

technical documentation

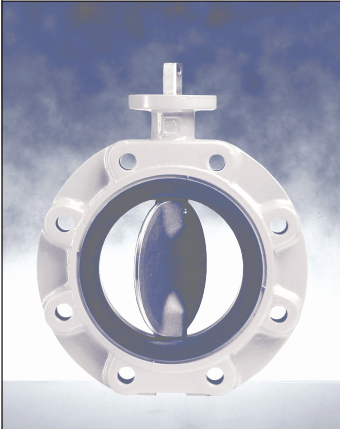
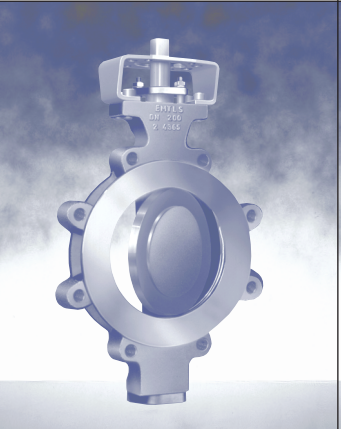


pneumatic actuators

electric actuators

hydraulic actuators



1.4 SUMMARY OF OUR SALES PROGRAMME

1.4.1 Butterfly valves and check valves

Eurovalve range, centric rubberlined butterfly valves, DN40 - DN2000	Eurovalve range, double eccentric high-performance butterfly valves DN80 - DN600	Centric, PTFE lined butterfly valves, DN25 - DN1200	Euro check range, double disc wafer type, rubber seal, check valves DN50 - DN600
			

1.4.2 Manual operators

Wormgear operators for open/close and regulating purposes

Lever operator for open/close and regulating purposes	Wormgear operators for open/close and regulating purposes
	

NB: Detailed Technical Documentation of the above programme is available on request.

1.5 ACTUATION PHILOSOPHY





The Wouter Witzel product philosophy for actuation is being able to supply, out of a wide spectrum of brands and types, the optimum solution for each specific case of valve actuation, according to the requirements of different market segments and customers. In order to match the desired quality, specification, performance at the right price, we classify the actuators into three categories viz.:

- **Economic category**
- **General purpose category**
- **Heavy duty category**

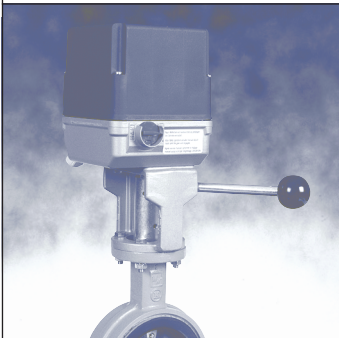



1.5.1 Valve actuators

Wouter Witzel has carefully compiled a very complete and balanced programme of pneumatic, electric and hydraulic actuators with many optional ancillaries.


PNEUMATIC ACTUATORS

ECONOMIC Range AT	GENERAL PURPOSE Range E/P	GENERAL PURPOSE Range GT	HEAVY DUTY Range TPN
			
Design: Rack and pinion type, double and single acting <i>(shown with solenoid valve)</i>	Design: Rack and pinion, double and single acting <i>(shown with manual override)</i>	Design: Rack and pinion, double and single acting <i>(shown with positioner)</i>	Design: Long stroke rack and pinion, double and single acting <i>(shown with switchbox)</i>

ELECTRIC ACTUATORS

ECONOMIC Range M	GENERAL PURPOSE Range EL	GENERAL PURPOSE Range DP	HEAVY DUTY Range SA
			
Design: Quarter turn actuator, on/off and control duty. Lever for manual override	Design: Quarter turn actuator, on/off and control duty. Handwheel for manual override	Design: Quarter turn actuator, on/off and control duty. Handwheel for manual override	Design: Quarter turn actuator, on/off and control duty, based on multi-turn actuator with worm gearbox. Handwheel for manual override

HYDRAULIC ACTUATORS

ECONOMIC Range BRC

Design: Rotary type, double acting, on/off duty

NB: The figures shown are examples only. Other configurations available.

2 PRODUCT DATA: PNEUMATIC ACTUATORS

2.1 GENERAL

Pneumatic actuators use compressed filtered dry or lubricated air as energy power source.

Main features of pneumatic actuators are:

- Simple and reliable construction
- Compact design
- Short operation times
- Spring return actuators for fail-safe operation
- Suitable for control duty with a 100% duty rate
- Most economical way of power actuation for smaller sizes of butterfly valves

Wouter Witzel use both our own TPN actuator design and products from the world's best known pneumatic actuator manufacturers.

2.2 PRODUCT CONFIGURATION

Most pneumatic actuators used by Wouter Witzel have an interface according VDI/VDE 3845 (NAMUR) for mounting solenoid valves and signal transmitters or positioners. Pneumatic actuators can be equipped with many ancillaries such as:

Ancillary:

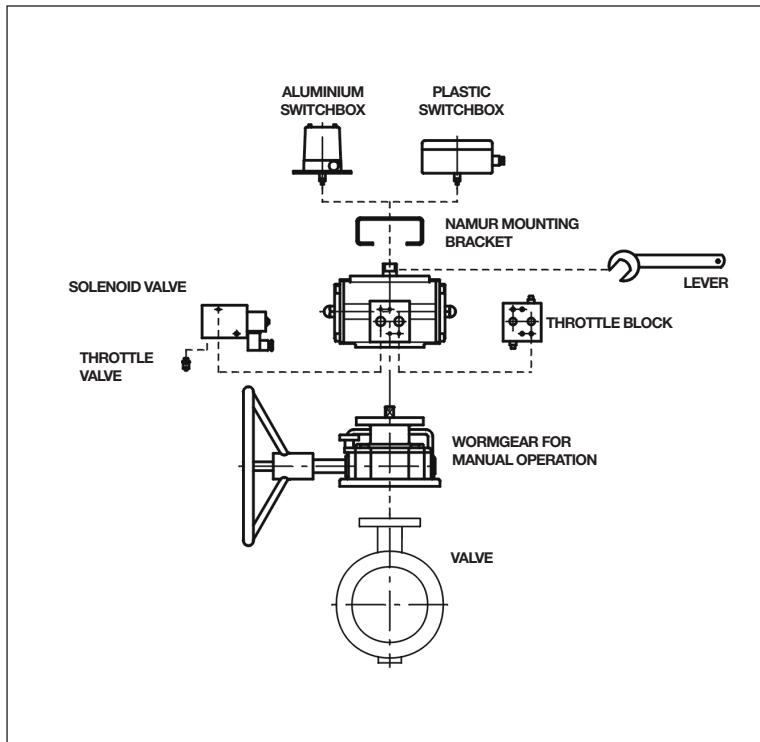
- Limit switches
(direct mounted to actuator or in a switchbox)
- Solenoid valve
- Throttle valve / throttle block / hydraulic speed control
- Positioner
- Potentiometer
- Electronic position transmitter
- Worm gearbox
- Air tank
- Lever
- Air filter regulator
- Gauge(s)

Function:

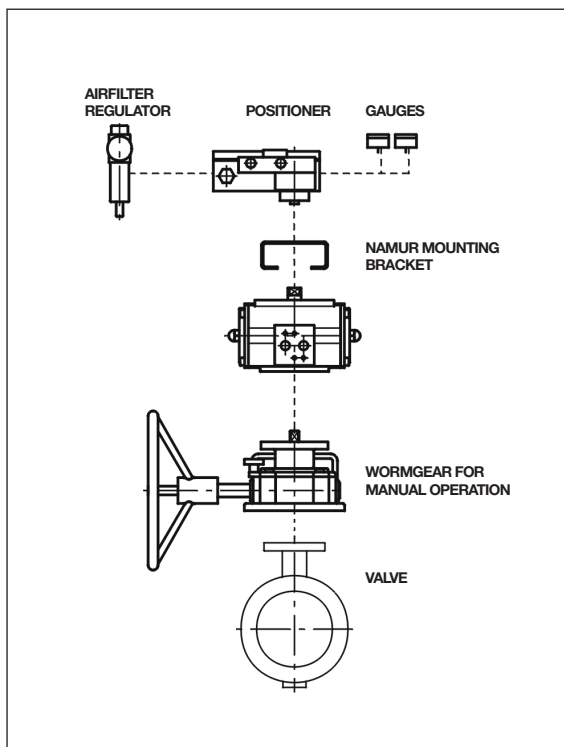
- remote open/closed position monitoring of the valve
(mechanical switches or inductive proximity sensors)
- remote on/off operation of actuator
- speed control for increased operating times
- valve disc positioning based on a variable input signal
- continuous valve disc position feedback
(resistance signal)
- continuous valve disc position feedback (current signal)
- manual operation after air failure / manual override
- operation after air failure (up to several operations)
- manual operation after air failure (only for double acting
actuators up to valve size DN200)
- reducing pressure and filtering of supplied air
- visual indication of actual air pressure

NB: Specific technical information on request

2.2.1 Product configuration pneumatic actuators for on/off duty



2.2.2 Product configuration pneumatic actuators for control duty



Product sheet

PNEUMATIC ACTUATOR, RANGE AT

Application

For pneumatic quarter turn on/off or control duty, both double acting (DA) and spring return (SR), of Wouter Witzel butterfly valves. Economic category. Compact design and low weight. Same dimensions for double and single acting actuator.

Product description

- Twin-piston / rack and pinion actuator type
- Body of hard anodised aluminium
- End caps of aluminium, polyester coated
- Adjustable travel stops for both directions
- Anti-blowout shaft
- Mechanical position indication
- Interface for solenoid valves acc. VDI/VDE 3845 (NAMUR)
- Interface for signal transmitters and positioners acc. VDI/VDE 3845 (NAMUR)
- Flange dimensions acc. to ISO 5211
- Lifetime lubricated under normal working conditions

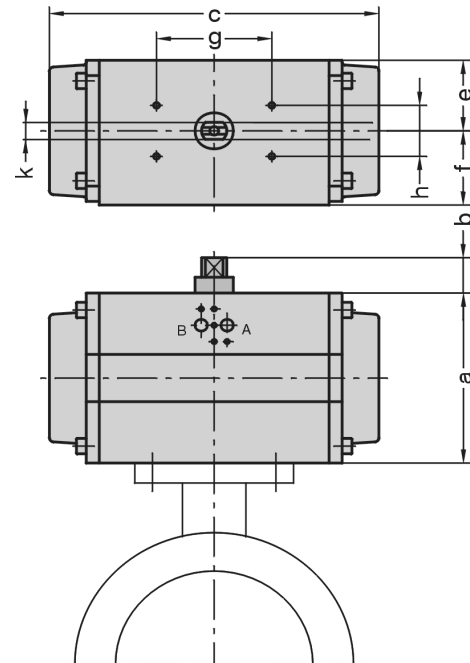
Technical data

- Stroke : 90° with ± 4° adjustment
- Rotation : Clockwise closing
- Operating medium : Dry or lubricated air
- Temperature : -20° to +80° C
- Coating colour : RAL 5015, blue (end caps only)
- Air connection : DA/SR15: 2x G1/8"
DA/SR30-1200: 2x G1/4"
DA/SR3000: 2x G1/2"
- Supply pressure : min. 2,5 bar up to max. 10 bar

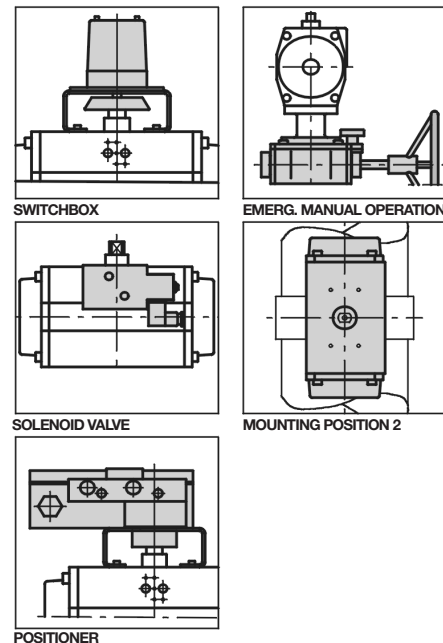
Options

- Limit switches or switchbox
- Solenoid valve
- Speed control
- Position transmitter
- Positioner
- Wormgear for emergency manual operation
- Seals for other temperature range
- Chemical version: electroless nickel plated, polyester coated
- Indirect mounting (console and adaptor)
- Mounting parallel to pipeline (mounting position 2)

Figure



OPTIONS



Actuator type	ISO	Dimensions [mm]								Weight [kg]		Air consumption [l/stroke]	
		a	b	c	e	f	g	h	k	DA	SR	Port A	Port B
DA15 / SR15	F03 / F04	67	20	138	29	37	80	30	8	0.9	1	0.13	0.09
DA30 / SR30	F03 / F04 / F05	83	20	152	37	44	80	30	8	1.5	1.6	0.17	0.27
DA60 / SR60	F04 / F05 / F07	100	20	202	43	49	80	30	14	2.8	3.1	0.2	0.4
DA100 / SR100	F05 / F07	110	20	230	49	53	80	30	14	4.1	4.5	0.3	0.6
DA150 / SR150	F07 / F10	125	20	271	55	63	80	30	14	5.9	6.7	0.7	0.9
DA220 / SR220	F10 / F12	142	30	308	64	69	130	30	27	9.1	10	1.0	1.6
DA300 / SR300	F10 / F12	155	30	360	70	73	130	30	27	12	14	1.5	2.1
DA450 / SR450	F10 / F12	175	30	405	78	81	130	30	27	16	19	2.4	2.6
DA600 / SR600	F10 / F12	196	50	464	88	91	130	30	27	22	25	3.2	4.7
DA900 / SR900	F12 / F14	220	50	520	100	100	130	30	27	32	40	4.3	6.9
DA1200 / SR1200	F14	240	50	576	110	110	130	30	32	44	52	6	8
DA3000 / SR3000	F16	330	50	684	154	161	130	30	55	90	112	10	12

Product sheet

PNEUMATIC ACTUATOR, RANGE E / P

Application

For pneumatic quarter turn on/off or control duty, both double acting (ED/PD) and spring return (ES/PS), of Wouter Witzel butterfly valves. General purpose category. Compact design and low weight.

Product description

- Twin-piston / rack and pinion actuator type
- Body and end caps of aluminium, polyurethane coated
- Adjustable travelstop for only one end position
- Anti-blowout shaft
- Mechanical position indication
- Interface for solenoid valves acc. VDI/VDE 3845 (NAMUR)
- Interface for signal transmitters and positioners acc. VDI/VDE 3845 (NAMUR)
- Flange dimensions acc. to ISO 5211
- Lifetime lubricated under normal working conditions

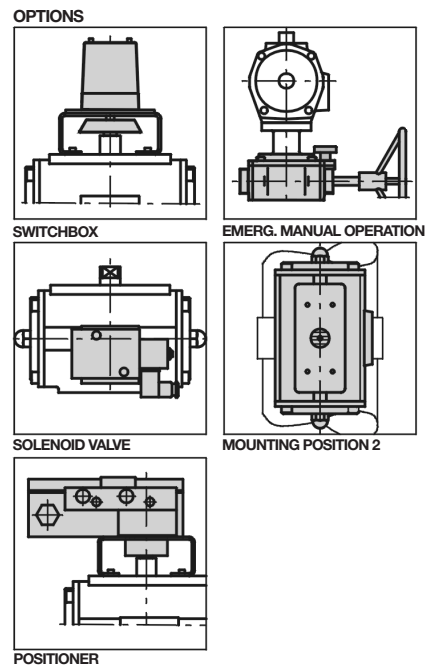
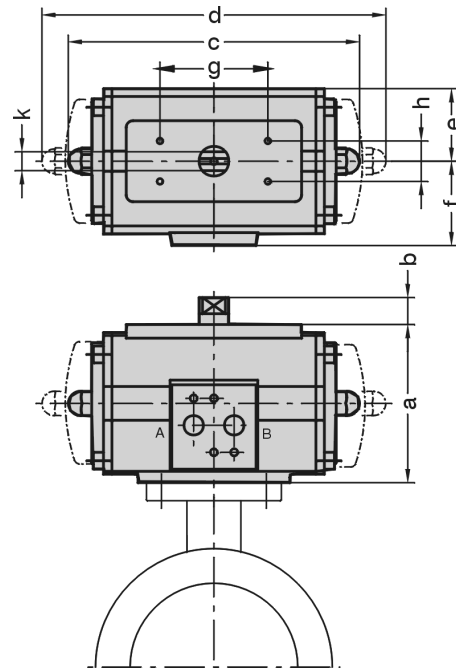
Technical data

- Stroke : 90° with + 1° / -10° adjustment
- Rotation : Clockwise closing
- Operating medium : Dry or lubricated air
- Temperature : -20° to +80° C
- Coating colour : RAL 1007, yellow
- Air connection : 2x G 1/4"
- Supply pressure : min. 3 bar up to max. 10 bar

Options

- Limit switches or switchbox
- Solenoid valve
- Speed control
- Position transmitter
- Positioner
- Wormgear for emergency manual operation
- Adjustable travel stops for both end positions
- Limit stop full-stroke (LF) for open or closed position
- Chemical version: CSR coating for corrosion resistance under extreme (chemical) conditions
- Indirect mounting (console with adaptor)
- Mounting parallel to pipeline (mounting position 2)

Figure



Actuator type	ISO	Dimensions [mm]									Weight [kg]		Air consumption [l/stroke]	
		a	b	c	d	e	f	g	h	k	DA	SR	Port A	Port B
											ED/PD	ES/PS		
ED25 / ES25	F04 / F05	80	20	159	172	37	46	80	30	10	1.3	1.7	0.10	0.11
ED40 / ES40	F05 / F07	93	20	180	204	43	53	80	30	14	1.8	2.4	0.16	0.22
ED65 / ES65	F05 / F07	105	20	199	249	49	58	80	30	14	2.4	3.6	0.33	0.36
ED100 / ES100	F05 / F07	118	20	221	267	54	63	80	30	14	3.1	4.6	0.35	0.49
ED200 / ES200	F07 / F10	143	20	283	360	64	73	80	30	19	5.8	9.1	0.8	1.0
ED350 / ES350	F07 / F10	181	20	305	387	87	94	80	30	19	10.4	16.9	1.8	1.9
ED600 / ES600	F10 / F12	220	30	387	477	104	113	130	30	36	19.4	27.6	2.9	3.1
ED950 / ES950	F10 / F14	259	30	424	517	116	126	130	30	36	26.4	38.6	4.7	4.9
ED1600 / ES1600	F16	297	30	516	637	133	142	130	30	36	42.7	65.8	7.3	8.0
PD2500 / PS2500	F16	356	30	378	570	175	185	130	30	36	56.8	88.2	8.0	9.3
PD4000 / PS4000	F16 / F25	380	30	502	834	190	200	130	30	36	86.6	131.8	13.5	17.5

Product sheet

PNEUMATIC ACTUATOR, RANGE GT

Application

For pneumatic quarter turn on/off or control duty, both double acting (GTD) and spring return (GTE), of Wouter Witzel butterfly valves. General purpose category. Compact design and low weight. Same dimensions for double and single acting actuator.

Product description

- Twin-piston / rack and pinion actuator type
- Body of anodised aluminium
- End caps of aluminium, polyurethane coated
- Adjustable travel stop for only one end position
- Mechanical position indication
- Interface for solenoid valves acc. VDI/VDE 3845 (NAMUR)
- Interface for signal transmitters and positioners acc. VDI/VDE 3845 (NAMUR)
- Flange dimensions acc. to ISO 5211
- Lifetime lubricated under normal working conditions

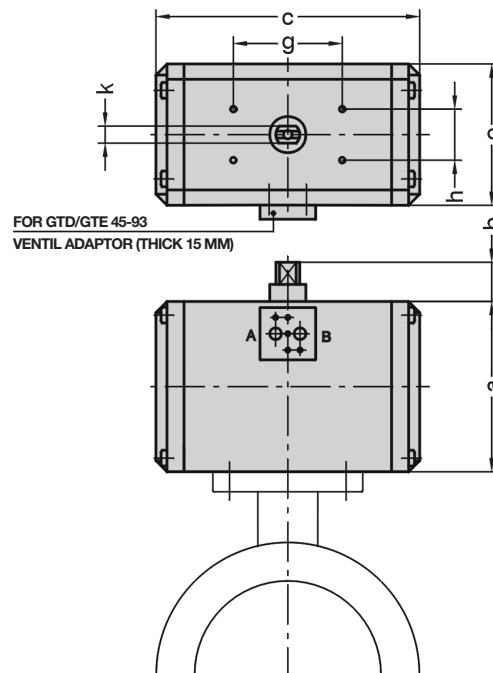
Technical data

- Stroke : 90° with + 6° / -10° adjustment
 Rotation : Clockwise closing
 Operating medium : Dry or lubricated air
 Temperature : -20° to +95° C
 Coating colour : RAL 5015, blue (end caps only)
 Air connection : 2x G 1/4"
 Supply pressure : min. 2 bar up to max. 10 bar

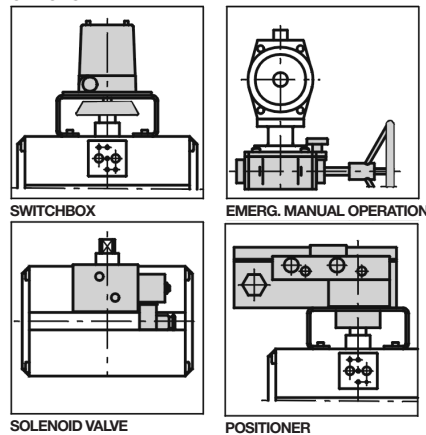
Options

- Limit switches or switchbox
- Solenoid valve
- Speed control
- Position transmitter
- Positioner
- Wormgear for emergency manual operation
- Travel stops for both end positions
- Seals for other temperature range
- Chemical version: Body hard anodised (GC type)
- Stainless steel body AISI 304 (ET type)
- Indirect mounting (console with adaptor)
- Mounting parallel to pipeline (mounting position 2)

Figure



OPTIONS



Actuator type	ISO	Dimensions [mm]							Weight [kg]		Air consumption [l/stroke]	
		a	b	c	e	g	h	k	GTD	GTE	Port A	Port B
GTD65 / GTE65	F05 / F07	88	30	139	70	80	30	10	1.4	1.6	0.15	0.21
GTD77 / GTE77	F05 / F07	100	30	160	84	80	30	10	2.0	2.4	0.27	0.37
GTD83 / GTE83	F05 / F07	108	30	182	92	80	30	10	2.6	3.0	0.39	0.53
GTD93 / GTE93	F05 / F07	117	30	215	100	80	30	14	3.4	3.8	0.45	0.65
GTD110 / GTE110	F07 / F10	140	30	222	120	80	30	14	4.9	5.9	0.74	1.23
GTD115 / GTE115	F07 / F10	140	30	294	120	80	30	20	7.1	8.4	1.2	1.5
GTD127 / GTE127	F07 / F10	160	30	300	138	80	30	20	8.9	11	1.6	2.3
GTD143 / GTE143	F10 / F12	198	30	350	172	130	30	20	12	16	2.6	2.4
GTD163 / GTE163	F10 / F12	198	30	380	172	130	30	28	16	20	3.1	4.2
GTD210 / GTE210	F14	255	30	478	224	130	30	32	31	39	5.9	8.4
GTD250 / GTE250	F16	302	30	603	272	130	30	32	62	84	12.5	15.5
GTD254 / GTE254	F16	302	30	683	272	130	30	32	75	97	18.0	15.5

Product sheet

PNEUMATIC ACTUATOR, RANGE TPN A

Application

For pneumatic quarter turn on/off or control duty, double acting (TPN A), of Wouter Witzel butterfly valves. Heavy duty category.

Product description

- Gear rack / gear wheel actuator type
- Body of cast iron GG25, polyurethane coated
- End caps of aluminium
- Cylinders of bronze
- Adjustable travel stops for both end positions
- Mechanical position indication
- Interface for signal transmitters and positioners acc. VDI/VDE 3845 (NAMUR)
- Flange dimensions acc. to ISO 5211
- Lifetime lubricated under normal working conditions

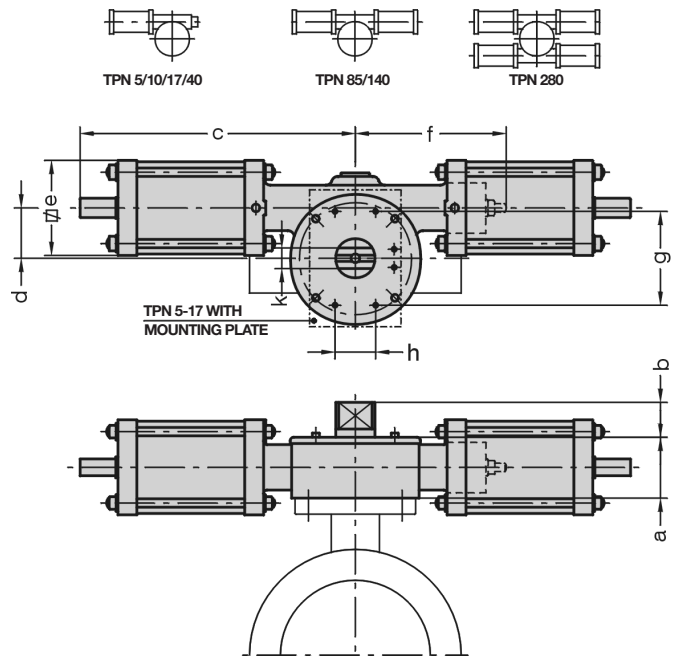
Technical data

- Stroke : 90° with ± 10° adjustment
 Rotation : Clockwise closing
 Operating medium : Dry or lubricated air
 Temperature : -20° to +80° C
 Coating colour : RAL 2000, orange
 Air connection : 2x G 1/4"
 Supply pressure : min. 2 bar up to max. 10 bar

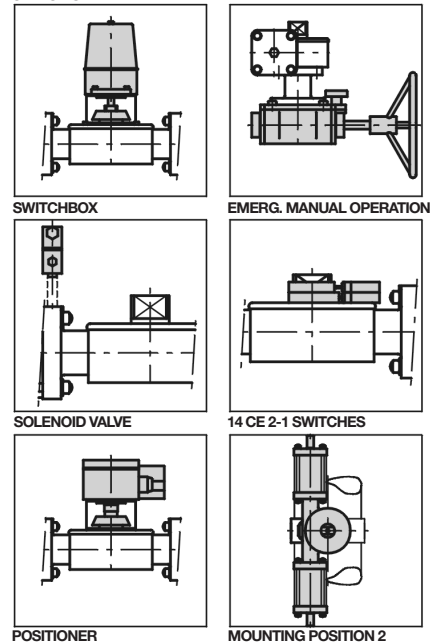
Options

- Limit switches or switchbox
- Solenoid valve
- Speed control
- Position transmitter
- Positioner
- Air connection G1/2"
- Wormgear for emergency manual operation
- Mounting parallel to pipeline (mounting position 2)

Figure double acting TPN A:



OPTIONS



Actuator type	ISO	Dimensions [mm]										Weight [kg]	Air consumption [l/stroke]	
		a	b	c	d	e	f	g	h	k	TPN A		Port A	Port B
TPN5A	F07	118	30	220	28	100	100	80	30	14	8	0.17	0.17	
TPN10A	F07	125	30	290	48	100	133	80	30	14	10	0.34	0.34	
TPN17A	F07	125	30	290	48	130	133	80	30	14	15	0.61	0.61	
TPN40A	F07 / F10 / F12	167	30	382	61	180	170	80	30	19	30	1.5	1.5	
TPN85A	F10 / F12 / F14	185	30	395	72	160	-	130	30	30	45	2.9	2.9	
TPN140A	F10 / F12 / F14 / F16	215	30	490	96	180	-	130	30	30	85	5.1	5.1	
TPN280A	F10 / F12 / F14 / F16	215	30	490	96	180	-	130	30	30	150	10.1	10.1	
TPN420A	F16 / F25	215	30	720	96	180	-	130	30	30	250	15	15	

Product sheet

PNEUMATIC ACTUATOR, RANGE TPN B

Application

For pneumatic quarter turn on/off or control duty, spring return (TPN B), of Wouter Witzel butterfly valves. Heavy duty category.

Product description

- Gear rack / gear wheel actuator type
- Body of cast iron GG25, polyurethane coated
- End caps of aluminium
- Cylinders of bronze
- Adjustable travel stops for both end positions
- Mechanical position indication
- Interface for signal transmitters and positioners acc. VDI/VDE 3845 (NAMUR)
- Flange dimensions acc. to ISO 5211
- Lifetime lubricated under normal working conditions
- Available as spring to open (S.O.) and spring to close (S.C.) actuator

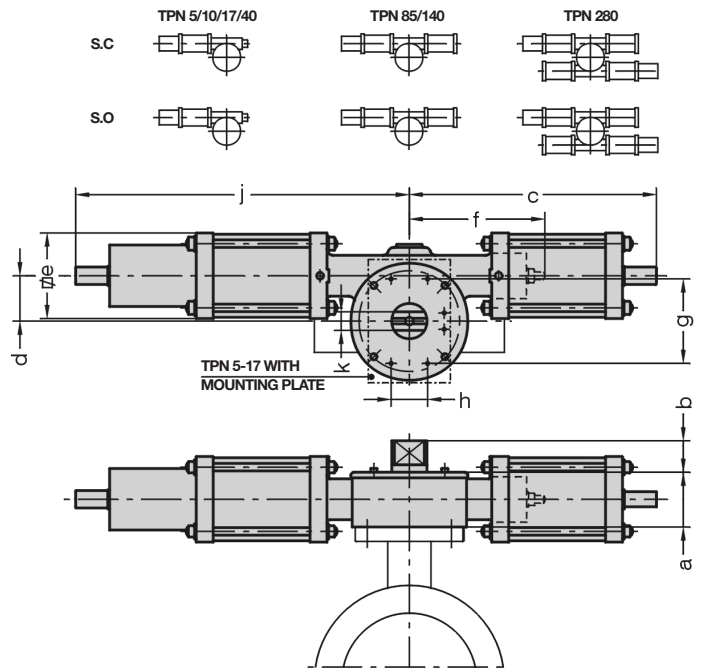
Technical data

- Stroke : 90° with ± 10° adjustment
 Rotation : Clockwise closing (ccw closing for TPN5B – TPN40B spring to open)
 Operating medium : Dry or lubricated air
 Temperature : -20° to +80° C
 Coating colour : RAL 2000, orange
 Air connection : G 1/4"
 Supply pressure : min. 2 bar up to max. 10 bar

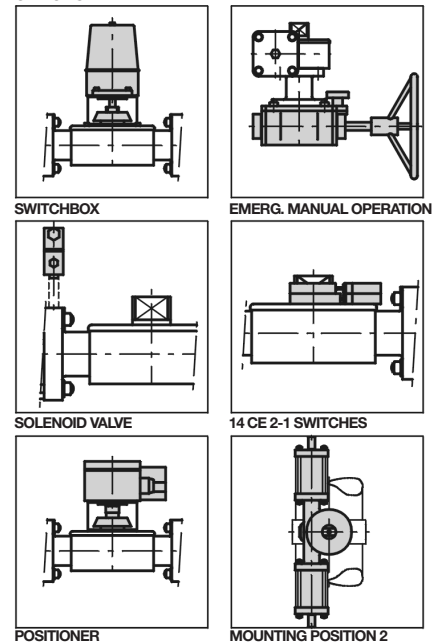
Options

- Limit switches or switchbox
- Solenoid valve
- Speed control
- Position transmitter
- Positioner
- Air connection G 1/2"
- Wormgear for emergency manual operation
- Mounting parallel to pipeline (mounting position 2)

Figure single acting TPN B



OPTIONS



Actuator type	ISO	Dimensions [mm]										Weight [kg]	Air consumption [l/stroke]
		a	b	c	d	e	f	g	h	j	k		
TPN5B	F07	118	30	-	28	100	100	80	30	310	14	12	0.17
TPN17B	F07	125	30	-	48	130	133	80	30	495	14	22	0.61
TPN40B	F07 / F10 / F12	167	30	-	61	180	170	80	30	590	19	45	1.5
TPN85B	F10 / F12 / F14	185	30	395	72	160	-	130	30	610	30	62	2.9
TPN140B	F10 / F12 / F14 / F16	215	30	490	96	180	-	130	30	815	30	100	5.1
TPN280B	F10 / F12 / F14 / F16	215	30	490	96	180	-	130	30	815	30	175	10.1

3 PRODUCT DATA: ELECTRIC ACTUATORS

3.1 GENERAL

Main features of electric actuators are:

- High torque output
- Self braking construction
- Low noise level
- Smooth operation over complete valve stroke
- Most economical way of power actuation for bigger sizes of butterfly valves

Electric actuators can be divided into two groups:

- Quarter turn actuators, can be directly mounted to a butterfly valve
- Multi-turn actuators, require a worm gearbox to convert to 90 degrees rotation

3.2 PRODUCT CONFIGURATION

All electric actuators used by Wouter Witzel are provided with at least two internal switches for switching off the motor in both end positions, a mechanical position indicator and a facility for emergency hand operation. Depending on make and/or type the actuators are standard also provided with:

- | | |
|---------------------|---|
| • Torque switches | protection of the valve /actuator against mechanical overload |
| • Thermo protection | protection of motor windings against overheating |
| • Limit switches | remote open/closed position monitoring of the valve |
| • Space heater | protection of the actuator against condensation |

Electric actuators can be equipped with many internal ancillaries such as:

Ancillary:

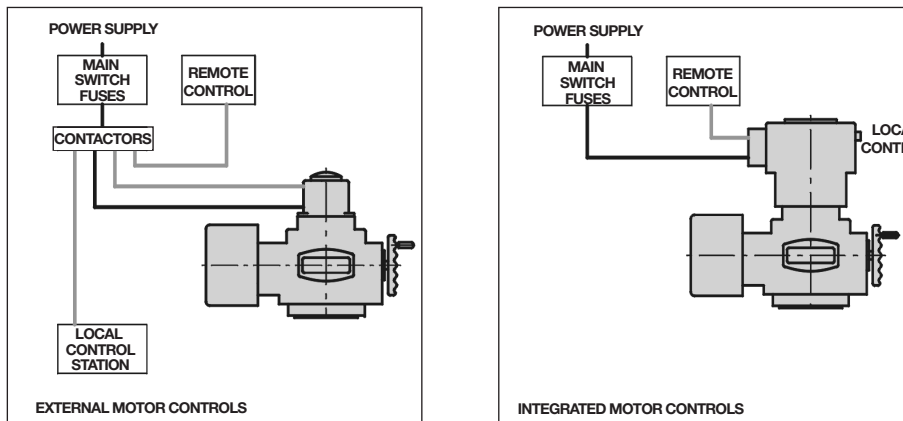
- Extra switches
- Tandem switches
- Potentiometer
- Electronic position transmitter
- Electronic positioner
- Timer board

Function:

- remote open/closed or intermediate position monitoring of the valve (for switching a single electrical circuit)
- remote open/closed or intermediate position monitoring of the valve (for switching two different electrical circuits by one switch)
- continuous valve disc position feedback (resistance signal)
- continuous valve disc position feedback (current signal)
- valve disc positioning based on a variable input signal
- increased operating times by means of pulse – pause operation

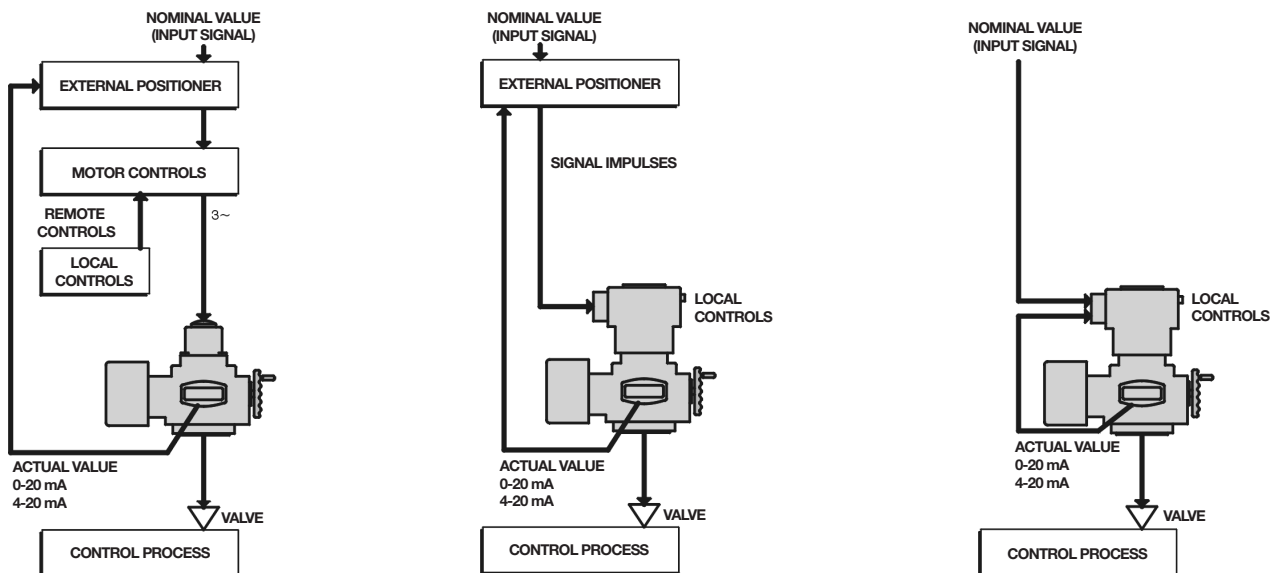
3.2.1 Electric actuators for on/off duty

The more sophisticated electric actuators can also be equipped with an integrated motor control unit with programmable controls including reversing contactors for motor controls and diagnose functions. The actuator can be remote controlled over potential-free contacts. Extra features of an integrated motor control unit can include a local control station.



3.2.2 Electric actuators for control duty

Control duty means that the actuator positions the valve disc according to an input signal. Based on this input signal, a positioner processes signals and sends them to the motor controls. The motor of the actuator is switched on and off by the motor controls in open or closed direction, only if a deviation arises between the input and feedback signals. As long there is no difference between the input and feedback signals the motor remains switched off. As an option a continuous valve disc position feedback can be supplied.



External motor controls

- External positioner receives input signal from master controller
- On/off switching in open or closed direction by external motor controls based on signal impulses processed by external positioner
- Valve position feedback to external positioner as an option

Integrated motor controls

- External positioner receives input signal from master controller
- On/off switching in open or closed direction by integrated motor controls based on signal impulses processed by external positioner
- Valve position feedback to external positioner as an option

Integrated motor controls with internal positioner

- Integrated positioner receives input signal from master controller
- On/off switching in open or closed direction by integrated motor controls based on signal impulses processed by internal positioner
- Valve position feedback to internal positioner is required. Feedback to master controller as an option

Product sheet

ELECTRIC ACTUATOR, RANGE M

Application

For electric quarter turn on/off or control duty of small sized Wouter Witzel butterfly valves. Economic category.

Product description

- Body of aluminium, cover of plastic
- Self-locking
- 2 Limit switches in both end positions: 1 for switching off the motor and 1 for remote position indication
- Auto / Manual selector switch
- Manual override by means of a lever
- Space heater
- Connection of motor and controls on terminal strip
- Mechanical position indicator
- Flange dimensions acc. to ISO 5211

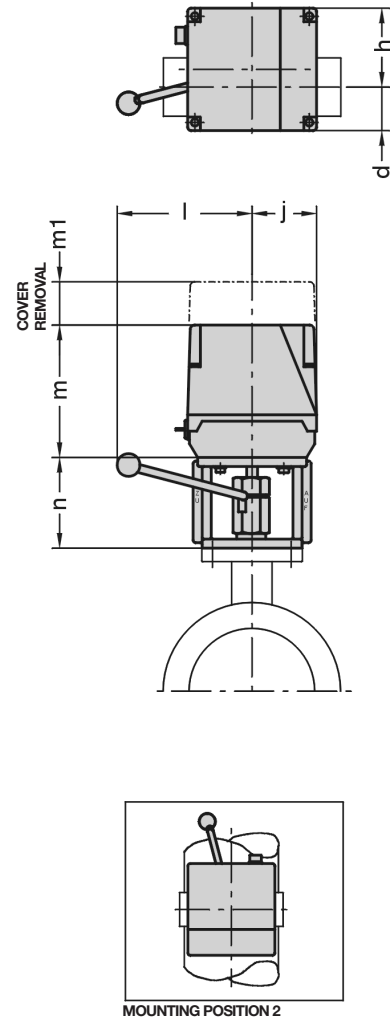
Technical data

- Stroke : 90° with ± 5° adjustment
- Rotation : Clockwise closing
- Voltages : Single phase 24, 110, 230VAC
- Enclosure : IP54
- Temperature : 0° to +50° C
- Cable entry : 1x Pg13,5, 2x Pg11

Options

- Potentiometer for position feedback
- Positioner including electronic position transmitter (only in combination with motor 24VAC)
- Enclosure IP65 (aluminium cover)
- Mounting position 2

Figure



Actuator type	ISO	Dimensions [mm]							Weight [kg]
		d	h	j	l	m	m1	n	
M135	F07	47	87	71	195	160	140	100	2.5
M140	F07	47	87	71	195	200	140	100	3
M150	F07	47	87	71	195	160	140	100	2.5
M180	F07	47	87	71	195	200	140	100	3

Product sheet

ELECTRIC ACTUATOR, RANGE EL

Application

For electric quarter turn on/off or control duty of Wouter Witzel butterfly valves. Economic category. Compact design and low weight.

Product description

- Body of aluminium, cover of steel, polyurethane coated
- Thermal protection of motor windings
- Self-locking
- 2 Limitswitches in both end positions: 1 for switching off the motor and 1 for remote position indication
- Torque switches for open and closed direction (except EL 55)
- Adjustable travel stops for both end positions
- Manual override by means of a handwheel
- Space heater
- Connection of motor and controls on terminal strip
- Mechanical position indicator
- Flange dimensions acc. to ISO 5211

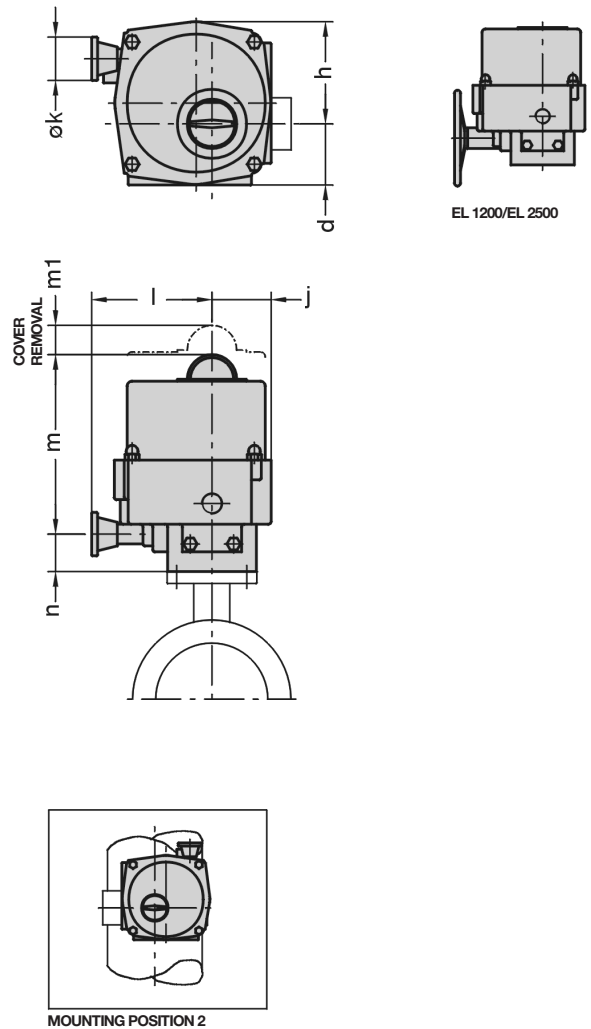
Technical data

Stroke	: 90° with ± 10° adjustment
Rotation	: Clockwise closing
Duty rating	: S2 - 30%, up to 60 starts per hour
Voltages	: Single phase 24, 110/120, 220/240 VAC Three phase 380, 415, 460 VAC Direct current 24VDC
Enclosure	: IP65
Temperature	: -20° to +80° C
Coating colour	: RAL 1007, yellow
Cable entry	: 3x Pg 13,5 (type EL55 - EL150) 3x Pg 21 (type EL200 - EL2500)

Options

- Speed control unit
- Potentiometer for position feedback
- Position transmitter, output 4 – 20 mA
- Positioner for control duty, input 4 ñ20 mA or 0 – 10V
- Local control unit
- Plug/socket connector
- Explosion proof actuator EEx d IIB T4, to EN 50018
- Enclosure IP67
- Mounting position 2 (handwheel shaft parallel to pipeline)

Figure



Actuator type	ISO	Dimensions [mm]								Weight [kg]
		d	h	j	k	l	m	m1	n	
EL55	F05 / F07	70	95	60	60	130	212	145	43	6
EL100	F05 / F07	77	120	82	93	135	245	165	47	11
EL150	F05 / F07	77	120	82	93	135	245	165	47	11
EL200	F07 / F10	96	141	109	160	170	261	165	54	16.5
EL350	F07 / F10	96	141	109	160	170	261	165	54	17
EL500	F10	123	166	128	195	195	255	165	63	25.5
EL800	F12	123	166	128	195	195	293	190	63	26
EL1200	F14	123	175	128	350	263	304	110	74	37
EL2500	F16	160	232	220	600	320	280	125	105	75

Product sheet

ELECTRIC ACTUATOR, RANGE SD

Application

For electric quarter turn on/off or control duty of Wouter Witzel butterfly valves. General purpose category.

Product description

- Squirrel cage 3 phase induction motor (except Z3)
- Thermal protection of motor winding
- Self-locking
- Travel limit switches for both end positions
- Torque switches for open and closed direction (except Z3 and OA)
- Adjustable travel stops for both end positions
- Manual override by means of a handwheel
- Space heater
- Connection of motor and controls on terminal strip
- Mechanical position indicator
- Flange dimensions acc. to ISO 5211

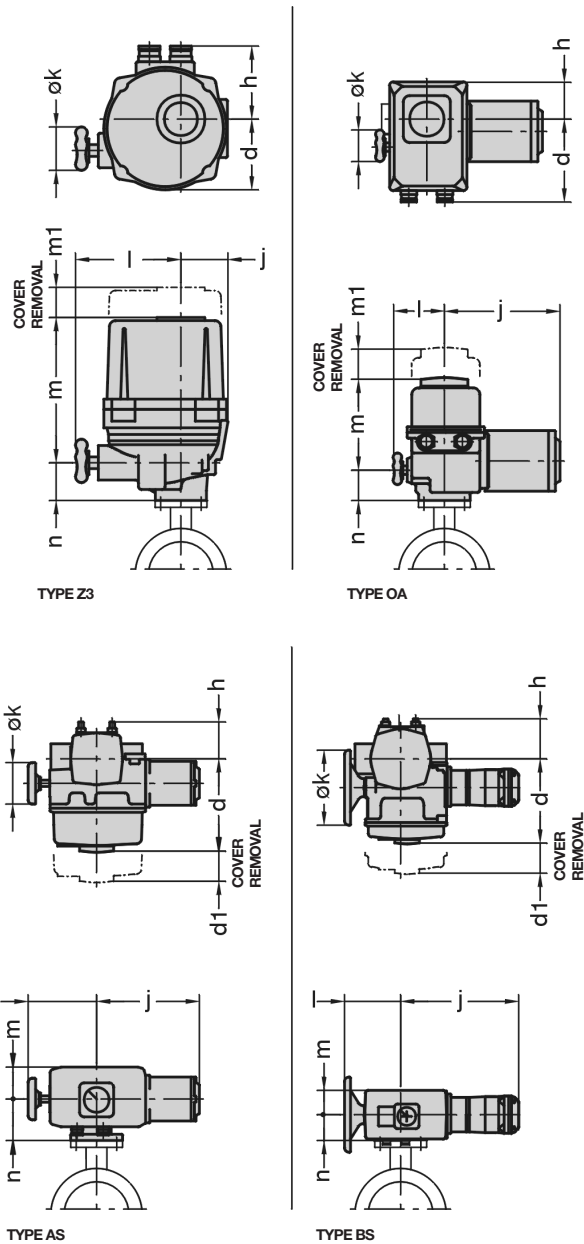
Technical data

- Stroke : 90° with ± 2° adjustment
- Rotation : Clockwise closing
- Voltages : Single phase 24, 110/120, 220/240
 Three phase 380/415 (except Z3)
 Direct current 24VDC
- Enclosure : IP67
- Temperature : -20° to +70° C
- Coating colour : RAL 7001, grey
- Cable entry : 2x Pg16 (cable glands included)

Options

- Extra limit switches for open and closed position
- Potentiometer 1 kOhm for position feedback
- Position transmitter, output 4-20 mA
- Integral motor control unit INTEGRAL+
- Explosion proof actuator EEx ed IIC T4, to EN 50014-20
- Mounting position 2 (handwheel shaft parallel to pipeline)

Figure



Actuator type	ISO	Dimensions [mm]									Weight [kg]
		d	d1	h	j	k	l	m	m1	n	
Z3	F05	90	-	93	59	60	134	186	120	48	5
OA6	F05 / F07	145	-	65	202	60	90	171	100	53	5.7
OA8	F05 / F07	145	-	65	202	60	90	171	100	53	6.8
OAP	F05 / F07	145	-	65	260	60	90	171	100	53	7.2
OA15	F07 / F10	145	-	65	260	100	112	171	100	53	7.5
AS18	F07 / F10	226	105	89	312	100	165	77	-	100	16
AS25	F07 / F10	226	105	89	312	165	187	77	-	100	18
ASP	F07 / F10	226	105	89	340	165	187	77	-	100	16
AS50	F07 / F10	226	105	89	340	250	184	77	-	100	18
AS80	F12	226	105	89	360	250	187	77	-	131	20
BS50	F12	284	65	134	392	165	187	81	-	86	25
BS100	F12 / F14	284	65	134	392	250	187	81	-	86	26
BS150	F14	284	65	134	392	250	187	81	-	86	28

Product sheet

ELECTRIC ACTUATOR, RANGE SG NORM

Application

For electric quarter turn on/off duty of all Wouter Witzel butterfly valves. General purpose category.

Product description

- Squirrel cage induction motor (3 phase)
- Thermal protection of motor winding
- Self-locking
- Travel limit switches for both end positions
- Torque switches for open and closed direction
- Adjustable travel stops for both end positions
- Manual override by means of a handwheel
- Space heater
- Plug/socket connection for motor and controls
- Mechanical position indicator
- Flange dimensions acc. to ISO 5211

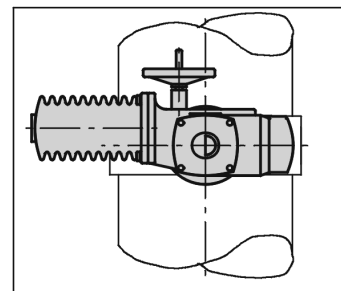
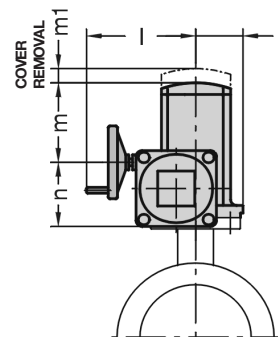
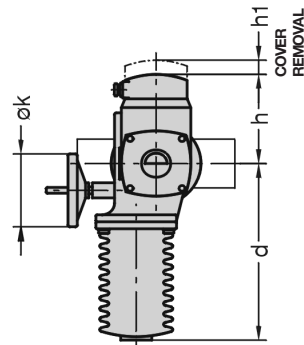
Technical data

- Stroke : 90° with ± 5° adjustment
- Rotation : Clockwise closing
- Duty rating : S2-15 min.
- Voltages : 3 phase AC
- Enclosure : IP67
- Temperature : -25° to +80° C
- Coating colour : RAL 9007, silver grey
- Cable entry : 1x Pg 13,5 2x Pg 21

Options

- Single phase motor with adjustable motorspeed
- Tandem limit switches / torque switches
- Potentiometer for position feedback
- Electronic position transmitter, output 4-20 mA
- Integrated motor control unit (Auma Matic)
- Explosion proof actuator EEx ed IIC T4, to EN 50014
- Extra corrosion protection
- Enclosure IP68-6 (up to 6 m head of water for 72 hours)
- Mounting position 2 (handwheel shaft parallel to pipeline)

Figure



MOUNTING POSITION 2

Actuator type	ISO	Dimensions [mm]									Weight [kg]
		d	h	h1	j	k	l	m	m1	n	
SG05.1	F05 / F07	291	195	30	58	160	191	193	30	82	18
SG07.1	F07 / F10	291	195	30	58	160	191	193	30	82	18
SG10.1	F10 / F12	301	205	30	75	160	216	203	30	88	24
SG12.1	F12 / F14	301	205	30	75	160	233	211	30	102	28

Product sheet

ELECTRIC ACTUATOR, RANGE SG MATIC

Application

For electric quarter turn on/off duty of all Wouter Witzel butterfly valves. General purpose category.

Product description

- Squirrel cage induction motor (3 phase)
- Thermal protection of motor winding
- Self-locking
- Travel limit switches for both end positions
- Torque switches for open and closed direction
- Adjustable travel stops for both end positions
- Integrated motor control unit (Matic) with:
 - Reversing contactors with mechanical and electrical interlocks
 - Push buttons "open-stop-close"
 - Selector switch "local-off-remote" (padlockable)
 - Opto-couplers for remote control signals (24V DC, internal supply)
 - 4 signal relays "open-close-selector switch local-selector switch remote"
 - Phase discriminator
 - Programmable logic
 - Monitoring relay for collective fault signal
 - Plug/socket connection for motor and controls
- Manual override by means of a handwheel
- Space heater
- Mechanical position indicator
- Flange dimensions acc. to ISO 5211

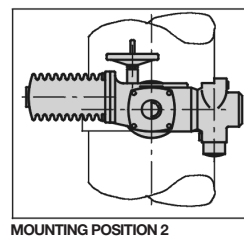
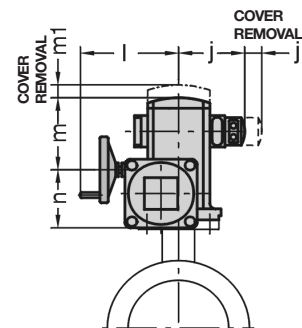
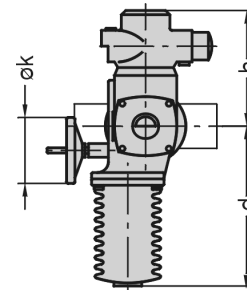
Technical data

Stroke	: 90° with ± 5° adjustment
Rotation	: Clockwise closing
Duty rating	: S2-15 min.
Voltages	: 3 phase AC
Enclosure	: IP67
Temperature	: -25° to +70° C
Coating colour	: RAL 9007, silver grey
Cable entry	: 1x Pg 13,5 2x Pg 21

Options

- Single phase motor with adjustable motorspeed
- Tandem limit switches / torque switches
- Potentiometer for position feedback
- Electronic position transmitter, output 4-20 mA
- Indication lamps "open-fault-close" on motor control unit
- Fieldbus interface (Profibus DP, Profibus FMS, Interbus S, Modbus RTU)
- Extra corrosion protection
- Enclosure IP68-6 (up to 6 m head of water for 72 hours)
- Wall bracket for motor control unit
- Mounting position 2 (handwheel shaft parallel to pipeline)

Figure



MOUNTING POSITION 2

Actuator type	ISO	Dimensions [mm]									Weight [kg]
		d	h	j	j1	k	l	m	m1	n	
SG05.1 - AM01.1	F05 / F07	291	340	220	30	160	191	193	30	82	25
SG07.1 - AM01.1	F07 / F10	291	340	220	30	160	191	193	30	82	25
SG10.1 - AM01.1	F10 / F12	301	350	220	30	160	216	203	30	88	31
SG12.1 - AM01.1	F12 / F14	301	350	220	30	160	233	211	30	102	35

Product sheet

ELECTRIC ACTUATOR, RANGE AS / VM

Application

For electric quarter turn on/off or control duty of all Wouter Witzel butterfly valves. General purpose category. Compact design and low weight

Product description

- Electronically commutated motor with speed adjustment
- Thermal protection of motor winding
- Self-locking
- Hall-sensors for both end positions
- Patented sensor for torque measuring (except ASO models)
- Adjustable travel stops for both end positions
- Integrated motor control unit (Variomatic) with:
 - Push buttons "open-stop-close"
 - Selector switch "local-off-remote" (padlockable)
 - LEDs for "open-fault-close" indication
- Adjustable operating time
- Plug/socket connection for motor and controls
- Manual override by means of a handwheel
- Mechanical position indicator
- Flange dimensions acc. to ISO 5211

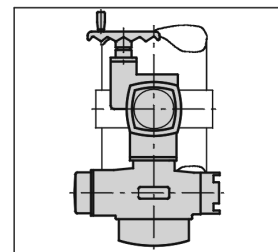
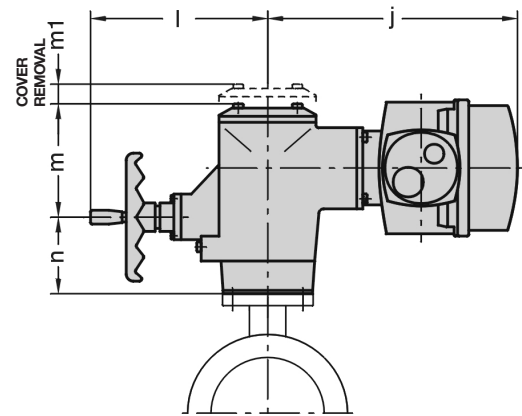
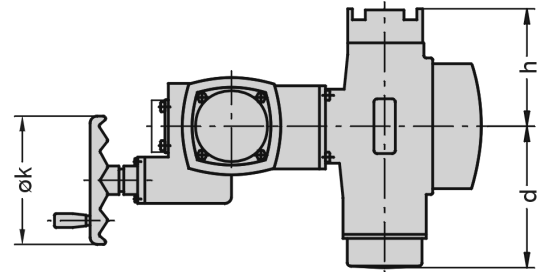
Technical data

- Stroke : 90° with ± 8° adjustment
- Rotation : Clockwise closing
- Duty rating : S2 - 15 min.
- Voltages : Single phase 220/240V AC
- Enclosure : IP67
- Temperature : -25° to +70° C
- Coating colour : RAL 9007, silver grey
- Cable entry : 1x Pg 13,5 2x Pg 21

Options

- Extra relays for open and closed position
- ASR actuator for control duty S5 - 40% ED (1800 starts/hour)
- Potentiometer for position feedback
- Electronic position transmitter, output 4 – 20 mA
- Positioner, input 4 – 20 mA
- Fieldbus interface (Profibus DP, Profibus FMS, Interbus S, Modbus RTU)
- Extra corrosion protection
- Enclosure IP68-6 (up to 6 meter head of water for 72 hours)
- Wall bracket for motor control unit
- Mounting position 2 (handwheel shaft parallel to pipeline)

Figure



Actuator type	ISO	Dimensions [mm]								Weight [kg]
		d	h	j	k	l	m	m1	n	
AS03/VM	F04 / F05 / F07	199	118	259	100	157	96	40	64	8
AS06/VM	F04 / F05 / F07	199	118	259	100	157	96	40	64	8
AS6/VM	F04 / F05 / F07	199	118	259	100	200	96	40	64	8
AS12/VM	F05 / F07	199	118	269	125	203	108	50	80	11
AS25/VM	F07 / F10	199	118	281	160	236	126	60	99	16
AS50/VM	F10 / F12	199	118	296	200	237	142	60	111	24

Product sheet

ELECTRIC ACTUATOR, RANGE DP

Application

For electric quarter turn on/off duty of Wouter Witzel butterfly valves. General purpose category.

Product description

- Squirrel cage induction motor (3 phase)
- Thermal protection of motor winding
- Self-locking
- Lifetime lubricated under normal working conditions
- Travel limit switches for both end positions
- Torque switches for open and closed direction
- Adjustable travel stops for both end positions
- Manual override by means of a handwheel
- Space heater
- Plug/socket connection for motor and controls
- Mechanical position indicator
- Flange dimensions acc. to ISO 5211

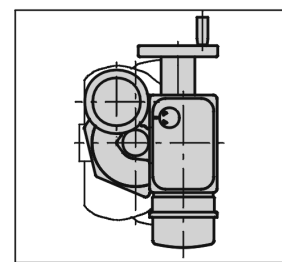
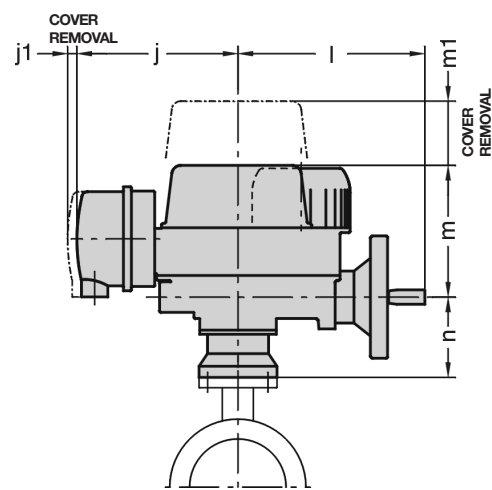
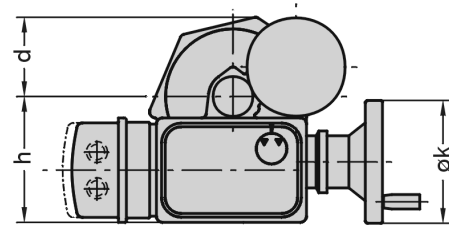
Technical data

- Stroke : 90° with ± 5° adjustment
- Rotation : Clockwise closing
- Duty rating : S2 - 15 min.
- Voltages : 3 phase AC
- Enclosure : IP67
- Temperature : -20° to +80° C
- Coating colour : RAL 5015, blue
- Cable entry : 1x Pg 13,5 2x Pg 29

Options

- Single phase motor
- Tandem limit switches/torque switches
- Potentiometer for position feedback
- Electronic position transmitter, output 4-20 mA
- DMI 002 Integral motor control unit
- Explosion proof actuator EEx ed IIC T4, to EN 50014
- Extra corrosion protection in combination with enclosure IP68-5 (up to 5 m water head for 24 hours)
- Mounting position 2 (handwheel shaft parallel to pipeline)

Figure



MOUNTING POSITION 2

Actuator type	ISO	Dimensions [mm]									Weight [kg]
		d	h	j	j1	k	l	m	m1	n	
DP30 / DP59	F05 / F07	126	179	252	15	125/160	201	203	105	113	19
DP119	F05 / F07	126	179	252	15	200	201	203	105	129	19
DP319	F07 / F10	126	179	252	15	125	281	203	105	227	34
DP799	F10 / F12	126	179	252	15	160	281	203	105	227	34
DP1599	F12 / F14	126	179	252	15	200	281	203	105	253	43
DP3200	F14 / F16	129	205	262	15	250	324	216	105	290	77

Product sheet

ELECTRIC ACTUATOR, RANGE DPMC

Application

For electric quarter turn on/off duty of all Wouter Witzel butterfly valves. General purpose category.

Product description

- Squirrel cage induction motor (3 phase)
- Thermal protection of motor winding
- Self-locking
- Travel limit switches for both end positions
- Torque switches for open and closed direction
- Integrated motor control unit (Matic MC 002) with:
 - Reversing contactors with mechanical and electrical interlocks
 - Selector switch "open-stop-close"
 - Selector switch "local-off-remote" (lockable)
- Opto-couplers for remote control signals (24V DC, internal supply)
- 4 signal relays "open-close-selector switch local-selector switch remote"
- Automatic correction of rotation direction
- Programmable logic
- Monitoring relay for collective fault signal
- Plug/socket connection for motor and controls
- Adjustable travel stops for both end positions
- Manual override by means of a handwheel
- Space heater
- Mechanical position indicator
- Flange dimensions acc. to ISO 5211

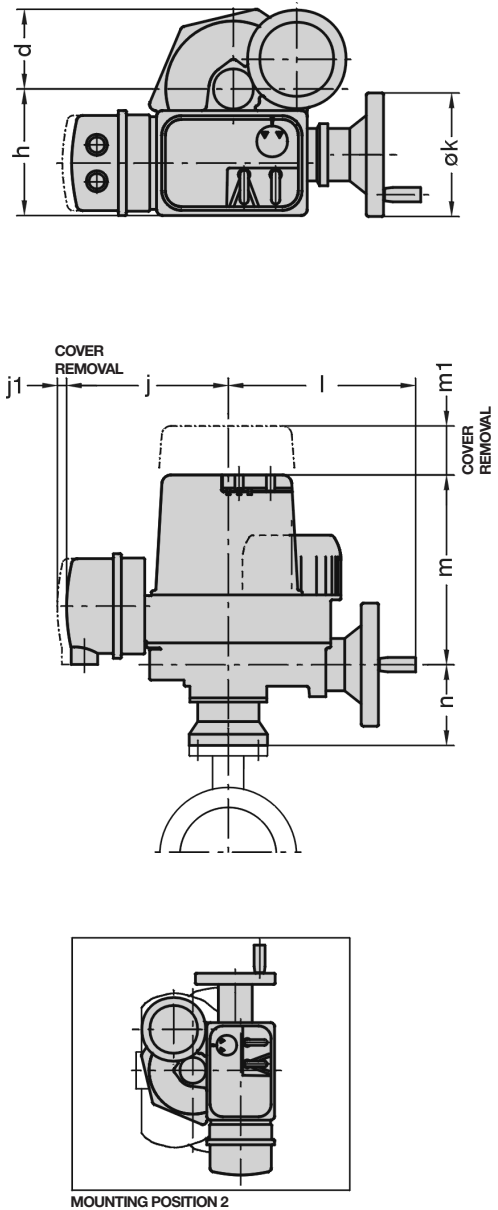
Technical data

- Stroke : 90° with ± 5° adjustment
- Rotation : Clockwise closing
- Duty rating : S2 - 15 min.
- Voltages : 3 phase AC
- Enclosure : IP67
- Temperature : -20° to +70° C
- Coating colour : RAL 5015, blue
- Cable entry : 1x Pg 13,5 2x Pg 29

Options

- Single phase motor
- MC 003: as MC 002 with extra electronic position transmitter 4 - 20 mA (internal supply)
- MC 004: as MC 002 with 2 extra electronic contacts for intermediate positions
- Indication lamps "open - failure -close"
- Fieldbus interface (Profibus DP, Profibus FMS, Interbus S)
- Explosion proof actuator EEx ed IIC T4, to EN 50014
- Extra corrosion protection
- Enclosure IP68-5 (up to 5 meter water head for 24 hours)
- Mounting position 2 (handwheel shaft parallel to pipeline)

Figure



Actuator type	ISO	Dimensions [mm]									Weight [kg]
		d	h	j	j1	k	l	m	m1	n	
DPMC30 / DPMC59	F05 / F07	126	179	252	15	125 / 160	201	281	185	113	24
DPMC119	F05 / F07	126	179	252	15	200	201	301	205	129	24
DPMC319	F07 / F10	126	179	252	15	125	281	281	185	227	39
DPMC799	F10 / F12	126	179	252	15	160	281	281	185	227	39
DPMC1599	F12 / F14	126	179	252	15	200	281	281	185	253	48
DPMC3200	F14 / F16	129	205	262	15	250	324	314	205	290	82

Product sheet

ELECTRIC ACTUATOR, RANGE SA NORM / GS(M)

Application

For electric quarter turn on/off or control duty of Wouter Witzel butterfly valves. Heavy duty category.

Product description

- Squirrel cage induction motor (3 phase)
- Thermal protection of motor winding
- Self-locking
- Travel limit switches for both end positions
- Torque switches for open and closed direction
- Blinker transmitter
- Space heater
- Manual override by means of a handwheel
- Plug/socket connection for motor and controls
- Wormgear for reduction to 90° rotation with adjustable mechanical end stops for both end positions
- Mechanical position indicator on wormgear
- Flange dimensions acc. to ISO 5211

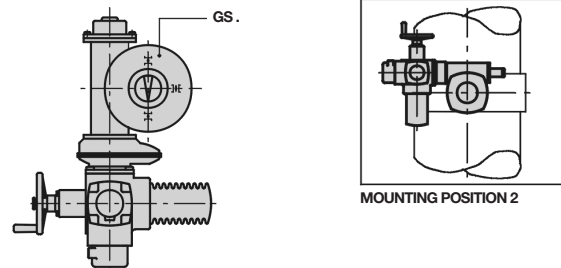
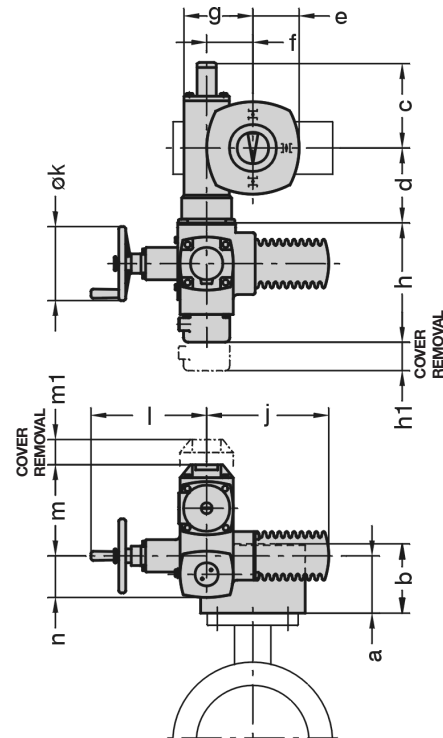
Technical data

- Stroke : 90° with ± 5° adjustment
- Rotation : Clockwise closing
- Duty rating : S2 - 15 min.
- Voltages : 3 phase AC
- Enclosure : IP67
- Temperature : -25° to +80° C
- Coating colour : RAL 9007, silver grey
- Cable entry : 1x Pg 13,5 2x Pg 21

Options

- Single phase or direct current motor
- Motor for control duty S4 - 25% ED (1200 starts per hour)
- Tandem limit switches / torque switches
- Additional mechanical position indicator on motor unit
- Potentiometer for position feedback
- Electronic position transmitter, output 4-20 mA
- Explosion proof actuator EEx ed IIC T4, to EN 50014
- Extra corrosion protection
- Enclosure IP68-6 (up to 6 m head of water for 72 hours)
- Mounting position 2 (handwheel shaft parallel to pipeline)

Figure



Actuator type	ISO	Dimensions [mm]															Weight [kg]
		a	b	c	d	e	f	g	h	h1	j	k	l	m	m1	n	
SA07.1 - GSM40.3	F05 / F07	72	70	96	100	52	40	68	273	30	265	160	249	197	180	102	25
SA07.1 - GSM50.3	F07 / F10	80	80	96	100	63	50	77	273	30	265	160	249	197	180	102	27
SA07.5 - GSM63.3	F10 / F12	85	94	128	125	75	63	94	273	30	265	160	249	197	180	102	33
SA07.5 - GSM80.3	F12 / F14	97	107	133	130	88	80	111	273	30	265	160	249	197	180	102	39
SA07.5 - GSM100.3/VZ4.3	F14 / F16	115	142	187	259	105	100	148	273	30	265	160	249	197	180	102	58
SA07.5 - GSM125.3/VZ4.3	F16 / F25	115	145	192	264	125	125	173	273	30	265	160	249	197	180	102	70
SA10.1 - GSM125.3/VZ4.3	F16 / F25	125	145	192	264	125	125	173	275	30	282	200	254	197	180	115	75
SA07.5 - GS160.3/GZ160.3	F25 / F30	130	155	290	275	165	160	218	273	30	265	160	249	197	180	102	115
SA10.1 - GS160.3/GZ160.3	F25 / F30	140	155	290	275	165	160	218	275	30	282	200	254	197	180	115	120

other sizes available on request

Product sheet

ELECTRIC ACTUATOR, RANGE SA MATIC / GS(M)

Application

For electric quarter turn on/off or control duty of Wouter Witzel butterfly valves. Heavy duty category.

Product description

- Squirrel cage induction motor (3 phase)
- Thermal protection of motor winding
- Self-locking
- Travel limit switches for both end positions
- Torque switches for open and closed direction
- Blinker transmitter
- Integrated motor control unit (Matic) with:
 - Reversing contactors with mechanical and electrical interlocks
 - Push buttons "open-stop-close"
 - Selector switch "local-off-remote" (lockable)
 - Opto-couplers for remote control signals (24V DC, internal supply)
 - 4 signal relays "open-close-selector switch local-selector switch remote"
 - Phase discriminator
 - Programmable logic
 - Monitoring relay for collective fault signal
 - Plug/socket connection for motor and controls
- Manual override by means of a handwheel
- Space heater
- Wormgear for reduction to 90° rotation with adjustable mechanical end stops for both end positions
- Mechanical position indicator on wormgear
- Flange dimensions acc. to ISO 5211

Technical data

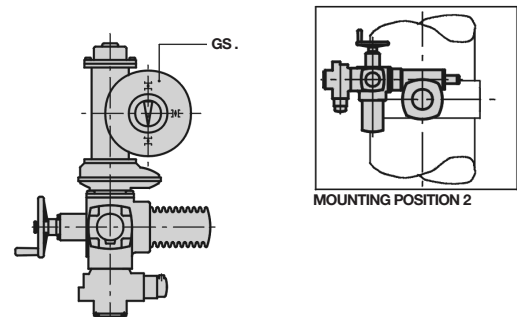
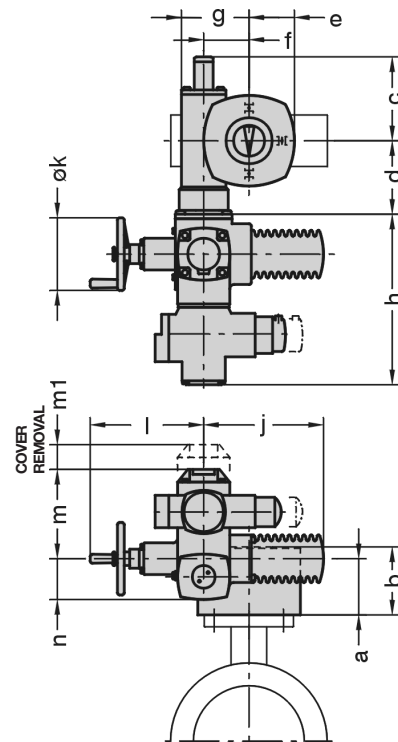
- Stroke : 90° with ± 5° adjustment
- Rotation : Clockwise closing
- Duty rating : S2 - 15 min.
- Voltages : 3 phase AC
- Enclosure : IP67
- Temperature : -25° to +70° C
- Coating colour : RAL 9007, silver grey
- Cable entry : 1x Pg 13,5 2x Pg 21

Options

- Single phase motor
- Motor for control duty S4 - 25% ED (1200 starts per hour)
- Additional mechanical position indicator on motor unit
- Tandem limit switches / torque switches
- Potentiometer for position feedback
- Electronic position transmitter, output 4-20 mA

- Positoner, input 4 - 20 mA
- Indication lamps "open-fault-close" on motor control unit
- Fieldbus interface (Profibus DP, Profibus FMS, Interbus S, Modbus RTU)
- Extra corrosion protection
- Explosion proof actuator EEx ed IIC T4, to EN 50014
- Enclosure IP68-6 (up to 6 m head of water for 72 hours)
- Mounting position 2 (handwheel shaft parallel to pipeline)

Figure



Actuator type	ISO	Dimensions [mm]															Weight [kg]
		a	b	c	d	e	f	g	h	h1	j	k	l	m	m1	n	
SA07.1 - AM01.1 - GSM40.3	F05 / F07	72	70	96	100	52	40	68	418	30	265	160	249	197	180	102	32
SA07.1 - AM01.1 - GSM50.3	F07 / F10	80	80	96	100	63	50	77	418	30	265	160	249	197	180	102	34
SA07.5 - AM01.1 - GSM63.3	F10 / F12	85	94	128	125	75	63	94	418	30	265	160	249	197	180	102	40
SA07.5 - AM01.1 - GSM80.3	F12 / F14	97	107	133	130	88	80	111	418	30	265	160	249	197	180	102	46
SA07.5 - AM01.1 - GSM100.3/VZ4.3	F14 / F16	115	142	187	259	105	100	148	418	30	265	160	249	197	180	102	63
SA07.5 - AM01.1 - GSM125.3/VZ4.3	F16 / F25	115	145	192	264	125	125	173	418	30	265	160	249	197	180	102	74
SA10.1 - AM01.1 - GSM125.3/VZ4.3	F16 / F25	125	145	192	264	125	125	173	420	30	282	200	254	197	180	115	78
SA07.5 - AM01.1 - GS160.3/GZ160.3	F25 / F30	130	155	290	275	165	160	218	420	30	265	160	249	197	180	102	122
SA10.1 - AM01.1 - GS160.3/GZ160.3	F25 / F30	140	155	290	275	165	160	218	420	30	282	200	254	197	180	115	127

other sizes available on request

Product sheet

ELECTRIC ACTUATOR, RANGE SA NORM / M.F

Application

For electric quarter turn on/off or control duty of all Wouter Witzel butterfly valves. Heavy duty category.

Product description

- Squirrel cage induction motor (3 phase)
- Thermal protection of motor winding
- Self-locking
- Travel limit switches for both end positions
- Torque switches for open and closed direction
- Blinker transmitter
- Space heater
- Manual override by means of a handwheel
- Plug/socket connection for motor and controls
- Wormgear for reduction to 90° rotation with adjustable mechanical end stops for both end positions
- Mechanical position indicator on wormgear
- Flange dimensions acc. to ISO 5211

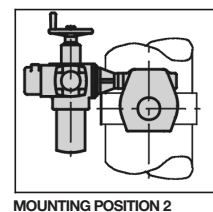
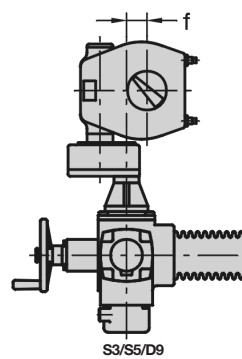
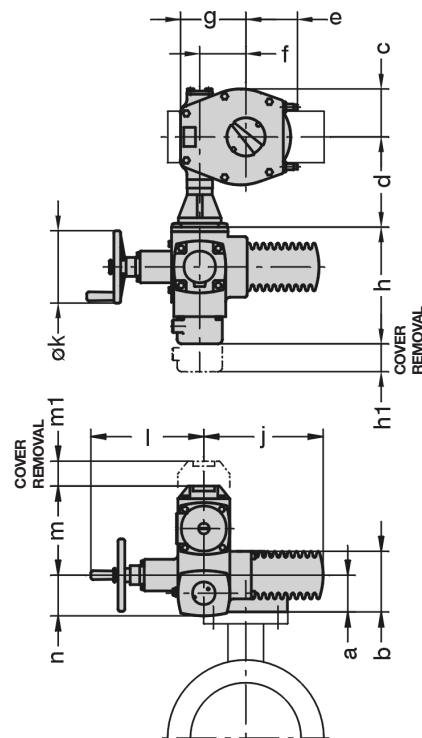
Technical data

- Stroke : 90° with ± 5° adjustment
- Rotation : Clockwise closing
- Duty rating : S2 - 15 min.
- Voltages : 3 phase AC
- Enclosure : IP67
- Temperature : -25° to +80° C
- Coating colour : RAL 9007, silver grey
- Cable entry : 1x Pg 13,5 2x Pg 21

Options

- Single phase or direct current motor
- Motor for control duty S4 - 25% ED (1200 starts per hour)
- Tandem limit switches / torque switches
- Additional mechanical position indicator on motor unit
- Potentiometer for position feedback
- Electronic position transmitter, output 4-20 mA
- Explosion proof actuator EEx ed IIC T4, to EN 50014
- Extra corrosion protection
- Enclosure IP68-6 (up to 6 m head of water for 72 hours)
- Mounting position 2 (handwheel shaft parallel to pipeline)

Figure



Actuator type	ISO	Dimensions [mm]														Weight [kg]	
		a	b	c	d	e	f	g	h	h1	j	k	l	m	m1		n
SA07.1 - MZF40	F07 / F10	72	71	63	95	67	60	92	273	30	265	160	249	197	180	102	29
SA07.5 - MYF40	F10 / F12	80	92	76	148	82	77	127	273	30	265	160	249	197	180	102	37
SA07.5 - MYF40/S3	F10 / F12	80	92	76	275	82	-1	127	273	30	265	160	249	197	180	102	52
SA07.5 - MBF64	F14 / F16	88	100	115	178	128	111	168	273	30	265	160	249	197	180	102	50
SA07.5 - MBF64/S3	F14 / F16	88	100	115	306	128	33	168	273	30	265	160	249	197	180	102	65
SA07.5 - MCF72/S5	F14 / F16	110	105	138	321	127	59	194	273	30	265	160	249	197	180	102	58
SA07.5 - MFF57/S5	F16 / F25	106	128	143	331	158	60	195	273	30	265	160	249	197	180	102	84
SA10.1 - MFF36/S5	F16 / F25	116	128	143	331	158	54	195	275	30	282	200	254	197	180	115	88
SA10.1 - MFF36/D9	F16 / F25	116	128	143	425	158	138	195	275	30	282	200	254	197	180	115	101
SA10.1 - MJF50/S5	F25 / F30	115	160	178	363	174	181	261	275	30	282	200	254	197	180	115	127
SA10.1 - MJF50/D9	F25 / F30	115	160	178	425	174	181	261	275	30	282	200	254	197	180	115	140

other sizes available on request

Product sheet

ELECTRIC ACTUATOR, RANGE SA Matic / M.F

Application

For electric quarter turn on/off or control duty of Wouter Witzel butterfly valves. Heavy duty category.

Product description

- Squirrel cage induction motor (3 phase)
- Thermal protection of motor winding
- Self-locking
- Travel limit switches for both end positions
- Torque switches for open and closed direction
- Blinker transmitter
- Space heater
- Integrated motor control unit (Matic) with:
 - Reversing contactors with mechanical and electrical interlocks
 - Push buttons "open-stop-close"
 - Selector switch "local-off-remote" (lockable)
 - Opto-couplers for remote control signals (24V DC, internal supply)
 - 4 signal relays "open-close-selector switch local-selector switch remote"
 - Phase discriminator
 - Programmable logic
 - Monitoring relay for collective fault signal
 - Plug/socket connection for motor and controls
- Manual override by means of a handwheel
- Worm gearbox for reduction to 90° rotation with adjustable mechanical end stops for both end positions
- Mechanical position indicator on wormgear
- Flange dimensions acc. to ISO 5211

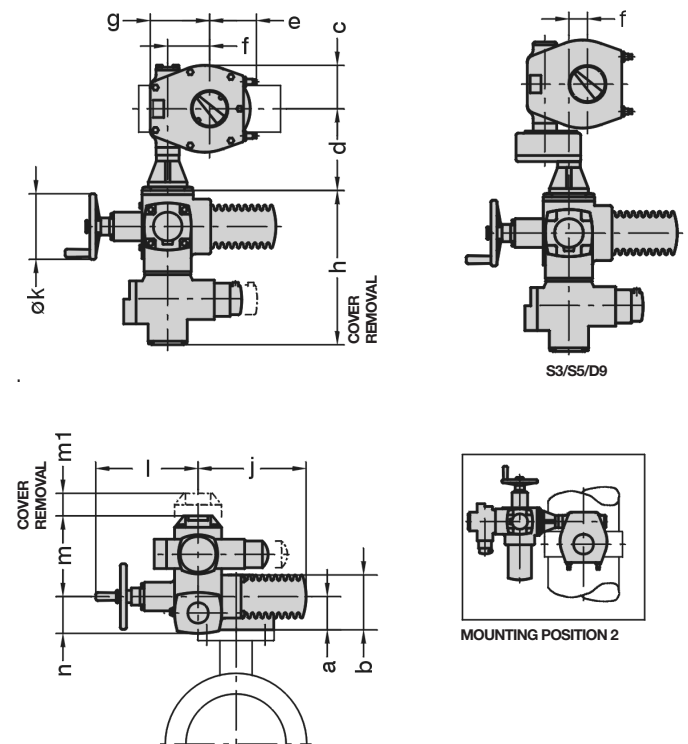
Technical data

- Stroke : 90° with ± 5° adjustment
 Rotation : Clockwise closing
 Duty rating : S2 - 15 min. up to 60 starts per hour
 Voltages : 3 phase AC
 Enclosure : IP67 (worm gearbox IP65)
 Temperature : -25° to +70° C
 Coating colour : RAL 9007, silver grey
 Cable entry : 1x Pg 13,5 2x Pg 21

Options

- Single phase current motor
- Motor for control duty S4 - 25% ED (1200 starts per hour)
- Additional mechanical position indicator on motor unit
- Tandem limit switches / torque switches
- Potentiometer for position feedback
- Electronic position transmitter, output 4-20 mA
- Positioner, input 4-20 mA
- Indication lamps iopen-fault-closei on motor control unit
- Fieldbus interface (Profibus DP, Profibus FMS, Interbus S, Modbus RTU)
- Extra corrosion protection
- Explosion proof actuator EEx ed IIC T4, to EN 50014
- Enclosure IP68-6 (up to 6 m head of water for 72 hours)
- Mounting position 2 (handwheel shaft parallel to pipeline)

Figure



Actuator type	ISO	Dimensions [mm]														Weight [kg]
		a	b	c	d	e	f	g	h	j	k	l	m	m1	n	
SA07.1 - AM01.1 - MZF40	F07 / F10	72	71	63	95	67	60	92	418	265	160	249	197	180	102	36
SA07.5 - AM01.1 - MYF40	F10 / F12	80	92	76	148	82	77	127	418	265	160	249	197	180	102	44
SA07.5 - AM01.1 - MYF40/S3	F10 / F12	80	92	76	275	82	-1	127	418	265	160	249	197	180	102	59
SA07.5 - AM01.1 - MBF64	F14 / F16	88	100	115	178	128	111	168	418	265	160	249	197	180	102	57
SA07.5 - AM01.1 - MBF64/S3	F14 / F16	88	100	115	306	128	33	168	418	265	160	249	197	180	102	72
SA07.5 - AM01.1 - MCF72/S5	F14 / F16	110	105	138	321	127	59	194	418	265	160	249	197	180	102	65
SA07.5 - AM01.1 - MFF57/S5	F16 / F25	106	128	143	331	158	60	195	418	265	160	249	197	180	102	91
SA10.1 - AM01.1 - MFF36/S5	F16 / F25	116	128	143	331	158	54	195	420	282	200	254	197	180	115	95
SA10.1 - AM01.1 - MFF36/D9	F16 / F25	116	128	143	425	158	138	195	420	282	200	254	197	180	115	108
SA10.1 - AM01.1 - MJF50/S5	F25 / F30	115	160	178	363	174	181	261	420	282	200	254	197	180	115	134
SA10.1 - AM01.1 - MJF50/D9	F25 / F30	115	160	178	425	174	181	261	420	282	200	254	197	180	115	147

other sizes available on request

Product sheet

ELECTRIC ACTUATOR, RANGE D / M.F

Application

For electric quarter turn on/off or control duty of Wouter Witzel butterfly valves. Heavy duty category.

Product description

- Squirrel cage induction motor (3 phase)
- Thermal protection of motor winding
- Self-locking
- Travel limit switches for both end positions
- Torque switches for open and closed direction
- Plug/socket connection for motor and controls
- Blinker transmitter
- Space heater
- Manual override by means of a handwheel
- Wormgear for reduction to 90° rotation with 2 adjustable mechanical endstops for both endpositions
- Mechanical position indication on wormgear
- Flange dimensions acc. to ISO 5211

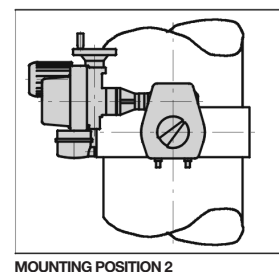
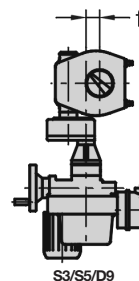
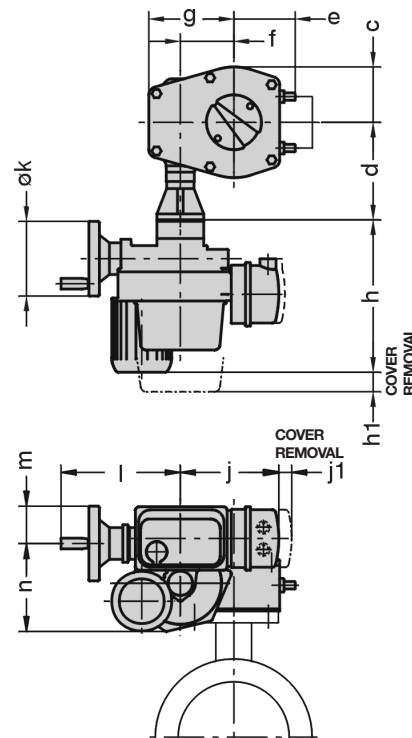
Technical data

- Stroke : 90° with ± 5° adjustment
- Rotation : Clockwise closing
- Duty rating : S2 - 15 min.
- Voltages : 3 phase AC
- Enclosure : IP67 (wormgear IP65)
- Temperature : -20° to +80° C
- Coating colour : RAL 5015,blue
- Cable entry : 1x Pg 13,5 2x Pg 29

Options

- Single phase motor
- Motor for control duty S4 - 25% ED (1200 starts per hour)
- Tandem limit switches / torque switches
- Additional mechanical position indicator on motor unit
- Potentiometer for position feedback
- Electronic position transmitter, output 4-20 mA
- Integrated motor control unit (Matic C)
- Explosion proof actuator EEx ed IIC T4, to EN 50014
- Extra corrosion protection
- Enclosure IP68-5 (up to 5 m head of water for 24 hours)
- Mounting position 2 (handwheel shaft parallel to pipeline)

Figure



Actuator type	ISO	Dimensions [mm]														Weight [kg]	
		a	b	c	d	e	f	g	h	h1	j	j1	k	l	m		n
D30 - MZF40	F07 / F10	130	71	63	95	67	60	92	280	105	252	15	125	280	82	224	24
D59 - MYF40	F10 / F12	138	92	76	148	82	77	127	280	105	252	15	160	280	82	224	34
D59 - MYF40/S3	F10 / F12	138	92	76	275	82	-1	127	280	105	252	15	160	280	82	224	49
D59 - MBF64	F14 / F16	146	100	115	178	128	111	168	280	105	252	15	160	280	82	224	47
D59 - MBF64/S3	F14 / F16	146	100	115	306	128	33	168	280	105	252	15	160	280	82	224	62
D59 - MCF72/S5	F14 / F16	168	105	138	321	127	59	194	280	105	252	15	160	280	82	224	68
D59 - MFF57/S5	F16 / F25	164	128	143	331	158	60	195	280	105	252	15	160	280	82	224	81
D120 - MFF36/S5	F16 / F25	173	128	143	331	158	54	195	371	105	262	15	200	322	98	236	89
D120 - MFF36/D9	F16 / F25	173	128	143	425	158	138	195	371	105	262	15	200	322	98	236	102
D120 - MJF50/S5	F25 / F30	172	160	178	363	174	181	261	371	105	262	15	200	322	98	236	128
D120 - MJF50/D9	F25 / F30	172	160	178	425	174	181	261	371	105	262	15	200	322	98	236	141

other sizes available on request

Product sheet

ELECTRIC ACTUATOR, RANGE DMC / M.F

Application

For electric quarter turn on/off or control duty of Wouter Witzel butterfly valves. Heavy duty category.

Product description

- Squirrel cage induction motor (3 phase)
- Thermal protection of motor winding
- Self-locking
- Travel limit switches for both end positions
- Torque switches for open and closed direction
- Space heater
- Integrated motor control unit (Matic MC 002) with:
 - Reversing contactors with mechanical and electrical interlocks
 - Selector switch "open-stop-close"
 - Selector switch "local-off-remote" (lockable)
 - Opto-couplers for remote control signals (24V DC, internal supply)
 - 4 signal relays "open-close-selector switch local-selector switch remote"
 - Automatic correction of rotation direction
 - Programmable logic
 - Monitoring relay for collective fault signal
 - Plug/socket connection for motor and controls
- Manual override by means of a handwheel
- Blinker transmitter
- Worm gearbox for reduction to 90° rotation with adjustable mechanical end stops for both end positions
- Mechanical position indicator on wormgear
- Flange dimensions acc. to ISO 5211

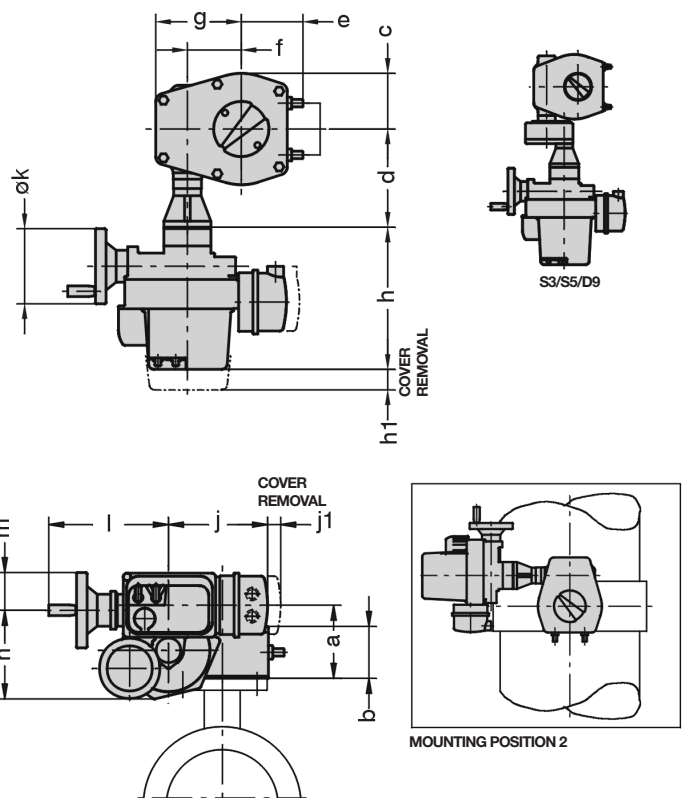
Technical data

- Stroke : 90° with ± 5° adjustment
- Rotation : Clockwise closing
- Duty rating : S2 - 15 min.
- Voltages : 3 phase AC
- Enclosure : IP67 (worm gearbox IP65)
- Temperature : -20° to +70° C
- Coating colour : RAL 5015, blue
- Cable entry : 1x Pg 13,5 2x Pg 29

Options

- Motor for control duty S4 - 25% ED (1200 starts per hour)
- Additional mechanical position indicator on motor unit
- MC 003: as MC 002 with extra position transmitter 4 - 20 mA (internal supply) and mechanical position indicator
- MC 004: as MC 002 with 2 extra electronic contacts for intermediate positions
- MC 005: as MC 002 with extra positioner for control duty, input 4 - 20 mA, position transmitter 4 - 20 mA (internal supply) and mechanical position indicator
- Indication lamps "open - failure -close"
- Explosion proof actuator EEx ed IIC T4, to EN 50014
- Extra corrosion protection
- Enclosure IP68-5 (up to 5 m water head for 24 hours)
- Mounting position 2 (handwheel shaft parallel to pipeline)

Figure



Actuator type	ISO	Dimensions [mm]														Weight [kg]	
		a	b	c	d	e	f	g	h	h1	j	j1	k	l	m		n
DMC30 - MZF40	F07 / F10	130	71	63	95	67	60	92	348	185	252	15	125	281	82	224	29
DMC59 - MYF40	F10 / F12	138	92	76	148	82	77	127	347	185	252	15	160	281	82	224	39
DMC59 - MYF40/S3	F10 / F12	138	92	76	275	82	-1	127	347	185	252	15	160	281	82	224	54
DMC59 - MBF64	F14 / F16	146	100	115	178	128	111	168	347	185	252	15	160	281	82	224	52
DMC59 - MBF64/S3	F14 / F16	146	100	115	306	128	33	168	347	185	252	15	160	281	82	224	67
DMC59 - MCF72/S5	F14 / F16	168	105	138	321	127	59	194	347	185	252	15	160	281	82	224	73
DMC59 - MFF57/S5	F16 / F25	164	128	143	331	158	60	195	347	185	252	15	160	281	82	224	86
DMC120 - MFF36/S5	F16 / F25	173	128	143	331	158	54	195	384	205	262	15	200	324	98	236	95
DMC120 - MFF36/D9	F16 / F25	173	128	143	425	158	138	195	384	205	262	15	200	324	98	236	108
DMC120 - MJF50/S5	F25 / F30	172	160	178	363	174	97	261	384	205	262	15	200	324	98	236	134
DMC120 - MJF50/D9	F25 / F30	172	160	178	425	174	181	261	384	205	262	15	200	324	98	236	147

other sizes available on request

Product sheet

ELECTRIC ACTUATOR, RANGE IQ / M.F

Application

For electric quarter turn on/off or control duty of Wouter Witzel butterfly valves. Heavy duty category.

Product description

- Three phase Class F insulated squirrel cage motor
- Integrated motor control unit
- Thermostat for protection of motor windings
- Electronic torque control
- Four indication contacts, configurable by Infrared setting tool
- Local control station. Selector switch "local-remote". Control knob "open-stop-close"
- Several interlock and monitoring facilities
- Lockable hand/auto lever to engage handwheel operation. Energisation of the motor automatically re-engages power operation
- Segregated connection of motor and controls on terminal block, located in separate sealed compartment
- Local LCD valve position indication (illuminated)
- Worm gearbox for reduction to 90° rotation with adjustable end stops for both end positions
- Mechanical position indicator on wormgear
- Flange dimensions acc. to ISO 5211

Technical data

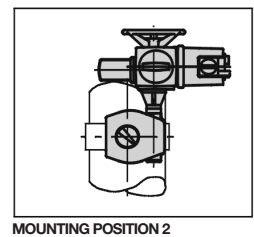
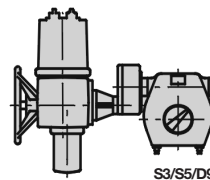
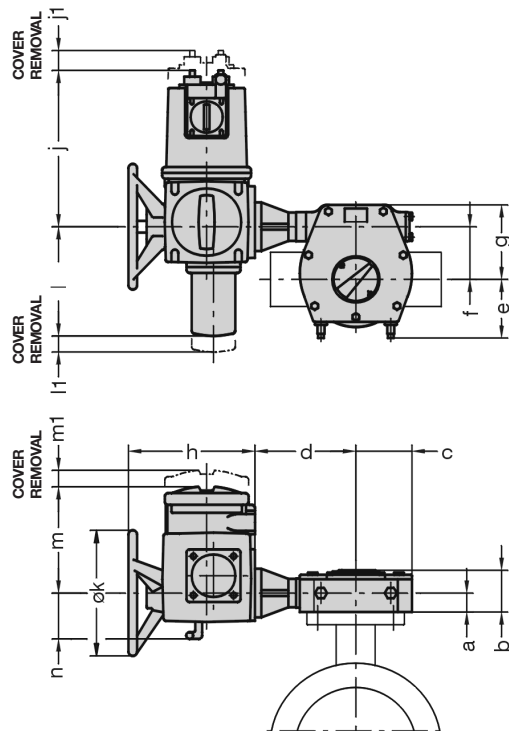
- Stroke : 90° with ± 5° adjustment
- Rotation : Clockwise closing
- Duty rating : S2 – 20% ED, up to 60 starts per hour
- Enclosure : IP68 (up to 3 m head of water for 48 hrs.)
- Temperature : -30° to +70° C
- Coating : BS4800 00A13, charcoal grey
- Cable entry : 1x M40, 2x M25 or 1x Pg29, 2x Pg16 or 2x 1", 1x 1 1/2" ASA NPT

Options

- Set of alarm relays "battery low-thermostat tripped-remote selected"
- Additional status signal contacts
- Motor for control duty S4 - 50% ED (1200 starts per hour)
- Electronic position transmitter (CPT), output 4-20 mA
- Positioner (Folomatic), input 4 - 20 mA
- Interrupter timer
- Several explosion proof enclosures (CSA, FM, CENELEC)

- Fieldbus interface (ie Pakscan, Modbus, Profibus, Fieldbus Foundation)
- Mounting position 2 (handwheel shaft parallel to pipeline)

Figure



Actuator type	ISO	Dimensions [mm]																Weight [kg]
		a	b	c	d	e	f	g	h	j	j1	k	l	l1	m	m1	n	
IQ10 - MZF40	F07 / F10	32	71	63	93	67	60	92	282	373	210	300	260	175	260	30	109	36
IQ12 - MYF40	F10 / F12	40	92	76	148	82	77	127	282	373	210	300	260	175	260	30	109	44
IQ12 - MBF64	F14 / F16	48	100	115	178	128	111	168	282	373	210	300	260	175	260	30	109	57
IQ10 - MBF64/S3	F14 / F16	48	100	115	306	128	33	168	282	373	210	300	260	175	260	30	109	72
IQ12 - MCF72/S3	F14 / F16	48	105	138	321	127	59	194	282	373	210	300	260	175	260	30	109	78
IQ12 - MFF57/S5	F16 / F25	66	128	143	331	158	54	195	282	373	210	300	260	175	260	30	109	91
IQ12 - MFF36/D9	F16 / F25	66	128	143	425	158	138	195	282	373	210	300	260	175	260	30	109	104
IQ12 - MJF50/D9	F25 / F30	65	160	178	425	174	181	261	282	373	210	300	260	175	260	30	109	143

other sizes available on request

4 PRODUCT DATA: HYDRAULIC ACTUATORS

4.1 GENERAL

Hydraulic actuators use oil under high pressure as energy power source.

Main features of hydraulic actuators are:

- Compact and small design
- Smooth operation over complete valve stroke
- Spring return actuators for fail-safe operation
- Possibility for submerged or sub-sea operation

4.2 PRODUCT CONFIGURATION

Hydraulic actuators can be equipped with many ancillaries such as:

Ancillary:

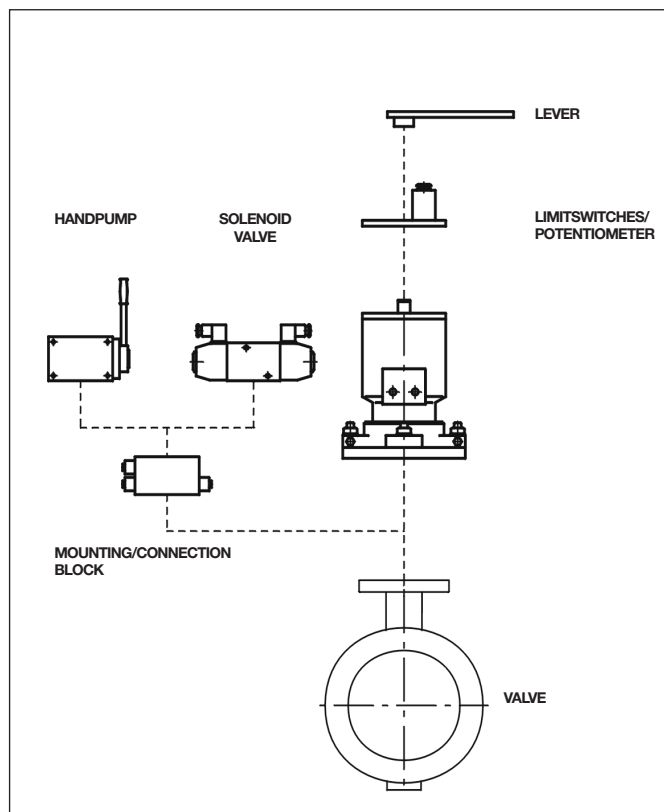
- Limit switches
(direct mounted to actuator or in a switchbox)
- Solenoid valves
- Throttle block
- Potentiometer
- Pilot operated check valves
- Lever or hand pump unit

Function:

- remote open/closed position monitoring of the valve
(mechanical switches or inductive proximity sensors)
- remote on/off operation of actuator
- speed control for increased operating times
- continuous valve disc position feedback (resistance signal)
- maintain valve disc position after hydraulic supply failure
- manual override or operation after hydraulic supply failure

NB: Specific technical information on request

4.2.1. Product configuration hydraulic actuators for on/off duty



Product sheet

HYDRAULIC ACTUATOR, RANGE BRC

Application

For hydraulic quarter turn on/off duty of Wouter Witzel butterfly valves. General purpose applications. Compact design.

Product description

- Body and piston of ductile iron (GGG40), alkyd coated
- Balanced rotary principle which eliminates side / bending forces on valve stem.
- Mechanical position indicator
- Easy adaption and mounting
- Flange dimensions acc. to ISO 5211
- Working pressure min. 30 bar, max. 210 bar

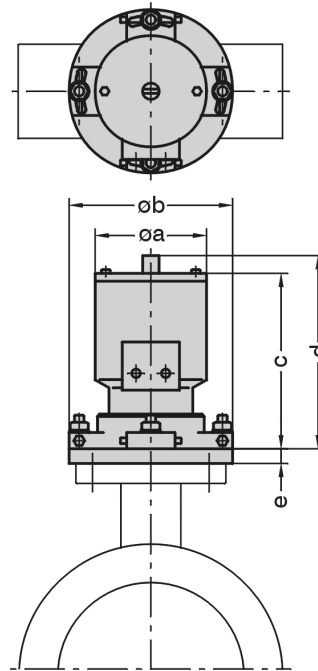
Technical data

Stroke	: 90° with ± 1° adjustment
Rotation	: Clockwise closing
Temperature	: -20° to +80° C
Coating	: Hempalin 53240, no. 50800 red
Hydraulic connection	: 2x 3/8" BSPF

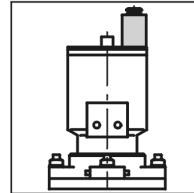
Options

- Reed limit switches RLS
- Current position transmitter CPI
- Multifunction blocks
- Solenoid valve
- Local operation by means of a lever (BRC002,BRC012)
- Local operation by means of a handpump (BRC022>)
- Local power unit (LPU)
- Version for submerged or subsea applications (epoxy coating)
- High temperature version (A2) (> 80°C)
- Low temperature version (A3) (down to -40°C)
- Single acting, spring return actuator BRCF

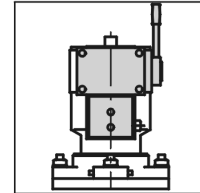
Figure



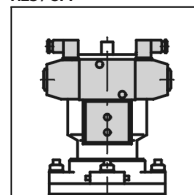
OPTIONS



RLS / CPI



HANDPUMP

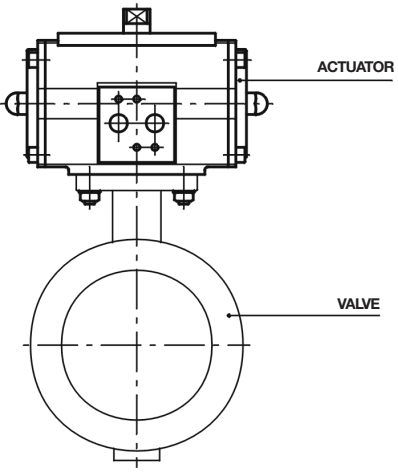
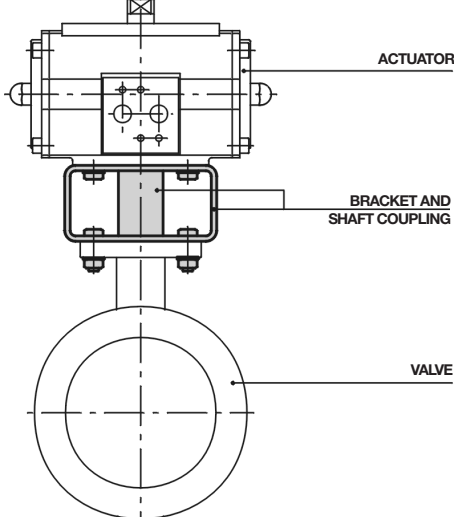


SOLENOID VALVE

Actuator type	ISO	Dimensions [mm]					Weight [kg]
		a	b	c	d	e	
BRC 002	F05 / F07	96	128	147	179	25	12.1
BRC 012	F10	126	153	182	218	25	20.2
BRC 022	F10 / F12 / F14	164	213	212	235	25	41.5
BRC 032	F14 / F16	203	243	270	318	30	69.5
BRC 052	F14 / F16 / F25	236	295	323	376	45	127
BRC 072	F16 / F25 / F30	290	334	378	440	60	203
BRC 092	F25 / F30 / F35 / F40	364	430	462	533	45	327

5 TECHNICAL INFO

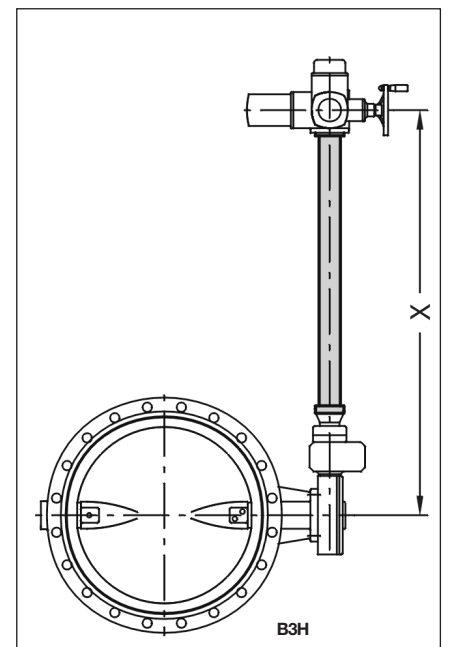
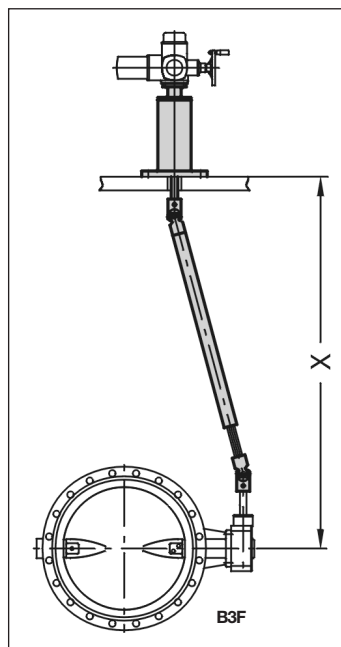
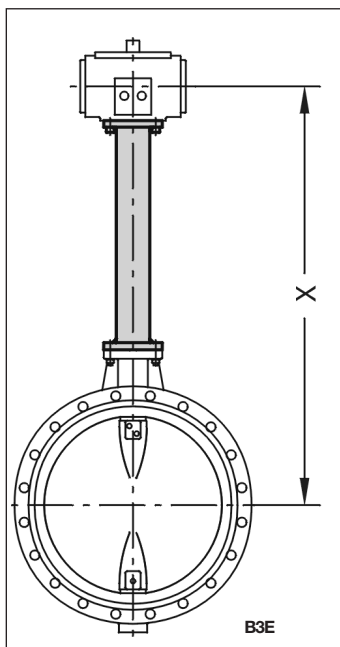
5.1 DIRECT OR INDIRECT MOUNTING

Direct mounting Actuator directly mounted to the valve	Indirect mounting Bracket between actuator and valve
	
<p>Typical applications:</p> <ul style="list-style-type: none"> • Centric rubberlined valves with fluid temperatures up to 110 °C • Centric rubberlined valves with fluid temperatures between 110 °C and 150 °C (with extra heat isolating gasket) • Centric rubberlined butterfly valves for buried service (with extra sealing gasket between valve and actuator) 	<p>Typical applications:</p> <ul style="list-style-type: none"> • Centric rubber- or PTFE lined butterfly valves for (petro-) chemical industries • Butterfly valves for high temperature service (≥ 150 °C) • High performance butterfly valves with stuffing box and gland • Actuator with different mounting flange size to valve

5.2 EXTENSIONS

Wouter Witzel supplies different and special types of extension spindles for remote mounting of actuators. The following are standard options:

- B3E:** Steel extension spindle between valve head and actuator (also suitable for buried or submerged duty of the valve)
- B3F:** Steel or stainless steel extension spindle between wormgear and electric actuator for operation from another floor level actuator mounted on a floor pedestal (extension spindle based on 2 universal joints and sliding bush which allows misalignment)
- B3H:** Steel extension spindle between wormgear and electric multi turn actuator



5.3 INTERFACE FLANGE DIMENSIONS AND TORQUES (ACCORDING ISO 5211)

Flange type ISO 5211	Maximum transmittable torque (Nm)	PCD [mm]	n x Dbolt	Threaded depth* [mm]	Figure
F05	125	50	4 x M6	8	
F07	250	70	4 x M8	12	
F10	500	102	4 x M10	15	
F12	1000	125	4 x M12	18	
F14	2000	140	4 x M16	24	
F16	4000	165	4 x M20	30	
F25	8000	254	8 x M16	24	
F30	16000	298	8 x M20	30	
F35	32000	356	8 x M30	45	
F40	64000	406	8 x M36	54	
F48	125000	483	12 x M36	54	

* According ISO 5211: For materials with a proof stress $R_{p0.2} = 200 \text{ N/mm}^2$

5.4 ADJUSTMENT AND TESTING

Wouter Witzel supply valve/actuator assemblies which are carefully adjusted and tested in the factory before dispatch. The assembly is ready for operation in the pipe line.

Valve/actuator assembly	Adjustment	Testing
Valve with pneumatic actuator	Adjustment of actuator's mechanical end stop(s), when applied. Adjustment of optional ancillaries e.g. limit switches, position transmitters, positioners	Functional test, open / close at 5 bar supply pressure, unless otherwise specified Functional test of optional ancillaries
Valve with electric actuator	Adjustment of actuator's mechanical end stops and limit switches Adjustment of the torque switches, when applicable <ul style="list-style-type: none"> • Open direction: Set torque value is based on valve torque + 10%, unless otherwise specified • Closed direction: 95% of the value for open direction Adjustment of optional ancillaries e.g. extra switches, position transmitters, positioners	Functional test, open / close Functional test of optional ancillaries
Valve with hydraulic actuator	Adjustment of the actuator mechanical end stop(s), when applied. Adjustment of optional ancillaries e.g. limit switches, position transmitters	Functional test, open / close at 110 bar supply pressure, unless otherwise specified Functional test of optional ancillaries

5.5 ENVIRONMENTAL PROTECTION

5.5.1 Requirements for actuators to be used in hazardous areas

Specific measures have been taken on an international level in order to avoid any material damage or the loss of human lives by an explosion caused by the accidental ignition of a gas in a hazardous area. Hazardous areas are places where the presence of explosive or ignitable gases do, or may, occur. A customer always has to specify area classification and requested type of protection

Area classification:

Zone 0: Continuously present (during long periods)

Zone 1: Not likely to be present (regular service)

Zone 2: Accidentally present (short time service - never in regular service)

Marking conforming to the EN 50014 standard:

EEx m II T4

Types of protection		Zones		
		0	1	2
d	Flameproof enclosure EN 50018		•	•
e	Increased safety EN 50019		•	•
i	Intrinsic safety "ia" or "ib" EN 50020	ia	•	•
		ib	•	•
m	Encapsulation EN 50028		•	•

Groups of equipment	
I	Electrical apparatus intended for use in mines susceptible to firedamp (e.g. fuel tanks)
II	Electrical apparatus for use in locations with explosive atmospheres other than mines for types of protection d and i group II is subdivided into IIA, IIB, IIC

Groups	Gas	Ignition temperature ¹⁾ (°C)	Temperature class						
			T1	T2	T3	T4	T5	T6	
I	methane (firedamp)								
II	A	acetone	540	•					
		acetic acid	485	•					
		ammonia	630	•					
		ethane	515	•					
		methylene chloride	556	•					
		methane (CH ₄)	595	•					
		carbon monoxide	605	•					
	propane	470	•						
	B	n-butane	365		•				
		n-butyl	370		•				
		hydrogen sulphide	270			•			
		n-hexane	240			•			
		acetaldehyde	140				•		
		ethyl ether	170				•		
ethyle nitrite		90						•	
C	ethylene	425		•					
	ethyl oxide	429-440		•					
C	acetylene (C ₂ H ₂)	305		•					
	carbon bisulphide (CS ₂)	102					•		
	hydrogen (H ₂)	560	•						

(1): temperature of a hot surface able to ignite a gas mixture

(2): IIB certified products may be used as equipment of group IIA. Similarly, IIC certified products may be used as equipment of groups IIA and IIB

Temperature class	Maximum surface temperatures (°C) Gas ignition by contact with hot surfaces
T1	450 °C
T2	300 °C
T3	200 °C
T4	135 °C
T5	100 °C
T6	85 °C

5.5.2 IP classes

Protection of enclosures against ingress of dust and water. IP classes according IEC 529 and EN 60529.

IP class	Dust and sand protection	Water protection
IP 54	Dust protected. Ingress of dust is not totally prevented.	Protected against splashing from any direction
IP 55	Dust protected. Ingress of dust is not totally prevented.	Protected against water jets from any direction
IP 64	Dust tight.	Protected against splashing from any direction
IP 65	Dust tight.	Protected against water jets from any direction
IP 66	Dust tight.	Protected against powerfull water jets from any direction
IP 67	Dust tight.	Protected against temporarily immersion.
IP 68	Dust tight.	Protected against continuous immersion under specified conditions (eg. depth)

5.6 FIELDBUS SYSTEMS

5.6.1 General

Both manual operated and automated valves are often part of a remote controlled and / or monitored system. Therefore valve actuators and operators have to be provided with sensors and solenoid valves. Wouter Witzel can supply valve actuators with accessories suitable for fieldbus systems. Pneumatic actuators can be provided with limit switches (inductive proximity type) suitable for direct connection to the AS-i (Actuator Sensor Interface) fieldbus system including pre-wired solenoid valves (see figure 1). Also the more sophisticated electric actuators can be provided with interfaces for communication with higher level fieldbus systems such as Interbus S, Profibus FMS or Profibus DP fieldbus systems.

5.6.2 AS-i

Originally developed by a group of German sensor suppliers such as IFM, Pepperl & Fuchs and others, AS-i is designed as replacement for conventional field wiring particularly in on / off switching and contact status monitoring. It is capable of handling two discrete inputs - open and closed - and two discrete outputs for single and dual coil solenoid operation. It also has the facility for basic diagnostics and has power carrying capability to operate low power solenoids. Figure 2 shows the decrease of field wiring when AS-i fieldbus wiring is applied. The AS-i fieldbus can be simply integrated with PLC and PC-based control systems and higher level fieldbus systems.

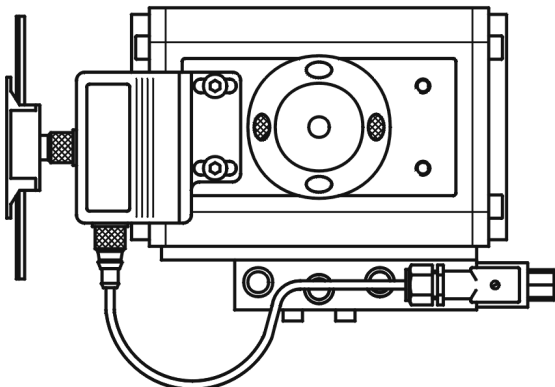


Figure 1: Pneumatic actuator provided with proximity switches and solenoid valve in AS-i configuration

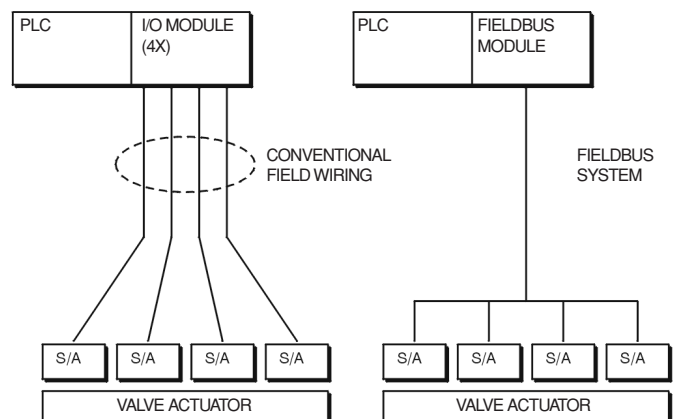


Figure 2: Conventional wiring and fieldbus wiring

6 INFORMATION ABOUT EUROPEAN DIRECTIVES AND CE MARKING

(Only applicable to valves / actuators to be used in the European Union)

All European Community countries have national laws concerning health, safety and environmental requirements, which are based on directives drawn up by the European Union.

Examples of European Directives which may be applicable to valves, actuators and ancillaries are:

- **Machinery Directive.**

Machinery supplied in the EU must satisfy wide-ranging health and safety requirements for example on construction, moving parts and stability.

- *Manually operated valves (by lever or wormgear) are outside the scope of the machinery directive because of the hand operation and have no CE marking.*
- *A power operated valve / actuator assembly does not require a CE mark because of the Machinery Directive. It has no independant function but is intended to be installed as a component into a piping system which should become certified and CE marked entirely. Wouter Witzel supplies a Declaration of Incorporation (IIB) and a detailed user manual to support the end user in satisfying the requirements.*
- *Valves and / or actuators to be used as a safety component according the Machinery Directive should be ordered by the purchaser accordingly.*
- *Valves supplied by Wouter Witzel with bare shaft are usually provided with actuators by the purchaser. It is his responsibility to satisfy the requirements of the Directives where applicable.*

- **Electro-Magnetic Compatibility Directive (EMC)**

Covering the non-generation of electromagnetic disturbance and immunity from such disturbance.

Applicable to eg. electric actuators and ancillaries. CE marking because of this directory is mandatory.

- **Low Voltage Directive.**

Applicable to safety aspects of electric products for 50 – 1000 V AC and 75 – 1500 V DC supply.

Applicable to eg. electric actuators. No CE marking required because of this Directive.