Butterfly Valve

BOAX-S/SF

PN 6/10/16 (BOAX-S)
PN 10/16 (BOAX-SF)
DN 20 - 600

Type Series Booklet

Legal information/Copyright

Type Series Booklet BOAX-S/SF

Contents

Butterfly Valves

Centred-disc Butterfly Valves

BOAX-S/SF

Main applications

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

Fluids handled

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

Operating data

Table 1: Operating properties

Characteristic	Value
Pressure class	BOAX-S : PN 6/10/16 BOAX-SF : PN 10/16
Nominal size	DN 20 - 600
Max. permissible pressure [bar]	16
Min. permissible temperature [°C]*	≥ -10
Max. permissible temperature [°C]	≤ +130
Temperature with ▪ XU liner ▪ K liner	 ▪ -10 °C to +130 °C ▪ -10 °C to +90 °C
Actuation at ΔP at ambient temperature ▪ DN 20-200 ▪ DN 250-600	 ▪ 16 bar max. ▪ 10 bar max.
Vacuum operation down to	0.2 bar absolute
Max. permissible flow velocity at operating pressure	4 m/s (max.) for water

Design details

Design

- Semi-lug body - T2 (BOAX-S)
- Full-lug body with raised faces - T4 (BOAX-SF)
- Suitable for downstream dismantling and as dead-end valve (BOAX-S/SF)
- Maintenance-free butterfly valve
- Extended neck allows insulation (in acc. with applicable German energy-saving regulation, for DN 20 to 200)
- Thermal barrier enables straightforward fastening of insulation at the top flange skirt.
- Elastomer liner: thicker elastomer in the area of the shaft passage ensures leak-proof sealing to atmosphere
- The spherically machined valve disc ensures perfectly tight shut-off: no leakage visible to the naked eye
- Shell and leak 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 6 (BOAX-S), 10 and 16
- Marking in accordance with EN 19
- Valves manufactured without paint wetting impairment substances
- Body coating: polyurethane, 80 µm, RAL 2002 (orange)
- Standard manual actuation:
  - LP lever
  - MA and MR manual gearboxes

Variants

- BOAX-S/SF THERMAX

  The thermometer of BOAX-S/SF with lever can measure temperatures from 0 °C to +140 °C in heating systems and temperatures from -20 °C to +60 °C in cooling systems. DN 20-250, accuracy class 1.

8408.12/07-EN

Actuator variants

- Data of LP levers:
  - 4 handle lengths: 165 mm, 260 mm, 330 mm and 460 mm
  - Made of aluminium alloy
  - Coating:

    - Handle: polyurethane, thickness 80 µm, colour: RAL 9011, black

    - Toggle lever: polyurethane, thickness 80 µm, colour: RAL 2002, orange
  - Cannot be removed
  - Can be locked in 13 positions (2 limit positions and 11 intermediate positions)
- The handwheel of the MA manual gearbox can be locked with a chain (padlock not included in scope of supply).
- Characteristics of MA manual gearboxes:
  - The MA manual gearboxes developed by KSB-AMRI cover torques of up to 250 Nm.
  - Force transmission via planetary gear makes them ideally suited for centred-disc butterfly valves.
  - Exterior coating: polyurethane, average thickness 80 µm, colour: RAL 9011 black
  - Actuator/valve interface to ISO 5211
  - Interchangeable insert enables mounting of actuator on different types of shaft ends (square or flat).
  - Ambient temperature: -20 °C to +80 °C
  - IP65 enclosure
- MA manual gearboxes can be equipped with an electrical limit switch box.
  - This limit switch box is mounted between the valve and the gearbox.
  - It can be equipped with two switches (1 for OPEN, 1 for CLOSED) of the following types:

    - Standard microswitch or explosion-proof microswitch

    - Standard proximity sensor or proximity sensor to NAMUR
  - Connection is effected either by cable gland or connector.
  - This limit switch box is supplied in IP65 enclosure as standard.
- MN / MR manual gearboxes[1)]
- Electric actuators (BOAXMAT-S / BOAXMAT-SF units)

Automation options

- AMTROBOX M limit switch box with MA manual gearbox

Valve body materials

Table 2: Overview of available materials

Material	Material number	KSB code
EN-GJS-400-15	5.3106	3g

Product benefits

- Thermometer of accuracy class 1 (optional). Please indicate when ordering the valve.
- Valve certified to
  - DVGW, ÖVGW, SVGW and BELGAQUA for drinking water applications, with EPDM elastomer liner, approved by KTW, ILP Nancy
- Spherically machined disc with rounded sealing contour
  - ensures durable and permanently tight shut-off
- Neck extension between actuator and valve body
  - enables heat insulation of the piping
- Semi-lug body or full-lug body with raised faces
  - Enables downstream dismantling
- Actuation via padlockable or lead-sealable lever (DN 20-250)
- Manual gearbox
  - Space-saving design
  - IP67 enclosure (MN and MR in standard design), IP68 (MR for marine applications)
- Electric actuator
  - Space-saving design
  - IP68
  - 24 VDC / 230 VAC / 400 VAC

Product information

Product information as per Pressure Equipment Directive 2014/68/EU (PED)

The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Groups 1 and 2.

EC Machinery Directive 2006/42/EC

Valves with actuators can meet the requirements of the 2006/42/EC Machinery Directive for partly completed machinery.

Product information as per Regulation No. 1907/2006 (REACH)

For information as per chemicals Regulation (EC) No. 1907/2006 (REACH), see https://www.ksb.com/ksb-en/About-KSB/Corporate-responsibility/reach/ .

Certifications

Table 3: Overview

Label	Effective in:	Comment
BUREAU VERITAS	Worldwide	
DVGW	Germany	Approved in accordance with the German drinking water regulation
ÖVGW GEPRÜFT	Austria	Approved in accordance with the Austrian drinking water regulation
SVGW SSIGE	Switzerland	Approved in accordance with Swiss drinking water regulation
BELGAQUA	Belgium	Approved in accordance with the Belgian drinking water regulation
ACS	France	Approved in accordance with the French drinking water regulation
WRAS APPROVED PRODUCT	United Kingdom	Approved in accordance with the UK drinking water regulation

1 MN manual gearbox not available for Germany.

Related documents

Table 4: Information/documents

Document	Reference number
Operating manual	8417.8
AMTROBOX M type series booklet	8523.1
AMTROBOX F type series booklet	8528.5

Purchase order specifications

1. Type
2. Nominal pressure
3. Nominal size
4. Fluid handled
5. Flow rate / flow velocity
6. Operating temperature
7. Materials (body, valve disc, seat)
8. Line connection, flange facing and flange surface quality
9. Actuator / automation
10. Reference number

8408.12/07-EN

Technical data

Hydraulic data of the butterfly valve

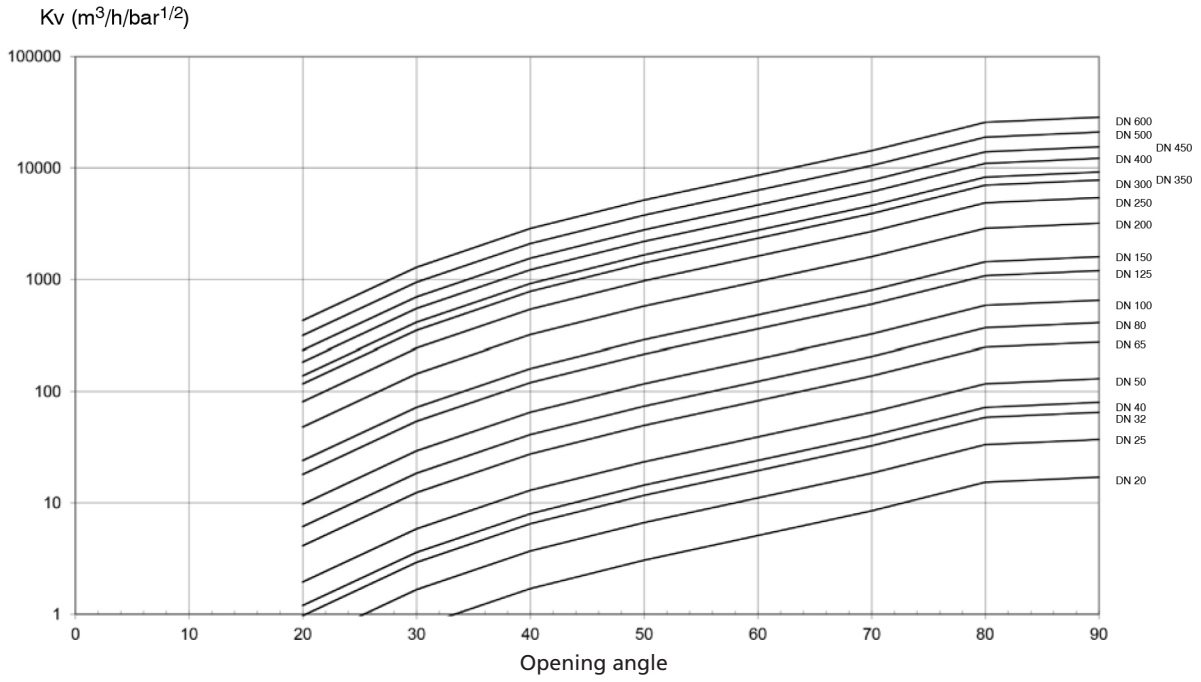


Illustration of hydraulic data

Table 5: Table of coefficients Kv [mm] and Zeta

DN	Kv as a function of opening angle									Zeta
	10 °	20 °	30 °	40 °	50 °	60 °	70 °	80 °	90 °	
20/25[2)]	0	0,6	1,7	4	6,7	11	19	33	37	0,46
20[3)]	0	0,26	0,77	1,7	3,1	5,1	8,5	15,3	17	0,88
25[3)]	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

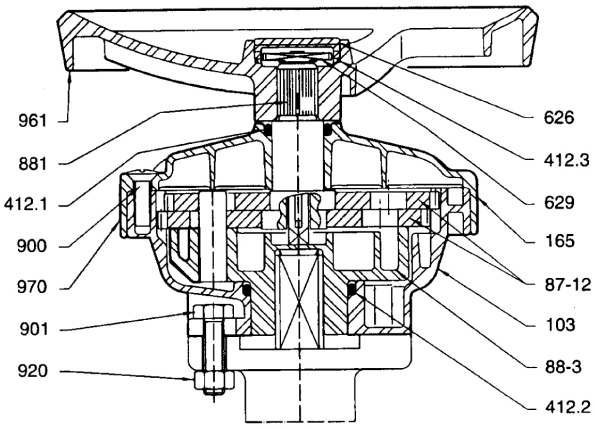
8408.12/07-EN

2 BOAX-S
3 BOAX-SF

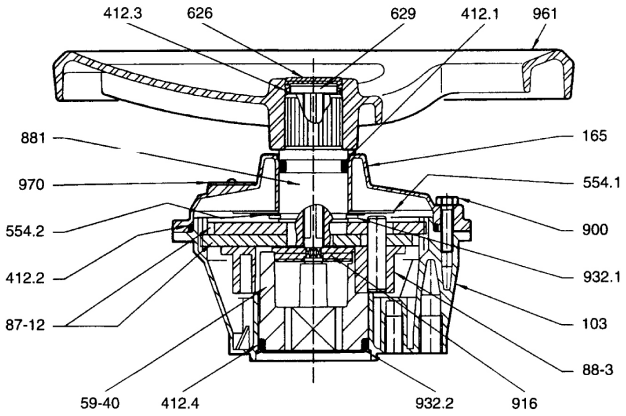
Characteristics of MA manual gearbox

Table 6: Type series

Type	Nominal output torque [Nm]	Nominal input torque [Nm]	Number of handwheel turns
MA			
12	125	23	8
25	250	40	8



MA 12



MA 25

Table 7: List of components

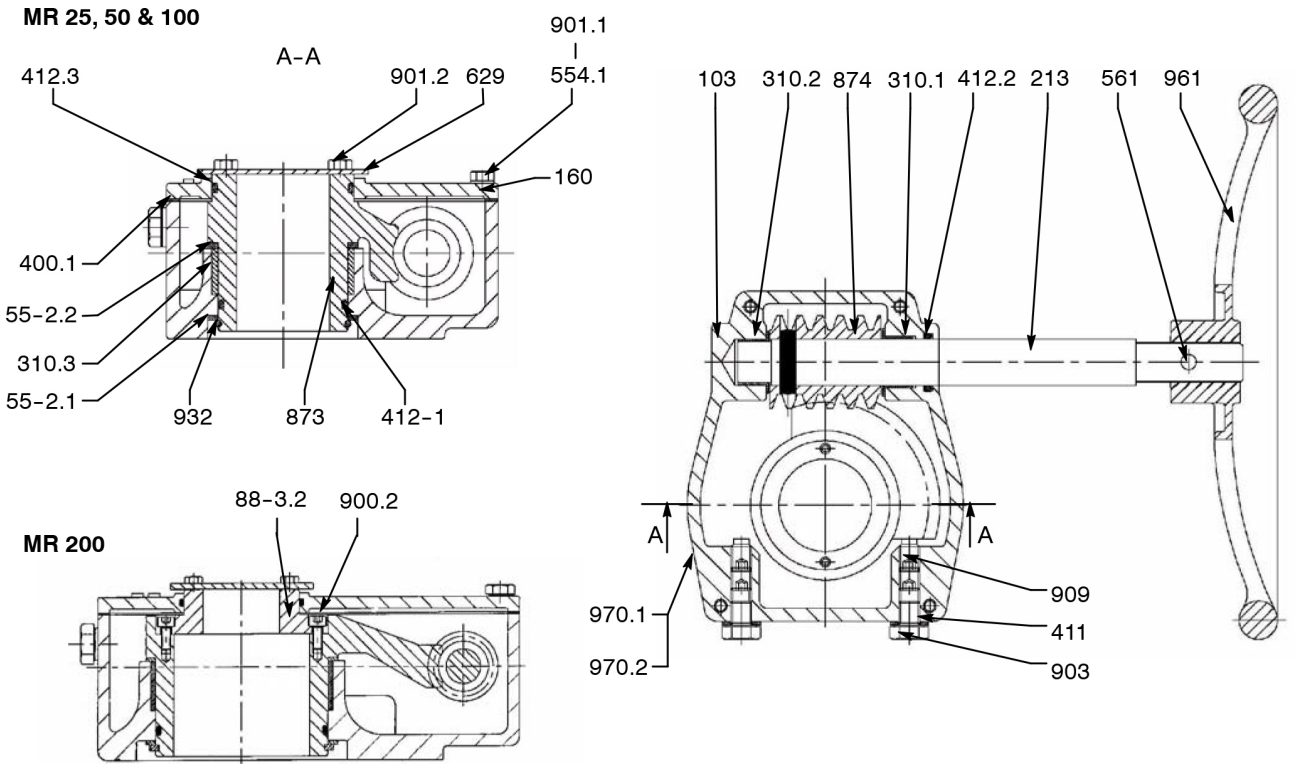
Part No.	Description	Materials
103	Gear housing	Light metal alloy
165	Bonnet	Light metal alloy
412.1	O-ring	Nitrile
412.2	O-ring	Nitrile
412.3	O-ring	Nitrile
626	Sight glass	Polycarbonate
629	Position indicator	Polypropylene
87-12	Planet wheel	Steel
881	Eccentric shaft	Phosphate steel
88-3	Torque-transmitting element	Light metal alloy (MA 12) / light metal alloy + steel (MA 25)
900	Thread-cutting screw	Galvanised steel
961	Handwheel	Light metal alloy
970	Name plate	Adhesive label, polyester-coated
For MA 12 only:		
901	Hexagon head bolt	Galvanised steel
920	Nut	Galvanised steel
For MA 25 only:		
412.4	O-ring	Nitrile
554.1	Washer, flat	Galvanised steel
554.2	Disc spring	Galvanised steel
59-40	Actuating bush	Zinc alloy
916	Plug	Nitrile
932.1	External circlip	Steel
932.2	Internal circlip	Steel

8408.12/07-EN

Characteristics of MR manual gearbox

Table 8: Type series

Type	Nominal output torque [Nm]	Nominal input torque [Nm]	Number of handwheel turns
MR			
25	250	27	8
50	500	42	10
100	1000	70	12,5
200	2000	100	20



Sectional drawings of MR 25 to MR 200

Table 9: List of components

Part No.	Description	Materials
103	Gear housing	Nodular cast iron JS 1040
160	Cover	Nodular cast iron JS 1040
213	Actuating shaft	Stainless steel (13 % chrome)
310.1	Self-lubricating bush	Steel with PTFE coating
310.2	Self-lubricating bush	Steel with PTFE coating
310.3	Self-lubricating bush or surface treatment	Surface treatment
400.1	Gasket	Composite material
411	Joint ring	Composite material
412.1	O-ring	Nitrile
412.2	O-ring	Nitrile
412.3	O-ring	Nitrile
55-2.1	Sliding disc	Tempered steel
55-2.2	Anti-friction disc or surface treatment	Surface treatment
554.1	Washer, flat	Stainless steel
561	Pin	Stainless steel
629	Position indicator	Polyamide 6-6
873	Worm wheel	Nodular cast iron JS 1040
874	Worm shaft	Tempered steel
88-3.2	Torque-transmitting element	Steel (MR 200 only)
900.2	Hexagon socket head cap screw	Tempered steel (MR 200 only)
901.1	Hexagon head bolt	Stainless steel
901.2	Hexagon head bolt	Stainless steel
903	Plug	Polyethylene or stainless steel
909	Adjusting screw	Tempered steel
932	External circlip	Tempered steel
961	Handwheel	Nodular cast iron
970.1	Name plate	Stainless steel
970.2	Installation instructions	

8408.12/07-EN

Technical data of electric actuators

BOAXMAT-S / BOAXMAT-SF unit

Valve with electric quarter-turn actuator, make: BERNARD Controls (www.bernardcontrols.com)

Main electrical components

Table 10: Electrical equipment

Parameter	Type								
	AQ1L	AQ3L	AQ7L	AQ5	AQ10	AQ15	AQ25	AQ50	SQ120
Limit switches for OPEN and CLOSED positions	4 SPDT								
Adjustable mechanical limit switches	Non-adjustable		Standard						
Torque switches for OPEN and CLOSED positions	Fail-safe position only			No			Standard		-
Protection by temperature switch	No			Standard (except 24 V DC)					Standard
Manual override	Standard								
Position indicator	Standard								
Heating resistor	Electronic			Integrated					
Enclosure	IP68								IP67
Frequency of starts	S4-30 %								
Operating temperature	-20 °C to +60 °C								-20 °C to +70 °C

Electrical data for standard actuating time

Table 11: Single-phase alternating current 85-260 V AC, 50/60 Hz

Parameter	Type		
	AQ1L	AQ3L	AQ7L
Nominal current [A]	0,3	0,3	0,4
Starting current [A]	0,8	0,8	1,0
Power [W]	20	20	20

Table 12: Single-phase alternating current 220-230 V AC, 50/60 Hz

Parameter	Type				
	AQ5	AQ10	AQ15	AQ25	AQ50
Nominal current [A]	0,6	0,6	0,8	1,1	1,2
Starting current [A]	0,7	0,7	1,1	1,4	1,7
Power [W]	15	15	30	40	60

Table 13: Single-phase alternating current 230 V AC, 50 Hz

Parameter	Type
	SQ120
Nominal current [A]	1,2
Starting current [A]	1,7
Power [W]	60

Table 14: Three-phase alternating current 380-415 V AC, 50 Hz

Parameter	Type					
	AQ5	AQ10	AQ15	AQ25	AQ50	SQ120
Nominal current [A]	0,3	0,3	0,3	0,3	0,4	0,3
Starting current [A]	0,5	0,5	0,5	0,5	0,8	0,8
Power [W]	30	30	30	30	70	60

Table 15: Direct current 24 V DC

Parameter	Type						
	AQ1L	AQ3L	AQ7L	AQ5	AQ10	AQ15	AQ25
Nominal current [A]	0,4	0,4	0,5	2,5	2,5	2,5	3,5
Starting current [A]	2,5	2,5	6,0	8,0	8,0	8,0	10,0
Power [W]	20	20	20	30	30	30	50

Actuator selection - liquid fluids

Table 16: Single-phase alternating current 85-260 V AC, 50 Hz and direct current 24 V DC

DN	Type	Standard actuating time [sec]
20	AQ1L	13
25		
32		
40		
50	AQ3L	15
65		
80	AQ7L	15
100		

Table 17: Single-phase alternating current 230 V AC, 50/60 Hz

DN	Type	Standard actuating time [sec]	
		For 50 Hz	For 60 Hz
20	AQ5	16	13
25			
32			
40			
50			
65			
80			
100	AQ10	25	21
125			
150	AQ15	30	25
200	AQ25	30	25
250			
300	AQ50	35	30
350			
400	SQ120	60	60
450			
500			
600	Contact KSB.		

Table 18: Direct current 24 V DC

DN	Type	Standard actuating time [sec]
20	AQ5	13
25		
32		
40		
50		
65		
80		
100		
125	AQ10	21
150		
200	AQ15	25
250	AQ25	25

8408.12/07-EN

Table 19: Three-phase alternating current 400 V AC, 50 Hz

DN	Type	Standard actuating time [sec]
20	AQ5	16
25		
32		
40		
50		
65		
80		
100	AQ10	25
125		
150	AQ15	30
200	AQ25	30
250		
300	AQ50	35
350		
400	SQ120	60
450		
500		
600	Contact KSB.	

Characteristics for AQL electric actuators

The electric actuators are based on an electric quarter-turn actuator with ISO 5211 interface.

Type	Nominal output torque [Nm]	Valve/actuator interface ISO 5211[4]	Shaft end dimensions [mm]		
			Depth	Square end	Flat end[5]
AQ1L on/off duty / positioning	15	F03, F04, F05	20	14	9
AQ3L on/off duty / positioning	30	F03, F04, F05	20	14	9
AQ7L on/off duty / positioning	70	F05, F07	25	22[6]	11 and 14

Table 20: On/off duty

Parameter	Type		
	AQ1L	AQ3L	AQ7L
Nominal torque [Nm]	15	30	70
Actuating time [sec]	13	15	15
Nominal power [W]	20	20	20
Standard equipment			
Control unit	Prewired		
Torque switch	Fail-safe position only - blocking detection		
Motor tripping	Electronic switch		
Adjustable mechanical limit switches	Non-adjustable		Adjustable
Adjustable limit switches for signalling	Yes		
Anti-condensation heater	Integrated as standard		
Manual override	Yes - hexagon head bolt 10 mm		
Power supply			
230 V AC ~, 50 Hz	Yes - same motor		
230 V AC ~, 60 Hz	Yes - same motor		
24 V AC/DC	Yes - same motor		
Connection	2 x ISO M20		
Max. cable cross-section	Cable gland not included		

Table 21: Positioning

Parameter	Type		
	AQ1L	AQ3L	AQ7L
Nominal torque [Nm]	15	30	70
Actuating time [sec]	13	15	15
Nominal power [W]	20	20	20
Standard equipment			
Control unit	4 - 20 mA		
Torque switch	Fail-safe position only - blocking detection		
Motor tripping	Electronic switch (1/Open, 1/Closed)		
Adjustable mechanical limit switches	Non-adjustable		Adjustable
Adjustable limit switches for signalling	Yes		
Anti-condensation heater	Integrated as standard		
Manual override	Yes - hexagon head bolt 10 mm		
Power supply			
230 V AC ~, 50 Hz	Yes - same motor		
230 V AC ~, 60 Hz	Yes - same motor		
24 V AC/DC	Yes - same motor		
Connection	2 x ISO M20		
Max. cable cross-section	Cable gland not included		

Characteristics for AQ electric actuators

The electric actuators are based on an electric quarter-turn actuator with ISO 5211 interface.

4 Direct mounting in the case of identical interfaces
5 On request
6 16-mm square end on request

8408.12/07-EN

Type	Nominal output torque [Nm]	Valve/actuator interface ISO 5211[7)]	Shaft end dimensions [mm]		
			Depth	Square end	Flat end
AQ5	50	F05, F07	30	16[8)]	19[9)]
AQ10	100	F05, F07	30	16[8)]	19[9)]
AQ15	150	F05, F07	30	16[8)]	19[9)]
AQ25	250	F07, F10	45	25 and 27	19 and 22[10)]
AQ50	500	F07, F10	45	25 and 27	19 and 22[10)]

Table 22: On/off duty

Parameter	Type				
	AQ5	AQ10	AQ15	AQ25	AQ50
Nominal torque [Nm]	50	100	150	250	500
Actuating time [sec]	50 Hz: 16 60 Hz: 13	50 Hz: 25 60 Hz: 21	50 Hz: 30 60 Hz: 25	50 Hz: 30 60 Hz: 25	50 Hz: 35 60 Hz: 30
Nominal power [W]	15	15	30	40	60
Standard equipment					
Control unit	Prewired				
Torque switch	Fail-safe position only - blocking detection			Torque switch	
Motor tripping	Mechanical contact				
Adjustable mechanical limit switches	Adjustable				
Adjustable limit switches for signalling	Yes				
Anti-condensation heater	Integrated as standard				
Manual override	Yes - with handwheel				
Power supply					
230 V AC ~, 50 Hz	Yes - same motor				
230 V AC ~, 60 Hz	Yes - same motor				
400 V AC, 3~, 50 Hz	Yes - same motor				
24 V AC/DC	Yes - different motor				
Connection	3 x ISO M20 + 2 x ISO M16				
Max. cable cross-section	Cable gland not included				

Table 23: Positioning

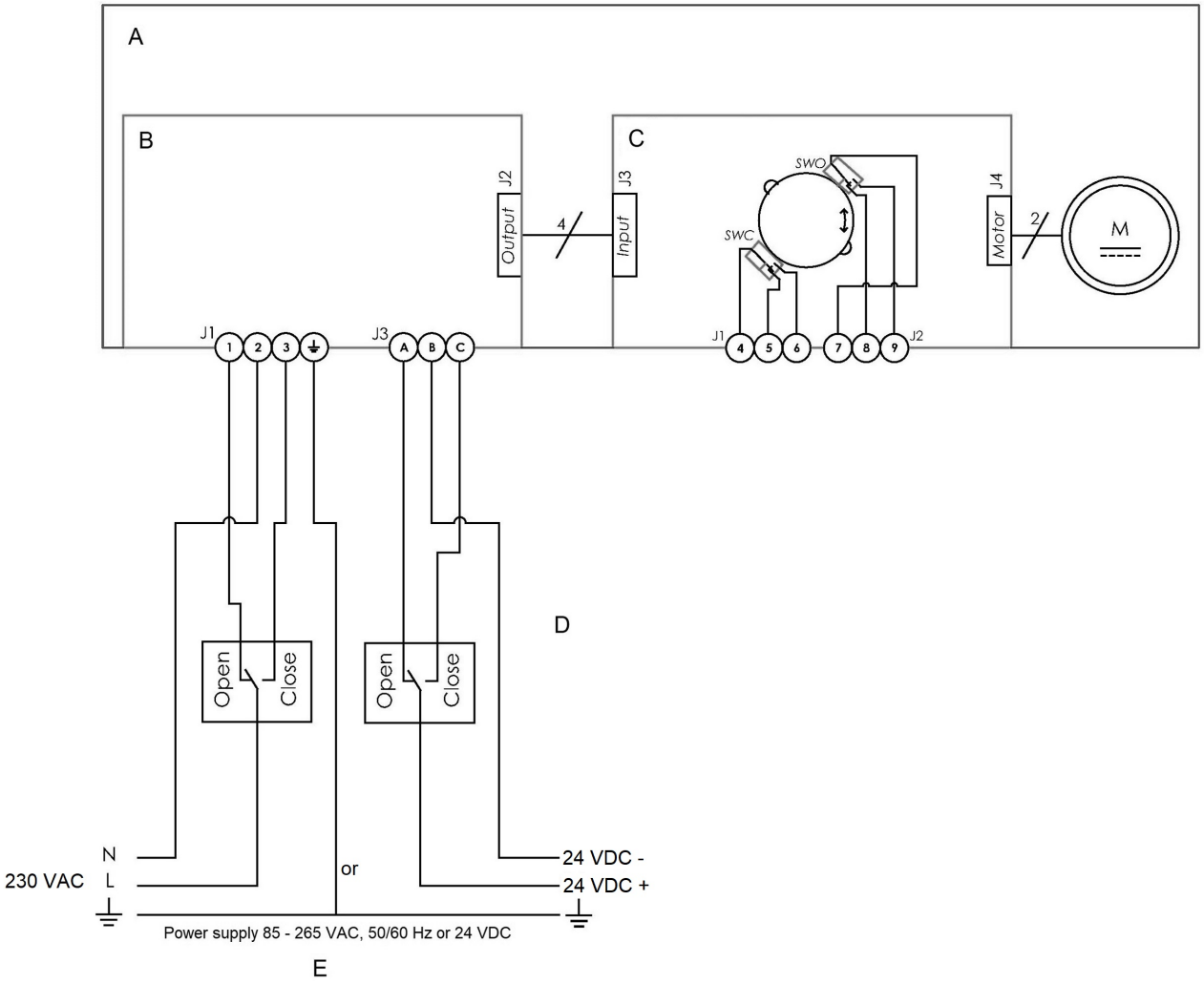
Parameter	Type				
	AQ5	AQ10	AQ15	AQ25	AQ50
Nominal torque [Nm]	50	100	150	250	500
Actuating time [sec]	50 Hz: 16 60 Hz: 13	50 Hz: 25 60 Hz: 21	50 Hz: 30 60 Hz: 25	50 Hz: 30 60 Hz: 25	50 Hz: 35 60 Hz: 30
Nominal power [W]	15	15	30	40	60
Standard equipment					
Control unit	Prewired				
Torque switch	Fail-safe position only - blocking detection			Torque switch	
Motor tripping	Mechanical contact				
Adjustable mechanical limit switches	Adjustable				
Adjustable limit switches for signalling	Yes				
Anti-condensation heater	Integrated as standard				
Manual override	Yes - with handwheel				
Power supply					
230 V AC ~, 50 Hz	Yes - same motor				
230 V AC ~, 60 Hz	Yes - same motor				

7 Direct mounting in the case of identical interfaces
8 On request
9 9-mm, 11-mm, 14-mm and 17-mm flat ends on request
10 14-mm and 17-mm flat ends on request

Parameter	Type				
	AQ5	AQ10	AQ15	AQ25	AQ50
400 V AC, 3~, 50 Hz	Yes - same motor				
Connection	3 x ISO M20 + 2 x ISO M16				
Max. cable cross-section	Cable gland not included				

8408.12/07-EN

Wiring diagram for AQL (24 V DC/230 V AC)

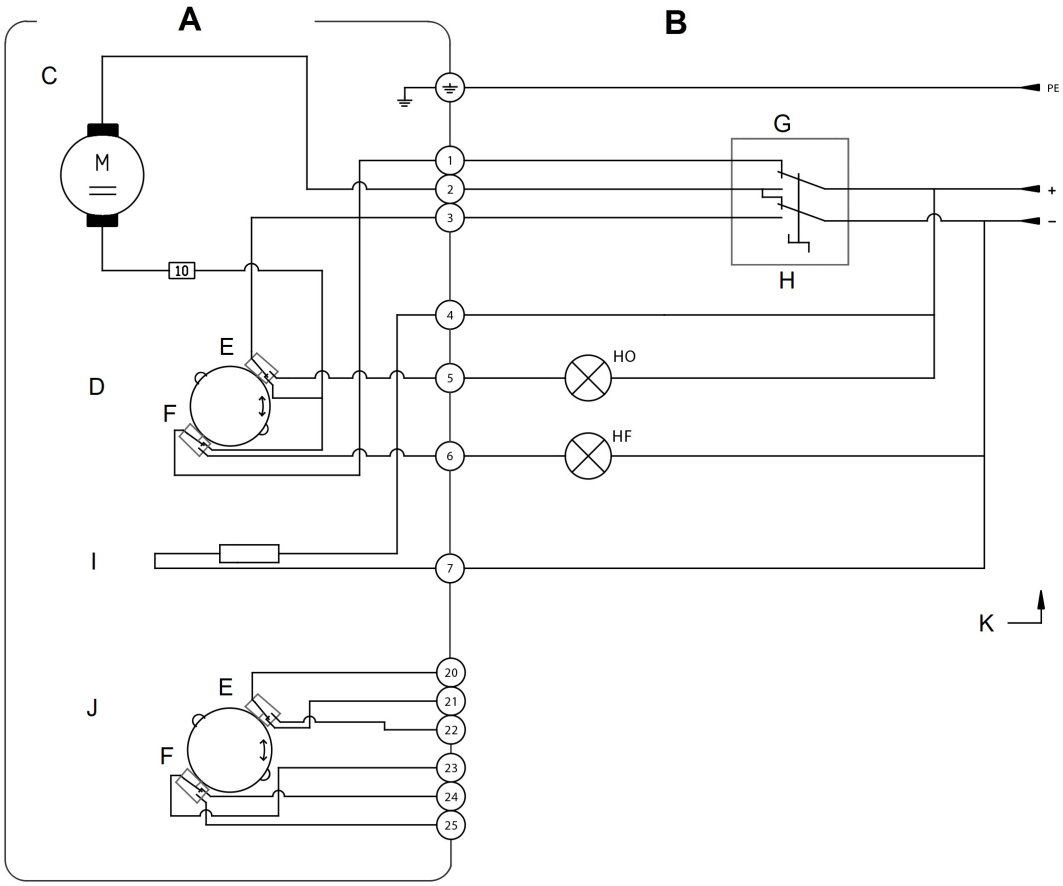


Wiring diagram for AQL

Table 24: Key

A	Actuator wiring	E	No simultaneous alternating current (V AC) and direct current (V DC) power supply
B	Power PCB	SWC	Closed
C	Switch PCB	SWO	Open
D	Connection by customer		

Wiring diagram for AQ 5/10/15 single-phase, prewired (24 V DC)



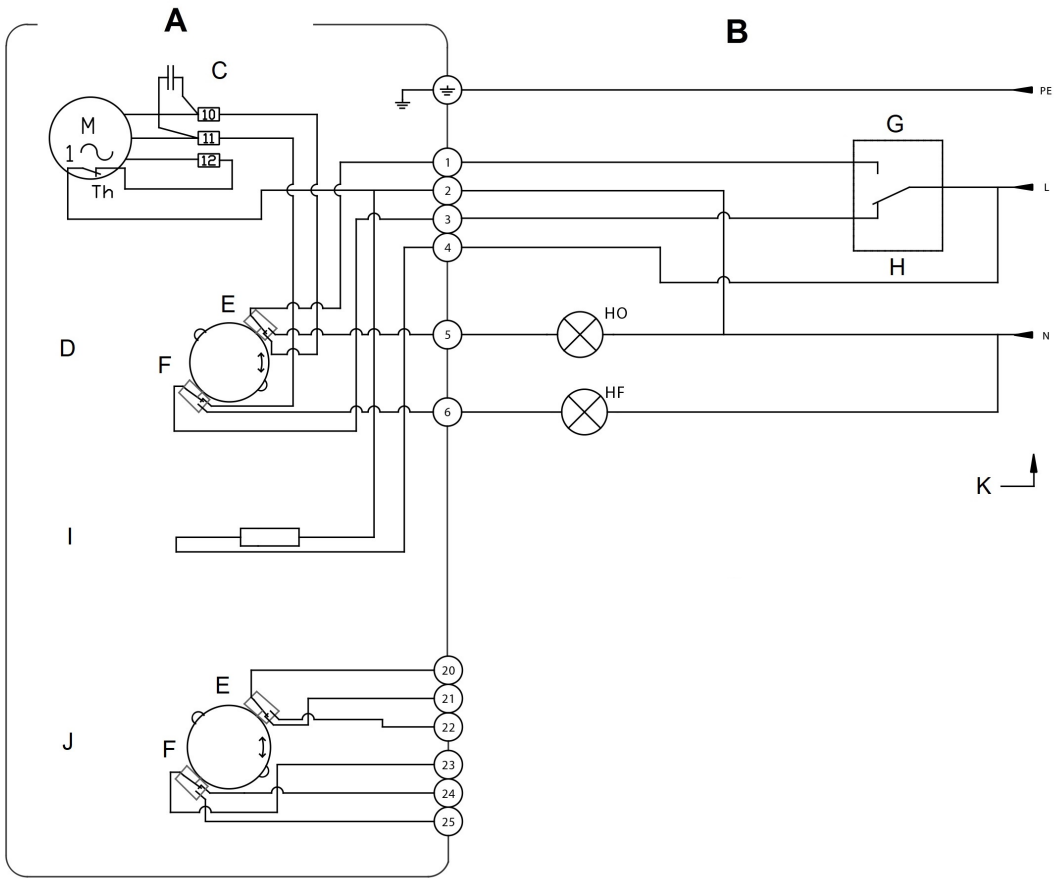
Wiring diagram for AQ 5/10/15 single-phase, prewired, 24 V DC

Table 25: Symbols key

A	Multi-turn actuator	H	Opening: opening control contact
B	Recommended customer-supplied wiring	I	Heating resistor
C	Motor	J	Additional limit switch
D	Limit switch	K	Power supply: 24 V DC
E	Open	HO	Open-position signalling
F	Closed	HF	Closed-position signalling
G	Closing: closing control contact		

8408.12/07-EN

Wiring diagram for AQ 5/10/15 three-phase, prewired (230 V AC)

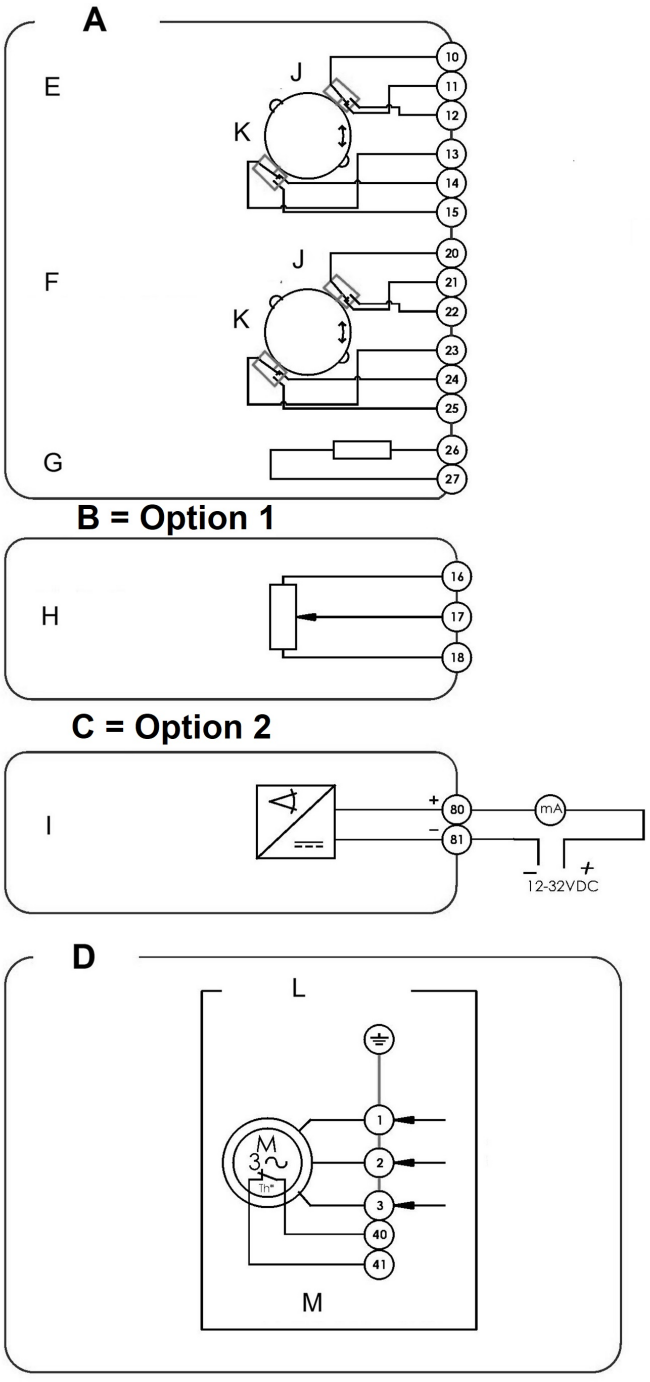


Wiring diagram for AQ 5/10/15 three-phase, prewired, 230 V AC

Table 26: Symbols key

A	Multi-turn actuator	H	Closing: closing control contact
B	Recommended customer-supplied wiring	I	Heating resistor
C	Capacitor	J	Additional limit switch
D	Limit switch	K	Single-phase power supply
E	Open	HO	Open-position signalling
F	Closed	HF	Closed-position signalling
G	Opening: opening control contact	Th	Thermal motor protection

Wiring diagram for AQ 5/10/15 three-phase, prewired (400 V AC)



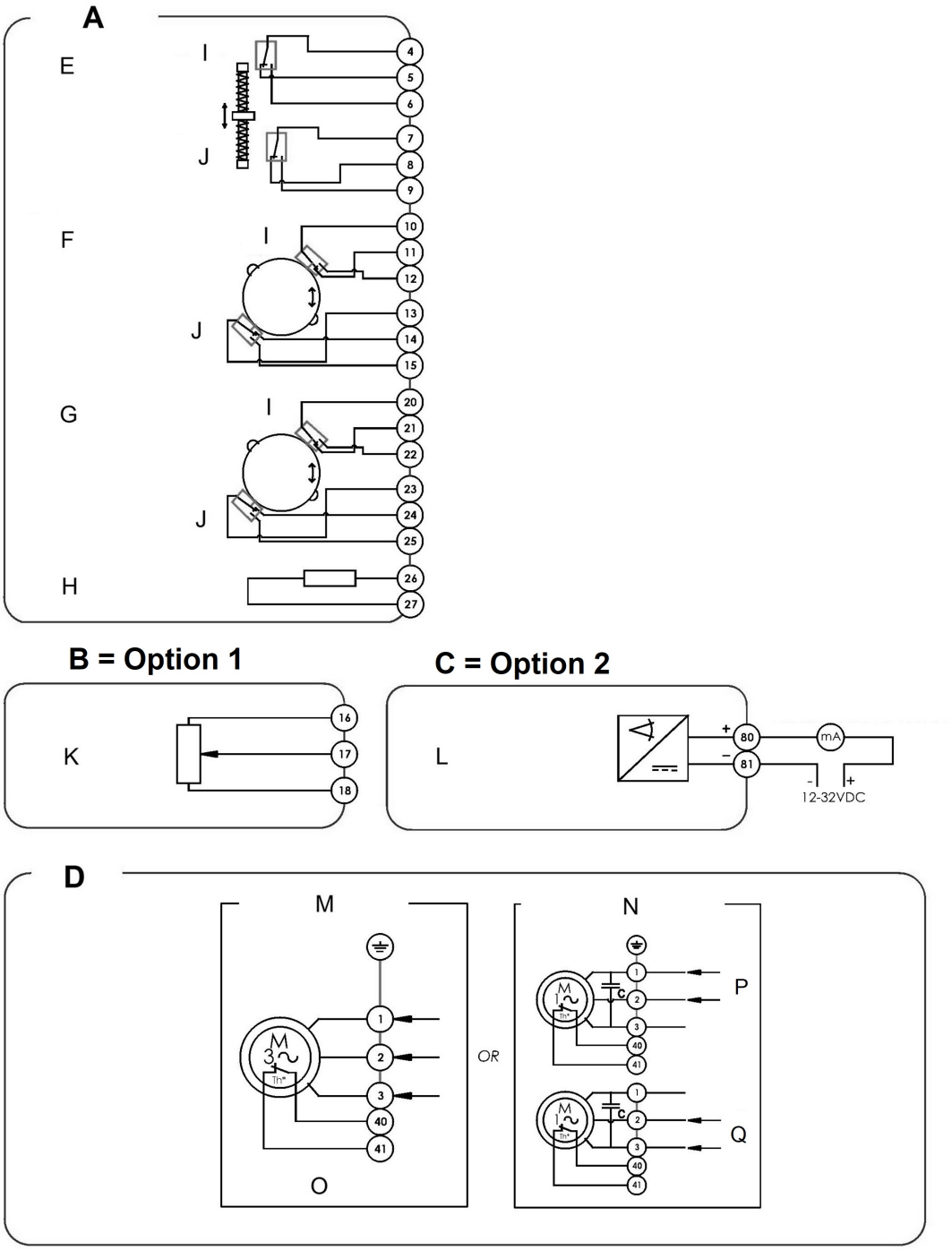
Wiring diagram for AQ 5/10/15 three-phase, prewired

Table 27: Key

A	Standard	H	Potentiometer (option 1)
B	Option 1: potentiometer	I	Positioner (option 2)
C	Option 2: positioner	J	Open
D	Motor	K	Closed
E	Limit switch	L	Three-phase actuator
F	Additional limit switch	M	Note: three-phase direct = closing
G	Heating resistor	Th	Thermal motor protection

8408.12/07-EN

Wiring diagram for AQ 25/30/50 standard (400 V AC)



Wiring diagram for AQ 25/30/50 standard

Table 28: Key

A	Standard	J	Closed
B	Option 1: potentiometer	K	Potentiometer (option 1)
C	Option 2: positioner	L	Positioner (option 2)
D	Motor	M	Three-phase actuator
E	Torque switch	N	Single-phase actuator
F	Limit switch	O	Note: three-phase direct = closing
G	Additional limit switch	P	Open
H	Heating resistor	Q	Close
I	Open		

Materials

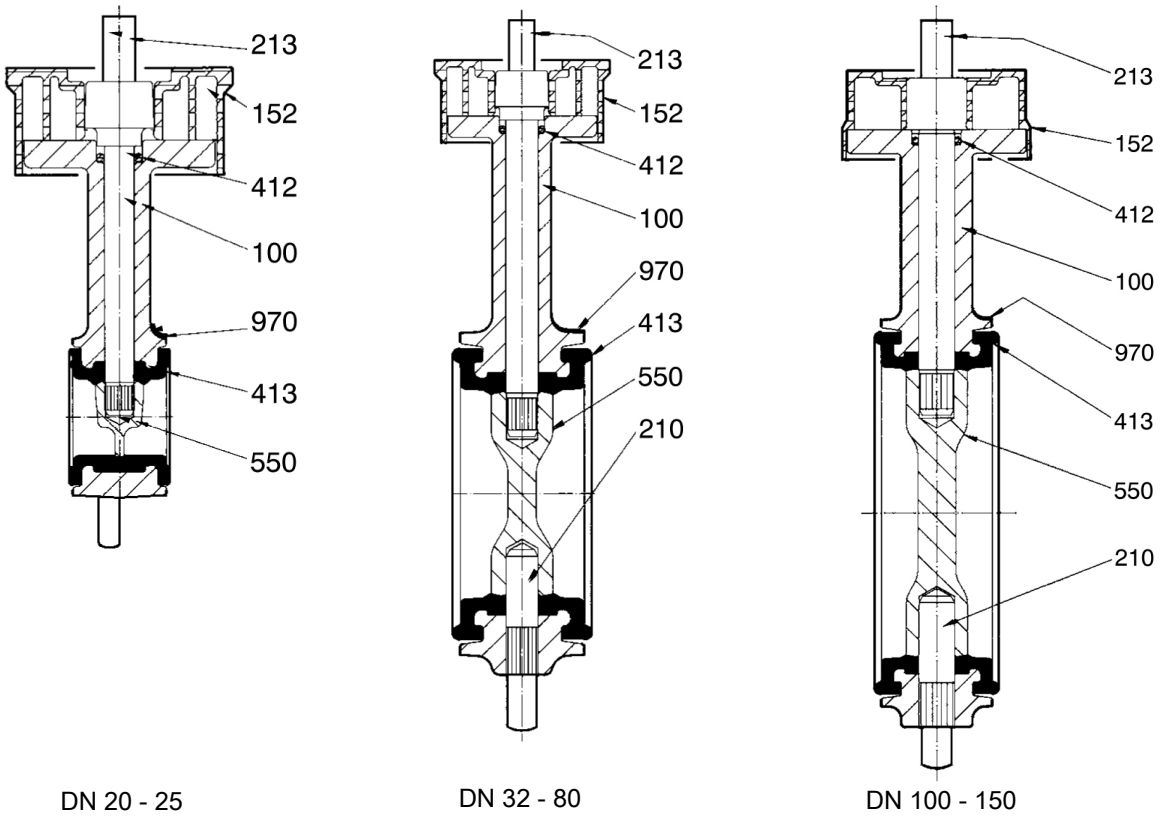


Fig. 1: Sectional drawings of BOAX-S/SF DN 20 to DN 150

8408.12/07-EN

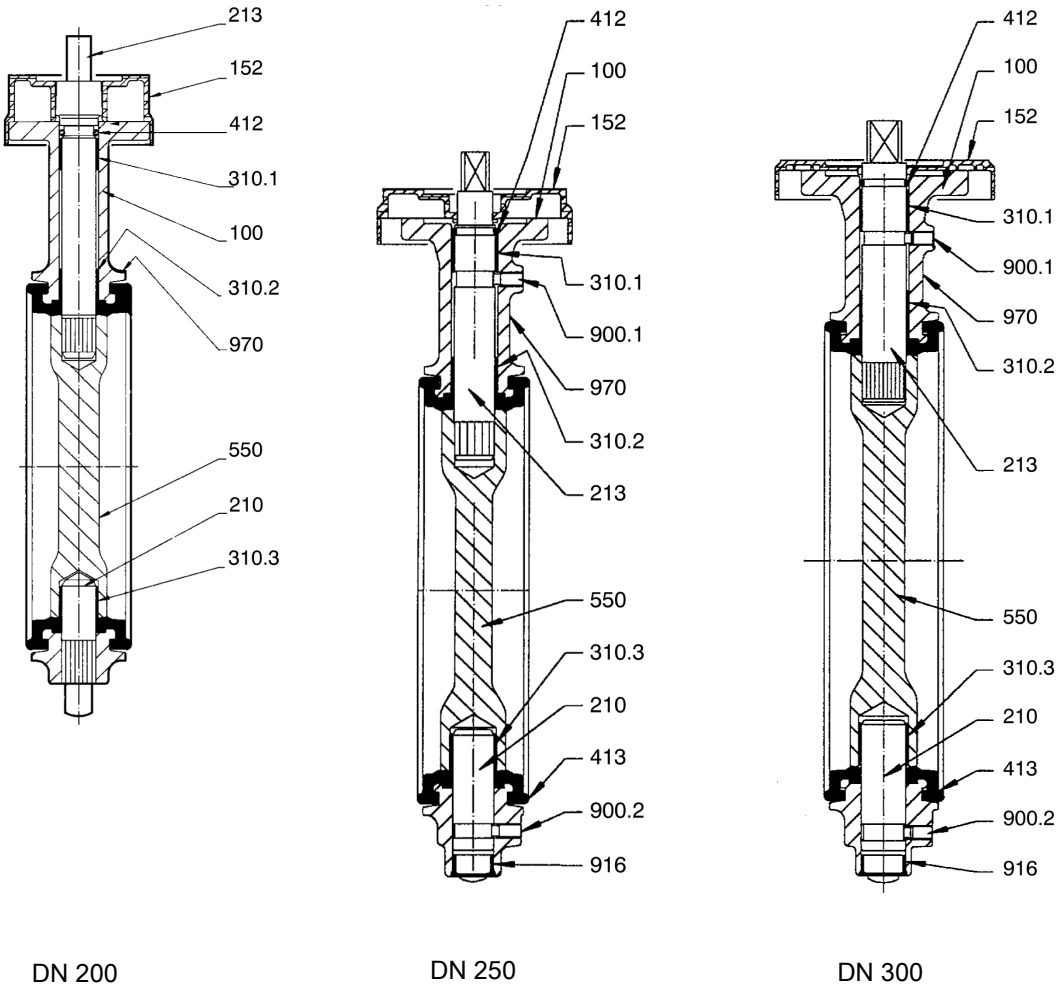


Fig. 2: Sectional drawings of BOAX-S/SF DN 200 to DN 300

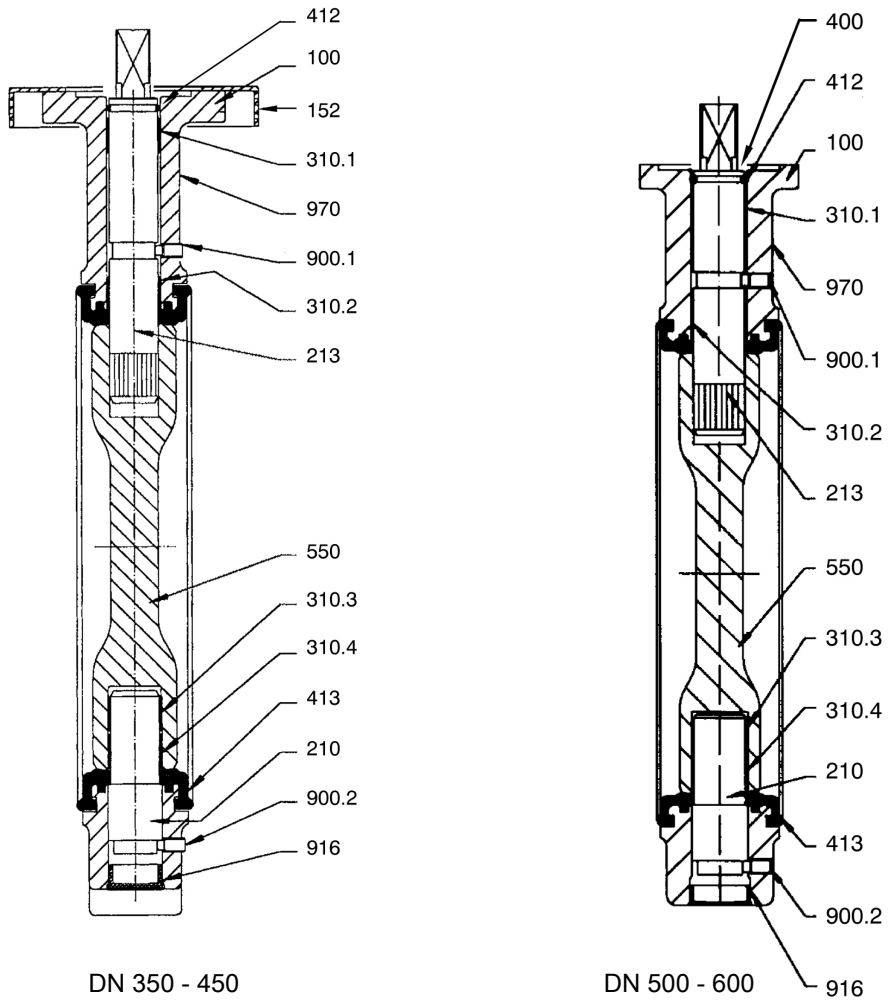


Fig. 3: Sectional drawings of BOAX-S/SF DN 350 to DN 600

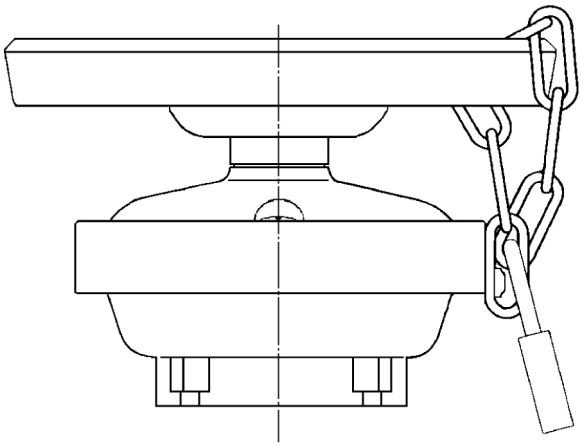
Table 29: List of components

Part No.	Description	DN	Materials	KSB code
100	Body	20 - 600	Nodular cast iron JS 1030	3g
152	Thermal barrier	20 - 450	Polyamide, glass-fibre reinforced	
210	Shaft	20 - 600	Stainless steel, 13 % chromium - 1.4029	6k
213	Actuating shaft	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	High-grade nitrile	K
550	Valve disc	20 - 600	Stainless steel 1.4301/1.4308 (18-10)	6g
901.1	Bolt	250 - 600	Stainless steel	
901.2	Bolt	250 - 600	Stainless steel	
916	Plug	250 - 600	Polyethylene	
970	Name plate	20 - 600	Adhesive label, polyester-coated	

8408.12/07-EN

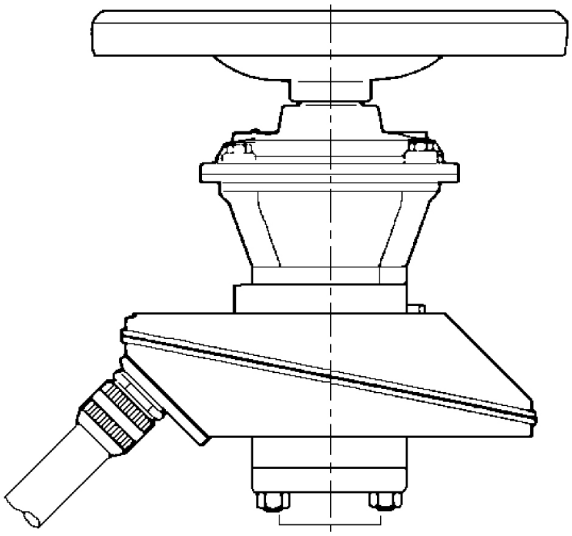
Variants

Locking by chain



Locking arrangement of MA manual gearbox (chain and padlock)

AMTROBOX limit switch box



AMTROBOX M limit switch box for MA manual gearbox

MR manual gearbox and handwheel extension

For some applications, the handwheel needs to be fitted at a distance from the manual gearbox.
This is accomplished by fitting a handwheel extension:

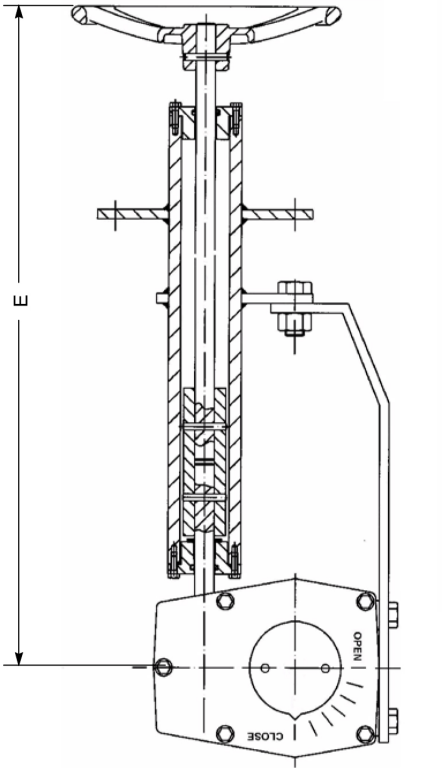
- Extension made of steel, with polyurethane coating, RAL 7016, thickness 80 µm (standard version)
- Actuating shaft and bolting made of stainless steel
- Handwheel (identical to standard handwheel of the manual gearbox)

Maximum extension (dimension E): 3 m. Longer extensions on request. Minimum length see table below.
Fitting an extra support is strongly recommended to safeguard the rigidity of the assembly. It must be supplied and fitted by the customer at the site.

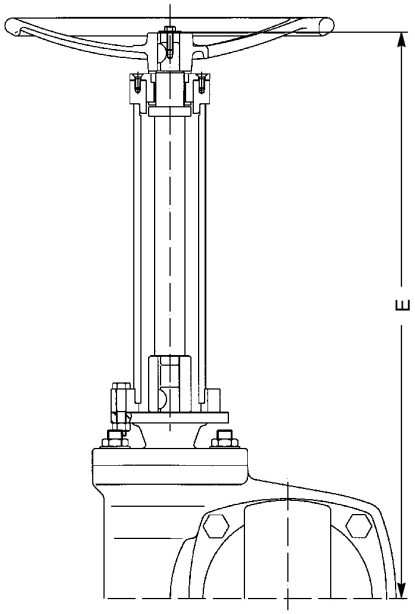
Recommended set-up for this version:

- Valve fitted in a horizontal position
- MR fitted with the actuating shaft in the vertical position
- Extension fitted with the axis in the vertical position

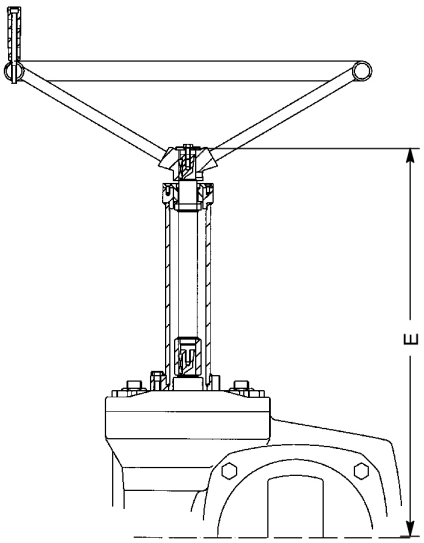
MR 25 to 200



MR 400, 800 and 1600



MR 600 and 1200



Type	E min.
MR	[mm]
25	500
50	550
100	600
200	600
400	500
600	500
800	500
1200	600
1600	600

Simpler solutions are available for the MR 25 to 200 models, provided that the actuating shaft is perfectly guided at the site. Contact KSB.

8408.12/07-EN

Dimensions and weights

Dimensions and weights of BOAX-S

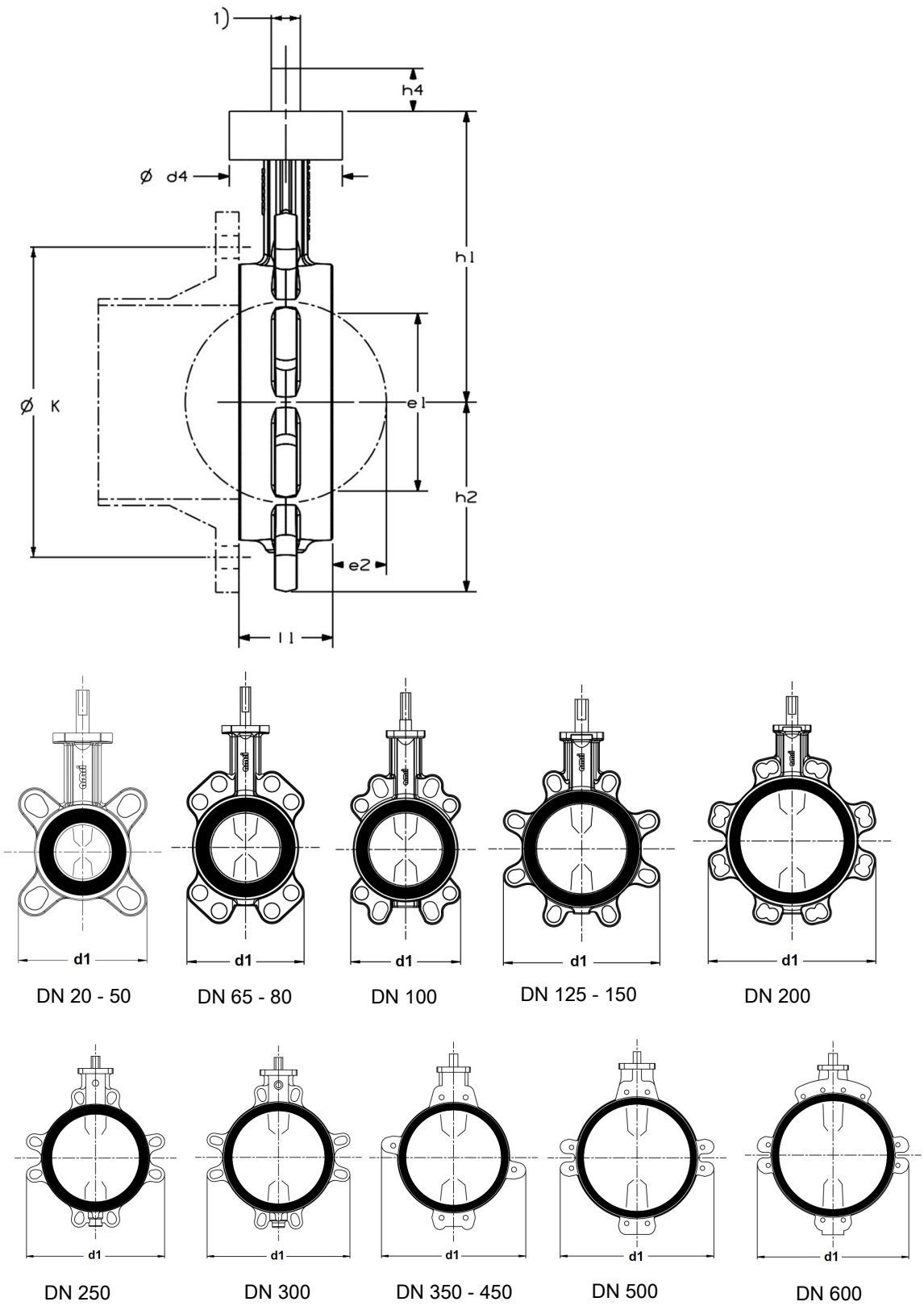


Fig. 4: Sectional drawings of BOAX-S

Table 30: Dimensions and weights

DN	l1	d1	d4	h1	h2	Top flange to ISO 5211		Flat shaft end			Square shaft end		Valve disc		[kg]
						No.	h4	⍁ s	Ø z	h3	⍁ s	h3	e1	e2	
	[mm]	[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
20/25	27	84	70	111	41,5	F05	40	9	12	11	-	-	15	2	0,6
32	27	101	70	115	50,3	F05	40	9	12	11	-	-	31	5	0,9
40	33	108	70	133	53,9	F05	40	9	12	15	-	-	32	4	1,2
50	43	118	70	137,5	58,8	F05	40	9	12	15	-	-	33	4	1,5
65	46	132	70	164	82	F05	40	9	12	21	-	-	55	11	2,2
80	46	138	70	170	88,9	F05	40	9	12	21	-	-	71	17	2,8
100	52	150	70	191	103	F05	40	11	14	24	-	-	90	23	4,4
125	56	234	70	204,5	117,3	F05	40	11	14	24	-	-	119	35	5,6
150	56	260	95	224	130	F07	42	17	22	25	-	-	144	46	7,8
200	60	322	95	252	161	F07	42	17	22	25	-	-	196	69	11,9
250	68	394	133	275	197	F10	38	-	-	-	19	25	249	92	17,8
300	78	462	158	290	231	F12	28,5	-	-	-	22	29	297	111	32,0
350	78	538	183	338	269	F12	29	-	-	-	25	40	326	127	60,0
400	102	604	183	383	302	F14	29	-	-	-	36	50	370	140	80,0
450	114	656	183	413	329	F14	29	-	-	-	36	55	422	160	110,0
500	127	716	-	440	359	F14	29	-	-	-	36	55	478	178	145,0
600	154	836	-	495	439	F16	29	-	-	-	50	65	566	215	220,0

8408.12/07-EN

Connection in acc. with EN 1092-1 for BOAX-S

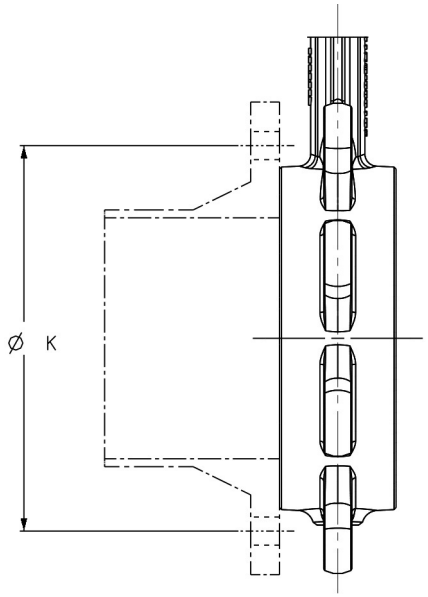


Fig. 5: Connection for BOAX-S

Table 31: Bolt circle diameter [mm]

DN	Bolt circle diameter Ø K		
	PN 6	PN 10	PN 16
20/25	75	85	85
32	90	100	100
40	100	110	110
50	110	125	125
65	130	145	145
80	150	160	160
100	170	180	180
125	200	210	210
150	225	240	240
200	280	295	295
250	335	350	355
300	395	400	410
350	-	460	470
400	-	515	525
450	-	565	585
500	-	620	650
600	-	725	770

8408.12/07-EN

Dimensions and weights of BOAX-SF

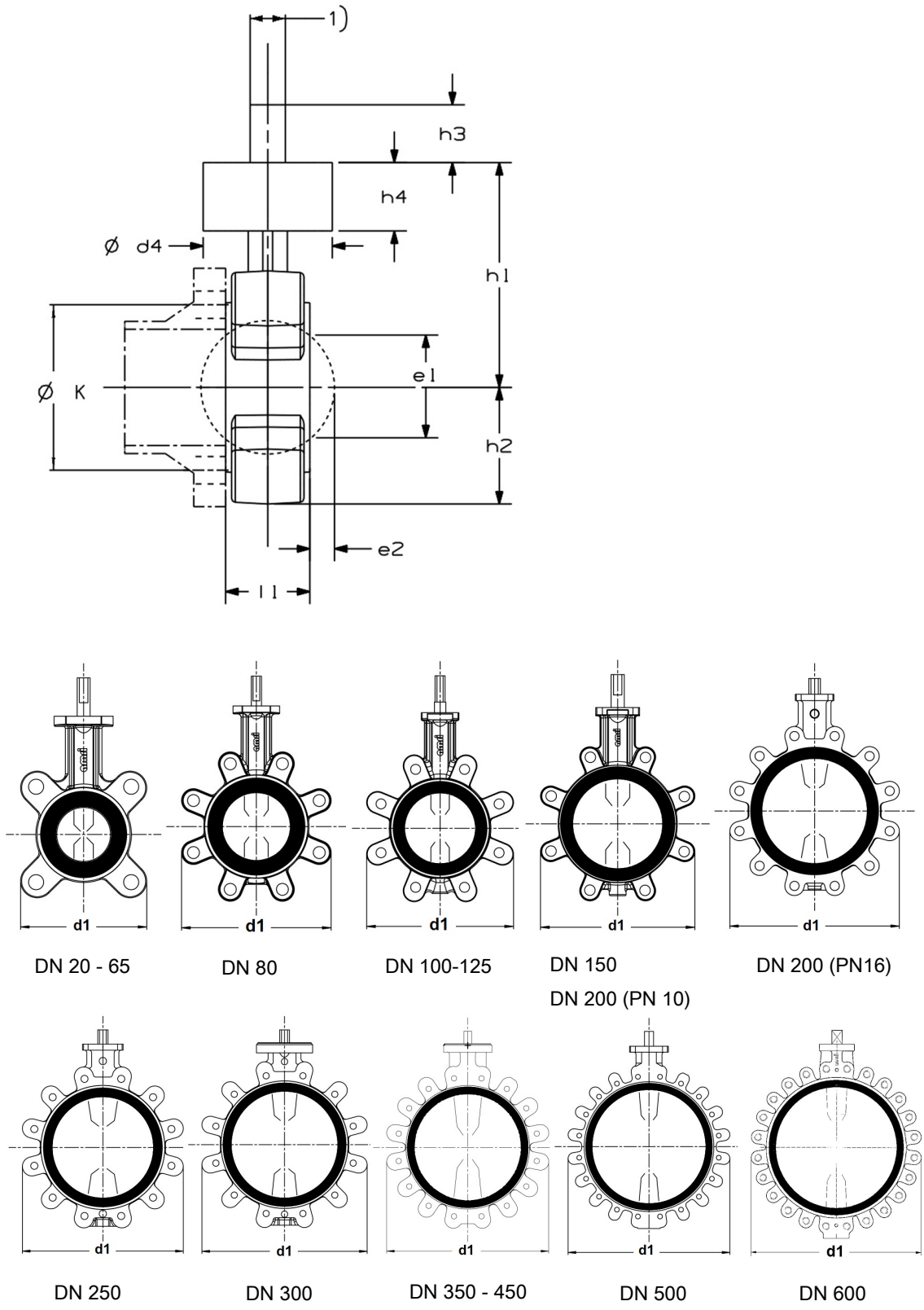


Fig. 6: Sectional drawings of BOAX-SF

8408.12/07-EN

Table 32: Dimensions and weights

DN	PN	l1	d1	d4	h1	h2	Top flange to ISO 5211		Flat shaft end			Square shaft end		Valve disc		[kg]
							No.	h4	⍁ s	Ø z	h3	⍁ s	h3	e1	e2	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
20	10/16	27	88	70	111	41,5	F05	40	9	12	11	-	-	15	2	1,0
25	10/16	27	88	70	111	41,5	F05	40	9	12	11	-	-	15	2	1,0
32	10/16	33	108	70	133	50,3	F05	40	9	12	11	-	-	31	5	2,0
40	10/16	33	108	70	133	53,9	F05	40	9	12	15	-	-	32	4	2,0
50	10/16	43	120	70	137,5	58,8	F05	40	9	12	15	-	-	33	4	2,5
65	10/16	46	134	70	164	82	F05	40	9	12	21	-	-	55	11	3,0
80	10/16	46	178	70	170	88,9	F05	40	9	12	21	-	-	71	17	4,5
100	10/16	52	210	70	191	103	F05	40	11	14	24	-	-	90	23	5,5
125	10/16	56	236	70	204,5	117,3	F05	40	11	14	24	-	-	119	35	9,0
150	10/16	56	260	95	224	130	F07	42	17	22	25	-	-	144	46	11,0
200	10	60	312	95	252	156	F07	42	17	22	25	-	-	196	69	24,0
200	16	60	322	95	252	161	F07	42	17	22	25	-	-	196	69	25,0
250	10	68	396	133	275	198	F10	38	-	-	-	19	25	249	92	39,0
300	10	78	466	158	290	233	F12	28,5	-	-	-	22	29	297	111	46,0
350	10	78	530	183	338	265	F12	29	-	-	-	25	40	326	127	70,0
400	10	102	598	183	383	296	F14	29	-	-	-	36	50	370	140	101,0
450	10	114	656	183	413	329	F14	29	-	-	-	36	55	422	160	160,0
500	10	127	708	-	440	359	F14	27	-	-	-	36	55	478	178	179,0
600	10	154	822	-	495	439	F16	27	-	-	-	50	65	566	215	256,0

Connection in acc. with EN 1092-1 for BOAX-SF

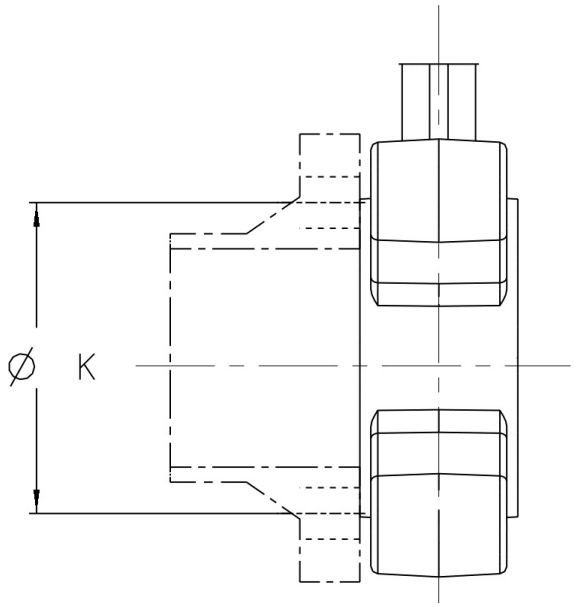


Fig. 7: Connection for BOAX-SF

Table 33: Bolt circle diameter Ø K

DN	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

8408.12/07-EN

Dimensions and weights of BOAX-S/SF + LP lever

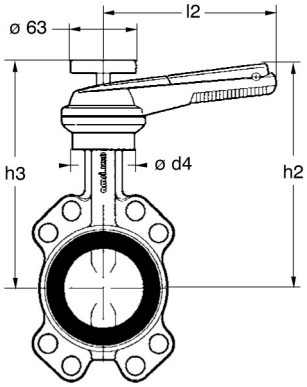


Fig. 8: Unit comprising BOAX-S + LP lever

Table 34: Dimensions and weights of BOAX-S/SF with LP lever

DN	l2	h2	h3	d4	BOAX-S	BOAX-SF
	[mm]	[mm]	[mm]	[mm]	[kg][11)]	[kg][11)]
20/25	165	163,1	156	70	1,1	-
20	165	163,1	156	70	-	1,3
25	165	163,1	156	70	-	1,3
32	165	167,1	178	70	1,5	2,6
40	165	185,1	178	70	1,8	2,6
50	165	189,6	183	70	2,1	3,1
65	165	216,1	209	70	2,8	3,6
80	165	222,1	215	70	3,4	5,1
100	230	253	253	70	5,2	6,3
125	230	256	266	70	6,2	9,8
150	330	298	298	95	9,1	12,3
200	330	326	326	95	13,2	25,3
250	460	374	374	133	20,1	41,3

11 The weights given refer to the valve + actuating element.

Dimensions and weights of BOAX-S/SF + MA manual gearbox

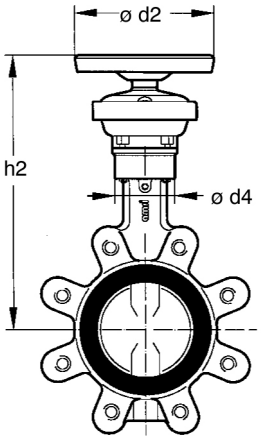


Fig. 9: Unit comprising BOAX-SF + MA manual gearbox

Table 35: Dimensions and weights of BOAX-S/SF with MA manual gearbox – DN 20 - 250

DN	Type	d2	h2	d4	BOAX-S	BOAX-SF
		[mm]	[mm]	[mm]	[kg][12)]	[kg][12)]
20/25	MA12	140	198	60	2,1	-
20	MA12	140	195	60	-	2,5
25	MA12	140	198	60	-	2,5
32	MA12	140	202	60	2,4	3,5
40	MA12	140	220	60	2,7	3,5
50	MA12	140	225	60	3,0	4,0
65	MA12	140	251	60	3,7	4,5
80	MA12	140	257	60	4,3	6,0
100	MA12	140	285	70	5,9	7,0
125	MA12	140	299	70	7,1	10,5
150	MA25	225	355	95	10,8	14,0
200	MA25	225	383	95	14,9	27,0
250	MA25	225	406	133	20,8	42,0

8408.12/07-EN

12 The weights given refer to the valve + actuating element.

Dimensions and weights of BOAX-S/SF + MN and MR manual gearboxes

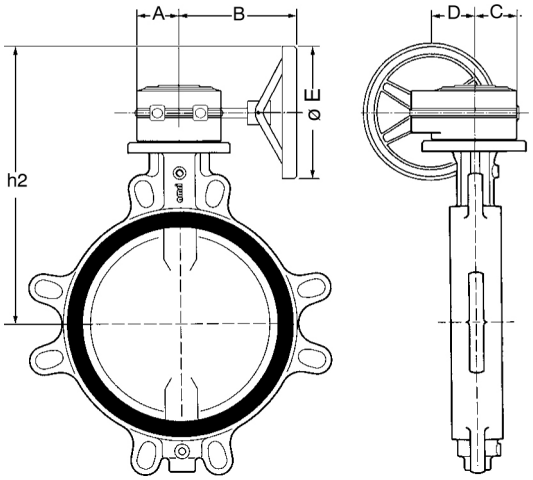


Fig. 10: Unit comprising BOAX-S + MN/MR manual gearbox

Table 36: Dimensions and weights of BOAX-S/SF with MN and MR manual gearboxes – DN 20 - 250

DN	Type	A	B	C	D	ØE	h2	BOAX-S	BOAX-SF
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg][13)]	[kg][13)]
150	MN25	46	140	38	41	200	318	9,7	12,9
200	MR25	62	184	66	64	225	403	18,9	32,0
250	MR25	62	184	66	64	225	426	24,8	46,0
300	MR50	74	184	77	76	225	453	42,0	56,0
350	MR50	74	184	77	76	225	501	70,0	80,0
400	MR100	86	233	88	88	350	595	95,0	116,0
450	MR100	86	233	88	88	350	625	125,0	175,0
500	MR100	86	233	88	88	350	677	160	194,0
600	MR200	120	270	108	117	350	743	244	280,0

8408.12/07-EN

13 The weights given refer to the valve + actuating element.

Dimensions and weights of BOAXMAT-S and BOAXMAT-SF

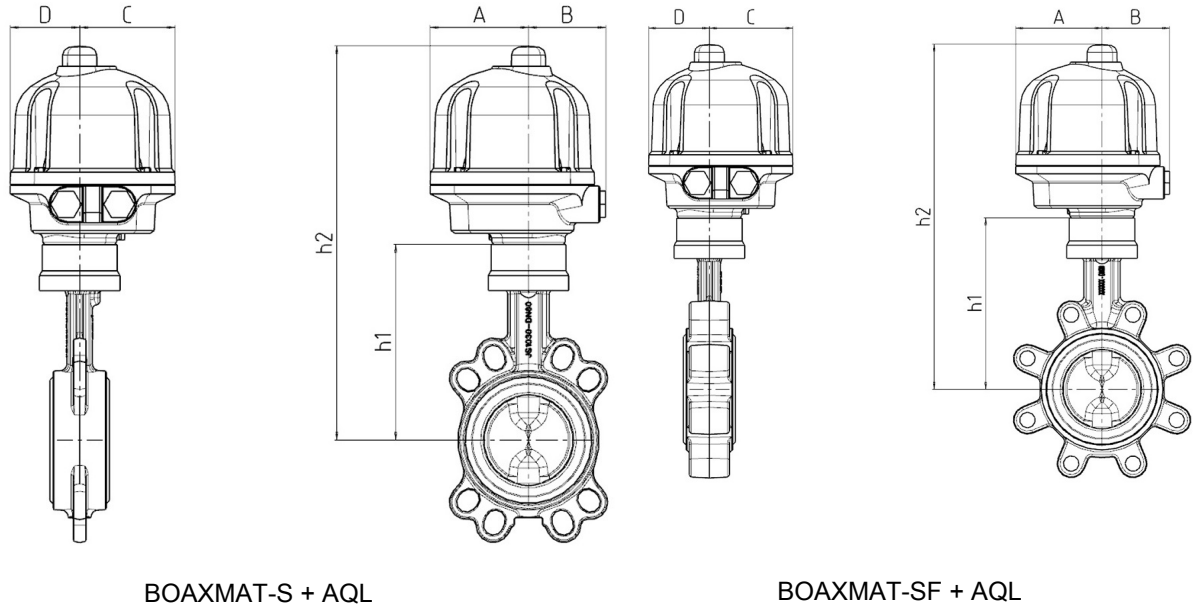


Fig. 11: Sectional drawings of BOAXMAT-S/SF with AQL

Table 37: Dimensions and weights of BOAXMAT-S/SF with AQL

DN	PS	Type	A (230V)	B	C	D	h1	h2	BOAX-S	BOAX-SF
	[bar]			[mm]	[mm]	[mm]	[mm]	[mm]	[kg][14)]	[kg][14)]
20/25	10/16	AQ1L	67	85	83	60	104	277	3,1	-
20	10/16	AQ1L	67	85	83	60	104	277	-	3,5
25	10/16	AQ1L	67	85	83	60	104	277	-	3,5
32	10/16	AQ1L	67	85	83	60	108	281	3,4	4,5
40	10/16	AQ1L	67	85	83	60	126	299	3,7	4,5
50	10/16	AQ3L	67	85	83	60	131	304	4,0	5,0
65	10/16	AQ3L	67	85	83	60	157	330	4,7	5,5
80	10/16	AQ7L	67	85	83	60	163	354	5,8	7,5
100	10/16	AQ7L	67	85	83	60	191	382	7,4	8,5
125	10/16	Contact KSB.								

8408.12/07-EN

14 The weights given refer to the valve + actuating element.

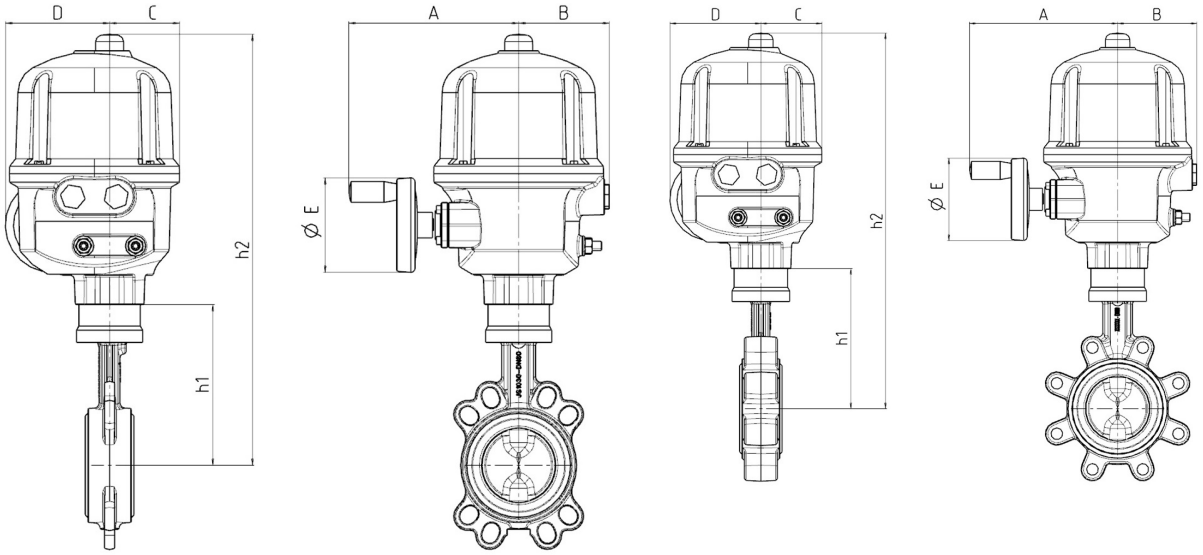


Fig. 12: Sectional drawings of BOAXMAT-S/SF with AQ or SQ

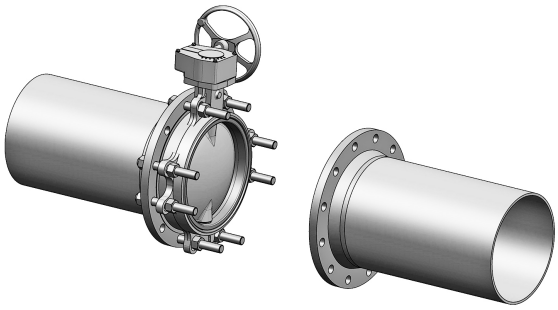
Table 38: Dimensions and weights of BOAXMAT-S/SF with AQ or SQ

DN	PS	Type	A	B	C	D	E	h1	h2	BOAX-S	BOAX-SF
	[bar]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg][14)]	[kg][14)]
20/25	10/16	AQ5	180	96	74	110	100	104	390	10,6	-
20	10/16	AQ5	180	96	74	110	100	104	390	-	11,0
25	10/16	AQ5	180	96	74	110	100	104	390	-	11,0
32	10/16	AQ5	180	96	74	110	100	108	394	10,9	12,0
40	10/16	AQ5	180	96	74	110	100	126	412	11,2	12,0
50	10/16	AQ5	180	96	74	110	100	131	417	11,5	12,5
65	10/16	AQ5	180	96	74	110	100	157	443	12,2	13,0
80	10/16	AQ5	180	96	74	110	100	163	449	12,8	14,5
100	10/16	AQ10	180	96	74	110	100	191	477	14,4	15,5
125	10/16	AQ10	180	96	74	110	100	205	491	15,6	19,0
150	10/16	AQ15	180	96	74	110	100	224	510	17,8	21,0
200	10/16	AQ15	248	117	86	138	100	252	569	24,9	37,0
250	10	AQ25	248	117	86	138	100	275	603	30,8	52,0
300	10	AQ50	248	117	86	138	100	290	618	47,0	61,0
350	10	AQ50	310	117	86	174	200	338	666	75,0	85,0
400	10	SQ120	Contact KSB.							117,0	138,0
450	10	SQ120	Contact KSB.							147,0	197,0
500	10	SQ120	Contact KSB.							182,0	216,0

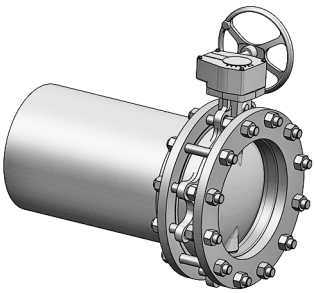
Installation information

Dead-end service and downstream dismantling of BOAX-S and BOAX-SF

BOAX-S

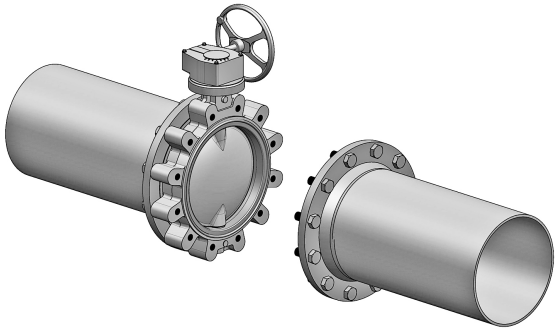


Downstream dismantling

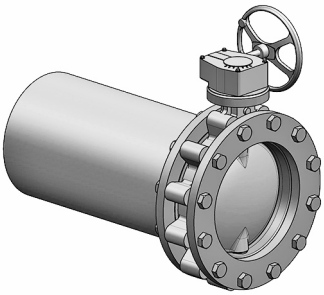


Dead-end service

BOAX-SF



Downstream dismantling



Dead-end service

8408.12/07-EN

Flange connection bolts

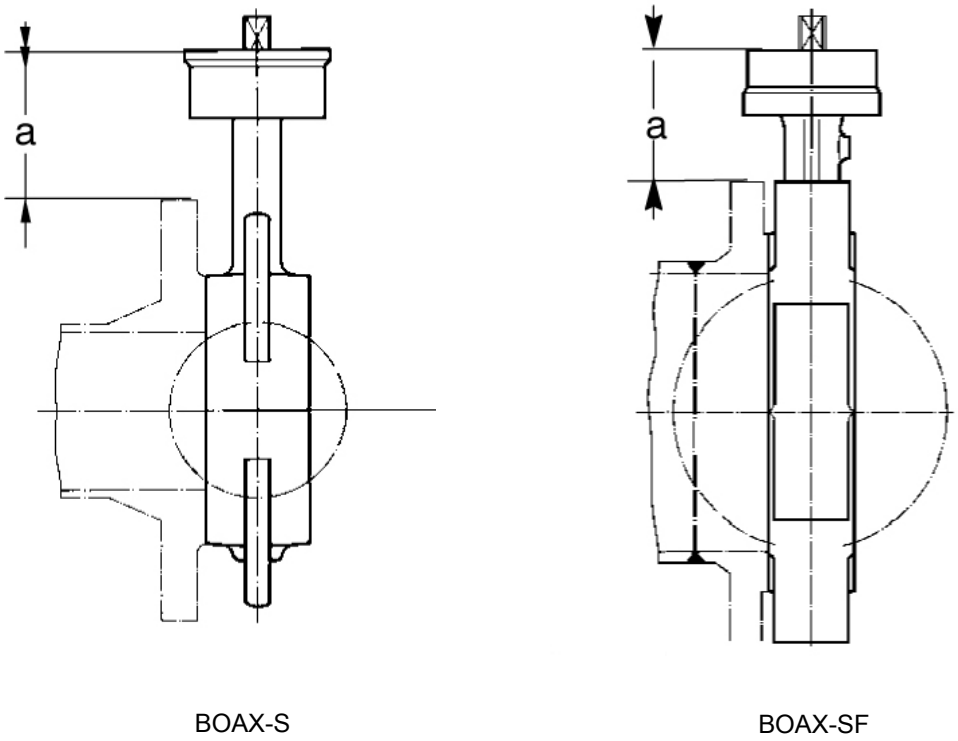


Fig. 13: Flange connection for BOAX-S and BOAX-SF

Table 39: BOAX-S – Dimensions [mm]

DN	EN 1092 PN 6 Type 11		EN 1092 PN 10 Type 11		EN 1092 PN 16 Type 11	
	a	Bolt size	a	Bolt size	a	Bolt size
Bolt/Nut						
20/25	54,0	4 x M10 x 75	46,5	4 x M12 x 80	46,5	4 x M12 x 80
32	48,0	4 x M12 x 80	38,0	4 x M16 x 85	38,0	4 x M16 x 85
40	61,0	4 x M12 x 80	51,0	4 x M16 x 85	51,0	4 x M16 x 85
50	60,5	4 x M12 x 90	48,0	4 x M16 x 100	48,0	4 x M16 x 100
65	77,0	4 x M12 x 90	64,5	8 x M16 x 100	64,5	8 x M16 x 100
80	68,0	4 x M16 x 100	63,0	8 x M16 x 110	63,0	8 x M16 x 110
100	86,0	4 x M16 x 110	81,0	8 x M16 x 110	81,0	8 x M16 x 110
125	84,5	8 x M16 x 115	79,5	8 x M16 x 120	79,5	8 x M16 x 120
150	91,5	8 x M16 x 115	81,5	8 x M20 x 130	81,5	8 x M20 x 120
200	92,0	8 x M16 x 125	82,0	8 x M20 x 130	82,0	12 x M20 x 130
250	87,5	12 x M16 x 135	77,5	12 x M20 x 150	72,5	12 x M24 x 150
300	69,5	12 x M20 x 150	67,0	12 x M20 x 160	59,5	12 x M24 x 160
Threaded rods						
350	-	-	90,0	(10 x M20 x 180) + (12 x M20 x 50)	82,5	(10 x M24 x 195) + (12 x M24 x 55)
400	-	-	100,5	(10 x M24 x 210) + (12 x M24 x 50)	93,0	(10 x M27 x 230) + (12 x M27 x 60)
450	-	-	105,5	(12 x M24 x 230) + (16 x M24 x 55)	93,0	(12 x M27 x 260) + (16 x M27 x 70)
500	-	-	108,0	(12 x M24 x 240) + (16 x M24 x 55)	85,5	(12 x M30 x 285) + (16 x M30 x 75)
600	-	-	107,0	(10 x M27 x 290) + (20 x M27 x 60)	77,0	(10 x M33 x 340) + (20 x M33 x 90)
When threaded rods or double-ended studs are used, at least 1 nut height must be added to the above bolt lengths.						

Table 40: BOAX-SF – Dimensions [mm]

DN	EN 1092 PN 10 Type 11		EN 1092 PN 16 Type 11	
	a	Bolt size	a	Bolt size
Bolt/Nut				
20	51,5	8 x M12 x 30	51,5	8 x M12 x 30
25	46,5	8 x M12 x 30	46,5	8 x M12 x 30
32	38,0	8 x M16 x 30	38,0	8 x M16 x 30
40	51,0	8 x M16 x 30	51,0	8 x M16 x 30
50	48,0	8 x M16 x 35	48,0	8 x M16 x 35
65	64,5	16 x M16 x 35	64,5	16 x M16 x 35
80	63,0	16 x M16 x 40	63,0	16 x M16 x 40
100	81,0	16 x M16 x 40	81,0	16 x M16 x 40
125	79,5	16 x M16 x 40	79,5	16 x M16 x 40
150	81,5	16 x M20 x 45	81,5	16 x M20 x 45
200	82,0	16 x M20 x 50	82,0	24 x M20 x 50
250	77,5	24 x M20 x 50	72,5	24 x M24 x 50
300	67,0	24 x M20 x 50	59,5	24 x M24 x 50
Threaded rods				
350	90,0	32 x M20 x 55	82,5	32 x M24 x 60
400	100,5	32 x M24 x 60	93,0	32 x M27 x 70
450	105,5	40 x M24 x 60	93,0	40 x M27 x 70
500	108,0	40 x M24 x 60	85,5	40 x M30 x 80
600	107,0	40 x M27 x 70	77,0	40 x M33 x 90
When threaded rods or double-ended studs are used, at least 1 nut height must be added to the above bolt lengths.				

8408.12/07-EN

Insulation dimensions

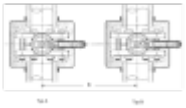


Fig. 14: Minimum spacing b between manifold branches

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

Table 41: Minimum spacings b [mm]

Size	DN	BOAX-S/SF size A																		
		20/25	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
BOAX-S/SF size B	20/25	245	-	-	250	265	270	295	305	310	325	340	370	410	430	487	532	572	612	672
	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

The butterfly valves are 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 travel stops.

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

Full motor protection is only assured if the temperature switch mounted in the winding has been connected correctly.

The actuators are stopped by means of the travel stops.

The torque switches of the actuators act as safety trips. They trip the actuator via the control unit in the event of a fault and simultaneously signal the fault.

The torque switches are momentary-contact switches.

10/06/2021

8408.12/07-EN

KSB S.A.S.
4, allée des Barbanniers • 92635 Gennevilliers Cedex (France)
Tél. 09 69 39 29 79
www.ksb.fr