

Butterfly Valve with Electric Actuator

BOAXMAT-SF

PN 10/16
DN 20-600

Type Series Booklet



Legal information/Copyright

Type Series Booklet BOAXMAT-SF

Original operating manual

KSB Aktiengesellschaft

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Butterfly Valves

Centred-disc Butterfly Valves with Electric Actuator

BOAXMAT-SF



Main applications

- Spray irrigation systems
- Irrigation systems
- Pressure boosting
- Domestic water supply
- Air-conditioning systems
- Paint shops
- Rainwater harvesting
- Swimming pools
- Hot-water heating systems
- Washing plants

Fluids handled

- Drinking water
- Heating water
- Water
- Cooling water
- Water/glycol mixtures
- Compressed air
- Gas
- Oil
- Other fluids on request.

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 10/16
Nominal size	DN 20-600
Max. permissible pressure	16 bar
Max. permissible temperature	+130 °C
Min. permissible temperature	-10 °C
Actuation at ΔP	
at ambient temperature	
▪ DN 20-200	▪ 16 bar (max.)
▪ DN 250-600	▪ 10 bar (max.)
Suitable for vacuum applications down to	0.2 bar absolute
Max. permissible flow velocity at operating pressure	4 m/s (max.) for water

Design details

Design

- Maintenance-free butterfly valve
- Full-lug body with raised faces (T4)
- Suitable for downstream dismantling and as dead-end valve
- Extended neck allows insulation
- Anti-condensation feature enables straightforward fastening of insulation on the top flange skirt
- Elastomer liner: thicker elastomer in the area of the stem passage ensures leak-proof sealing to the atmosphere
- Perfectly tight shut-off: no leakage visible to the naked eye
- Shell strength, shell tightness and seat tightness test to EN 12266-1, leakage rate A, and ISO 5208, category A
- Face-to-face length to ISO 5752-20 and EN 558-1-20
- Top flange to ISO 5211
- Flange connections to EN/ISO PN 10 and 16
- Marked in accordance with EN 19
- Manufactured without substances which impair the adhesive strength of paint
- External coating: polyurethane, 80 µm, RAL 2002 (orange)
- The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for liquids in Group 1 and fluids in Group 2.
- The valve/actuator assembly can be regarded as partly completed machinery as defined by the Machinery Directive 2006/42/EC.
- The valves meet the requirements of the REACH 1907/2006 regulation. None of the substances listed in the candidate list and in Annex XIV of the regulation is present in a concentration above 0.1 % (w/w) (Article 33/REACH).

ACTELEC OA3 to AS200 quarter-turn actuators as per type series booklet 8521.12

- Power supply:
Alternating current 230 V, 50 Hz: all models
Three-phase current 230 V or 400 V, 50 Hz: all models except OA3
- Frequency of starts: 54-30 %
- Actuator in enclosure IP 67

- Ambient temperature: - 20 °C to + 70 °C

ACTELEC LEA and LEB quarter-turn actuators as per type series booklet 8521.16

- Power supply:
Alternating current 230 V, 50 Hz - 60 Hz
24V, AC / DC
- Frequency of starts: 54-30 %
- Enclosure IP 65
- Ambient temperature: - 10 °C to + 50 °C

Variants

- Butterfly valve cleaned and packaged, free from substances which impair the adhesive strength of paint
- ACTELEC actuators can be mounted on request. Actuator equipment options:
 - Explosion-proof model / two additional limit switches
 - Epoxy coating
 - Motor: 54-50 % for closed-loop control operation
 - Actual-position feedback
 - Positioner
 - Control units
 - Other voltages

Body materials

Overview of available materials

Material	Material number	Temperature limit
EN-GJS-400-15	JS 1030	-10 °C to 200 °C

Product benefits

- Valve certified to
 - ACS/DVGW for drinking water applications, with XU elastomer liner
 - DVGW for mineral gas applications, with EG liner
- Elastomer liner
 - EPDM-XU approved by KTW, ILP Nancy
- Spherically machined valve disc with rounded sealing contour
 - ensures durable and permanently tight shut-off
- Anti-condensation feature between actuating element and valve body
 - enables insulation of the piping
- Full-lug body with raised faces
 - enables downstream dismantling
- Valve free of dirt particles, for use in paint shops
- Factory-set assembly consisting of valve and electric actuator
- Electric actuator
 - compact
 - IP 67 or IP 65
 - 230V / 400V / 24V

Related documents

Related documents

Document	Reference No.
Operating manuals	8417.8

On all enquiries/orders please specify

1. Type
2. Nominal pressure
3. Nominal size
4. Fluid handled
5. Flow rate/velocity
6. Temperature
7. Materials required (body, valve disc, seat)
8. Line connection, flange facing and flange surface quality
9. Number of type series booklet

Technical data

Hydraulic characteristics

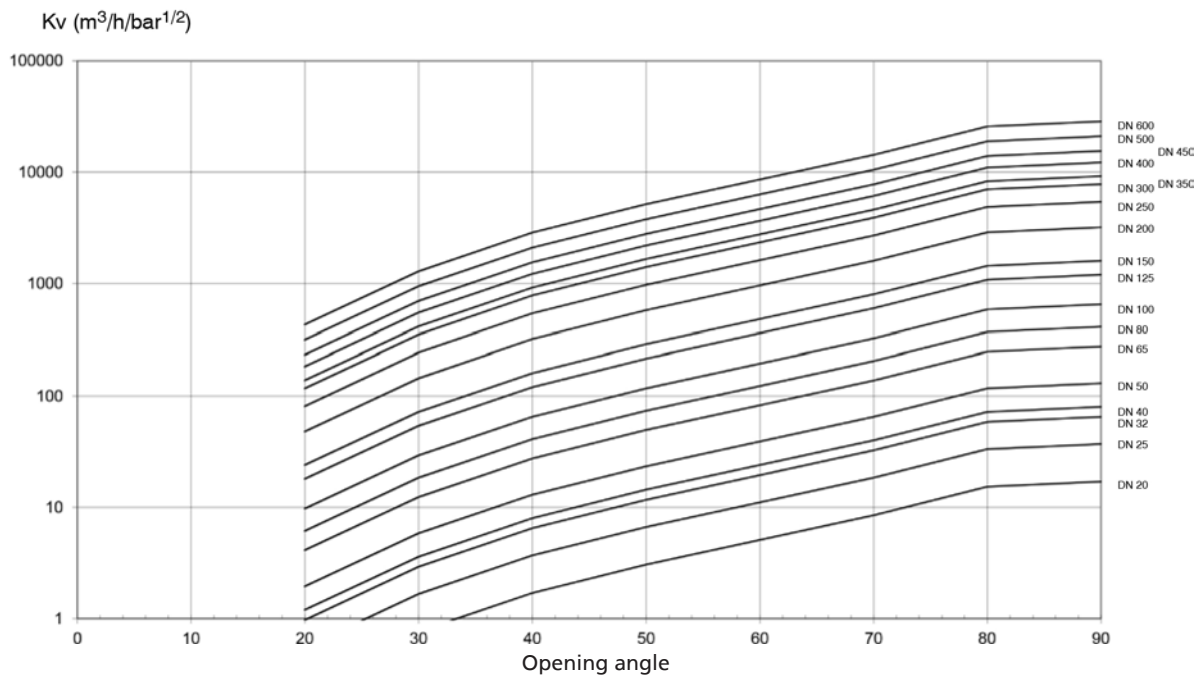


Table of Kv and zeta values

DN	Kv as a function of opening angle										Zeta Values
	10 °	20 °	30 °	40 °	50 °	60 °	70 °	80 °	90 °		
20	0	0,26	0,77	1,7	3,1	5,1	8,5	15,3	17	0,88	
25	0	0,6	1,7	4	6,7	11	19	33	37	0,46	
32	0	1,0	2,9	6,5	11,7	19,5	32,5	58,5	65	0,40	
40	0	1,2	3,6	8,0	14,4	24	40	72	80	0,64	
50	0,1	2	5,9	13	23,4	39	65	117	130	0,59	
65	0,3	4,1	12,4	27,5	49,5	82,5	137,5	247,5	275	0,38	
80	0,4	6,2	18,5	41	74	123	205	369	410	0,39	
100	0,7	9,8	29,3	65	117	195	325	585	650	0,38	
125	1,2	18	54	120	216	360	600	1080	1200	0,27	
150	1,6	24	72	160	288	480	800	1440	1600	0,32	
200	3,2	48	144	320	576	960	1600	2880	3200	0,25	
250	5,4	81	243	540	972	1620	2700	4860	5400	0,21	
300	7,8	117	351	780	1404	2340	3900	7020	7800	0,21	
350	9,2	138	414	920	1656	2760	4600	8280	9200	0,28	
400	12,2	183	549	1220	2196	3660	6100	10980	12200	0,27	
450	15,5	232,5	698	1550	2790	4650	7750	13950	15500	0,27	
500	21	315	945	2100	3780	6300	10500	18900	21000	0,23	
600	28,6	429	1287	2860	5148	8580	14300	25740	28600	0,25	

Main electrical components

ACTELEC

Type	LEA2	LEA3	LEB4	LEB10	OA3	OA6	OA8	OA15	ASP	AS50	BS100	AS200
Limit switches for OPEN and CLOSED positions	Standard											
Adjustable mechanical limit stops	Standard											
Torque switches for OPEN and CLOSED positions	Standard											
Protection by thermal switch	-	-	Standard									
Manual override	Standard											
Visual position indicator	Standard											
Heating resistor	Integrated		-	-	To be connected							

Electrical data for standard actuating time

Single-phase current 230 V, 50 Hz and 24 V, AC/DC

ACTELEC	LEA2	LEA3	LEB4	LEB10	OA3	OA6	OA8	OA15	ASP	AS50	BS100	AS200
Rated current [A]	0,1	0,14	0,8	0,5	0,7	0,6	1,2	0,6	1,8	1,2	1,2	2,5
Starting current [A]	0,24	0,3	0,9	0,6	0,9	0,9	1,7	0,9	2,5	1,7	1,7	3,5
Power [W]	35,0	45,0	30,0	15,0	27,0	30,0	60,0	30,0	100,0	60,0	60,0	200,0

Three-phase alternating current, 400 V, 50 Hz

ACTELEC	OA6	OA8	OA15	ASP	AS50	BS100	AS200
Rated current [A]	0,3	0,6	0,3	0,8	0,3	0,6	0,6
Starting current [A]	0,5	1,1	0,5	1,6	0,8	1,1	1,2
Power [W]	30,0	100,0	30,0	150,0	60,0	100,0	100,0

Actuator selection - liquid fluids

Single-phase current 230 V, 50 Hz and 24 V, AC/DC

DN	ACTELEC	Standard actuating time	ACTELEC	Standard actuating time
20	LEA2	20s	OA3	11s
25				
32				
40				
50	LEA3	20s		
65	LEB4	6s		
80	LEB10	35s	OA6	6s
100				
125			6s ¹⁾	OA8
150	-	-	OA15	15s ¹⁾
200	-	-	ASP	10s ¹⁾
250	-	-		
300	-	-	AS50	30s ¹⁾
350	-	-		
400	-	-	BS100	60s ¹⁾
450	-	-		
500	-	-		
600	-	-	AS200	70s ¹⁾

Three-phase alternating current, 400 V, 50 Hz

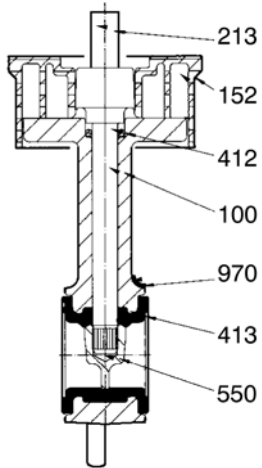
DN	ACTELEC	Standard actuating time
20	OA6	6s
25		
32		
40		
50		
65		
80		
100		
125	OA8	6s ¹⁾
150	OA15	15s ¹⁾
200	ASP	10s ¹⁾
250		
300	AS50	30s ¹⁾
350		
400	BS100	60s ¹⁾
450		
500		
600	AS200	70s ¹⁾

¹⁾ Other actuating times on request

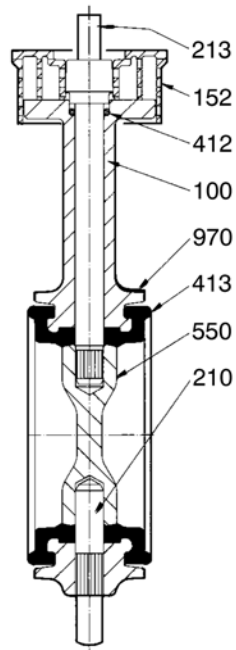
Materials

DN 20-150

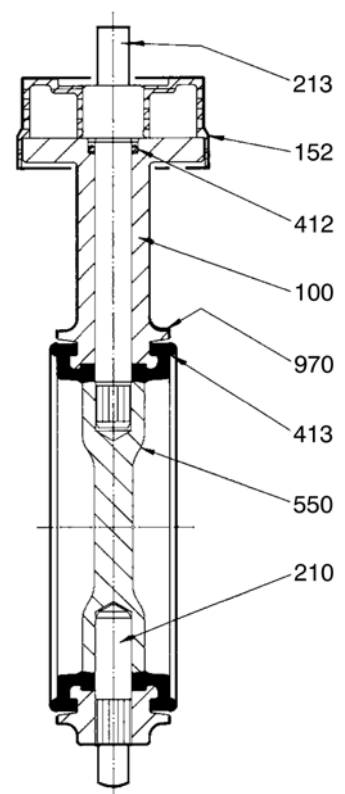
DN 20-25



DN 32-80

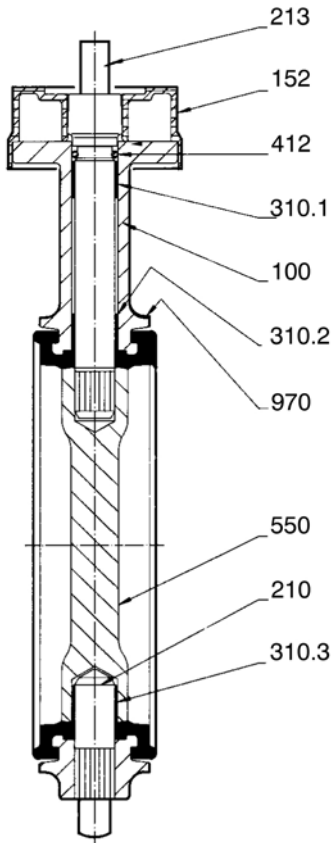


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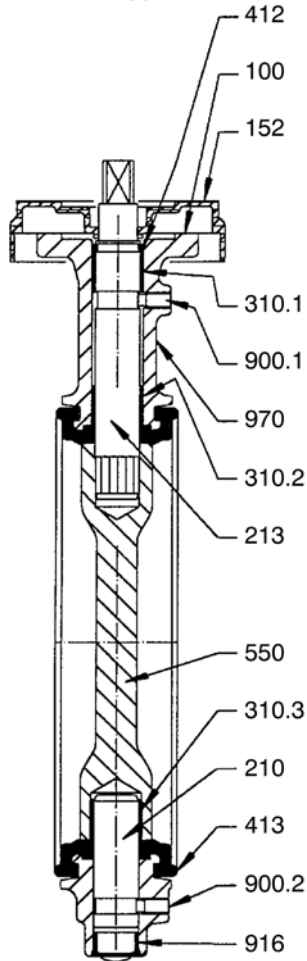


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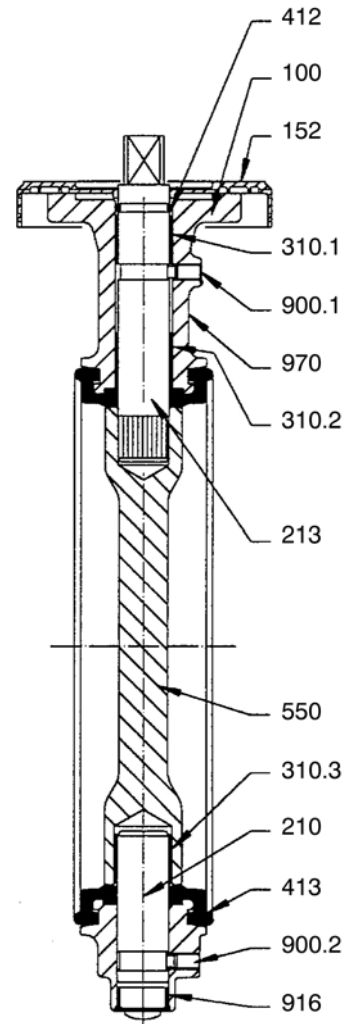
DN 200



DN 250

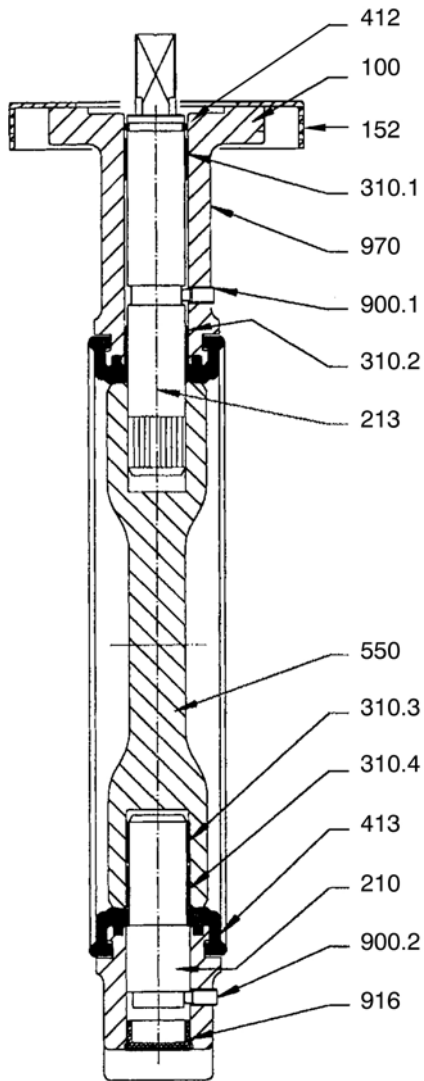


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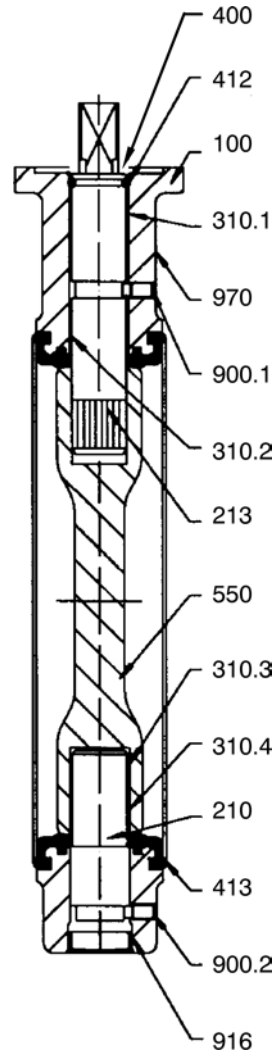


DN 350-600

DN 350-450



DN 500-600

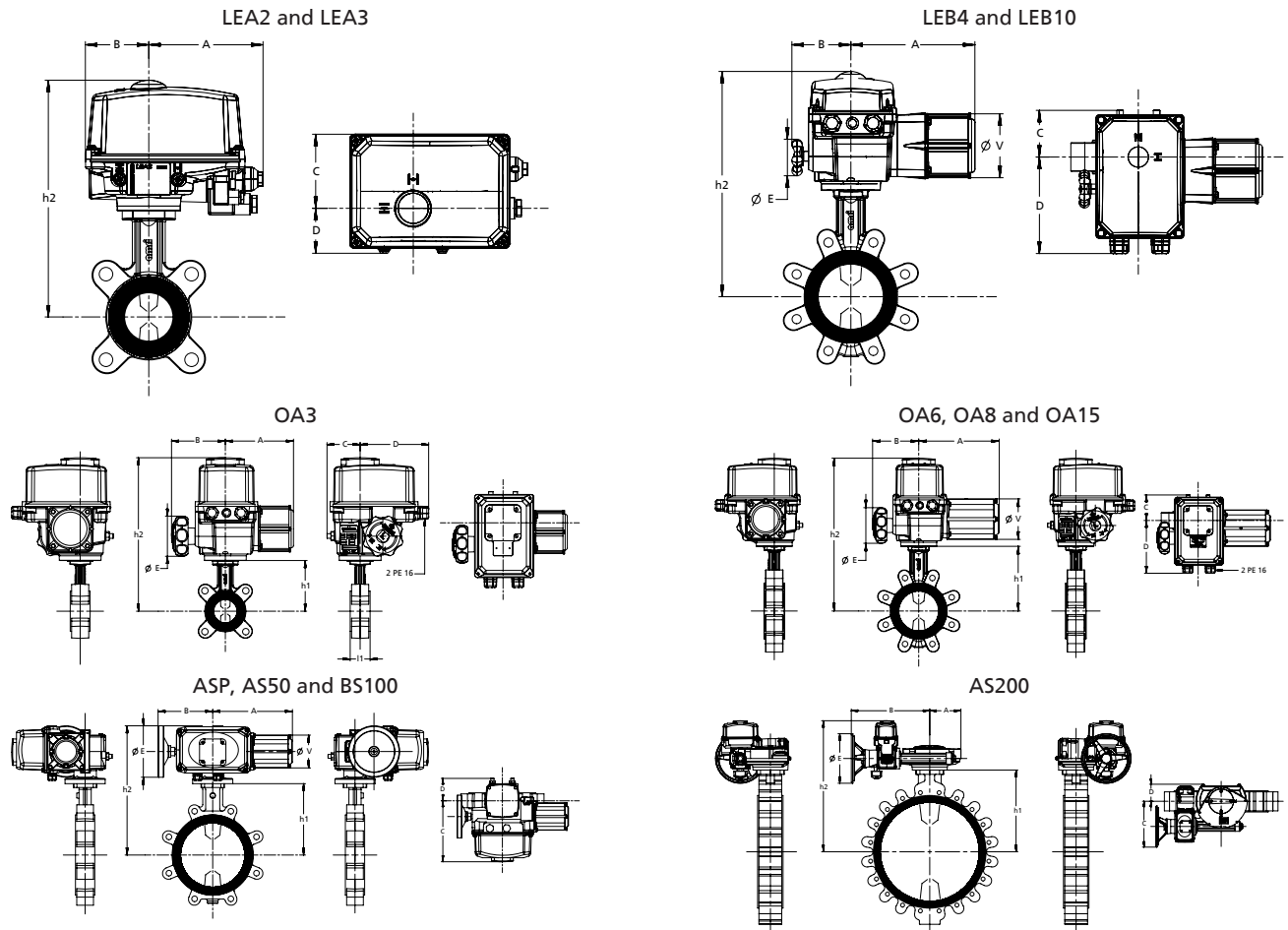


List of components

Part No.	Description	DN	Materials	KSB code
100	Body	20-600	Nodular cast iron JS 1030	3g
152	Anti-condensation feature	20-450	Polyamide, glass-fibre reinforced	
210	Stem	20-600	Stainless steel, 13% chromium - 1.4029	6k
213	Actuating stem	20-600	Stainless steel, 13% chromium - 1.4029	6k
310.1	Plain bearing	200-600	Steel with reinforced PTFE coating	
310.2	Plain bearing	200-600	Steel with reinforced PTFE coating	
310.3	Plain bearing	200-600	Steel with reinforced PTFE coating	
310.4	Plain bearing	350-600	Steel with reinforced PTFE coating	
400	Gasket	500-600	Polypropylene	
412	O-ring	250-600	EPDM	
413	Liner	20-600	EPDM	XU
		20-600	Nitrile HT	K
550	Valve disc	20-600	Stainless steel 1.4301/1.4308 (18-10)	6g
900.1	Screw	250-600	Stainless steel	
900.2	Screw	250-600	Stainless steel	
916	Plug	250-600	Polyethylene	
970	Name plate	20-600	Adhesive label, polyester-coated	

Dimensions

Drawings



Dimensions

Dimensions in [mm]

DN	Actuator	l1	h1	h2	A		B	C	D	E	V
					230V	24V					
20	LEA2	27	101	236	100	100	65	77	41	-	-
25	LEA2	27	104	239	100	100	65	77	41	-	-
32	LEA2	33	126	261	100	100	65	77	41	-	-
40	LEA2	33	126	261	100	100	65	77	41	-	-
50	LEA3	43	131	266	100	100	65	77	41	-	-
65	LEB4	46	157	341	148	202	90	140	65	60	106
80	LEB10	46	163	347	148	202	90	140	65	60	106
100	LEB10	52	191	375	148	202	90	140	65	60	106
125	LEB10	56	205	389	148	202	90	140	65	60	106

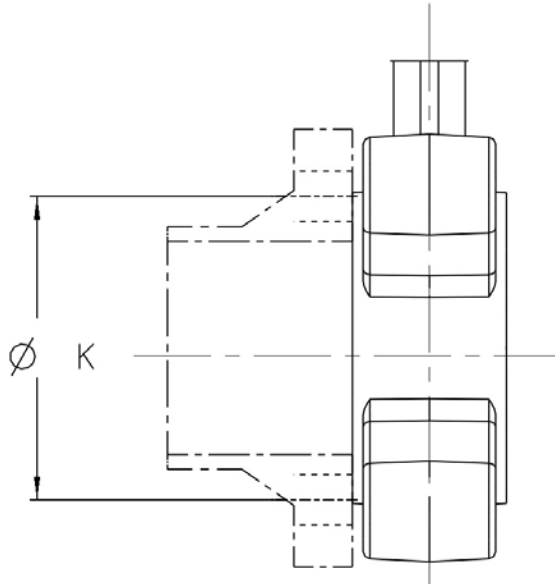
Dimensions in [mm]

DN	Actuator	l1	h1	h2	A	B	C	D	E	V
20	OA3	33	109	343	157	116	127	73	90	90
25	OA3	33	109	343	157	116	127	73	90	90
32	OA3	33	105	321	157	116	127	73	90	90
40	OA3	33	126	371	157	116	127	73	90	90
50	OA3	43	131	376	157	116	127	73	90	90
65	OA3	46	157	402	157	116	127	73	90	90
20	OA6	33	101	317	203	116	127	73	90	90

DN	Actuator	l1	h1	h2	A	B	C	D	E	V
25	OA6	33	104	320	203	116	127	73	90	90
32	OA6	33	108	324	203	116	127	73	90	90
40	OA6	33	126	342	203	116	127	73	90	90
50	OA6	43	131	347	203	116	127	73	90	90
65	OA6	46	157	373	203	116	127	73	90	90
80	OA6	46	163	379	203	116	127	73	90	90
100	OA6	52	191	389	203	116	127	73	90	90
125	OA8	56	205	420	203	116	127	73	90	90
150	OA15	56	224	439	246	116	127	73	90	139
200	ASP	56	252	429	312	187	229	84	160	139
250	ASP	60	275	452	312	187	229	84	160	139
300	AS50	78	289,5	467	360	168	229	84	250	139
350	AS50	78	338	429	360	168	229	84	250	139
400	BS100	102	383	550	412	171	284	140	250	139
450	BS100	114	410	577	412	171	284	140	250	139
500	BS100	127	440	607	412	171	284	140	250	139
600	AS200	154	493	865	188	476	129	333	300	-

Flange connecting dimensions to EN 1092-1

	DN	Bolt circle diameter K	
		PN 10	PN 16
	20	75	75
	25	85	85
	32	100	100
	40	110	110
	50	125	125
	65	145	145
	80	160	160
	100	180	180
	125	210	210
	150	240	240
	200	295	295
	250	350	355
	300	400	410
	350	460	470
	400	515	525
	450	565	585
	500	620	650
	600	725	770



Notes on installation

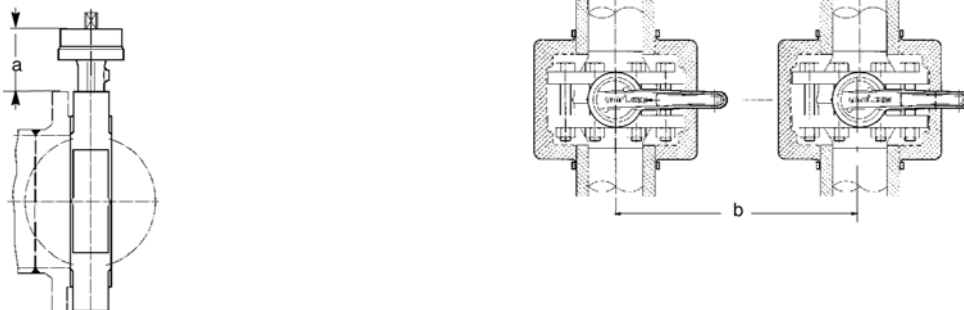
Flange connection bolts

Dimensions [mm]

DN	EN 1092 PN 6 Type 11		EN 1092 PN 6 Type 11	
	a	Bolt size	a	Bolt size
Bolt/Nut				
20	51,5	8xM12x30	51,5	8xM12x30
25	46,5	8xM12x30	46,5	8xM12x30
32	38,0	8xM16x30	38,0	8xM16x30
40	51,0	8xM16x30	51,0	8xM16x30
50	48,0	8xM16x35	48,0	8xM16x35
65	64,5	16xM16x35	64,5	16xM16x35
80	63,0	16xM16x40	63,0	16xM16x40
100	81,0	16xM16x40	81,0	16xM16x40
125	79,5	16xM16x40	79,5	16xM16x40
150	81,5	16xM20x45	81,5	16xM20x45
200	82,0	16xM20x50	82,0	24xM20x50
250	77,5	24xM20x50	72,5	24xM24x50
300	67,0	24xM20x50	59,5	24xM24x50
Threaded rod				
350	90,0	32xM20x55	82,5	32xM24x60
400	100,5	32xM24x60	93,0	32xM27x70
450	105,5	40xM24x60	93,0	40xM27x70
500	108,0	40xM24x60	85,5	40xM30x80
600	107,0	40xM27x70	77,0	40xM33x90

When threaded rods or bolts are used, at least 1 nut height shall be added to the above bolt lengths.

BOAX-SF "A" BOAX-SF "B"



Minimum spacings in manifold branches

The minimum spacings b in manifold branches must be provided as defined by heating system regulations, irrespective of the levers or manual gearboxes used.

Minimum spacings b [mm]

	DN	BOAXMAT-SF "A"																	
		20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
BOAXMAT-SF "B"	20	240	240	245	265	270	295	300	310	325	340	370	405	430	484	530	570	610	670
	25	-	245	250	265	270	295	305	310	325	340	370	410	430	487	532	572	612	672
	32	-	-	255	270	275	300	305	315	330	345	370	415	435	491	536	576	618	678
	40	-	-	-	290	295	320	325	335	345	365	390	430	455	510	554	594	635	695
	50	-	-	-	-	300	325	330	340	350	370	400	435	460	514	560	600	640	700
	65	-	-	-	-	-	350	355	365	380	395	425	460	485	540	585	625	665	725
	80	-	-	-	-	-	-	365	370	385	400	430	470	490	546	591	631	673	733
	100	-	-	-	-	-	-	-	380	395	410	440	475	500	554	600	640	680	740
	125	-	-	-	-	-	-	-	-	410	425	450	490	515	570	614	654	695	755
	150	-	-	-	-	-	-	-	-	-	440	470	510	530	585	630	670	710	770
	200	-	-	-	-	-	-	-	-	-	-	500	540	560	619	658	700	740	800
	250	-	-	-	-	-	-	-	-	-	-	-	575	600	651	696	736	778	838
	300	-	-	-	-	-	-	-	-	-	-	-	-	620	675	720	760	800	860
	350	-	-	-	-	-	-	-	-	-	-	-	-	-	730	775	815	855	915
	400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	820	860	900	960
	450	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	900	940	1000
	500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	980	1040
600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1100	

Notes on commissioning/start-up

BOAXMAT-SF has been set and tested at the factory.

Prior to any actuation, run the valve disc to the middle position and check the direction of rotation and the correct function of the limit stops.

BERNARD operating manuals and wiring diagrams are supplied with the product.

Full motor protection is only ensured if the thermal switch integrated in the winding has been connected correctly.

The actuators are stopped by means of the limit stops.

On actuator sizes AS and BS, torque switches provide additional safety. They trip the motor via the control unit in the event of a fault and simultaneously signal the fault.

The torque switches are momentary-contact switches.



KSB Aktiengesellschaft

Johann-Klein Straße 9 • 67227 Frankenthal (Allemagne)

Tél. +49 6233 86-0 • Fax +49 6233 86-3401

KSB S.A.S. • 4, allée des Barbanniers • 92635 Gennevilliers Cedex (France)

Tél. +33 1 41477500 • Fax +33 1 41477510 • www.ksb.fr