; 2 manual valve pilots baelz 260st

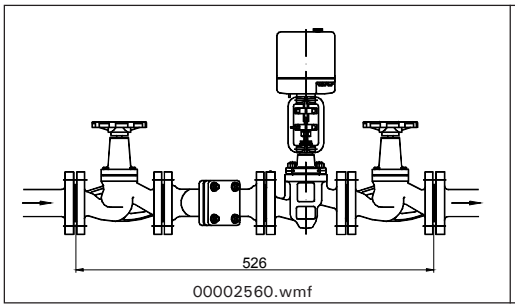


Fig. 17
conventional pipe work with 4 units
face - to - face length: 526 mm

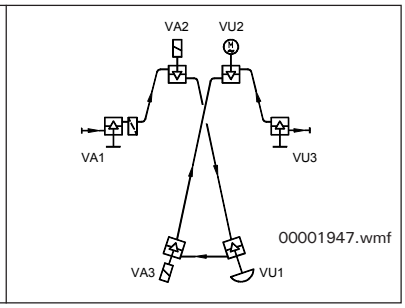


Fig. 18
185 pipe work, 1 unit instead of 4
face - to - face length: 130 mm

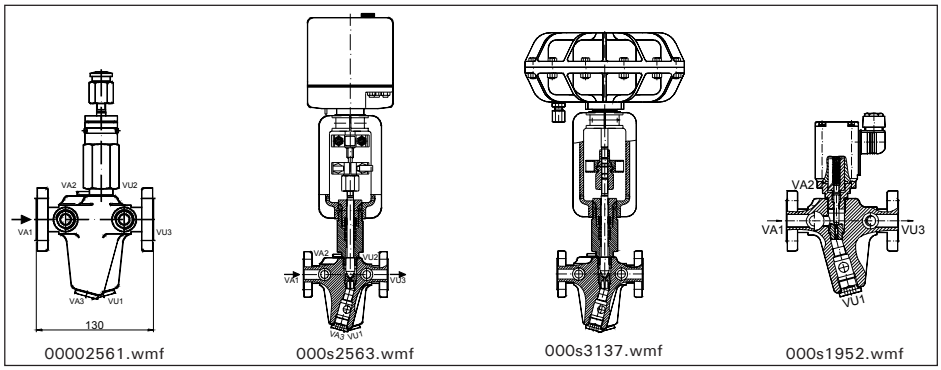


Fig. 19
body lay - out ND 15 | 185-373-E02 motorized valve | 185-373-P21 pneumatic valve | 185-266st solenoid valve

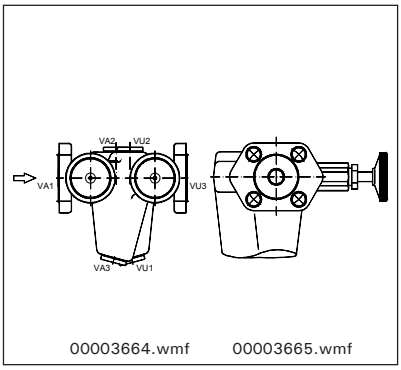


Fig. 20
185-260st-260st
with 2 manual valve pilots
(to clean strainer)

Text for quotations + orders:

2-way multi-purpose control valve with electric*1 or with pneumatic actuator*2 and i/p positioner, with incorporated strainer
baelz 185-373-XX ND 15, NP 40
Kvs = 0.025 / 0.04 / 0.1 / 0.12 / 0.16 / 0.3 / 0.6 / 1.0 / 1.2 / 1.4*3
with parabolic plug
Kvso = 0.004%
body material: stainless steel X20Cr13 – 1.4021
trim in stainless steel; stuffing box: V-rings in PTFE
max. 240°C/40 bar; stroke: 16 mm
flow ..... m³/h or ..... kg/h; pressure drop Δp_{100} = ... bar
max. closing pressure Δp_0 = 40 bar

with motorized actuator for open – stop – close control
baelz 185-373-E07-20-18-S21-230
Order No.: 185-002 + 373-E07-20-18-301

with motorized actuator for control signal 0...10 V or 4...20 mA
baelz 185-373-E07-20-18-S21-Fg5kΩ-230-1020-230-M
Order No.: 185-002 + 373-E07-20-18-411 + 1020-051 + 1020-151-M230/115

with pneumatic actuator and i/p positioner
baelz 185-373-P21-6-Fo-86/IP6000-M
Order No.: 185-002 + 373-P21-017 + 86-002
Supplement completely in stainless steel baelz 185-VA

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*3
available Kvs values
see page 5

ND	15										25			
Kvs	0,025	0,04	0,10	0,12	0,16	0,3	0,6	1,0	1,2	1,4	1,4	2,0	3,0	5,0

Bälz-electrodyn - control valves and control actuators

3.2 Valve serie baelz 192

Multipurpose self acting pressure reducing valve
with on - off solenoid pilot; for steam only

Checklist:
ND: 15 - 125
NP: 16 / 40
standard body:
GJS-400-18-LT (GGG40.3)
GP240GH (GS-C25)
temperatures:
max.: 240°C
speciality: self acting
type: min. 1 bar
differential pressure
needed to open this
valve; for pressure
reduction and on - off;
the ideal valve ahead of
heat - exchangers

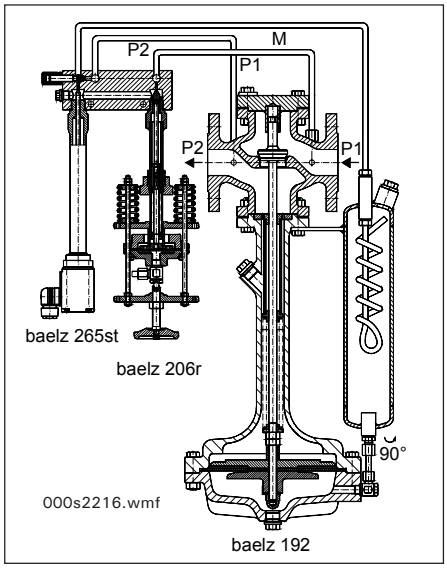


Fig. 21
192-206r-265st
steam pressure reducing valve
with on - off solenoid pilot

Text for quotations + orders:

Steam-actuated universal valve
baelz 192A
with flanged connection,
without stuffing box
body : GJS-400-18-LT-JS1025 (GGG40.3)
internal parts : stainless steel and EPDM
temp./pressure : max.240°C/10 bar - 120°C/13 bar
with VA-VU control head to receive pressure and solenoid pilot valves

						*3
ND	15	20	25	32	40	
Kvs	5	6	8	15	24	
ND	50	65	80	100	125	
Kvs	35	70	105	135	200	

*3
available Kvs values
see page 5

Fig. 22 typical application of the baelz 192 as energency stop - valve and steam pressure reducing valve ahead of an steam / water heat - exchangers with condensate outlet control

Bälz-electrodyn - control valves and control actuators

3.3 Valve serie baelz 334

For HVAC 2-way valve, in bronze, externally threaded

Checklist:
ND: 1/2 - 1 1/2"
NP: 16 / 25
body: red bronze Rg5
temperatures:
min.: -10°C
max.: +140°C *
externally threaded

* with silicone o-ring
max.: +190°C

ND	½	¾	1	1¼	1½	*3
Kvs	3,5	5	9	16	22	

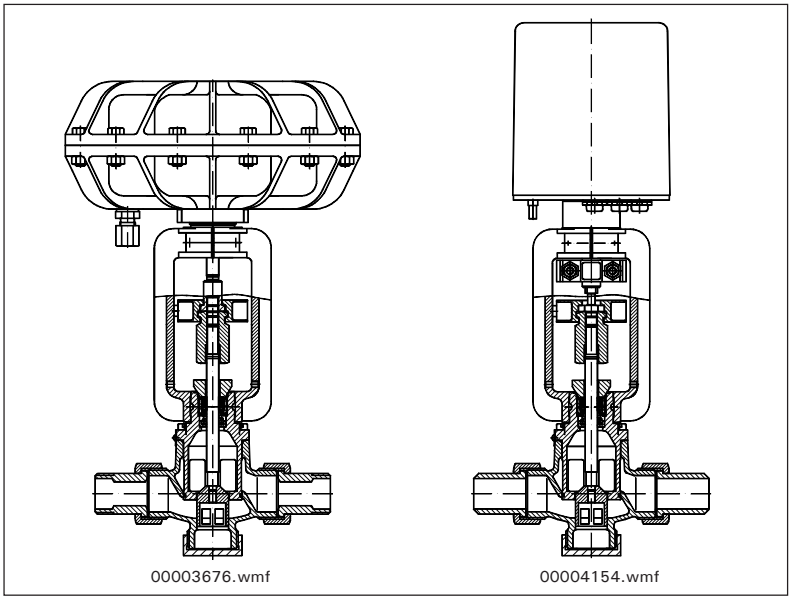


Fig. 23
334-373-P21 with threaded socket
334-373-E07 with weld-on socket

Text for quotations + orders:

2-way control valve baelz 334 NP 16/25
without actuator*1*2
Kvso = 0.004%
body/seat : red bronze Rg5
plug/spindle : stainless steel
stuffing box : V-rings in PTFE
temp./pressure : max. –10… + 140°C/22 bar
connection : with union nut in brass and weld-on socket or threaded socket
stroke : 12 mm
flow : .....
pressure drop
Δp_{100} : ..... bar
max. closing pressure*4
Δp_0 : ..... bar

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*3
available Kvs values
see page 5

*4
pressure Δp_0
see page 7 - 9

Fig. 24 2-way valve for HVAC applications

Bälz-electrodyn - control valves and control actuators

3.4 Valve serie baelz 340-B and 340-BB - available in stainless steel - 2-way valve

High volume selling universal 2-way valve, based on a 3-way body

Checklist:
ND: 15 - 300
NP: 16 / 25 / 40
standard body:
NP 16 + NP 25:
GJS-400-18-LT (GGG 40.3)
NP 40: GP240GH (GS-C25)
temperatures:
min.: -10°C
max.: +240°C or
+350°C type K
for hot oil / bellows type:
type K-SS: 350°C
spindle Ø: 10 mm
S 21: ND 15 - 125
spindle Ø: 22 mm
S 31 / 41: ND 150 - 300

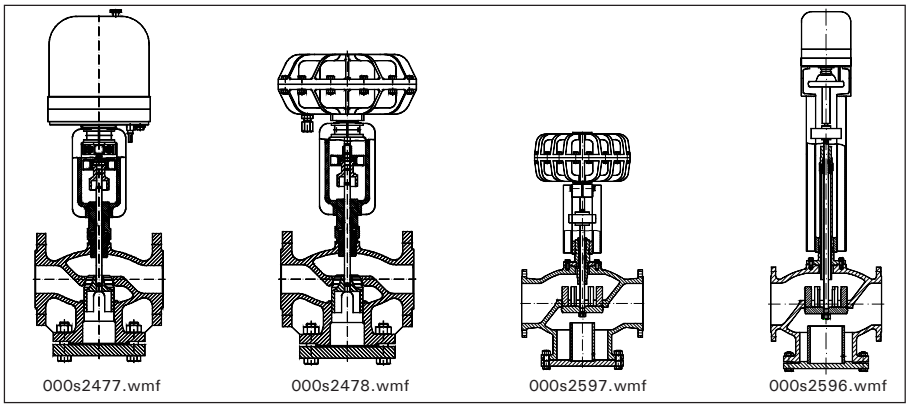


Fig. 25
motorized valve ND 15 - 125 | pneumatic valve ND 15 - 125 | up to 240°C motorized / pneumatic valve ND 150 - 300 mm | over 240°C up to 350°C

ND	15			20	25	32	40	50	65	80	100	125	150	200	250	300	*3
Kvs	2,0	3,0	5,6	6,3	9	16	25	36	63	105	130	200	360	580	960	1340	

*3
available Kvs values
see page 5


340-B-DN32-E07.JPG

Fig. 26
baelz 340-B with 373-E07


340-B-DN40-P21.JPG

Fig. 27
baelz 340-B with 373-P21


340-BB-E88-DN200.JPG

Fig. 28
baelz 340-BB with 373-E88

Bälz-electrodyn - control valves and control actuators

Text for quotations + orders:

We recommend to install ahead of each control valve a strainer baelz 70200.
2-way control valve with electric*1 or with pneumatic actuator*2
and i/p positioner
baelz 340-B-373-XX
with equal percentage V-port plug
Kvso = 0.004%
body material ND 15 - 125: GJS-400-18-LT – JS 1025 (GGG 40.3)
trim in stainless steel
stuffing box: V-rings in PTFE
max. 240°C/11 bar or max. 120°C/16 bar
stroke ND 15 - 25: 12 mm
ND 32 - 125: 22 mm
flow ..... m³/h or ..... kg/h of steam/water/....
pressure drop Δp_{100} = ... bar
max. closing pressure Δp_0 = ... bar*4

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*4
pressure Δp_0
see page 7 - 9

Control valve type 340-B-373-XX			NP 16					
			with motorized actuator XX = 373-E07-20-18-S21-230			with motorized actuator XX = 373-E40-40-20-S21-230		
ND	stroke [mm]	Kvs [m³/h]	Δp_0 max. [bar]	Order No.		Δp_0 max. [bar]	Order No.	
15	12	5.6	16	340-2115				
20	12	6.3	16	340-2116				
25	12	9	16	340-2117				
32	22	16	16	340-2118				
40	22	25	12	340-2119				
50	22	36	8	340-2120		16	340-2320	
65	22	63	4.6	340-2121		10	340-2321	
80	22	105	2.9	340-2122		6.9	340-2322	
100	22	130	1.7	340-2123		4.4	340-2323	
125	22	200	1	340-2124		2.8	340-2324	

Control valve type 340-B-373-XX			NP 16			
			with pneumatic actuator and i/p positioner XX = 373-P21-YY-Fu-S21-86/IP6000-M			
ND	stroke [mm]	Kvs [m³/h]	YY	Δp_0 max. [bar]	Order No.	
15	12	5.6	06	16	340-2615	
20	12	6.3	06	16	340-2616	
25	12	9	06	16	340-2617	
32	22	16	06	16	340-2618	
40	22	25	06	13.5	340-2619	
50	22	36	06	8.9	340-2620	
65	22	63	12	8	340-2621	
80	22	105	18	7	340-2622	
100	22	130	V6	8	340-2623	
125	22	200	V6	5	340-2624	

strainer type 70200 NP 16		
GJS-400-18-LT (GGG 40.3) max. 300°C/10 bar - 120°C/16 bar		
ND	Order No.	
15	70200-049	
20	70200-050	
25	70200-051	
32	70200-052	
40	70200-053	
50	70200-054	
65	70200-055	
80	70200-056	
100	70200-057	
125	70200-058	

Supplement for potentiometer 5 kΩ and sequence amplifier baelz 1020-230-M for baelz 373-E07 to receive a positioning signal 0-10 V or 4-20 mA
Supplement for potentiometer 5 kΩ and sequence amplifier baelz 1020-230-M for baelz 373-E40 to receive a positioning signal 0-10 V or 4-20 mA
Supplement for potentiometer 5 kΩ and sequence amplifier baelz 1020-230-M for baelz 373-E11 to receive a positioning signal 0-10 V or 4-20 mA
Supplement for 3-way solenoid valve baelz 268/2-230-M for baelz 373-P21
Supplement for air pressure reduction set baelz 54298-¼"-M
Supplement for feedback potentiometer 0-5 kΩ: baelz 373-E07-Fg-5kΩ
baelz 373-E40-Fg-5kΩ
baelz 373-E11-Fg-5kΩ
Supplement for spring return actuator baelz 373-E11-20-17 with 2000 N instead of baelz 373-E07

Bälz-electrodyn - control valves and control actuators

3.5 Valve serie baelz 340-ES-AS and 340-ES-MS in stainless steel

Checklist:
ND: 25 + 50
NP: 16 / 25 / 40
body:
GX3CrNiMo13-4 (1.4313)
temperatures:
min.: -10°C
max.: +240°C or
+350°C type K
for hot oil / bellows type:
type K-SS: 350°C
spindle Ø: 10 mm

Text for quotations + orders:

2-way control valve in stainless steel
baelz 340-ES-AS NP 16/25/40
without actuator*1*2
Kvso = 0.004%
body material : GX3CrNiMo13-4 - 1.4313
internal parts in contact with the medium
: X6CrNiMoTi17-12-2 - 1.4571
stuffing box : V-rings in PTFE
NP 16 max. : 240°C/14 bar-120°C/16 bar
NP 40 max. : 240°C/35 bar-120°C/40 bar
stroke ND 15 – 25: 12 mm
ND 32 – 125: 22 mm
flow : .....
pressure drop
Δp_{100} : ..... bar
max. closing pressure*4
Δp_0 : ..... bar

ND	25	50	*3
Kvs	9	36	

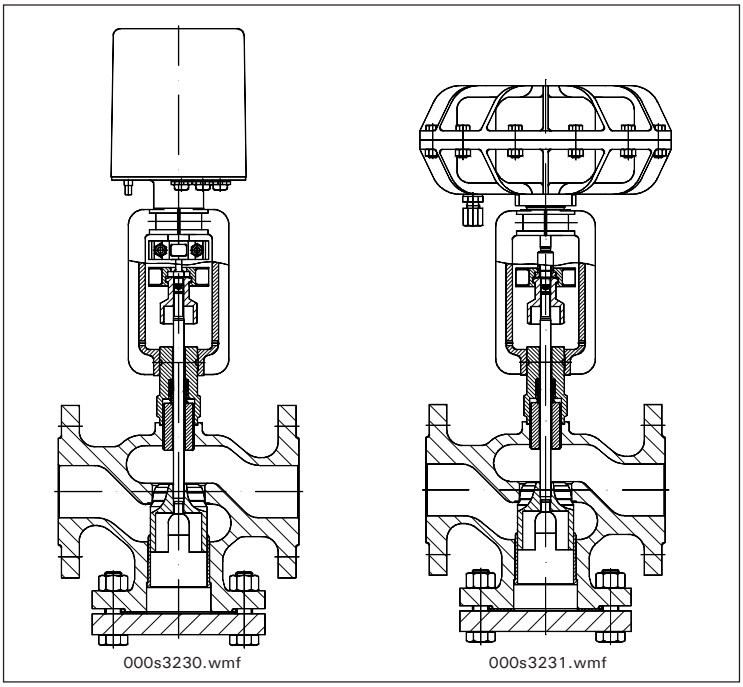


Fig. 29
baelz 340-ES with 373-E07 baelz 340-ES with 373-P21

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*3
available Kvs values
see page 5

*4
pressure Δp_0
see page 7 - 9

Fig. 30
baelz 340-ES with 373-E11

Bälz-electrodyn - control valves and control actuators

3.6 Valve serie baelz 340-BK-SS and baelz 340-BBK-SS

Checklist:
ND: 15 - 300
NP: 16 / 25 / 40
standard body:
NP 16 + NP 25:
GJS-400-18-LT (GGG 40.3)
NP 40: GP240GH (GS-C25)
temperatures:
min.: -10°C
max.: +350°C
spindle Ø: 10 mm
S 21: ND 15 - 125
spindle Ø: 22 mm
S 31 / 41: ND 150 - 300

*3

ND	15			20	25	32
Kvs	2,0	3,0	5,6	6,3	9	16
ND	40	50	65	80	100	125
Kvs	25	36	63	105	130	200
ND	150	200	250	300		
Kvs	360	580	960	1340		

*3 available Kvs values see page 5

*4 pressure Δp_0 see page 7 - 9

Text for quotations + orders:

2-way control valve with bellows
baelz 340-BK-SS NP 16
without actuator*1*2
Kvso = 0.004%
body material : GJS-400-18-LT – JS 1025 (GGG 40.3)
internal parts : stainless steel
stuffing box : with bellows and safety gland
medium : hot oil

temperature/pressure max.					
ND	15-125	150	200	250	300
°C/bar	350/8	350/8	350/6	350/3	350/2
°C/bar	120/16	120/10,6	120/6,7	120/3,8	120/2,2

stroke ND 15 – 25 : 12 mm
ND 32 – 125 : 22 mm
ND 150 : 44 mm
ND 200 – 300 : 66 mm
flow : .....
pressure drop
Δp_{100} : ..... bar
max. closing pressure*4
Δp_0 : ..... bar

*1 electric actuator see 373-EXX page 81 - 90

*2 pneumatic actuator see 373-PXX page 104 - 110

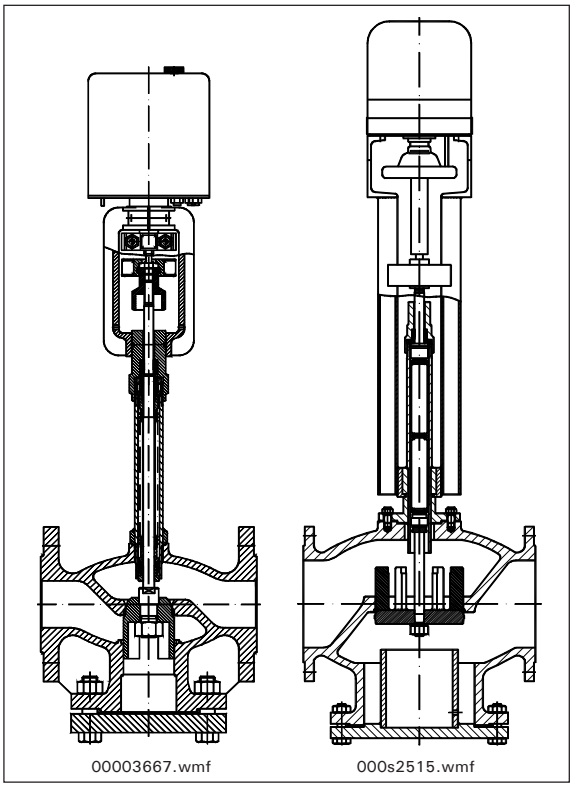


Fig. 31
baelz 340-BK-SS with 373-E07
baelz 340-BBK-SS with 373-E60


340-BK-SS-DN65-P21-IP86.JPG

Fig. 32
baelz 340-BK-SS with 373-P21 and IP86


340-BBK-SS-DN150-PN16-P31-IP86.JPG

Fig. 33
baelz 340-BBK-SS with 373-P31 and IP86

Bälz-electrodyn - control valves and control actuators

3.7 Valve serie baelz 340-B-EM and 340-BB-EM

2-way balanced valve for liquids

Checklist:
ND: 50 - 300
NP: 16 / 25
standard body:
GJS-400-18-LT (GGG 40.3)
temperatures:
min.: -10°C
max.: +225°C
spindle Ø: 10 mm
S 21: ND 50 - 125
spindle Ø: 22 mm
S 31 / 41: ND 150 - 300

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*3
available Kvs values
see page 5

*4
pressure Δp_0
see page 7 - 9

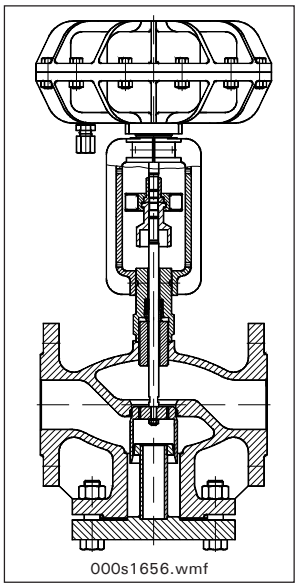


Fig. 34
340-B-EM-373-P21

Text for quotations + orders:

2-way balanced control valve
baelz 340-B-EM NP 16
without actuator*1*2
Kvso = 0.05%
body material : GJS-400-18-LT – JS1025
(GGG 40.3)

internal parts	: stainless steel	
stuffing box	: V-rings in PTFE	
water max.	: 225°C/13 bar - 120°C/16 bar	
steam max.	: 150°C/3,5 bar	
stroke	ND 50	: 12 mm
	ND 65 - 125	: 22 mm
	ND 150	: 44 mm
	ND 200 - 300	: 66 mm
flow	:	
pressure drop		
Δp_{100}	: ..... bar	
max. closing pressure*4		
Δp_0	: ..... bar	

ND	50	65	80	100	125	150	200	250	300	*3
Kvs	36	63	105	130	200	360	580	960	1340	

340-B-DN80-P21.JPG

Fig. 35
baelz 340-B-EM with 373-P21

Bälz-electrodyn - control valves and control actuators

3.8 Valve serie baelz 340-B-EMF and 340-BB-EMF

2-way balanced valve for steam

Checklist:
ND: 65 - 300
NP: 16 / 25 / 40
standard body:
NP 16 + NP 25:
GJS-400-18-LT (GGG 40.3)
NP 40: GP240GH (GS-C25)
temperatures:
min.: -10°C
max.: +240°C
spindle Ø: 10 mm
S 21: ND 65 - 125
spindle Ø: 22 mm
S 31 / 41: ND 150 - 300

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*3
available Kvs values
see page 5

*4
pressure Δp_0
see page 121-122

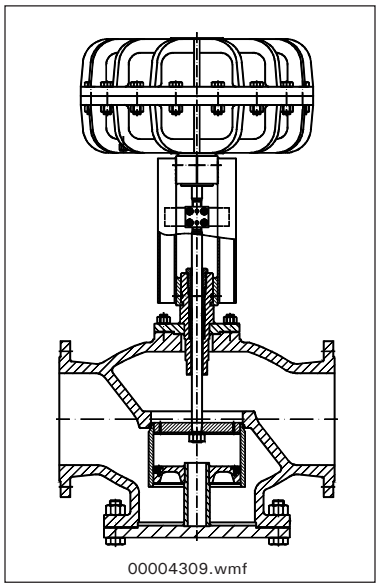


Fig. 36
340-BB-EMF-373-P41

Text for quotations + orders:

2-way balanced control valve
baelz 340-B-EMF NP 16/25
without actuator*1*2
Kvso = 0.004%
medium : steam
body material : GJS-400-18-LT – JS1025 (GGG 40.3)
internal parts : stainless steel
stuffing box : V-rings in PTFE
stroke ND 65 - 125 : 22 mm
ND 150 : 44 mm
ND 200 - 300 : 66 mm
flow : .....
pressure drop
Δp_{100} : ..... bar
max. closing pressure*4
Δp_0 : ..... bar

*3

ND	65	80	100	125	150	200	250	300
Kvs	63	105	130	200	360	580	960	1340

340-BB-EMF-P41-V6-8654298-270-DN200.JPG

Fig. 37
baelz 340-BB-EMF with 373-P41-V6

Bälz-electrodyn - control valves and control actuators

3.9 Valve serie baelz 344-VA and 344-EM-VA 2-way valve completely in stainless steel

Checklist: 344-VA
ND: 32 - 150
NP: 16 / 25 / 40
standard body:
GX5CrNiMo19-11 (1.4408)
temperatures:
min.: -10°C
max.: +240°C
spindle Ø: 10 mm
S 21: ND 32 - 125
spindle Ø: 22 mm
S 31 / 41: ND 150

Checklist: 344-EM-VA
ND: 50 - 125
NP: 16 / 25 / 40
standard body:
GX5CrNiMo19-11 (1.4408)
temperatures:
min.: -10°C
max.: +225°C
spindle Ø: 10 mm

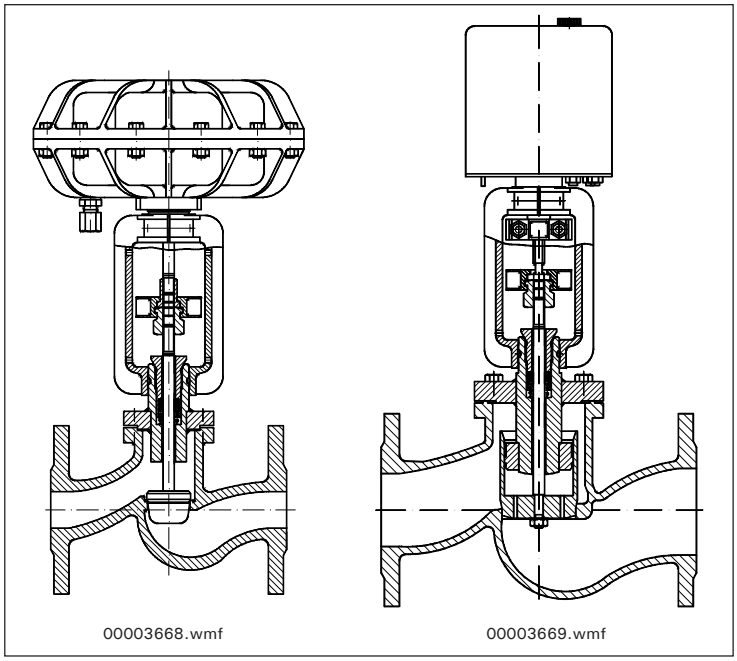


Fig. 38
344-VA-373-P21 344-EM-VA-373-E07

Text for quotations + orders:

2-way control valve in stainless steel
baelz 344-VA
without actuator*1*2
Kvso = 0.004%
body material : GX5CrNiMo19-11 - 1.4408
internal parts in contact with the medium
: X6CrNiMoTi17-12-2 - 1.4571
stuffing box : V-rings in PTFE
NP 16 max. : 240°C/10 bar - 100°C/13,5 bar
20°C/16 bar
NP 25 max. : 240°C/15,5 bar - 100°C/21,5 bar
20°C/25 bar
NP 40 max. : 240°C/25 bar - 100°C/34 bar
20°C/40 bar
stroke ND 32 - 125 : 22 mm
ND 150 : 44 mm
flow : .....
pressure drop
Δp_{100} : ..... bar
max. closing pressure*4
Δp_0 : ..... bar

Text for quotations + orders:

balanced 2-way control valve in stainless steel
baelz 344-EM-VA
without actuator*1*2
for liquid fluids
Kvso = 0.05%
body material : GX5CrNiMo19-11 - 1.4408
internal parts in contact with the medium
: X6CrNiMoTi17-12-2 - 1.4571
stuffing box : V-rings in PTFE
water:
NP 16 max. : 225°C/10,5 bar - 100°C/13,5 bar
20°C/16 bar
NP 25 max. : 225°C/16 bar - 100°C/21,5 bar
20°C/25 bar
NP 40 max. : 225°C/26 bar - 100°C/34 bar
20°C/40 bar
steam:
NP 16 max. :150°C/3,5 bar
stroke ND 50 - 125 : 22 mm
flow : .....
pressure drop
Δp_{100} : ..... bar
max. closing pressure*4
Δp_0 : ..... bar

*1
electric actuator
see 373-EXX page 81 - 90

*3
available Kvs values
see page 5

*1
pneumatic actuator
see 373-PXX page 104 - 110

*4
pressure Δp_0
see page 7 - 9

*3

ND	32	40	50	65	80	100	125	150
Kvs	15	25	39	63	92	136	215	315

Bälz-electrodyn - control valves and control actuators

3.10 Valve serie baelz 346-EMB

2-way balanced valve for steam

Checklist:
ND: 40 - 150
NP: 16 / 25 / 40
standard body:
NP 16 + NP 25:
GJS-400-18-LT (GGG 40.3)
NP 40: GP240GH (GS-C25)
temperatures:
min.: -10°C
max.: +240°C or
+350°C type K
with screw - in seat
and bellows for
pressure balancing

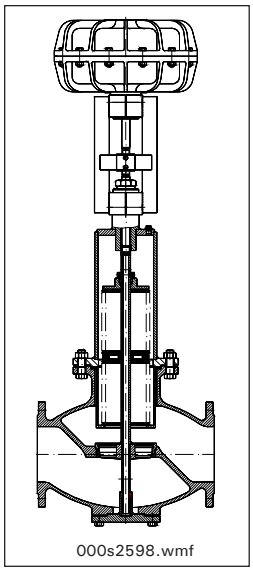


Fig. 39
346-EMB-373-P31

Text for quotations + orders:

balanced 2-way control valve
baelz 346-EMB NP 16/25
without actuator*1*2
Kvso = 0.004%
medium : steam
body material : GJS-400-18-LT – JS1025 (GGG 40.3)
internal parts : stainless steel
stuffing box : V-rings in PTFE
stroke ND 40-125 : 22 mm
ND 150 : 44 mm
flow : .....
pressure drop
Δp_{100} : ..... bar
max. closing pressure*4
Δp_0 : ..... bar

*3

ND	40	50	65	80	100	125	150
Kvs	20	36	50	63	90	100	200


346-EMB-P21-IP86-DN125.JPG

Fig. 40
346-EMB with 373-P21


346-EMB-DN50-PN40-E11.JPG

Fig. 41
346-EMB with 373-E11

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*3
available Kvs values
see page 5

*4
pressure Δp_0
see page 7 - 9

Bälz-electrodyn - control valves and control actuators

3.11 Valve serie baelz 346-22

standard 2-way control valve for high differential pressures

Checklist:
ND: 65 - 125
NP: 16 / 25 / 40
standard body:
NP 16 + NP 25:
GJS-400-18-LT (GGG 40.3)
NP 40:
GP240GH (GS-C25)
temperatures:
min.: -10°C
max.: +240°C or
+350°C type K
for hot oil / bellows type:
type K-SS-S31
spindle Ø: 22 mm

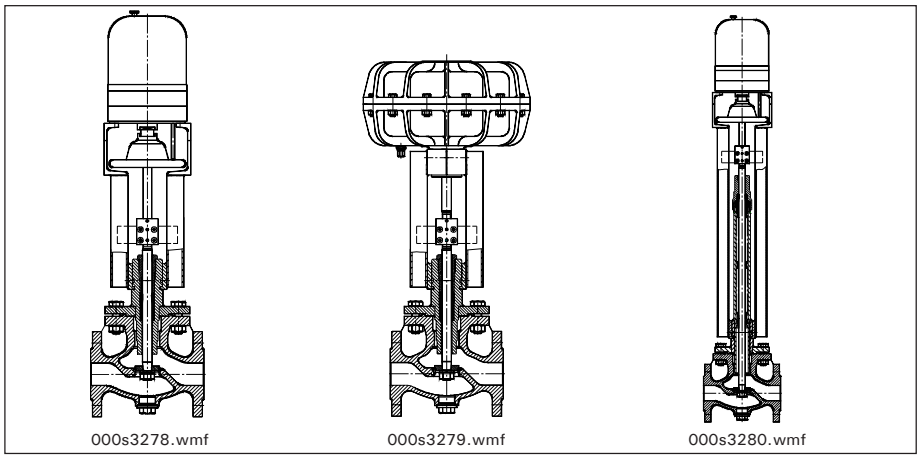


Fig. 42
346-22 with 373-E60 346-22 with P31-Fo 346-22-K-SS with 373-E60

Text for quotations + orders:

2-way control valve
baelz 346-22 NP 16
without actuator*1*2
Kvso = 0.004%
with stronger spindle for higher pressures
spindle-Ø 22 mm
suitable for mounting of 373-E60, -E88, -P31-18-Fo
body material : GJS-400-18-LT – JS1025 (GGG 40.3)
internal parts : stainless steel
stuffing box : V-rings in PTFE
temp./pressure : max. 240°C/11 bar - 120°C/16 bar
flow : .....
pressure drop
Δp_{100} : ..... bar
max. closing pressure*4
Δp_0 : ..... bar

ND	65	80	100	125
Kvs	63	105	130	200

*3

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*3
available Kvs values
see page 5

*4
pressure Δp_0
see page 7 - 9

346-22-DN125-P31-1.JPG

Fig. 43
346-22 with 373-P31

Bälz-electrodyn - control valves and control actuators

3.12 Valve serie baelz 356

standard 2-way control valve 356 NP 16 / 25 / 40

Checklist:
ND 15 - 65
NP 16 / 25 / 40
standard body:
C 22.8
special executions:
in stainless steel 1.4571
temperatures:
min.: -10°C
max.: 240°C / max.: 350°C type K

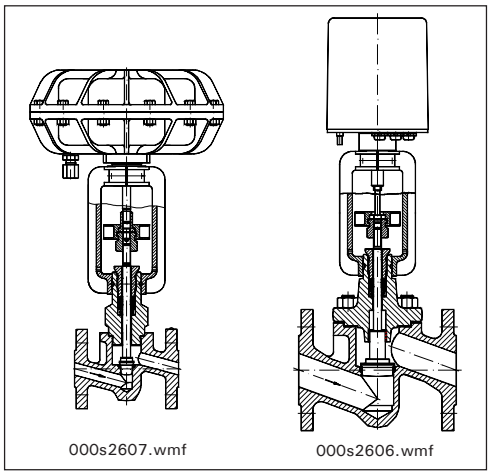


Fig. 44
356-373-P21 356-373-E07

356-DN25-P21.JPG

Fig. 45
356 with 373-P21

356-DN40-E07.JPG

Fig. 46
356 with 373-E07

Bälz-electrodyn - control valves and control actuators

Text for quotations + orders:

We recommend to install ahead of each control valve a strainer baelz 70200.
2-way control valve with electric*1 or with pneumatic actuator*2
and i/p positioner
baelz 356-373-XX
with parabolic equal percentage plug
Kvso = 0.004%
body material
ND 15 – 25: stainless steel X6CrNiMoTi 17-12-2 – 1.4571 (baelz 356-MS)
ND 32 – 65: forged steel P250GH – 1.0460 (C22.8)
trim in stainless steel
stuffing box: V-rings in PTFE
NP 16: max. 240°C/13.2 bar or max. 120°C/16 bar
NP 40: max. 240°C/30 bar or max. 120°C/40 bar
stroke: ND 15 – 25: 16 mm
ND 32 – 65: 22 mm
flow ..... m³/h or ..... kg/h of steam/water/....
pressure drop Δp_{100} = ... bar
max. closing pressure Δp_0 = ... bar*4

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*3
available Kvs values
see page 5

*4
pressure Δp_0
see page 7 - 9

*3

ND	15	20	25	32
Kvs	3,8	6,5	9,3	14
ND	40	50	65	
Kvs	23	40	63	

Control valve type 356-373-XX			NP 16/25/40							
			with motorized actuator XX = 373-E07-20-18-S21-230				with motorized actuator XX = 373-E40-40-20-S21-230			
ND	stroke [mm]	Kvs [m³/h]	NP	Δp_0 max. [bar]	Order No.		NP	Δp_0 max. [bar]	Order No.	
15	16	3.8	16/25/40	16/25/40	356-2001					
20	16	6.5	16/25/40	16/25/40	356-2011					
25	16	9.3	16/25/40	16/25/40	356-2021					
32	22	14	16/25/40	16/20	356-2031					
40	22	23	16/25/40	12	356-2041					
50	22	40	16/25/40	8	356-2051		16	16	356-2351	
65	22	63	16	4.6	356-2061		16	10	356-2361	
65	22	63	25/40	4.6	356-2071		40	10	356-2371	

Control valve type 356-373-XX			NP 16				NP 40			
			with pneumatic actuator XX = 373-P21-YY-Fo-S21-86/IP6000-M				with pneumatic actuator XX = 373-P21-YY-Fo-S21-86/IP6000-M			
ND	stroke [mm]	Kvs [m³/h]	YY	Δp_0 max. [bar]	Order No.		YY	Δp_0 max. [bar]	Order No.	
15	16	3.8	06	16	356-2531		12	40	356-2631	
20	16	6.5	06	16	356-2541		12	40	356-2641	
25	16	9.3	06	16	356-2551		12	40	356-2651	
32	22	14	06	16	356-2561		12	36	356-2661	
40	22	23	06	13.5	356-2571		18	27	356-2671	
50	22	40	06	8.9	356-2581		V6	34	356-2681	
65	22	63	12	8	356-2591		V6	20	356-2691	

Supplement for potentiometer 5 kΩ and sequence amplifier baelz 1020-230-M for baelz 373-E07
to receive a positioning signal 0-10 V or 4-20 mA
Supplement for potentiometer 5 kΩ and sequence amplifier baelz 1020-230-M for baelz 373-E40
to receive a positioning signal 0-10 V or 4-20 mA
Supplement for potentiometer 5 kΩ and sequence amplifier baelz 1020-230-M for baelz 373-E11
to receive a positioning signal 0-10 V or 4-20 mA

Supplement for 3-way solenoid valve baelz 268/2-230-M for baelz 373-P21

Supplement for air pressure reduction set baelz 54298-¼"-M

Supplement for feedback potentiometer 0-5 kΩ: baelz 373-E07-Fg-5kΩ
baelz 373-E40-Fg-5kΩ
baelz 373-E11-Fg-5kΩ

Supplement for spring return actuator baelz 373-E11-20-17 with 2000 N instead of baelz 373-E07

Bälz-electrodyn - control valves and control actuators

3.13 Valve serie baelz 356-K-SS

Checklist:
ND 15 - 65
NP 16 / 25 / 40
standard body:
C 22.8
special executions:
in stainless steel 1.4571
temperatures:
min.: -10°C
max.: 350°C

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*3
available Kvs values
see page 5

*4
pressure Δp_0
see page 7 - 9

*3

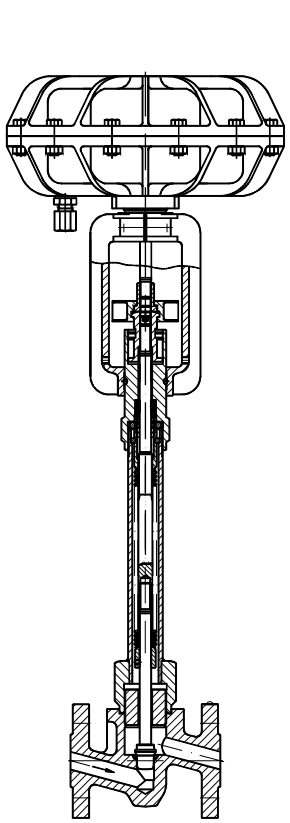
ND	15	20	25	32
Kvs	3,8	6,5	9,3	14
ND	40	50	65	
Kvs	23	40	63	

Text for quotations + orders:

We recommend to install ahead of each control valve a strainer baelz 70200.
2-way control valve with bellows
without actuator*1*2
baelz 356-K-SS
with parabolic equal percentage plug*3
Kvso = 0.004%
body material
ND 15 – 25: stainless steel X6CrNiMoTi 17-12-2 – 1.4571 (baelz 356-MS)
ND 32 – 65: forged steel P250GH – 1.0460 (C22.8)
trim in stainless steel
stuffing box: with bellows and safety gland
NP 16: max. 350°C/10 bar or max. 120°C/16 bar
NP 40: max. 350°C/13 bar or max. 120°C/40 bar
stroke: ND 15 – 25: 16 mm
ND 32 – 65: 22 mm
flow ..... m³/h or ..... kg/h of steam/water/....
pressure drop Δp_{100} = ... bar
max. closing pressure Δp_0 = ... bar*4

356-K-SS-DN20-E07.JPG

Fig. 47
356-SS with 373-E07



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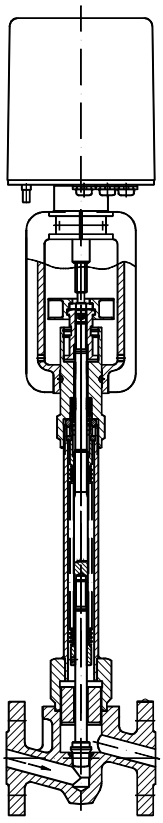

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Fig. 48
356-K-SS-373-P21 356-K-SS-373-E07

Bälz-electrodyn - control valves and control actuators

3.14 Valve serie baelz 358 and 359

Checklist:
ND 15 - 65
NP 63 / 100 / 160
standard body:
ND 15-25 : C22.8 or 13CrMo4-5
ND 32-65 : GP240GH or G17CrMo5-5
temperatures:
min.: -10°C
max.: 350°C
higher temperature on request

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*3
available Kvs values
see page 5

*4
pressure Δp_0
see page 7 - 9

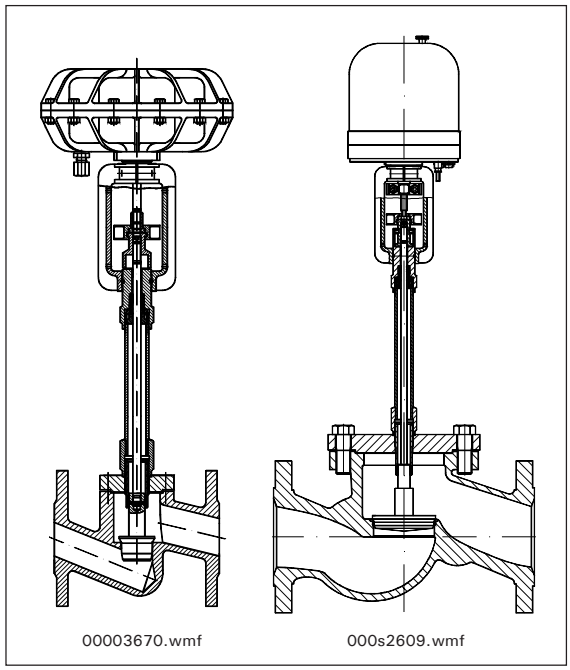


Fig. 49
358-K-373-P21 359-K-373-E40

358-K-373-E60
-DN50-PN160.JPG

Fig. 50
358-K with 373-E60

ND	15	20	25	32	*3
Kvs	3,8	6,5	9,3	14	
ND	40	50	65		
Kvs	23	40	63		

Text for quotations + orders:

2-way control valve baelz 358-K
NP 63/100/160
without actuator*1*2
Kvso = 0.004%
body material
ND 15 - 25 : 13CrMo4-5 -1.7335 (13CrMo44)
ND 32 - 50 : G17CrMo5-5 - 1.7357 (GS-17CrMo55)
internal parts : stainless steel
spindle-Ø : 10 mm
stuffing box : V-rings in PTFE
NP 63 max. : 350°C/ 61 bar - 300°C/ 63 bar
NP 100 max. : 350°C/ 95 bar - 300°C/100 bar
NP 160 max. : 350°C/153 bar - 300°C/160 bar
stroke ND 15 – 25 : 12 mm
ND 32 – 65 : 22 mm
flow : .....
pressure drop
Δp_{100} : ..... bar
max. closing pressure*4
Δp_0 : ..... bar

Text for quotations + orders:

2-way control valve baelz 359-K
NP 63/100/160
without actuator*1*2
Kvso = 0.004%
body material
ND 15 - 25 : P250GH -1.0460 (C 22.8)
ND 32 - 50 : GP240GH -1.0619 (GS-C 25)
internal parts : stainless steel
spindle-Ø : 10 mm
stuffing box : V-rings in PTFE
NP 63 max. : 350°C/36 bar - 120°C/ 63 bar
NP 100 max. : 350°C/56 bar - 120°C/100 bar
NP 160 max. : 350°C/90 bar - 120°C/160 bar
stroke ND 15 - 25 : 12 mm
ND 32 - 50 : 22 mm
flow : .....
pressure drop
Δp_{100} : ..... bar
max. closing pressure*4
Δp_0 : ..... bar

Bälz-electrodyn - control valves and control actuators

3.15 Valve serie baelz 359-ASA

Checklist:
ND 15 - 125
ANSI 150 / 300
standard body:
A 216 (GP240GH)
temperatures:
min.: -10°C
max.: +240°C or
+350°C type K

ND	15	20	25	32	40	*3
Kvs	3,8	6,5	9,3	14	23	
ND	50	65	80	100	125	
Kvs	40	63	105	130	200	

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*3
available Kvs values
see page 5

*4
pressure Δp_0
see page 7 - 9

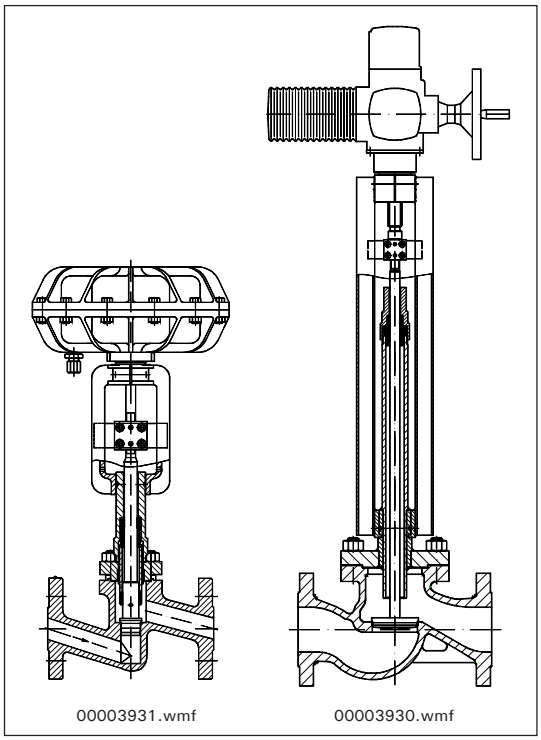


Fig. 51
359-ASA-373-P21 359-ASA-K-373-E88

359-ASA-373-E02-1020
-DN25-ANSI150.JPG

Fig. 52
359-ASA-373-E02

Text for quotations + orders:

2-way control valve baelz 359-ASA
ANSI 150 / 300
without actuator*1*2
Kvso = 0.004%
body material
A 216 (GP240GH)
internal parts : stainless steel
spindle-Ø : 16 / 22 mm
stuffing box : V-rings in PTFE
ANSI 150 max. : 240°C/ 11 bar - 120°C/ 16 bar
ANSI 300 max. : 240°C/ 32 bar - 120°C/ 40 bar
stroke ND 15 – 25 : 12 mm
ND 32 – 125 : 22 mm
flow : .....
pressure drop
Δp_{100} : ..... bar
max. closing pressure*4
Δp_0 : ..... bar

Text for quotations + orders:

2-way control valve baelz 359-ASA-K
ANSI 150 / 300
without actuator*1*2
Kvso = 0.004%
body material
A 216 (GP240GH)
internal parts : stainless steel
spindle-Ø : 16 / 22 mm
stuffing box : V-rings in PTFE
ANSI 150 max. : 350°C/ 8 bar - 120°C/ 16 bar
ANSI 300 max. : 350°C/ 24 bar - 120°C/ 40 bar
stroke ND 15 – 25 : 12 mm
ND 32 – 125 : 22 mm
flow : .....
pressure drop
Δp_{100} : ..... bar
max. closing pressure*4
Δp_0 : ..... bar

Bälz-electrodyn - control valves and control actuators

3.16 New cage valve serie baelz 360-EM-C and 360-EM-CC

Checklist:
ND 50 - 200
NP 40 / 63 / 100 / 160
balanced design; metallic seated
standard body:
GP240GH or G17CrMo5-5
spindle Ø: 16 or 22 mm
temperatures:
min.: -10°C
max.: 250°C
higher temperature on request

ND	50	65	80	100
Kvs	36	60	80	130
ND	125	150	200	
Kvs	150	200	300	

*3

DN	Thrust			
	1000 N	2000 N	4000 N	9000 N
	bar g			
50	15	44	100	
65	10	34	82	
80	6,5	28	70	
100	2,0	20	56	147
125	-	12	39	107
150	-	6	25	73
200	-	1,5	14	46

*4

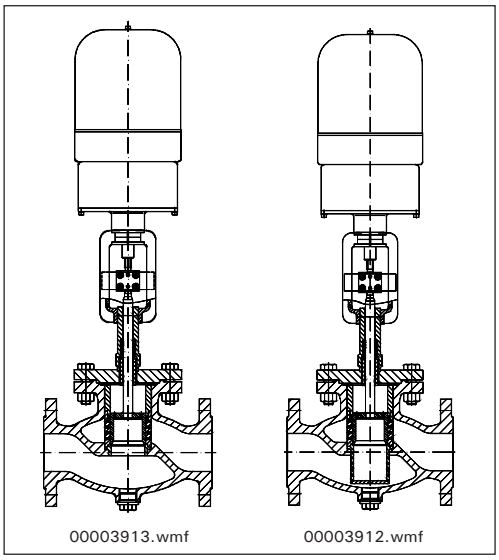


Fig. 53
360-EM-C-373-E11 360-EM-CC-373-E11

360-EM-C-373-E11-DN100.JPG

Fig. 54
360-EM-C-373-E11

available Kvs values
see page 5

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

Text for quotations + orders:

2-way control valve baelz 360-EM-C
NP 40/63/100/160
balanced, with piston plug in fixed cage
metallic seated
without actuator*1*2
Kvso = 0.05%
body material
ND 50 - 200 : GP240GH - 1.0619 (GS-C25)
G17CrMo5-5 - 1.7357
(GS-17CrMo55)
internal parts : stainless steel; guides hardened
spindle-Ø : 16 mm / 22 mm
stuffing box : V-rings in PTFE
NP 40 max. : 250°C / 32 bar
NP 63 max. : 250°C / 45 bar
NP 100 max. : 250°C / 70 bar
NP 160 max. : 250°C / 112 bar
stroke : 22 - 66 mm
flow : ..... fluid : .....
temperature : ..... °C
pressure drop Δp_{100} : ..... bar
max. closing pressure*4
Δp_0 : ..... bar

Text for quotations + orders:

2-way control valve baelz 360-EM-CC
NP 40/63/100/160
balanced, with piston plug in fixed cage and
additional perforated second cage
metallic seated
without actuator*1*2
Kvso = 0.05%
body material
ND 50 - 200 : GP240GH - 1.0619 (GS-C25)
G17CrMo5-5 - 1.7357
(GS-17CrMo55)
internal parts : stainless steel; guides hardened
spindle-Ø : 16 mm / 22 mm
stuffing box : V-rings in PTFE
NP 40 max. : 250°C / 32 bar
NP 63 max. : 250°C / 45 bar
NP 100 max. : 250°C / 70 bar
NP 160 max. : 250°C / 112 bar
stroke : 22 - 66 mm
flow : ..... fluid : .....
temperature : ..... °C
pressure drop Δp_{100} : ..... bar
max. closing pressure*4
Δp_0 : ..... bar

Bälz-electrodyn - control valves and control actuators

4. Short presentation of all available 3-way control valves from baelz 335 to baelz 354

4.1 Valve serie baelz 335

For HVAC 3-way valve, in bronze, externally threaded

Checklist:
ND: 1/2 - 1 1/2"
NP: 16 / 25
body: red bronze Rg5
temperatures:
min.: -10°C
max.: +140°C
externally threaded
335´s way B
is not tight closing

ND	½	¾	1	1¼	1½	*3
Kvs	3,5	5	9	16	22	

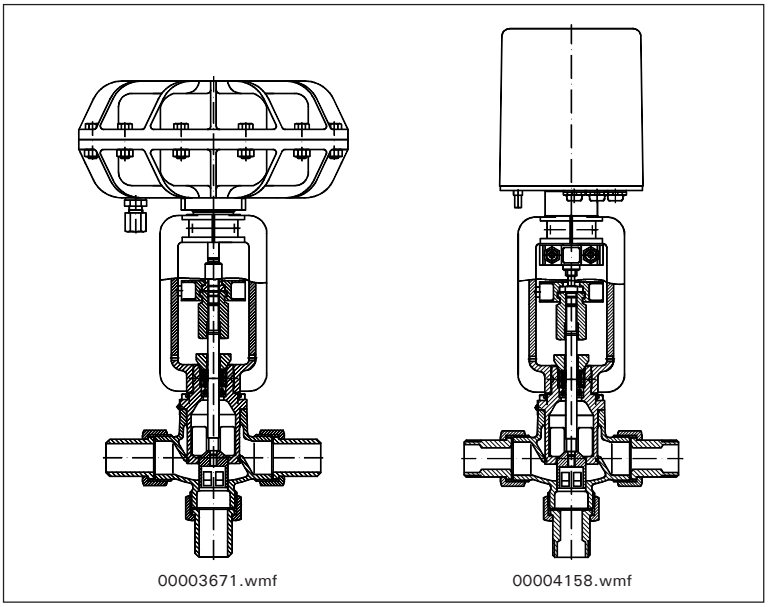


Fig. 55
335-373-P21 with weld-on socket
335-373-E07 with threaded socket

Text for quotations + orders:

3-way control valve baelz 335 NP 16/25
without actuator*1*2
trough-way (A-AB) Kvso = 0.004%
angle-way ((B-AB) Kvso = 2% , (3rd-way not tight closing)
body/seat : red bronze Rg5
plug/spindle : stainless steel
stuffing box : V-rings in PTFE
temp./pressure : max. –10... + 140°C/22 bar
connection : with union nut in brass and weld-on socket or threaded socket
stroke : 12 mm
flow : .....
pressure drop
Δp_{100} : ..... bar
max. closing pressure for mixing valves*4
(2 inlets / 1 outlet)
Δp_0 : ..... bar
max. closing pressure for diverting valves*4
(1 inlet / 2 outlets)
Δp_0 : ..... bar

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*3
available Kvs values
see page 5

*4
pressure Δp_0
see page 7 - 9

Fig. 56 3-way valve for HVAC applications

Bälz-electrodyn - control valves and control actuators

4.2 Valve serie baelz 342-B, 347-B, 347-BB

High volume selling universal 3-way valve baelz 342 in spheroidal GJS-400-18-LT (GGG 40.3)

Checklist:
ND: 15 - 300
NP: 16 / 25 / 40
standard body:
NP 16 + 25:
GJS-400-18-LT (GGG 40.3)
NP 40:
GP240GH (GS-C25)
temperatures:
min.: -10°C
max.: +240°C or
+350°C type K
342: 3rd-way B not tight closing
347: 3rd-way B tight closing

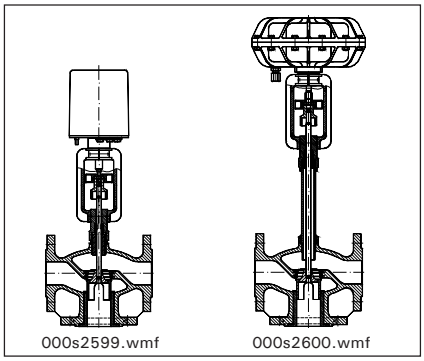


Fig. 57
347-B-373-E07 347-BK-373-P21

Text for quotations + orders:

3-way control valve baelz 342-B NP 16
without actuator*1*2
trough-way (A-AB) Kvso = 0.004%
angle-way (B-AB) Kvso = 2%
body material : GJS-400-18-LT – JS 1025 (GGG 40.3)
internal parts : stainless steel
stuffing box : V-rings in PTFE
temp./pressure
ND 15 - 125 : max. 240°C/11 bar – 120°C/16 bar
stroke ND 15 – 25 : 12 mm
ND 32 – 125 : 22 mm
flow : .....
pressure drop Δp_{100} : ..... bar
max. closing pressure for mixing valve*4
(2 inlets / 1 outlet) Δp_0 : ..... bar
max. closing pressure for diverting valve*4
(1 inlet / 2 outlets) Δp_0 : ..... bar

Text for quotations + orders:

3-way control valve baelz 342-BK NP 25
without actuator*1*2
trough-way (A-AB) Kvso = 0.004%
angle-way (B-AB) Kvso = 2%
body material : GJS-400-18-LT – JS 1025 (GGG 40.3)
internal parts : stainless steel
stuffing box : V-rings in PTFE
temp./pressure : max. 350°C/13 bar - 120°C/25 bar
stroke ND 15 – 25 : 12 mm
ND 32 – 125 : 22 mm
flow : .....
pressure drop Δp_{100} : ..... bar
max. closing pressure for mixing valve*4
(2 inlets / 1 outlet) Δp_0 : ..... bar
max. closing pressure for diverting valve*4
(1 inlet / 2 outlets) Δp_0 : ..... bar

Text for quotations + orders:

3-way control valve baelz 347-B NP 16
without actuator*1*2
trough-way (A-AB) Kvso = 0.004%
angle-way (B-AB) Kvso = 0.004%
body material : GJS-400-18-LT – JS 1025 (GGG 40.3)
internal parts : stainless steel
stuffing box : V-rings in PTFE
temp./pressure
ND 15 - 250 : max. 240°C/11 bar - 120°C/16 bar
ND 300 : max. 240°C/11 bar - 120°C/11 bar
stroke ND 15 – 25 : 12 mm
ND 32 – 125 : 22 mm
ND 150 : 44 mm
ND 200 – 300 : 66 mm
flow : .....
pressure drop Δp_{100} : ..... bar
max. closing pressure
for mixing valve (2 inlets / 1 outlet)*4
Δp_0 : ..... bar
max. closing pressure
for diverting valve (1 inlet / 2 outlets)*4
Δp_0 : ..... bar

*3

ND	15			20	25	32
Kvs	2,0	3,0	5,6	6,3	9	16
ND	40	50	65	80	100	125
Kvs	25	36	63	105	130	200
ND	150	200	250	300		
Kvs	360	580	960	1340		

*1 electric actuator
see 373-EXX page 81 - 90

*2 pneumatic actuator
see 373-PXX page 104 - 110

*3 available Kvs values
see page 5

*4 pressure Δp_0
see page 7 - 9


342-B-DN32-E07.JPG
Fig. 58
342-B with 373-E07


347-BB-E40-DN150-PN16-2.JPG
Fig. 59
347-BB with 373-E40

Bälz-electrodyn - control valves and control actuators

4.3 Hot oil bellows valve series baelz 342-BK-SS, 347-BK-SS, 347-BBK-SS

Assuredly the best valve serie for hot oil systems

Checklist:
ND: 15 - 300
NP: 16 / 25 / 40
standard body:
342 / 347:
NP 16 + NP 25:
GJS-400-18-LT (GGG 40.3)
NP 40:
GP240GH (GS-C25)
temperatures:
min.: -10°C
max.: +350°C
342: 3-way valve,
3rd-way B not tight
347: 3-way, 3rd-way B tight

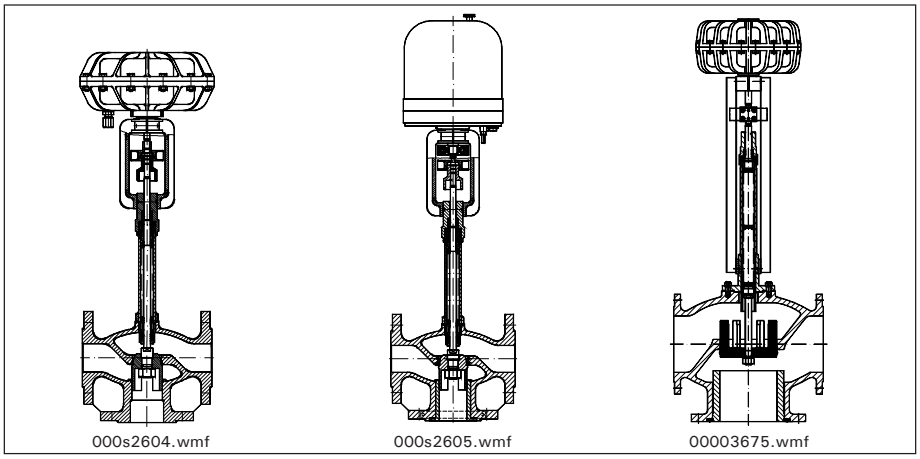


Fig. 60
342-BK-SS-373-P21 347-BK-SS-373-E40 347-BBK-SS-373-P31

ND	15			20	25	32	40	50	65	80	100	125	150	200	250	300	*3
Kvs	2,0	3,0	5,6	6,3	9	16	25	36	63	105	130	200	360	580	960	1340	

*3
available Kvs values
see page 5


342-BK-SS-DN32-P21-IP86.JPG

Fig. 61
342-BK-SS with 373-P21 and IP86


342-BK-SS-DN32-E07.JPG

Fig. 62
342-BK-SS with 373-E07


347-BBK-SS-5441311.JPG

Fig. 63
347-BBK-SS with 373-P41-V

Bälz-electrodyn - control valves and control actuators

Text for quotations + orders:

We recommend to install ahead of each control valve a strainer baelz 70200.

Hot oil 3-way valve with bellows and with electric*1 or
with pneumatic actuator*2 and i/p positioner
as mixing valve (2 inlets A + B, 1 outlet AB)
baelz 342-BK-SS-373-XX
with equal percentage V-port plug
trough-way (A-AB) Kvso = 0.004%
angle-way (B-AB) Kvso = 2%
body material: GJS-400-18-LT – JS 1025 (GGG 40.3)
trim in stainless steel; spindle seal with bellows and safety gland
max. 350°C/8 bar or max. 120°C/16 bar
stroke ND 15 – 25: 12 mm
ND 32 – 125: 22 mm
flow : hot oil: ..... m³/h
pressure drop Δp_{100} = ... bar
max. closing pressure Δp_0 = ... bar*4
as mixing valve

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*4
pressure Δp_0
see page 7 - 9

Control valve type 342-BK-SS-373-XX			NP 16						
			with motorized actuator XX = 373-E07-20-18-S21-230			with pneumatic actuator and i/p postioner XX = 373-P21-YY-Fu-S21-86/IP6000-M			
ND	stroke [mm]	Kvs [m³/h]	Δp_0 max. [bar]	Order No.		YY	Δp_0 max. [bar]	Order No.	
15	12	5.6	16	342-2115		06	16	342-2615	
20	12	6.3	16	342-2116		06	16	342-2616	
25	12	9	16	342-2117		06	16	342-2617	
32	22	16	16	342-2118		06	16	342-2618	
40	22	25	12	342-2119		06	13.5	342-2619	
50	22	36	8	342-2120		06	8.9	342-2620	
65	22	63	4.6	342-2121		12	8	342-2621	
80	22	105	2.9	342-2122		18	7	342-2622	
100	22	130	1.7	342-2123		V6	8	342-2623	
125	22	200	1	342-2124		V6	5	342-2624	

Supplement for potentiometer 5 kΩ and sequence amplifier baelz 1020-230-M for baelz 373-E07 to receive a positioning signal 0-10 V or 4-20 mA
Supplement for potentiometer 5 kΩ and sequence amplifier baelz 1020-230-M for baelz 373-E40 to receive a positioning signal 0-10 V or 4-20 mA
Supplement for potentiometer 5 kΩ and sequence amplifier baelz 1020-230-M for baelz 373-E11 to receive a positioning signal 0-10 V or 4-20 mA
Supplement for 3-way solenoid valve baelz 268/2-230-M for baelz 373-P21
Supplement for air pressure reduction set baelz 54298-¼"-M:
Supplement for feedback potentiometer 0-5 kΩ: baelz 373-E07-Fg-5kΩ
baelz 373-E40-Fg-5kΩ
baelz 373-E11-Fg-5kΩ
Supplement for spring return actuator baelz 373-E11-20-17 with 2000 N instead of baelz 373-E07

Bälz-electrodyn - control valves and control actuators

4.4 Balanced 3-way valve for liquids baelz 347-B-EM

Checklist:
ND: 50 - 300
NP: 16 / 25
standard body:
GJS-400-18-LT (GGG 40.3)
temperatures:
min.: -10°C
max.: +225°C
spindle Ø: 10 mm
S 21: ND 50 - 125
spindle Ø: 22 mm
S 31 / 41: ND 150 - 300

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*3
available Kvs values
see page 5

*4
pressure Δp_0
see page 7 - 9

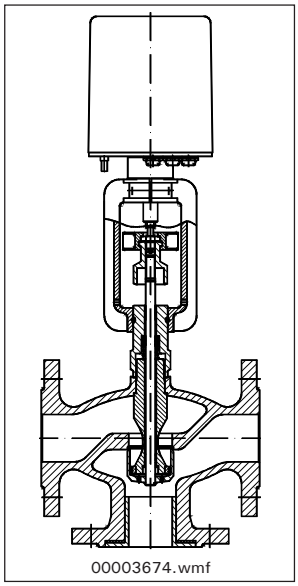


Fig. 64
347-B-EM-373-E07

Text for quotations + orders:

balanced 3-way control valve baelz 347-B-EM
NP 16
without actuator*1*2
Kvso = 0.05%
body material : GJS-400-18-LT – JS 1025 (GGG 40.3)
internal parts : stainless steel
stuffing box : V-rings in PTFE
water : max. 225°C/13 bar - 120°C/16 bar
stroke ND 50 : 12 mm
ND 65 - 125 : 22 mm
ND 150 : 44 mm
ND 200 - 300 : 66 mm
flow : .....
pressure drop Δp_{100} : ..... bar
max. closing pressure for mixing valve*4
(2 inlets / 1 outlet) Δp_0 : ..... bar
max. closing pressure for diverting valve*4
(1 inlet / 2 outlets) Δp_0 : ..... bar

*3

ND	50	65	80	100	125	150	200	250	300
Kvs	36	63	105	130	200	360	580	960	1340

Fig. 65
347-BB-EM-373-E60

Bälz-electrodyn - control valves and control actuators

4.5 Valve serie baelz 342-ES-AS, 342-ES-MS, 347-ES-AS, 347-ES-MS in stainless steel

Checklist:
ND: 25 + 50
NP: 16 / 25 / 40
body:
GX3CrNiMo13-4 (1.4313)
temperatures:
min.: -10°C
max.: +240°C or
+350°C type K
for hot oil / bellows type:
type K-SS: 350°C
spindle Ø: 10 mm
342: 3-way valve,
3rd-way B not tight
347: 3-way, 3rd-way B tight

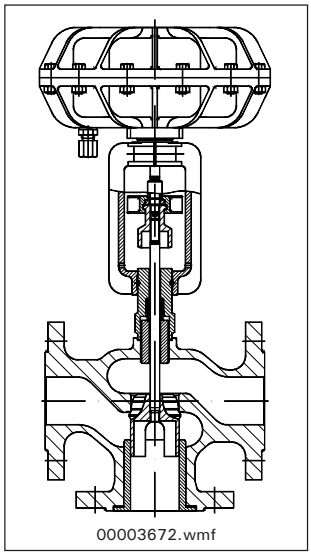


Fig. 66
347-ES-373-P21

Text for quotations + orders:

3-way control valve in stainless steel
baelz 342-ES-AS NP 16/25/40
without actuator*1*2
trough-way (A-AB): Kvso = 0.004%
angle-way (B-AB): Kvso = 2%
body material : GX3CrNiMo13-4 - 1.4313
internal parts in contact with the medium
: X6CrNiMoTi17-12-2 - 1.4571
stuffing box : V-rings in PTFE
NP 16 max. : 240°C/14 bar - 120°C/16 bar
NP 40 max. : 240°C/35 bar - 120°C/40 bar
stroke ND 15 – 25 : 12 mm
ND 32 – 125 : 22 mm
flow : .....
pressure drop Δp_{100} : ..... bar
max. closing pressure for mixing valve*4
(2 inlets / 1 outlet) Δp_0 : ..... bar
max. closing pressure for diverting valve*4
(1 inlet / 2 outlets) Δp_0 : ..... bar

ND	25	50
Kvs	9	36

*3

347-B-ES-DN50-P21.JPG

Fig. 67
347-ES with 373-P21

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*3
available Kvs values
see page 5

*4
pressure Δp_0
see page 7 - 9

Bälz-electrodyn - control valves and control actuators

4.6 Valve serie baelz 353 and 354

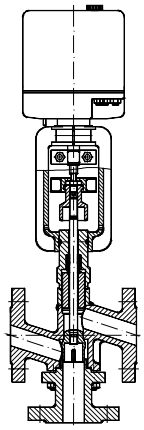
Stainless steel 3-way valve baelz 353 and 354

Checklist: 353
ND: 15 - 25
NP: 16 / 25 / 40
standard body:
X6CrNiMoTi17-12-2 (1.4571)
temperatures:
min.: -10°C
max.: +240°C
spindle Ø: 10 mm

Checklist: 354-VA
ND: 32 - 125
NP: 16 - 40
standard body:
GX5CrNiMo19-11 (1.4408)
temperatures:
min.: -10°C
max.: +240°C
spindle Ø: 10 mm

354-E40-DN125.JPG

Fig. 68
354-373-E40



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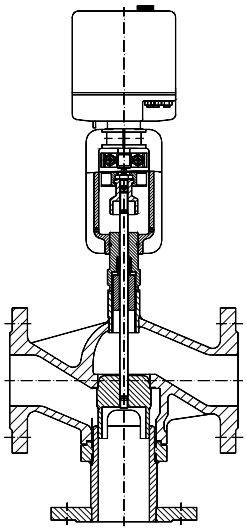

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Fig. 69
353-373-E02
354-373-E02

Text for quotations + orders:

3-way control valve in stainless steel
baelz 353 NP 16/25/40
without actuator*1*2
trough-way (A-AB) Kvso = 0.004%
angle-way (B-AB) Kvso = 0.004%
body material : X6CrNiMoTi17-12-2 - 1.4571
internal parts : stainless steel
stuffing box : V-rings in PTFE
temp./pressure : max. 240°C/30 bar - 120°C/40 bar
stroke : 12 mm
flow : .....
pressure drop Δp_{100} : ..... bar
max. closing pressure for mixing valve*4
(2 inlets / 1 outlet) Δp_0 : ..... bar
max. closing pressure for diverting valve*4
(1 inlet / 2 outlets) Δp_0 : ..... bar

Text for quotations + orders:

3-way control valve in stainless steel
baelz 354-VA NP 10 - 40
without actuator*1*2
trough-way (A-AB) Kvso = 0.004%
angle-way (B-AB) Kvso = 0.004%
body material : GX5CrNiMo19-11 - 1.4408
internal parts : stainless steel
stuffing box : V-rings in PTFE
NP 16 max. : 240°C/10 bar - 100°C/13,5 bar
20°C/16 bar
NP 25 max. : 240°C/15,5 bar - 100°C/21,5 bar
20°C/25 bar
NP 40 max. : 240°C/25 bar - 100°C/34 bar
20°C/40 bar
stroke ND 32 -125 : 22 mm
flow : .....
pressure drop Δp_{100} : ..... bar
max. closing pressure for mixing valve*4
(2 inlets / 1 outlet) Δp_0 : ..... bar
max. closing pressure for diverting valve*4
(1 inlet / 2 outlets) Δp_0 : ..... bar

*3

ND	15	20	25	32	40	80	65	80	100	125
Kvs	5,6	6,3	9	16	25	36	63	105	130	200

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

*3
available Kvs values
see page 5

*4
pressure Δp_0
see page 7 - 9

Bälz-hydrodynamic - controllable nozzle ejectors water/water

5. Short presentation of all available ejector based on control valve bodies: from baelz 471 to baelz 591

5.1 Ejector series baelz 471 and baelz 475 water/water - threaded connections

Ejector series water/water
baelz 471-373-E07
with motorized actuator
baelz 373-E07

Checklist:
ND: 1/2 - 1 1/2"
NP: 16 / 25
standard body: red bronze Rg5
temperatures:
min.: -10°C
max.: +140°C
externally threaded, with union nut in brass and weld-on socket or threaded socket

Service conditions:

	01 motive	03 suction	04 discharge
temperature [°C]			
flow [kg/h] m			

max. secondary pressure drop h_{max}: ..... bar at m04
min. primary differential pressure H_{min}: ..... bar

Ejector series water/water
baelz 475-373-E05
with motorized actuator
baelz 373-E05

Checklist:
ND: 3/4"
NP: 16
standard body: red bronze Rg5
temperatures:
min.: -10°C
max.: +110°C
externally threaded, with union nut in brass and weld-on socket or threaded socket

Service conditions:

	01 motive	03 suction	04 discharge
temperature [°C]			
flow [kg/h] m			

max. secondary pressure drop h_{max}: ..... bar at m04
min. primary differential pressure H_{min}: ..... bar

electric actuator
see 373-EXX page 81 - 90

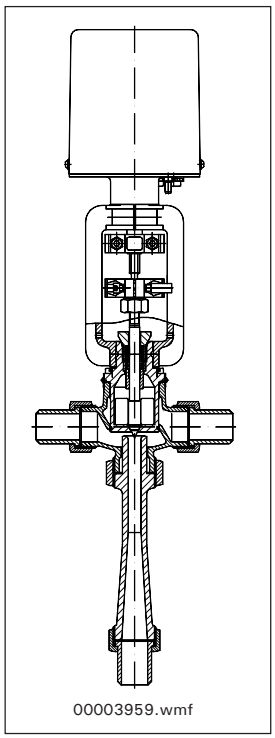
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Fig. 70
471-373-E07
with weld-on socket


471-G½-373-E06-1020.JPG

Fig. 71
471-373-E06-1020
with weld-on socket

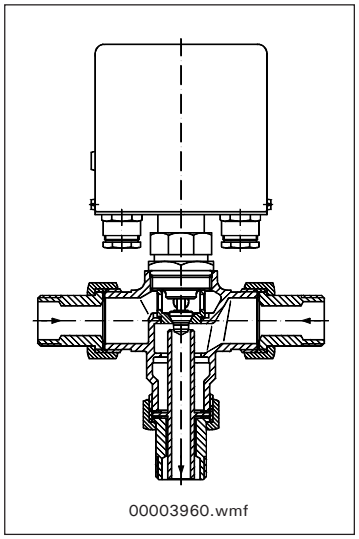
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Fig. 72
475-373-E05
with threaded socket


475-E05-DN20.JPG

Fig. 73
475-373-E05
with threaded socket

Bälz-hydrodynamic - controllable nozzle ejectors water/water

5.2 Ejector series water/water baelz 480 - flanged connections

5.2.1 General datas

Checklist:
ND: 15 - 300
NP: 16 / 25 / 40
standard body:
NP 16 + NP 25:
GJS-400-18-LT (GGG 40.3)
NP 40: GP240GH (GS-C25)
temperatures:
min.: -10°C
max.: +240°C or
+350°C type K

ND 15 - 125	spindle Ø: 10 mm
up to ND 100/nozzle ≥ 40 mm	spindle Ø: 16 mm
ND 150 - 300	spindle Ø: 22 mm

ND	15	25	32	40	50
nozzle	8.0	10	12.5	16	20
ND	65	80	100	125	150
nozzle	25	37	47	60	65

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

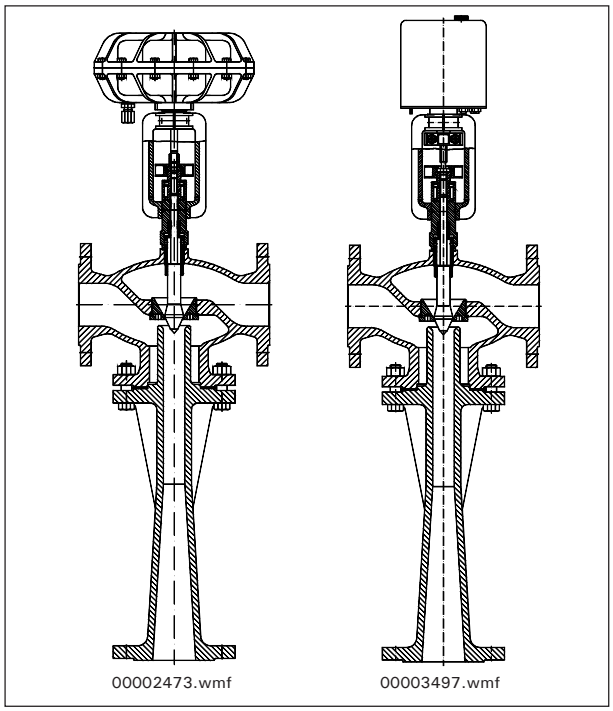

Fig. 74
480-373-P21 480-373-E07

max. secondary pressure drop h_{max}: ..... bar at m04
min. primary differential pressure H_{min}: ..... bar

Text for quotations + orders:

controllable water ejector Jetomat for mixing and circulation
without actuator*1*2
body material
NP 16 + NP 25 : GJS-400-18-LT (GGG 40.3)
NP 40 : GP240GH (GS-C25)
diffuser material
NP 16 + NP 25 : ND 15 - 125 GJS-400-18-LT (GGG 40.3)
ND 150 - 300 with welded diffuser
NP 40 : ND 15 - 300 with welded diffuser
nozzle and spindle : stainless steel
stuffing box : V-rings in PTFE
temp./pressure
NP 16:max. 240°C/11 bar or max. 120°C/16 bar
NP 25:max. 240°C/18 bar or max. 120°C/25 bar
NP 40:max. 240°C/32 bar or max. 120°C/40 bar
stroke : ND 15-125 : 22 mm
up to ND 65/nozzle ≥ 25 mm : 40 mm
ND 150 : 44 mm
ND 200 - 300 : 66 mm

Service conditions:

	01 motive	03 suction	04 discharge
temperature [°C]			
flow [kg/h] m			


480-E07-DN50-PN16-25.JPG

Fig. 75
480-373-E07


480-P32-DN200-PN16.JPG

Fig. 76
480-373-P32

Bälz-hydrodynamic - controllable nozzle ejectors water/water

5.2.2 Controllable water ejectors in water heat distributing systems

Conventional installations with
X secondary loops needed a main pump and
X 3-way mixing valves,
X circulating pumps together with manual isolating valves,
X parts of a switch cabinet and cablings for the circulating pumps.
Substituting the 3-way mixing valves by ejectors, the circulating pumps of the secondary loops are no longer needed, because it is known that ejectors do not only admix but also work as pumps and therefore circulate the complete flow in the secondary loop.

Consequences:
1. Reduction of the investment costs.
   Reason: X secondary circulating pumps together with manual isolating fittings and X corresponding parts of a switch cabinet including cablings are left out.
2. Savings of electric energy and consequently of costs for current consumption.
   Reason: In case of more than 2 secondary loops, i. e. X > 2, the electrical power is lower than the complete electrical power of a conventional installation with main pump and X secondary circulating pumps.
3. Lower need of primary energy.
   Reason: Optimal cooling of the heating water.
4. Reduction of costs for maintenance and repairs, therefore increasing the availability of the installations.
   Reason: The ejectors do not wear out.

The following 2 basic system lay-outs with ejectors show this Baelz technology in standard applications.
By applying this technology, Baelz can sell:
- the motorized or pneumatic ejectors
- controllers and sensors to control these ejectors

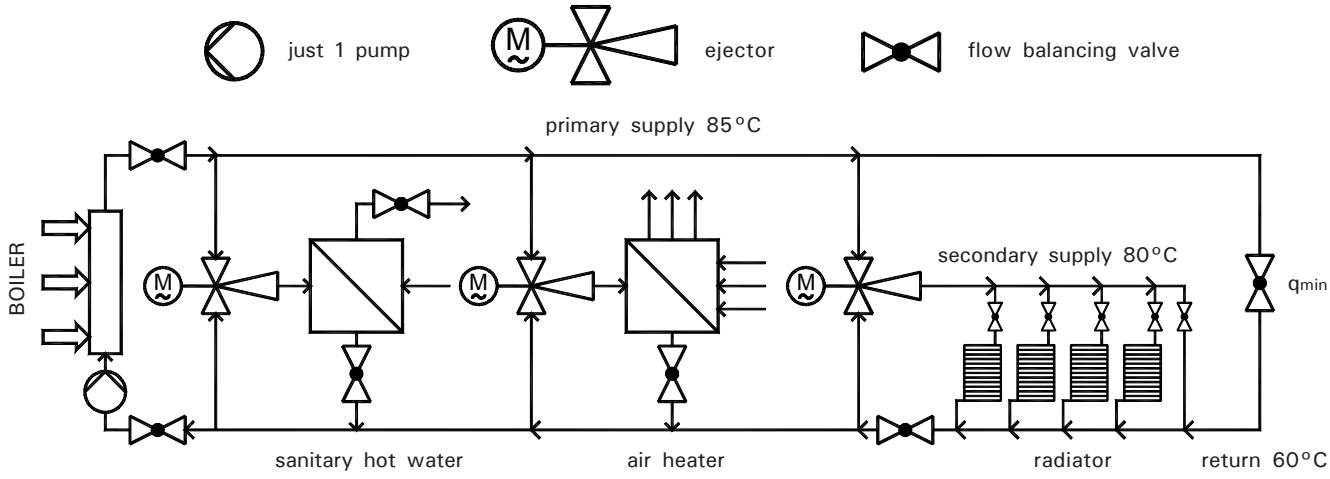

Fig. 77
example 1: ejectors to control secondary loops of a boiler installation with only one pump in the whole system

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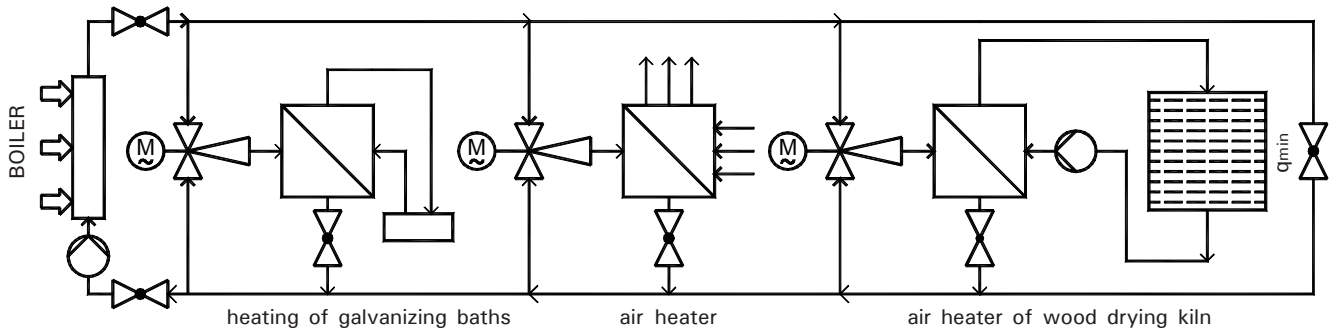

Fig. 78
example 2: ejectors to control heat consumers in industry

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Bälz-vapordynamic - steam-water mixing ejector

5.3 Steam-water mixing ejector flanged baelz 585 in cast spheroidal iron or stainless steel Steam-water mixing ejector externally threaded baelz 586 in red bronze Rg 5

5.3.1 General datas

Checklist baelz 585:
ND 15 - 125 NP 16
GJS-400-18-LT
(GGG 40.3)
GX5CrNiMo19-11
1.4408 stainless steel
min.: 5°C
max.: 200°C

Checklist baelz 586:
ND ¾", 1", 1½"
Rg 5
min.: 5°C
max.: 200°C

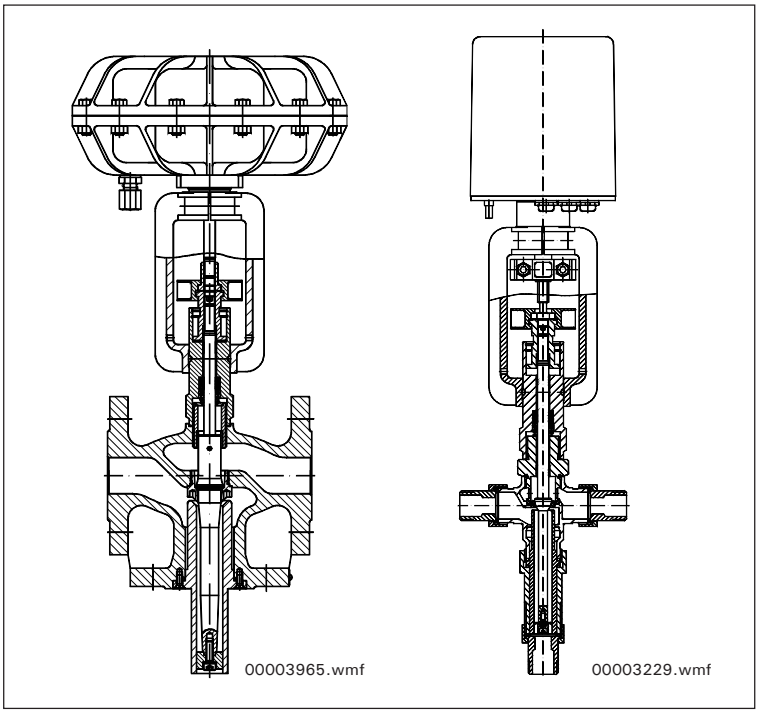


Fig. 79
585-373-P21
steam-water mixing ejector with flanged connections

586-373-E07
steam-water mixing ejector externally threaded

Fig. 80
585-373-E07

electric actuator
see 373-EXX page 81 - 90

pneumatic actuator
see 373-PXX page 104 - 110

max. - load

data	steam 01		cold water 03		hot water 04	
pressure	p01* =	bar abs	p03 =	bar abs	p04 =	bar abs
temperature	t01 =	°C	t03 =	°C	t04 =	°C
flow	m01 =	kg/h	m03 =	kg/h	m04 =	kg/h
to heat an accumulator state available volume	m^3					
time to heat up	h					

*pressure p01 should be ≥ p03 + 0,5 bar

min. - load

data	steam 01		cold water 03		hot water 04	
flow	m01 =	kg/h	m03 =	kg/h	m04 =	kg/h

Bälz-vapordynamic - steam-water mixing ejector

5.3.2 Applications

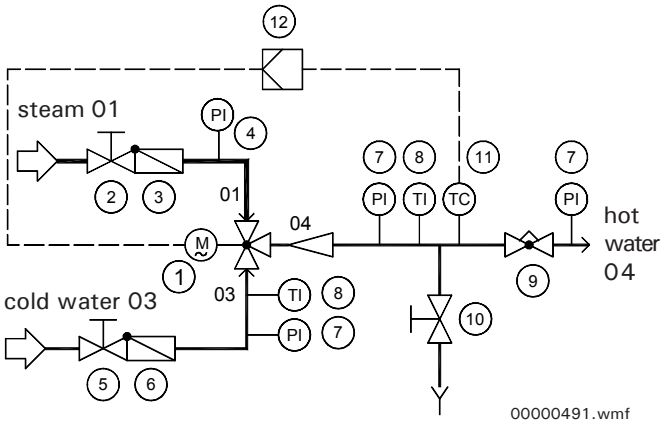


Fig. 81 general lay out

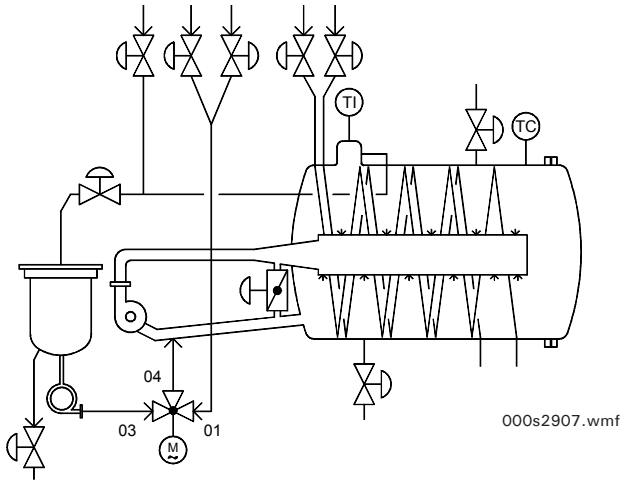


Fig. 82 heating up of a dye machine

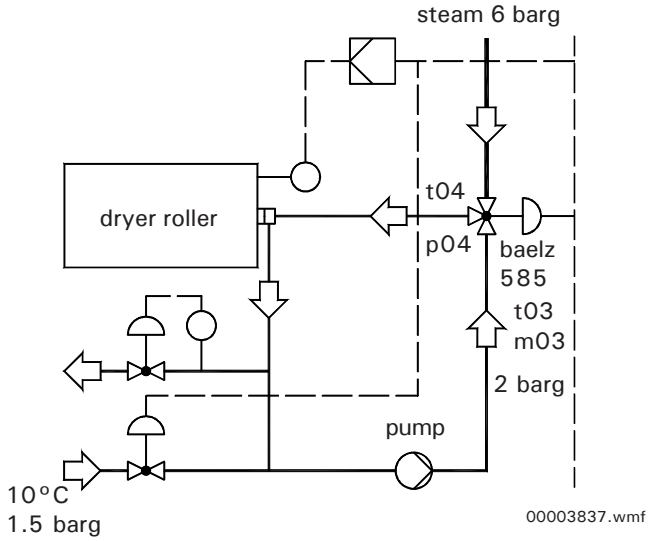


Fig. 83 heating (cooling) of a calander

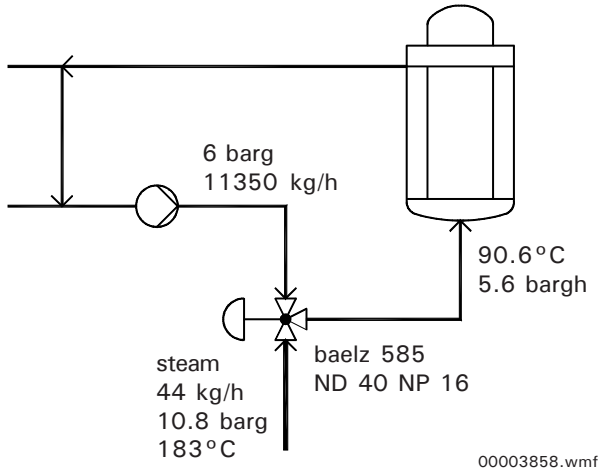


Fig. 84 heating of a double jacqueted reactor

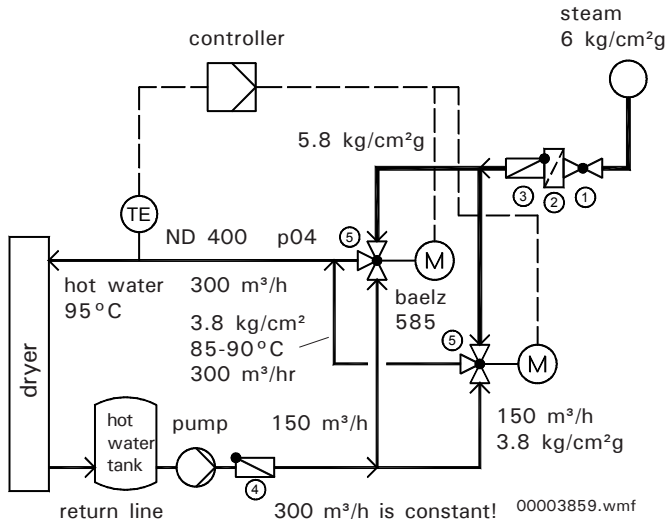


Fig. 85 creating hot water for a big dryer

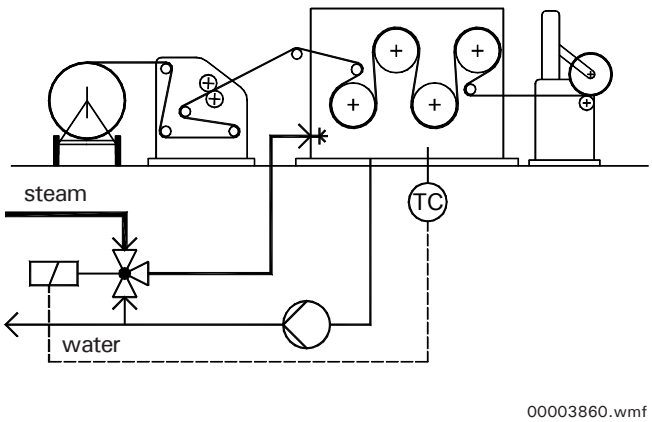


Fig. 86 washing machine

Bälz-vapordynamic - controllable nozzle ejectors steam/steam

5.4 Ejector series steam/steam baelz 590

5.4.1 General datas

Checklist:
ND: 15 - 300
NP: 16 / 25 / 40
standard body:
NP 16 + NP 25:
GJS-400-18-LT (GGG 40.3)
NP 40: GP240GH (GS-C25)
temperatures:
min.: -10°C
max.: +240°C or
+350°C type K
ND 15 - 125 spindle Ø: 10 mm
up to ND 100/nozzle ≥40 mm spindle Ø: 16 mm
ND 150 - 300 spindle Ø: 22 mm

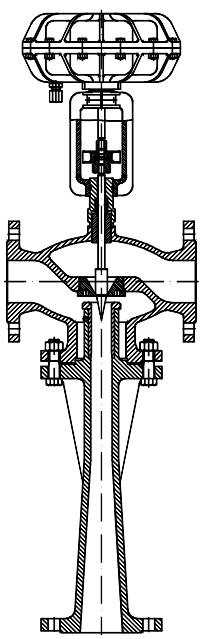
ND	15	25	32	40	50
nozzle	6.5	10	12.5	16	20
ND	65	80	100	125	150
nozzle	25	32	40	50	65

*1

electric actuator
see 373-EXX page 81 - 90

*2

pneumatic actuator
see 373-PXX page 104 - 110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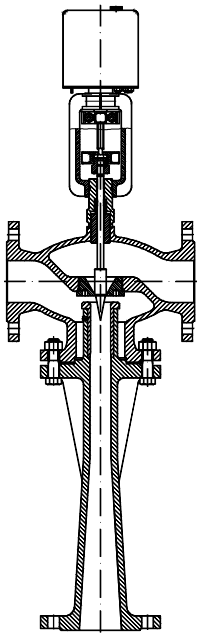

00003498.wmf

Fig. 87
590-373-P21 590-373-E07

Text for quotations + orders:

controllable steam ejector Jetomat for vapour compression / recirculation
without actuator*1*2
body material
NP 16 + NP 25 : GJS-400-18-LT (GGG 40.3)
NP 40 : GP240GH (GS-C25)
diffuser material
NP 16 + NP 25 : ND 15 - 125 GJS-400-18-LT (GGG 40.3) with throat in stainless steel
ND 150 - 300 with welded diffuser, throat in stainless steel
NP 40 : ND 15 - 300 with welded diffuser, throat in stainless steel
nozzle and spindle : stainless steel
stuffing box : V-rings in PTFE
temp./pressure
NP 16:max. 240°C/11 bar or max. 120°C/16 bar
NP 25:max. 240°C/18 bar or max. 120°C/25 bar
NP 40:max. 240°C/32 bar or max. 120°C/40 bar
stroke : ND 15-125 : 22 mm
up to ND 65/nozzle ≥25 mm : 40 mm
ND 150 : 44 mm
ND 200 - 300 : 66 mm


590-P32-DN150-1.JPG

Fig. 88
590-373-P32

Service conditions:

	01 motive	03 suction	04 discharge	dB (A)
pressure [bar abs]				
flow [kg/h] m				

max. closing pressure
Δp_0 : ..... bar

Bälz-vapordynamic - controllable nozzle ejectors steam/steam

Bälz-vapordynamic

5.4.2 Controllable steam ejector applications

Controllable steam ejectors are used for the most different tasks in the heat and process technology. In the following there are only three applications given.

1. **Vapour recompression.** Low pressure steam, which is lost in conventional installations, or re-evaporated condensate is compressed to a higher pressure and can be re-used. The savings of primary energy which are obtained by this technology are considerable.
2. **Steam conditioning.** High pressure steam and low pressure steam are mixed into product steam. If necessary, its temperature can be reduced by water injection in the ejector down to saturated steam temperature. This technology saves primary energy by re-using low pressure steam and it saves investment costs in comparison with conventional methods (reduction valves with integrated or downstream water injection).
3. **Re-circulation and suction of condensate** in drum dryers of paper and textile industry. This technology has, in comparison with heating by control valves, the following advantages: Firstly savings in steam traps, because several cylinders can be controlled in parallel and e.g. for three cylinders only one steam trap is needed. In the second place savings in steam, because the drum is heated equally owing to admixture and suction of condensate and therefore it needs no bad point supply. Thirdly increase of performance and quality.

For applying this technology, Baelz offers:
- steam ejectors baelz 590 with electric or pneumatic actuator
- controllers and sensors baelz 6490 - 6496 to control these ejectors

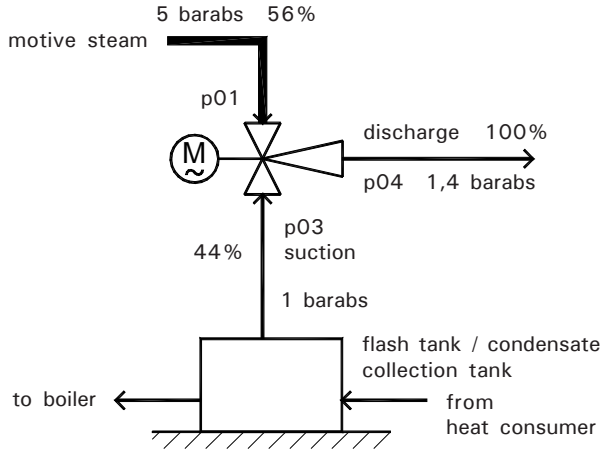


Fig. 89
example 1: vapour compression

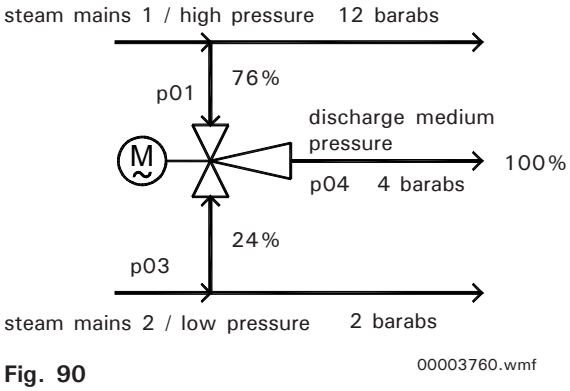


Fig. 90
example 2: steam mixing

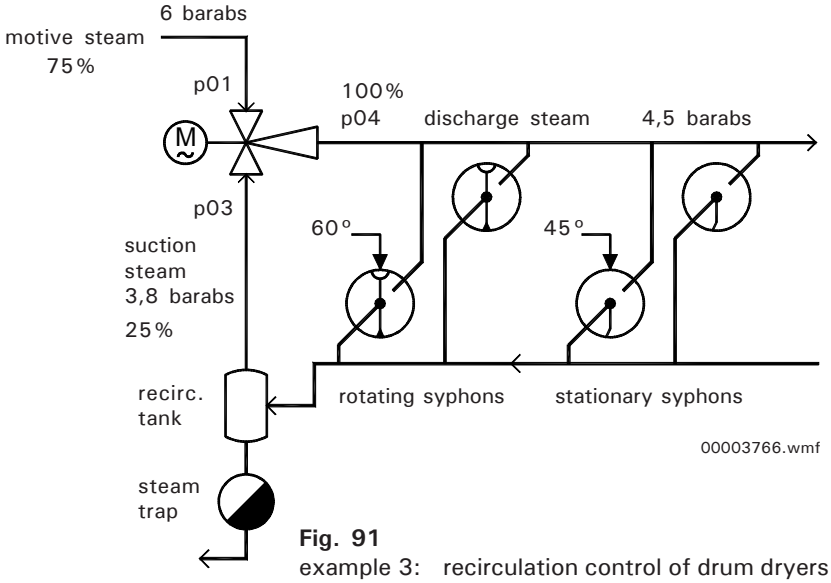


Fig. 91
example 3: recirculation control of drum dryers

Bälz-vapordynamic - steam conditioner with water injection

5.5 Steam conditioner baelz 591 or steam desuperheater baelz 591

5.5.1 General datas

Checklist:
ND: 32 - 300
NP: 16 / 25 / 40
standard body:
NP 16 + NP 25:
GJS-400-18-LT (GGG 40.3)
NP 40: GP240GH (GS-C25)
temperatures:
min.: -10°C
max.: +240°C or
+350°C type K
ND 32 - 125 tube-spindle Ø: 16 mm
ND 150 tube-spindle Ø: 22 mm
ND 200 - 300 tube-spindle Ø: 36 mm

ND	32	40	50	65
nozzle	12	28	39	50
ND	80	100	125	150
nozzle	62	82	105	105

*1
electric actuator
see 373-EXX page 81 - 90

*2
pneumatic actuator
see 373-PXX page 104 - 110

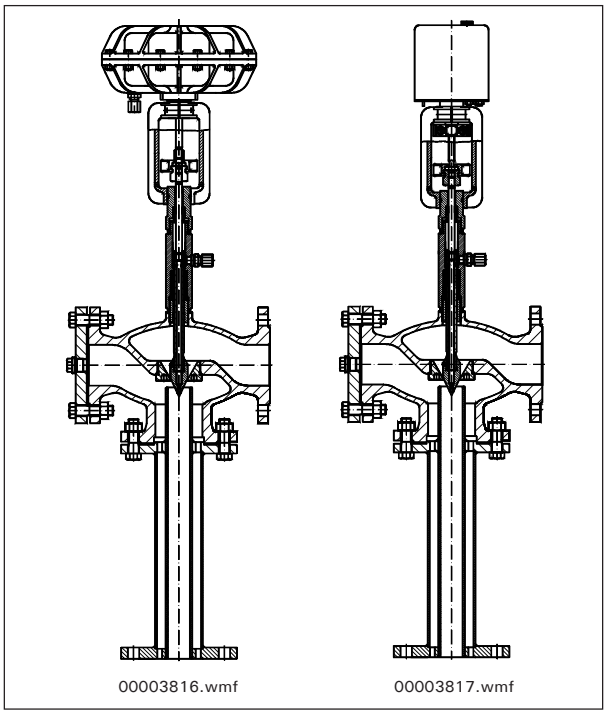


Fig. 92
591-373-P21 591-373-E07

Text for quotations + orders:

steam conditioner/desuperheater with water injection
without actuator*1*2
body material
NP 16 + NP 25 : GJS-400-18-LT (GGG 40.3)
NP 40 : GP240GH (GS-C25)
diffuser material
NP 16 / 25 / 40 : GJS-400-18-LT (GGG 40.3)
with welded diffuser, throat in stainless steel
nozzle, plug and spindle : stainless steel
stuffing box : V-rings in PTFE
temp./pressure
NP 16:max. 240°C/11 bar or max. 120°C/16 bar
NP 25:max. 240°C/18 bar or max. 120°C/25 bar
NP 40:max. 240°C/32 bar or max. 120°C/40 bar
stroke : ND 32 -125 : 22 / 40 mm
ND 150 : 44 mm
ND 200 - 300 : 66 mm


591-DN50-P21-IP86.JPG

Fig. 93
591-373-P21

Service conditions:

	01 primary	04 secondary	02 water injection	dB (A)
pressure [bar abs]				
temperature [°C]				
flow [kg/h] m				

max. closing pressure
Δp_0 : ..... bar

Bälz-vapordynamic - steam conditioner with water injection

5.5.2 Applications

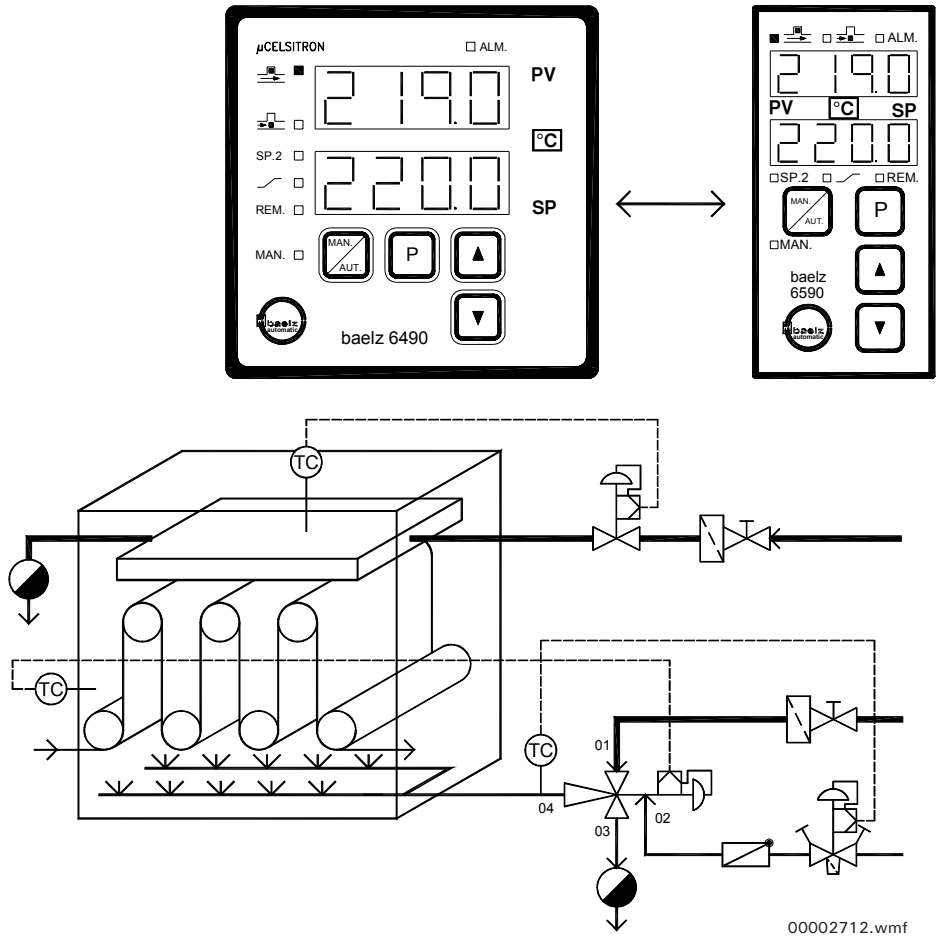


Fig. 94 textile steamer with steam conditioner baelz 591 to create saturated steam atmosphere and ceiling heating to avoid condensed water droplets

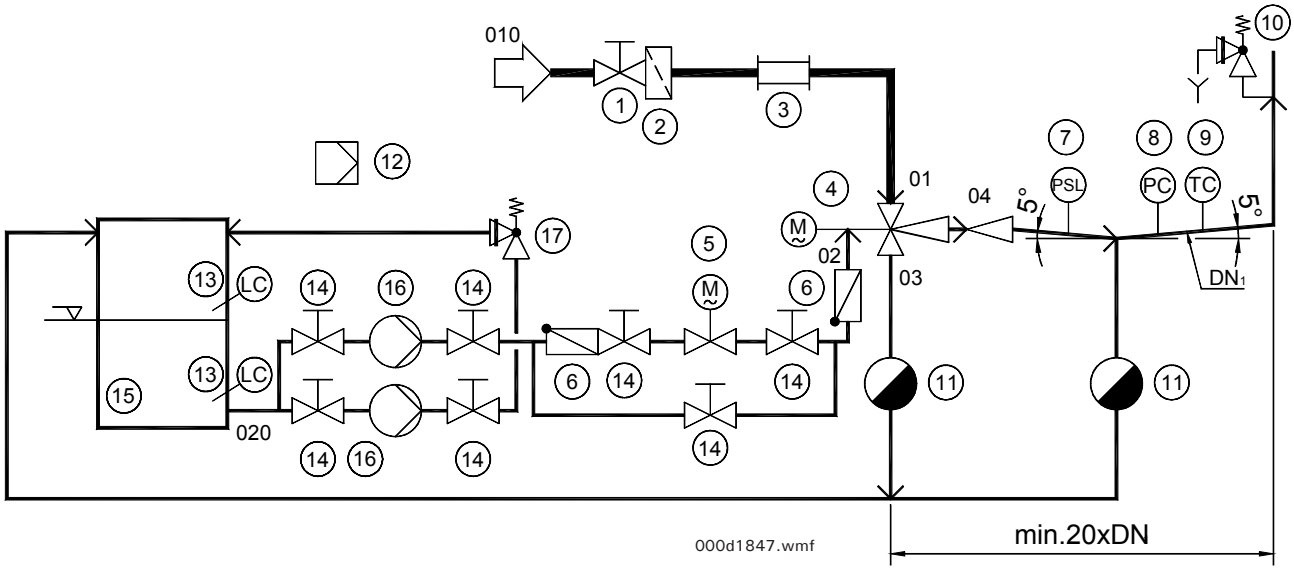
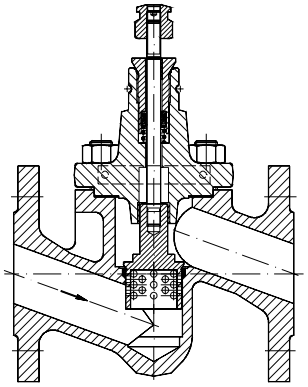


Fig. 95 desuperheater / steam conditioner with condensate tank for water injection

Bälz-electrodyn - control valves and control actuators

6. Special trim design for baelz valves

6.1 Cage plug for: - low noise type or - Kvs - adaption (smaller Kvs - values in bigger ND)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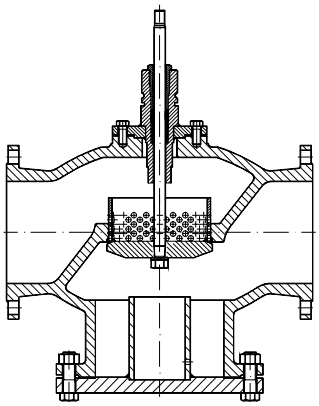
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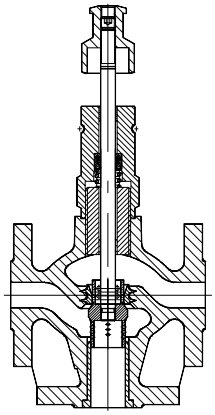
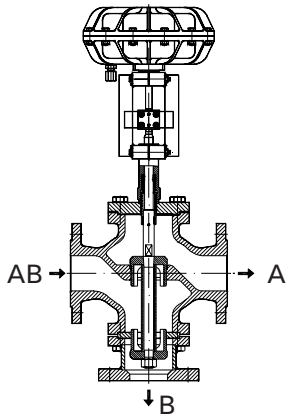

000s3283.wmf

Fig. 96 baelz 356-LK baelz 340-BB-LK baelz 347-B-LK

6.2 Three way diverting valves with separated plug for higher differential pressures with 4 flange valve body

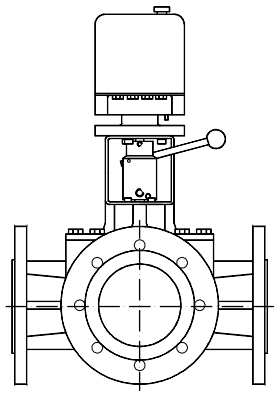


000s3270.wmf

Available on individual inquiry.

Fig. 97 baelz 347-U

7. Butterfly valves and mixer with electric rotary actuators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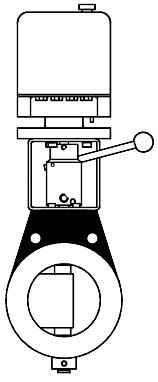
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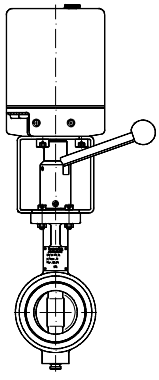

00001765.wmf

Fig. 98 3-way mixing valve butterfly valve metallic seated butterfly valve soft seated

Bälz-electrodyn - control valves and control actuators

8. Selection of a control valve + control valve questionnaire

8.1 The following guide can be used to select a valve:

8.1.1 Service conditions and valve data	selected types and comments
flowing fluid:	for high temperature oil use valves with bellows 340-BK-SS as 2-way valve 342-BK-SS as 3-way valve - 3rd-way not tight 347-BK-SS as 3-way valve - 3rd-way tight
max. flow	if known please state max. pressure drop Δp_{100} if not known select min. 20% of inlet steam pressure p_1 or select
..... m^3 / h volume	the same pressure drop for liquid flows in the valve that occurs in the heat consumer.
..... kg / h mass	If no data are known select control valve 1 or 2 ND smaller than pipeline.
temperature .....degree C	up to 240°C the normal types 340 / 342 / 347 / 356 can be used; for higher temperatures the types 340-BK, 342-BK, 347-BK, 356-K with cooling tube K can be used
max. closing pressure Δp_o .....bar	this differential pressure determines the force of the actuator and / or the selection of a balanced valve

8.1.2 Actuators

required travel time for the actuator: ..... sec.	see specifications baelz 373 .....
required power for the actuator: ..... V, ... Hz	motorized actuators are available for 230, 110 or 24 V, 50 or 60 Hz
required air pressure: .....bar	pneumatic actuators 373-P can accept max. 6 bar, but there are different types with 3, 6, 12 or 18 springs for pressures of 1, 3 or 6 bars
ambient temperature for the actuator: ..... °C	see specifications of actuators baelz 373 .....
required protection class for the actuator: ..... IP	see specifications of actuators baelz 373 .....
hand - operation	All motorized actuators incorporate manual override operation with the only exception of 373-E11 All pneumatic actuators have an option for hand operation top or side mounted

Bälz-electrodyn - control valves and control actuators

8.2 Control valve questionnaire

Customer:			Inquiry No.:	
			Project followed by:	
			Service:	Tel.:
Project No.:	Day No.:		Quantity:	
Type of body	☐ 2-way	☐ mixing	☐ diverting	☐
nominal diameter	ND		nominal pressure	NP
Connections	flange		ext. threaded / welding ends	
body material / trim material			/	
stuffing box	☐ PTFE V- rings	☐	☐	☐ stainless steel bellows
basic valve characteristic		☐ linear	☐	☐ equal percentage
Kvs value	Kvs =		Cvs =	

Service conditions

	min.	norm	max.	Dimension
Fluid				
Flow rate				
Inlet pressure				bar absolute
Outlet pressure				bar absolute
Kvs value				
Temperature				
Density				
Closing pressure				bar
Noise level				dB (A)

Actuator

Pneumatic actuator	**Electric actuator**
Type 373 - P ...	Type 373-E...
diaphragm surface ☐ cm²	Thrust ☐ kN
	Voltage / Frequency ☐ V / Hz
	positioning time ☐ s; travel ☐ mm
Position in case of air failure ☐ AB A B ☐ AB A B ☐ AB ← A B ☐ AB → A B ☐ ☐ AB → A ☐ AB ← A ☐ open ☐ closed ☐	Position in case of power failure ☐ AB A B ☐ AB A B AB ← A B AB → A B ☐ ☐ AB → A ☐ AB ← A ☐ open ☐ closed ☐
available air pressure ☐ bar a	
positioning signal ☐ bar a	

Accessories	**Accessories**
manual intervention top mounted ☐	Suppl. contacts baelz 376 in position: open 1 x ☐ 2 x ☐ / closed 1 x ☐ 2 x ☐
Contacts suppl. baelz 376 Position open ☐ closed ☐	
Positioner: pneumatic baelz 93 ☐ / electro. pneumatic baelz 86 ☐	position feedback ☐ Ohm
air reducing with filter baelz 54298 ☐	position feedback 4 - 20 mA baelz 1017 ☐
Solenoid valves ☐ 286 / 2 ☐ 270 / 2 ☐ 279 ☐ 280 Voltage ☐ Volts	electric heating for stuffing box ☐ for actuator ☐
	servo - amplifier baelz 1020 power supply ☐ 24 V, 50 Hz ☐ 230 V, 50 Hz

Bälz-electrodyn - control valves and control actuators

8.2.1 Control valve questionnaire - example 3-way mixing motorized valve

Customer:					Inquiry No.:		
Textile Finishing					Project followed by:		
					Service:	Tel.:	
Project No.:	Day No.:				Quantity:		
Type of body	☐ 2-way	☒ mixing			☐ diverting	☐	
nominal diameter	ND 50	nominal pressure			NP 16		
Connections	flange X	ext. threaded / welding ends					
body material / trim material		GJS-400-18-LT (GGG 40.3) / SS					
stuffing box	☒ PTFE V- rings	☐			☐	☒ stainless steel bellows	
basic valve characteristic		☐ linear			☐	☒ equal percentage	
Kvs value	Kvs = 36				Cvs = 42		

Service conditions

Fluid	hot oil						Dimension
Flow rate	min.		norm		max.	30	m^3 / h
Inlet pressure						5	bar absolute
Outlet pressure						4,5	bar absolute
Kvs value						36	
Temperature	300						°C
Density	690,45						kg / m^3
Closing pressure	5						bar
Noise level	46						dB (A)

Actuator

Pneumatic actuator	Electric actuator
Type 373 - P ...	Type 373-E07-20-18-S21
diaphragm surface ☐ cm^2	Thrust 2 kN
Position in case of air failure	Voltage / Frequency 230 V / 50 Hz
☐ AB ⋈ A, B — ☐ AB ⋈ A, B — ☐ ⋈ — ☐ AB → A — ☐ AB ← A — ☐ open — ☐ closed	positioning time 74 s; travel 22 mm
	Position in case of power failure stays in its position
	☒ AB ⋈ A, B — ☐ AB ⋈ A, B — ☐ ⋈ — ☐ AB → A — ☐ AB ← A — ☐ open — ☐ closed
available air pressure ☐ bar a	
positioning signal ☐ bar a	

Accessories	Accessories
manual intervention top mounted ☐	Suppl. contacts baelz 376 in position: open 1 x ☐ 2 x ☐ / closed 1 x ☐ 2 x ☐
Contacts suppl. baelz 376 Position open ☐ closed ☐	
Positioner: pneumatic baelz 93 ☐ / electro. pneumatic baelz 86 ☐	position feedback ☐ Ohm
air reducing with filter baelz 54298 ☐	position feedback 4 - 20 mA baelz 1017 ☐
Solenoid valves ☐ 286 / 2 270 / 2 ☐ ☐ 279 ☐ 280 Voltage ☐ Volts	electric heating for stuffing box ☐ for actuator ☐
	servo - amplifier baelz 1020 power supply ☐ 24 V, 50 Hz ☐ 230 V, 50 Hz

Bälz-electrodyn - control valves and control actuators

8.2.2 Control valve questionnaire - example 2-way pneumatic valve

Customer:		Inquiry No.:	
Textile Finishing		Project followed by:	
		Service:	Tel.:
Project No.:	Day No.:	Quantity: 3 pieces	

Type of body	☒ 2-way	☐	mixing	☐	diverting	☐	
nominal diameter	ND 65	nominal pressure		NP 16			
Connections	flange X	ext. threaded / welding ends					
body material / trim material		C 22.8 / SS					
stuffing box	☒ PTFE V- rings	☐		☐		☒ stainless steel bellows	
basic valve characteristic		☐ linear		☐		☒ equal percentage	
Kvs value	Kvs = 63			Cvs = 73			

Service conditions

Fluid	steam						Dimension
Flow rate	min.	200	norm	1500	max.	2000	kg / h
Inlet pressure		10		10		13	bar absolute
Outlet pressure		9,5		9,5		12,5	bar absolute
Kvs value						63	
Temperature	180°C					192°C	°C
Density	5,15					6,62	kg / m³
Closing pressure	13						bar
Noise level	73						dB (A)

Actuator

Pneumatic actuator		Electric actuator	
Type 373-P21-V6-Fo		Type 373-E...	
diaphragm surface	240 cm²	Thrust	kN
		Voltage / Frequency	V / Hz
		positioning time	s; travel mm

Position in case of air failure (pneumatic actuator)

AB–A/B (mixing)	☐
AB–A/B (diverting)	☐
2-way	☐
3-way angle	☐
AB → A	☒
AB ← A	☐
open	☐
closed	☒

available air pressure	7 bar a
positioning signal	7 bar a

Position in case of power failure stays in its position (electric actuator)

AB–A/B (mixing)	☐
AB–A/B (diverting)	☐
2-way	☐
3-way angle	☐
AB → A	☐
AB ← A	☐
open	☐
closed	☐

Accessories (pneumatic)

manual intervention top mounted		☐
Contacts suppl.	baelz 376 Position	open ☒ closed ☒
Positioner	pneumatic baelz 93	☐
	electro. pneumatic baelz 86	☒
air reducing with filter baelz 54298		☒
Solenoid valves	☐ 286 / 2	270 / 2 ☐
☐ 279 ☐ 280	Voltage	Volts

Accessories (electric)

Suppl. contacts baelz 376 in position	open	1 x ☐ 2 x ☐
	closed	1 x ☐ 2 x ☐
position feedback		Ohm
position feedback 4 - 20 mA baelz 1017		☐
electric heating for stuffing box ☐	for actuator	☐
servo - amplifier baelz 1020 power supply	☐ 24 V, 50 Hz	☐ 230 V, 50 Hz

Bälz-electrodyn - control valves and control actuators

9. Pressure drop and max. diff. pressures for 2-way valves

Each valve or ejector is installed into a pipeline and influences liquid or gaseous flow. By the automatic actuator (installed on top of the valve or ejector body) the flow rate is changed. To size the valve or ejector various data are necessary. The nominal bore (ND, DN) determines the port sizes of the inlet and outlet of a valve or an ejector and by that how the valve may be fixed to the pipeline. ND = nominal diameter, in Europe standardized to ND (nominal diameter). A valve with a ND 100 has inlet and outlet ports of 100 mm.

The nominal pressure NP of a valve determines the maximum admissible pressures and temperatures for given valve body materials.

For on - off valves it is sufficient to state ND and NP, not for a control valve, a control ejector. Pressures and temperatures can only be admitted to limits supported by the actuator.

For the positioning force of an actuator the differential pressure Δp_0 in the closed position is important while the pressure drop Δp_{100} with the fully opened valve together with the maximum flow quantity G determines the Kvs- or Cvs- value.

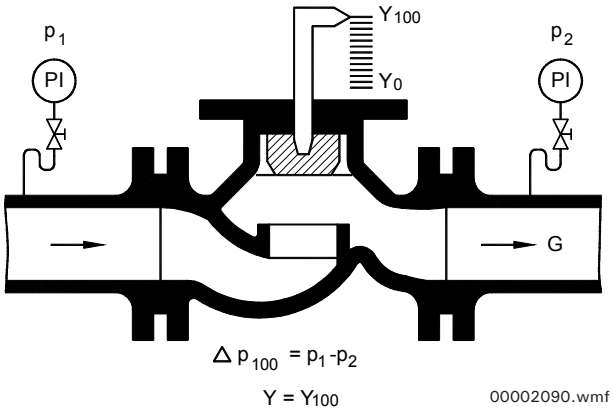


Fig. 99
pressure drop with opened valve necessary for Kvs - value determination; Δp_{100}

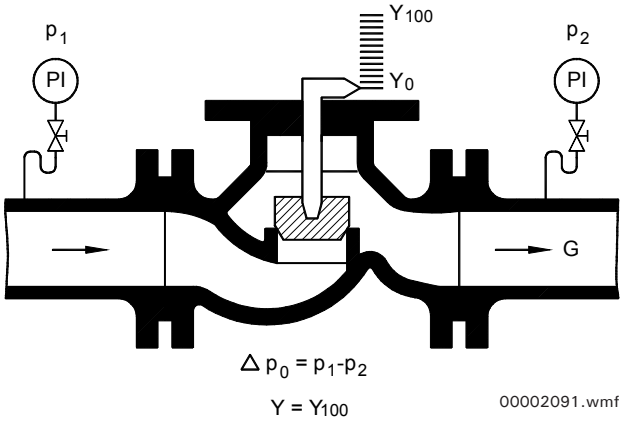


Fig. 100
differential pressure with closed valve necessary for determination of the closing force of the actuator; Δp_0

G = flow rate
p_1 = pressure on the valve inlet
p_2 = pressure on the valve outlet
Δp_0 = differential pressure with closed valve
Δp_{100} = pressure drop across opened valve
Y_0 = travel Y = 0%, i. e. the valve is closed
Y_{100} = travel Y = 100%, i. e. the valve is fully opened

Bälz-electrodyn - control valves and control actuators

10. Plug types and plug characteristics for 2-way valves

10.1 Intrinsic valves characteristics

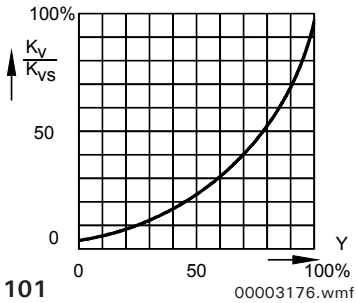


Fig. 101

equal percentage

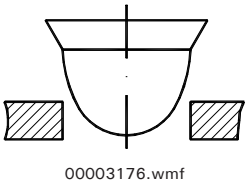


Fig. 102
baelz 356

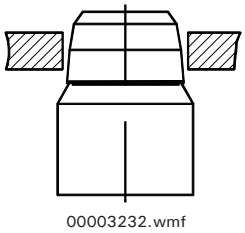


Fig. 103
baelz 340

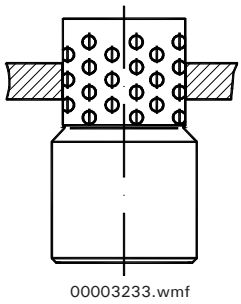


Fig. 104
baelz 340-LK

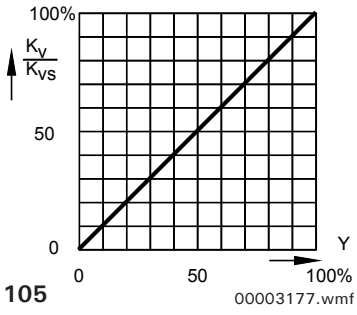


Fig. 105

linear

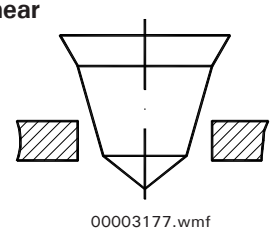


Fig. 106
baelz 356-S

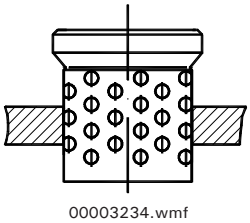


Fig. 107
baelz 356-LK

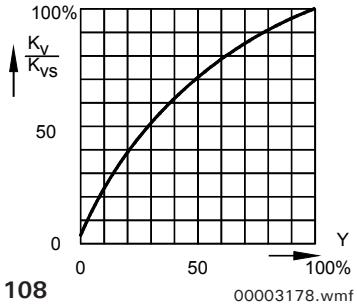


Fig. 108

on - off

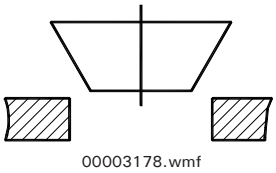


Fig. 109
baelz 340, baelz 356

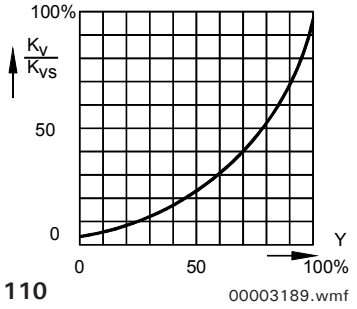
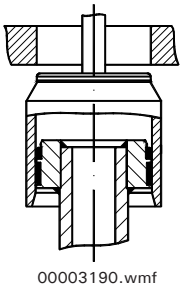


Fig. 110



equal percentage

Fig. 111
baelz 340-B-EM

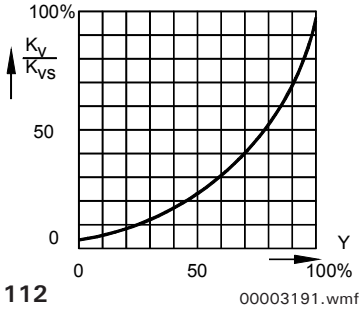
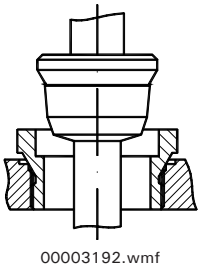


Fig. 112



equal percentage

Fig. 113
baelz 346-EMB

Bälz-electrodyn - control valves and control actuators

10.2 Valve authority

The relation $\Delta p_{100} / \Delta p_0$ determines the reaction of a control valve, if the travel changes. This reaction (valve authority) depends on this relation $\Delta p_{100} / \Delta p_0$ and principally on the basic valve characteristic.

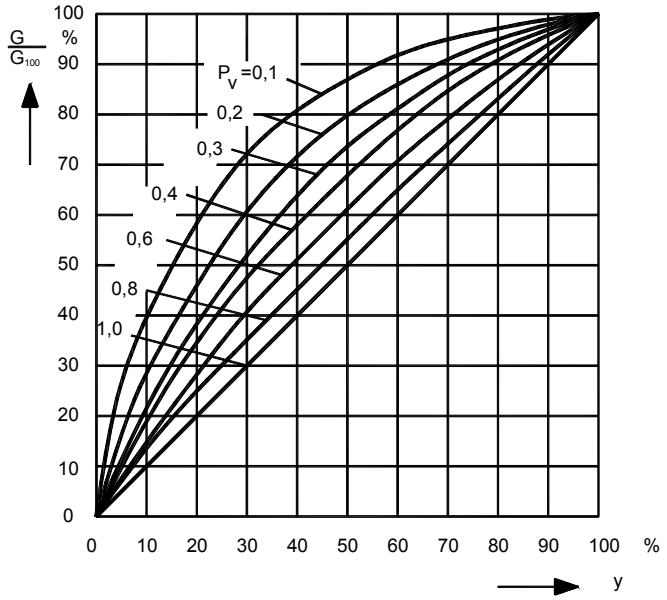


Fig. 114
operational characteristics of a control valve with basic linear characteristics for liquids

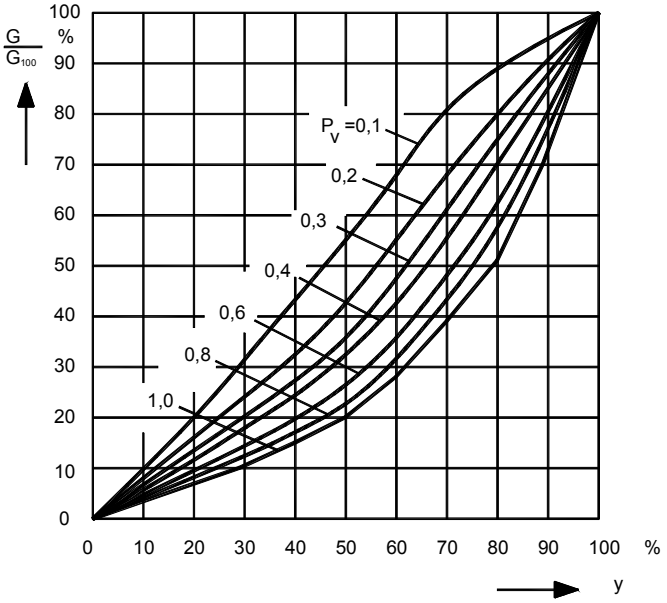


Fig. 115
operational characteristics of a control valve with basic equal percentage characteristics for liquids

G / G_{100} = flow rate
Δp_{100} = pressure drop with fully opened valve
Δp_0 = differential pressure with closed valve
Y = travel of control valve

p_v = valve authority = $\dfrac{\Delta p_{100}}{\Delta p_0}$

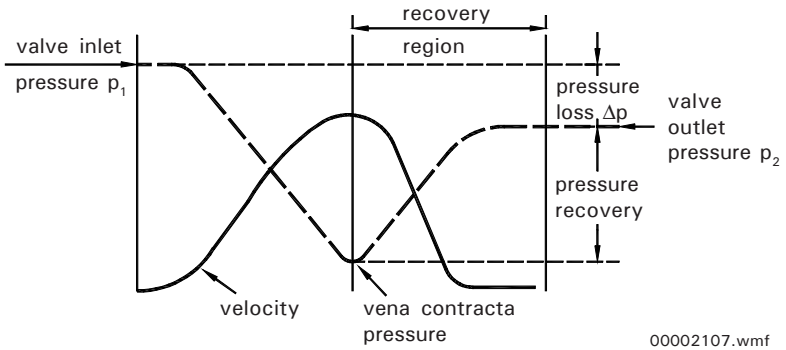


Fig. 116
valve velocity and pressure relationships

Illustrates how velocity and pressure vary as fluid passes through a valve. First, velocity increases, then velocity decreases as it moves through the valve. It thus obeys the continuity principle which requires the velocity to increase when the area decreases for a uniform flow rate. This increased velocity in turn requires a lower pressure. The point of maximum fluid jet contraction - and thus lowest pressure - is called the vena contracta. Beyond this point the flow area returns to its former value in the recovery region. It is in this region that most friction and turbulence losses occur, a fact that accounts for most of the pressure drops between p_1 and p_2. The difference between exit pressure p_2 and pressure at the vena contracta is called pressure recovery.

Bälz-electrodyn - control valves and control actuators

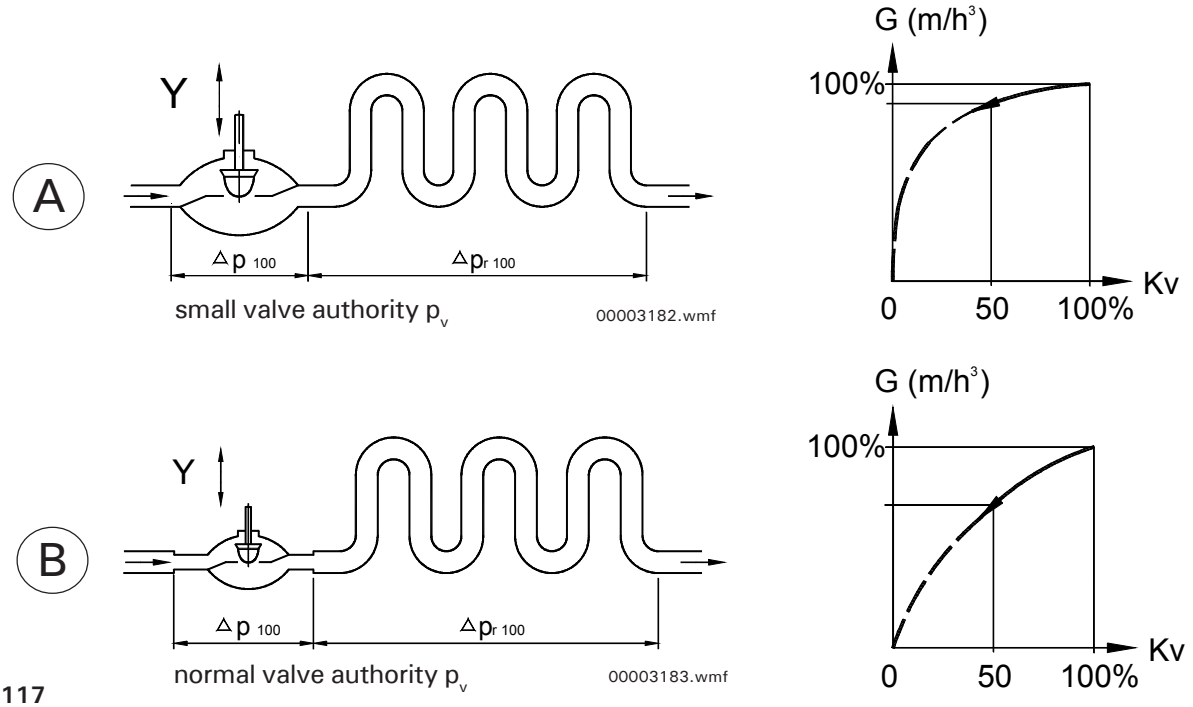


Fig. 117

These 2 examples show visually what happens, if the pressure drop in the heat consumer $\Delta p_{r\,100}$ is relatively high (example A) or low (example B) compared to the pressure drop Δp_{100} across the valve.

For A: at 50 % stroke the flow is still ~ 90 %
For B: at 50 % stroke the flow is ~ 60 %; B is considerably better
i. e.: for practical solutions:
pressure drop across the valve must always be min the same than across the heat consumer or higher, never lower.

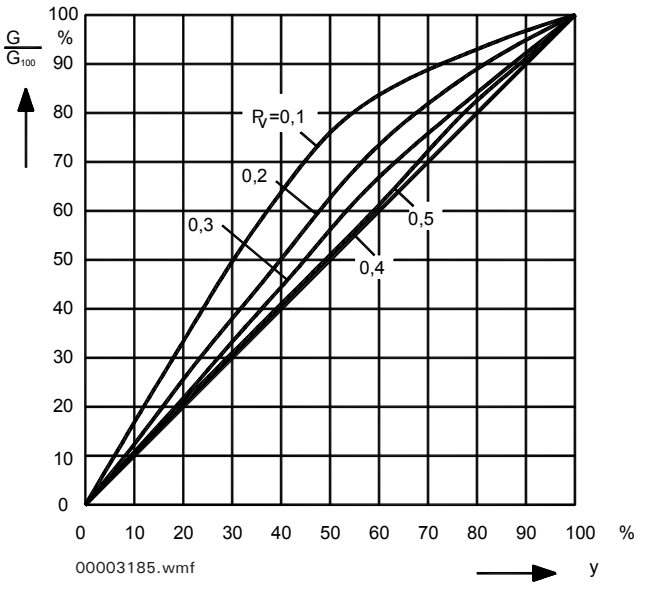


Fig. 118
operational characteristics of a control valve with basic **linear** characteristics for steam

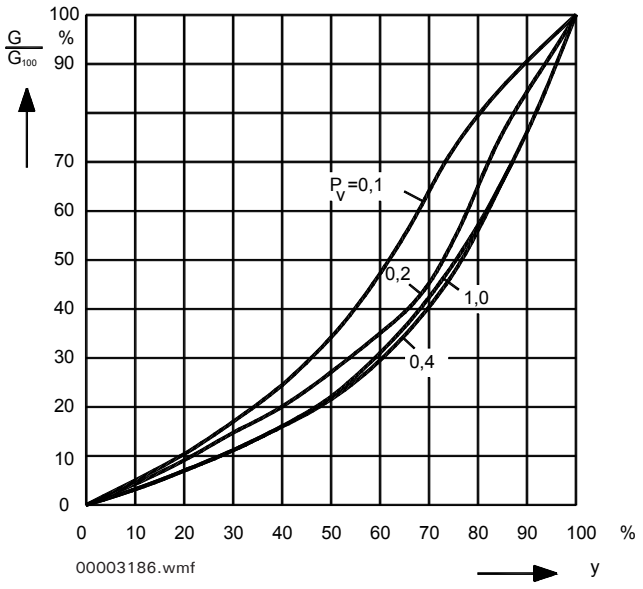


Fig. 119
operational characteristics of a control valve with basic **equal percentage** characteristics for steam

Bälz-electrodyn - control valves and control actuators

10.3 Global characteristics of a control valve in an installation

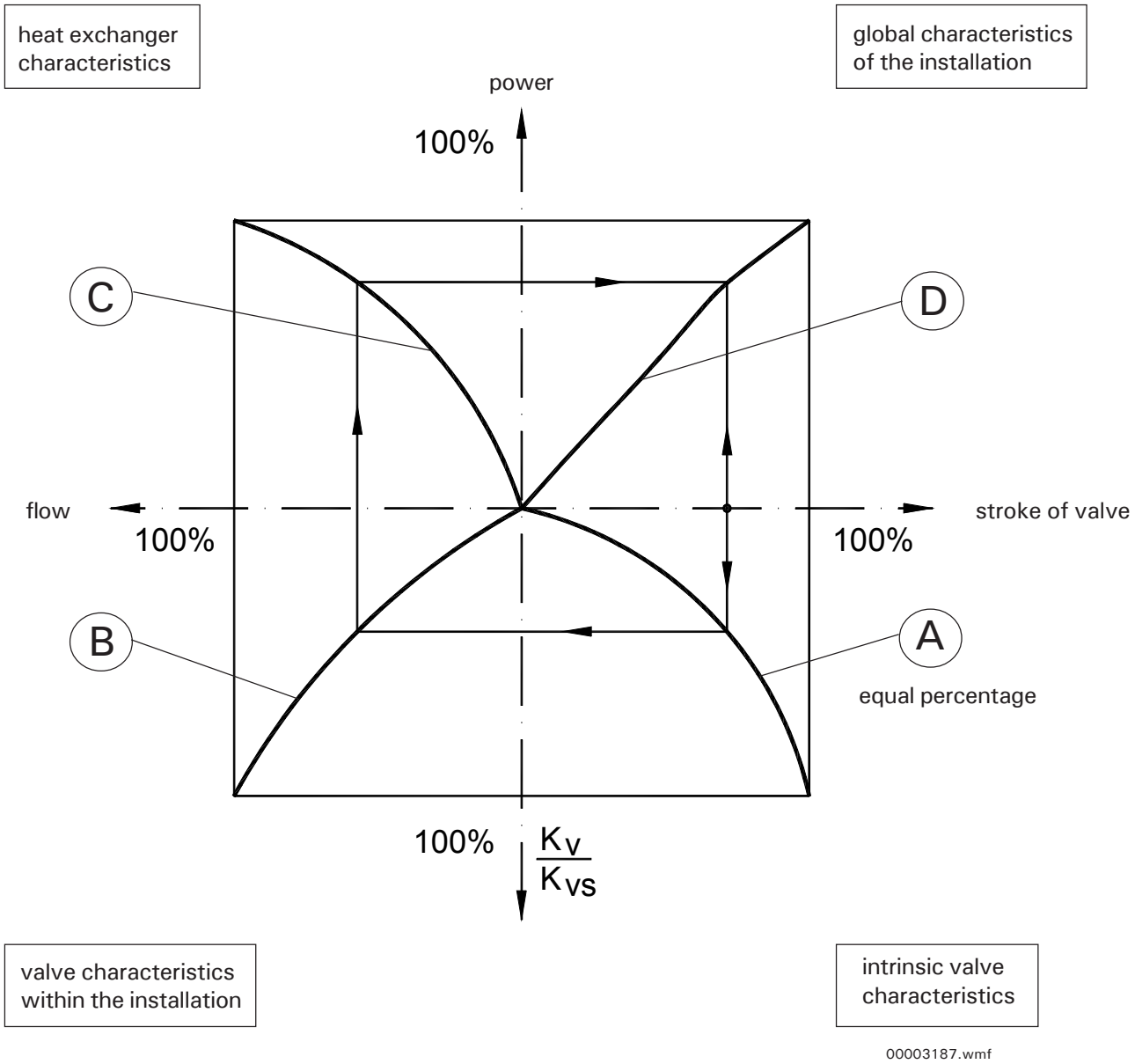


Fig. 120
When discussing about control valve characteristics, this figure should be taken into consideration

A: In the original intrinsic valve characteristics of a valve, here with equal percentage plug messured in a test bench where the totally available pressure drop is only used at the valve.

B: Valve characteristics in a real installation.

C: Heat exchanger characteristics power versus flow.

D: Global stroke / power characteristics, if such a global characteristic is reached, control result will be good.

Bälz-electrodyn - control valves and control actuators

11. Guide for selecting noise level and cavitation limitation in control valves:

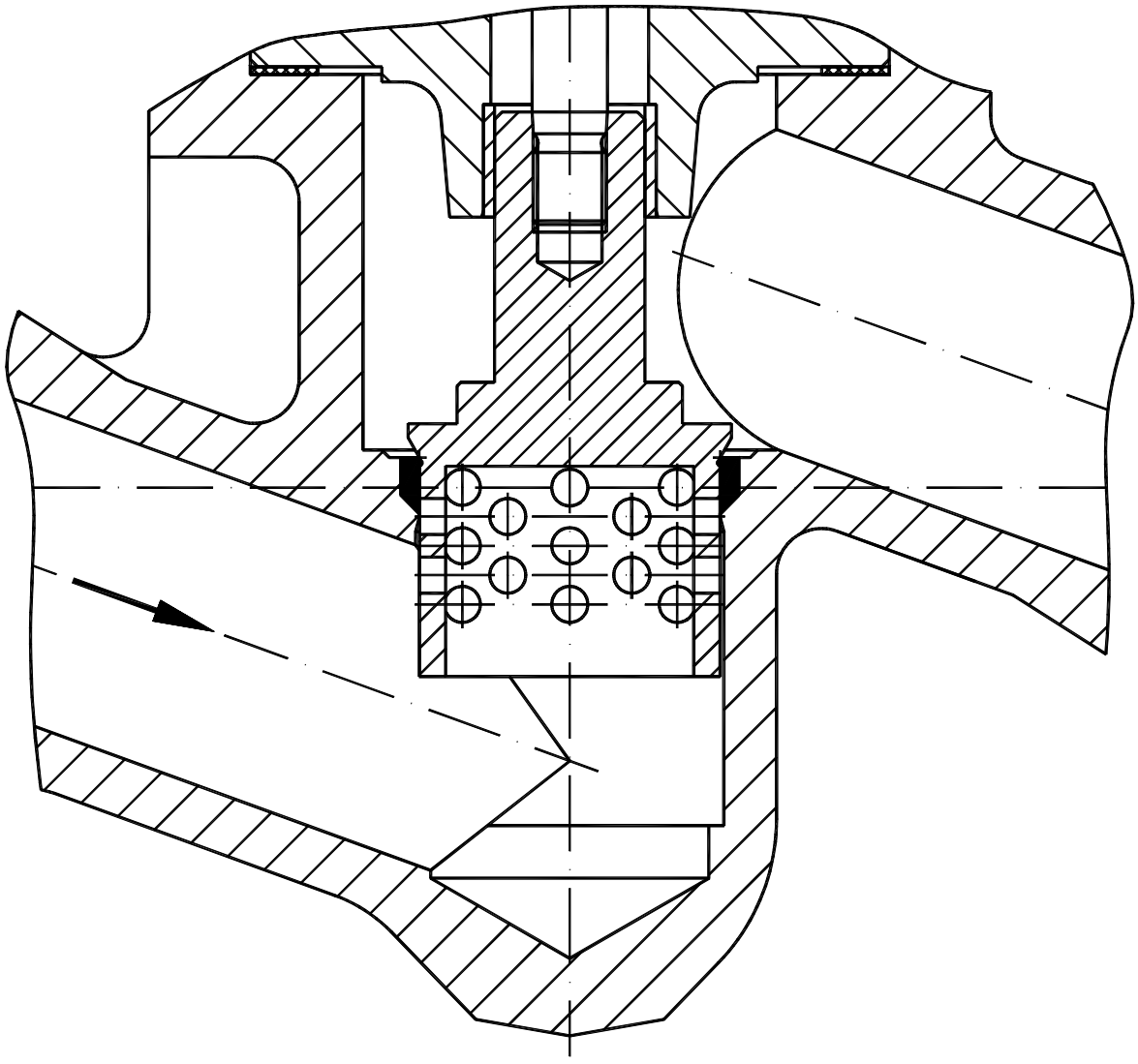
Baelz noise reducing devices or "cavitation - within - the - valve - avoiding devices" for steam and hot water (condensate).

11.1 General information

Baelz uses 3 different devices to reduce noise or avoid cavitation.

11.2 Device 1 - cage plug LK possible in all valve series:

Replace normal parabolic plug by a cage plug, that gives flow another direction and cuts the otherwise compact flow into smaller directed partial flows.



00004051.wmf

Fig. 121

Bälz-electrodyn - control valves and control actuators

11.3 Device 2 - muffling orfice baelz 6250

To avoid the valve´s destruction Baelz selected the already very often successfully applied solution: give the valve a small portion of pressure drop and give the muffling orifice baelz 6250 installed down stream of the valve (1, 2 or 3 orifices) the bigher portion of the pressure drop. It is cheeper to destroy an orifice then to destroy the valve body!

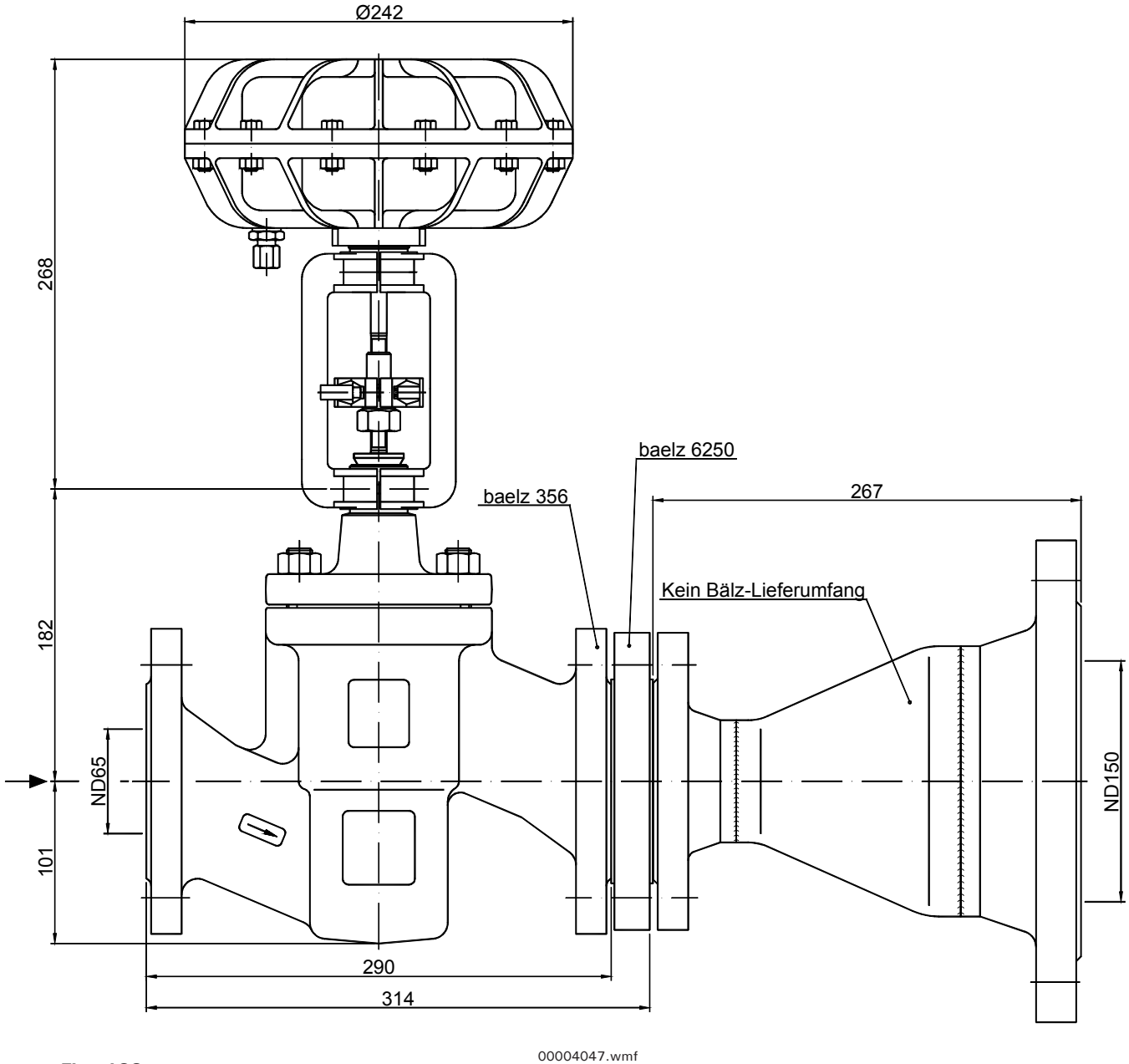


Fig. 122

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11.4 Device 3 - high tech valve baelz 360

Use a high differential pressure handling valve type, our new series baelz 360-EM-C where the piston plug guides through a fixedcage with wholes and an eventually second fixed bottom orifice basket, if very high pressure drops must be handled.

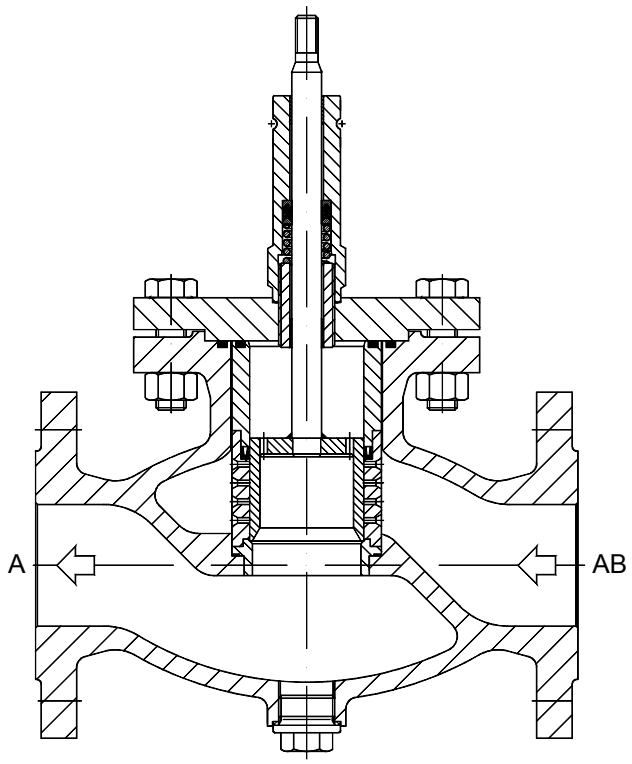

Fig. 123
fixed cage with wholes;
piston type plug

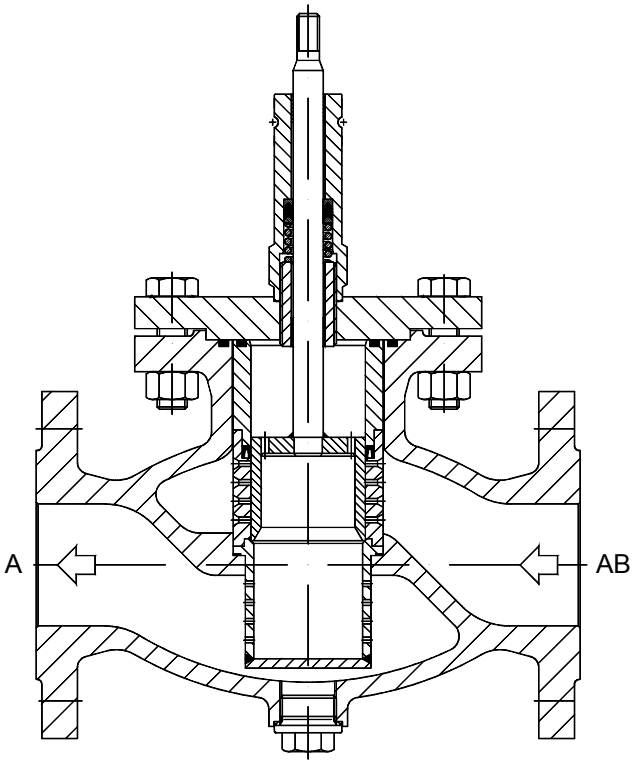

Fig. 124
with additional bottom basket

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11.5 Examples of solutions for hot water (condensate)

Reduction of noise and avoidance of cavitation at unbalanced and balanced valves.

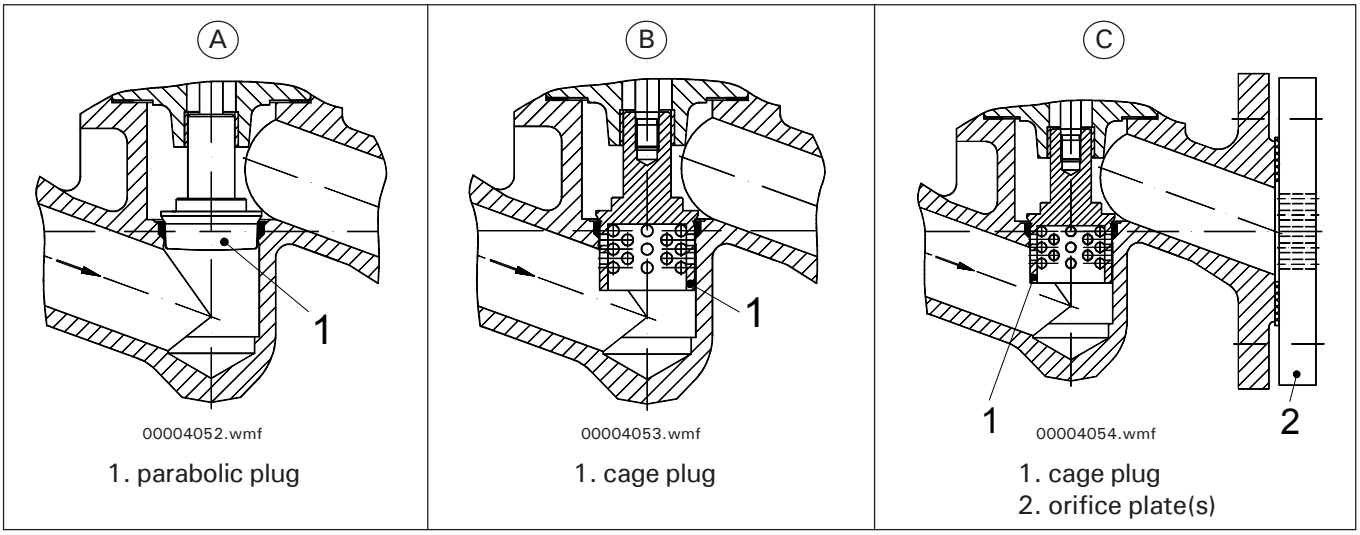


Fig. 125 unbalanced valves

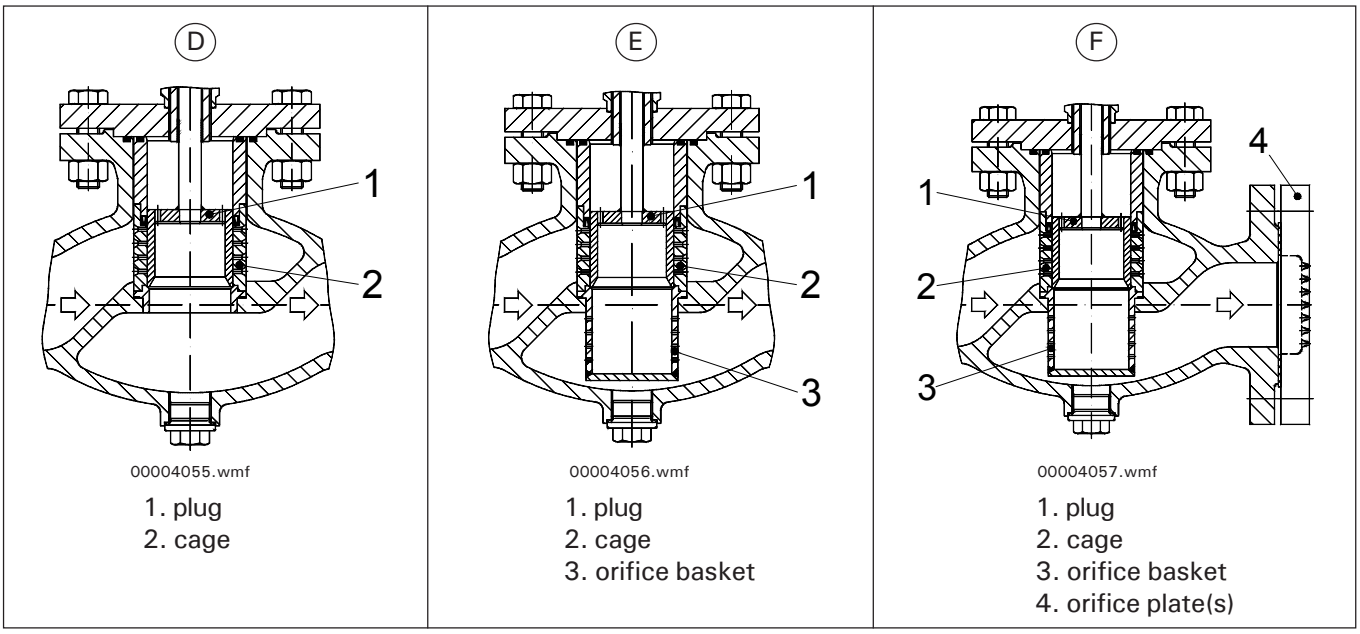


Fig. 126 balanced valves

Application hot water

temperature T_V = 120°C inlet pressure P1 = 6 barabs outlet pressure P2 = 3 barabs saturated P_V = 2 barabs steam pressure of temperature T_V				150°C 16 barabs 5 barabs 4.8 barabs				
fig.	A	B	D	A	B	C	D	E
cavitation	Yes	No	No	Yes	Yes	No	Yes	No
noise reduction dB(A)	0	30	30	0	6	31	20	31
in comparison with X_F	<0.2	0.2<X_F<0,5	0.5 <X_F<0,75	< 0.2	0.2 <X_F < 0,5	0.2 <X_F < 0,5	0.2 <X_F < 0,5	0.75 < X_F

X_F = ratio of differential pressures in liquides $X_F = \frac{P1 - P2}{P1 - Pv}$

Bälz-electrodyn - control valves and control actuators

11.6 Examples of solutions for steam

Reduction of noise and avoidance of cavitation at unbalanced and balanced valves.

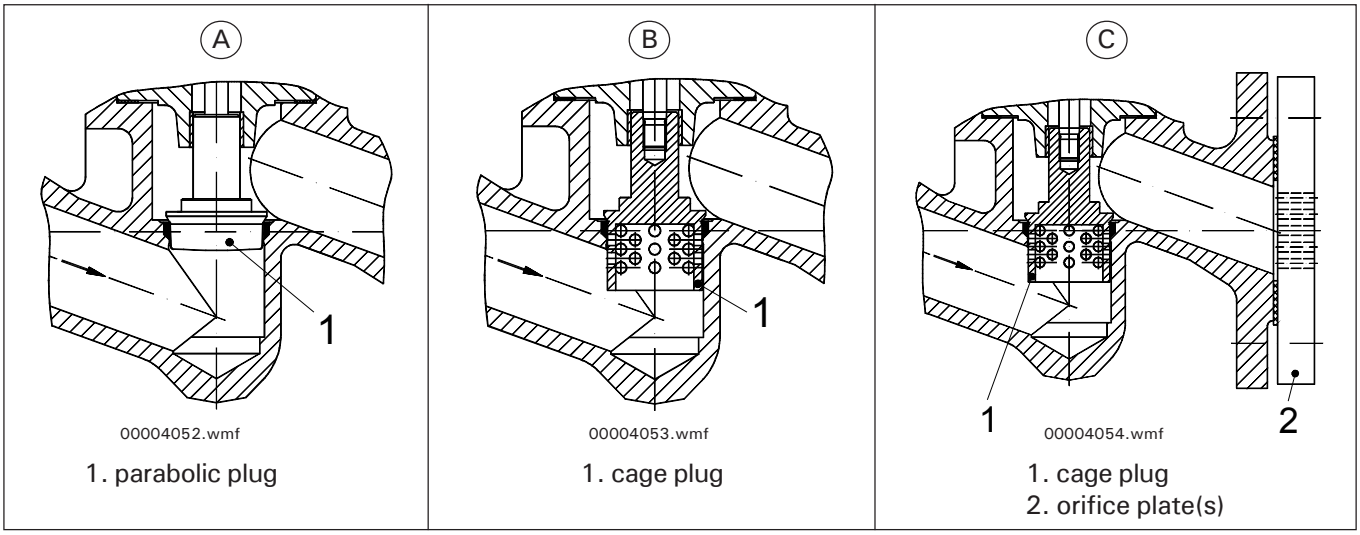


Fig. 127 unbalanced valves

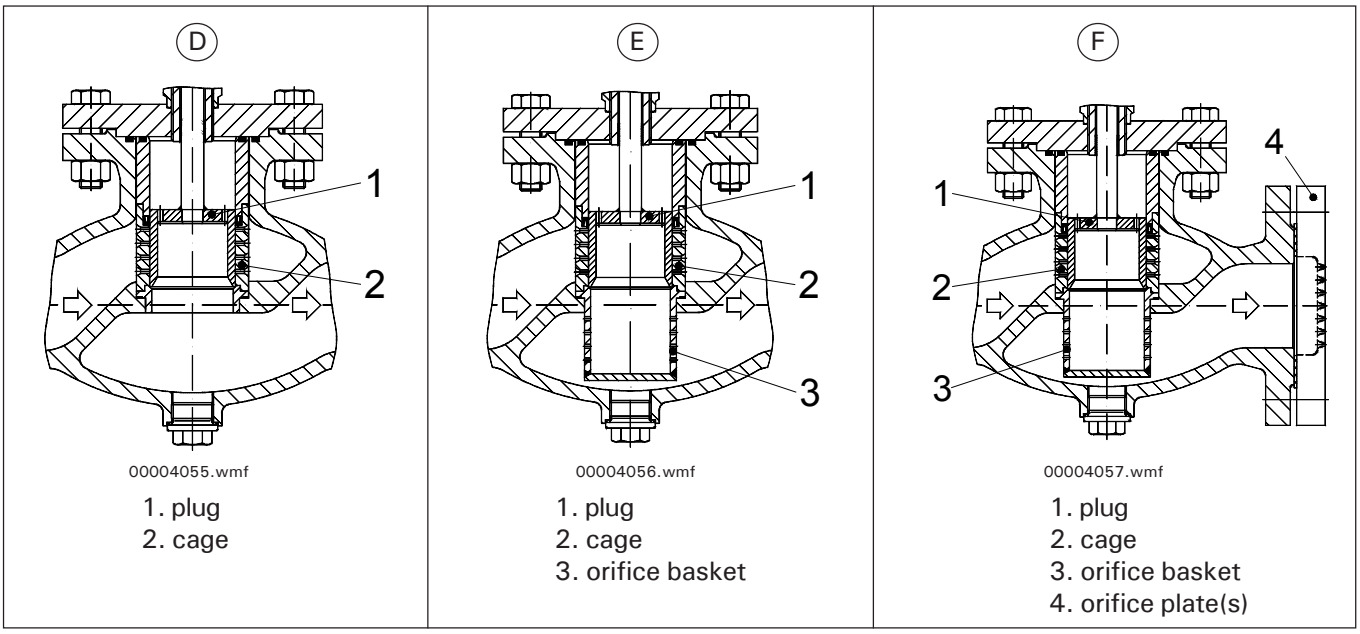


Fig. 128 balanced valves

Application steam

inlet pressure = 10 bar g outlet pressure = 2 bar g						
fig.	A	B	C	D	E	F
noise reduction dB (A) in comparison with fig.A parabolic plug	0	7	11 – 21 *	8	12	16 – 23 *

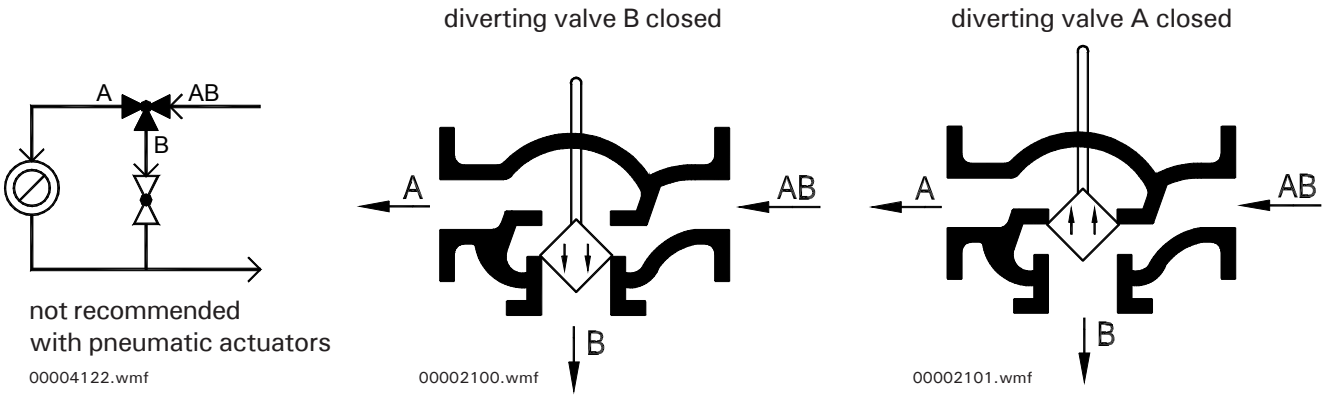
* one - five orifice plates

Bälz-electrodyn - control valves and control actuators

12. Three way valve in liquid systems

3-way valves can be installed as mixing- or diverting valves.

A diverting valve: 1 inlet AB, 2 outlets A + B



B mixing valve: 2 inlets A + B, 1 outlet AB

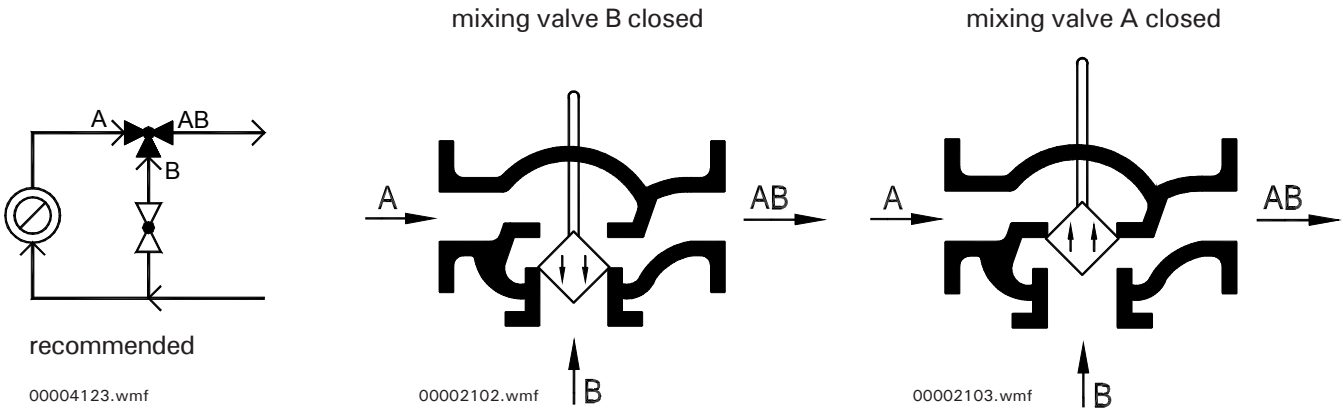


Fig. 129
diverting (A) or mixing valves (B)

A mixing valve is defined as a valve with 2 inlets (A and B) and 1 outlet (AB).
A diverting valve is defined as a valve with 1 inlet (AB) and 2 outlets (A and B).

3-way valves can be installed as mixing or diverting valves. In the upper figures the three - way valve is shown as a diverting valve. In both end - positions (plug in upper position or plug in lower position) the plug will shortly before it has reached the seat be pressed into seat by the flow. With large pressure drops this may lead in these positions to a hammering of the plug. That is why a diverting valve of such design can only be installed with low differential pressures and only as a motorized valve, not as pneumatic valves. We limit max. diff. pressure to 0,6 bar for all diverting valves.

In comparison to that, the lower figures show the 3-way valve as mixing valves. In this case shortly before the plug reaches the end positions it is pushed away from the seat. These conditions are dynamically more favourable and therefore, it is recommended to install the three - way valve always as mixing valve, a mixing valve can easily handle higher differential pressures without hammering.

Baelz limits for diverting valves the max. admissible differential pressure to 0,6 bar; pneumatic operated valves must never be installed as diverting valves!

Bälz-electrodyn - control valves and control actuators

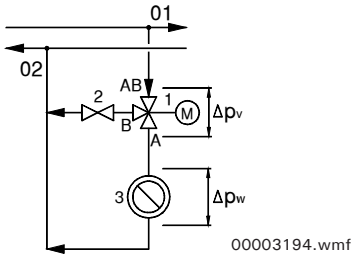


Fig. 130 diverting valve Δp_0 max. 0,6 bar (1 in, 2 outs)

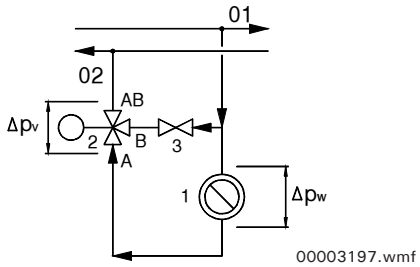


Fig. 131 mixing valve (2 ins, 1 out)
secondary circuit without pump

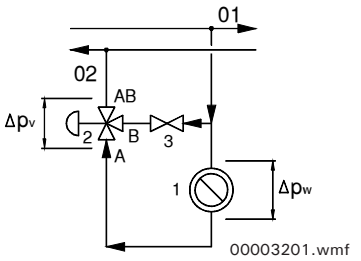


Fig. 132 mixing valve (2 ins, 1 out)
secondary circuit without pump

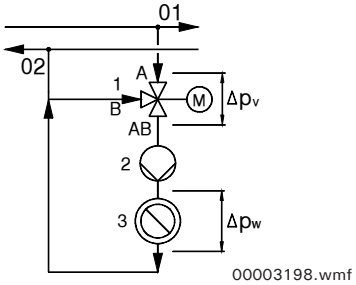


Fig. 133 mixing valve (2 ins, 1 out)
secondary circuit with pump

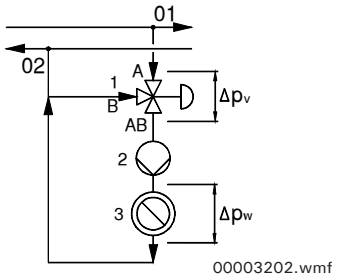


Fig. 134 mixing valve (2 ins, 1 out)
secondary circuit with pump

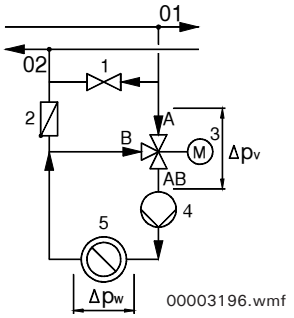


Fig. 135 constant flow in primary and secondary circuit;
valve in secondary circuit as mixing valve

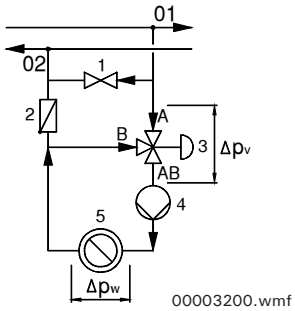


Fig. 136 constant flow in primary and secondary circuit;
valve in secondary circuit as mixing valve

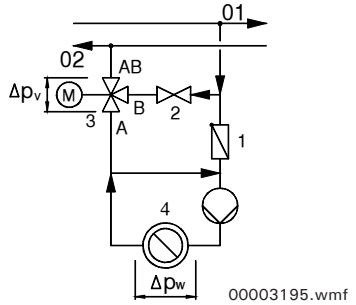


Fig. 137 constant flow in primary and secondary circuit;
valve in primary circuit as mixing valve

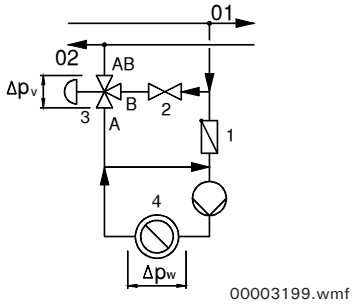


Fig. 138 constant flow in primary and secondary circuit;
valve in primary circuit as mixing valve

Bälz-electrodyn - control valves and control actuators

13. Examples of Kvs-value calculations

13.1 Calculation of kv-value for saturated steam

$kv = M / (P1 \bullet f)$

$M = kv \bullet P1 \bullet f$

with $f = 22 \bullet \sqrt{X} \bullet (1-0.72 \bullet X)$
and $X = (P1-P2) / P1$

if $X >= 0.46$ then $f = 10$

M (kg/h) : Saturated steam flow
P1 (barabs) : Inlet pressure
P2 (barabs) : Outlet pressure

Example 1:

M (kg/h)	: 500	500
P1 (barabs)	: 5	5
P2 (barabs)	: 4	2
X	: 0.2	0.6
f	: 8.42	10*
kv (m³/h)	: 11.9	10

*f = 10 because X>0.46

Example 2:

kv (m³/h)	: 16	16
P1 (barabs)	: 7	7
P2 (barabs)	: 6	3
X	: 0.14	0.57
f	: 7.40	10*
M (kg/h)	: 829	1120

*f = 10 because X>0.46

Bälz-electrodyn - control valves and control actuators

13.2 Simplified calculation of duty in kW (steam just condensing)

Correct equation:

$Q = M / 3600 \times r$

Simplified equation:

$Q_A = M / f$

Q (kW) : Power
M (kg/h) : Saturated steam flow
r (kJ/kg) : Evaporation enthalpy
f (-) : Constant

Steam pressure (barabs)	Evaporation enthalpy (kJ/kg)	Power of 100 kg/h steam (kW)	Approach $Q_A = M / f$ (kW)		Tolerance $(Q - Q_A)/Q$ (%)
1	2257.9	62.7	100/1.65 =	60.6	3.35
2	2201.6	61.1		60.6	0.82
3	2163.2	60		60.6	-0.01
4	2133	59.3		60.6	-2.20
5	2107.4	58.5		60.6	-3.60
6	2085	58	100/1.70	58.8	-1.40
7	2064.9	57.4		58.8	-2.40
8	2046.5	56.8		58.8	-3.50
9	2029.5	56.3		58.8	-4.50
10	2013.6	55.9		58.8	-5.20
12.5	1977.4	54.9	100/1.80	55.5	-1.10
15	1945.2	54		55.5	-2.80
17.5	1915.9	53.2		55.5	-4.30
20	1888.6	52.5		55.5	-5.70
22.5	1863.1	51.8	100/1.90	52.6	-1.50
25	1839	51		52.6	-3.10
27.5	1816	50.4		52.6	-4.30
30	1793.9	49.8		52.6	-5.60

		Faktor f =
1 <= Steam pressure <= 5 barabs	:	1.65
5 < Steam pressure <= 10 barabs	:	1.70
10 < Steam pressure <= 20 barabs	:	1.80
20 < Steam pressure <= 30 barabs	:	1.90

Bälz-electrodyn - control valves and control actuators

13.3 Physical properties of steam (for pressure 1-70 barabs)

Pabs bar	ϑ °C	v˝ $\frac{m^3}{kg}$	h˝ $\frac{kJ}{kg}$	r $\frac{kJ}{kg}$
1,0	99,63	1,694	2675,4	2257,9
1,1	102,32	1,549	2679,6	2250,8
1,2	104,81	1,428	2683,4	2244,1
1,3	107,13	1,325	2687,0	2237,8
1,4	109,32	1,236	2690,3	2231,9
1,5	111,37	1,159	2693,4	2226,2
1,6	113,32	1,091	2696,2	2220,9
1,7	115,17	1,031	2699,0	2215,7
1,8	116,93	0,9772	2701,5	2210,8
1,9	118,62	0,9290	2704,0	2206,1
2,0	120,23	0,8854	2706,3	2201,6
2,1	121,78	0,8459	2708,5	2197,2
2,2	123,27	0,8098	2710,6	2193,0
2,3	124,71	0,7768	2712,6	2188,9
2,4	126,09	0,7465	2714,5	2184,9
2,5	127,43	0,7184	2716,4	2181,0
2,6	128,73	0,6925	2718,2	2177,3
2,7	129,98	0,6684	2719,9	2173,6
2,8	131,20	0,6460	2721,5	2170,1
2,9	132,39	0,6251	2723,1	2166,6
3,0	133,54	0,6056	2724,7	2163,2
3,2	135,75	0,5700	2727,6	2156,7
3,4	137,86	0,5385	2730,3	2150,4
3,6	139,86	0,5103	2732,9	2144,4
3,8	141,78	0,4851	2735,3	2138,6
4,0	143,62	0,4622	2737,6	2133,0
4,2	145,39	0,4415	2739,8	2127,5
4,4	147,09	0,4226	2741,9	2122,3
4,6	148,73	0,4053	2743,9	2117,2
4,8	150,31	0,3894	2745,7	2112,2
5,0	151,84	0,3747	2747,5	2107,4
5,5	155,46	0,3425	2751,6	2096,0
6,0	158,84	0,3155	2755,5	2085,0
6,5	161,99	0,2925	2758,8	2074,7
7,0	164,96	0,2727	2762,0	2064,9
7,5	167,76	0,2555	2764,9	2055,5
8,0	170,41	0,2403	2767,5	2046,5
8,5	172,93	0,2268	2769,9	2037,8
9,0	175,36	0,2148	2772,1	2029,5
9,5	177,66	0,2040	2774,2	2021,4
10	179,88	0,1943	2776,2	2013,6
11	184,07	0,1774	2779,7	1998,5
12	187,96	0,1632	2782,7	1984,3
13	191,61	0,1511	2785,4	1970,7
14	195,04	0,1407	2787,8	1957,7
15	198,29	0,1317	2789,9	1945,2
16	201,37	0,1237	2791,7	1933,2
17	204,31	0,1166	2793,4	1921,5
18	207,11	0,1103	2794,8	1910,3
19	209,80	0,1047	2796,1	1899,3

Pabs bar	ϑ °C	v˝ $\frac{m^3}{kg}$	h˝ $\frac{kJ}{kg}$	r $\frac{kJ}{kg}$
20	212,37	0,09954	2797,2	1888,6
21	214,85	0,09489	2798,2	1878,2
22	217,24	0,09065	2799,1	1868,1
23	219,55	0,08677	2799,8	1858,2
24	221,78	0,08320	2800,4	1848,5
25	223,94	0,07991	2800,9	1839,0
26	226,04	0,07686	2801,4	1829,6
27	228,07	0,07402	2801,7	1820,5
28	230,05	0,07139	2802,0	1811,5
29	231,97	0,06893	2802,2	1802,6
30	233,84	0,06663	2802,3	1793,9
31	235,67	0,06447	2802,3	1785,4
32	237,45	0,06244	2802,3	1776,9
33	239,18	0,06053	2802,3	1768,6
34	240,88	0,05873	2802,1	1760,3
35	242,54	0,05703	2802,0	1752,2
36	244,16	0,05541	2801,7	1744,2
37	245,75	0,05389	2801,4	1736,2
38	247,31	0,05244	2801,1	1728,4
39	248,84	0,05106	2800,8	1720,6
40	250,33	0,04975	2800,3	1712,9
41	251,80	0,04850	2799,9	1705,3
42	253,24	0,04731	2799,4	1697,8
43	254,66	0,04617	2798,9	1690,3
44	256,05	0,04508	2798,3	1682,9
45	257,41	0,04404	2797,7	1675,6
46	258,75	0,04304	2797,0	1668,3
47	260,07	0,04208	2796,4	1661,1
48	261,37	0,04116	2795,7	1653,9
49	262,65	0,04028	2794,9	1646,8
50	263,91	0,03943	2794,2	1639,7
51	265,15	0,03861	2793,4	1632,7
52	266,37	0,03782	2792,6	1625,7
53	267,58	0,03707	2791,7	1618,8
54	268,76	0,03633	2790,8	1611,9
55	269,93	0,03563	2789,9	1605,0
56	271,09	0,03495	2789,0	1598,2
57	272,22	0,03429	2788,0	1591,4
58	273,35	0,03365	2787,0	1584,7
59	274,46	0,03303	2786,0	1578,0
60	275,55	0,03244	2785,0	1571,3
61	276,63	0,03186	2784,0	1564,7
62	277,70	0,03130	2782,9	1558,0
63	278,75	0,03076	2781,8	1551,5
64	279,79	0,03023	2780,6	1544,9
65	280,82	0,02972	2779,5	1538,4
66	281,84	0,02922	2778,3	1531,9
67	282,84	0,02874	2777,1	1525,4
68	283,84	0,02827	2775,9	1518,9
69	284,82	0,02782	2774,7	1512,5
70	285,79	0,02737	2773,5	1506,0

ϑ = temperature
v˝ = specific volume
$\frac{1}{v''}$ = density

h˝ = upstream enthalpy of steam
r = heat of vaporization

Bälz-electrodyn - control valves and control actuators

13.4 Calculation of kv-value for oil

$$kv = V \bullet \sqrt{\rho / (1000 \bullet \Delta P)}$$

$$kv^* = kv / Fre$$

with
$\Delta P = (P1-P2)$
$u = (4 \bullet 10^6 \bullet V) / (3600 \bullet \pi \bullet ND^2)$
$Re = (u \bullet ND \bullet 10^{-3}) / \gamma$
$Fre = 1 / \sqrt{(1 + 315 / Re)}$

V (m³/h) : Oil flow
P1 (barabs) : Inlet pressure
P2 (barabs) : Outlet pressure
ΔP (bar) : Pressure loss in valve
T1 (°C) : Inlet temperature
ρ (kg/m³) : Density of T1
ND : Nominal diameter
Re (-) : Reynold´s value
u (m/s) : Velocity
γ (m²/s) : kinematic viscosity
Fre (-) : Correction factor

Example:

Fluid	: Transcal N	Essotherm 650
V (m³/h)	: 25	100
P1 (barabs)	: 5	7
P2 (barabs)	: 4.5	6
T1 (°C)	: 40	150
ΔP (bar)	: 0.5	1
ρ (kg/m³)	: 858	813
γ (m²/s)	: $31 \bullet 10^{-6}$	$9.2 \bullet 10^{-6}$
kv (m³/h)	: 32.8 ⇒ ND 50 kvs 36	90.2 ⇒ ND 80 kvs 105
u (m/s)	: 3.53	5.53
Re (-)	: 5705	48087
Fre (-)	: 0.97	0.996
kv*(m³/h)	: 33.8	90.5

Bälz-electrodyn - control valves and control actuators

13.5 Calculation of kv-value for water

$kv = V \bullet \sqrt{\rho / (1000 \bullet \Delta P)}$

$V = kv \bullet \sqrt{(1000 \bullet \Delta P) / \rho}$

$\Delta P = (V^2 \bullet \rho) / (kv^2 \bullet 1000)$

$\Delta P^* = 0.3 \bullet [P1-(T1/100)^4]$

with $\Delta P = (P1-P2)$
and $P2 >= (P1s+1)$

V (m³/h) : Water flow
P1 (barabs) : Inlet pressure
P2 (barabs) : Outlet pressure
P1s (barabs) : Saturated pressure of temperature T1
ΔP (bar) : Pressure loss in valve
T1 (°C) : Inlet temperature
ρ (kg/m³) : Density of T1

$\Delta P <= \Delta P^*$ $\Rightarrow$ No cavitation
if $P2 < (P1s+1)$ $\Rightarrow$ please ask baelz!

Example 1:

V (m³/h)	: 10	25	40
P1 (barabs)	: 8	5	6
P2 (barabs)	: 7	3	2
T1 (°C)	: 100	90	130
ρ (kg/m³)	: 958	965	935
ΔP (bar)	: 1	2	4
P1s (barabs)	: 1	0.7	2.7
kv (m³/h)	: 9.78	17.4	***
ΔP* (bar)	: 2.1	1.3	
Cavitation	: No	Yes	

Example 2:

kv (m³/h)	: 10	15
P1 (barabs)	: 8	4
P2 (barabs)	: 6	1.5
T1 (°C)	: 110	140
ρ (kg/m³)	: 951	926
ΔP (bar)	: 2	2.5
P1s (barabs)	: 1.43	3.6
V (m³/h)	: 14.5	***
ΔP* (bar)	: 1.96	
Cavitation	: Yes	

Example 3:

kv (m³/h)	: 20	16
P1 (barabs)	: 5	4
T1 (°C)	: 90	130
V (m³/h)	: 20	23.4
ρ (kg/m³)	: 965	935
P1s (barabs)	: 0.7	2.7
ΔP (bar)	: 0.97	2.0
P2 (barabs)	: 4.03	2***
ΔP* (bar)	: 1.3	
Cavitation	: No	

***P2 < P1s $\Rightarrow$ please ask baelz!

Bälz-electrodyn - control valves and control actuators

14. General information about electrical linear actuators baelz 373-EXX

Most of these actuators use as motors synchronous motors with rotors incorporating permanent solenoids.
The travel / stroke time is normally for industrial applications 30 sec - 1 min., for HVAC applications 2,5 - 5 min..

Linear motorized actuators with or without spring - return

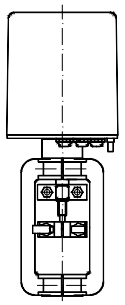


Fig. 139
baelz 373-E07

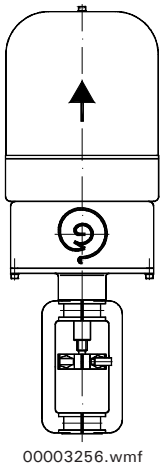


Fig. 140
baelz 373-E11-Z

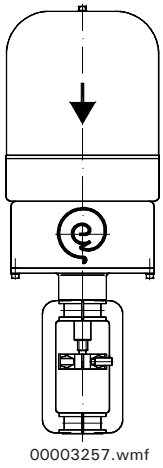


Fig. 141
baelz 373-E11-D

Table to select electric actuator		
thrust N	speed mm / min.	**type baelz 373-**
700 - 2000	6 - 20	E02, E06, E07, E11*, E13*
4000	20 - 38	E40
9000	18	E60
30000	22 - 96	E88

* 10 N = 1 kg

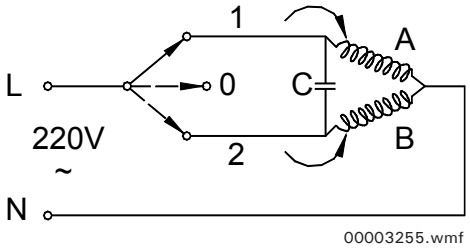


Fig. 142
How to operate an open - stop - close valve actuator with capacitor: feed line voltage via contact 1 to coil.
A: motor turns clockwise; feed line voltage via contact 2 to coil
B: motor turns anti - clockwise

For most of the standard applications there is need a 3 wire cable to position the actuator. End switches in the end positions (open, closed) cut - off line voltage to the motor by a thrust depending mechanism.

The main characteristics for selection of a linear valve actuator:

- motor voltage: 230 V; 50 / 60 Hz
  110 V; 50 / 60 Hz
  24 V; 50 / 60 Hz
  24 V;
- positionning speed: min. 6 mm / min.
  max. 96 mm / min.
- thrust: min. 700 N
  max. 30000 N
- protection class: min. IP 42
  max. IP 63
- with or without manual override
- accessories: - additional end switches
  - position feedback potentiometer normally 0 - 5 kΩ
  - position indication 0 / 4 - 20 mA
  - electronic positioner to position valve by a signal 0 / 2 - 20 V or 0 / 4 - 20 mA
  - spring return mechanism to put valve in a fail safe position
  - mechanical stroke limiting

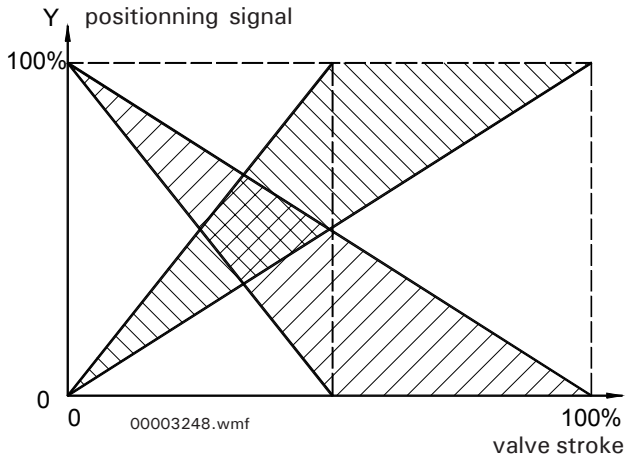


Fig. 143
diagram of setting possibilities of electronic positioner baelz 1020 0 / 2 - 10 V and 0 / 4 - 20 mA or digital positioner baelz 7020

Bälz-electrodyn - control valves and control actuators

Operation principle and thrust depending end position cut - off is explained in the following figures. Spindle S goes up and down to positionning the valve plug into by a controller determined position. When the plug reaches the open or closed end position, spring F is compressed displacing lever W operating the correspondant end contacts E. Spring F force depends of type of actuator 1000 N for 373-E02, 2000 N for 373-E07, 4000 N for 373-E40, 9000 N for 373-E60 a.s.o.

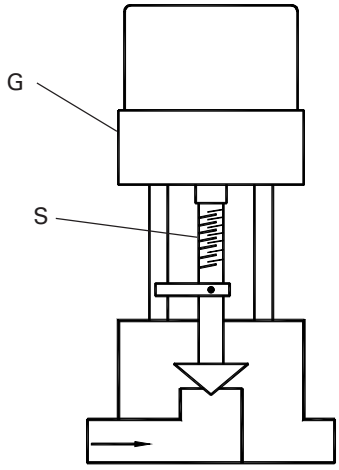
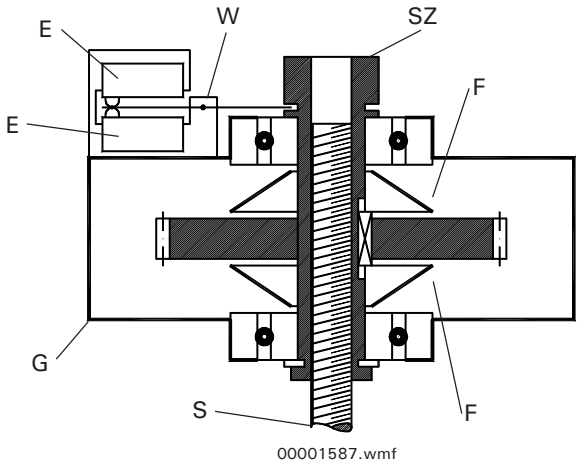


Fig. 144
2-way motorized valve with motorized actuator, its gear box G and spindle S



F - spring element
G - gear box
E - end switch
W - lever
SZ - pinion gear
S - spindle

Fig. 145
cut - view of thrust depending end switch mechanism

Operating principle of spring return actuator baelz 373-E11 and baelz 373-E13

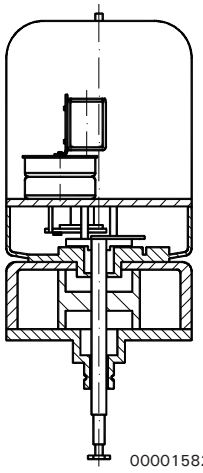


Fig. 146
The spring return actuator exists in 2 versions; either the spindle is pushed downwards in an end position (E11 - D) or the spindle is pulled upwards into an end position (E11 - Z).
To release the spring mechanism from the motor and its gear, the E11 / E 13 incorporates a solenoid. When the power supply to the solenoid is cut - off, the 12 mm long spiralled spring (good for 1.000.000 ups and downs) puts the valve plug in an upper or lower position. The time for such an action is 10 - max. 15 sec. All elements are of special design selected to assure the required safety function.

Electrical wiring of spring return actuator baelz 373-E11

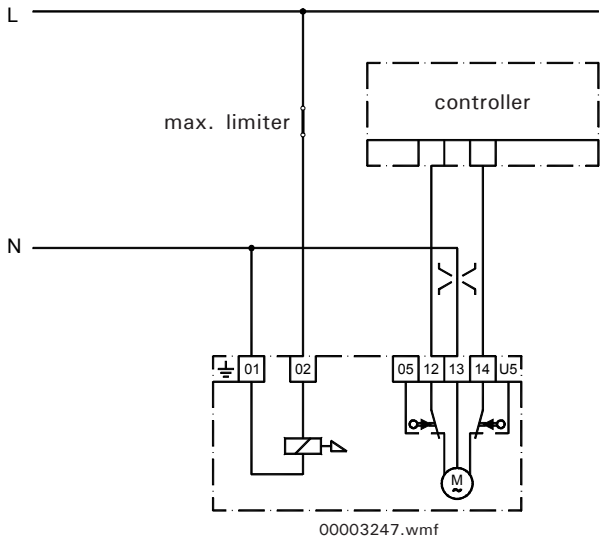
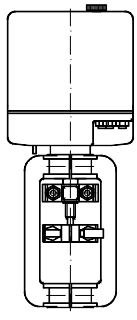


Fig. 147
Electrical connection for the standard open - stop - close action is identical to that of standard motorized actuator. The additional safety check if power is available is done by the solenoid on - terminals 01 + 02.

Bälz-electrodyn - control valves and control actuators

15. Available motorized actuators for valves with valve spindle Ø of 10 mm

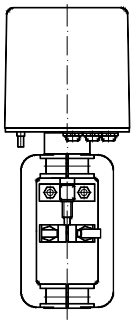
baelz 373-E02



00001591.wmf

Fig. 148

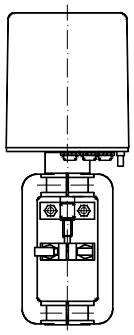
baelz 373-E06



00003239.wmf

Fig. 149

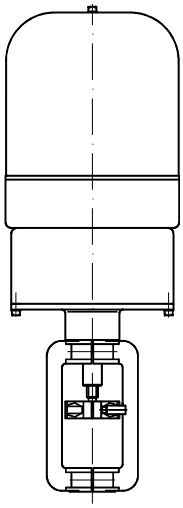
baelz 373-E07



00003240.wmf

Fig. 150

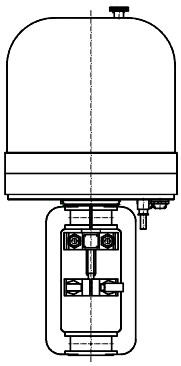
baelz 373-E11



00001592.wmf

Fig. 151

baelz 373-E40



00001562.wmf

Fig. 152

Motorized actuators baelz 373–E...-S21 for ambient temperature 0 ... 50°C				
type	thrust	speed	power	class of protection
baelz 373-	N	mm / min.	VA	
E02-10-18-S21	1000	18	4,6	IP 42
E06-20-06-S21	2000	6	3,5	
E06-07-18-S21	700	18	3,5	
E07-20-06-S21	2000	6	4,1	
E07-20-18-S21	2000	18	11,7	
E11-Z-20-06-S21 [1)]	2000	6	27	IP 44
E11-D-20-06-S21 [1)]	2000	6	27	
E11-Z-20-17-S21 [1)]	2000	17	44	
E11-D-20-17-S21 [1)]	2000	17	44	
E13-Z- - -S21 [1)*]				
E13-D- - -S21 [1)*]				
E13-Z- - -S21 [1)*]				
E13-D- - -S21 [1)*]				
E40-40-20-S21	4000	20	21	IP 42 / IP 63
E40-40-38-S21	4000	38	11W	

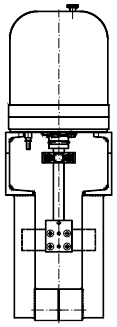
[1)] Actuators E11 - E13 are spring return actuators either to push (D) or to pull (Z).

[1)*] This actuator is not yet available.

Bälz-electrodyn - control valves and control actuators

16. Available motorized actuators for valves with spindle Ø of 22 mm

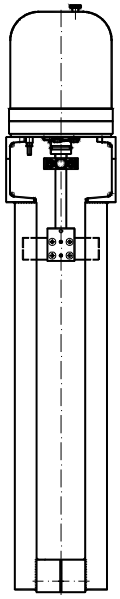
baelz 373-E40-S31



00003258.wmf

Fig. 153

baelz 373-E40-S31C

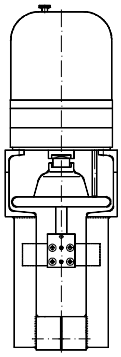


Long yoke

00003259.wmf

Fig. 154

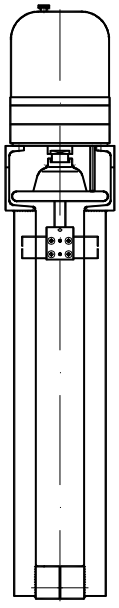
baelz 373-E60-S31



00001590.wmf

Fig. 155

baelz 373-E60-S31C

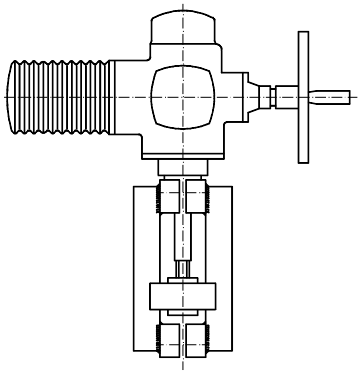


Long yoke

00003249.wmf

Fig. 156

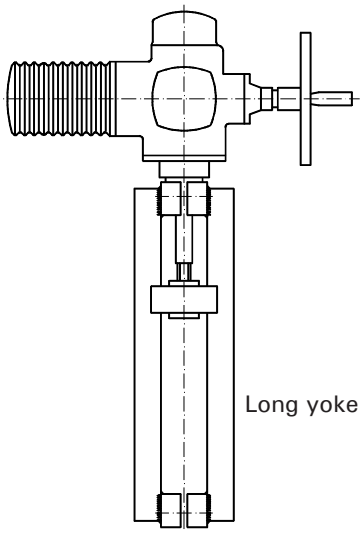
baelz 373-E88-S41



00001588.wmf

Fig. 157

baelz 373-E88-S41C



Long yoke

00001589.wmf

Fig. 158

Linear push and pull electric actuators baelz 373-E...-S31 / S41 for ambient temperature of 0 - 50°C				
type	thrust	speed	power	class of protection
baelz 373-	N	mm / min.	VA	
E40-40-20-S31	4000	20	21	IP 42 / IP 63
E40-40-38-S31	4000	38	11W	
E60-90-18-S31	9000	18	37	IP 42
E88-300-96-S41	30000	96	370W	IP 67

Bälz-electrodyn - control valves and control actuators

17. Additional parts to be incorporated into the electrical actuators on request

baelz 376-2EZ	2 end position switches
baelz 376-Fg ... Ohm	1 feedback potentiometer 200 Ohm or 5 kOhm
baelz 376-2EZ–Fg ...Ohm	with 2 end position switches and feedback potentiometer
baelz 376-Hz	with electrical heating against condensing water
baelz 1017	with feedback signal for position 4 - 20 mA; baelz 376-Fg 5 kOhm is needed for this application
baelz 1020	with electronic positioner baelz 1020 for a positionning signal of 0 / 2 – 10 V or 0 / 4 – 20 mA; baelz 376-Fg 5 kOhm is needed for this application
baelz 1522	relays for actuators with DC motor
baelz 7020	digital positioner

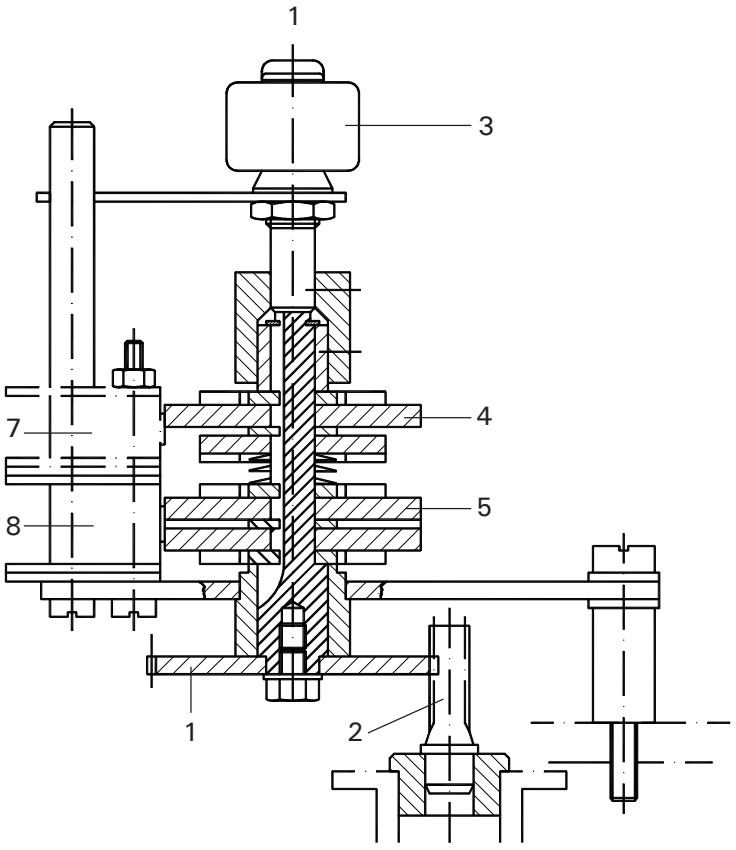


Fig. 159
Feedback potentiometer + 2 end switches mounted on an actuator

1: main pinion
2: toothed spindle
3: potentiometer
4 / 5: cams to operate the end switches
7 / 8: end switches

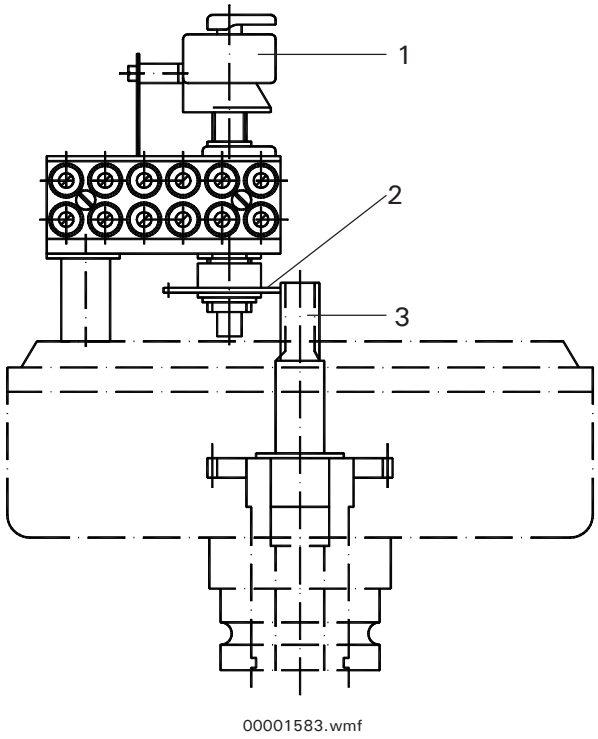


Fig. 160
Feedback potentiometer mounted in the actuator

1: potentiometer
2: main pinion
3: toothed spindle

Bälz-electrodyn - control valves and control actuators

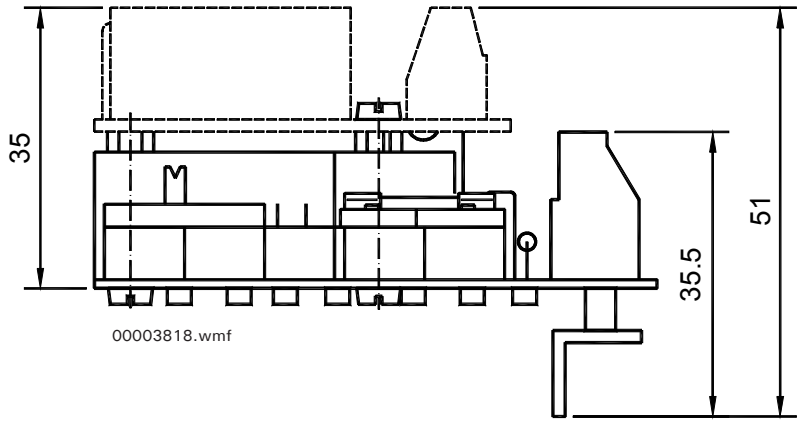
17.1 Electronic positioner baelz 1020 for motorized actuators baelz 373-E02, 373-E06, 373-E07, 373-E11, 373-E40, 373-E60

The electronic positioner baelz 1020 is designed for being incorporated within the motorized actuators under the cover or at the yoke or in an electric panel on rails.
It uses an external signal of 0/4 - 20 mA or 0/2 - 10 V to position a motorized actuator with a feedback potentiometer of 0 - 5 kΩ.

Technical data:

power supply	: either 24 or 115 or 230 V AC
input signal	: selectable by switches 0…10 V, 2…10 V or 0…20 mA, 4…20 mA
differential open / close	: 0.6% - 2.7%
power consumption	: 4 VA at 24 V, 50/60 cycles
protection class	: IP 00

A separate power supply unit for 230 V baelz 1020-SVA is available.



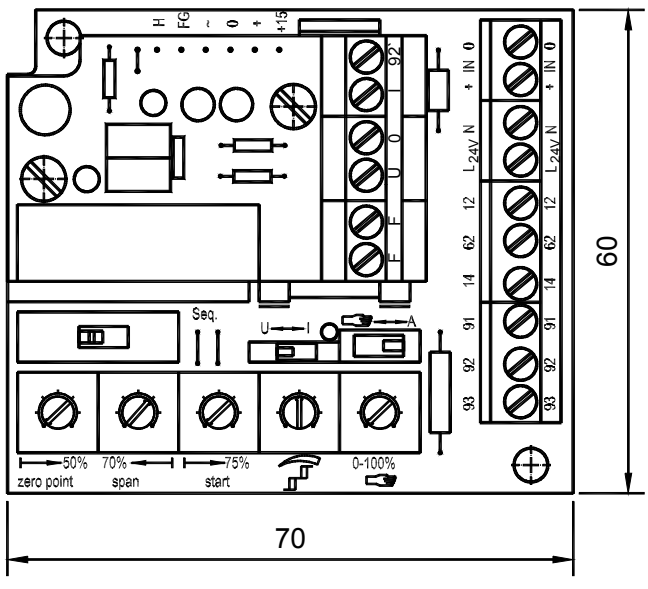


Fig. 161
electronic positioner baelz 1020

Fig. 162
baelz 373-E07-Fg-1020

Fig. 163
baelz 373-E40-Fg-1020

Fig. 164
baelz 373-E60-Fg-1020

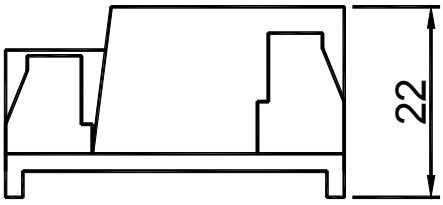
Fig. 165
baelz 373-E11-Fg-1020

Bälz-electrodyn - control valves and control actuators

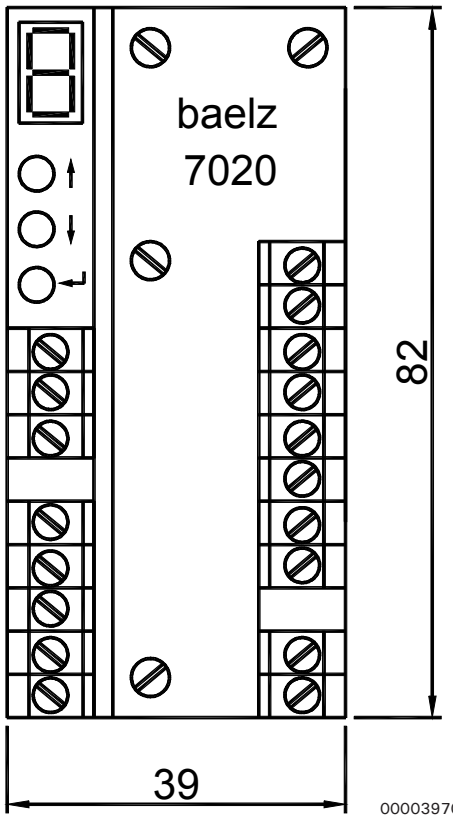
17.2 Digital positioner baelz 7020 for motorized actuators baelz 373-E02, 373-E06, 373-E07, 373-E11, 373-E40, 373-E60

The digital positioner baelz 7020 is designed for being incorporated within the motorized actuators under the cover or at the yoke or in an electric panel on rails.

It uses an external signal of 0/4 - 20 mA or 0/2 - 10 V to position a motorized actuator with or without a feedback potentiometer of 0 - 5 kΩ;
with a one-digit display and 3 push-buttons, to set its parameters;
with a serial SV-interface for an easy and comfortable setting procedure.
RS 485-interface Modbus RTU mode is available.



00003969.wmf



00003970.wmf

Fig. 166
digital positioner baelz 7020

373-E07-7020.JPG

Fig. 167
baelz 373-E07-Fg-7020

373-E40-7020.JPG

Fig. 168
baelz 373-E40-Fg-7020

373-E60-7020-Fg-1.JPG

Fig. 169
baelz 373-E60-Fg-7020

373-E11-7020.JPG

Fig. 170
baelz 373-E11-Fg-7020

Bälz-electrodyn - control valves and control actuators

18. Wiring diagrams

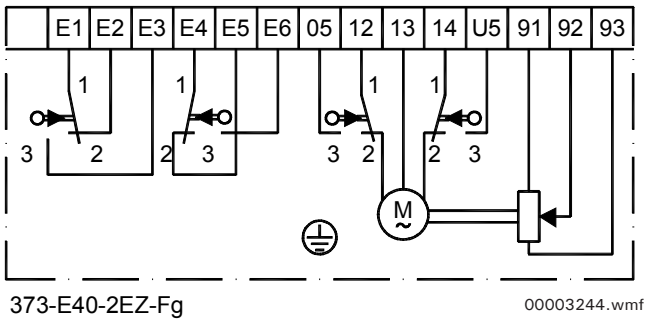


Fig. 171
wiring diagram of an electric actuator baelz 373-E40 with its 2 motor end switches at right hand,
1 feedback potentiometer 0 - 5 kOhm and at left
2 additional end switches.

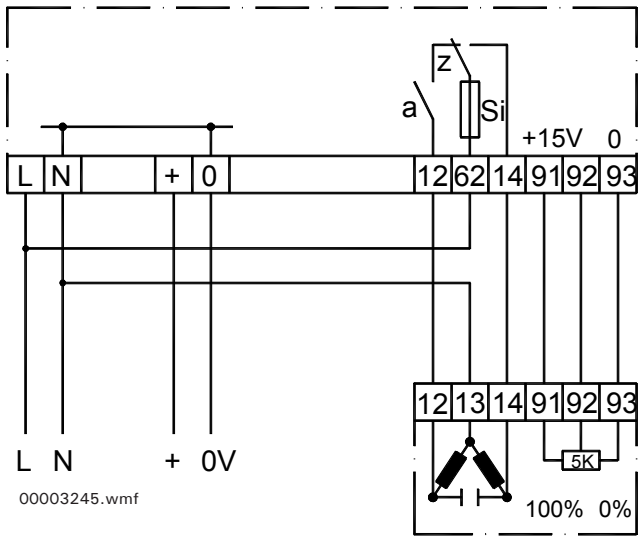


Fig. 172
wiring diagram of a 24 V, 50 / 60 Hz actuator with electronic positioner baelz 1020 and feedback potentiometer positionning signal can be 0 / 2 - 10 V or 0 / 4 - 20 mA, serval options available.

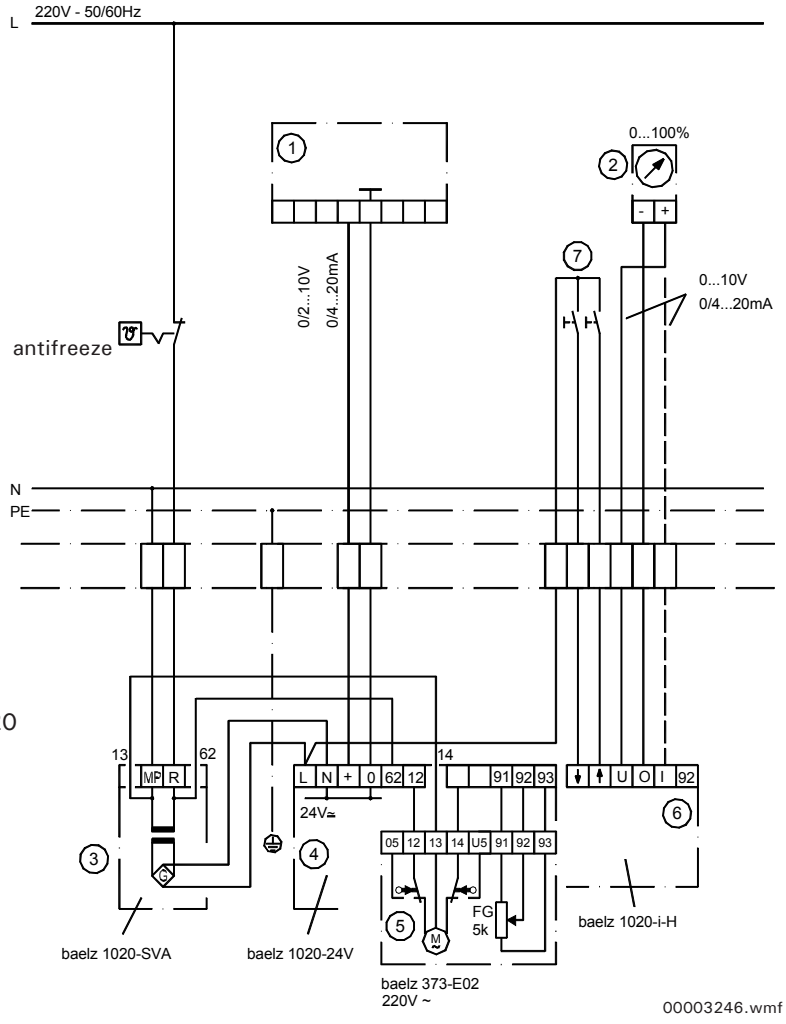


Fig 173
wiring diagram of electronic positioner baelz 1020 integrated into actuator baelz 373-E02 with feedback potentiometer;
baelz 1020 here with 3 options:
2 manual overrides to open and close and
a separate position indication signal.

Bälz-electrodyn - control valves and control actuators

19. How to mount an electrical actuator on a baelz valve

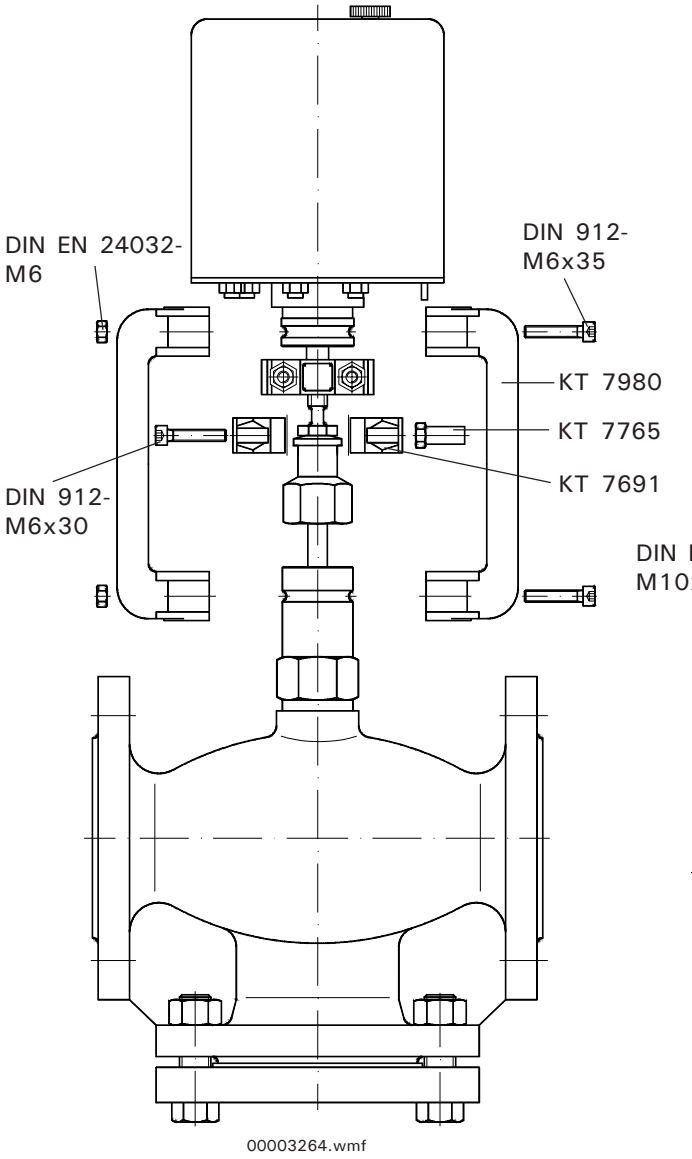


Fig. 174
mounting an actuator baelz 373-E06-S21
on a valve baelz 340-B
ND 15 - ND 125

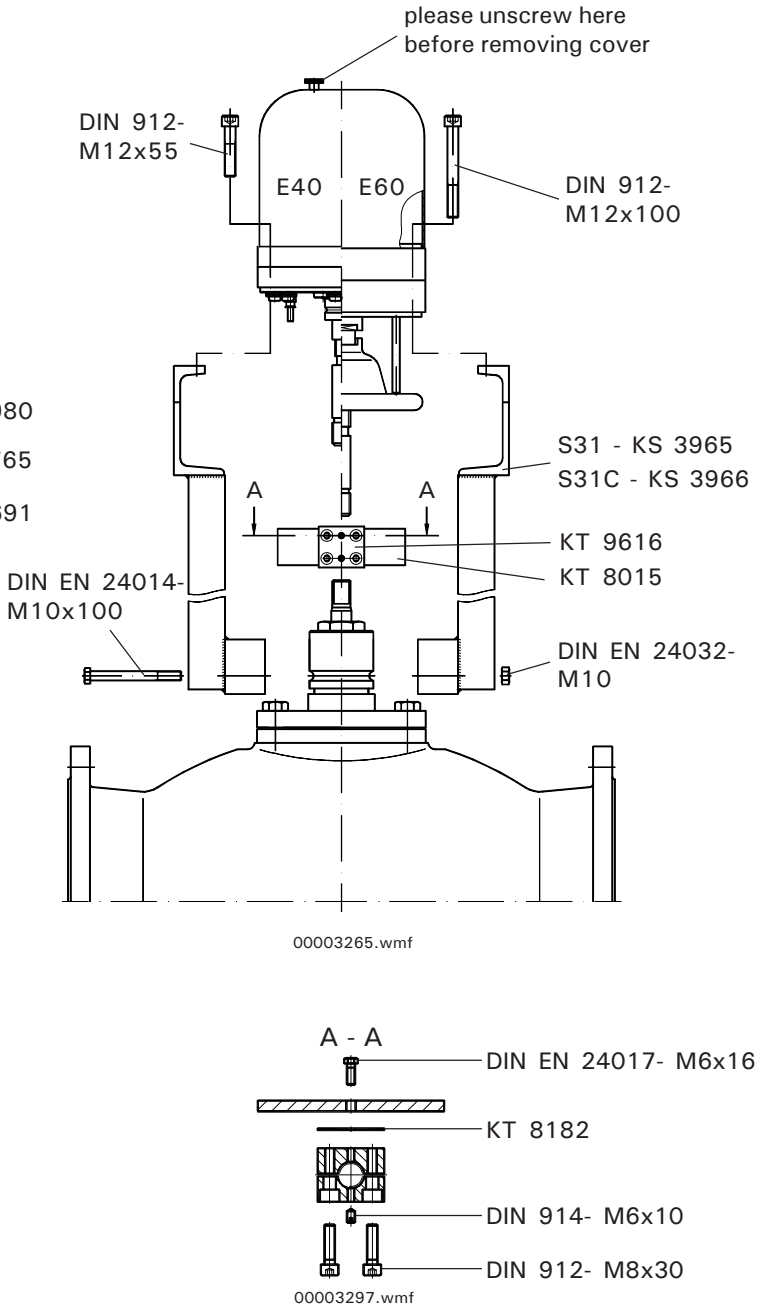


Fig. 175
mounting an actuator baelz 373-E40-S31
and baelz 373-E60-S31 on a valve baelz 340-BB
ND 150 - ND 300

Bälz-electrodyn - control valves and control actuators

20. Short presentation of all electric actuators from baelz 373-E02 to baelz 373-E88

20.1 Actuator baelz 373-E02

Text for quotations + orders:

Linear motorized actuator
baelz 373-E02-10-18-S21
with hand operation
with thrust depending limit switches
thrust : 1000 N
actuator speed Ty : 18 mm/min. → 50 Hz
21.6 mm/min. → 60 Hz
protection class : IP 42
ambient conditions : max. 0…50°C, 0-75% r.F.
not condensing
cover : plastic
including actuator spindle, coupling, aluminium-yoke and fastening screws
voltage optional 230 V, 115 V, 24 V, 50/60 Hz
weight approx. 2.2 kg

Accessories:
- with 2 additional way-depending limit switches (2EZ)
- with 1 incorporated potentiometer (Fg)
(200 Ω, 5 kΩ or 1 kΩ)
- with 2 additional way-depending limit switches and 1 incorporated potentiometer (2EZ-Fg)
(200 Ω, 5 kΩ or 1 kΩ)

Linear motorized actuator
baelz 373-E02-10-17-S21-24VDC/1522
as above, but
24 V d.c. voltage
actuator speed Ty: 17 mm/min.
incl. relay kit baelz 1522
weight approx. 2.2 kg

Extra charges:
protection class IP54

heating in actuator

silicon-free design

plastic-cover height: 86 mm
plastic-cover height: 200 mm

mechanical stroke limiting

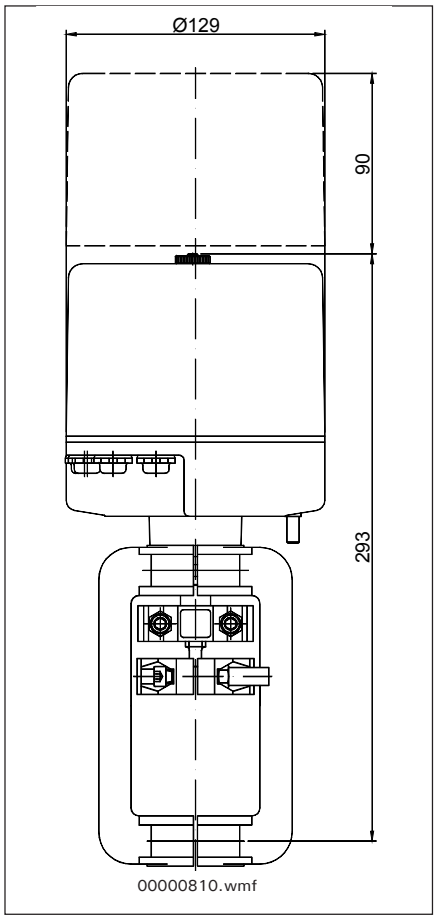


Fig. 176
actuator baelz 373-E02-S21

Fig. 177
actuator baelz 373-E02

Bälz-electrodyn - control valves and control actuators

20.2 Actuator baelz 373-E06

Text for quotations + orders:

Linear motorized actuator
baelz 373-E06-20-06-S21
with hand operation
with wear resisting torque-motor-magnetic-clutch
without limit switches
thrust : 2000 N
actuator speed Ty : 6 mm/min. → 50 Hz
7 mm/min. → 60 Hz
protection class : IP 42
ambient conditions : max. 0…50°C, 0-75% r.F.
not condensing
cover : plastic
including actuator spindle, coupling, aluminium-yoke and fastening screws
voltage optional 230 V and 24 V, 50/60 Hz
115 V, 50 and 60 Hz
weight approx. 2.0 kg

Accessories:
- with 2 additional way-depending limit switches (2EZ)
- with 1 incorporated potentiometer (Fg)
(200 Ω, 5 kΩ or 1 kΩ)
- with 2 additional way-depending limit switches and 1 incorporated potentiometer (2EZ-Fg)
(200 Ω, 5 kΩ or 1 kΩ)

Extra charges:
silicon-free design

plastic-cover height: 200 mm

mechanical stroke limiting

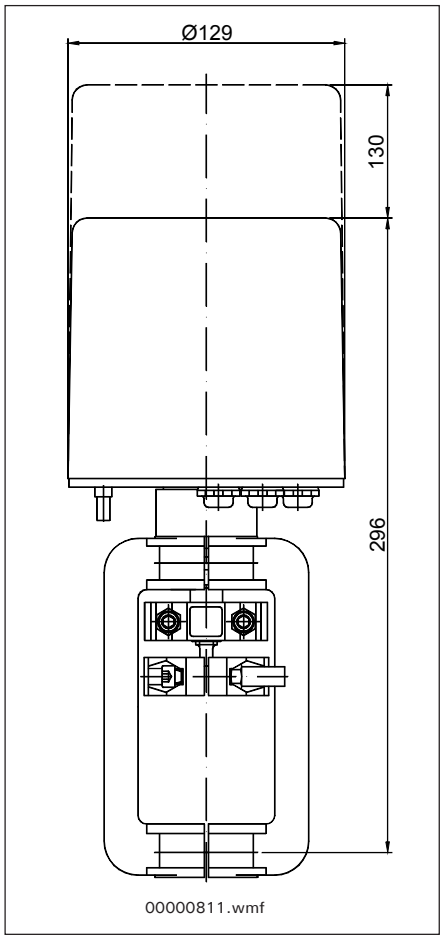


Fig. 178
actuator baelz 373-E06-S21

Fig. 179
actuator baelz 373-E06

Bälz-electrodyn - control valves and control actuators

20.3 Actuator baelz 373-E07

Text for quotations + orders:

Linear motorized actuator
baelz 373-E07-20-06-S21
suitable up to ND 125 - stroke max. 22 mm
with closed gear box
with hand operation
with thrust depending limit switches
thrust : 2000 N
actuator speed Ty : 6 mm/min. → 50 Hz
7.2 mm/min. → 60 Hz
protection class : IP 42
ambient conditions : max. 0…50°C, 0-75% r.F.
not condensing
cover : plastic
including actuator spindle, coupling, aluminium-yoke and fastening screws
voltage optional 230 V, 115 V, 24 V, 50/60 Hz
weight approx. 2.2 kg

Linear motorized actuator
baelz 373-E07-20-18-S21
as above baelz 373-E07-20-06, but
actuator speed Ty : 18 mm/min. → 50 Hz
21.7 mm/min. → 60 Hz
voltage optional : 230 V, 115 V, 24 V, 50/60 Hz
weight approx. : 2.2 kg

Accessories:
- with 2 additional way-depending limit switches (2EZ)
- with 1 incorporated potentiometer (Fg) (multiple) 0-3/5 kΩ
in conformity to the stroke (other values on demand)
- with 2 additional way-depending limit switches and 1 incorporated potentiometer (2EZ-Fg)
(200 Ω, 5 kΩ or 1 kΩ)

Extra charges:
protection class IP54
silicon-free design
mechanical stroke limiting

Linear motorized actuator
baelz 373-E07-20-39-S21
suitable up to ND 125 - stroke max. 22 mm
with closed gear box
with hand operation
with thrust depending limit switches
thrust : 2000 N
actuator speed Ty : 32.5 mm/min. → 50 Hz
39 mm/min. → 60 Hz
protection class : IP 42
ambient conditions : max. 0…50°C, 0-75% r.F.
not condensing
cover : plastic
including actuator spindle, coupling, aluminium-yoke and fastening screws
voltage optional 230 V, 115 V, 24 V, 50/60 Hz

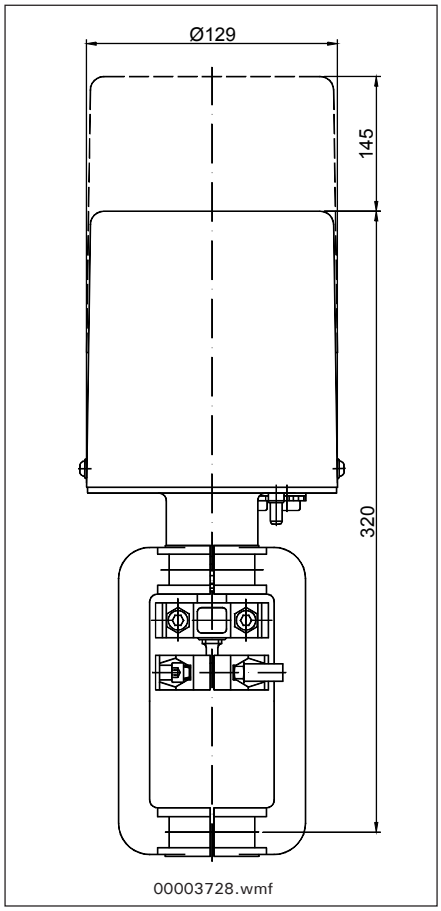


Fig. 180
actuator baelz 373-E07-S21

Fig. 181
actuator baelz 373-E07

Bälz-electrodyn - control valves and control actuators

20.4 Actuator baelz 373-E11

Text for quotations + orders:

Linear motorized actuator with spring-return
baelz 373-E11-Z-20-06-S21
pulling in case of power failure
without hand operation
with thrust depending limit switches
thrust : 2000 N
actuator speed Ty : 6 mm/min. → 50 Hz
7.2 mm/min. → 60 Hz
protection class : IP 44
ambient conditions : max. 0…50°C, 0-75% r.F.
not condensing
cover : galvanized sheet steel
including actuator spindle, coupling, aluminium-yoke and fastening screws
voltage optional 230 V, 115 V, 24 V, 50/60 Hz
TÜV-tested
weight approx. 10.8 kg

Linear motorized actuator with spring-return
baelz 373-E11-D-20-06-S21
pushing in case of power failure
other information as baelz 373-E11-Z-20-06-S21
TÜV-tested

Linear motorized actuator with spring-return
baelz 373-E11-Z-20-17-S21
pulling in case of power failure
without hand operation
with thrust depending limit switches
thrust : 2000 N
actuator speed Ty : 17 mm/min. → 50 Hz
20.4 mm/min. → 60 Hz
protection class : IP 44
ambient conditions : max. 0…50°C, 0-75% r.F.
not condensing
cover : galvanized sheet steel
including actuator spindle, coupling, aluminium-yoke and fastening screws
voltage optional 230 V, 115 V, 24 V, 50/60 Hz

Linear motorized actuator with spring-return
baelz 373-E11-D-20-17-S21
pushing in case of power failure
other information as baelz 373-E11-Z-20-17

Accessories:
- with 2 additional way-depending limit switches (2EZ)
- with 1 incorporated potentiometer (Fg)
(200 Ω, 5 kΩ or 1 kΩ)
- with 2 additional way-depending limit switches and 1 incorporated potentiometer (2EZ-Fg)
(200 Ω, 5 kΩ or 1 kΩ)

Extra charges:
protection class IP54 and silicon-free design

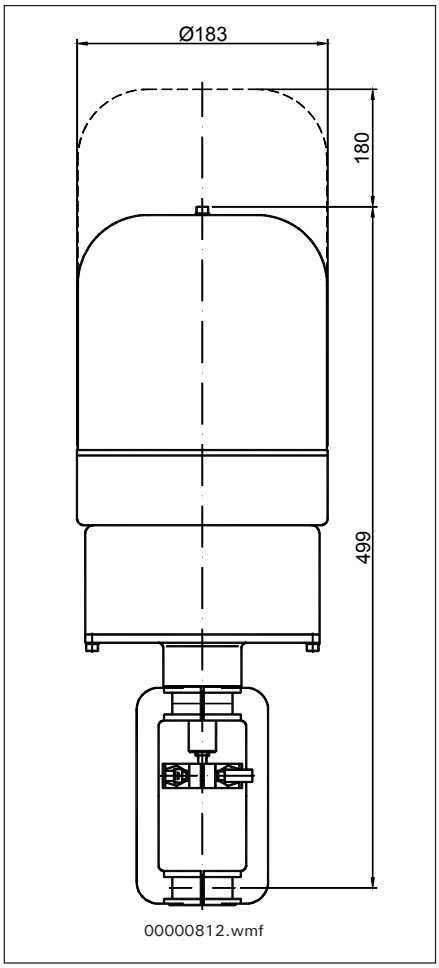


Fig. 182
actuator baelz 373-E11-S21

Fig. 183
actuator baelz 373-E11

Bälz-electrodyn - control valves and control actuators

20.5 Actuator baelz 373-E40

Text for quotations + orders:

Linear motorized actuator
baelz 373-E40-40-20-S21
with hand operation
with thrust depending limit switches
thrust : 4000 N
actuator speed Ty : 20 mm/min. → 50 Hz
24 mm/min. → 60 Hz
protection class : IP 42
ambient conditions : max. 0…50°C, 0-75% r.F.
not condensing
cover : galvanized sheet steel
including actuator spindle, coupling, aluminium-yoke (S21) / steel-yoke (S31) and fastening screws
voltage optional 230 V, 115 V, 24 V, 50/60 Hz
weight approx. 8.0 kg

Linear motorized actuator
baelz 373-E40-40-38-S21
actuator speed Ty : 38 mm/min. → 50 Hz
47.4 mm/min. → 60 Hz
mode of operation S4 - 60%;
switch frequency 120 c/h.
Because of the follow of 4 mm valve stroke the break time for the variation of rotation direction is 1 s, provisionally appropriate for control.
Voltage optional 230 V, 115 V, 24 V/50 + 60 Hz
other information as baelz 373-E40-40-20…

Linear motorized actuator
baelz 373-E40-40-20-S31
for valves **without cooling tube** ND 150 up
weight approx. 12.5 kg

Linear motorized actuator
baelz 373-E40-40-38-S31
for valves **without cooling tube** ND 150 up

Linear motorized actuator
baelz 373-E40-40-20-S31C
for valves **with cooling tube** ND 150 up
weight approx. 16.5 kg

Linear motorized actuator
baelz 373-E40-40-38-S31C
for valves with cooling tube ND 150 up

Accessories:
- with 2 additional way-depending limit switches (2EZ)
- with 1 incorporated potentiometer (Fg)
(200 Ω, 5 kΩ or 1 kΩ)
- with 2 additional way-depending limit switches and 1 incorporated potentiometer (2EZ-Fg)
(200 Ω, 5 kΩ or 1 kΩ)

Extra charges: **protection class IP 63** mounting position: **vertical, heating in actuator or silicon-free design**

373-e40.jpg

Fig. 184
actuator baelz 373-E40

Bälz-electrodyn - control valves and control actuators

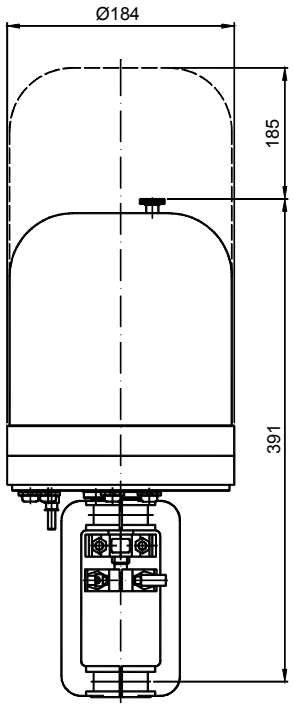


Fig. 185
actuator baelz 373-E40-S21

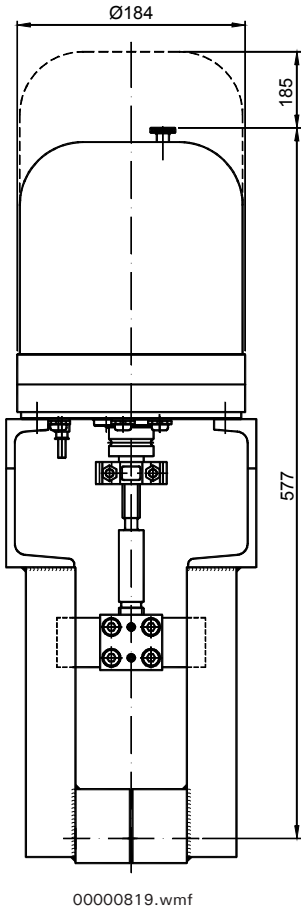


Fig. 186
actuator baelz 373-E40-S31

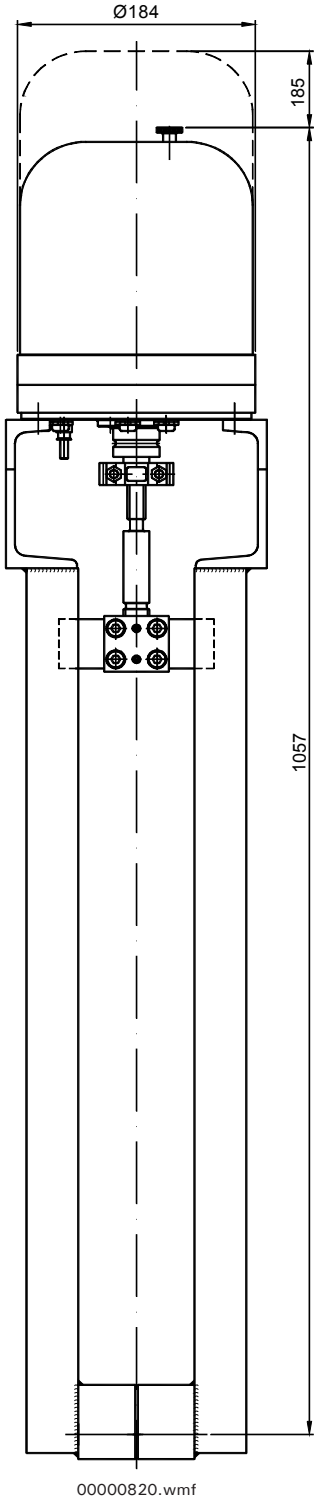


Fig. 187
actuator baelz 373-E40-S31C

Bälz-electrodyn - control valves and control actuators

20.6 Actuator baelz 373-E60

Text for quotations + orders:

Linear motorized actuator
baelz 373-E60-90-18-S31
with hand operation
with thrust depending limit switches
thrust : 9000 N
actuator speed Ty : 18 mm/min. → 50 Hz
21.6 mm/min. → 60 Hz
protection class : IP 42
ambient conditions : max. 0…50°C, 0-75% r.F.
not condensing
cover : galvanized sheet steel
including actuator spindle, coupling, steel-yoke and fastening screws
voltage optional 230 V, 115 V, 24 V, 50/60 Hz
for valves **without cooling tube** ND 150 up
weight approx. 19.5 kg

Linear motorized actuator
baelz 373-E60-90-18-S31C
for valves **with cooling tube** ND 150 up
weight approx. 23.5 kg

Accessories:
- with 2 additional way-depending limit switches (2EZ)
- with 1 incorporated potentiometer (Fg)
(200 Ω, 5 kΩ or 1 kΩ)
- with 2 additional way-depending limit switches and 1 incorporated potentiometer (2EZ-Fg)
(200 Ω, 5 kΩ or 1 kΩ)

Extra charges:
protection class IP54

silicon-free design

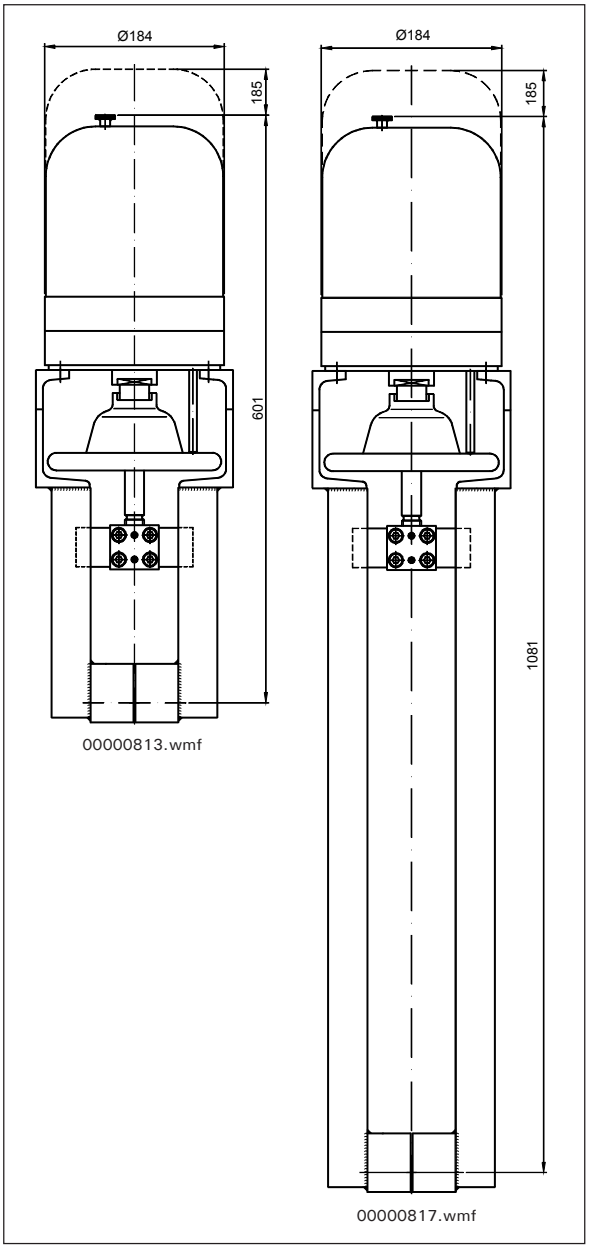


Fig. 188
actuator baelz 373-E60-S31 actuator baelz 373-E60-S31C


373-e60.jpg

Fig. 189
actuator baelz 373-E60

Bälz-electrodyn - control valves and control actuators

20.7 Actuator baelz 373-E88

Text for quotations + orders:

Linear motorized actuator
baelz 373-E88-100-22-S41
for mounting on control valves from ND 65 - 125
for on-off- control (baelz 346-22)
with hand operation
with switch off depending on torque and
2 limit switches; for each final position 1 breaker and 1 maker
with thermo-contact (motor protection)
thrust : 10 kN
actuator speed Ty : 22 mm/min.
3-phase current : 400 V, 50 Hz; 0.025 kW
protection class : IP 67
heating in switch compartment
ambient conditions : -25…+60°C, 0-75% r.F.
including actuator spindle, coupling and steel-yoke S41
weight approx. 25.0 kg

Fig. 190
373-E88-300-96-1.JPG

Linear motorized actuator
baelz 373-E88-300-96-S41
as above baelz 373-E88-100-22, but
for mounting to control valves
for on-off- control; for strokes up to 66 mm
thrust : 30 kN
actuator speed Ty : 96 mm/min.
3-phase current : 400 V, 50 Hz; 0.37 kW
including actuator spindle, coupling, steel-yoke and fastening screws.
for BB series ND 150 up.
weight approx. 34.5 kg

baelz 373-E88-300-96-S41C
for valves with cooling tube, BBK and BBK-SS series
weight approx. 39.0 kg

Extra charges:
4 add. single switches for intermediate setting
with 4 independent from each other adjustable switching cams
(2 for on/off final position / 2 any adjustable for intermediate setting)

potentiometer 200 Ω, 1 kΩ or 5 kΩ

output signal : **4 - 20 mA** internal position feedback
input signal : 4 - 20 mA
programmable control logic:
switch off way in a final position ON/OFF;
way-depending/ torque-depending
remote-control TIPP-operation/self-latching action
location-control TIPP-operation/self-latching action
power supply unit : 24 V control voltage
power pack : turn contactor max. 1.5 kW
selector switch : location-off-remote, lockable in each position
and : bush button ON-STOP-OFF
electical connection : plug 1 Pg13.5/ 2 Pg21
protection class : IP 67, EN 60529
relay for report on disturbances programmable reaction at signal failure
STOP/ON/OFF.

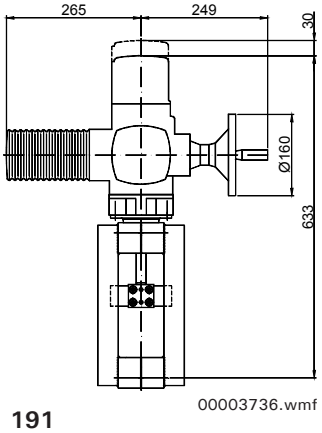


Fig. 191
actuator baelz 373-E88-100-22-S41

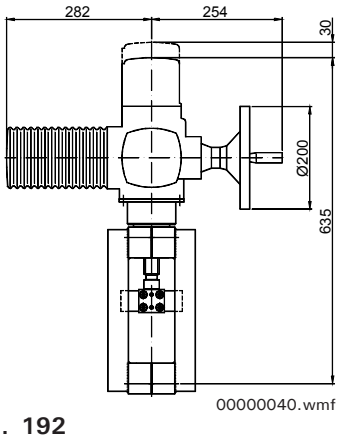


Fig. 192
actuator baelz 373-E88-300-96-S41

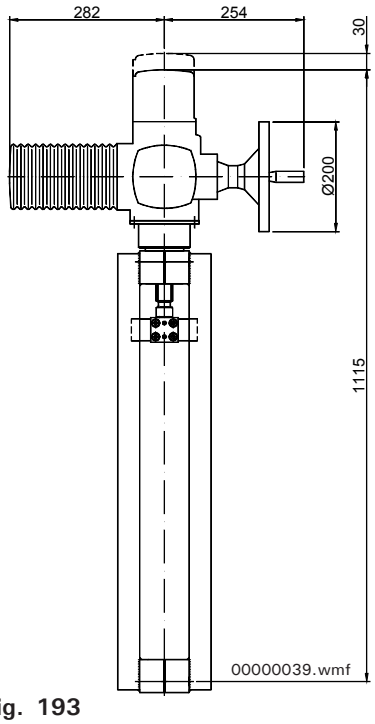


Fig. 193
actuator baelz 373-E88-300-96-S41-C

Bälz-electrodyn - control valves and control actuators

Text for quotations + orders:

Linear motorized actuator with fale safe function
baelz 373-E88-ALS75
for mounting to control valves
The fale safe function enables the actuator to close (fail-close) or open (fail-open) a valve instantly in case of an emergency situation.
A fail safe operation is either initiated by loss of the power supply or by a command from the control room.
A spring in the fail-safe unit of the actuator serves as the energy source.

Fig. 194
373-E88-ALS75-1.JPG

stroke	: 100 mm
thrust	: 7500 N
actuator speed Ty (adjustable)	: 50 - 400 mm/min.

Motor

Type of duty according to VDE 0530 / IEC34	: Short-time duty S2 – 15 min.
Insulation class	: F
Current value 1-ph AC 220 – 240 V; 50/60 Hz	: max. 1,5A
Electrical input power	: about 160 W
Protection class	: IP 67
Weight together with electronic control	: appr. 20 kg
Ambient temperature	: -10°C…+70°C

Actuator controls
The controls can be mounted directly to the actuator or separately from the actuator on a wall bracket

Voltage supply	: 220 – 240 50/60 Hz or 110 - 120V AC; 50/60 Hz
Motor controls	: Power electronics with integral motor controller
Binary inputs (galvanic isolation: opti-isolators)	: OPEN-STOP-CLOSE-EMERGENCY
Analoque input	: Nominal operating time or speed E3 = 0/4-20 mA
Relay outputs	: Collective fault signal 5 programmable output relays (change-over contacts,max. 30 V DC/1 A)
Analogue output (option)	: Position feedback signal (position actual value) E2 OUT = 0/4 - 20 mA (galvanically isolated)
4 electronic intermediate positions	: Each intermediate position can be a position (requires potentiometer) between 0 and 100 %. Signal: Continuous contact NO/NC, impulse
Torque by-pass	: Adjustable within range of 0.2 to 5seconds. During this time the torque monitoring is not active.
Logging of operating data	: Hours / minutes of operation. Number of: starts, power failures, torque faults in direction OPEN and CLOSE.
Display elements	: LC Display, 4 lines with 20 characters each
Diagnose LEDs	: Display and programming board: 8 LEDs (end positions, actuator signals) Interface board: 3 LEDs (internal run commands, faults)
Setting/ programming	: Via menu and the push-buttons of the locals controls/ push-buttons on the display/programming board Programming interface RS232.
Local controls	: Selector switch LOCAL-OFF-REMOTE Push-buttons OPEN-STOP-CLOSE Indication lights for end position OPEN, FAULT, end position CLOSED.

Bälz-electrodyn - control valves and control actuators

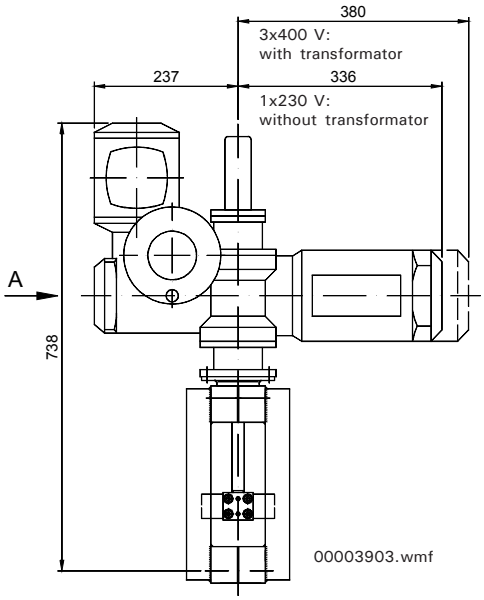


Fig. 195
actuator baelz 373-E88-ALS75-S41

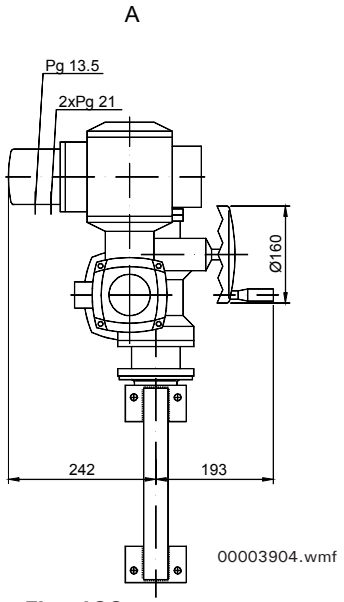


Fig. 196
actuator baelz 373-E88-ALS75-S41

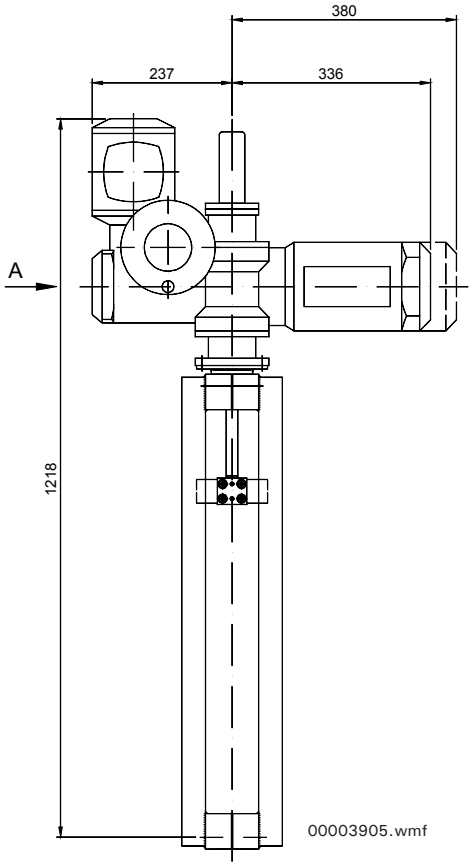


Fig. 197
actuator baelz 373-E88-ALS75-S41-C

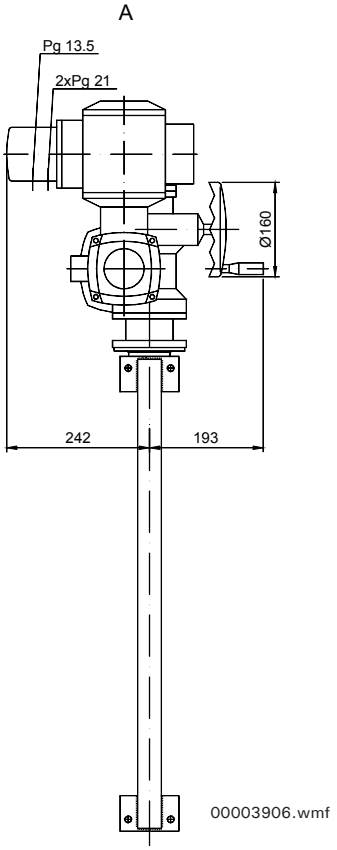


Fig. 198
actuator baelz 373-E88-ALS75-S41-C

Bälz-electrodyn - control valves and control actuators

21. The linear pneumatic actuators baelz 373-PXX

These pneumatic actuators have the following advantages:

- quick positionning
- defined position, if there is no air
- high thrusts
- can be used in higher ambient temperatures
- can be used in explosion proof zones
- adaptation to needed thrust by selecting the number of used springs and their precompression
- easy to change from air - to - open into air - to - close without special tool
- top or side mounted hand wheel available

Table of actuator selection baelz 373-PXX

thrust by springs* Py N	diaphragm surface cm^2	max. stroke mm	**baelz type baelz 373-**
1020 - 4030	240	22	P21-3 to P21-18
7590	240	22	P21-V6
1846 - 3692	240	40	P22-3 to P22-6
2480 - 10560	620	44	P31-3 to P31-18
2201 - 8115	620	66	P32-3 to P32-18
3765 - 41600	1250	44,66	P41-3 to P41-V6

* at closed position, i. e. stroke = 0 mm

All these diaphragm operated actuators are spring loaded. They exist in 2 versions regarding spring positions and air admission:

Fo: springs to push; air to pull
Fu: springs to pull; air to push

These are their components:
- diaphragm housing in aluminium; good for max. air pressure of 6 bar g
- roll - diaphragm; it is only allowed to admit air on one diaphragm side, otherwise the diaphragm is separated from the diaphragm disk
- diaphragm - disk; in steel to fix diaphragm on its outer diameter and the actuator spindle in its center
- springs; depending on type 3 - 18 springs are incorporated
- actuator spindle
- Yoke to mount actuator on its valve; there exist 2 basic designs:
  S 21 for spindle diameter 10 mm
  S 31 for spindle diameter of 16 + 22 mm

Bälz-electrodyn - control valves and control actuators

21.1 Linear pneumatic actuators baelz 373-PXX-S21 with spindle Ø 10 mm

baelz 373-P21-Fo
baelz 373-P21-Fu

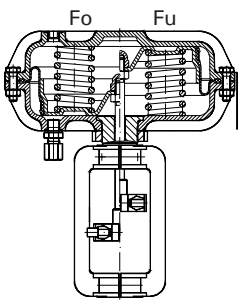


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Fig. 199

baelz 373-P21-V6-Fo
baelz 373-P21-V6-Fu

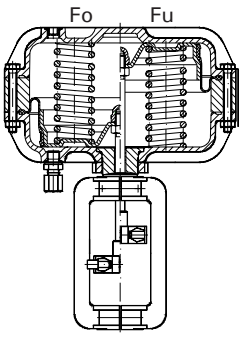

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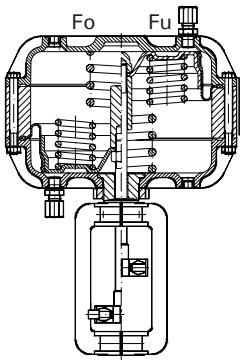
Fig. 200

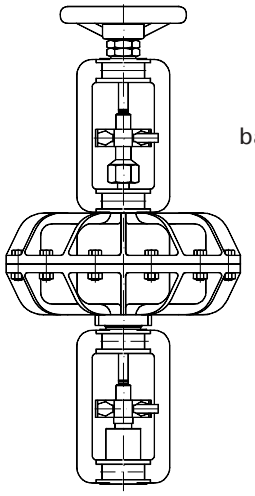
baelz 373-P22-Fo
baelz 373-P22-Fu



00003266.wmf

Fig. 201

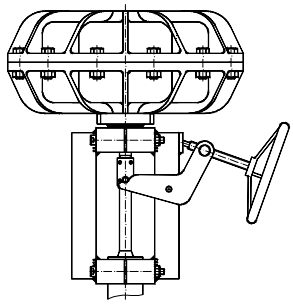
baelz 373-P21-XX-Fx-H21



00000013.wmf

Fig. 202

baelz 373-P21-XX-Fx-HS21



00000065.wmf

Fig. 203

Pneumatic actuators baelz 373-P ... -XX-Fx-S21 ambient conditions: 0 - 70°C; 0 - 90 % r. h.; IP 65							
baelz 373-	stroke	diaphragm surface	volume	thrust N1	thrust N2	air pressure Py 0	air pressure Py 100
P... -XX-Fx-S ...	mm	cm^2	dm^3	N	N	bar g	bar g
P21-03-Fo / Fu-S21	12	240	0,55	1360	2180	0,55	0,9
P21-06-Fo / Fu-S21	12	240	0,55	2720	4360	1,1	1,8
P21-12-Fo / Fu-S21	12	240	0,55	4520	7200	1,8	2,9
P21-18-Fo / Fu-S21	12	240	0,55	5370	8560	2,1	3,5
P21-03-Fo / Fu-S21	16	240	0,55	1360	2450	0,6	1,15
P21-06-Fo / Fu-S21	16	240	0,55	2720	4900	1,2	2,3
P21-12-Fo / Fu-S21	16	240	0,55	4520	8100	2,0	3,6
P21-18-Fo / Fu-S21	16	240	0,55	5370	9630	2,4	4,2
P21-V6-Fo / Fu-S21	16	240	1,55	8670	12110	3,3	4,8
P21-03-Fo / Fu-S21	22	240	0,55	1020	2520	0,4	1,05
P21-06-Fo / Fu-S21	22	240	0,55	2040	5040	0,8	2,1
P21-12-Fo / Fu-S21	22	240	0,55	3390	8330	1,35	3,4
P21-18-Fo / Fu-S21	22	240	0,55	4030	9900	1,65	4,1
P21-V6-Fo / Fu-S21	22	240	1,55	7590	12330	2,7	4,6
P22-03-Fo / Fu-S21	40	240	2,0	1846	6190	0,75	2,5
P22-06-Fo / Fu-S21	40	240	2,0	3692	12380	1,5	5,1

XX: number of springs
N1: thrust due to spring precompression at stroke 0
N2: thrust at 100% stroke
Py 0: air pressure to begin to open
Py 100: air pressure for 100% stroke

Bälz-electrodyn - control valves and control actuators

21.2 Linear pneumatic actuators baelz 373-PXX-S31, for spindle Ø 22 mm

baelz 373-P31-Fo
baelz 373-P31-Fu

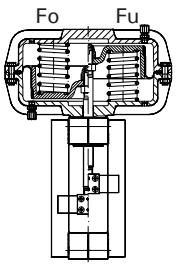


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Fig. 204

baelz 373-P31-Fo-H31
baelz 373-P31-Fu-H31

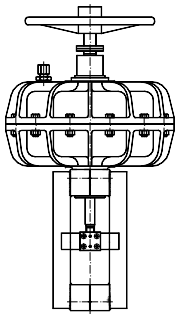

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Fig. 205

baelz 373-P32-Fo
baelz 373-P32-Fu

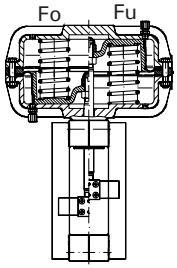

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Fig. 206

baelz 373-P41-Fo
baelz 373-P41-Fu

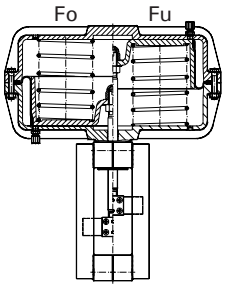

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Fig. 207

baelz 373-P41-Fo-H31
baelz 373-P41-Fu-H31

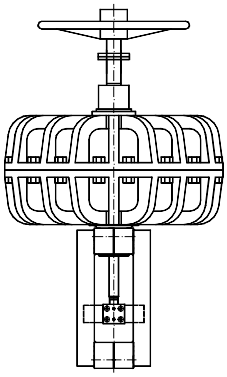

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Fig. 208

baelz 373-P41-V6-Fo
baelz 373-P41-V6-Fu

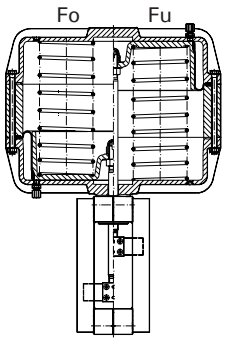

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Fig. 209

Pneumatic actuators baelz 373-P ... -XX-Fx-S31 ambient conditions: 0 - 70°C; 0 - 90% r. h.; IP 65

baelz 373-	stroke	diaphragm surface	volume	thrust N1	thrust N2	air pressure Py 0	air pressure Py 100
P ...-XX-Fx-S31	mm	cm^2	dm^3	N	N	bar g	bar g
P31-03-Fo / Fu-S31	44	620	3	2480	6120	0,35	1,15
P31-06-Fo / Fu-S31	44	620	3	4960	12240	0,75	2,1
P31-18-Fo / Fu-S31	44	620	3	10560	26060	1,65	4,25
P32-03-Fo / Fu-S31	66	620	4,2	2201	7388	0,35	1,2
P32-06-Fo / Fu-S31	66	620	4,2	4402	14776	0,7	2,4
P32-18-Fo / Fu-S31	66	620	4,2	8115	27241	1,3	4,4
P41-03-Fo / Fu-S31	44	1250	5,5	5040	12400	0,4	1
P41-06-Fo / Fu-S31	44	1250	5,5	10080	24800	0,8	2
P41-V6-Fo / Fu-S31	44	1250	8,3	41600	57800	3,3	4,6
P41-03-Fo / Fu-S31	66	1250	5,5	3765	9285	0,3	0,8
P41-06-Fo / Fu-S31	66	1250	5,5	7530	18570	0,6	1,5
P41-V6-Fo / Fu-S31	66	1250	8,3	31920	60060	3	5

S31: short yoke for valves with spindle Ø 22 mm
S31C: long yoke for valves with spindle Ø 22 mm
Fo / Fu: spring position:
Fo: springs to push; air to pull
Fu: springs to pull; air to push

XX: number of springs
N 1: thrust due to spring precompression at stroke 0
N 2: thrust at 100% stroke
Py 0: air pressure to begin to open
Py 100: air pressure for 100% stroke

Bälz-electrodyn - control valves and control actuators

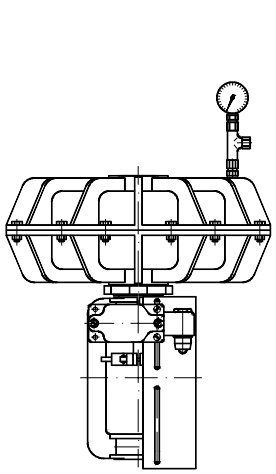
21.3 Accessories for pneumatic actuators

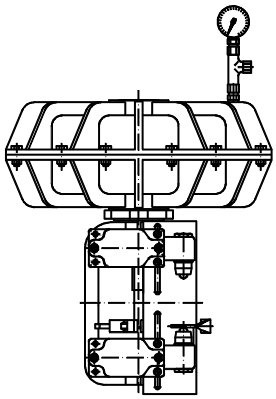
baelz 376-1 PEZA	with 1 end switch in position open
baelz 376-1 PEZZ	with 1 end switch in position closed
baelz 376-2 PEZAZ	with 2 end switches in position open and closed
baelz 376-Ex-1 PEZA	with 1 explosion proof end switch in position open
baelz 376-Ex-1 PEZZ	with 1 explosion proof end switch in position closed
baelz 376-Ex-2 PEZAZ	with 2 explosion proof end switches in position open and closed
baelz 376-INI	inductive limit switch
baelz 376-GFg ... Ohm	with 1 position feedback potentiometer
baelz 376-GFg 5 kOhm - 1017	with position feedback signal 4 - 20 mA
baelz 376-D21	with water pocket
baelz 376-D31	with water pocket
baelz 86	with i / p positioner 4 - 20 mA baelz 86
baelz 88-SP400	digital positioner 4 – 20 mA
baelz 93	with p / p positioner baelz 93
baelz 268/2, baelz 268/2-Ex	with 3-way solenoid valve baelz 268/2,...V,...Hz; explosion proof 268/2-Ex,...V ,...Hz
baelz 270, baelz 270-Ex	with 3-way solenoid valve baelz 270/2,...V,...Hz; explosion proof 270/2-Ex,...V ,...Hz
baelz 279, baelz 279-Ex	with 2 solenoid valves baelz 268 and 2 restrictors baelz 520; explosion proof 268-Ex
baelz 280, baelz 280-Ex	with 2 solenoid valves baelz 268, 2 restrices and 1 three way solenoid valve baelz 268/2; explosion proof 268-Ex
H21 for P21	top mounted hand wheel for P21 (not P21-06)
H31 for P31 + P41	top mounted hand wheel for P31 + P41
HS21 for P21	side mounted hand wheel for P21
HS31 for P31 + P41	side mounted hand wheel for P31 + P41
baelz 373-0-Hb	mechanical stroke limiting

21.4 Additional equipment for pneumatic actuators

	baelz 376-...PEZ.. PEZ limit switch	**baelz 376-Ex-...PEZ.. Ex PEZ limit switch**	**baelz 376-INI...-PF INI inductive limit switch**	**baelz 376-GFg potentiometer**
power supply			5…25 V DC two wire connection DIN 19234 (Namur)	range: 0…200 Ω 0…1 kΩ 0…5 kΩ stroke P21: 12 / 16 / 22 mm stroke P31: 44 mm stroke P41: 44 / 66 mm
dimension (BxDxL)	about 45 x 45 x 200 mm	about 50 x 50 x 200 mm	Φ18 mm, L=40 mm	
switching capacity	0,5 A 230 V (AC15)	6 A 380 V AC, 0,4 A 220 V DC	(4 A 250 V AC with contact protection relay baelz 465)	
type of protection	IP 66	Exd3n G5 PTB Nr.: B/E 10989	IP 67	

Bälz-electrodyn - control valves and control actuators





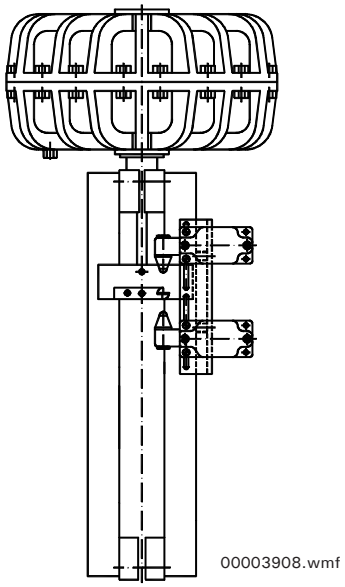
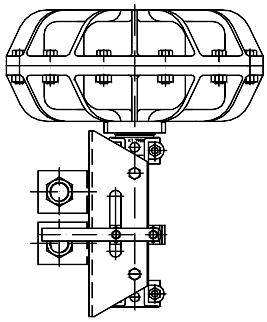


Fig. 210

baelz 376-1PEZA
for 373-P21

baelz 376-2PEZAZ
for 373-P21

baelz 376-2PEZAZ
for 373-P31/P41



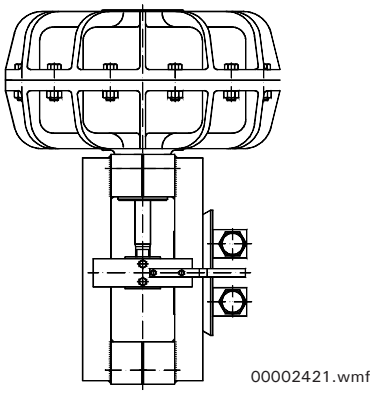
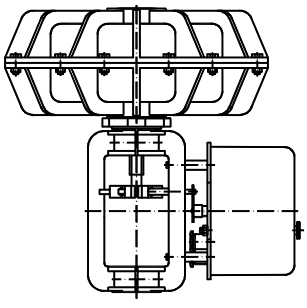


Fig. 211

baelz 376-INIAZ-PF
for 373-P21

baelz 376-INIAZ-PF
for 373-P31/P41



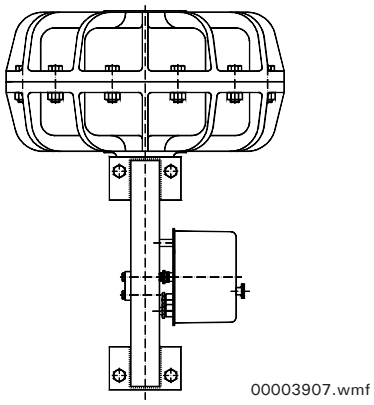


Fig. 212

baelz 376-GFg
for 373-P21

baelz 376-GFg
for 373-P31/P41

Bälz-electrodyn - control valves and control actuators

21.5 Analog i/p positioner baelz 86 for pneumatic actuators

Outline.
In the IP6000 series of electro-pneumatic positioners, the pneumatic valve is positionned via the current signal of a controller.

Specifications:

item	**baelz 86 IP 6000**		**baelz 86 IP 6100**	
	levery type lever		rotary type with cam	
	single action	double action	single action	double action
input current	4…20 mA DC (standard) *1			
input resistance	235 +/- 15 Ω (4…20 mA)			
supply air pressure	0.14…0.6 MPa (1.4…6 kgf/cm²)			
standard stroke	10…85 mm (external lever allowable runout angle 10°…30°		60°…100° *2	
sensitivity	within 0.1% F.S.		within 0.5% F.S.	
linearity	within +/- 1% F.S.		within +/- 2% F.S.	
hysteresis	within 0.75% F.S.		within 1% F.S.	
repeatability	within +/- 0.5% F.S.			
thermal coefficient	within 0.1% F.S /°C.			
output flow rate	80 l/min (ANR) or more (SUP=0.14 MPa) *3			
air consumption (bleed)	within 5 l/min (ANR) or less (SUP=0.14 MPa) *3			
ambient and using fluid temperature	-20…+80°C (non-explosion proof) -20…+60°C EEx ib IIC T6			
certification, Ex code	EEx ib IIC T5, EEx ib IIC T6 PTB Nr.Ex-82/2167 ATEX certification will be soon available			
air connection port	Rc (PT) ¼ female			
electric wiring connection port	G (PF) ½ female			
wiring method	conduit system-pressure tight packing system			
	resin G (PF) ½ connector (non-explosion proof, option)			
material	aluminium diecast for the body			
weight	approx 2.6 kg with terminal box (approx 2.4 kg without terminal box)			

*1 ½ split range is possible with the standard type (by adjusting the span)
*2 The stroke is adjustable in 0°…60° and 0°…100°
*3 Standard air temperature 20°C, absolute pressure 760 mmHg, relative humidity 65%

Air consumption:

	P21	**P21-V6**	**P22**	**P31**	**P32**	**P41**	**P41-V6**
	Nm³/h						
blow-off at 4 mA and 1,2 bar	0.27	0.27	0.27	0.27	0.27	0.27	0.27
blow-off at 4 mA and 1,4 bar	0.3	0.3	0.3	0.3	0.3	0.3	0.3
blow-off at 4 mA and 2 bar	0.36	0.36	0.36	0.36	0.36	0.36	0.36
blow-off at 4 mA and 3 bar	0.49	0.49	0.49	0.49	0.49	0.49	0.49
blow-off at 4 mA and 4 bar	0.61	0.61	0.61	0.61	0.61	0.61	0.61
blow-off at 4 mA and 5 bar	0.73	0.73	0.73	0.73	0.73	0.73	0.73
blow-off at 4 mA and 6 bar	0.86	0.86	0.86	0.86	0.86	0.86	0.86
air consumption for 1 x filling at 1.2 bar	0.0011	0.0031	0.0039	0.006	0.008	0.011	0.018
air consumption for 1 x filling at 1.4 bar	0.0012	0.0032	0.004	0.0062	0.009	0.012	0.019
air consumption for 1 x filling at 2 bar	0.0015	0.0042	0.005	0.008	0.011	0.015	0.023
air consumption for 1 x filling at 3 bar	0.002	0.0058	0.0068	0.011	0.015	0.02	0.031
air consumption for 1 x filling at 4 bar	0.0025	0.007	0.0085	0.014	0.018	0.025	0.038
air consumption for 1 x filling at 5 bar	0.003	0.0086	0.01	0.017	0.022	0.03	0.045
air consumption for 1 x filling at 6 bar	0.0035	0.01	0.012	0.019	0.026	0.035	0.054
examples for total air consumption: we have per hour 30 total ups and downs (consumption = blow-off + 30*) * **air consumption for 1 x filling**							
	Nm³/h						
total air consumption at 1.2 bar	0,31	0.37	0.39	0.45	0.51	0.6	0.81
total air consumption at 1.4 bar	0.34	0.4	0.42	0.49	0.57	0.66	0.87
total air consumption at 2 bar	0.41	0.49	0.51	0.6	0.69	0.81	1.05
total air consumption at 3 bar	0.55	0.67	0.7	0.82	0.94	1.09	1.42
total air consumption at 4 bar	0.69	0.82	0.87	1.03	1.15	1.36	1.75
total air consumption at 5 bar	0.82	0.99	1.03	1.24	1.39	1.63	2.08
total air consumption at 6 bar	0.97	1.16	1.22	1.43	1.64	1.91	2.48

Bälz-electrodyn - control valves and control actuators

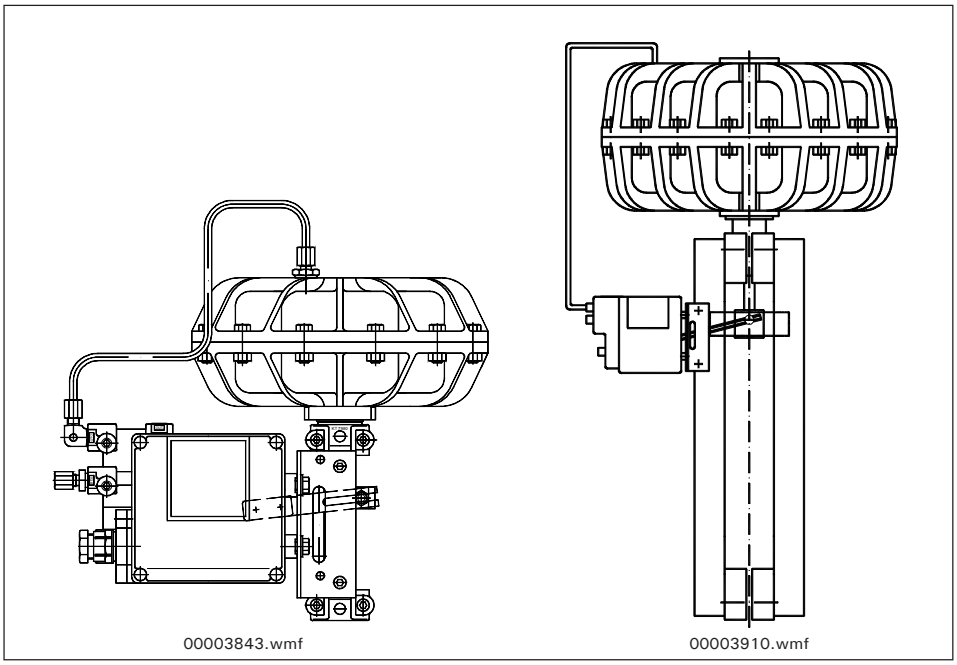


Fig. 213
baelz 373-P21-86

baelz 373-P31-86

Fig. 214
baelz 86 IP6000

Fig. 215
baelz 86 IP6100
for rotary actuators

Fig. 216
baelz 373-P21-86

Fig. 217
baelz 373-P31-86

Bälz-electrodyn - control valves and control actuators

21.6 Digital positioner baelz 88-SP400 for pneumatic actuators

This positioner is a kind of servo control mechanism for air operated automatic control system.

Specifications:

	baelz 88-SP400	**baelz 88-SP400 EEx**	**PA interface**	**PA interface EEx**
explosion protection to EN 50014, EN 50020 and EN 50021	without	EEx ia/ib II 2 G EEx ia/ib IIC T6 class1 zone1 groups A,B,C,D class1 zone1 AEx(FM)Ex(CSA)ib IIC	without	EEx ia/ib II 2 G EEx ia/ib IIC T6 class1 zone1 groups A,B,C,D class1 zone1 AEx(FM)Ex(CSA)ib IIC
mounting location		zone 1		zone 1
permissible ambient temperature for operation	-10…+80°C	T4: -10…+80°C T5: -10…+65°C T6: -10…+50°C	-10…+80°C	T4: -10…+80°C T5: -10…+65°C T6: -10…+50°C
connection	electric M20x1.5 pneumatic G ¼"	electric M20x1.5 pneumatic G ¼"	electric M20x1.5 pneumatic G ¼"	electric M20x1.5 pneumatic G ¼"
travel range (linear actuators)	8…66 mm	8…66 mm	8…66 mm	8…66 mm
degree of protection	IP 65 to EN 60529 / NEMA 4x	IP 65 to EN 60529 / NEMA 4x	IP 65 to EN 60529 / NEMA 4x	IP 65 to EN 60529 / NEMA 4x
rated signal range	4…20 mA (two-wire system)	4…20 mA (two-wire system) for connections to circuits with intrinsically safe U<=30 V DC, Ik<=100 mA P<=1 W	via bus bus voltage 9 to 32 V	via bus (certified intrinsically safe circuit) bus connection with barrier, ia or ib group IIC or IIB Umax<=24 V, Imax <=200 mA, P<=1.2 W
required load voltage (Ω = at 20 mA)	<=6.4 V (=320 Ω)	<=7.8 V (=390 Ω)		
current to maintain power supply	>=3.6 mA	>=3.6 mA		
pressure	1.4…6 bar	1.4…6 bar	1.4…6 bar	1.4…6 bar
consumption of inlet air in stabile state	0.036 Nm³/h	0.036 Nm³/h	0.036 Nm³/h	0.036 Nm³/h
unrestr. flow of : At inlet air valve (Nm³/h) out air valve (Nm³/h)	2 bar 4 bar 6 bar 4.1 7.1 9.8 8.2 13.7 18.9	2 bar 4 bar 6 bar 4.1 7.1 9.8 8.2 13.7 18.9	2 bar 4 bar 6 bar 4.1 7.1 9.8 8.2 13.7 18.9	2 bar 4 bar 6 bar 4.1 7.1 9.8 8.2 13.7 18.9
casing	(plastic)	(plastic)	(plastic)	(plastic)
weight basic device	0.9 kg	0.9 kg	0.9 kg	0.9 kg
weight with attachement parts	1.8 kg	1.8 kg	1.8 kg	1.8 kg
communication			layers 1 + 2 according to PROFIBUS PA, transmission system to IEC 1158-2; slave function layer 7 (protocol layer) according to PROFIBUS DP, standard EN 50170 with extended PROFIBUS functionality (all data acyclic; manipulated variable, feedbacks and status cyclic in addition)	
	baelz 88-SP401	**baelz 88-SP401 EEx**		
	technical data see baelz SP400 but	technical data see baelz SP4010 EEx but		
casing	metal GK-AlSi 12	metal GK-AlSi 12		
weight basic device	1.3 kg	1.3 kg		
weight with attachement parts	2.2 kg	2.2 kg		

Bälz-electrodyn - control valves and control actuators

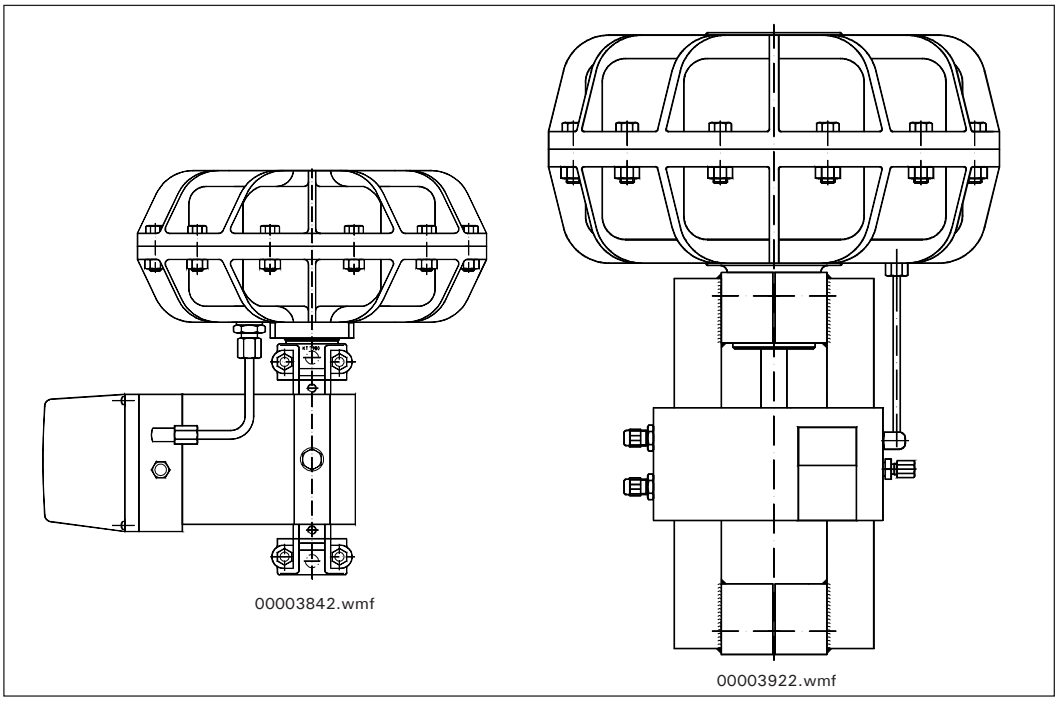


Fig. 218
baelz 373-P21-88-SP400 baelz 373-P31-88-SP400

Fig. 219
baelz 373-P22-88-SP400
pneumatic actautor with digital positioner baelz 88-SP400
and air pressure reducing set baelz 54298

Bälz-electrodyn - control valves and control actuators

21.7 Pneumatic positioner baelz 93 for pneumatic actuators

This positioner is a kind of servo control mechanism for air operated automatic control system.
Can be used as a double-acting positioner as well as a single-acting positioner, because this model has a double-acting pilot valve.

Specifications:

item	**baelz 93 IP 300** lever type
medium	pressure air filtered 10 micron oil free
supply pressure	1.4…7 bar
signal pressure	0.2…1 bar (split range is possible)
restoring angle (stroke)	10…85 mm
sensitivity	0.1 %
linearity	+/- 1 %
hysteresis	0.75 %
max air consumption	single-acting positioner : 10 l/min (Supply 1.4 bar) double-acting positioner: 20 l/min (Supply 5 bar)
connections	1/4” pipe connection ports 1/8” gauge ports
temperature coefficient of linearity and hysteresis	0.1 %/C
material	aluminium diecast for the body
weight	2.2 kg (without manometers)

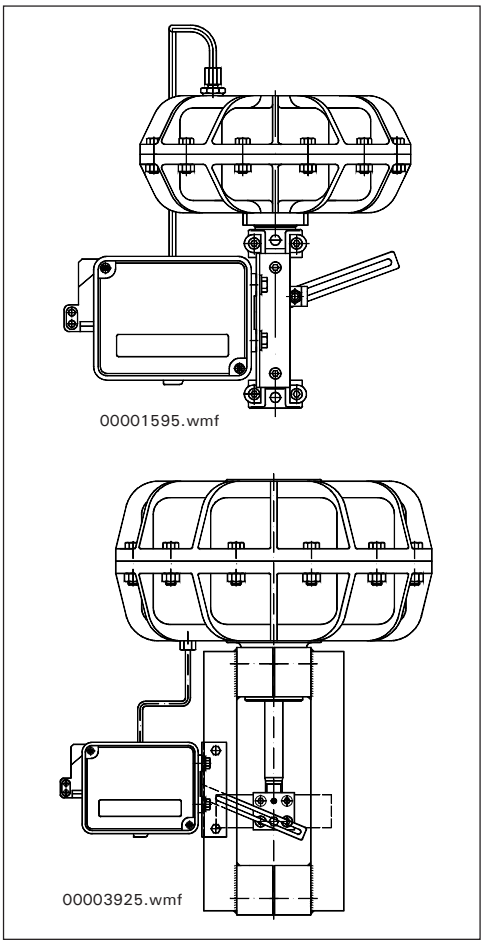


Fig. 220
baelz 373-P21-93 and
baelz 373-P31-93

Fig. 221

baelz 373-P21 with pneumatic positioner baelz 93 and with 1 end switch

Bälz-electrodyn - control valves and control actuators

21.8 Accessories for pneumatic actuators (mounted of a pneumatic actuator baelz 373-P21)

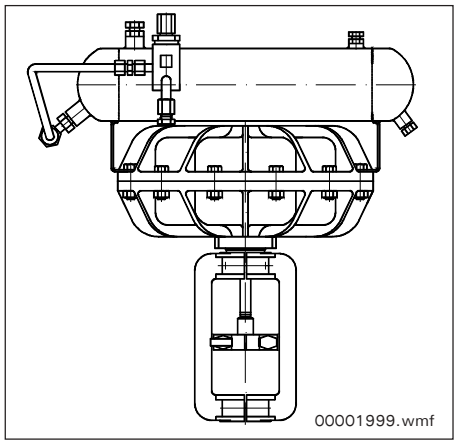


Fig. 222
baelz 373-P21-D21

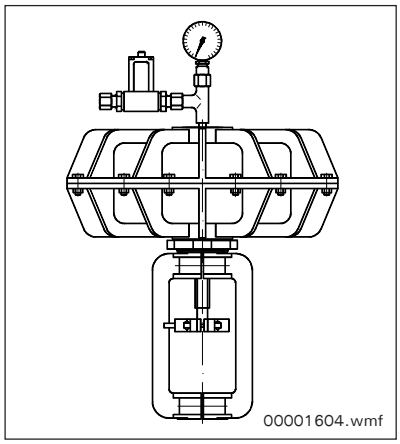


Fig. 223
baelz 373-P21-268/2

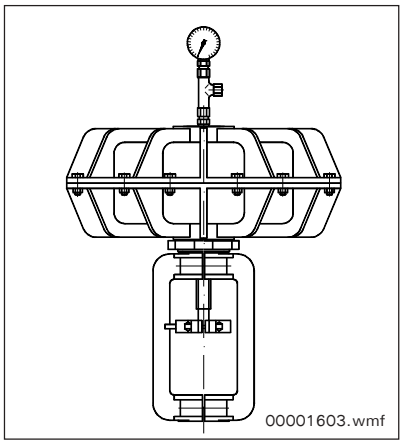


Fig. 224
baelz 373-P21-70802

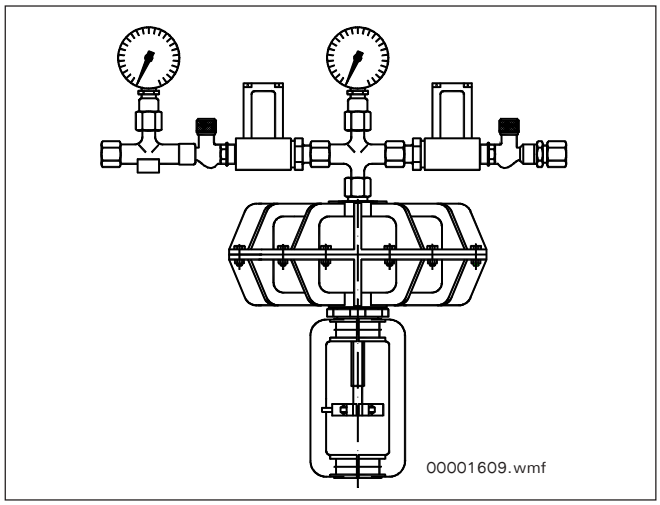


Fig. 225
baelz 373-P21-279

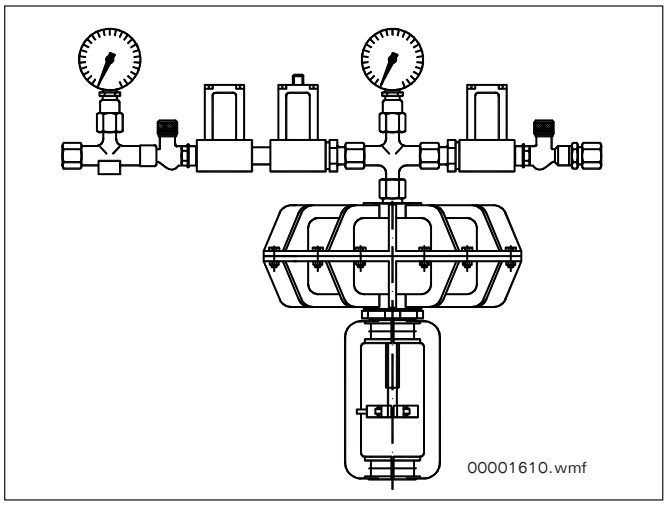


Fig. 226
baelz 373-P21-280

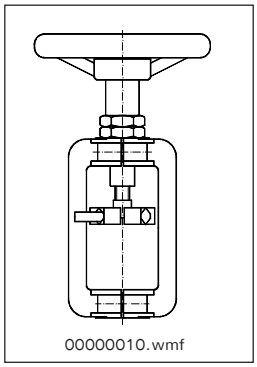


Fig. 227
baelz 373-H21

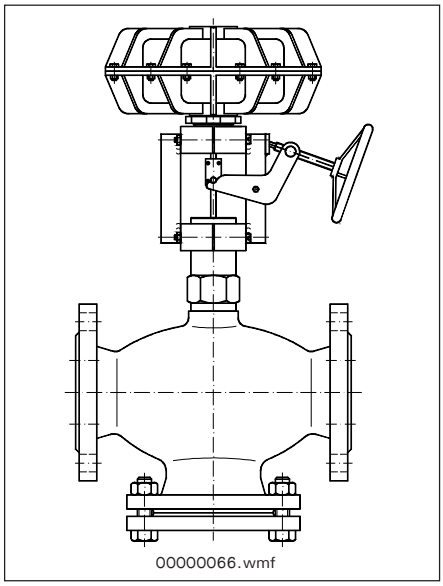


Fig. 228
baelz 373-P21-HS21

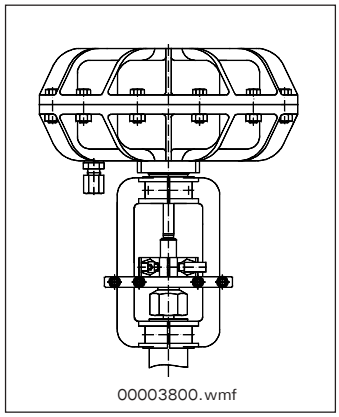


Fig. 229
baelz 373-0-Hb

Bälz-electrodyn - control valves and control actuators

21.9 Air pressure reducing set baelz 54298 with incorporated sinter filter

Text for quotations + orders:

Air pressure reducing set baelz 54298
with incorporated sinter filter

air in	: max. 16 bar g
air out	: adjustable 0.5 .... 10 bar g
with manometer	: Ø63 mm for G½ Ø50 mm for G¼
body	: valve body in zinc pressure casting
internal parts	: brass / stainless steel
sinter filter body	: plastic poly carbonat
G¼	: secondary pressure 0.5 ... 10 bar g weight approx. 0.8 kg
G½	: secondary pressure 0.5 ... 10 bar g weight approx. 1.8 kg

Accessories:
- **fixing angle for wall mounting for G½ and G¼**

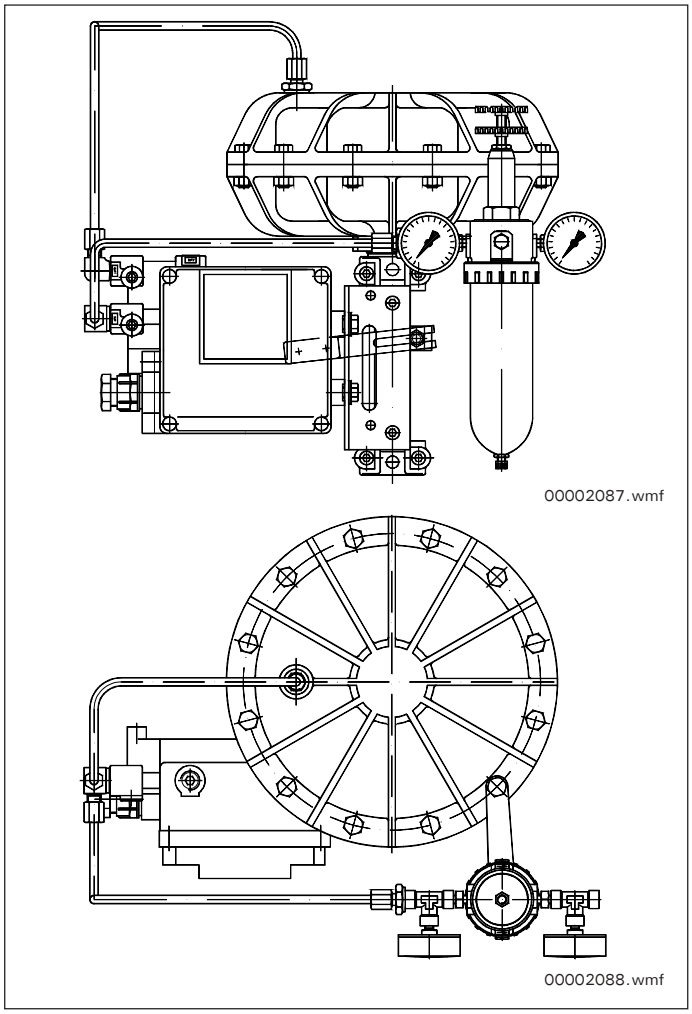


Fig. 230
baelz 373-P21-86-54298


373-P21-86-54298.JPG

Fig. 231
baelz 373-P21-86-54298
pneumatic actuator with analog i/p positioner baelz 86 and
air pressure reducing set baelz 54298

Bälz-electrodyn - control valves and control actuators

22. How to mount a pneumatic actuator on a baelz valve

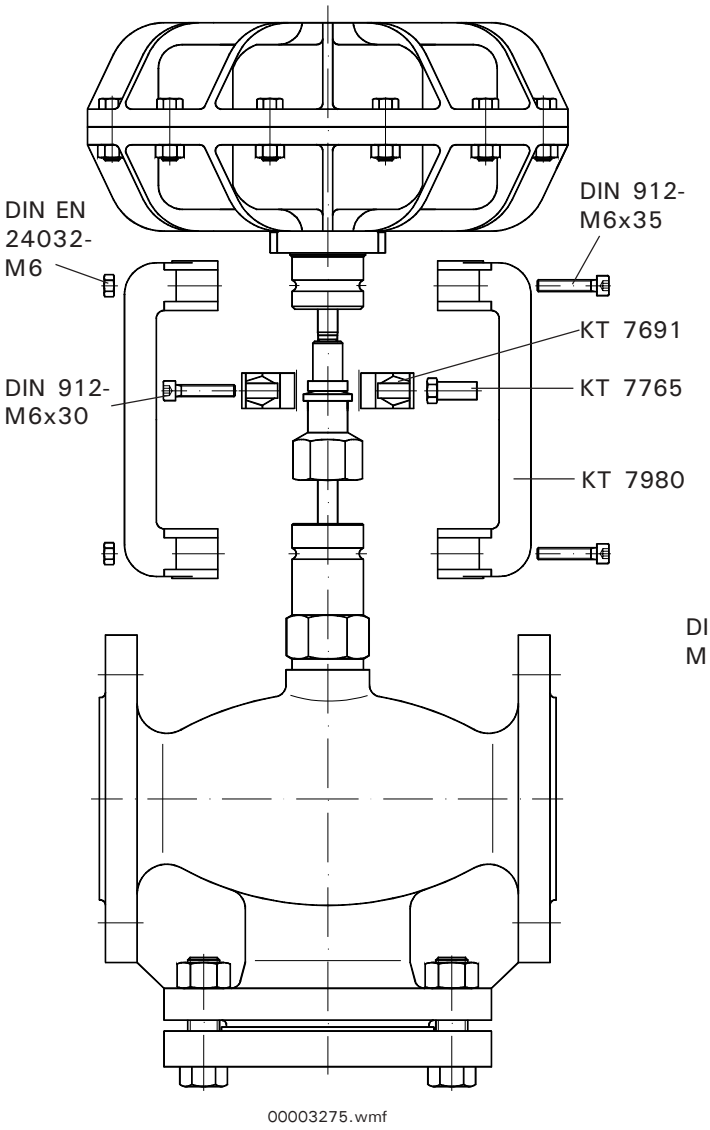


Fig. 232
mounting of a pneumatic actuator baelz 373-P21 on a valve baelz 340-B

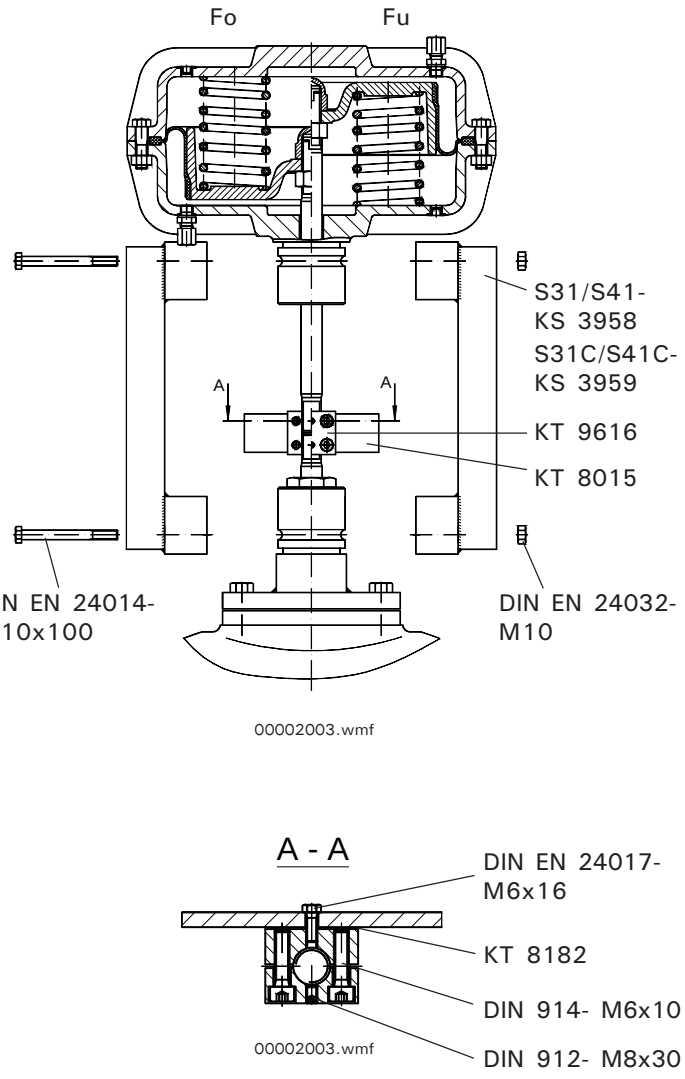


Fig. 233
mounting of a pneumatic actuator baelz 373-P31 on a valve baelz 340-BB

Bälz-electrodyn - control valves and control actuators

23. Short presentation of all pneumatic actuators from baelz 373-P21 to baelz 373-P41

23.1 Actuator baelz 373-P21

Text for quotations + orders:

Linear pneumatic actuator
baelz 373-P21-…-S21

P21-Fu (springs on the bottom) pulling by the spring force and pushing by the compressed air
P21-Fo (springs on the top) pushing by the spring force and pulling by the compressed air

for spindle diameter : 10 mm
diaphragm : NBR
ambient conditions : 0…70°C, 0…90% r.F.
H21 : hand operation
P21-… -H21 : hand wheel-∅ 140 mm
P21-V6-H21 : hand wheel-∅ 200 mm
P21- 3-Fo/Fu : weight approx. 5.3 kg
P21- 6-Fo/Fu : weight approx. 5.6 kg
P21- 12-Fo/Fu : weight approx. 5.9 kg
P21- 18-Fo/Fu : weight approx. 6.0 kg
P21- V6-Fo/Fu : weight approx. 8.8 kg
hand operation : weight approx. 2.0 kg
TÜV-tested (P21-6-Fu, P21-12-Fu, P21-18-Fu, P21-V6-Fu)
necessary compressed air pressure: max. 6 bar

Extra charges:
diaphragm: silicon
max. ambient temperature: 90°C
mechanical stroke limiting

polyester-plating
for linear pneumatic actuator
suitable for water pressure admission
internal and external plating
incl. actuator-yoke, screws
Yoke, screws and mounting parts in stainless steel
black Polyester-plating, RAL 9005
max. ambient temperature: **50°C**

damping container for water D21 without response throttle
damping container for water D21/1 with response throttle

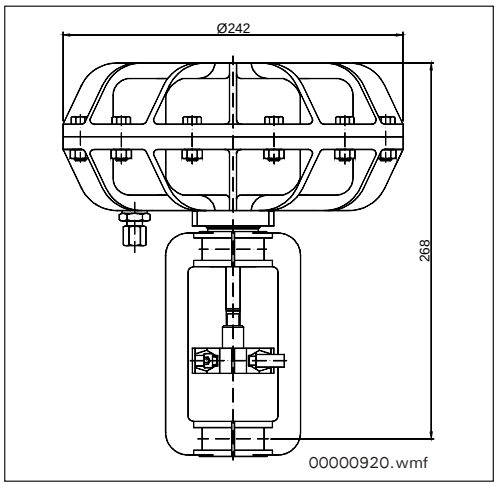


Fig. 234
actuator baelz 373-P21-S21

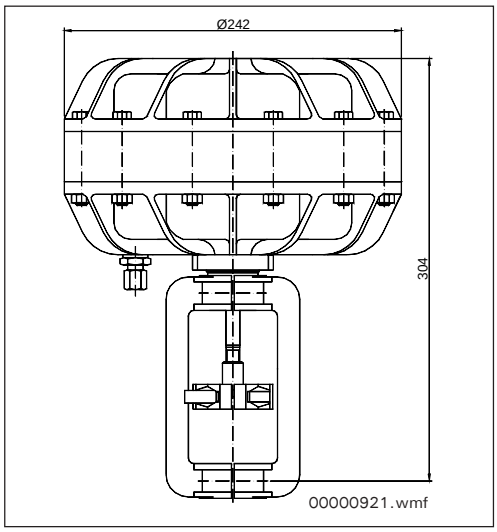


Fig. 235
actuator baelz 373-P21-V6-S21

Fig. 236
actuator baelz 373-P21

Fig. 237
actuator baelz 373-P21-V6

Bälz-electrodyn - control valves and control actuators

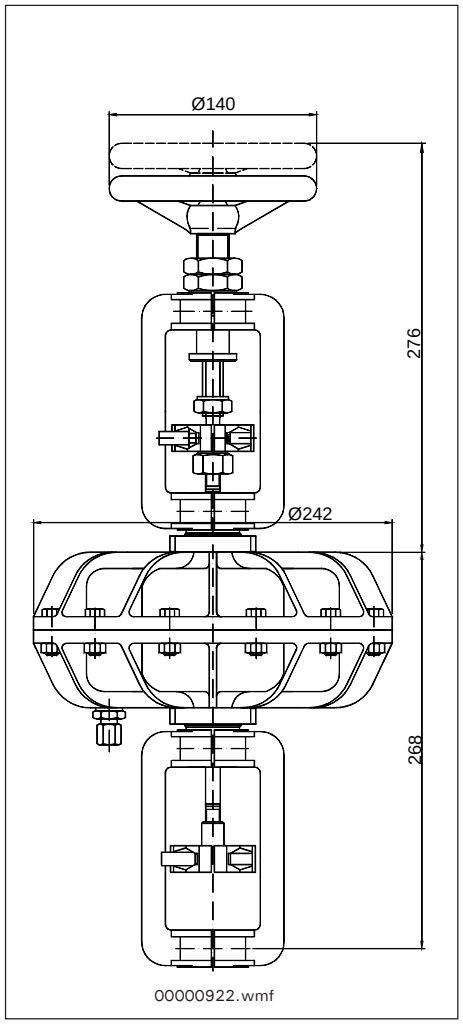


Fig. 238
actuator baelz 373-P21-S21-H21

Fig. 239
actuator baelz 373-P21-H21

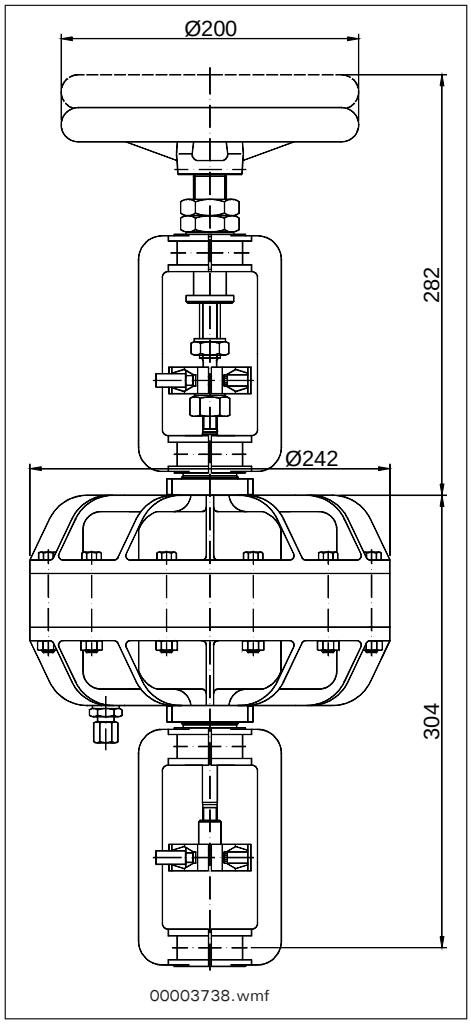


Fig. 240
actuator baelz 373-P21-V6-S21-H21

Bälz-electrodyn - control valves and control actuators

23.2 Actuator baelz 373-P22

Text for quotations + orders:

Linear pneumatic actuator
baelz 373-P22-6-Fo-S21
6 springs on the top, pushing by the spring
force and pulling by the compressed air
for spindle diameter : 10 mm
stroke max. : 40 mm
diaphragm : NBR
ambient conditions : 0…70°C, 0-90% r.F.
weight approx. : 6.6 kg
necessary compressed air pressure : 3 bar

Extra charges:
damping container for water D21 without response throttle
damping container for water D21/1 with response throttle

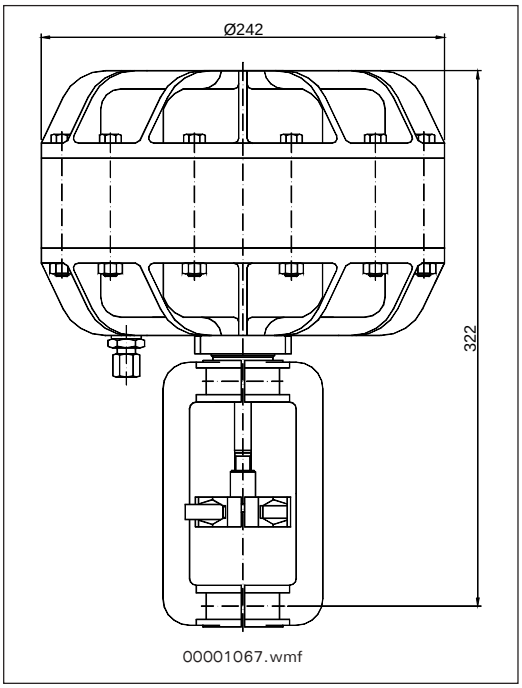


Fig. 241
actuator baelz 373-P22-S21

Fig. 242
actuator baelz 373-P22

Bälz-electrodyn - control valves and control actuators

23.3 Actuator baelz 373-P31

Text for quotations + orders:

Linear pneumatic actuator
baelz 373-P31-S31
for control or ON/OFF operation
P31-Fu (springs on the bottom) pulling by the spring force and pushing by the compressed air
P31-Fo (springs on the top) pushing by the spring force and pulling by the compressed air

ambient conditions	: 0…50°C, 0-90% r.F. not condensing
H31	: hand operation
P31- 3-Fo/Fu	: weight approx. 27.7 kg
P31- 6-Fo/Fu	: weight approx. 29.5 kg
P31- 18-Fo/Fu	: weight approx. 32.5 kg
hand operation	: weight approx. 11.0 kg

for valves **without cooling tube** ND 150 up.
necessary compressed air pressure : max. 6 bar

Linear pneumatic actuator
baelz 373-P31-..-..-S31C
For valves **with cooling tube** ND 150 up.

P31- 3-Fo/Fu	: weight approx. 31.7 kg
P31- 6-Fo/Fu	: weight approx. 33.5 kg
P31- 18-Fo/Fu	: weight approx. 36.5 kg
hand operation	: weight approx. 11.0 kg

necessary compressed air pressure : max. 6 bar

Extra charges:
damping container for water D31 without response throttle
damping container for water D31/1 with response throttle

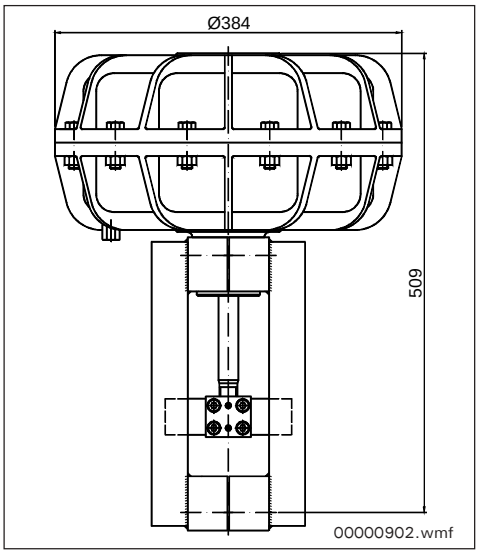


Fig. 243
actuator baelz 373-P31-S31

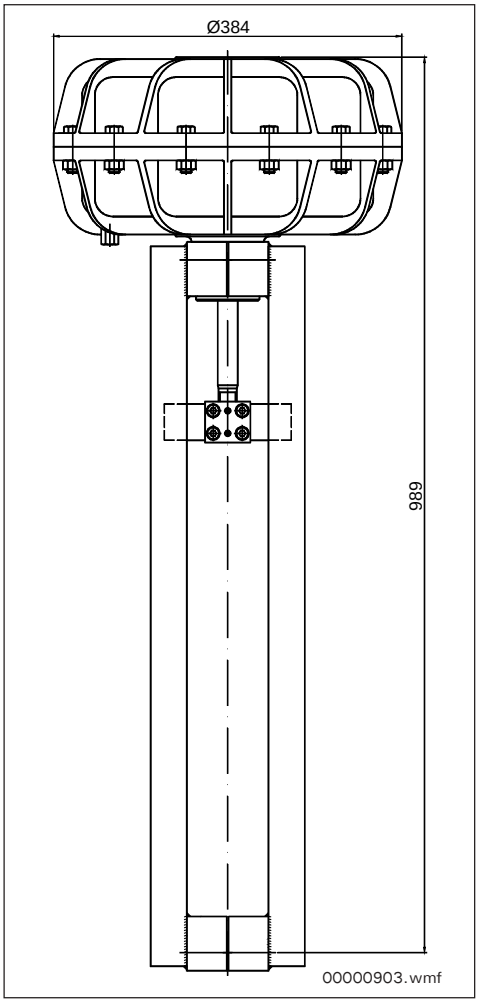


Fig. 246
actuator baelz 373-P31-S31C

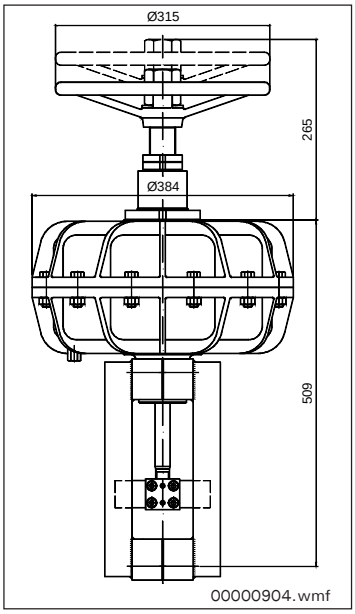


Fig. 244
actuator baelz 373-P31-S31-H31

Fig. 245
actuator baelz 373-P31

Bälz-electrodyn - control valves and control actuators

23.4 Actuator baelz 373-P32

Text for quotations + orders:

Linear pneumatic actuator
baelz 373-P32-6-Fo-S31
6 springs on the top, pushing by the spring
force and pulling by the compressed air
for stroke 66 mm
differential pressure on demand
weight approx. 36.0 kg
necessary compressed air pressure : 3 bar

Extra charges:
damping container for water D31 without response throttle
damping container for water D31/1 with response throttle

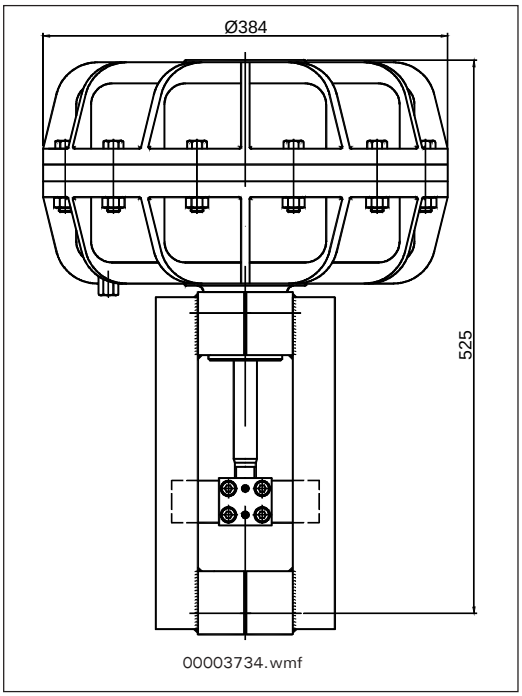


Fig. 247
actuator baelz 373-P32-S31

Fig. 248
actuator baelz 373-P32

Bälz-electrodyn - control valves and control actuators

23.5 Actuator baelz 373-P41

Text for quotations + orders:

Linear pneumatic actuator
baelz 373-P41-S31
for control or ON/OFF operation
P41-Fu (springs on the bottom) pulling by the spring force and pushing by the compressed air
P41-Fo (springs on the top) pushing by the spring force and pulling by the compressed air

ambient conditions	: 0…50°C, 0-90% r.F. not condensing
H31	: hand operation
P41- 3-Fo/Fu	: weight approx. 55.5 kg
P41- 6-Fo/Fu	: weight approx. 58.5 kg
P41-V6-Fo/Fu	: weight approx. 62.5 kg
hand operation	: weight approx. 11.0 kg

for valves **without cooling tube** ND 200 up
necessary compressed air pressure : max. 6 bar

Linear pneumatic actuator
baelz 373-P41-S31C
For valves **with cooling tube** ND 200 up.

P41- 3-Fo/Fu	: weight approx. 59.5 kg
P41- 6-Fo/Fu	: weight approx. 62.5 kg
P41- 18-Fo/Fu	: weight approx. 66.5 kg
hand operation	: weight approx. 11.0 kg

necessary compressed air pressure : max. 6 bar

Extra charges:
damping container for water D41 without response throttle
damping container for water D41/1 with response throttle

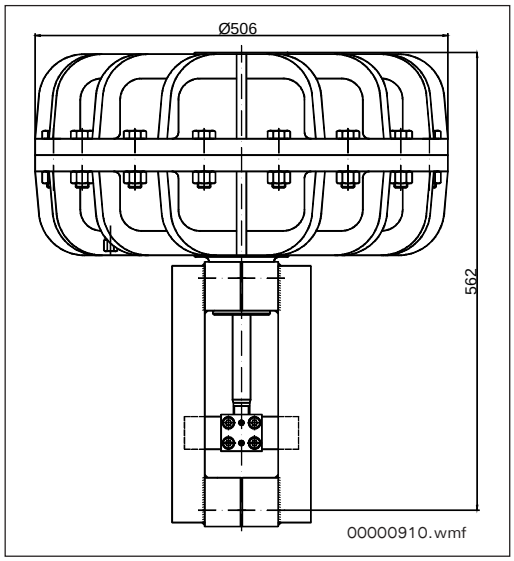


Fig. 249
actuator baelz 373-P41-S31

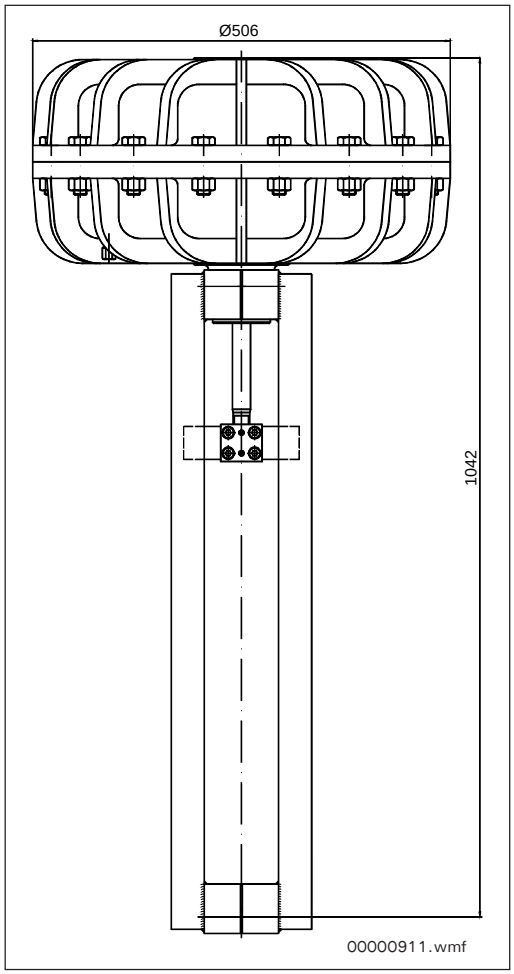


Fig. 250
actuator baelz 373-P41-S31C

Fig. 251
actuator baelz 373-P41

Bälz-electrodyn - control valves and control actuators

Fig. 252
actuator baelz 373-P41-V6

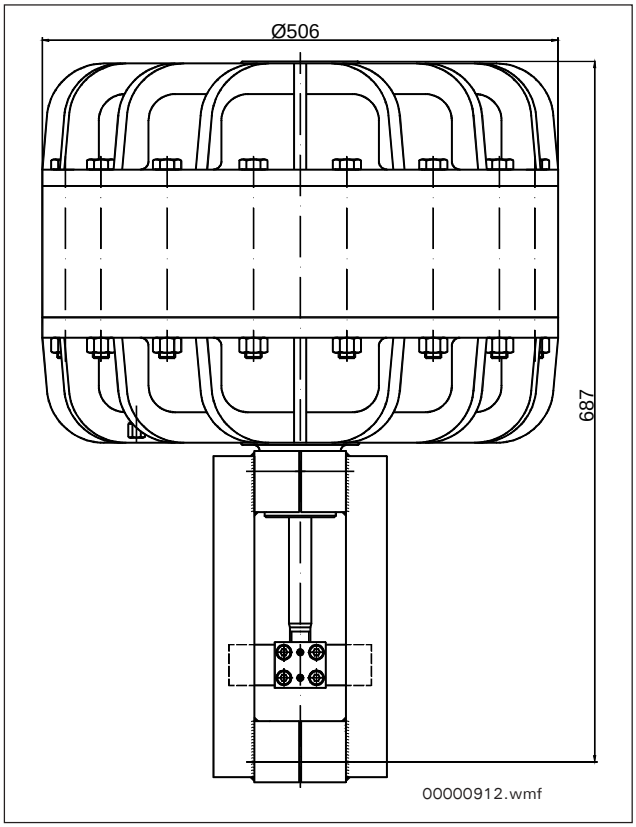


Fig. 253
actuator baelz 373-P41-V6-S31

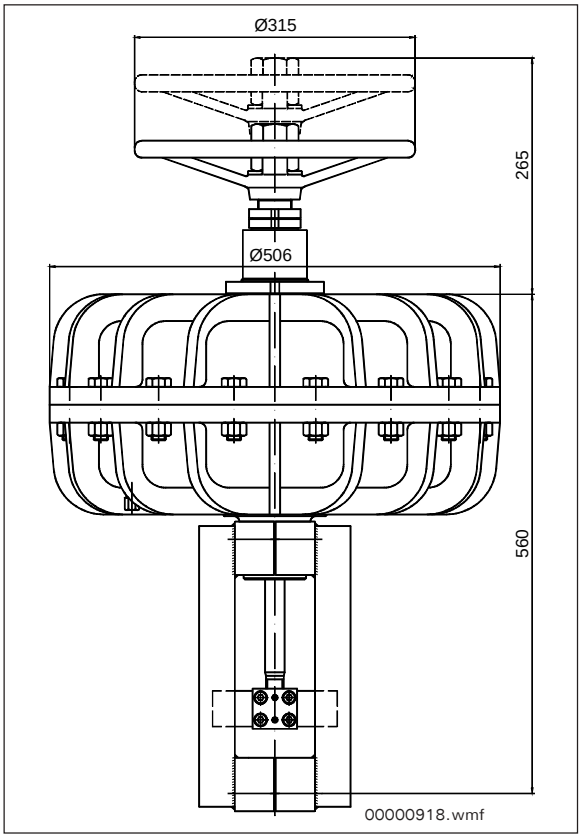


Fig. 254
actuator baelz 373-P41-S31-H31

Bälz-electrodyn - control valves and control actuators

24. Electric rotary actuators baelz 375

Baelz has in its delivery program 2 types of rotary actuators baelz 375-E03 and baelz 375-E41.
They can be mounted on 3-way cocks, butterfly valves or air louvers.

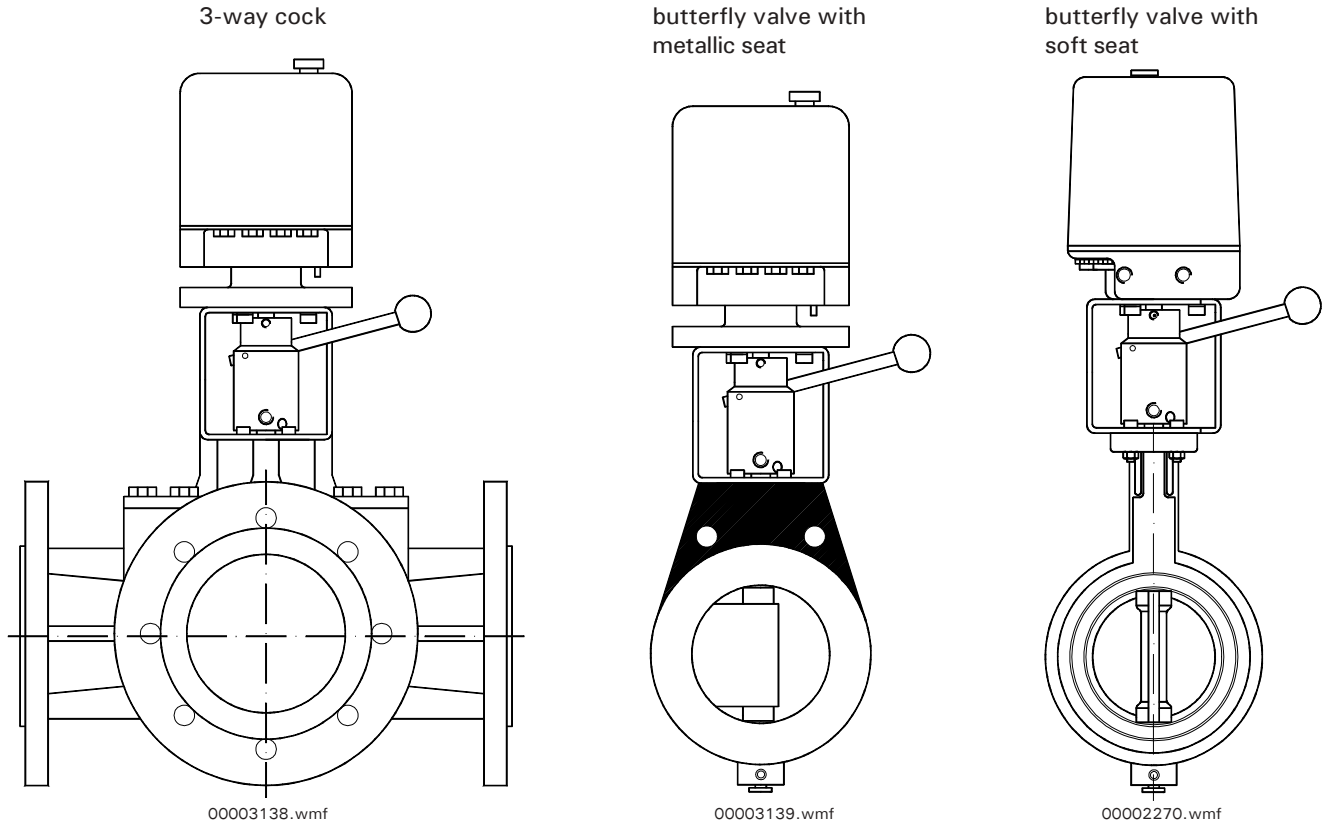


Fig. 255
examples of cocks + valves with rotary actuators

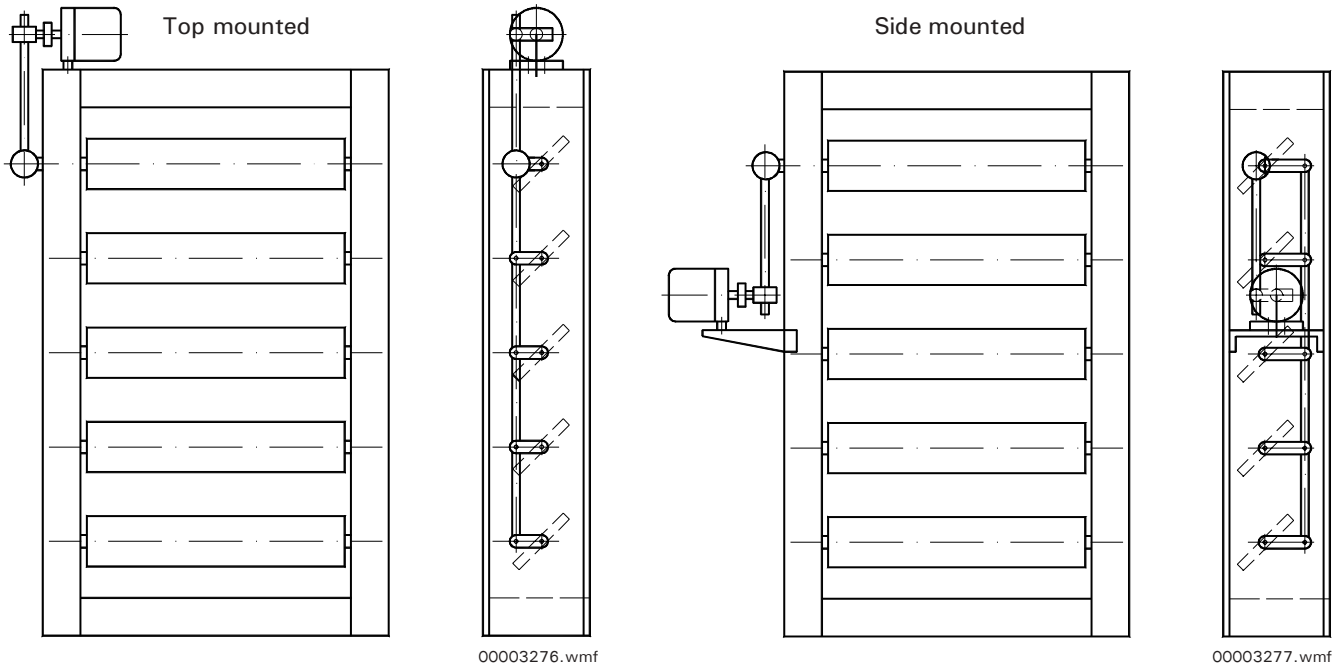


Fig. 256
examples how to use a rotary actuator with louvers

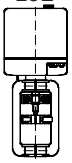
Bälz-electrodyn - control valves and control actuators

25. Max. allowable differential pressures based on actuator draw / push F.

25.1 Max. differential pressure against which the motorized 2-way or 3-way mixing valve (in at A + B, out at AB) closes; for valves baelz 334, 335, 340, 342, 344, 347, 340-BB, 346-22, 347-BB, 340-ES, 342-ES, 347-ES, 353, 354, 356, 358-K, 359-K, 359-ASA with actuators see first column.

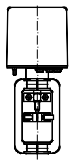
type	F	ND	Δpmax bar												
baelz 373-	N	15	20	25	32	40	50	65	80	100	125	150	200	250	300
E02- 10-	1000	25	25	16	10	6,3	4	2,4	1,5	1	0,6				
E06- 20-	2000	40	40	32	20	12	8	4,8	3	2	1,2				
E07- 20-	2000	40	40	35	20	12	8	4,6	2,9	1,7	1				
E11- 20-	2000	40	40	35	20	12	8	4,6	2,9	1,7	1				
E40- 40-	4000	40	40	40	40	27	16	10	6,9	4,4	2,8	1,7			
E60- 90-	9000					(40)*	(40)*	(25)*	(16)*	(10)*	(6,6)*	4,3	2,4	1,5	1
E88- 100-	10000						40	28	18	11	7,4	5	2,7	1,7	1,1
	13000						40	37	24	15	9,8	6,7	3,7	2,3	1,5
	16000						40	40	30	19	12	8,4	4,6	2,9	2
E88- 300-	30000								(40)*	(36)*	(23)*	15,3	9	5,8	3,9
	35000											18,9	10,5	6,7	4,6
	40000											21,7	12,1	7,7	5,3

baelz 373-E02



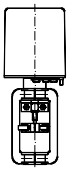
00001591.wmf

baelz 373-E06



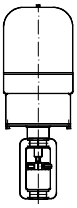
00003239.wmf

baelz 373-E07



00003240.wmf

baelz 373-E11



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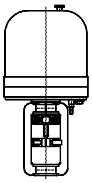
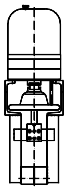
baelz 373-E40



00001562.wmf

baelz 373-E60



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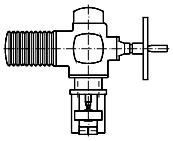
baelz 373-E88-100



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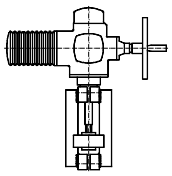
baelz 373-E88-300



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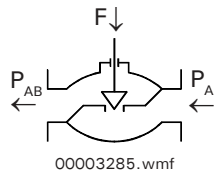
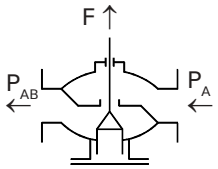


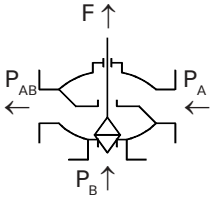
00003285.wmf

Δpmax = P_A - P_{AB}



00003286.wmf

Δpmax = P_A - P_{AB}

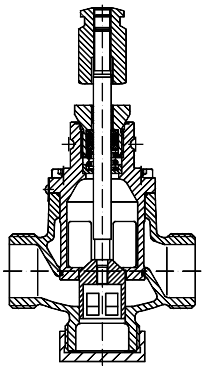


00003288.wmf

Δpmax = P_A - P_{AB}

Δpmax = P_A - P_B

baelz 334



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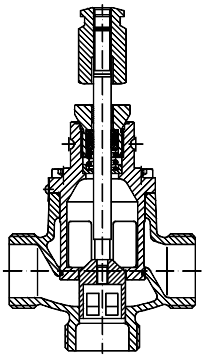
baelz 335



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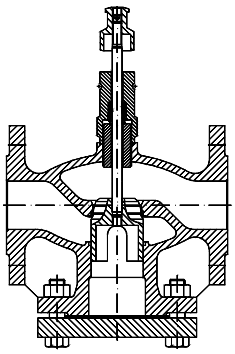
baelz 340...



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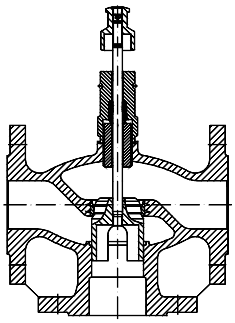
baelz 342...



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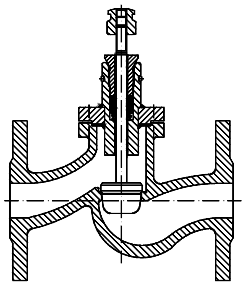
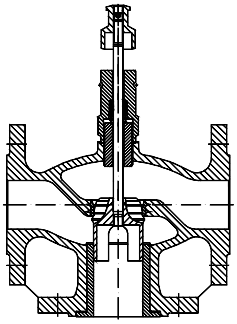
baelz 344



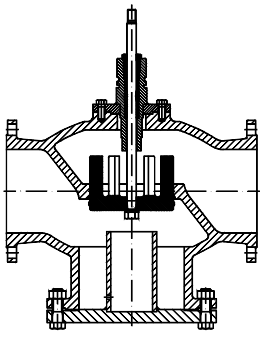
00001517.wmf

baelz 347...



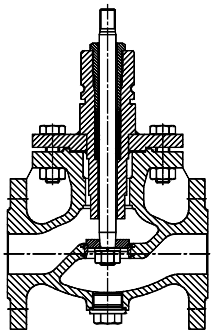
00003226.wmf

baelz 340-BB...



00001655.wmf

***baelz 346-22**



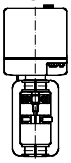
00003252.wmf

Bälz-electrodyn - control valves and control actuators

Motorized valves; same table as page before, only additional cut - views of valves

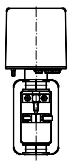
type		F	ND						Δpmax bar						
baelz 373-		N	15	20	25	32	40	50	65	80	100	125	150	200	250	300
E02-	10-	1000	25	25	16	10	6,3	4	2,4	1,5	1	0,6				
E06-	20-	2000	40	40	32	20	12	8	4,8	3	2	1,2				
E07-	20-	2000	40	40	35	20	12	8	4,6	2,9	1,7	1				
E11-	20-	2000	40	40	35	20	12	8	4,6	2,9	1,7	1				
E40-	40-	4000	40	40	40	40	27	16	10	6,9	4,4	2,8	1,7			
E60-	90-	9000					(40)*	(40)*	(25)*	(16)*	(10)*	(6,6)*	4,3	2,4	1,5	1
E88-	100-	10000						40	28	18	11	7,4	5	2,7	1,7	1,1
		13000						40	37	24	15	9,8	6,7	3,7	2,3	1,5
		16000						40	40	30	19	12	8,4	4,6	2,9	2
E88-	300-	30000								(40)*	(36)*	(23)*	15,3	9	5,8	3,9
		35000											18,9	10,5	6,7	4,6
		40000											21,7	12,1	7,7	5,3

baelz 373-E02



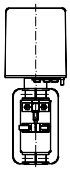
00001591.wmf

baelz 373-E06



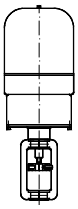
00003239.wmf

baelz 373-E07



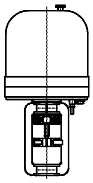
00003240.wmf

baelz 373-E11



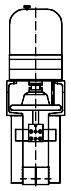
00001592.wmf

baelz 373-E40



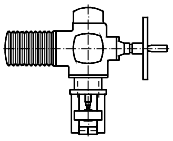
00001562.wmf

baelz 373-E60



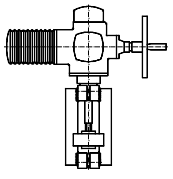
00001590.wmf

baelz 373-E88-100



00003296.wmf

baelz 373-E88-300



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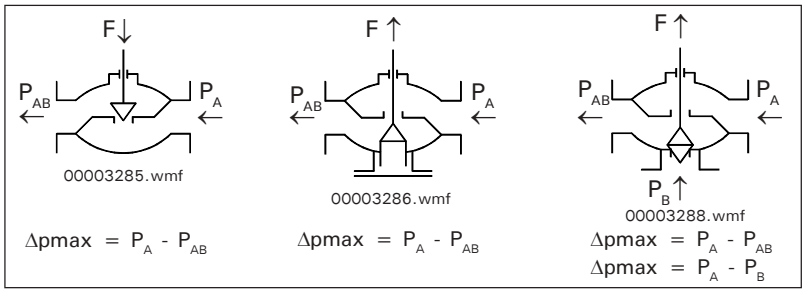
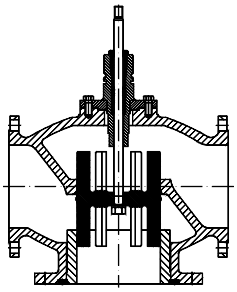
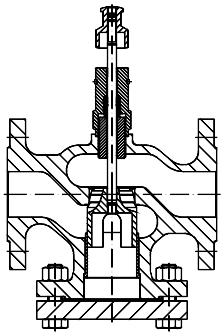


baelz 347-BB...



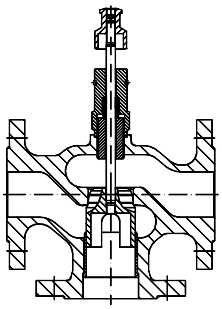
00001524.wmf

baelz 340-ES...



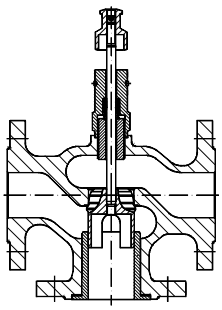
00003235.wmf

baelz 342-ES...



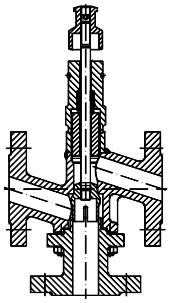
00003289.wmf

baelz 347-ES...



00003290.wmf

baelz 353...



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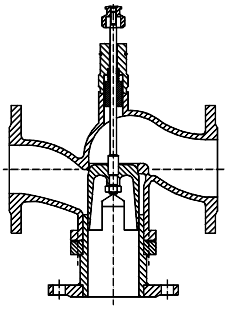
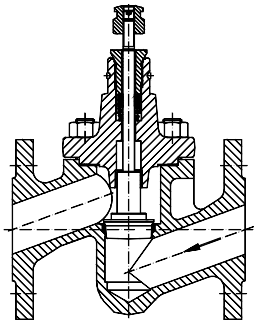
baelz 354...



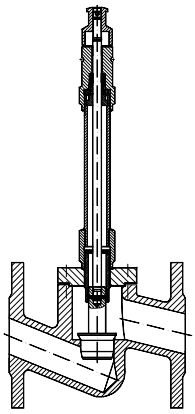
00003238.wmf

baelz 356...



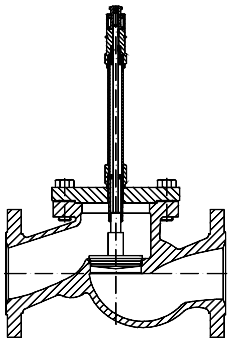
00000746.wmf

baelz 358-K



00002485.wmf

baelz 359-K



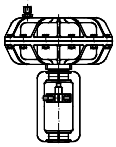
00003251.wmf

Bälz-electrodyn - control valves and control actuators

25.2 Max. differential pressure against which the pneumatic 2-way valve closes; valve normally closed; for valves baelz 334, 340, 340-BB, 340-ES, 344, 346-22, 356, 358-K, 359-K, 359-ASA.
pz = necessary air signal pressure

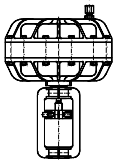
type	F	pz	ND Δpmax bar													
baelz 373-	N	bar	15	20	25	32	40	50	65	80	100	125	150	200	250	300
P21- 3	1020	1,2	29	29	16	9,9	6,3	4,6	2,7	1,8	1	0,6				
P21- 6	2040	3	40	40	35	21	13,5	8,9	5,2	3,4	2,2	1,4				
P21- 12	3390	6	40	40	40	36	23	14	8	5	3,5	2,1				
P21- 18	4030	6	40	40	40	40	27	18	10	7	4,5	2,8				
P21- V6	7590	6	40	40	40	40	40	34	20	13	8	5				
P31- 3	2480 / (4223)*	1,2					(27)*	(17)*	(9,6)*	(6,1)*	(3,6)*	(2,1)*	1,1			
P31- 6	4960 / (8446)*	3					(57)*	(35)*	(21)*	(13)*	(8,5)*	(5,5)*	2,4			
P31- 18	10560 / (18120)*	6					(120)*	(80)*	(40)*	(30)*	(19)*	(12)*	5,3			
P41- 3	3765	1,2											2,4	1	0,6	0,4
P41- 6	7530	3					(103)*	(65)*	(38)*	(25)*	(15)*	(10)*	5	2	1,3	0,9
P41- V6	31920	6					(290)*	(186)*	(110)*	(65)*	(45)*	(29)*	17	8,5	5,2	3,6

baelz 373-P21



00003241.wmf

baelz 373-P21-V6



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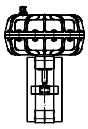
baelz 373-P31



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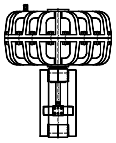
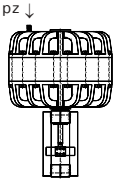
baelz 373-P41

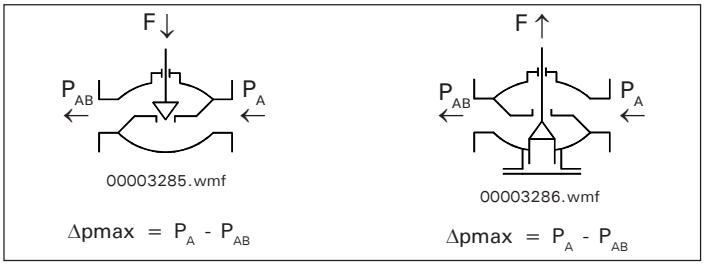


00003243.wmf

baelz 373-P41-V6



00003295.wmf



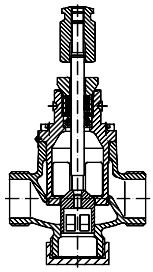
00003285.wmf

Δpmax = P_A - P_{AB}

00003286.wmf

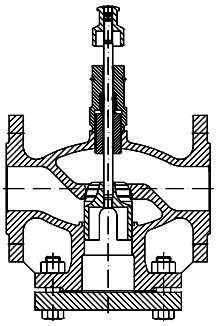
Δpmax = P_A - P_{AB}

baelz 334



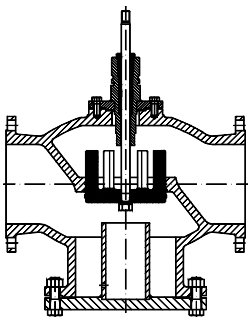
00002263.wmf

baelz 340...



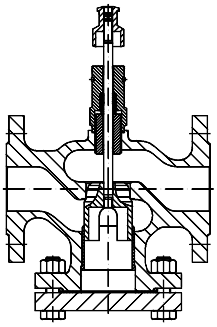
00001755.wmf

baelz 340-BB...



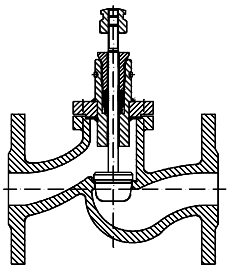
00001655.wmf

baelz 340-ES...



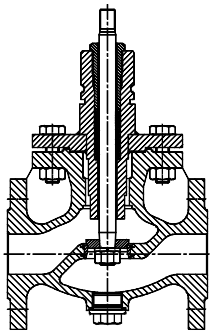
00003235.wmf

baelz 344



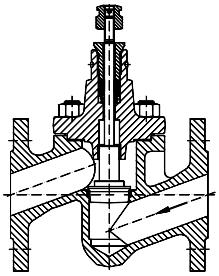
00001517.wmf

***baelz 346-22**



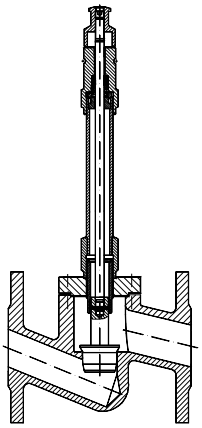
00003252.wmf

baelz 356...



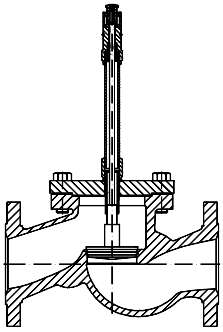
00000746.wmf

baelz 358-K



00002485.wmf

baelz 359-K



00003251.wmf

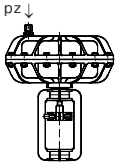
Bälz-electrodyn - control valves and control actuators

25.3 Max. differential pressure against which the pneumatic 2-way valve closes; valve normally open; for valves baelz 334, 340, 340-BB, 340-ES, 344, 356, 358-K, 359-K, 359-ASA.
pz = necessary air signal pressure

type	F	pz	ND Δpmax bar													
baelz 373-	N	bar	15	20	25	32	40	50	65	80	100	125	150	200	250	300
P21- 3	1020	1,2	7	7	4,5	2,8	1,8	1,1	0,6	0,4	-	-				
		3	40	40	40	40	31	19	12	8	5	3				
		6	40	40	40	40	40	40	30	20	12	8				
P21- 6	2040	3	40	40	35	21	14	8	5,3	3,5	2,2	1,4				
		6	40	40	40	40	40	39	24	16	10	6				
P31- 3	2480	1,2											0,6			
		3											6			
		6											14,8			
P31- 6	4960	3											3			
		6											12			
P41- 3	3765	1,2											1,2	0,7	0,4	0,3
		3											12	6,8	4,3	3
		6											30	17	11	7,5
P41- 6	7530	3												5	3	2
		6												15	10	6

baelz 373-P21

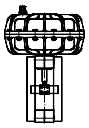
pz↓



00003241.wmf

baelz 373-P31

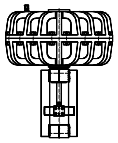
pz↓



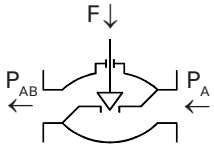
00000906.wmf

baelz 373-P41

pz↓

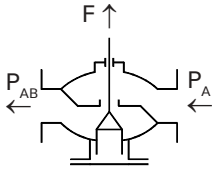


00003243.wmf



00003285.wmf

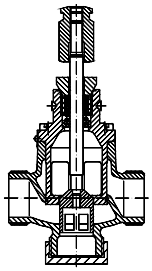
$\Delta pmax = P_A - P_{AB}$



00003286.wmf

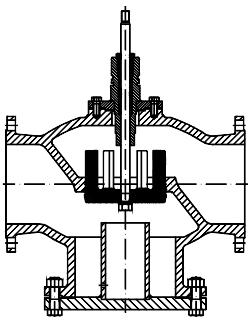
$\Delta pmax = P_A - P_{AB}$

baelz 334



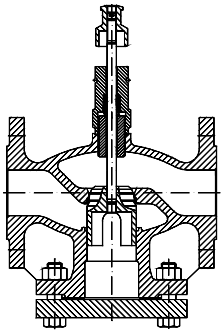
00002263.wmf

baelz 340-BB...



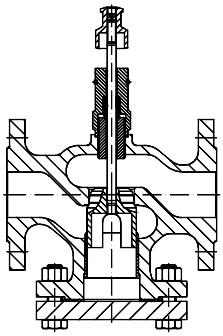
00001655.wmf

baelz 340...



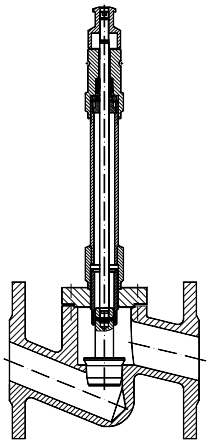
00001755.wmf

baelz 340-ES...



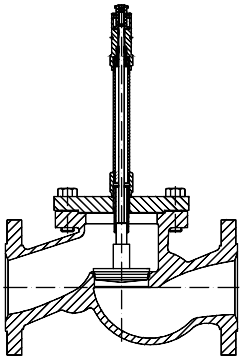
00003235.wmf

baelz 358-K



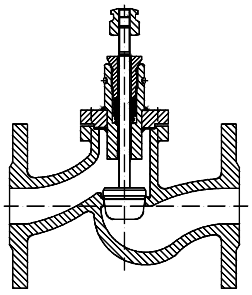
00002485.wmf

baelz 359-K



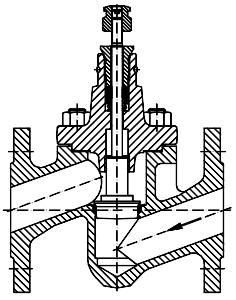
00003251.wmf

baelz 344



00001517.wmf

baelz 356...



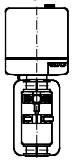
00000746.wmf

Bälz-electrodyn - control valves and control actuators

25.4 Max. differential pressure against which the motorized 3-way diverting valve (in at AB, out at A + B) can be operated; for valves baelz 335, 342-B, 342-BK, 342-BK-SS, 347-B, 347-BK, 347-BK-SS, 347-BB, 347-BBK, 347-BBK-SS; for higher differential pressures a special design with 2 separate plugs is available.

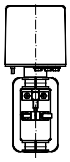
type	F	ND Δpmax bar													
baelz 373-	N	15	20	25	32	40	50	65	80	100	125	150	200	250	300
E02- 10-	1000	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,5				
E06- 20-	2000	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6				
E07- 20-	2000	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6				
E11- 20-	2000	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6				
E40- 40-	4000	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6				
E60- 90-	9000											0,6	0,4	0,2	0,1
E88- 100-	10000											1	0,6	0,6	0,6
E88- 300-	30000											1	0,6	0,6	0,6

baelz 373-E02



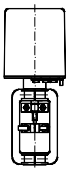
00001591.wmf

baelz 373-E06



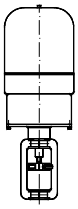
00003239.wmf

baelz 373-E07



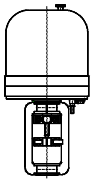
00003240.wmf

baelz 373-E11



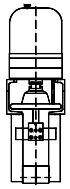
00001592.wmf

baelz 373-E40



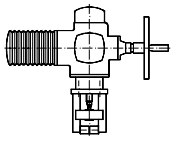
00001562.wmf

baelz 373-E60



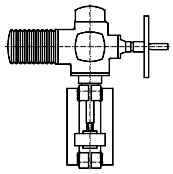
00001590.wmf

baelz 373-E88-100

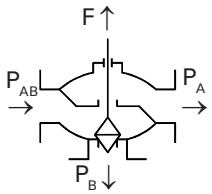


00003296.wmf

baelz 373-E88-300



00001588.wmf

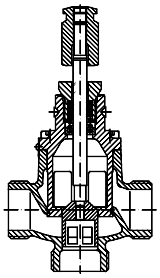


00003287.wmf

Δpmax = P_{AB} - P_A

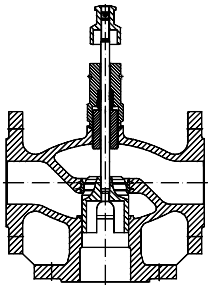
Δpmax = P_{AB} - P_B

baelz 335



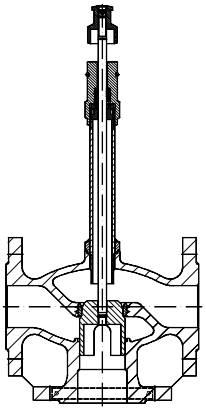
00002264.wmf

baelz 342-B



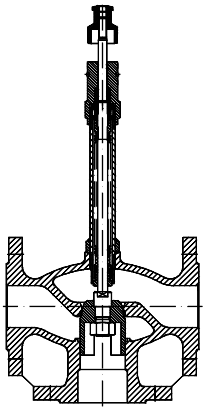
00003225.wmf

baelz 342-BK



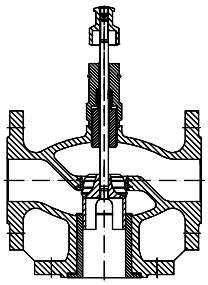
00001515.wmf

baelz 342-BK-SS



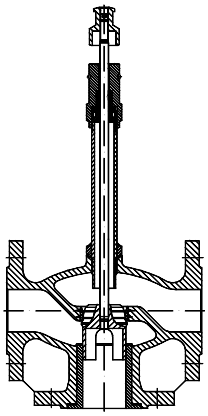
00003236.wmf

baelz 347-B



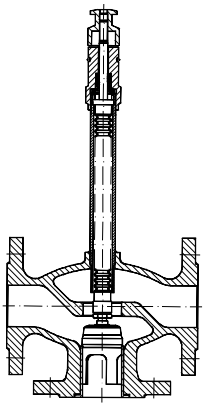
00003226.wmf

baelz 347-BK



00003227.wmf

baelz 347-BK-SS



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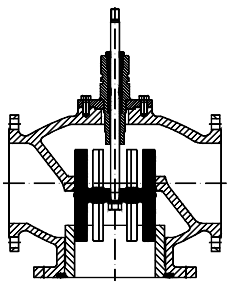
baelz 347-BB



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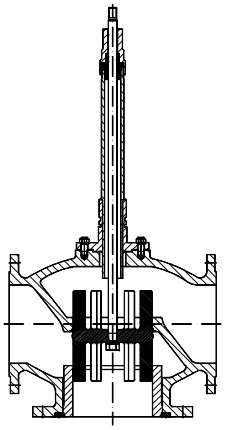
baelz 347-BBK



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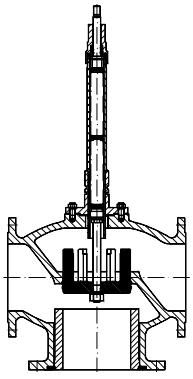
baelz 347-BBK-SS



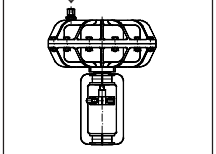
00001674.wmf

Bälz-electrodyn - control valves and control actuators

25.5 Max. differential pressure against which the pneumatic 3-way mixing valve (in at A + B, out at AB) can be operated; for valves baelz 335, 342, 347, 347-BB, 342-ES, 347-ES, 353, 354.
pz = necessary air signal pressure

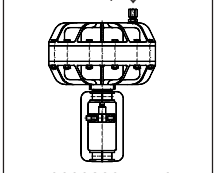
type	F	pz	ND ΔPmax bar													
baelz 373-	N	bar	15	20	25	32	40	50	65	80	100	125	150	200	250	300
P21- 3	1020	1,2	7	7	4,5	2,8	1,8	1,1	0,6	0,4	0,3	0,2				
P21- 6	2040	3	40	40	35	21	13,5	8	5	3,4	2,2	1,4				
P21- 12	3390	6	40	40	40	36	23	14	8	5	3,5	2,1				
P21- 18	4030	6	40	40	40	40	27	18	10	7	4,5	2,8				
P21- V6	7590	6	40	40	29	18	11,5	7	4,3	2,8	1,8	1,2				
P31- 3	2480	1,2											0,6			
P31- 6	4960	3											2,3			
P31- 18	10560	6											5			
P41- 3	3765	1,2											2,4	1	0,65	0,45
P41- 6	7530	3											4,8	2	1,3	0,9
P41- V6	31920	6											8,2	3,5	2,3	1,6

baelz 373-P21



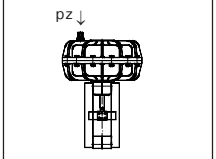
00003241.wmf

baelz 373-P21-V6



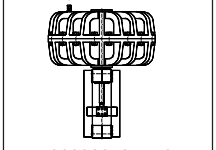
00003294.wmf

baelz 373-P31



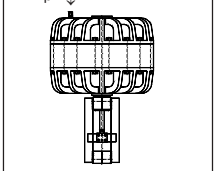
00000906.wmf

baelz 373-P41



00003243.wmf

baelz 373-P41-V6



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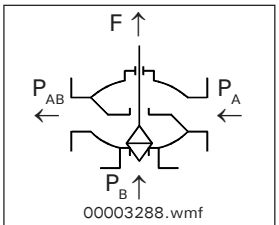
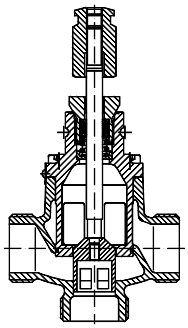


00003288.wmf

ΔPmax = P_A - P_{AB}

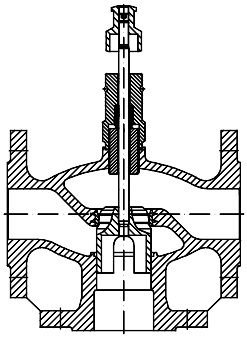
ΔPmax = P_A - P_B

baelz 335



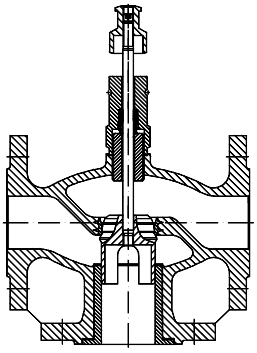
00002264.wmf

baelz 342...



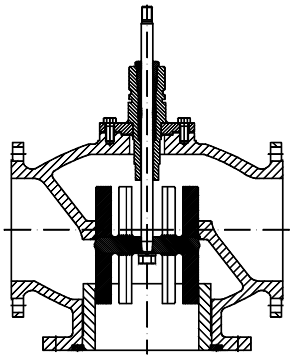
00003225.wmf

baelz 347...



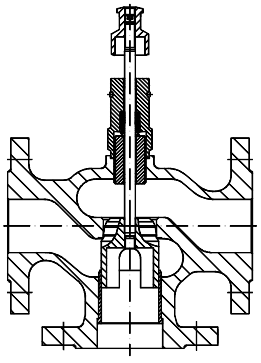
00003226.wmf

baelz 347-BB...



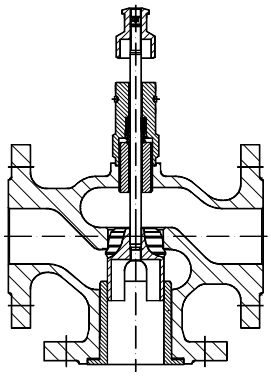
00001524.wmf

baelz 342-ES...



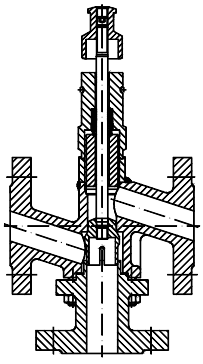
00003289.wmf

baelz 347-ES...



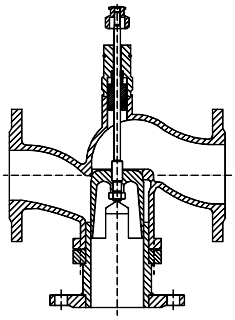
00003290.wmf

baelz 353...



00003237.wmf

baelz 354...



00003238.wmf

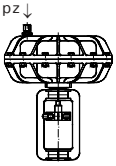
Bälz-electrodyn - control valves and control actuators

25.6 Max. differential pressure against which the pneumatic 3-way diverting valve (in at AB, out at A + B) can be operated; for valves baelz 335, 342-B, 342-BK, 342-BK-SS, 347-B, 347-BK, 347-BK-SS, 347-BB, 347-BBK, 347-BBK-SS; for higher differential pressures a special design with 2 separate plugs is available. pz = necessary air signal pressure

type	F	pz	ND Δpmax bar												
baelz 373-	N	bar	15	20	25	32	40	50	65	80	100	125	150	200	250	300
P21- 3	1020	1,2	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6				
P21- 6	2040	3	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6				
P21- 12	3390	6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6				
P21- 18	4030	6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6				
P21- V6	7590	6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6				
P31- 3	2480	1,2											0,6			
P31- 6	4960	3											0,6			
P31- 18	10560	6											0,6			
P41- 3	3765	1,2											0,6	0,6	0,6	0,6
P41- 6	7530	3											0,6	0,6	0,6	0,6
P41- V6	31920	6											0,6	0,6	0,6	0,6

baelz 373-P21

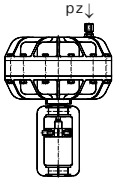
pz↓



00003241.wmf

baelz 373-P21-V6

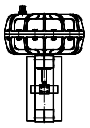
pz↓



00003294.wmf

baelz 373-P31

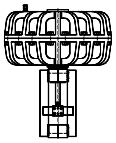
pz↓



00000906.wmf

baelz 373-P41

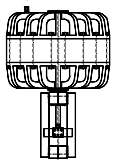
pz↓



00003243.wmf

baelz 373-P41-V6

pz↓



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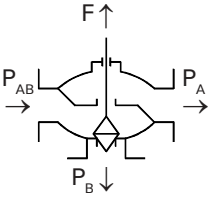

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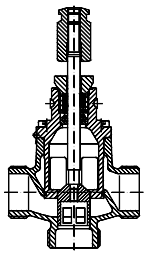
Δpmax = P_{AB} - P_A

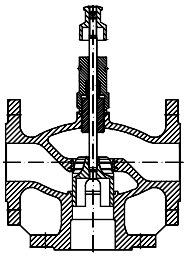
Δpmax = P_{AB} - P_B

baelz 335



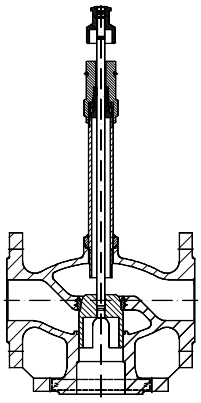
00002264.wmf

baelz 342-B



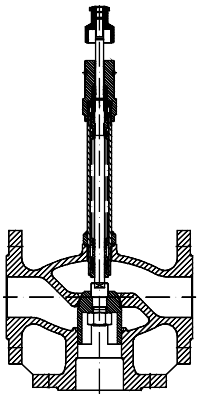
00003225.wmf

baelz 342-BK



00001515.wmf

baelz 342-BK-SS



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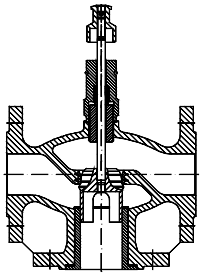
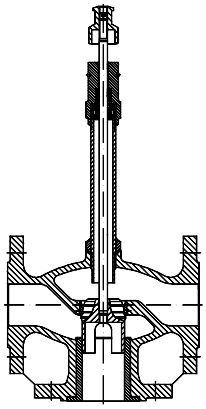
baelz 347-B



00003226.wmf

baelz 347-BK



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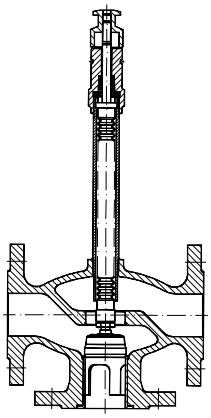
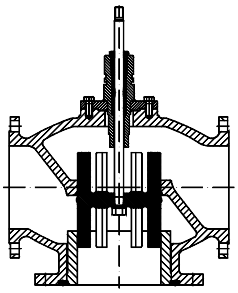
baelz 347-BK-SS



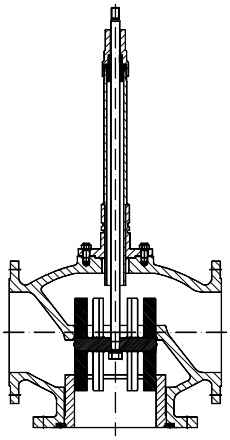
00001673.wmf

baelz 347-BB



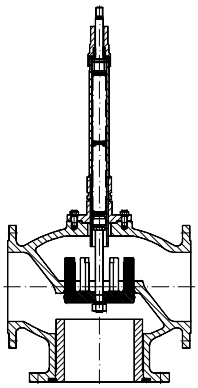
00001524.wmf

baelz 347-BBK



00001672.wmf

baelz 347-BBK-SS



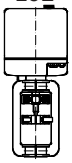
00001674.wmf

Bälz-electrodyn - control valves and control actuators

25.7 Max. differential pressure against which the motorized balanced 2 and 3-way valve can be operated; for valves baelz 340-B-EM, 344-EM, 347-B-EM; for liquids and lower steam pressures.

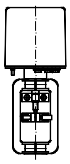
type	F	ND ΔPmax bar									
baelz 373-	N	40	50	65	80	100	125	150	200	250	300
E02- 10-	1000	18	12	7,2	4,5	3	1,8				
E06- 20-	2000	36	24	14	9	6	3,6				
E07- 20-	2000	36	24	14	9	6	3,6				
E11- 20-	2000	36	24	14	9	6	3,6				
E40- 40-	4000	40	40	30	20	13	8	5			
E60- 90-	9000							13	7	4,5	3
E88- 100-	10000							40	24,9	18,6	7,3
	13000							40	34	26	10,5
	16000							40	40	33	13
E88- 300-	30000							40	40	40	28
	35000							40	40	40	40
	40000										

baelz 373-E02



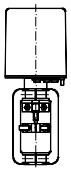
00001591.wmf

baelz 373-E06



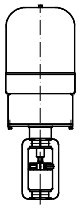
00003239.wmf

baelz 373-E07



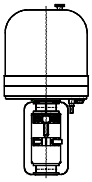
00003240.wmf

baelz 373-E11



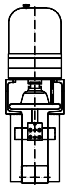
00001592.wmf

baelz 373-E40



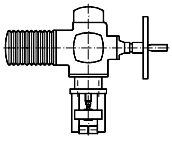
00001562.wmf

baelz 373-E60



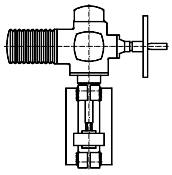
00001590.wmf

baelz 373-E88-100

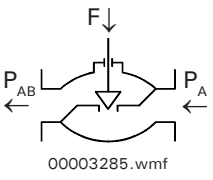


00003296.wmf

baelz 373-E88-300

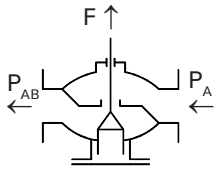


00001588.wmf



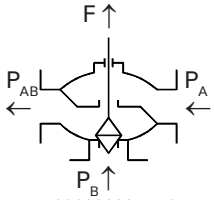
00003285.wmf

$\Delta pmax = P_A - P_{AB}$



00003286.wmf

$\Delta pmax = P_A - P_{AB}$

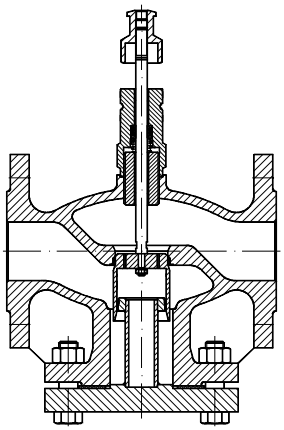


00003288.wmf

$\Delta pmax = P_A - P_{AB}$

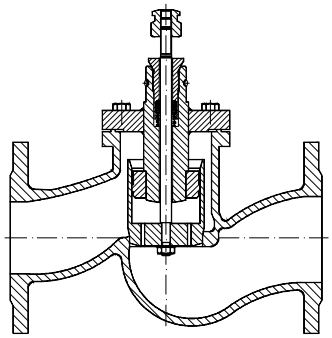
$\Delta pmax = P_A - P_B$

baelz 340-B-EM



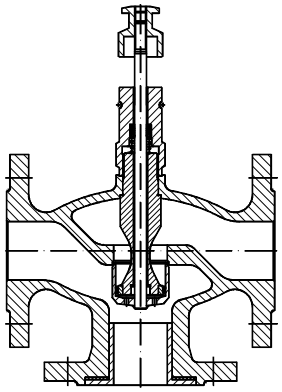
000s3291.wmf

baelz 344-EM



00001518.wmf

baelz 347-B-EM



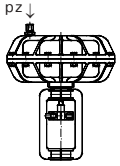
00001660.wmf

Bälz-electrodyn - control valves and control actuators

25.8 Max. differential pressure against which the pneumatic balanced 2-way valve closes; valve normally closed; for valves baelz 340-B-EM, 344-EM, 340-BB-EM; for liquids and lower steam pressures.
pz = necessary air signal pressure

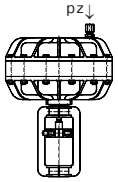
type	F	pz	ND Δpmax bar									
baelz 373-	N	bar	40	50	65	80	100	125	150	200	250	300
P21- 3	1020	1,2	18	13	7	5	3	1,8				
P21- 6	2040	3	39	24	15	9	6	4				
P21- 12	3390	6	40	40	22	14	10	6				
P21- 18	4030	6	40	40	27	19	12	8				
P21- V6	7590	6	40	40	40	36	22	13				
P31- 3	2480	1,2							3,3			
P31- 6	4960	3							7			
P31- 18	10560	6							15			
P41- 3	3765	1,2							7,2	3	1,8	1,2
P41- 6	7530	3							15	6	3,9	2,7
P41- V6	31920	6							40	30	19	13

baelz 373-P21



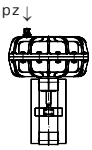
00003241.wmf

baelz 373-P21-V6



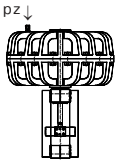
00003294.wmf

baelz 373-P31



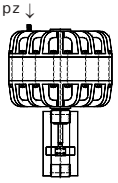
00000906.wmf

baelz 373-P41

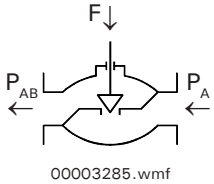


00003243.wmf

baelz 373-P41-V6

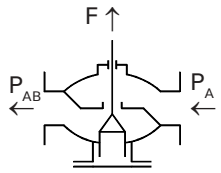


00003295.wmf



00003285.wmf

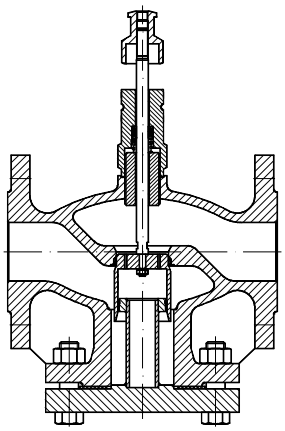
Δpmax = P_A - P_{AB}



00003286.wmf

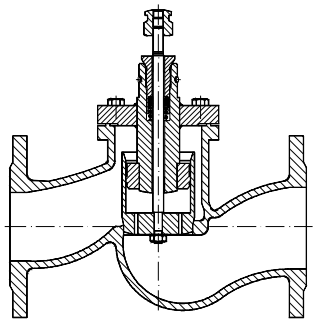
Δpmax = P_A - P_{AB}

baelz 340-B-EM



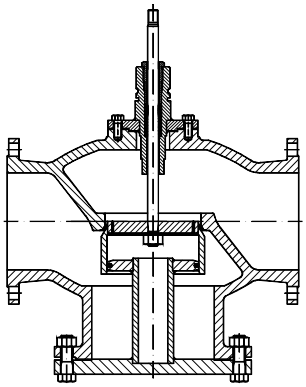
000s3291.wmf

baelz 344-EM



00001518.wmf

baelz 340-BB-EM



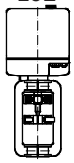
00001659.wmf

Bälz-electrodyn - control valves and control actuators

25.9 Max. differential pressure against which the motorized balanced 2-way valve can be operated; for valve baelz 340-B-EMF, 340-BB-EMF; for steam pressures.

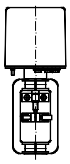
type	F	ND Δ pmax bar							
baelz 373-	N	65	80	100	125	150	200	250	300
E02- 10-	1000	40	40	-	-				
E06- 20-	2000	40	40	40	40				
E07- 20-	2000	40	40	40	40				
E11- 20-	2000	40	40	40	40				
E40- 40-	4000	40	40	40	40	8,2			
E60- 90-	9000					31,9	20	13,5	9,4
E88- 100-	10000					36,7	23,4	16,1	11,5
	13000					40	33,5	23,9	17,9
	16000					40	40	31,7	24,2
E88- 300-	30000					40	40	40	40
	35000					40	40	40	40
	40000					40	40	40	40

baelz 373-E02



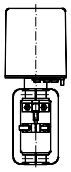
00001591.wmf

baelz 373-E06



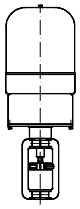
00003239.wmf

baelz 373-E07



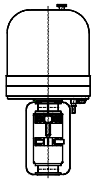
00003240.wmf

baelz 373-E11



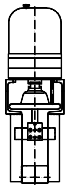
00001592.wmf

baelz 373-E40



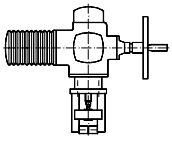
00001562.wmf

baelz 373-E60



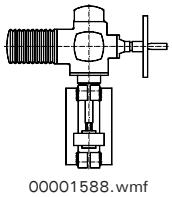
00001590.wmf

baelz 373-E88-100

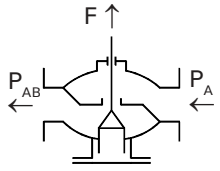


00003296.wmf

baelz 373-E88-300



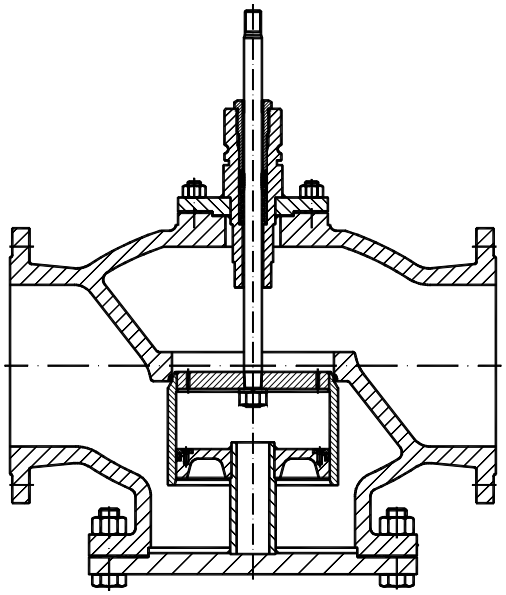
00001588.wmf



00003286.wmf

Δpmax = P_A - P_{AB}

baelz 340-BB-EMF



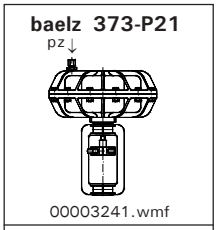
00004310.wmf

Bälz-electrodyn - control valves and control actuators

25.10 Max. differential pressure against which the pneumatic balanced 2-way valve closes; valve normally closed; for valve baelz 340-B-EMF, 340-BB-EMF.
pz = necessary air signal pressure

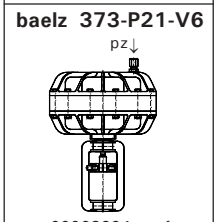
type	F	pz	ND Δpmax bar							
baelz 373-	N	bar	65	80	100	125	150	200	250	300
P21- 3	1020	1,2	40	40	-	-				
P21- 6	2040	3	40	40	40	40				
P21- 12	3390	6	40	40	40	40				
P21- 18	4030	6	40	40	40	40				
P21- V6	7590	6	40	40	40	40				
P22- 1	800	1,2	40	40	-	-				
P22- 3	1846	3	40	40	40	40				
P22- 6	3692	6	40	40	40	40				
P31- 3	2480	1,2					1			
P31- 6	4960	3					12,8			
P31- 18	10560	6					39,4			
P32- 6	4402	3					10	4,6	1,6	-
P32- 18	8115	6					27,7	17,1	11,2	7,5
P41- 3	3765	1,2					7,1	2,5	-	-
P41- 6	7530	3					24,9	15,1	9,7	6,3
P41- V6	31920	6					40	40	40	40

baelz 373-P21



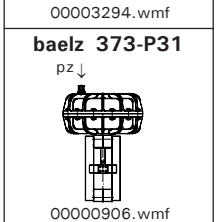
00003241.wmf

baelz 373-P21-V6



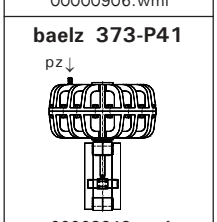
00003294.wmf

baelz 373-P31



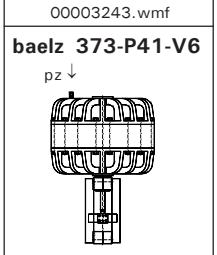
00000906.wmf

baelz 373-P41

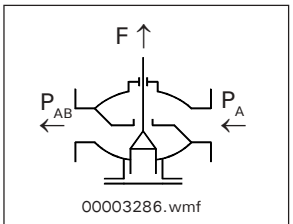


00003243.wmf

baelz 373-P41-V6



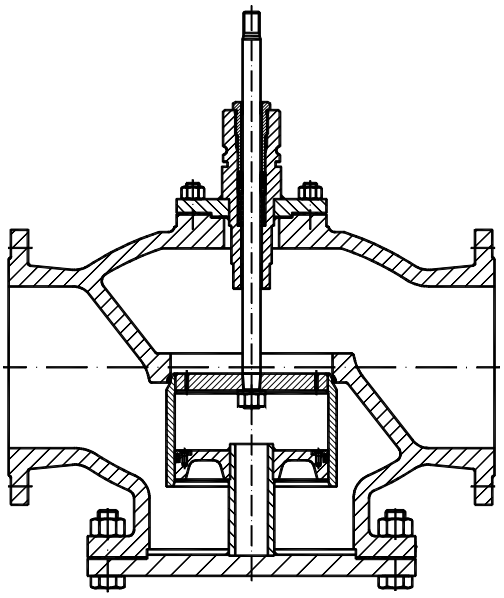
00003295.wmf



00003286.wmf

Δpmax = P_A - P_{AB}

baelz 340-BB-EMF



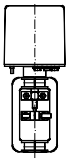
00004310.wmf

Bälz-electrodyn - control valves and control actuators

25.11 Max. differential pressure against which the motorized balanced 2-way valve for steam closes; valve normally closed;
for valve baelz 346-EMB; be aware of reduced Kvs-value.

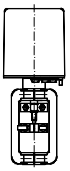
type	F	ND Δpmax bar						
baelz 373-	N	40	50	65	80	100	125	150
E06- 20-	2000	40	20,4	11	10,4	4,4	2,1	
E07- 20-	2000	40	20,4	11	10,4	4,4	2,1	
E11- 20-	2000	40	20,4	11	10,4	4,4	2,1	
E40- 40-	4000	40	40	32	32	17	10	
E88- 300-	30000							31,4
	35000							40
	40000							40

baelz 373-E06



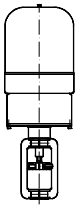
00003239.wmf

baelz 373-E07



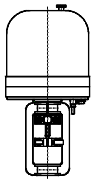
00003240.wmf

baelz 373-E11



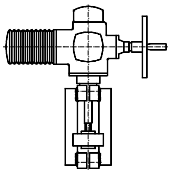
00001592.wmf

baelz 373-E40

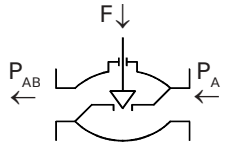


00001562.wmf

baelz 373-E88-300



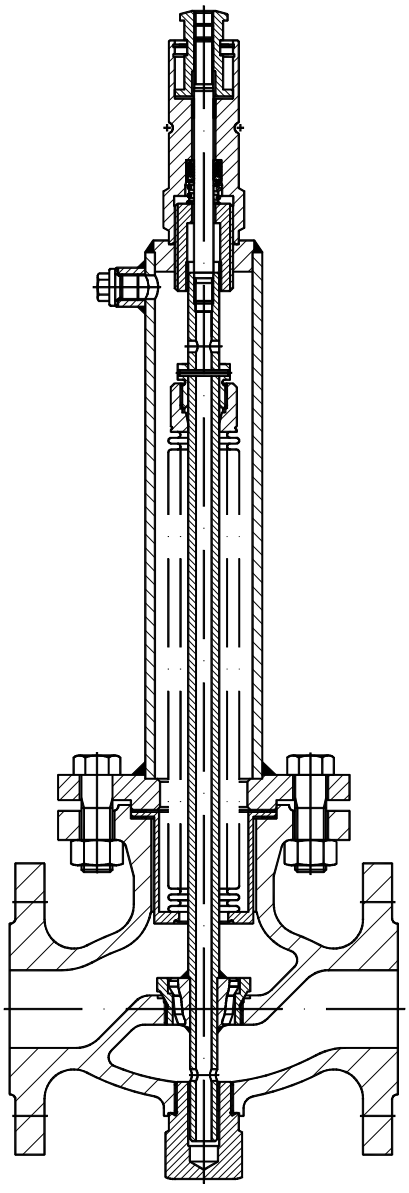
00001588.wmf



00003285.wmf

$\Delta pmax = P_A - P_{AB}$

baelz 346-EMB



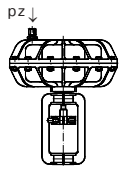
00001622.wmf

Bälz-electrodyn - control valves and control actuators

25.12 Max. differential pressure against which the pneumatic balanced 2-way valve for steam closes;
valve normally closed;
for valve baelz 346-EMB; be aware of reduced Kvs-value.
pz = necessary air signal pressure

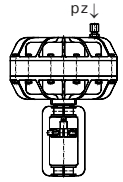
type	F	pz	ND Δpmax bar						
baelz 373-	N	bar	40	50	65	80	100	125	150
P21- 6	2040	3	40	21	11,5	10,8	4,6	2,3	
P21- 12	3390	6	40	40	25,7	25,7	13	7,9	
P21- 18	4030	6	40	40	32	32	17	10,6	
P21- V6	7590	6	40	40	40	40	40	25,7	
P41- V6	31920	6							39

baelz 373-P21



00003241.wmf

baelz 373-P21-V6



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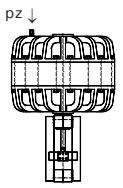
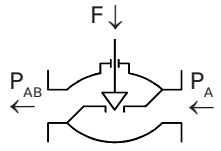
baelz 373-P41-V6



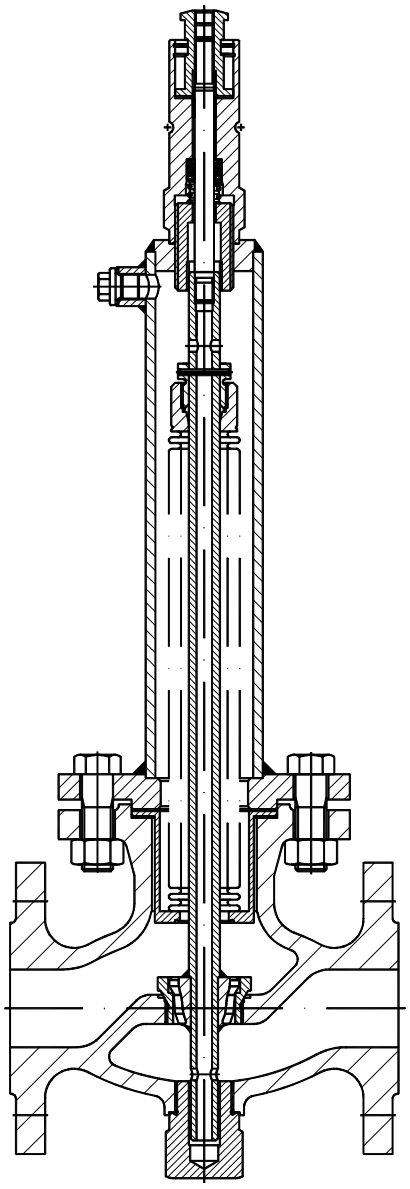
00003295.wmf



00003285.wmf

$\Delta pmax = P_A - P_{AB}$

baelz 346-EMB



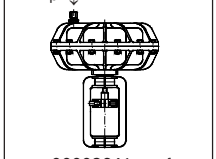
00001622.wmf

Bälz-electrodyn - control valves and control actuators

25.13 Max. differential pressure against which the pneumatic balanced 3-way valve can be operated as mixing valve or diverting valve; normally way AB - B closed;
for valves baelz 347-B-EM, 347-BB-EM
pz = necessary air signal pressure

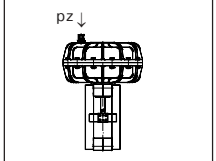
type	F	pz	ND Δpmax bar									
baelz 373-	N	bar	40	50	65	80	100	125	150	200	250	300
P21- 3	1020	1,2	4	2,5	1,7	1	0,7	0,5				
P21- 6	2040	3	32	20	12	8	5	3				
P21- 12	3390	6	40	35	21	14	9	4,8				
P31- 3	2480	1,2							3,3			
P31- 6	4960	3							7			
P31- 18	10560	6							15			
P41- 3	3765	1,2							7,2	3	1,8	1,2
P41- 6	7530	3							15	6	3,9	2,7
P41- V6	31920	6							40	30	19	13

baelz 373-P21



00003241.wmf

baelz 373-P31



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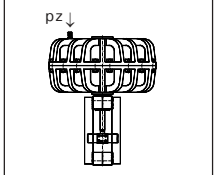
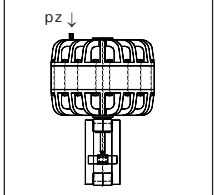
baelz 373-P41

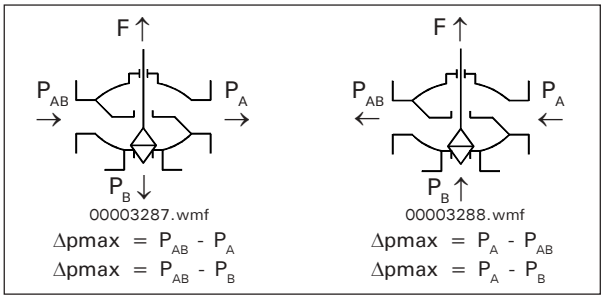


00003243.wmf

baelz 373-P41-V6



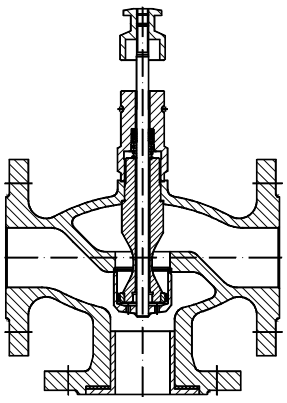
00003295.wmf



00003287.wmf
Δpmax = P_{AB} - P_A
Δpmax = P_{AB} - P_B

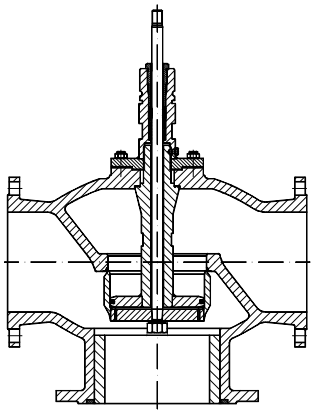
00003288.wmf
Δpmax = P_A - P_{AB}
Δpmax = P_A - P_B

baelz 347-B-EM



00001660.wmf

baelz 347-BB-EM
ND 150 + 300



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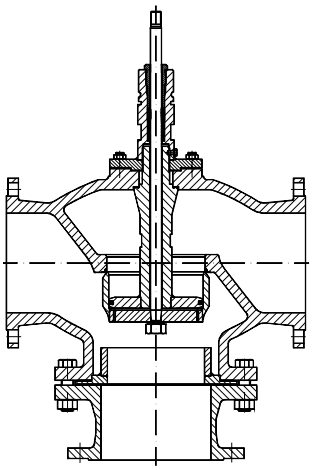
baelz 347-BB-EM
ND 200 + 250



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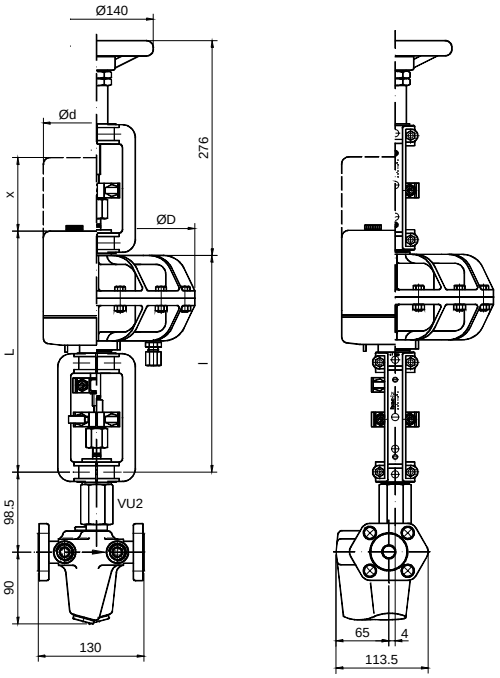
Bälz-electrodyn - control valves and control actuators

26. Dimensions

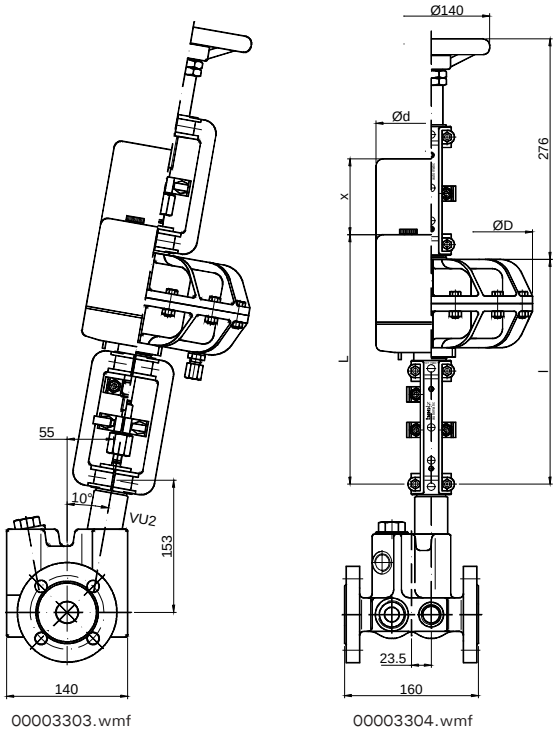
baelz 185 DN 15



00000655.wmf 00000656.wmf

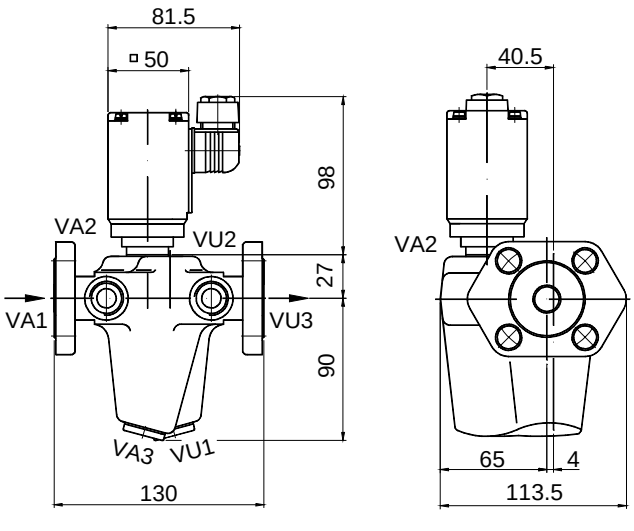
Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 02	293	90	129		
E 06	296	130	129		
E 07	317	145	129		
E 11	499	180	183		
E 40	391	185	184		
P 21				268	242
P 21 V6				304	242
P22				322	242

baelz 185 DN 25



00003303.wmf 00003304.wmf

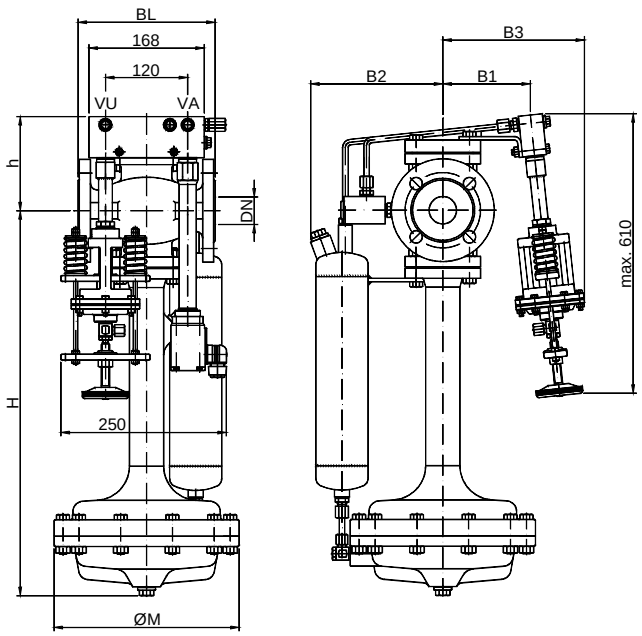
baelz 185-266st DN 15



00001967.wmf 00001968.wmf

Bälz-electrodyn - control valves and control actuators

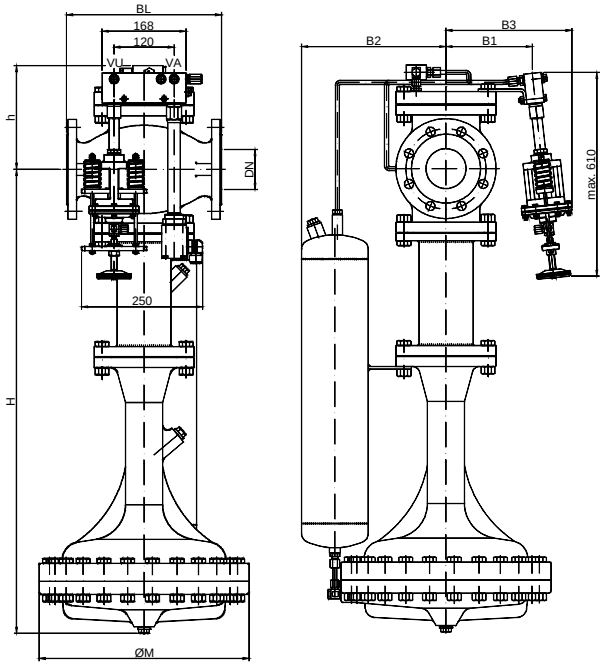
baelz 192 DN 15 - 65



00002735.wmf 00002736.wmf

DN	BL	H PN 16/40	h PN 16/40	B1	B2 PN 16	B2 PN 40	B3	Ø M
mm								
15	130	560	110	80	185	185	180	270
20	150	560	110	85	185	185	185	270
25	160	570	110	90	185	185	190	270
32	180	565	145	125	185	185	225	270
40	200	565	145	125	185	185	225	270
50	230	580	160	125	185	185	225	270
65	290	595	180	140	185	215	240	270

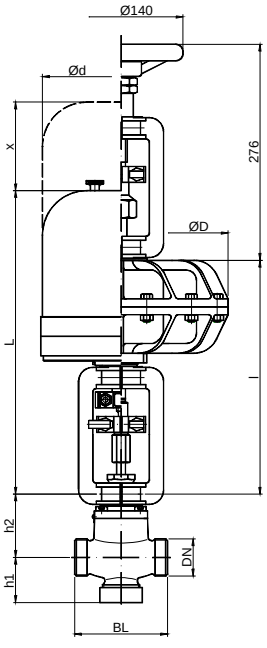
baelz 192 DN 80 - 150



00002738.wmf 00002739.wmf

DN	BL	H PN 16/40	h PN 16/40	B1	B2	B3	Ø M
mm							
80	310	930	210	175	290	270	420
100	350	950	235	190	290	285	420
125	400	930	255	210	290	305	420
150	480	945	265	225	290	320	420

baelz 334 DN ½ - 1½



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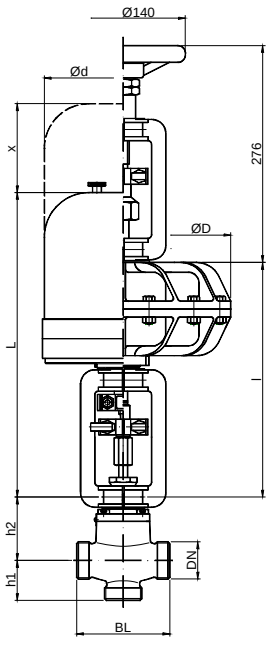
baelz 335 DN ½ - 1½



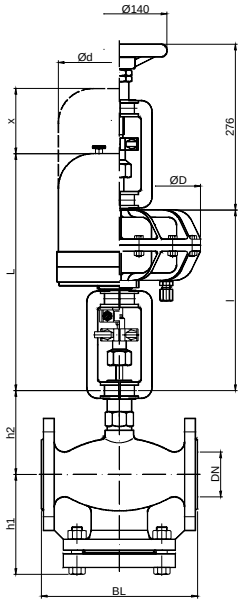
00003317.wmf

DN		BL	h 1 334	h 1 335	h 2
		mm			
½ "	15	92	38	33	72
¾ "	20	95	45	40	72
1 "	25	105	50	45	72
1 ¼ "	32	105	58	53	72
1 ½ "	40	114	62	57	72

Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 02	293	90	129		
E 06	296	130	129		
E 07	317	145	129		
E 11	499	180	183		
E 40	391	185	184		
P 21				268	242
P 21 V6				304	242
P22				322	242

Bälz-electrodyn - control valves and control actuators

baelz 340-B DN 15 - 125
baelz 340-ES DN 15 - 125
baelz 340-B-EM DN 50 - 125



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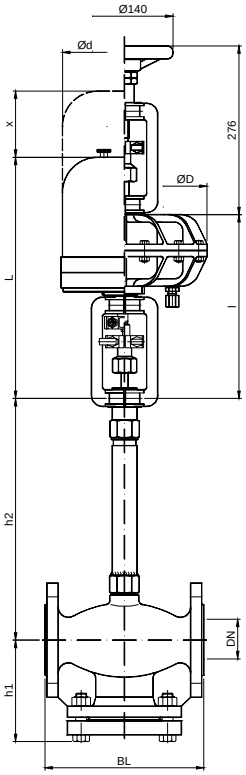
baelz 340-BK DN 15 - 125
baelz 340-BK-SS DN 15 - 125



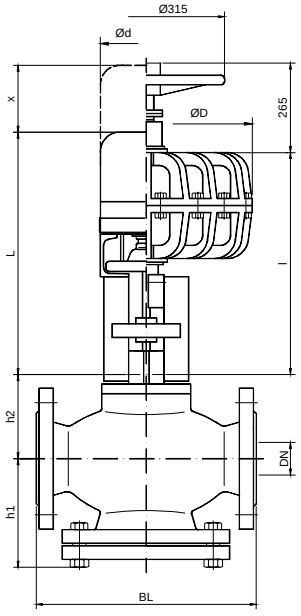
00000303.wmf

DN	BL	h 1	h 2 340-B / -ES / -B-EM	h 2 340-BK / -BK-SS
mm				
15	130	101	105	231
20	150	103	105	231
25	160	113	105	231
32	180	130	104	283
40	200	135	114	281
50	230	147	124	277
65	290	159	144	269
80	310	166	154	269
100	350	189	169	262
125	400	243	189	252

Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 02	293	90	129		
E 06	296	130	129		
E 07	317	145	129		
E 11	499	180	183		
E 40	391	185	184		
P 21				268	242
P 21 V6				304	242
P22				322	242

baelz 340-BBK DN 150 - 300
baelz 340-BBK-SS DN 150-300

baelz 340-BB
DN 150 - 300
baelz 340-BB-EM
DN 150 - 300



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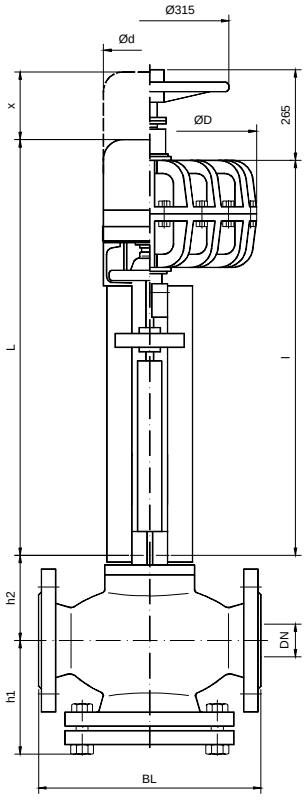


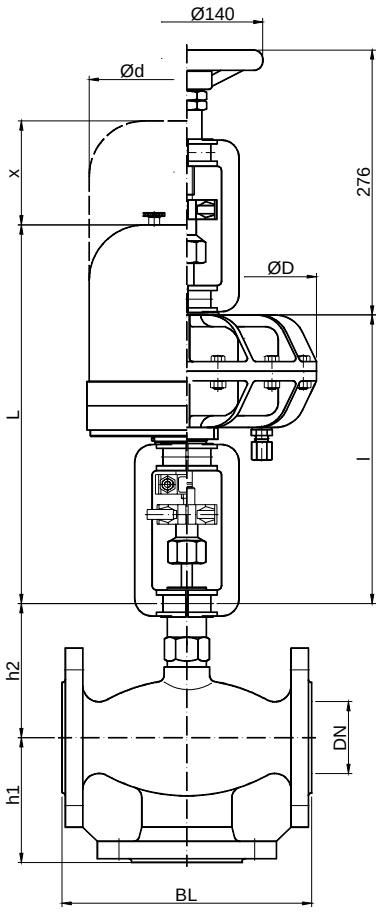
00000376.wmf

DN	BL	h 1 PN 16	h 1 PN 25	h 1 PN 40	h 2 340-BB / -BB-EM	h 2 340-BBK / -BBK-SS
mm						
150	480	269	277	277	244	234
200	600	272	280	288	268	258
250	730	314	322	332	317	307
300	850	327	335	345	361	351

Actuator baelz 373...	L 340 -BB / -BB-EM	L 340 -BBK / -BBK-SS	x	Ø d	l 340 -BB / -BB-EM	l 340 -BBK / -BBK-SS	Ø D
	mm						
E 40	577	1057	185	184			
E 60	601	1081	185	184			
P 31					509	989	384
P 32					525	1005	384
P 41					562	1042	506
P 41 V6					687	1167	506

Bälz-electrodyn - control valves and control actuators

baelz 342-B DN 15 - 125
baelz 342-ES DN 15 - 125
baelz 347-B DN 15 - 125
baelz 347-ES DN 15 - 125
baelz 347-B-EM DN 50 - 125



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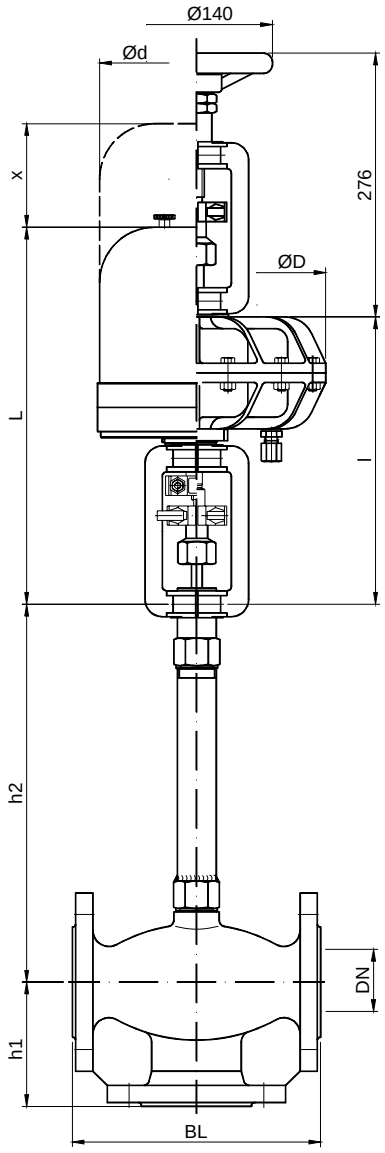
baelz 342-BK DN 15 - 125
baelz 342-BK-SS DN 15 - 125
baelz 347-BK DN 15 - 125
baelz 347-BK-SS DN 15 - 125



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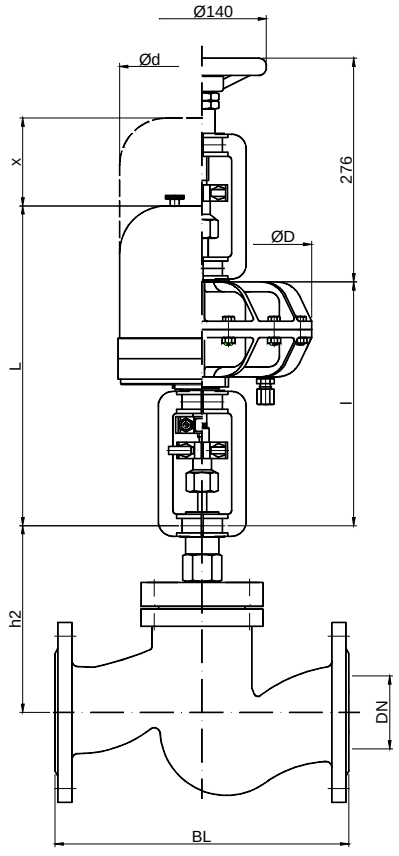
baelz 344-VA DN 32 - 125
baelz 344-EM-VA DN 50 - 125



00000443.wmf

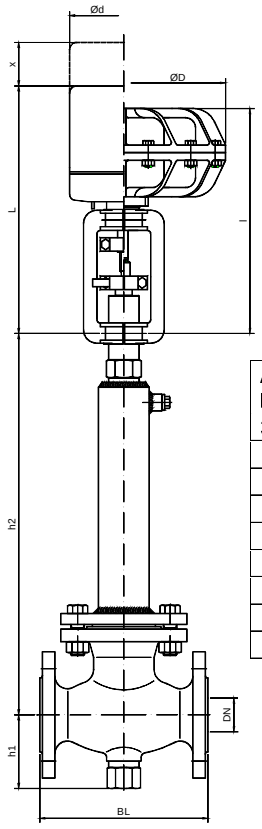
DN	BL	h 1	h 2 342-B / -ES 347-B / -ES / -B-EM	h 2 342-BK / -BK-SS 347-BK / -BK-SS	h 2* 344-VA / -EM-VA
mm					
15	130	75	105	231	
20	150	75	105	231	
25	160	85	105	231	
32	180	100	104	283	145
40	200	105	114	281	155
50	230	115	124	277	174
65	290	125	144	269	184
80	310	130	154	269	189
100	350	150	169	262	208
125	400	200	189	252	227

*reserved to change dimensions

Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 02	293	90	129		
E 06	296	130	129		
E 07	317	145	129		
E 11	499	180	183		
E 40	391	185	184		
P 21				268	242
P 21 V6				304	242
P22				322	242

Bälz-electrodyn - control valves and control actuators

baelz 346-EMB DN 40 - 125



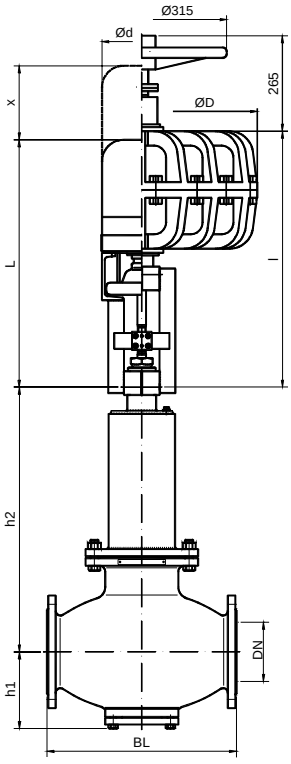
00001648.wmf

DN	BL	h 1	h 2 PN 16/25	h 2 PN 40
mm				
40	200	88	388	454
50	230	98	395	475
65	290	118	397	485
80	310	128	415	430
100	350	143	398	445
125	400	163	407	434
150	480	194	670	699

Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 02	293	90	129		
E 06	296	130	129		
E 07	317	145	129		
E 11	499	180	183		
E 40	391	185	184		
P 21				268	242
P 21 V6				304	242
P 22				322	242

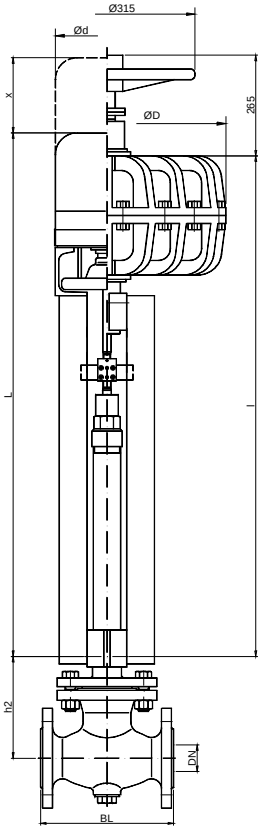
Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 40	577	185	184		
E 60	601	185	184		
P 31				509	384
P 32				525	384
P 41				562	506
P 41 V6				687	506

baelz 346-EMB DN 150



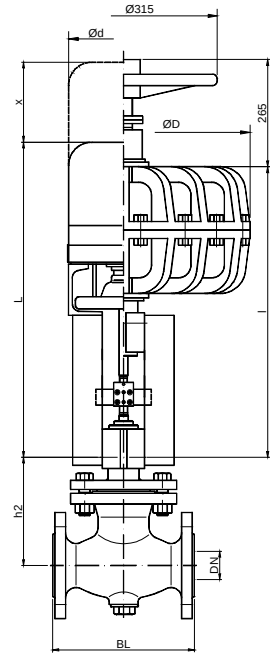
00002019.wmf

baelz 346-22-K DN 65 - 125



00003310.wmf

baelz 346-22 DN 65 - 125



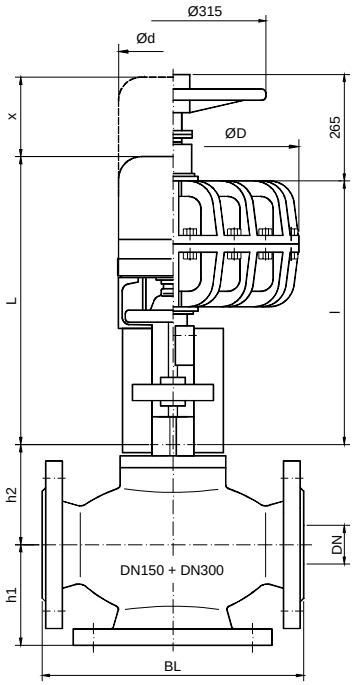
00003307.wmf

DN	BL	h 2 PN 16/25	h 2 PN 40
mm			
65	290	205	209
80	310	212	216
100	350	232	236
125	400	284	288

Actuator baelz 373...	L 346-22	L 346-22-K	x	Ø d	l 346-22	l 346-22-K	Ø D
	mm						
E 40	577	1057	185	184			
E 60	601	1081	185	184			
P 31					509	989	384
P 32					525	1005	384
P 41					562	1042	506
P41 V6					687	1167	506

Bälz-electrodyn - control valves and control actuators

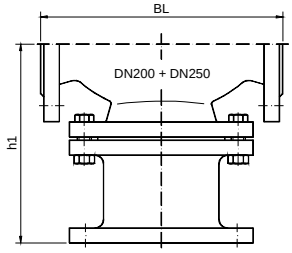
baelz 347-BB DN 150 - 300



00000031.wmf

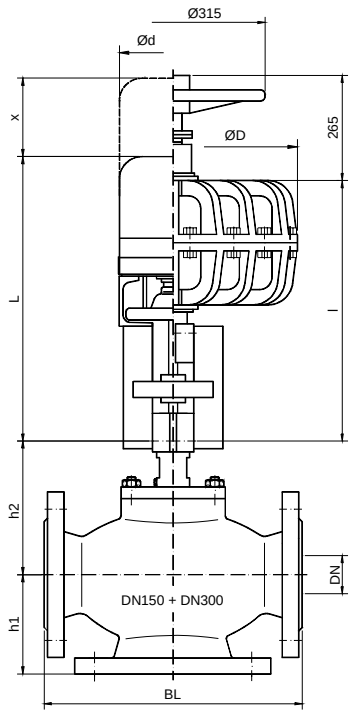
DN	BL	h 1	h 2 347-BB	h 2 347-BB-EM
mm				
150	480	240	244	324
200	600	381	268	348
250	730	427	317	397
300	850	288	361	441

Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 40	577	185	184		
E 60	601	185	184		
P 31				509	384
P 32				525	384
P 41				562	506
P 41 V6				687	506



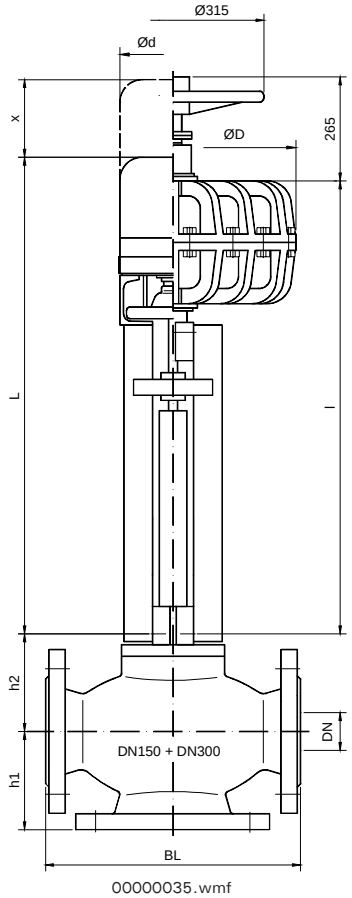
00003324.wmf

baelz 347-BB-EM DN 150 - 300

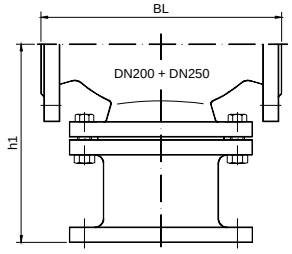


00003323.wmf

baelz 347-BBK DN 150 -300
baelz 347-BBK-SS DN 150 - 300



00000035.wmf



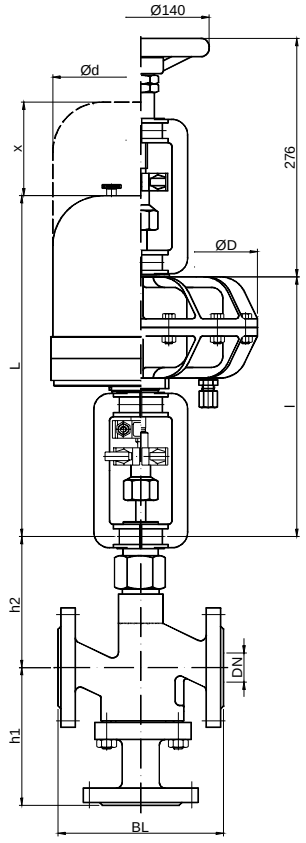
00000036.wmf

DN	BL	h 1	h 2
mm			
150	480	240	234
200	600	381	258
250	730	427	307
300	850	288	351

Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 40	1057	185	184		
E 60	1081	185	184		
P 31				989	384
P 32				1005	384
P 41				1042	506
P 41 V6				1167	506

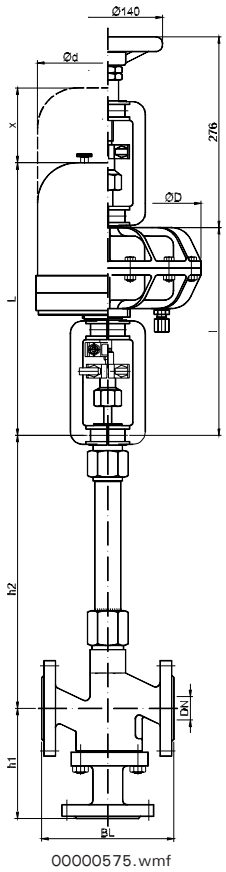
Bälz-electrodyn - control valves and control actuators

baelz 353 DN 15 - 25



00000598.wmf

baelz 353-K DN 15 - 25

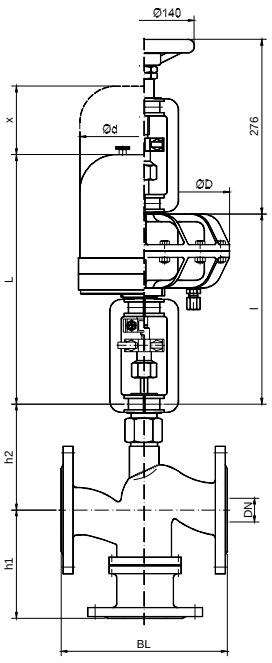


00000575.wmf

DN	BL	h 1	h 2 353	h 2 353-K
mm				
15	130	111	104	262
20	150	111	104	262
25	160	111	114	272

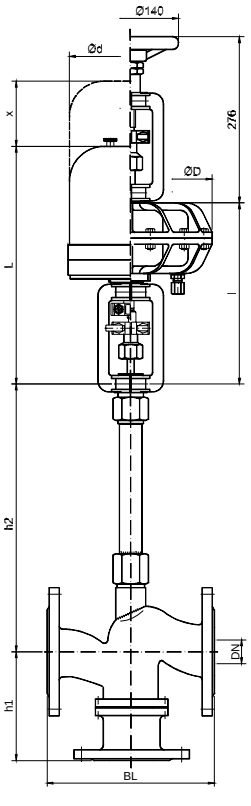
Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 02	293	90	129		
E 06	296	130	129		
E 07	317	145	129		
E 11	499	180	183		
E 40	391	185	184		
P 21				268	242
P 21 V6				304	242
P 22				322	242

baelz 354 DN 32 - 125



00000452.wmf

baelz 354-K DN 32 - 125



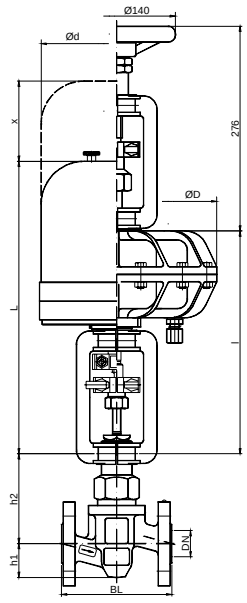
00000724.wmf

DN	BL	h 1*	h 2* 354	h 2* 354-K
mm				
32	180	160	145	381
40	200	160	145	381
50	230	170	150	386
65	290	180	154	390
80	310	190	157	393
100	350	200	165	401
125	400	220	175	411

*reserved to change dimensions

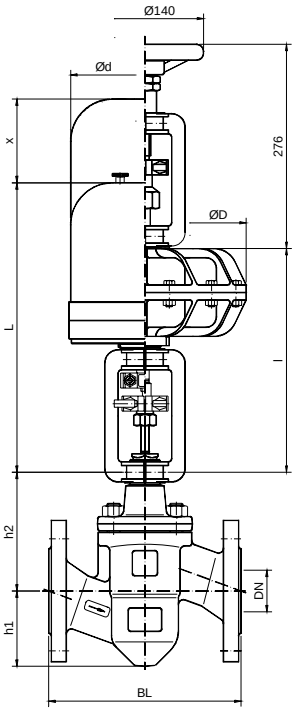
Bälz-electrodyn - control valves and control actuators

baelz 356 DN 15 - 25



00000727.wmf

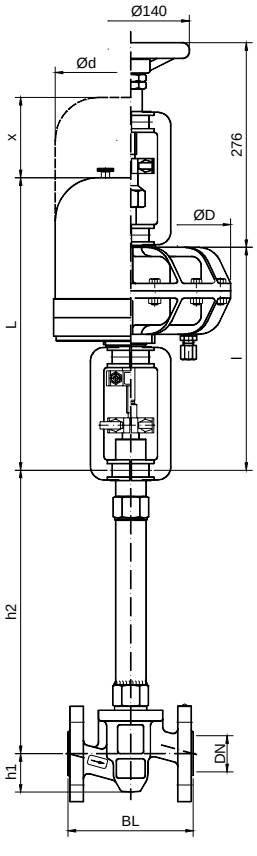
baelz 356 DN 32 - 65



00000458.wmf

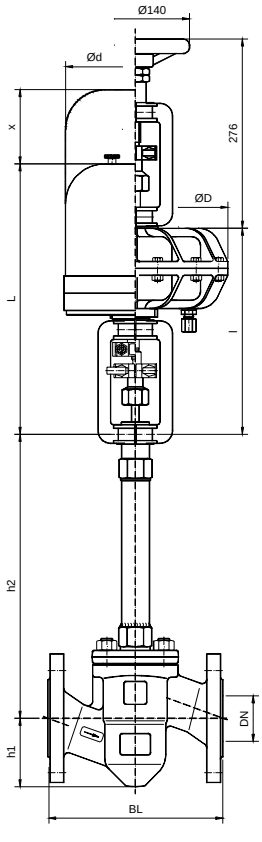
DN	BL	h 1	h 2 356	h 2 356-K
mm				
15	130	40	106	331
20	150	45	106	331
25	160	55	106	331
32	180	62	111	358
40	200	73	132	372
50	230	90	142	382
65	290	101	182	425

baelz 356-K DN 15 - 25
baelz 356-K-SS DN 15 - 25



00000730.wmf

baelz 356-K DN 32 - 65
baelz 356-K-SS DN 32 - 65

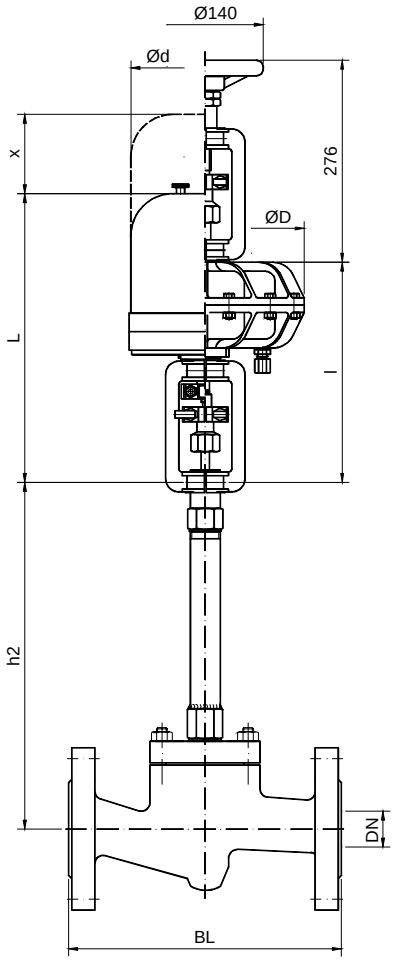


00000455.wmf

Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 02	293	90	129		
E 06	296	130	129		
E 07	317	145	129		
E 11	499	180	183		
E 40	391	185	184		
P 21				268	242
P 21 V6				304	242
P 22				322	242

Bälz-electrodyn - control valves and control actuators

baelz 358-K DN 15 - 65
baelz 359-K DN 15 - 65



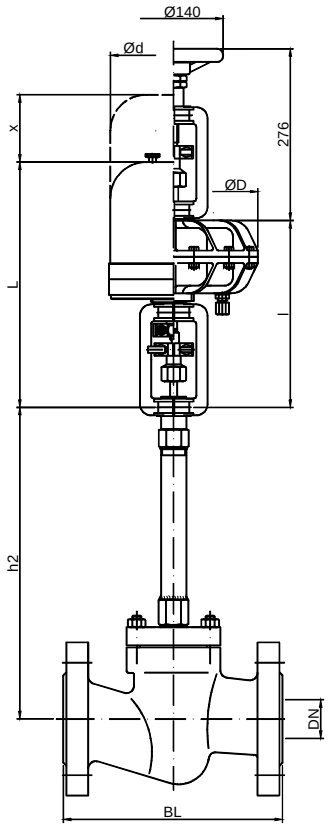
00000461.wmf

DN	BL			h 2*
	PN 63	PN 100	PN 160	
	mm			
15	210	210	210	370
20	230	230	230	370
25	230	230	230	380
32	260	260	260	384
40	260	260	260	389
50	300	300	300	409
65	340	340	340	449

*reserved to change dimensions

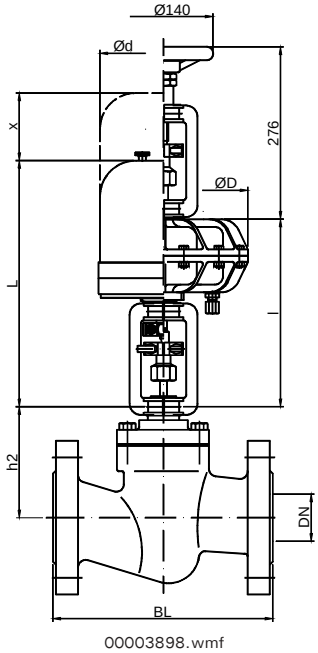
Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 02	293	90	129		
E 06	296	130	129		
E 07	317	145	129		
E 11	499	180	183		
E 40	391	185	184		
P 21				268	242
P 21 V6				304	242
P 22				322	242

baelz 359-ASA-K DN 15 - 125



00003804.wmf

baelz 359-ASA DN 15 - 125



00003898.wmf

NPS	BL		h2*	
	ANSI 150	ANSI 300	359-ASA	359-ASA-K
	mm			
½	108	152	260	380
¾	118	173	260	380
1	127	203	260	390
1¼	140	216	315	400
1½	165	229	315	405
2	203	267	315	420
2½	216	292	450	550
3	241	318	470	570
4	292	356	500	650
5	356	400	690	800

*reserved to change dimensions

Bälz-electrodyn - control valves and control actuators

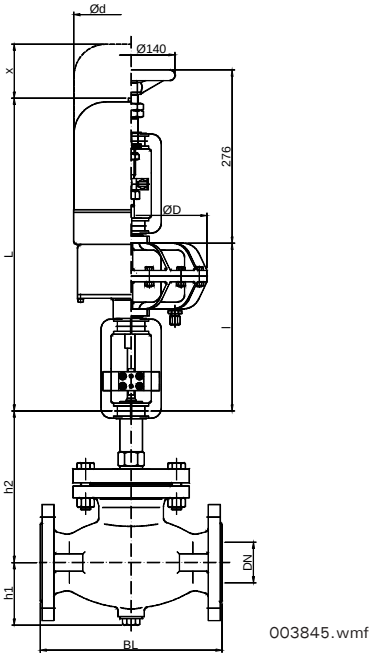
baelz 360-EM-C DN 50 - 125
baelz 360-EM-CC DN 50 - 125

DN	BL		h1	h 2	h 2*
	PN 40	PN 63/100/160		PN 40	PN 63/100/160
mm					
50	230	300	80	230	243
65	290	340	100	242	255
80	310	380	110	249	265
100	350	430	125	269	280
125	400	500	145	321	340

baelz 360-K-EM-C DN 50 - 125
baelz 360-K-EM-CC DN 50 - 125

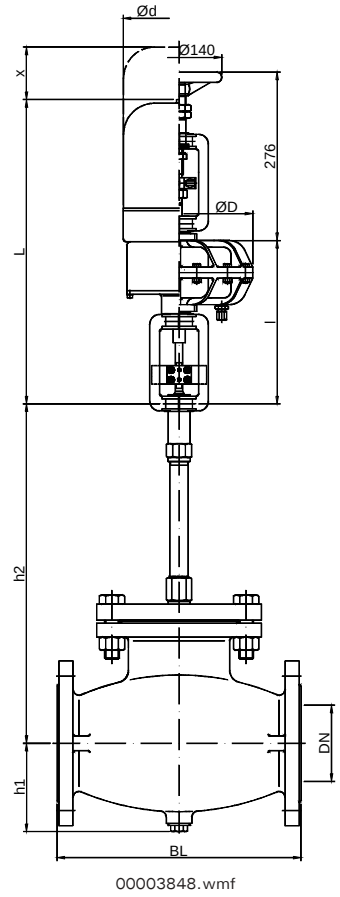
DN	BL		h1	h 2	h 2*
	PN 40	PN 63/100/160		PN 40	PN 63/100/160
mm					
50	230	300	80	520	533
65	290	340	100	532	545
80	310	380	110	539	555
100	350	430	125	559	570
125	400	500	145	611	630

*reserved to change dimensions



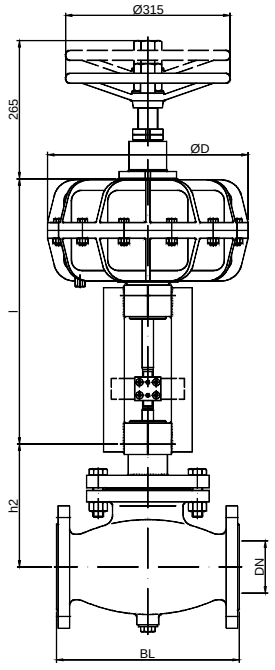
003845.wmf

Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 11	499	180	183		
E 40	391	185	184		
P 21				268	242
P 21 V6				304	242
P 22				322	242



00003848.wmf

baelz 360-EM-C DN 100 - 125
baelz 360-EM-CC DN 100 - 125



00003961.wmf

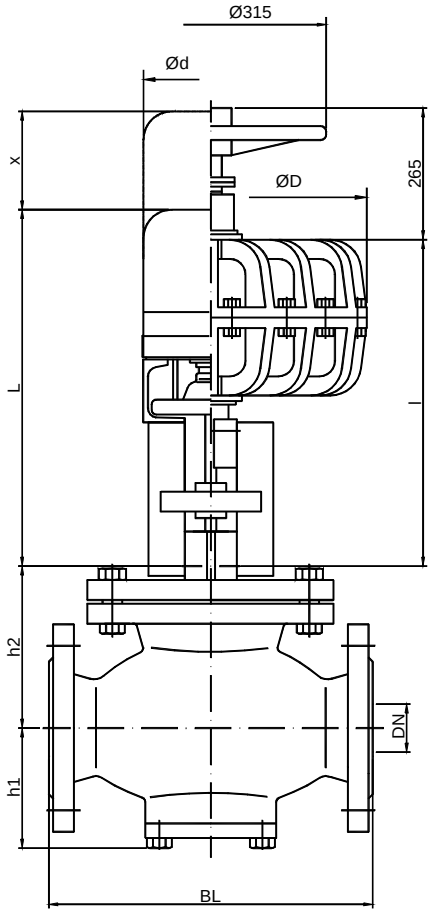
DN	BL		h 2	h 2*
	PN 40	PN 63/100/160	PN 40	PN 63/100/160
mm				
100	350	430	236	247
125	400	500	288	307

*reserved to change dimensions

Actuator baelz 373...	l	Ø D
	mm	
P 31	509	384
P 32	525	384

Bälz-electrodyn - control valves and control actuators

baelz 360-EM-C DN 150 - 200
baelz 360-EM-CC DN 150 - 200



00003850.wmf

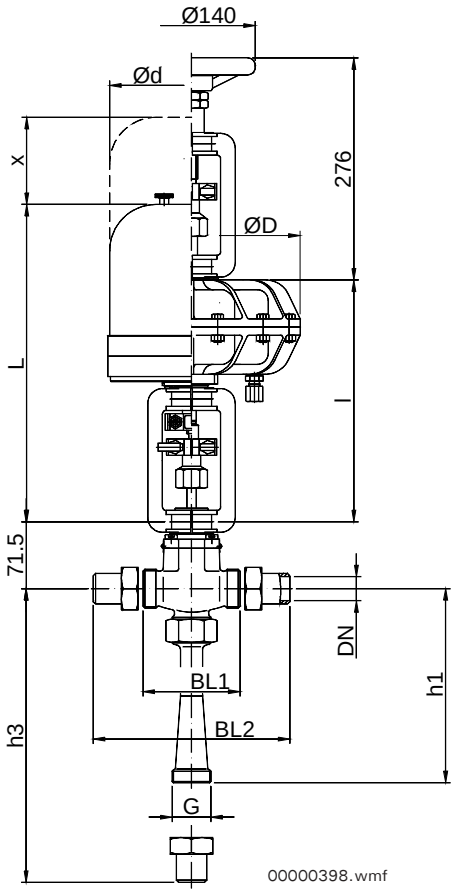
Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 40	577	185	184		
E 60	601	185	184		
P 31				509	384
P 32				525	384

DN	BL		h1	h 2	h 2*
	PN 40	PN 63/100/160		PN 40	PN 63/100/160
	mm				
150	480	550	194	330	340
200	600	650	218	335	355

*reserved to change dimensions

Bälz-electrodyn - control valves and control actuators

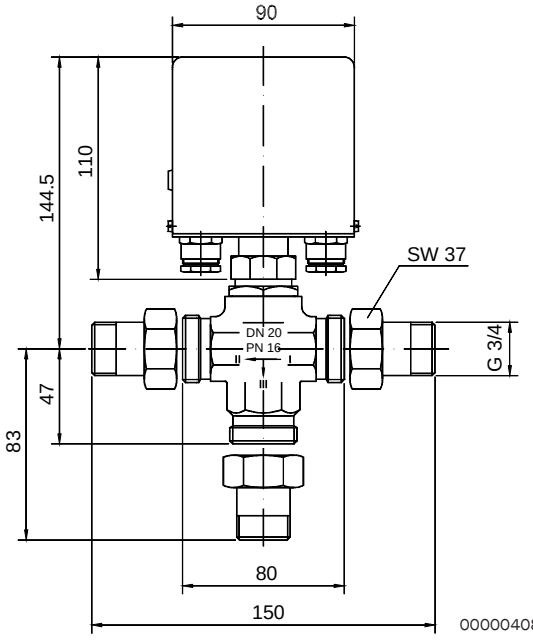
baelz 471 DN ½ - 1½

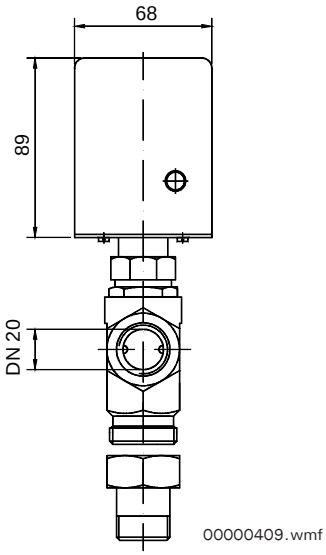


DN		h 1	h 3	BL 1	BL 2	G
		mm				
½ "	15	126	162	92	164	¾
¾ "	20	153	189	95	167	1
1 "	25	210	251	105	187	1 ¼
1 ¼ "	32	245	286	105	187	1 ½
1 ½ "	40	311	357	114	206	2

Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 02	293	90	129		
E 06	296	130	129		
E 07	317	145	129		
E 11	499	180	183		
P 21				268	242

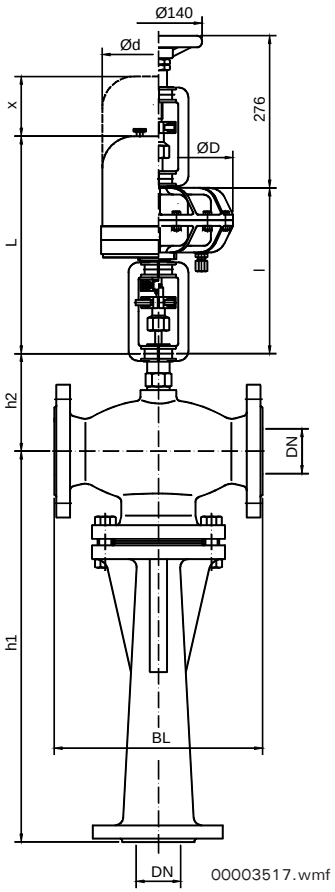
baelz 475 DN ¾



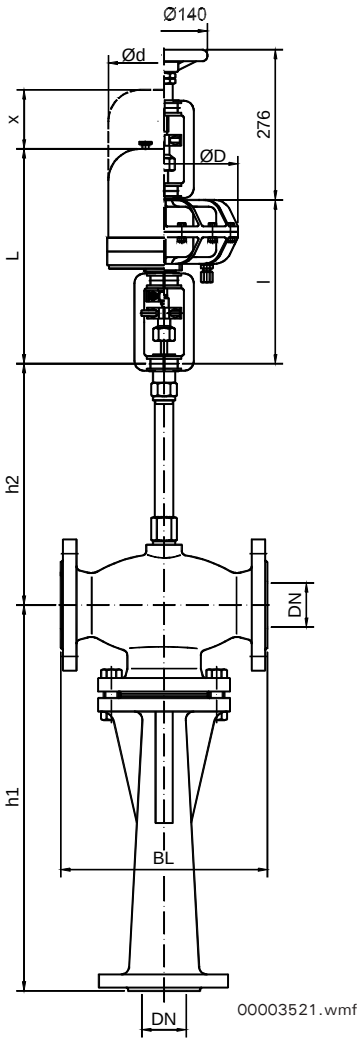


Bälz-electrodyn - control valves and control actuators

baelz 480 DN 15-125



baelz 480-K DN 15-125

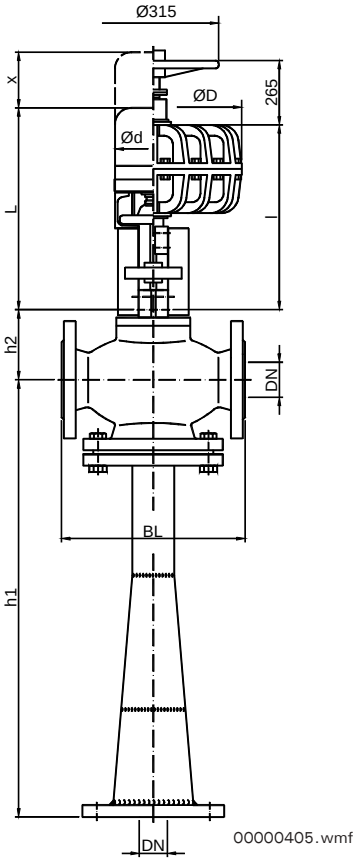


DN	BL	h 1 PN 16/25	h 1* PN 40	h 1* PN 16/25	h 2 480	h 2 480-K
			mm			
15	130	175	176	-	109	261
25	160	202	229	-	110	263
32	180	302	302	-	104	339
40	200	358	358	-	114	349
50	230	402	429	-	124	359
65	290	539	573	-	144	379
80	310	600	695	-	154	389
100	350	624	912	912	169	404
125	400	836	1066	1066	189	424

*with welded diffusor

Actuator baelz 373...	L	x	Ø d	l	Ø D
			mm		
E 02	293	90	129		
E 06	296	130	129		
E 07	317	145	129		
E 11	499	180	183		
E 40	391	185	184		
P 21				268	242
P 21 V6				304	242
P22				322	242

baelz 480 DN 150-300

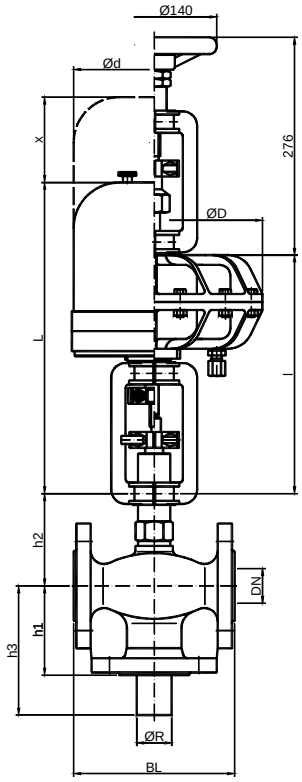


DN	BL	h 1	h 2
		mm	
150	480	1260	244
200	600	1651	268
250	730	2070	317
300	850	2460	361

Actuator baelz 373...	L	x	Ø d	l	Ø D
			mm		
E 40	577	185	184		
E 60	601	185	184		
P 31				509	384
P 32				525	384
P 41				562	506
P 41 V6				687	506

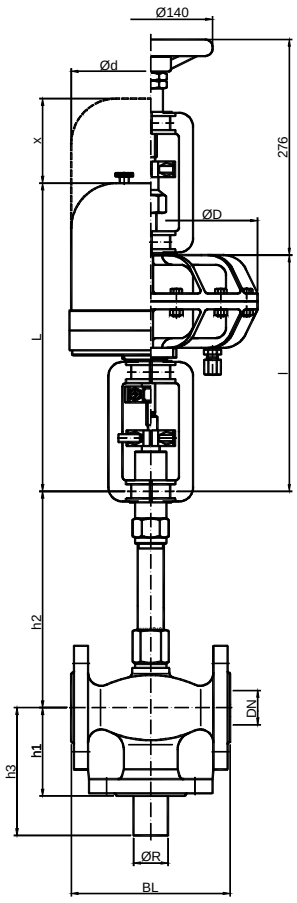
Bälz-electrodyn - control valves and control actuators

baelz 585 DN 15-125



000d2848.wmf

baelz 585-K DN 15-125



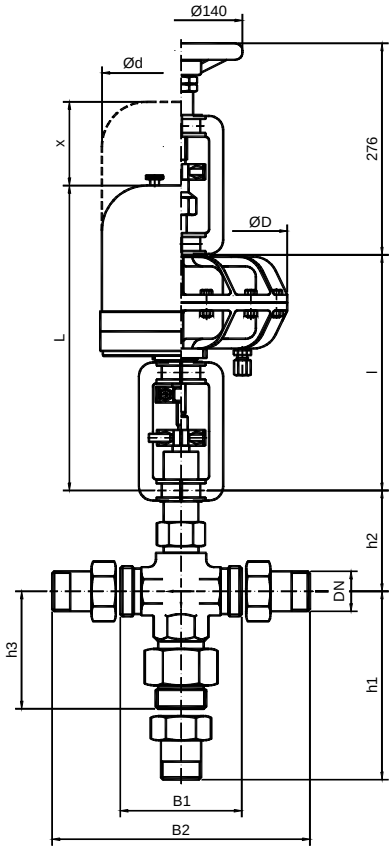
00002967.wmf

DN	BL	ØR	h 1	h 2 585	h 2 585-K	h 3*
mm						
15	130	15	85	109	261	142
25	160	26	85	110	262	142
32	180	35	100	104	339	157
40	200	41	105	114	349	162
50	230	52	115	124	359	172
65	290	68	125	144	379	182
80	310	80	130	154	389	187
100	350	105	150	169	404	207
125	400	128	200	189	424	257

*reserved to change dimensions

Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 02	293	90	129		
E 06	296	130	129		
E 07	317	145	129		
E 11	499	180	183		
E 40	391	185	184		
P 21				268	242
P 21 V6				304	242
P22				322	242

baelz 586 DN ¾", 1", 1½"

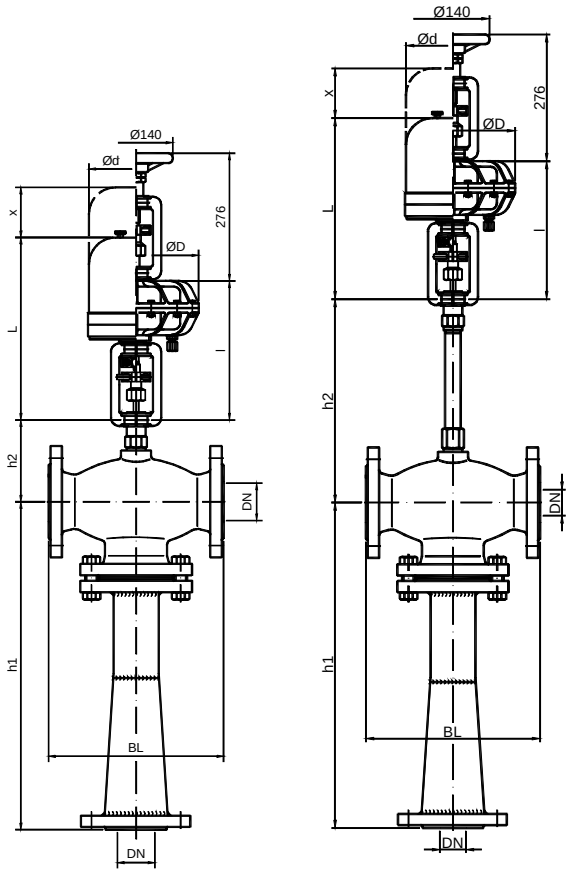


00002854.wmf

DN	B 1	B 2	h 1	h 2	h 3
mm					
G ¾	80	152	150	101	114
G 1	90	174	136	101	94
G 1½	115	198	170	87	129

Bälz-electrodyn - control valves and control actuators

baelz 590 DN 15-125 **baelz 590-K DN 15-125**



00003524.wmf 00003527.wmf

DN	BL	h 1* PN 16/25	h 1** PN 16/25/40	h 2 590	h 2 590-K
mm					
15	130	175	176	109	261
25	160	202	229	110	263
32	180	302	302	104	339
40	200	358	358	114	349
50	230	402	429	124	359
65	290	539	573	144	379
80	310	600	695	154	389
100	350	624	912	169	404
125	400	836	1066	189	424

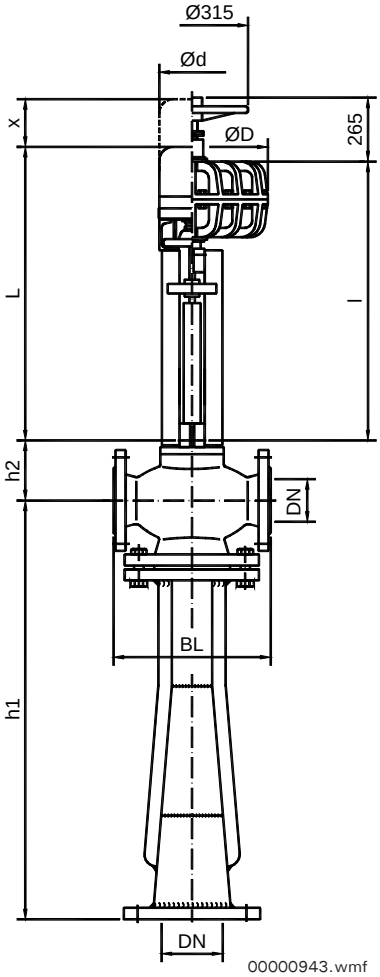
*with throat in stainless steel

*with welded diffusor, throat in stainless steel

*/**reserved to change dimensions

Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 02	293	90	129		
E 06	296	130	129		
E 07	317	145	129		
E 11	499	180	183		
E 40	391	185	184		
P 21				268	242
P 21 V6				304	242
P22				322	242

baelz 590-K DN 150-300



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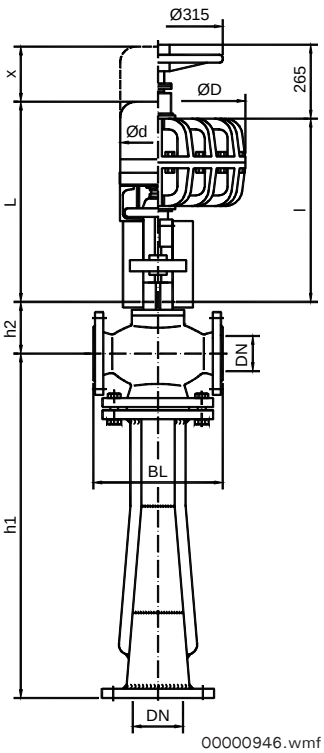
baelz 590 DN 150-300



00000946.wmf

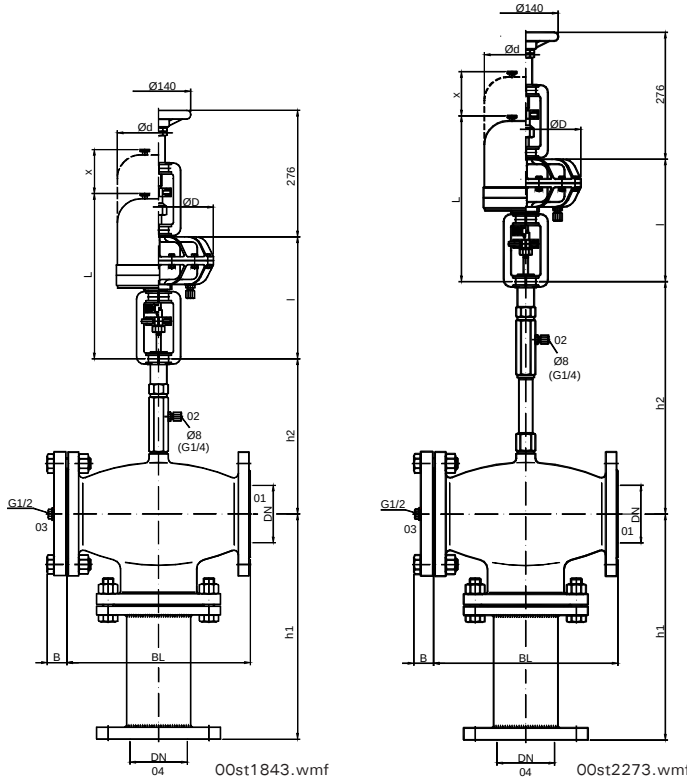
DN	BL	h 1*	h 2 590	h 2 590-K
mm				
150	480	1260	244	234
200	600	1651	268	258
250	730	2070	317	307
300	850	2460	361	351

*reserved to change dimensions

Actuator baelz 373...	L 590	L 590-K	x	Ø d	l 590	l 590-K	Ø D
	mm						
E 40	577	1057	185	184			
E 60	601	1081	185	184			
P 31					509	989	384
P 32					525	1005	384
P 41					562	1042	506
P 41 V6					687	1167	506

Bälz-electrodyn - control valves and control actuators

baelz 591 DN 32-125 **baelz 591-K DN 32-125**



DN	BL	h 1*	h 2 591	h 2 591-K	B
mm					
32	180	175	254	488	33
40	200	222	264	498	33
50	230	283	274	508	35
65	290	469	294	528	37
80	310	576	304	538	39
100	350	737	319	553	39
125	400	797	339	573	43

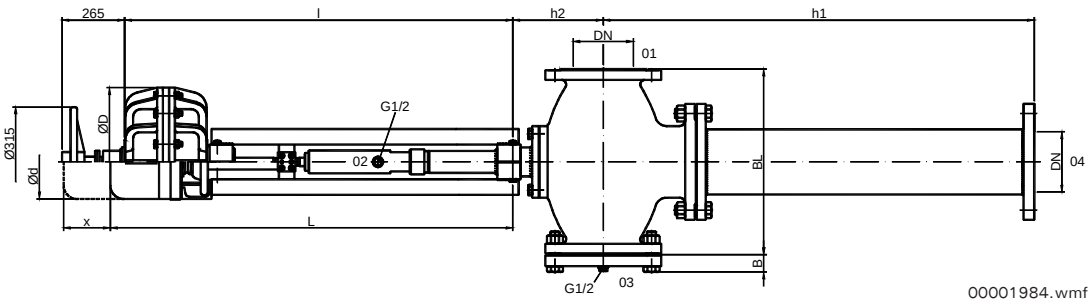
*reserved to change dimensions

Actuator baelz 373...	L	x	Ø d	l	Ø D
	mm				
E 02	293	90	129		
E 06	296	130	129		
E 07	317	145	129		
E 11	499	180	183		
E 40	391	185	184		
P 21				268	242
P 21 V6				304	242
P22				322	242

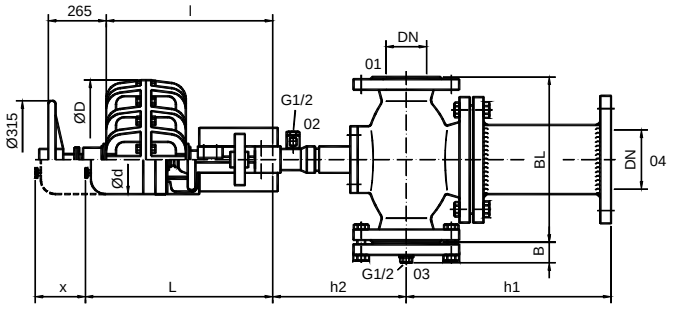
DN	BL PN 16-40	BL* PN 63	B PN 16	B PN 25	B PN 40	B PN 63	h 1* PN 16-40	h 1* PN 63	h 2 591 PN 16-40	h 2* 591 PN 63	h 1 591-K PN 16-40	h 1* 591-K PN 63
mm												
150	480	550	37	45	45	57	1116	1136	434	450	244	260
200	600	650	39	47	53	65	1357	1450	458	560	268	370
250	730	775	43	51	59	69	1597	1696	507	685	317	495
300	850	900	45	53	63	75	2090	2240	551	760	361	570

*reserved to change dimensions

baelz 591-K DN 150-300



baelz 591 DN 150-300



Actuator baelz 373...	L 591	L 591-K	x	Ø d	l 591	l 591-K	Ø D
	mm						
E 40	577	1057	185	184			
E 60	601	1081	185	184			
P 31					509	989	384
P 32					525	1005	384
P 41					562	1042	506
P 41 V6					687	1167	506