# Characterised Control Valves with Actuators



**Technical Databook** 







**Belimo Asia Pacific** 



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## Characterised Control Valves and Rotary Actuators for modulating control

· · · · · · · · · · · · · · · · · · ·										
Flow Chara	characteristics cteristic: equal	of Character percentage	rised Control	Valves		PN Designation: 3-way, PN40 (DN1525), PN25 (DN3250) 2-way, PN40 (DN1525), PN25 (DN3250) PN16 (DN65150)				
Connection		Internal thread								
Kvs[m <sup>3</sup> /h]	0.25	0.4	0.63	1	1.6	2.5	4	6.3	4	6.3
DN[mm]	15	15	15	15	15	15	15	15	20	20
2-way	R2015-P25-S1	R2015-P4-S1	R2015-P63-S1	R2015-1-S1	R2015-1P6-S1	R2015-2P5-S1	R2015-4-S1	R2015-6P3-S1	R2020-4-S1	R2020-6P3-S1
Modulating	DC (0)210V									
	TR24-SR									
Fail-Safe	TRF24-SR									
Fast Running	LRQ24A-SR									
3-point										
	TR24									
	TR230-3									
Fail-Safe	TRF24-2									
Connection					Interna	thread				
Kvs[m³/h]	0.25		0.4	0.63		1	1.6	2.5		4
DN[mm]	15		15	15	1	5	15	15		15
3-way	R3015-P25-S	S1 R30	15-P4-S1	R3015-P63-S1	R3015	5-1-S1	R3015-1P6-S1	R3015-2F	95-S1	R3015-4-S1
Modulating	DC (0)210V									
	TR24-SR									
Fail-Safe	TRF24-SR									
Fast Running	LRQ24A-SR									
3-point										
	TR24									
	TR230-3									
E-11 0-4-	70504.0									

## Open/Close Ball Valves and Rotary Actuators for shut-off or change-over functions

Flow of	characteristics of O	pen/Close Ball Valv	es	PN Design	PN Designation: 3-way, PN40 (DN1525), PN25 (DN3250) 2-way, PN40 (DN1525), PN25 (DN3250) PN16 (DN65150)				
Connection				Internal thread					
Kvs[m <sup>3</sup> /h]	15	15	32	26	32	31	49		
DN[mm]	15	20	20	25	32	40	50		
2-way	R2015-S1	R2020-S1	R2020-S2	R2025-S2	R2025-S2 R2032-S2** R2040-S2** R2050				

Open/Close

	TR24	LR24A(-S)	NR24A(-S)
	TR230-3	LR230A(-S)	NR230A(-S)
<b>F</b> 11 <b>A</b> <i>I</i>	TRF24(-S)	LRF24(-S)	NRFA(-S2)
Fall-Sale	TRF230(-S)	LRF230(-S)	NRFA(-S2)
Fast Running	LRQ24A		SRQ24A

Connection	Internal thread							
<b>Kvs</b> [m <sup>3</sup> /h]	15	12	32	26	18	32	31	49
DN[mm]	15	20	20	25	32	32	40	50
3-way	R3015-S1	R3020-S1	R3020-S2	R3025-S2	R3032-S2	R3032-S3	R3040-S3	R3050-S4

Open/Close

	TR24	LR24A(-S)	NR24A(-S)	SR24A(-S)
	TR230-3	LR230A(-S)	NR230A(-S)	SR230A(-S)
E-11 0-6-	TRF24(-S)	LRF24(-S)	NRFA(-S2)	SRFA(-S2)
Fall-Sale	TRF230(-S)	LRF230(-S)	NRFA(-S2)	SRFA(-S2)
Fast Running	LRQ24A		NRQ24A	SRQ24A



## Characterised Control Valves and Rotary Actuators for modulating control

Flow characteristics of Characterised Control Valves Characteristic: equal percentage						PN Designa	ation: 3-way, 2-way,	PN40 (DN PN40 (DN PN16 (DN	1525),  1525),  65150	PN25 (DI PN25 (DI )	N3250) N3250)		
Internal thread							Flange PN16						
6.3	10	10	16	20	16	25	25	40	63	100	140	230	320
25	25 32 32 32 40 40						50	50	65	80	100	125	150
R2025-6P3-S2	R2025-10-S2	R2032-10-S2	R2032-16-S2**	R2032-20-S2	R2040-16-S2**	R2040-25-S2**	R2050-25-S3	R2050-40-S3	R664AO	R679AO	R6099AO	R6124AO	R6149AO

LR24A-SR	NR24A-SR	SR24A-SR-5	GR24A-SR-7
LRF24-SR	NRF24A-SR	SRF24A-SR-5	GRK24A-MF-7
LRQ24A-SR	SRQ24A-SR	SRQS5*	

LR24A(-S)	NR24A(-S)	SR24A(-S)-5	GR24A-7
LR230A(-S)	NR230A(-S)	SR230A(-S)-5	GR230A-7
LF24-3	NRFS*	SRFS*	GRK24A-MF-7

	Internal thread									
4	6.3	6.3	10	10	16	16	25	25	40	58
20	20	25	25	32	32	40	40	50	50	50
R3020-4-S1	R3020-6P3-S1	R3025-6P3-S2	R3025-10-S2	R3032-10-S2	R3032-16-S3	R3040-16-S3	R3040-25-S4	R3050-25-S4	R3050-40-S4	R3050-58-S4

TR24-SR	LR24A-SR	NR24A-SR	SR24A-SR
TRF24-SR	LRF24-SR	NRF24A-SR	SRF24A-SR
LRQ24A-SR		NRQ24A-SR	SRQ24A-SR

TR24	LR24A(-S)	NR24A(-S)	SR24A(-S)
TR230-3	LR230A(-S)	NR230A(-S)	SR230A(-S)
TRF24-2	LF24-3	NRFS*	SRFS*

## Open/Close Ball Valves and Rotary Actuators for shut-off or change-over functions

Flow characteristics of Open/Close Ball Valves				PN Designation: 3-way, PN40 (DN1525), PN25 (DN3250) 2-way, PN40 (DN1525), PN25 (DN3250) PN16 (DN65150)			
Flange PN16							
	120	180	230	390	570		
	65	80	100	125	150		
	R665AO	R680AO	R6100AO	R6125AO	R6150AO		

SR24A(-S)-5	GR24A-7
SR230A(-S)-5	GR230A-7
SRFA(-S2)-5	GRK24A-7
SRFA(-S2)-5	

\* NRFS/SRFS/SRQS..-5 model for Customising.

\*\* Non-spring return: using NR.. series actuator for application > 70°C. Spring return: using NRF.. series actuator for application > 70°C. Fast-running: using NRQ.. series actuator for application > 70°C.



#### An ordinary Ball Valve is unsuitable as a control device





Characteristic of an ordinary Ball Valve

#### Belimo has added "control" to the Ball Valve



In order to ensure good stability of control, a Control Valve must have a flow characteristic that complements the nonlinear characteristic of the heat exchanger in the HVAC system.

An equal-percentage valve characteristic is described in order to produce a linear relationship between the thermal output and the amount of opening of the control device. This means that the flow rate increases slowly as the valve begins to open. Characteristic in ordinary Ball Valves is severely distorted.

The reason for this is that an ordinary Ball Valve has an extremely high flow coefficient (Kvs value) compared with its nominal size, several times that of a comparable globe valve.

Therefore, an ordinary Ball Valve is not very suitable for performing control functions:

- · Quick-opening flow characteristic
- · Flow coefficient excessive due to the design
- · Inadequate flow control in the part-load range

Belimo has succeeded in solving the problem of the distorted flow characteristic of ordinary Ball Valves. A so-called "characterising disc" in the inlet of the Characterised Control Valve converts the valve's characteristic to the equal-percentage kind. The side of the characterising disc facing the ball is concave and is in contact with the surface of the ball. Thus, the actual flow is regulated by the hole in the ball and by the V-shaped aperture in the characterising disc.

The Kvs value is reduced and corresponds approximately to that of a Globe Valve of comparable size. In order to avoid having to fit pipe reducers in the majority of cases, each valve size is also available with wide choices of different Kvs values.

#### Advantages of the Belimo Characterised Control Valve



- · Equal-percentage characteristic
- No initial jump in flow on opening
- · Excellent stability of control thanks to the characterising disc
- · Kvs values similar to those of Globe Valves of comparable size
- Fewer pipe reducers needed
- High rangeability
- High close-off pressure
- Tight-sealing



## The elements of the Characterised Control Valve



(1) Simple direct attachment with a central screw

- Square spindle head for form-fit attachment of the Rotary Actuator
- (3) Identical mounting flange for all sizes
- (4) Spindle with O-rings for long service life
- (5) Ball and spindle made of stainless steel
- 6 Characterising disc produces equalpercentage flow characteristic
- 7 Internal screw connection (ISO 7/1)
- 8 Forged fitting, nickel-plated brass body
- Vent part to prevent the accumulation of condensation
- (10) Thermal decoupling of actuator from valve
- (11) Flange (ISO 7005-2)
- (12) GG25, polyester coated body



#### Optimum choice of Kvs values of identical size

- · Better controllability
- · Lower installation costs

The Belimo range of Characterised Control Valves includes 2-way and 3-way types that are available in a variety of sizes and with a choice of Kvs value. A Characterised Control Valve is normally supplied as a unit complete with a suitable Belimo Rotary Actuator.

Notes

- The control devices described in this publication are intended for using in the closed water circuits of heating, ventilation and air-conditioning systems. Use of the control devices in conjunction with other liquid or gaseous fluids is on request.
- Select the Characterised Control Valve according to the valve sizing diagram.
- Please pay attention to the notes at operation, mounting, commissioning, maintenance and project design.

Ordering

Ordering example\* (with LR24A)

- a) LR24A Rotary Actuator with R.. valve fitted\*\*
   -Order code: R..+LR24A
- b) LR24A Rotary Actuator and R.. valve supplied separately -Order code: R../LR24A
- c) LR24A Rotary Actuator packed loose
   Order code: LR24A
   An order for a Parallel second backed on a standard second second backed on a standard second backed on a standard second se
  - \*An order for a R.. valve usually includes an actuator

## Sizing diagram for Characterised Control Valves

#### Legend

$\label{eq:max} \begin{tabular}{lllllllllllllllllllllllllllllllllll$
·—·—·– △P <sub>max</sub> for low-noise operation
$\triangle \mathbf{P_{v100}}$ pressure difference with Ball Valve fully open
$\dot{\mathbf{V}}_{_{100}}$ Nominal flow rate at $ riangle P_{_{v100}}$

#### Formula for Kvs



# Definition of Close-off pressure $\triangle \mathsf{Ps}$

Differential pressure at which the actuator can still seal the valve tightly allowing for the appropriate leakage rate.



**∆**p<sub>v100</sub>[kPa]

#### Sizing table for Characterised Control Valves

Kvs[m³/h]	0.25	0.4	0.63	1	1.6	2.5	4	6.3	4	6.3
DN[mm]	15	15	15	15	15	15	15	15	20	20
	R2015-P25-S1	R2015-P4-S1	R2015-P63-S1	R2015-1-S1	R2015-1P6-S1	R2015-2P5-S1	R2015-4-S1	R2015-6P3-S1	R2020-4-S1	R2020-6P3-S1
	R3015-P25-S1	R3015-P4-S1	R3015-P63-S1	R3015-1-S1	R3015-1P6-S1	R3015-2P5-S1	R3015-4-S1	-	R3020-4-S1	R3020-6P3-S1
Kvs[m³/h]	6.3	10	10	16	20	16	25	25	40	58
DN[mm]	25	25	32	32	32	40	40	50	50	50
	R2025-6P3-S2	R2025-10-S2	R2032-10-S2	-	R2032-20-S2	R2040-16-S2	R2040-25-S2	R2050-25-S3	R2050-40-S3	-
	R3025-6P3-S2	R3025-10-S2	R3032-10-S2	R3032-16-S3	-	R3040-16-S3	R3040-25-S4	R3050-25-S4	R3050-40-S4	R3050-58-S4
Kvs[m³/h]	63	100	140	230	320					
DN[mm]	65	80	100	125	150					

R6149AO



R664AO

R679AO

R6099AO

R6124AO



## Sizing table for Open/Close Ball Valves

Differential pressure △p <sub>v100</sub> [kPa]	$\rangle$	0.1	1	3	10	<b>Kvs</b> [m³/h]	DN [mm]	2-way
		0.47	1.50	2.60	4.74	15	15	R2015-S1
		0.47	1.50	2.60	4.74	15	20	R2020-S1
Flow		1.01	3.20	5.54	10.12	32	20	R2020-S2
V <sub>100</sub> [m³/h]		0.82	2.60	4.50	8.22	26	25	R2025-S2
		1.01	3.20	5.54	10.12	32	32	R2032-S2
		0.98	3.10	5.37	9.80	31	40	R2040-S2
		1.55	4.90	8.49	15.50	49	50	R2050-S3

Differential pressure △p <sub>v100</sub> [kPa]

Flow V<sub>100</sub> [m³/h]

al pressure Pa]	$\rangle$	0.1	1	3	10	<b>Kvs</b> [m³/h]	<b>DN</b> [mm]	3-way ►
]		0.47	1.50	2.60	4.74	15	15	R3015-S1
		0.38	1.20	2.08	3.79	12	20	R3020-S1
		1.01	3.20	5.54	10.12	32	20	R3020-S2
		0.82	2.60	4.50	8.22	26	25	R3025-S2
		0.57	1.80	3.12	5.69	18	32	R3032-S2
	1	1.01	3.20	5.54	10.12	32	32	R3032-S3
		0.98	3.10	5.37	9.80	31	40	R3040-S3
		1.55	4.90	8.49	15.50	49	50	R3050-S4

## R2..xx-S..

Characterised control valve, 2-way, Internal thread

- For open and closed cold and warm water systems
- For modulating water-side control of air handling units and heating systems
- Air bubble tight



BELIMO

## Type overview

Туре	<b>kvs</b> [ m³/h]	<b>DN</b> []	<b>Rp</b> ["]	<b>PN</b> []	n(gl) []	Sv min.
D2015 D25 S1	0.25	15	1/2	40	2.2	50
R2013-F23-31	0.25	15	1/2	40	3.2	50
R2015-P4-S1	0.4	15	1/2	40	3.2	50
R2015-P63-S1	0.63	15	1/2	40	3.2	50
R2015-1-S1	1	15	1/2	40	3.2	50
R2015-1P6-S1	1.6	15	1/2	40	3.2	50
R2015-2P5-S1	2.5	15	1/2	40	3.2	50
R2015-4-S1	4	15	1/2	40	3.2	100
R2015-6P3-S1	6.3	15	1/2	40	3.2	100
R2020-4-S1	4	20	3/4	40	3.2	100
R2020-6P3-S1	6.3	20	3/4	40	3.2	100
R2025-6P3-S2	6.3	25	1	40	3.2	100
R2025-10-S2	10	25	1	40	3.2	100
R2032-10-S2	10	32	1 1/4	25	3.2	100
R2032-20-S2	20	32	1 1/4	25	3.2	100
R2040-16-S2	16	40	1 1/2	25	3.2	100
R2040-25-S2	25	40	1 1/2	25	3.2	100
R2050-25-S3	25	50	2	25	3.2	100
R2050-40-S3	40	50	2	25	3.2	100

## **Technical data**

Functional data	Media	Cold and warm water, water with glycol up to max. 50% vol.
	Medium temperature	-10120°C
	Medium temperature note	The allowed media temperature can be limited, depending on the type of actuator. Limitations can be found in the respective data sheets of the actuators.
	Closing pressure ∆ps	1400kPa
	Differential pressure $\Delta pmax$	350kPa
	Differential pressure note	200kPa for low-noise operation
	Flow characteristic	Equal percentage (VDI/VDE 2178), optimised in
		the opening range
	Leakage rate	Leakage rate A, air-bubble-tight (EN 12266-1)
	Pipe connectors	Internal thread according to ISO 7-1
	Angle of rotation	90° (Operating range 1590°)
	Installation position	Upright to horizontal (in relation to the stem)
	Maintenance	Maintenance-free
Materials	Housing	Brass body nickel-plated
	Closing element	Stainless steel
	Stem	Stainless steel
	Stem seal	O-ring EPDM
	Valve seat	PTFE, O-ring EPDM
	Characterising disc	TEFZEL
		R2032-20-S2 has no characterising disc



Safety notes							
$\bigwedge$	• The valve has been designed for use in stationary heating, ventilation and air-conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.						
	<ul> <li>Only authorised specialists may carry out installation. All approximately a second during installation.</li> </ul>	oplicable legal or institutional					
	<ul> <li>The valve does not contain any parts that can be replaced or</li> </ul>	repaired by the user.					
	<ul> <li>The valve may not be disposed of as household refuse. All locally valid regulation requirements must be observed</li> </ul>						
	<ul> <li>When determining the flow rate characteristic of controll directives must be observed.</li> </ul>	led devices, the recognised					
Product features							
Mode of operation	The characterised control valve is adjusted by a rotary actuator by a commercially available modulating or 3-point control syste valve – the throttling device – to the position dictated by the pos characterised control valve counterclockwise and close it clock	The actuator is controlled m and moves the ball of the sitioning signal. Open the wise.					
	Equal percentage now control is ensured by the integrated char	ractensing disc.					
Accessories							
	Description	Туре					
Mechanical accessories	Pipe connector to ballvalves DN 15 Rp 1/2"	ZR2315					
	Pipe connector to ballvalves DN 20 Rp 3/4"	ZR2320					
	Pipe connector to ballvalves DN 25 Rp 1"	ZR2325					
	Pipe connector to ballvalves DN 32 Rp 1 1/4"	ZR2332					
	Pipe connector to ballyalves DN 40 Rp 1 1/2	ZR2340 ZR2350					
		2112000					
Installation notes							
Recommended installation positions	The ball valve can be installed upright to horizontal. The ball value hanging position, i.e. with the stem pointing downwards.	lve may not be installed in a					
Water quality requirements	The water quality requirements specified in VDI 2035 must be a Belimo valves are regulating devices. For the valves to function they must be kept free from particle debris (e.g. welding beads The installation of suitable strainer is recommended.	adhered to. a correctly in the long term, during installation work).					
Maintenance	Ball valves and rotary actuators are maintenance-free. Before any kind of service work is carried out on the actuator, it is essential to isolate the rotary actuator from the power supply (by unplugging the electrical cable). Any pumps in the part of the piping system concerned must also be switched off and the appropriate slide valves closed (allow everything to cool down first if necessary and reduce the system pressure to ambient pressure level). The system must not be returned to service until the ball valve and the rotary actuator have been properly reassembled in accordance with the instructions and the pipeline has been refilled in the proper manner						
Flow direction	The direction of flow, specified by an arrow on the housing, is to otherwise the ball valve could become damaged. Please ensur- correct position (marking on the spindle).	o be complied with, since e that the ball is in the					

A - AB = 0%



## **Dimensions** [mm]

Dimensional drawings





L1: Maximum screwing depth. The actuator dimensions can be found on the respective actuator data sheet.





Туре	DN	Rp	L	L1	н	Weight approx.
	[]	["]	[ mm]	[ mm]	[ mm]	[ kg]
R2015-P25-S1	15	1/2	67	13	35	0.24
R2015-P4-S1	15	1/2	67	13	35	0.24
R2015-P63-S1	15	1/2	67	13	35	0.24
R2015-1-S1	15	1/2	67	13	35	0.24
R2015-1P6-S1	15	1/2	67	13	35	0.24
R2015-2P5-S1	15	1/2	67	13	44	0.30
R2015-4-S1	15	1/2	67	13	44	0.30
R2015-6P3-S1	15	1/2	67	13	44	0.30
R2020-4-S1	20	3/4	79	14	44	0.37
R2020-6P3-S2	20	3/4	79	14	44	0.37
R2025-6P3-S2	25	1	87	16	46	0.55
R2025-10-S2	25	1	87	16	46	0.55
R2032-10-S2	32	1 1/4	105	19	46	0.7
R2032-20-S2	32	1 1/4	105	19	50.5	0.8
R2040-16-S2	40	1 1/2	111	19	50.5	0.95
R2040-25-S2	40	1 1/2	111	19	50.5	0.95
R2050-25-S3	50	2	125	22	56	1.5
R2050-40-S3	50	2	125	22	56	1.5

\* R2032-20-S2 has no characterising disc







control of cold and hot water Applications

Water-side control of air handling units in air conditioning systems

2-way Characterised Control Valves DN65...150 Equal-percentage characteristics for modulating

· Water-side control in heating systems

#### **Technical data**

Flow medium	Cold and hot wa	ater, water with max. 50% volume of glycol			
Temp. of medium	-5+100°C				
Rated pressure	1600kPa				
Flow characteristic	Equal percenta	ge			
Rangeability	Sv>100				
Leakage rate	00.01% Kvs (	ANSI Class IV)			
	(No leakage wh	en ex-factory)			
Pipe connector	Flanged ISO 70	005-2			
Differential pressure $\triangle Pmax$	DN65125	350kPa (200kPa for low-noise operation)			
	DN150	250kPa			
Close-off pressure △Ps	DN65125	700kPa			
	DN150	400kPa			
Angle of rotation	90°				
Installation position	Upright to horiz	ontal (in relation to the stem)			
Maintenance	Maintenance-fr	ee			
Valve Material					
Body	GG25, Polyeste	er coated			
Ball	Stainless steel				
Seat	DN65125 RP	TFE			
	DN150 TFM160	00			
Shaft	Stainless steel				
O-ring	EPDM				
Characterising disc	Stainless steel				

#### **Product features**

Mode of Operation

The Characterised Control Valve is operated by a Rotary Actuator. The actuator is controlled by a standard modulating or 3-point control system and drives the ball of the valve - the throttling device - to the opening position dictated by the control signal. Equal-percentage characteristic of the flow rate ensured by the integral characterising disc.

#### Equal-percentage characteristic

**Dimensions** [mm]

#### **Dimensional drawings**

Valve type	DN		Dimensions[mm]						Weight	
	mm	In	ØA	ØD	Н	H1	L	N-ød	[kg]	
R664AO/R665AO	65	21⁄2"	105	145	128.0	12.0	93.0	4-18	4.8	
R679AO/R680AO	80	3"	125	160	134.5	12.0	108.0	8-18	7.2	
R6099AO/R6100AO	100	4"	148	180	144.0	15.5	120.0	8-18	10.5	
R6124AO/R6125AO	125	5"	174	210	158.0	15.5	142.0	8-18	14	
R6149AO/R6150AO	150	6"	204	240	176.5	15.5	170.0	8-22	21	



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Disc for Characterised Control Valve





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## R3..xx-S..



Characterised control valve, 3-way, Internal thread • For closed cold and warm water systems

- · For modulating water-side control of air handling units and heating systems
- Air bubble-tight (control path A AB)



## Type overview

Туре	<b>kvs</b> [ m³/h]	<b>DN</b> []	<b>Rp</b> ["]	<b>PN</b> []	n(gl) []	Sv min. []
R3015-P25-S1	0.25	15	1/2	40	3.2	50
R3015-P4-S1	0.4	15	1/2	40	3.2	50
R3015-P63-S1	0.63	15	1/2	40	3.2	50
R3015-1-S1	1	15	1/2	40	3.2	50
R3015-1P6-S1	1.6	15	1/2	40	3.2	50
R3015-2P5-S1	2.5	15	1/2	40	3.2	50
R3015-4-S1	4	15	1/2	40	3.2	100
R3020-4-S1	4	20	3/4	40	3.2	100
R3020-6P3-S1	6.3	20	3/4	40	3.2	100
R3025-6P3-S2	6.3	25	1	40	3.2	100
R3025-10-S2	10	25	1	40	3.2	100
R3032-10-S2	10	32	1 1/4	25	3.2	100
R3032-16-S3	16	32	1 1/4	25	3.2	100
R3040-16-S3	16	40	1 1/2	25	3.2	100
R3040-25-S4	25	40	1 1/2	25	3.2	100
R3050-25-S4	25	50	2	25	3.2	100
R3050-40-S4	40	50	2	25	3.2	100
R3050-58-S4	58	50	2	25	3.2	100

## **Technical data**

Functional data	Media	Cold and warm water, water with glycol up to max 50% vol.
	Medium temperature	-10120°C
	Medium temperature note	The allowed media temperature can be limited, depending on the type of actuator. Limitations can be found in the respective data sheets of the actuators.
	Closing pressure $\Delta ps$	1400kPa
	Differential pressure $\Delta pmax$	350kPa
	Differential pressure note	200kPa for low-noise operation
	Flow rate	Bypass B – AB: 70% of kvs value
	Flow characteristic	Control path A – AB: equal percentage (VDI/ VDE 2178), optimised in the opening range, Bypass B – AB: linear (VDI/VDE 2178)
	Leakage rate	Control path A - AB: Leakage rate A, air-bubble- tight (EN 12266-1), Bypass B - AB: Leakage class I (EN 1349 and EN 60534-4) approx. 12% of the kvs value, with respect to the largest value within the DN
	Pipe connectors	Internal thread according to ISO 7-1
	Angle of rotation	90° (Operating range control path A - AB 1590°, Bypass B – AB 1570°)
	Installation position	Upright to horizontal (in relation to the stem)
	Maintenance	Maintenance-free
Materials	Housing	Brass body nickel-plated
	Closing element	Stainless steel
	Stem	Stainless steel
	Stem seal	O-ring EPDM
	Valve seat	PTFE, O-ring EPDM
	Characterising disc	TEFZEL R3040-25-S4, R3050-40-S4, R3050-58-S4: Stainless steel



Satety notes									
Ŵ	<ul> <li>The valve has been designed for use in stationary heating, ventilation and air-condition systems and is not allowed to be used outside the specified field of application, especified in aircraft or in any other airborne means of transport.</li> <li>Only authorised specialists may carry out installation. All applicable legal or institution installation regulations must be complied during installation.</li> <li>The valve does not contain any parts that can be replaced or repaired by the user.</li> <li>The valve may not be disposed of as household refuse. All locally valid regulations arequirements must be observed.</li> <li>When determining the flow rate characteristic of controlled devices, the recognidirectives must be observed.</li> </ul>								
Product features									
Mode of operation	The characterised control valve is adjusted by a rotary act by a commercially available modulating or 3-point control valve – the throttling device – to the position dictated by th characterised control valve counterclockwise and close it o	uator. The actuator is controlled system and moves the ball of the ne positioning signal. Open the clockwise.							
Flow characteristic	Equal percentage flow control is ensured by the integrated	d characterising disc.							
Accessories									
	Description	Туре							
Mechanical accessories	Pipe connector to ballvalves DN 15 Rp 1/2"	ZR2315							
	Pipe connector to ballvalves DN 20 Rp 3/4"	ZR2320							
	Pipe connector to ballvalves DN 25 Rp 1"	ZR2325							
	Pipe connector to ballvalves DN 32 Rp 1 1/4"	ZR2332							
	Pipe connector to ballvalves DN 40 Rp 1 1/2"	ZR2340							
	Pipe connector to ballvalves DN 50 Rp 2"	ZR2350							
Installation notes									
Recommended installation positions	The ball valve can be installed upright to horizontal. The b hanging position, i.e. with the stem pointing downwards. $90^{\circ}$ $90^{\circ}$ $90^{\circ}$ $90^{\circ}$	all valve may not be installed in a							
Water quality requirements	The water quality requirements specified in VDI 2035 mus Belimo valves are regulating devices. For the valves to fur they must be kept free from particle debris (e.g. welding be The installation of suitable strainer is recommended.	t be adhered to. nction correctly in the long term, eads during installation work).							
Maintenance	Ball valves and rotary actuators are maintenance-free. Before any kind of service work is carried out on the actual rotary actuator from the power supply (by unplugging the e the part of the piping system concerned must also be switt slide valves closed (allow everything to cool down first if n pressure to ambient pressure level). The system must not be returned to service until the ball v been properly reassembled in accordance with the instruc- refilled in the proper manner.	tor, it is essential to isolate the electrical cable). Any pumps in ched off and the appropriate ecessary and reduce the system ralve and the rotary actuator have tions and the pipeline has been							
Flow direction	The direction of flow, specified by an arrow on the housing otherwise the ball valve could become damaged. Please e correct position (marking on the spindle).	g, is to be complied with, since ensure that the ball is in the							
	AB = 100%								



## Dimensions [mm]

**Dimensional drawings** 





Disc for Characterised Control Valve





L1: Maximum screwing depth. The actuator dimensions can be found on the respective actuator data sheet.

Туре	DN	Rp	L	L1	М	н	Weight approx.
	[]	["]	[ mm]	[ mm]	[ mm]	[ mm]	[ kg]
R3015-P25-S1	15	1/2	67	13	36	35	0.27
R3015-P4-S1	15	1/2	67	13	36	35	0.27
R3015-P63-S1	15	1/2	67	13	36	35	0.27
R3015-1-S1	15	1/2	67	13	36	35	0.27
R3015-1P6-S1	15	1/2	67	13	36	35	0.27
R3015-2P5-S1	15	1/2	67	13	36	44	0.37
R3015-4-S1	15	1/2	67	13	36	44	0.37
R3020-4-S1	20	3/4	79	14	41.5	46	0.45
R3020-6P3-S1	20	3/4	79	14	41.5	46	0.45
R3025-6P3-S2	25	1	87	16	45	46	0.65
R3025-10-S2	25	1	87	16	45	46	0.65
R3032-10-S2	32	1 1/4	105	19	55.5	46	0.97
R3032-16-S3	32	1 1/4	105	19	55.5	50.5	0.99
R3040-16-S3	40	1 1/2	111	19	56	50.5	1.15
R3040-25-S4	40	1 1/2	122	19	66.5	62	1.15
R3050-25-S4	50	2	125	22	68	56	1.9
R3050-40-S4	50	2	142	22	79	68	1.8
R3050-58-S4	50	2	142	22	79	68	1.8



## Open/close ball valve, 2-way, Internal thread

- For open and closed cold and warm water systems
- For shut-off functions on the water side and 2-point
- controls in air handling units and heating systems
- Air bubble tight

Туре



Туре	kvs	DN	Rp	PN
	[ m³/h]	[]	["]	[]
R2015-S1	15	15	1/2	40
R2020-S1	15	20	3/4	40
R2020-S2	32	20	3/4	40
R2025-S2	26	25	1	40
R2032-S2	32	32	1 1/4	25
R2040-S2	31	40	1 1/2	25
R2050-S3	49	50	2	25

**Technical data** 

Functional data	Media	Cold and warm water, water with glycol up to max. 50% vol.					
	Medium temperature	-10120°C					
	Medium temperature note	The allowed media temperature can be limited, depending					
		on the type of actuator. Limitations can be found in the					
		respective data sheets of the actuators.					
	Closing pressure $\Delta ps$	1400 kPa					
	Differential pressure $\Delta pmax$	1000 kPa					
	Differential pressure note	200 kPa for low-noise operation					
	Leakage rate	Leakage rate A, air-bubble-tight (EN 12266-1)					
	Pipe connectors	Internal thread according to ISO 7-1					
	Angle of rotation	90°					
	Installation position	Upright to horizontal (in relation to the stem)					
	Maintenance	Maintenance-free					
Materials	Housing	Brass body nickel-plated					
	Closing element	Stainless steel					
	Stem	Stainless steel					
	Stem seal	O-ring EPDM					
	Valve seat	PTFE, O-ring EPDM					

Safety notes



 The valve has been designed for use in stationary heating, ventilation and air-conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The valve does not contain any parts that can be replaced or repaired by the user.
- The valve may not be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- When determining the flow rate characteristic of controlled devices, the recognised directives must be observed.

#### **Product features**

Mode of operation

The Open/Close ball valve is adjusted by a rotary actuator. The rotary actuator is connected by an Open/Close signal. Open the ball valve counterclockwise and close it clockwise.

Accessories

	Description	Туре
Mechanical accessories	Pipe connector to ballvalves DN 15 Rp 1/2"	ZR2315
	Pipe connector to ballvalves DN 20 Rp 3/4"	ZR2320
	Pipe connector to ballvalves DN 25 Rp 1"	ZR2325
	Pipe connector to ballvalves DN 32 Rp 1 1/4"	ZR2332
	Pipe connector to ballvalves DN 40 Rp 1 1/2"	ZR2340
	Pipe connector to ballvalves DN 50 Rp 2"	ZR2350



#### Installation notes

**Recommended installation positions** 

The ball valve can be installed upright to horizontal. The ball valve may not be installed in a hanging position, i.e. with the stem pointing downwards.



Water quality requirements The water quality requirements specified in VDI 2035 must be adhered to. Belimo valves are regulating devices. For the valves to function correctly in the long term, they must be kept free from particle debris (e.g. welding beads during installation work). The installation of suitable strainer is recommended. Maintenance Ball valves and rotary actuators are maintenance-free. Before any kind of service work is carried out on the actuator, it is essential to isolate the rotary actuator from the power supply (by unplugging the electrical cable). Any pumps in the part of the piping system concerned must also be switched off and the appropriate slide valves closed (allow everything to cool down first if necessary and reduce the system pressure to ambient pressure level). The system must not be returned to service until the ball valve and the rotary actuator have been properly reassembled in accordance with the instructions and the pipeline has been refilled in the proper manner. **Flow direction** The direction of flow, specified by an arrow on the housing, is to be complied with, since otherwise the ball valve could become damaged. Please ensure that the ball is in the correct position (marking on the spindle).



#### **Dimensions** [mm]

**Dimensional drawings** 

4- Ø1



L1: Maximum screwing depth. The actuator dimensions can be found on the respective actuator data sheet.





Туре	DN	Rp	L	L1	H	Weight approx.
	IJ	IJ	լ տոյ	լ տոյ	լ տայ	[ kg]
R2015-S1	15	1/2	67	13	44	0.24
R2020-S1	20	3/4	79	14	44	0.37
R2020-S2	20	3/4	78	14	46	0.42
R2025-S2	25	1	87	16	46	0.50
R2032-S2	32	1 1/4	105	19	50.5	0.80
R2040-S2	40	1 1/2	111	19	50.5	0.91
R2050-S3	50	2	125	22	56	1.35





2-way Open/Close Ball Valves DN65...150 Open/Close control in cold and hot water circuits Applications

For Open/Close cold and hot water circuits in heating and ventilation systems on the water side.



## **Technical data**

Flow medium	Cold and hot water, water with max. 50% volume of glycol					
Temp. of medium	-5+100°C					
Rated pressure	1600kPa					
Leakage rate	00.01% Kvs (/	ANSI Class IV)				
	(No leakage wh	en ex-factory)				
Pipe connector	Flanged ISO 70	05-2				
Differential pressure $ riangle$ Pmax	DN65125	350kPa (200kPa for low-noise operation)				
	DN150	250kPa				
Close-off pressure $\triangle Ps$	DN65125	700kPa				
	DN150	400kPa				
Angle of rotation	90°					
Installation position	Upright to horize	ontal (in relation to the stem)				
Maintenance	Maintenance-fre	e				
Valve Material						
Body	GG25, Polyeste	r coated				
Ball	Stainless steel					
Seat	DN65125 RP	TFE				
	DN150 TFM160	0				
Shaft	Stainless steel					
O-ring	EPDM					

## **Product features**

Mode of Operation

The Open/Close Ball Valve is operated by a Rotary Actuator. The Rotary Actuator is controlled by an Open/Close signal.

#### **Dimensions** [mm]

#### Dimensional drawings

Valve type	DN		Dimensions[mm]						Weight	
	mm	In	ØA	ØD	н	H1	L	N-ød	[kg]	
R664AO/R665AO	65	21⁄2"	105	145	128.0	12.0	93.0	4-18	4.8	
R679AO/R680AO	80	3"	125	160	134.5	12.0	108.0	8-18	7.2	
R6099AO/R6100AO	100	4"	148	180	144.0	15.5	120.0	8-18	10.5	
R6124AO/R6125AO	125	5"	174	210	158.0	15.5	142.0	8-18	14	
R6149AO/R6150AO	150	6"	204	240	176.5	15.5	170.0	8-22	21	



Disc for Characterised Control Valve

V8.6 05.2017 • Subject to modification

## R3..-S..



Change-over ball valve, 3-way, Internal thread

- · For closed cold and warm water systems
- For switching functions on the water side and 2-point controls in air handling units and heating systems
- Air bubble-tight (control path A AB)



## Type overview

Туре	kvs	DN	Rp	PN	
	[ m³/h]	[]	["]	[]	
R3015-S1	15	15	1/2	40	
R3020-S1	12	20	3/4	40	
R3020-S2	32	20	3/4	40	
R3025-S2	26	25	1	40	
R3032-S2	18	32	1 1/4	25	
R3032-S3	32	32	1 1/4	25	
R3040-S3	31	40	1 1/2	25	
R3050-S4	49	50	2	25	

## **Technical data**

Functional data	Media	Cold and warm water, water with glycol up to max. 50% vol.
	Medium temperature	-10120°C
	Medium temperature note	The allowed media temperature can be limited, depending
		on the type of actuator. Limitations can be found in the
		respective data sheets of the actuators.
	Closing pressure $\Delta ps$	1400kPa
	Differential pressure $\Delta pmax$	1000kPa
	Differential pressure note	200kPa for low-noise operation
	Flow rate	Bypass B – AB: Approx. 50% of kvs value
	Leakage rate	Port A - AB: Leakage rate A, air-bubble-tight (EN 12266-1),
		Bypass B - AB: Leakage class I (EN 1349 and EN 60534-4)
		max. 1% of the kvs value
	Pipe connectors	Internal thread according to ISO 7-1
	Angle of rotation	90°
	Installation position	Upright to horizontal (in relation to the stem)
	Maintenance	Maintenance-free
Materials	Housing	Brass body nickel-plated
	Closing element	Stainless steel
	Stem	Stainless steel
	Stem seal	O-ring EPDM
	Valve seat	PTFE, O-ring EPDM

## Safety notes

•		
$\underline{\mathbb{V}}$	<ul> <li>The valve has been designed for use in stationary heati systems and is not allowed to be used outside the specini aircraft or in any other airborne means of transport.</li> <li>Only authorised specialists may carry out installation. installation regulations must be complied during installat</li> <li>The valve does not contain any parts that can be replace.</li> <li>The valve may not be disposed of as household refus requirements must be observed.</li> <li>When determining the flow rate characteristic of condirectives must be observed.</li> </ul>	ng, ventilation and air-conditioning ified field of application, especially All applicable legal or institutiona tion. eed or repaired by the user. e. All locally valid regulations and ontrolled devices, the recognised
Product features		
Mode of operation	The change-over ball valve is adjusted by a rotary actuato by an Open/Close signal.	r. The rotary actuator is connected
Accessories		
	Description	Туре
Mechanical accessories	Pipe connector to ballvalves DN 15 Rp 1/2"	ZR2315
	Pipe connector to ballvalves DN 20 Rp 3/4"	ZR2320
	Pipe connector to ballvalves DN 25 Rp 1"	ZR2325
	Pipe connector to ballvalves DN 32 Rp 1 1/4"	ZR2332
	Pipe connector to ballvalves DN 40 Rp 1 1/2"	ZR2340

Pipe connector to ballvalves DN 50 Rp 2"

ZR2350



#### Installation notes

Recommended installation positions	The ball valve can be installed upright to horizontal. The ball valve may not be installed in a hanging position, i.e. with the stem pointing downwards. $90^{\circ}$
Water quality requirements	The water quality requirements specified in VDI 2035 must be adhered to. Belimo valves are regulating devices. For the valves to function correctly in the long term, they must be kept free from particle debris (e.g. welding beads during installation work).

The installation of suitable strainer is recommended.

Maintenance

#### Ball valves and rotary actuators are maintenance-free. Before any kind of service work is carried out on the actuator, it is essential to isolate the rotary actuator from the power supply (by unplugging the electrical cable). Any pumps in the part of the piping system concerned must also be switched off and the appropriate slide valves closed (allow everything to cool down first if necessary and reduce the system pressure to ambient pressure level).

The system must not be returned to service until the ball valve and the rotary actuator have been properly reassembled in accordance with the instructions and the pipeline has been refilled in the proper manner.

The direction of flow, specified by an arrow on the housing, is to be complied with, since otherwise the ball valve could become damaged. Please ensure that the ball is in the

#### Flow direction



correct position (marking on the spindle).

#### **Dimensions** [mm]

**Dimensional drawings** 



L1: Maximum screwing depth. The actuator dimensions can be found on the respective actuator data sheet.



Туре	DN	Rp	L	L1	М	н	Weight approx.
	[]	["]	[ mm]	[ mm]	[ mm]	[ mm]	[ kg]
R3015-S1	15	1/2	67	13	36	44	0.27
R3020-S1	20	3/4	79	14	41.5	44	0.45
R3020-S2	20	3/4	78	14	41.5	46	0.46
R3025-S2	25	1	87	16	45	46	0.6
R3032-S2	32	1 1/4	105	19	55.5	50.5	0.97
R3032-S3	32	1 1/4	105	19	55.5	50.5	0.99
R3040-S3	40	1 1/2	111	19	56	50.5	1.2
R3050-S4	50	2	125	22	68	56	1.8

Те

#### Rotary actuator for ball valves

- Nominal torque 2Nm
- Nominal voltage AC/DC 24V
- Control modulating DC (0)2...10V



BELIN

chnical data			
Electrical data	Electrical data	Nominal voltage	AC/DC 24V
		Nominal voltage frequency	50/60Hz
		Nominal voltage range	AC 19.228.8V / DC 21.628.8V
		Power consumption in operation	0.5W
		Power consumption for wire sizing	1VA
		Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
		Parallel operation	Yes (note the performance data)
	Functional data	Torque motor	Min. 2Nm
		Positioning signal Y	DC (0)210V
		Positioning signal Y note	Input impedance 100kΩ
		Operating range Y	DC 210V
		Control operating range Y note	for 0100% (090°)
		Manual override	Gear disengagement with push-button
Safety		Running time motor	90s / 90°
		Sound power level motor max.	35dB(A)
		Position indication	Mechanical
	Safety	Protection class IEC/EN	III Safety extra-low voltage
		Degree of protection IEC/EN	IP40
		EMC	CE according to 2004/108/EC
		Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
		Mode of operation	Туре 1
		Rated impulse voltage supply / control	0.8kV
		Control pollution degree	3
		Ambient temperature	-750°C
		Non-operating temperature	-4080°C
		Ambient humidity	95% r.h., non-condensing
		Maintenance	Maintenance-free
	Weight	Weight	Approx. 0.4kg

Safety notes



- This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.



#### **Product features** Mode of operation The actuator is connected with a standard modulating signal of DC (0)2...10V and travels to the position defined by the positioning signal. Simple direct mounting Simple direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° increments. Manual override possible with lever (the gearing is disengaged as long as the self-resetting Manual override lever is pressed). High functional reliability The actuator is overload protected and automatically stops when the end stop is reached. The actuator switches off for seven seconds in the case of blocking, then attempts to restart. If the blocked condition persists, the actuator attempts to restart once every two minutes a total of 15 times and subsequently only once every two hours. Combination valve/actuator Refer to the valve documentation for suitable valves, their permitted medium temperatures and closing pressures.

#### **Electrical installation**

Notes	<ul> <li>Connection via safety isolating transformer.</li> <li>Parallel connection of other actuators possible. Observe the performance data.</li> </ul>
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#### Wiring diagrams



Dimensional drawings





Rotary actuator for ball valves

Nominal torque 2Nm

- Nominal voltage AC/DC 24V
  Control Open/Close, 3-point



Technical data       Nominal voltage       AC/DC 24V         Nominal voltage frequency       50/60Hz         Nominal voltage range       AC 19.228.8V / DC 21.628.8V         Power consumption in operation       0.5W         Power consumption for wire sizing       0.5W         Power consumption of wire sizing       0.5W         Power consumption for wire sizing       0.5W         Sund power level motor max       356B(A)         Position indication       Mechanical         Barted impulse voltage supply / control       0.8W         Control pollution dass IEC/EN       III Safety extra-low voltage         EMC       Control pollution degree       750°C         Non-operating temperature       -750°C         Non-operating temperature       -4060°C         Ambient humolity       95% r.h., non-condensi				
Electrical data       Nominal voltage       AC/DC 24V         Nominal voltage range       AC 19.228.8V / DC 21.628.8V         Power consumption in operation       0.5W         Power consumption for wire sizing       0.5VLA         Connection supply / control       Cable 1m, 3V.75m <sup>2</sup> Parallel operation       Yes (note the performance data)         Protection upply / control       Cable 1m, 3V.75m <sup>2</sup> Parallel operation       Yes (note the performance data)         Manual override       Gear disengagement with push-button         Manual override       Gear disengagement with push-button         Position indication       Mechanical         Position indication       Mechanical         Degree of protection class IEC/EN       III Safety extra-low voltage         Degree of protection IEC/EN       IP40         EMC       CE according to 2004/108/EC         Certification IEC/EN       IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage supply / control       0.8kV         Control pollution degree       3         Ambient tuminidity       95% f.h., non-condensing         Maintenance       Maintenance.free         Weight       Approx.0.4kg         Safety n	Technical data			
Nominal voltage frequency       50/60Hz         Nominal voltage range       AC 19.2. 28.8V / DC 21.628.8V         Power consumption in operation       0.5W         Power consumption for wire sizing       0.5VA         Connection supply / control       Cable 1m, 3 x 0.75mm <sup>2</sup> Parallel operation       Yes (note the performance data)         Parallel operation       Yes (note the performance data)         Parallel operation       Yes (note the performance data)         Banual override       Gear disengagement with push-button         Running time motor       100s / 90°         Sound power level motor max       35dB(A)         Position indication       Mechanical         Position indication       Mechanical         Safety       Protection iEC/EN       III Safety extar-low voltage         Degree of protection IEC/EN       III Safety extar-low voltage         Certification IEC/EN       III C/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage supply / control       0.8kV         Control polition degree       3         Ambient temperature       -750°C         Ambient humidity       95% r.h., non-condensing         Maintenance       Maintenance         Weight	Electrical data	Nominal voltage	AC/DC 24V	
Nominal voltage range       AC 19.228.8//DC 21.628.8//         Power consumption in operation       0.5W         Power consumption in operation       0.5VA         Connection supply / control       Cable 1m, 3 x 0.75mm <sup>2</sup> Parallel operation       Yes (note the performance data)         Functional data       Torque motor       Min. 2Nm         Manual override       Cear disengagement with push-button         Running time motor       1006 / 90'         Sound power level motor max.       33dB(A)         Position indication       Mechanical         Degree of protection IEC/EN       III Safety extra-low voltage         Degree of protection IEC/EN       III C/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage supply / control       0.8kV         Control pollution degree       -750''C         Non-operating temperature       -4080''C         Maintenance       Maintenance-free         Weight       Approx. 0.4kg         Safety notes <ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.</li>        Only authorised specialiste may caruly be aurofacturer's site. It does not contain</ul>		Nominal voltage frequency	50/60Hz	
Power consumption in operation       0.5W         Power consumption of wire sizing       0.5VA         Connection supply / control       Cable 1m, 3 x 0.75mm²         Parallel operation       Yes (note the performance data)         Torque motor       Min. 2Nm         Manual override       Gear disengagement with push-button         Running time motor       100s / 90°         Sound power level motor max.       35GB(A)         Position indication       Mechanical         Protection class IEC/EN       III Safety extra-low voltage         Degree of protection IEC/EN       III Safety extra-low voltage         Certification IEC/EN       III Safety extra-low voltage         Degree of protection IEC/EN       III A         Mode of operation       Type 1         Rated imputes voltage supply / control       0.8kV         Control pollution degree       3         Ambient temperature       -750°C         Non-operating temperature       -4080°C         Ambient numidity       95% r.h., non-condensing         Maintenance       Maintenance-free         Weight       Approx.0.4kg         Safety notes <ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning in any other airborne means of transport.<th></th><th>Nominal voltage range</th><th>AC 19.228.8V / DC 21.628.8V</th></li></ul>		Nominal voltage range	AC 19.228.8V / DC 21.628.8V	
Power consumption for wire sizing       0.5VA         Connection supply / control       Cable 1m, 3 x 0.75mm²         Parallel operation       Yes (note the performance data)         Torque motor       Min. 2Nm         Manual override       Gear disengagement with push-button         Running time motor       100s / 90°         Sound power level motor max.       35d8(A)         Position indication       Mechanical         Position indication       Mechanical         Degree of protection IEC/EN       III Safety extra-low voltage         Degree of protection IEC/EN       IIEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage supply / control       0.8kV         Control pollution degree       3         Ambient themperature       -750°C         Non-operating temperature       4080°C         Ambient numidity       95% r.h., non-condensing         Maintenance       Maintenance-free         Weight       Approx. 0.4kg         Safety notes <ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning installation.</li>        • Only authorised specialists may carry out installation.       • Donly authorised specialists may carry out installation.         • Donly aut</ul>		Power consumption in operation	0.5W	
Connection supply / control       Cable Im. 3 & 0.75mm <sup>2</sup> Parallel operation       Yes (note the performance data)         Torque motor       Min. 2Nm         Manual override       Gear disengagement with push-button         Running time motor       1006 / 90°         Sound power level motor max.       35GB(A)         Position indication       Mechanical         Degree of protection IEC/EN       III Safety extra-low voltage         Degree of protection IEC/EN       IIP40         EMC       Certification IEC/EN         Mode of operation       Type 1         Rated impulse voltage supply / control       0.8kV         Control polition degree       3         Ambient humidity       95% nh. non-condensing         Maintenance       Maintenance-free         Weight       Approx. 0.4kg         Safety notes <ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircaft or in any other airborne means of transport.         Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be completed during installation.         The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid re</li></ul>		Power consumption for wire sizing	0.5VA	
Functional data       Terque motor       Min. 2Nm         Manual override       Gear disengagement with push-button         Running time motor       1005 / 90°         Sound power level motor max.       35dB(A)         Position indication       Mechanical         Position indication       Mechanical         Position indication       Mechanical         Degree of protection IEC/EN       III Safety extra-low voltage         Degree of protection IEC/EN       III Safety extra-low voltage         Degree of protection IEC/EN       IEC/EN 00730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage supply / control       0.8kV         Control politition degree       3         Ambient temperature       -750°C         Non-coperating temperature       -4080°C         Ambient temperature       -750°C         Non-condensing       Maintenance         Maintenance       Maintenance-free         Weight       Approx. 0.4kg         Safety notes <ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of applicable legal or institutional instilation.</li>       10 pulse voltage specialitis may carry out installation.         O</ul>		Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>	
Functional data       Torque motor       Min. 2Nm         Manual override       Gear disengagement with push-button         Running time motor       100s / 90°         Sound power level motor max.       356B(A)         Position indication       Mechanical         Protection class IEC/EN       III Safety extra-low voltage         Degree of protection IEC/EN       IIP40         EMC       CE according to 2004/108/EC         Certification IEC/EN       IEC/EN 80730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage supply / control       0.8kV         Control pollution degree       3         Ambient temperature       -750°C         Non-operating temperature       -4080°C         Ambient numidity       95% r.h., non-condensing         Maintenance       Maintenance-free         Weight       Approx. 0.4kg         Safety notes <ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.</li>        Only authorised specialists may carry out installation.       Autor contrain any parts that can be replaced by the user.         The device contains electrical and electronic components and is</ul>		Parallel operation	Yes (note the performance data)	
Manual override       Gear disengagement with push-button         Running time motor       1006 / 90°         Sound power level motor max.       35dB(A)         Position indication       Mechanical         Position indication       Control as IEC/EN         III Safety position       Type 1         Rated impulse voltage supply / control       0.8kV         Control pollution degree       3         Ambient temperature       -750°C         Non-operating temperature       -408V°C         Ambient temperature       -750°C         Non-operating temperature       -408V°C         Ambient temperature       -190°C         Maintenance       Maintenance-free         Weight       Approx. 0.4kg         Safety notes <ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in airacraft or in any other airborne means of transport.</li></ul>	Functional data	Torque motor	Min. 2Nm	
Running time motor       1008 / 90°         Sound power level motor max.       35dB(A)         Position indication       Mechanical         Page of protection IEC/EN       IP40         EMC       CC action coording to 2004/108/EC         Certification IEC/EN       IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage supply / control       0.8kV         Control pollution degree       3         Ambient humidity       95% r.h., non-condensing         Maintenance       Maintenance-free         Weight       Approx. 0.4kg         Safety notes <ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.         Only authorised specialists may carry out installation.        <ul> <li>The device contains electrical a</li></ul></li></ul>		Manual override	Gear disengagement with push-button	
Sound power level motor max.       35dB(A)         Position indication       Mechanical         Protection class IEC/EN       III Safety extra-low voltage         Degree of protection IEC/EN       IP40         EMC       CE according to 2004/109/EC         Certification IEC/EN       IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage supply / control       0.8kV         Control pollution degree       3         Ambient temperature       -750°C         Non-operating temperature       4080°C         Ambient humidity       95% r.h., non-condensing         Maintenance       Maintenance-free         Weight       Approx. 0.4kg         Safety notes <ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.</li> <li>Only authorised specialists may carry out installation.</li> <li>The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.</li> <li>The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.</li> <li>Product features</li> <li>Simple direct mounting on the ball valve with only one screw. The mounting</li></ul>		Running time motor	100s / 90°	
Position indication       Mechanical         Protection class IEC/EN       III Safety extra-low voltage         Degree of protection IEC/EN       IP40         EMC       CE according to 2004/108/EC         Certification IEC/EN       IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage supply / control       0.8kV         Control pollution degree       3         Ambient temperature       -750°C         Non-operating temperature       -4080°C         Ambient humidity       95% r.h., non-condensing         Maintenance       Maintenance-free         Weight       Approx. 0.4kg         Safety notes <ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be useduside the specified field of application, especially installation regulations must be complied during installation.</li> <ul> <li>Only authorised specialists may carry out installation.</li> <li>The device contains electrical and electronic components and is not allowed to be useduing installation.</li> <li>The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.</li> <li>Product features</li> <li>Simple direct mounting</li> <li>Manual override possible with lever (the gearing is disengaged as long as the self-resetting lever is pressed).</li> <li< th=""><th></th><th>Sound power level motor max.</th><th>35dB(A)</th></li<></ul></ul>		Sound power level motor max.	35dB(A)	
Safety     Protection class IEC/EN     III Safety extra-low voltage       Degree of protection IEC/EN     IP40       EMC     CE according to 2004/109/EC       Certification IEC/EN     IEC/EN 60730-1 and IEC/EN 60730-2.14       Mode of operation     Type 1       Rated impulse voltage supply / contol     0.8kV       Control pollution degree     3       Ambient temperature     -750°C       Ambient temperature     4080°C		Position indication	Mechanical	
Degree of protection IEC/EN       IP40         EMC       CE according to 2004/108/EC         Certification IEC/EN       IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage supply / control       0.8kV         Control pollution degree       3         Ambient temperature       -750°C         Non-operating temperature       -4080°C         Ambient humidity       95% r.h., non-condensing         Maintenance       Maintenance-free         Weight       Approx. 0.4kg    Safety notes           • This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.          • Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be compiled during installation.         • The device ontains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.         Product features           Simple direct mounting          Simple direct mounting on the ball valve can be selected in 90° increments.          Manual override          Manual override possible with lever (the gearing is disengaged as long as the self-resett	Safety	Protection class IEC/EN	III Safety extra-low voltage	
ENC       CE according to 2004/108/EC         Certification IEC/EN       IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage supply / control       0.8kV         Control pollution degree       3         Ambient temperature       -750°C         Non-operating temperature       -4080°C         Ambient temperature       -750°C         Non-operating temperature       -4080°C         Ambient temperature       -4080°C         Maintenance       Maintenance-free         Weight       Approx. 0.4kg         Safety notes <ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.</li> <ul> <li>Only authorised specialists may carry out installation.</li> <li>Applicable legal or institutional installation installation.</li> <li>The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.</li> <li>The device contains electrical and electronic components and is not allowed to be disposed of a shousehold refuse. All locally valid regulations and requirements must be observed.</li> <li>Banual override</li> <li>Manual override</li> <li>Manual override</li> <li>Manual override pressible with lever (the gearing is disengaged as long as the self-resetting lever is pressed).</li></ul></ul>		Degree of protection IEC/EN	IP40	
Certification IEC/EN       IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage supply / control       0.8kV         Control pollution degree       3         Ambient temperature       -750°C         Non-operating temperature       -4080°C         Ambient humidity       95% r.h., non-condensing         Maintenance       Maintenance-free         Weight       Approx. 0.4kg         Safety notes <ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.</li> <ul> <li>Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.</li> <ul> <li>The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.</li> <li>The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.</li> <li>The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.</li> <li>The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.</li> <li>The device contains electrical and electronic c</li></ul></ul></ul>		EMC	CE according to 2004/108/EC	
Mode of operation       Type 1         Rated impulse voltage supply / control       0.8kV         Control pollution degree       3         Ambient temperature       -750°C         Non-operating temperature       -4080°C         Ambient humidity       95% r.h., non-condensing         Maintenance       Maintenance-free         Weight       Weight         Approx. 0.4kg       Veight         Approx. 0.4kg       • This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.         • Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be compiled during installation.         • The device contains electrical and electronic components and is not allowed to be uses.         • The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.         Product features       Simple direct mounting         Manual override       Manual override         Manual override       Karee to the valve can be selected in 90° increments.         Manual override       Manual override         Manual override       Karee to the valve documentation for suitable valves, their pe		Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14	
Rated impulse voltage supply / control       0.8kV         Control pollution degree       3         Ambient temperature       -750°C         Non-operating temperature       -4080°C         Ambient humidity       95% r.h., non-condensing         Maintenance       Maintenance-free         Weight       Approx. 0.4kg         Safety notes <ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.</li> <li>Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.</li> <li>The device enay only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.</li> <li>The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.</li> <li>Product features</li> <li>Simple direct mounting</li> <li>Manual override possible with lever (the gearing is disengaged as long as the self-resetting lever is pressed).</li> <li>Combination valve/actuator</li> <li>Refer to the valve documentation for suitable valves, their permitted medium temperatures and closing pressures.</li> <li>Ambient andecompresures</li> <li>Ambient and closing press</li></ul>		Mode of operation	Type 1	
Control pollution degree       3         Ambient temperature       -750°C         Non-operating temperature       -4080°C         Ambient humidity       95% r.h., non-condensing         Maintenance       Maintenance-free         Weight       Approx. 0.4kg         Safety notes <ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.</li> <li>Only authorised specialists may carry out installation.</li> <li>The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.</li> <li>The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.</li> <li>Product features</li> <li>Simple direct mounting Manual override</li> <li>Manual override</li> <li>Combination valve/actuator</li> <li>Refer to the valve documentation for suitable valves, their permitted medium temperatures and closing pressures.</li> <li>Neifer to the valve documentation for suitable valves, their permitted medium temperatures and closing pressures.</li> </ul>		Rated impulse voltage supply / control	0.8kV	
Ambient temperature       -750°C         Non-operating temperature       -4080°C         Ambient humidity       95% r.h., non-condensing         Maintenance       Maintenance-free         Weight       Approx. 0.4kg         Safety notes <ul> <li> <ul> <li></li></ul></li></ul>		Control pollution degree	3	
Non-operating temperature       -4080°C         Ambient humidity       95% r.h., non-condensing         Maintenance       Maintenance-free         Weight       Approx. 0.4kg         Safety notes <ul> <li> <ul></ul></li></ul>		Ambient temperature	-750°C	
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Maintenance       Maintenance-free         Weight       Weight       Approx. 0.4kg         Safety notes <ul> <li> <ul></ul></li></ul>		Ambient humidity	95% r.h., non-condensing	
Weight       Approx. 0.4kg         Safety notes       Image: Construct of the second sec		Maintenance	Maintenance-free	
Safety notes <ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.</li> <li>Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.</li> <li>The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.</li> <li>The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.</li> </ul> Product features          Simple direct mounting         Manual override         Manual override         Manual override         Combination valve/actuator <ul> <li>Refer to the valve documentation for suitable valves, their permitted medium temperatures and closing pressures.</li> </ul>	Weight	Weight	Approx. 0.4kg	
<ul> <li>Christy note:</li> <li>A Manual override</li> <li>Combination valve/actuator</li> <li>Combination valve/actuator</li> <li>This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.</li> <li>Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.</li> <li>The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.</li> <li>The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.</li> </ul>	Safety notes			
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<ul> <li>The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.</li> <li>The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.</li> </ul> <b>Product features</b> Simple direct mounting       Simple direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° increments.         Manual override       Manual override possible with lever (the gearing is disengaged as long as the self-resetting lever is pressed).         Refer to the valve documentation for suitable valves, their permitted medium temperatures and closing pressures.	$\underline{\wedge}$	<ul> <li>I his device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.</li> <li>Only authorised specialists may carry out installation. All applicable legal or institutional</li> </ul>		
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Product features         Simple direct mounting         Manual override         Manual override         Combination valve/actuator         Refer to the valve documentation for suitable valves, their permitted medium temperatures and closing pressures.		The device contains electrical and electron of as household refuse. All locally valid	tronic components and is not allowed to be disposed I regulations and requirements must be observed.	
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	Combination valve/actuator	Refer to the valve documentation for suit and closing pressures.	able valves, their permitted medium temperatures	



## **Electrical installation**

$\wedge$	Notes	<ul> <li>Connection via safety isolating transformer.</li> <li>Parallel connection of other actuators possible. Observe the performance data.</li> </ul>

#### Wiring diagrams



#### **General notes**

Functional reliability

Continuous pulsating into the end stop with pulsating 3-point control results in damage to the actuator. Steps must be taken to ensure that pulsating 3-point controllers stop in the end position.

The actuator switches off for seven seconds in the case of blocking, then attempts to restart. If the blocked condition persists, the actuator attempts to restart once every two minutes a total of 15 times and subsequently only once every two hours. Actuators for 3-point control in parallel operation must be synchronised once every week (by setting the controller signal to 0 or 100%) in order to guarantee position accuracy.

Pulse duration ≥0.5s

#### Dimensions [mm]

#### **Dimensional drawings**





Rotary actuator for ball valves

- Nominal torque 2Nm
- Nominal voltage AC 230V
- Control 3-point





Technical data		
Electrical data	Nominal voltage	AC 230V
	Nominal voltage frequency	50Hz
	Nominal voltage range	AC 207253V
	Power consumption in operation	1W
	Power consumption for wire sizing	1VA
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	No
Functional data	Torque motor	Min. 2Nm
	Manual override	Gear disengagement with push-button
	Running time motor	105s / 90°
	Sound power level motor max.	35dB(A)
	Position indication	Mechanical
Safety	Protection class IEC/EN	II Protective insulated
	Degree of protection IEC/EN	IP40
	EMC	CE according to 2004/108/EC
	Low voltage directive	CE according to 2006/95/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	4kV
	Control pollution degree	3
	Ambient temperature	-750°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	Approx. 0.4kg
Safety notes		



 This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The actuator is to be protected against moisture. It is not suitable for outdoor applications.
- The correct functioning of the strain relief for the cable in the actuator housing is to be checked.
- The installer must check for correct principle of operation after installation.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product features	
Simple direct mounting	Simple direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° increments.
Manual override	Manual override possible with lever (the gearing is disengaged as long as the self-resetting lever is pressed).
High functional reliability	The actuator switches off automatically when the end stops are reached. Pulse duration ≥0.5 s
Combination valve/actuator	Refer to the valve documentation for suitable valves, their permitted medium temperatures and closing pressures.
Electrical installation	

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Caution: Power supply voltage!

Notes

## Wiring diagrams



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## LR24A-SR

#### Modulating rotary actuator for ball valves

- Nominal torque 5Nm
- Nominal voltage AC/DC 24V
- Control Modulating DC (0)2...10V
- Position feedback DC 2...10V





Technical data		
Electrical data	Nominal voltage	AC/DC 24V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 19.228.8V / DC 19.228.8V
	Power consumption in operation	1.5W
	Power consumption in rest position	0.4W
	Power consumption for wire sizing	3VA
	Connection supply / control	Cable 1m, 4 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 5Nm
	Positioning signal Y	DC (0)210V
	Positioning signal Y note	Input impedance 100kΩ
	Operating range Y	DC 210V
	Position feedback U	DC 210V
	Position feedback U note	Max. 1mA
	Position accuracy	±5%
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	35dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	0.8kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	Approx. 0.55kg

Safety notes

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 This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product features	
Mode of operation	The actuator is connected with a standard modulating signal of DC (0)210V and travels to the position defined by the positioning signal. Measuring voltage U serves for the electrical display of the valve position 0100% and as slave control signal for other actuators.
Simple direct mounting	Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball valve can be selected in 90° steps.
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.
Accessories	

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

Electrical installation		
$\Lambda$	Notes	<ul> <li>Connection via safety isolating transformer.</li> <li>Parallel connection of other actuators possible. Observe the performance data.</li> <li>Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.</li> </ul>

## Wiring diagrams AC/DC 24V, modulating





- Cable colours:
- 1 = black
- 2 = red
- 3 = white 5 = orange

## Dimensions [mm]

#### Dimensional drawings



Rotary actuator for ball valves

- Nominal torque 5Nm
- Nominal voltage AC/DC 24V
- Control Open/Close, 3-point





Technical data		
Electrical data	Nominal voltage	AC/DC 24V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 19.228.8V / DC 19.228.8V
	Power consumption in operation	1.5W
	Power consumption in rest position	0.2W
	Power consumption for wire sizing	2VA
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 5Nm
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	35 dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Type 1
	Rated impulse voltage supply / control	0.8kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	Approx. 0.55kg

#### Safety notes



- This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product features		
Simple direct mounting	Straightforward direct mounting on the ball valve with onl tool is integrated in the plug-in position indication. The m ball valve can be selected in 90° steps.	ly one central screw. The assembly ounting position in relation to the
Manual override	Manual override with push-button possible (the gear is di is pressed or remains locked).	isengaged for as long as the button
High functional reliability	The actuator is overload protected, requires no limit swite the end stop is reached.	ches and automatically stops when
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.	
Accessories		
	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

## **Electrical installation**

Notes	<ul> <li>Connection via safety isolating transformer.</li> <li>Parallel connection of other actuators possible. Observe the performance data.</li> <li>Direction of rotation awitch is accurated Eastern actuary particles of rotation X2.</li> </ul>
	• Direction of rotation switch is covered. Factory setting. Direction of rotation +2.

#### Wiring diagrams





#### Cable colours: 1 = black 2 = red 3 = white



Cable colours: 1 = black 2 = red 3 = white

## **Dimensions** [mm]

#### Dimensional drawings



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Rotary actuator for ball valves

- Nominal torque 5Nm
- Nominal voltage AC/DC 24V
- Control Open/Close, 3-point
- With integrated auxiliary switch





inical data		
Electrical data	Nominal voltage	AC/DC 24V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 19.228.8V / DC 19.228.8V
	Power consumption in operation	1.5W
	Power consumption in rest position	0.2W
	Power consumption for wire sizing	2VA
	Auxiliary switch	1 x SPDT, 0100%
	Switching capacity auxiliary switch	1mA3 (0.5) A, AC 250 V (II Protective insulated)
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Connection auxiliary switch	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 5Nm
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	35dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Low voltage directive	CE according to 2006/95/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	0.8kV
	Rated impulse voltage auxiliary switch	2.5kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	Approx. 0.6kg

#### Safety notes



 This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



# Product features

Simple direct mounting	Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball valve can be selected in 90° steps.
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.
Flexible signalisation	With adjustable auxiliary switch (0100%)
	Auxiliary switch



#### Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

### **Electrical installation**

$\triangle$	Notes	<ul> <li>Connection via safety isolating transformer.</li> <li>Parallel connection of other actuators possible. Observe the performance data.</li> <li>Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.</li> </ul>

#### Wiring diagrams AC/DC 24V, Open/Close



## Dimensions [mm]

#### **Dimensional drawings**



Rotary actuator for ball valves

- Nominal torque 5Nm
- Nominal voltage AC 230V
- Control Open/Close, 3-point





Technical data		
Electrical data	Nominal voltage	AC 230V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 85265V
	Power consumption in operation	2W
	Power consumption in rest position	0.5W
	Power consumption for wire sizing	4VA
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 5Nm
	Manual override	Gear disengagement with push-button, can be
		locked
	Running time motor	90s / 90°
	Sound power level motor max.	35dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	Il Protective insulated
	Protection class UL	II Protective insulated
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Low voltage directive	CE according to 2006/95/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	4kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	Approx. 0.55kg

#### Safety notes



 This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



P5000A

P10000A

Product features		
Simple direct mounting	Straightforward direct mounting on the ball valve with only tool is integrated in the plug-in position indication. The mo ball valve can be selected in 90° steps.	one central screw. The assembly punting position in relation to the
Manual override	Manual override with push-button possible (the gear is dis is pressed or remains locked).	sengaged for as long as the button
High functional reliability	The actuator is overload protected, requires no limit switc the end stop is reached.	hes and automatically stops when
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.	
Accessories		
	Description	Туре
	Description	Type
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT	S1A S2A
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT Feedback potentiometer 140 Ohm, add-on	S1A S2A P140A
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT Feedback potentiometer 140 Ohm, add-on Feedback potentiometer 200 Ohm, add-on	S1A S2A P140A P200A
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT Feedback potentiometer 140 Ohm, add-on Feedback potentiometer 200 Ohm, add-on Feedback potentiometer 500 Ohm, add-on	S1A S2A P140A P200A P500A
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT Feedback potentiometer 140 Ohm, add-on Feedback potentiometer 200 Ohm, add-on Feedback potentiometer 500 Ohm, add-on Feedback potentiometer 1 kOhm, add-on	S1A S2A P140A P200A P500A P1000A

#### **Electrical installation**

Notes	<ul> <li>Caution: Power supply voltage!</li> <li>Parallel connection of other actuators possible. Observe the performance data.</li> <li>Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.</li> </ul>
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Feedback potentiometer 5 kOhm, add-on Feedback potentiometer 10 kOhm, add-on

#### Wiring diagrams



## **Dimensions** [mm]

#### **Dimensional drawings**



Technical d

Rotary actuator for ball valves

- Nominal torque 5Nm
- Nominal voltage AC 230V
- Control Open/Close, 3-point
- With integrated auxiliary switch



ata		
Electrical data	Nominal voltage	AC 230V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 85265V
	Power consumption in operation	2W
	Power consumption in rest position	0.5W
	Power consumption for wire sizing	4VA
	Auxiliary switch	1 x SPDT, 0100%
	Switching capacity auxiliary switch	1mA3 (0.5) A, AC 250V (II Protective insulated)
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Connection auxiliary switch	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 5Nm
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	35dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	II Protective insulated
	Protection class UL	II Protective insulated
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Low voltage directive	CE according to 2006/95/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	4kV
	Rated impulse voltage auxiliary switch	2.5kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	Approx. 0.6kg

#### Safety notes



 This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- · Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.


# Product features

Simple direct mounting	Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball valve can be selected in 90° steps.
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.
Flexible signalisation	With adjustable auxiliary switch (0100%)
	Auxiliary switch



# Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

# **Electrical installation**

Not	<ul> <li>Caution: Power supply voltage!</li> <li>Parallel connection of other actuators possible. Observe the performance data.</li> <li>Direction of rotation switch is covered. Eactory setting: Direction of rotation X2</li> </ul>
	Direction of rotation switch is covered. Factory setting. Direction of rotation 12.

# Wiring diagrams

#### AC 230V, Open/Close AC 230V, 3-point Т | | | S1 S2 S3 S1 S2 S3 Cable colours: Cable colours: 1 = blue 1 = blue 2 = brown 2 = brown **N**<sup>Y1</sup> Y2 (Y1) (Y2) Yź ¥1 3 = white 3 = white Ý2 S1 = violet S1 = violet Y2 X A - AB = 0% Y2 X 200 X A-AB=0% S2 = red S2 = red S3 = white S3 = white

# Dimensions [mm]



# Modulating rotary actuator for ball valves

- Nominal torque 10Nm
- Nominal voltage AC/DC 24V
- Control Modulating DC (0)2...10V
- Position feedback DC 2...10V





echnical data		
Electrical data	Nominal voltage	AC/DC 24V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 19.228.8V / DC 19.228.8V
	Power consumption in operation	2.5W
	Power consumption in rest position	0.4W
	Power consumption for wire sizing	5VA
	Connection supply / control	Cable 1m, 4 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 10Nm
	Positioning signal Y	DC (0)210V
	Positioning signal Y note	Input impedance 100kΩ
	Operating range Y	DC 210V
	Position feedback U	DC 210V
	Position feedback U note	Max. 1mA
	Position accuracy	±5%
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	35dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	0.8kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	Approx. 0.75kg

# Safety notes



- This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- · The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product features			
Mode of operation	The actuator is connected with a standard modulating signal of DC (0)210V and travels to the position defined by the positioning signal. Measuring voltage U serves for the electrical display of the valve position 0100% and as slave control signal for other actuators.		
Simple direct mounting	Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball valve can be selected in 90° steps.		
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is proposed or managed by		
High functional reliability	The actuator is overload protected, requires no limit switches and the end stop is reached.	automatically stops when	
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.		
Accessories			
	Description	Туре	
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A	
	Auxiliary switch, add-on, 2 x SPDT	S2A	
	Feedback potentiometer 140 Ohm, add-on	P140A	
	Feedback potentiometer 200 Ohm, add-on	P200A	
	Feedback potentiometer 500 Ohm, add-on P500A		
	Feedback potentiometer 1 kOhm, add-on	P1000A	
	Feedback potentiometer 2.8 kOhm, add-on	P2800A	
	Feedback potentiometer 5 kOhm, add-on	P5000A	
	Feedback potentiometer 10 kOhm, add-on	P10000A	
Electrical installation Notes	<ul> <li>Connection via safety isolating transformer.</li> <li>Parallel connection of other actuators possible. Observe the Direction of rotation switch is covered. Factory setting: Direction</li> </ul>	e performance data. ection of rotation Y2.	
Wiring diagrams			
AC/DC 24V, modulating	Override control (frost protection circuit)		
$ \begin{array}{c} 1 & \overrightarrow{} \\ - & \overrightarrow{} \\ 1 & \overrightarrow{} \\ 1 & 2 & 3 & 5 \\ \end{array} $ $ \begin{array}{c} Y \longrightarrow DC (0)210 V \\ DC 210 V \\ \hline V_{Y2} \end{array} $	Cable colours: 1 = black 2 = red 3 = white 5 = orange I = 0 I = 0	Cable colours: 1 = black 2 = red 3 = white 5 = orange	
Dimensions [mm]			
Dimensional drawings	107		

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Rotary actuator for ball valves

- Nominal torque 10Nm
- Nominal voltage AC/DC 24V
- Control Open/Close, 3-point





lechnical data		
Electrical data	Nominal voltage	AC/DC 24V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 19.228.8V / DC 19.228.8V
	Power consumption in operation	2W
	Power consumption in rest position	0.2W
	Power consumption for wire sizing	4VA
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 10Nm
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	35dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	0.8kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	Approx. 0.75kg
Safety notes		



- This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised • specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed • of as household refuse. All locally valid regulations and requirements must be observed.

# Product features

Simple direct mounting	Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball valve can be selected in 90° steps.
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.



Accessories		
	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

# **Electrical installation**

Note	<ul> <li>Connection via safety isolating transformer.</li> <li>Parallel connection of other actuators possible. Observe the performance data.</li> </ul>
	<ul> <li>Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.</li> </ul>

# Wiring diagrams





# Cable colours: 1 = black 2 = red 3 = white



Cable colours: 1 = black 2 = red 3 = white

# Dimensions [mm]





Rotary actuator for ball valves

- Nominal torque 10Nm
- Nominal voltage AC/DC 24V
- Control Open/Close, 3-point
- With integrated auxiliary switch





# Safety notes



 This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



# Product featuresSimple direct mountingStraightforward direct mounting on the ball valve with only one central screw. The assembly<br/>tool is integrated in the plug-in position indication. The mounting position in relation to the<br/>ball valve can be selected in 90° steps.Manual overrideManual override with push-button possible (the gear is disengaged for as long as the button<br/>is pressed or remains locked).High functional reliabilityThe actuator is overload protected, requires no limit switches and automatically stops when<br/>the end stop is reached.Adjustable angle of rotationAdjustable angle of rotation with mechanical end stops.

Flexible signalisation With adjustable auxiliary switch (0...100%)

Auxiliary switch



## Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

# **Electrical installation**

Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.
---

AC/DC 24V, 3-point

# Wiring diagrams

# AC/DC 24V, Open/Close



# Dimensions [mm]





Rotary actuator for ball valves

- Nominal torque 10Nm
- Nominal voltage AC 230V
- Control Open/Close, 3-point





Technical data		
Electrical data	Nominal voltage	AC 230V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 85265V
	Power consumption in operation	3W
	Power consumption in rest position	0.6W
	Power consumption for wire sizing	7VA
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 10Nm
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	35dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	II Protective insulated
	Protection class UL	II Protective insulated
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Low voltage directive	CE according to 2006/95/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	4kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	Approx. 0.75kg

# Safety notes



 This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



P1000A

P2800A

P5000A

P10000A

Product features		
Simple direct mounting	Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball valve can be selected in 90° steps.	
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).	
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.	
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.	
Accessories		
	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Feedback potentiometer 140 Ohm add-on	92A P140A
	Feedback potentiometer 200 Ohm. add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A

# Electrical installation

$\triangle$	Notes	<ul> <li>Caution: Power supply voltage!</li> <li>Parallel connection of other actuators possible. Observe the performance data.</li> </ul>
		<ul> <li>Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.</li> </ul>

Feedback potentiometer 1 kOhm, add-on

Feedback potentiometer 5 kOhm, add-on

Feedback potentiometer 10 kOhm, add-on

Feedback potentiometer 2.8 kOhm, add-on

# Wiring diagrams

AC 230V, Open/Close



# AC 230V, 3-point



Cable colours: 1 = blue 2 = brown 3 = white

# **Dimensions** [mm]

# Dimensional drawings

Cable colours:

1 = blue

2 = brown

3 = white



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Rotary actuator for ball valves

- Nominal torque 10Nm
- Nominal voltage AC 230V
- Control Open/Close, 3-point
- With integrated auxiliary switch





Technical data		
Electrical data	Nominal voltage	AC 230V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 85265V
	Power consumption in operation	3W
	Power consumption in rest position	0.6W
	Power consumption for wire sizing	7VA
	Auxiliary switch	1 x SPDT, 0100%
	Switching capacity auxiliary switch	1mA3 (0.5) A, AC 250 V (II Protective insulated)
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Connection auxiliary switch	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 10Nm
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	35dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	Il Protective insulated
	Protection class UL	II Protective insulated
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Low voltage directive	CE according to 2006/95/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	4kV
	Rated impulse voltage auxiliary switch	2.5kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	Approx. 0.8kg

# Safety notes



 This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- · Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



# Product features

Simple direct mounting	Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball valve can be selected in 90° steps.
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
Adjustable angle of rotation Flexible signalization	Adjustable angle of rotation with mechanical end stops. With adjustable auxiliary switch (0100%) Auxiliary switch
	A S1 S2 S3 L S1 S2 S3



# Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

AC 230V, 3-point

1

Y2 Y1

Y2

▶ A - AB = 0%

| | | S1 S2 S3

... 100%

d

Cable colours:

1 = blue

2 = brown

3 = white

S2 = red

S3 = white

S1 = violet

# **Electrical installation**

• Caution: Power supply voltage!	
<ul> <li>Parallel connection of other actuators possible. Observe the</li> <li>Direction of rotation switch is covered. Factory setting: Direction</li> </ul>	performance data. tion of rotation Y2.

# Wiring diagrams

# 

# Dimensions [mm]

# **Dimensional drawings**

Cable colours:

1 = blue

2 = brown

3 = white

S2 = red

S1 = violet

S3 = white



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43

28

(Y1) Y2

V8.6 05.2017 • Subject to modification

# SR24A-SR

# Modulating rotary actuator for ball valves

- Nominal torque 20Nm
- Nominal voltage AC/DC 24V
- Control Modulating DC (0)2...10V
- Position feedback DC 2...10V





Technical data		
Electrical data	Nominal voltage	AC/DC 24V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 19.228.8V / DC 19.228.8V
	Power consumption in operation	2.5W
	Power consumption in rest position	0.4W
	Power consumption for wire sizing	5VA
	Connection supply / control	Cable 1m, 4 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 20Nm
	Positioning signal Y	DC (0)210V
	Positioning signal Y note	Input impedance 100kΩ
	Operating range Y	DC 210V
	Position feedback U	DC 210V
	Position feedback U note	Max. 1mA
	Position accuracy	±5%
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	45dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	0.8kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	Approx. 1kg

# Safety notes



 This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed
  of as household refuse. All locally valid regulations and requirements must be observed.



Product features	
Mode of operation	The actuator is connected with a standard modulating signal of DC (0)210V and travels to the position defined by the positioning signal. Measuring voltage U serves for the electrical display of the valve position $0100\%$ and as slave control signal for other actuators.
Simple direct mounting	Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball valve can be selected in $90^{\circ}$ steps.
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.

# Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

# **Electrical installation**

$\underline{\wedge}$	Notes	<ul> <li>Connection via safety isolating transformer.</li> <li>Parallel connection of other actuators possible. Observe the performance data.</li> <li>Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.</li> </ul>

# Wiring diagrams

AC/DC 24V, modulating



# **Override control (frost protection circuit)**



Cable colours: 1 = black 2 = red 3 = white 5 = orange

# **Dimensions** [mm]



Rotary actuator for ball valves

Nominal torque 20Nm

- Nominal voltage AC/DC 24V
- Control Open/Close, 3-point





Technical data		
Electrical data	Nominal voltage	AC/DC 24V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 19.228.8V / DC 19.228.8V
	Power consumption in operation	2.5W
	Power consumption in rest position	0.2W
	Power consumption for wire sizing	5.5VA
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 20Nm
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	45dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	0.8kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	Approx. 1kg
Safety notes		
$\bigwedge$	<ul> <li>This device has been designed for use systems and is not allowed to be used in aircraft or in any other airborne mea</li> </ul>	in stationary heating, ventilation and air conditioning outside the specified field of application, especially ns of transport.
	<ul> <li>Only authorised specialists may carry</li> </ul>	out installation. All applicable legal or institutional
	<ul> <li>The switch for changing the direction must not in particular be reversed in a frost protectic</li> <li>The switch for changing the direction of rotation may only be operated by authorise specialists. The direction of rotation must not in particular be reversed in a frost protectic</li> </ul>	
	<ul> <li>circuit.</li> <li>The device may only be opened at the manufacturer's site. It does not contain any part that can be replaced or repaired by the user</li> </ul>	
	The cables must not be removed from	the device.
	The device contains electrical and electron of as household refuse. All locally valid	tronic components and is not allowed to be disposed I regulations and requirements must be observed.
Product fosturos		
FIGURE		
Simple direct mounting	Straightforward direct mounting on the ba tool is integrated in the plug-in position in ball valve can be selected in 90° steps.	all valve with only one central screw. The assembly idication. The mounting position in relation to the
Manual override	Manual override with push-button possib is pressed or remains locked).	le (the gear is disengaged for as long as the button
High functional reliability	The actuator is overload protected, requi the end stop is reached.	res no limit switches and automatically stops when

Adjustable angle of rotation with mechanical end stops.

Adjustable angle of rotation



Accessories			
	Description	Туре	
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A	
	Auxiliary switch, add-on, 2 x SPDT	S2A	
	Feedback potentiometer 140 Ohm, add-on	P140A	
	Feedback potentiometer 200 Ohm, add-on	P200A	
	Feedback potentiometer 500 Ohm, add-on	P500A	
	Feedback potentiometer 1 kOhm, add-on	P1000A	
	Feedback potentiometer 2.8 kOhm, add-on	P2800A	
	Feedback potentiometer 5 kOhm, add-on	P5000A	
	Feedback potentiometer 10 kOhm, add-on	P10000A	

# **Electrical installation**

Direction of retation owned to be before a radiaty betting. Direction of retation 12.
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# Wiring diagrams

# AC/DC 24V, Open/Close







Cable colours: 1 = black 2 = red 3 = white

# Dimensions [mm]

**Dimensional drawings** 



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43

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Rotary actuator for ball valves

- Nominal torque 20Nm
- Nominal voltage AC/DC 24V
- Control Open/Close, 3-point
- With integrated auxiliary switch





Technical data		
Electrical data	Nominal voltage	AC/DC 24V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 19.228.8V / DC 19.228.8V
	Power consumption in operation	2.5W
	Power consumption in rest position	0.2W
	Power consumption for wire sizing	5.5VA
	Auxiliary switch	1 x SPDT, 0100%
	Switching capacity auxiliary switch	1mA3 (0.5) A, AC 250V (II Protective
		insulated)
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Connection auxiliary switch	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 20Nm
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	45dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Low voltage directive	CE according to 2006/95/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	0.8kV
	Rated impulse voltage auxiliary switch	2.5kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	Approx. 1kg

# Safety notes



This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



# Product features

Simple direct mounting	Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the ball valve can be selected in 90° steps.
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.
Flexible signalisation	With adjustable auxiliary switch (0100%)
	Auxiliary switch



# Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

# **Electrical installation**

Λ	Notes	<ul> <li>Connection via safety isolating transformer.</li> </ul>
<u>/!\</u>		<ul> <li>Parallel connection of other actuators possible. Observe the performance data.</li> <li>Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.</li> </ul>

# Wiring diagrams AC/DC 24V, Open/Close



# Dimensions [mm]



Те

Rotary actuator for ball valves

- Nominal torque 20Nm
- Nominal voltage AC 230V
- Control Open/Close, 3-point





chnical data		
Electrical data	Nominal voltage	AC 230V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 85265V
	Power consumption in operation	3W
	Power consumption in rest position	0.6W
	Power consumption for wire sizing	7VA
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 20Nm
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	45dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	II Protective insulated
	Protection class UL	II Protective insulated
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Low voltage directive	CE according to 2006/95/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	4kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Weight	Weight	Approx. 1kg

# Safety notes



 This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- Caution: Power supply voltage!
  - Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
  - The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
  - The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
  - · The cables must not be removed from the device.
  - The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



P5000A

P10000A

Product features		
Simple direct mounting	Straightforward direct mounting on the ball valve with onl tool is integrated in the plug-in position indication. The moball valve can be selected in 90° steps.	y one central screw. The assembly ounting position in relation to the
Manual override	Manual override with push-button possible (the gear is di is pressed or remains locked).	sengaged for as long as the button
High functional reliability	The actuator is overload protected, requires no limit swite the end stop is reached.	ches and automatically stops when
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.	
Adjustable difgle of folation	, , , , , , , , , , , , , , , , , , , ,	
Accessories		
Accessories	Description	Туре
Accessories Electrical accessories	Description Auxiliary switch, add-on, 1 x SPDT	Type S1A
Accessories Electrical accessories	Description         Auxiliary switch, add-on, 1 x SPDT         Auxiliary switch, add-on, 2 x SPDT	<b>Type</b> S1A S2A
Accessories Electrical accessories	Description Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT Feedback potentiometer 140 Ohm, add-on	<b>Type</b> S1A S2A P140A
Accessories Electrical accessories	Description Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT Feedback potentiometer 140 Ohm, add-on Feedback potentiometer 200 Ohm, add-on	<b>Type</b> S1A S2A P140A P200A
Accessories Electrical accessories	Description Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT Feedback potentiometer 140 Ohm, add-on Feedback potentiometer 200 Ohm, add-on Feedback potentiometer 500 Ohm, add-on	<b>Type</b> S1A S2A P140A P200A P500A
Accessories Electrical accessories	Description Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT Feedback potentiometer 140 Ohm, add-on Feedback potentiometer 200 Ohm, add-on Feedback potentiometer 500 Ohm, add-on Feedback potentiometer 1 kOhm, add-on	<b>Type</b> S1A S2A P140A P200A P500A P1000A

# Electrical installation

Feedback potentiometer 5 kOhm, add-on

Feedback potentiometer 10 kOhm, add-on

# Wiring diagrams



# AC 230V, 3-point



Cable colours: 1 = blue 2 = brown 3 = white

# Dimensions [mm]

#### **Dimensional drawings**

Cable colours:

1 = blue

2 = brown

3 = white



Rotary actuator for ball valves

- Nominal torque 20Nm
- Nominal voltage AC 230V
- Control Open/Close, 3-point
- With integrated auxiliary switch





Technical data		
Electrical data	Nominal voltage	AC 230V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 85265V
	Power consumption in operation	3W
	Power consumption in rest position	0.6W
	Power consumption for wire sizing	7VA
	Auxiliary switch	1 x SPDT, 0100%
	Switching capacity auxiliary switch	1mA3 (0.5) A, AC 250V (II Protective insulated)
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Connection auxiliary switch	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 20Nm
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	45dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	II Protective insulated
	Protection class UL	II Protective insulated
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Low voltage directive	CE according to 2006/95/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	4kV
	Rated impulse voltage auxiliary switch	2.5kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C

Safety notes



Weight

 This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

95% r.h., non-condensing

Maintenance-free

Approx. 1kg

Caution: Power supply voltage!

Ambient humidity

Maintenance

Weight

- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed
  of as household refuse. All locally valid regulations and requirements must be observed.



# Product features Simple direct mounting Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting position in relation to the

	ball valve can be selected in 90° steps.
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.
Flexible signalisation	With adjustable auxiliary switch (0100%) Auxiliary switch



# Accessories

Auxiliary switch, add-on, 1 x SPDT	S1A
Auxiliary switch, add-on, 2 x SPDT	S2A
Feedback potentiometer 140 Ohm, add-on	P140A
Feedback potentiometer 200 Ohm, add-on	P200A
Feedback potentiometer 500 Ohm, add-on	P500A
Feedback potentiometer 1 kOhm, add-on	P1000A
Feedback potentiometer 2.8 kOhm, add-on	P2800A
Feedback potentiometer 5 kOhm, add-on	P5000A
Feedback potentiometer 10 kOhm, add-on	P10000A
	Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT Feedback potentiometer 140 Ohm, add-on Feedback potentiometer 200 Ohm, add-on Feedback potentiometer 500 Ohm, add-on Feedback potentiometer 1 kOhm, add-on Feedback potentiometer 2.8 kOhm, add-on Feedback potentiometer 5 kOhm, add-on Feedback potentiometer 10 kOhm, add-on

# **Electrical installation**

∧ Note	• Caution: Power supply voltage!
	<ul> <li>Parallel connection of other actuators possible. Observe the performance data.</li> <li>Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.</li> </ul>

# Wiring diagrams



# **Dimensions** [mm]



Rotary actuator for rotary valves

- Nominal torque 20Nm
- Nominal voltage AC/DC 24V
- Control Open/Close, 3-point





Fechnical data		
Electrical data	Nominal voltage	AC/DC 24V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 19.228.8V / DC 19.228.8V
	Power consumption in operation	2.5W
	Power consumption in rest position	0.2W
	Power consumption for wire sizing	5.5VA
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 20Nm
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	45dB(A)
	Position indication	Mechanically, integrated, two-section
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	0.8kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Mechanical data	Connection flange	F05
Weight	Weight	Approx. 1kg

# Safety notes



- This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



# **Product features**

Simple direct mounting	Simple direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.
Combination valve/actuator	For valves with the following mechanical specifications in accordance with ISO 5211 F05: - Square stem head SW = 14mm for form fit coupling of the rotary actuator.

- Hole circle d = 50mm

# Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

# **Electrical installation**

Notes	<ul> <li>Connection via safety isolating transformer.</li> <li>Parallel connection of other actuators possible. Observe the performance data.</li> <li>Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.</li> </ul>
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# Wiring diagrams

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**(**)<sup>Y1</sup> Y2

# AC/DC 24V, Open/Close

# AC/DC 24V, 3-point



Cable colours: 1 = black 2 = red 3 = white

# **Dimensions** [mm]



# SR24A-SR-5

Rotary actuator for rotary valves

- Nominal torque 20Nm
- Nominal voltage AC/DC 24V
- Control Modulating DC (0)2...10V
- Position feedback DC 2...10V





echnical data		
Electrical data	Nominal voltage	AC/DC 24V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 19.228.8V / DC 19.228.8V
	Power consumption in operation	2.5W
	Power consumption in rest position	0.4W
	Power consumption for wire sizing	5VA
	Connection supply / control	Cable 1m, 4 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 20Nm
	Positioning signal Y	DC (0)210V
	Positioning signal Y note	Input impedance 100kΩ
	Operating range Y	DC 210V
	Position feedback U	DC 210V
	Position feedback U note	Max. 1mA
	Position accuracy	±5%
	Manual override	Gear disengagement with push-button, can be
		locked
	Running time motor	90s / 90°
	Sound power level motor max.	45dB(A)
	Position indication	Mechanically, integrated, two-section
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	0.8kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Mechanical data	Connection flange	F05
Weight	Weight	Approx. 1kg

# Safety notes



- This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



# Mode of operation The actuator is connected with a standard modulating signal of DC (0)2...10V and travels to the position defined by the positioning signal. Measuring voltage U serves for the electrical display of the valve position 0...100% and as slave control signal for other actuators. Simple direct mounting Simple direct mounting on the rotary valve with mounting flange. The mounting position in

Manual overrideManual override with push-button possible (the gear is disengaged for as long as the button<br/>is pressed or remains locked).High functional reliabilityThe actuator is overload protected, requires no limit switches and automatically stops when<br/>the end stop is reached.Adjustable angle of rotationAdjustable angle of rotation with mechanical end stops.Combination valve/actuatorFor valves with the following mechanical specifications in accordance with ISO 5211 F05:<br/>- Square stem head SW = 14mm for form fit coupling of the rotary actuator.

#### - Hole circle d = 50mm

#### Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

# **Electrical installation**

$\underline{\mathbb{V}}$	Notes	<ul> <li>Connection via safety isolating transformer.</li> <li>Parallel connection of other actuators possible. Observe the performance data.</li> <li>Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.</li> </ul>

# Wiring diagrams

AC/DC 24V, modulating



# Override control (frost protection circuit)



Cable colours:

- 3 = white
- 5 = orange

# **Dimensions** [mm]





<sup>1 =</sup> black

<sup>2 =</sup> red

Rotary actuator for rotary valves

- Nominal torque 20Nm
- Nominal voltage AC 230V
- Control Open/Close, 3-point





Technical data		
Electrical data	Nominal voltage	AC 230V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 85265V
	Power consumption in operation	3W
	Power consumption in rest position	0.6W
	Power consumption for wire sizing	7VA
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 20Nm
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	45dB(A)
	Position indication	Mechanically, integrated, two-section
Safety	Protection class IEC/EN	Il Protective insulated
	Protection class UL	II Protective insulated
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Low voltage directive	CE according to 2006/95/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	4kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Mechanical data	Connection flange	F05
Weight	Weight	Approx. 1kg

# Safety notes



- This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



# **Product features**

Simple direct mounting	Simple direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.
Combination valve/actuator	For valves with the following mechanical specifications in accordance with ISO 5211 F05: - Square stem head SW = 14mm for form fit coupling of the rotary actuator. - Hole circle d = 50mm

# Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

# **Electrical installation**

• Direction of rotation switch is covered. Factory setting, Direction of rotation 12.	• Parallel connection of other actuators possible. Observe the	Observe the performance data. setting: Direction of rotation Y2.
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# Wiring diagrams

# AC 230V, Open/Close



#### Cable colours: 1 = blue 2 = brown





Cable colours: 1 = blue 2 = brown 3 = white

# **Dimensions** [mm]



# SR24A-S-5

Rotary actuator for rotary valves

- Nominal torque 20Nm
- Nominal voltage AC/DC 24V
- Control Open/Close, 3-point
- With integrated auxiliary switch





Technical data		
Electrical data	Nominal voltage	AC/DC 24V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 19.228.8V / DC 19.228.8V
	Power consumption in operation	2.5W
	Power consumption in rest position	0.2W
	Power consumption for wire sizing	5.5VA
	Auxiliary switch	1 x SPDT, 0100%
	Switching capacity auxiliary switch	1mA3 (0.5) A, AC 250 V (II Protective insulated)
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Connection auxiliary switch	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 20Nm
	Manual override	Gear disengagement with push-button, can be
		locked
	Running time motor	90s / 90°
	Sound power level motor max.	45dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Low voltage directive	CE according to 2006/95/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	0.8kV
	Rated impulse voltage auxiliary switch	2.5kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Mechanical data	Mechanical data	F05
Weight	Weight	Approx. 1kg

# Safety notes



- This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product features		
Simple direct mounting	Straightforward direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.	
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).	
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.	
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.	
Combination valve/actuator	For valves with the following mechanical specifications in accordance with ISO 5211 F05: - Square stem head SW = 14mm for form-fit coupling of the rotary actuator. - Hole circle d = 50mm	
Flexible signalisation	With adjustable auxiliary switch (0100%)	
	Auxiliary switch	

# Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

# **Electrical installation**

Note	<ul> <li>Connection via safety isolating transformer.</li> <li>Parallel connection of other actuators possible. Observe the performance data.</li> <li>Direction of rotation switch is covered. Eactory setting: Direction of rotation Y2</li> </ul>	

AC/DC 24V, 3-point

# Wiring diagrams

# AC/DC 24V, Open/Close



# Dimensions [mm]



Techn

Rotary actuator for rotary valves

- Nominal torque 20Nm
- Nominal voltage AC 230V
- Control Open/Close, 3-point
- With integrated auxiliary switch



ical data		
Electrical data	Nominal voltage	AC 230V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 85265V
	Power consumption in operation	3W
	Power consumption in rest position	0.6W
	Power consumption for wire sizing	7VA
	Auxiliary switch	1 x SPDT, 0100%
	Switching capacity auxiliary switch	1mA3 (0.5) A, AC 250V (II Protective insulated)
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Connection auxiliary switch	Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 20Nm
	Manual override	Gear disengagement with push-button, can be locked
	Running time motor	90s / 90°
	Sound power level motor max.	45dB(A)
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	Il Protective insulated
	Protection class UL	II Protective insulated
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Low voltage directive	CE according to 2006/95/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Туре 1
	Rated impulse voltage supply / control	4kV
	Rated impulse voltage auxiliary switch	2.5kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Mechanical data	Connection flange	F05
Weight	Weight	Approx. 1kg

## Safety notes



 This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- Caution: Power supply voltage!
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed
  of as household refuse. All locally valid regulations and requirements must be observed.



#### **Product features** Straightforward direct mounting on the rotary valve with mounting flange. The mounting Simple direct mounting position in relation to the fitting can be selected in 90° steps. Manual override Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked). High functional reliability The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached. Adjustable angle of rotation Adjustable angle of rotation with mechanical end stops. Combination valve/actuator For valves with the following mechanical specifications in accordance with ISO 5211 F05: - Square stem head SW = 14mm for form-fit coupling of the rotary actuator. - Hole circle d = 50mm Flexible signalisation With adjustable auxiliary switch (0...100%) Auxiliary switch

#### Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

# Electrical installation Notes • Caution: Power supply voltage! • Parallel connection of other actuators possible. Observe the performance data. • Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

# Wiring diagrams



# Dimensions [mm]



# GR24A-5 / -7

GR24A-5 Rotary actuator for rotary valves GR24A-7 Rotary actuator for rotary valves

- Nominal torque 40Nm
- Nominal voltage AC/DC 24V
- Control Open/Close





Technical data				
Electrical data	Nominal voltage	AC/DC 24V		
	Nominal voltage frequency	50/60Hz		
	Nominal voltage range	AC 19.228.8V / DC 19.228.8V		
	Power consumption in operation	4W		
	Power consumption at rest	2W		
	Power consumption for wire sizing	6VA		
	Connection supply / control	Cable 1m, 3 x 0.75mm <sup>2</sup>		
	Parallel operation	Yes (note the performance data)		
Functional data	Torque motor GR24A-5	min. 40Nm		
	GR24A-7	min. 40Nm		
	Manual override	Gear disengagement with push-button, can be locked		
	Running time motor	150s / 90°		
	Sound power level motor max.	45dB(A)		
	Position indication	Mechanical, pluggable		
Safety	Protection class IEC/EN	III Safety extra-low voltage		
Caloty	Protection class I II			
	Degree of protection IEC/EN			
	Degree of protection NEMA/UI	NEMA 2 LIL Enclosure Type 2		
	EMC	CE according to 2004/108/EC		
	Certification IEC/EN	Certified to IEC/EN 60730-1 and		
		IEC/EN 60730-2-14		
	Mode of operation	Type 1		
	Rated current voltage motor	0.8kV		
	Control pollution degree	3		
	Ambient temperature	-3050°C		
	Non-operating temperature	-4080°C		
	Ambient humidity	95% r.h., non-condensing		
	Maintenance	Maintenance-free		
Mechanical data	Connection flange GR24A-5	F05		
	GR24A-7	F07		
Weight	Weight	Approx 1.85kg		
	<u></u>			
Safety notes				
Δ	This device has been designed fo	r use in stationary heating, ventilation and air conditioning		
/!\	systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport			
	Only authorised specialists may carry out installation. All applicable legal or in			
	installation regulations must be co	omplied during installation.		
The switch for changing the direction		ection of rotation may only be operated by authorised		
	specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.			
	The device may only be opened	• The device may only be opened at the manufacturer's site. It does not contain any parts		
	that can be replaced or repaired by the user.			
	The cables must not be removed from the device.			
	<ul> <li>I he device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.</li> </ul>			
	<b>,</b>			
Product features				
Simple direct mounting	Simple direct mounting on the rotar	y valve with mounting flange. The mounting position in		

Manual overrideManual override with push-button possible (the gear is disengaged for as long as the button<br/>is pressed or remains locked).High functional reliabilityThe actuator is overload-proof, requires no limit switches and automatically stops when the<br/>end stop is reached.



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P5000A P10000A

Product features			
Combination valve/actuator	<ul> <li>For valves with the following mechanical specifications in accordance with ISO 5211 F05:</li> <li>Square stem head SW = 14mm for form-fit coupling of the rotary actuator.</li> <li>Hole circle d = 50mm</li> <li>For valves with the following mechanical specifications in accordance with ISO 5211 F07:</li> <li>Square stem head SW = 17mm for form-fit coupling of the rotary actuator.</li> <li>Hole circle d = 70mm</li> </ul>		
Accessories			
	Description	Туре	
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A	
	Auxiliary switch, add-on, 2 x SPDT	S2A	
	Feedback potentiometer 140 Ohm, add-on	P140A	
	Feedback potentiometer 200 Ohm, add-on	P200A	
	Feedback potentiometer 500 Ohm, add-on	P500A	
	Feedback potentiometer 1 kOhm, add-on	P1000A	

# Wiring diagram

Notes
Connection via safety isolating transformer.
Parallel connection of other actuators possible. Observe the performance data.
Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

Feedback potentiometer 5 kOhm, add-on Feedback potentiometer 10 kOhm, add-on

GR24A-5/-7

# AC/DC 24V, Open/Close







# Dimensions [mm]



# GR24A-SR-5 / -7



Modulating rotary actuator for rotary valves GR24A-SR-5 with mounting flange ISO 5211-F05 GR24A-SR-7 with mounting flange ISO 5211-F07

- Torque 40Nm
- Nominal voltage AC/DC 24V
- Control: modulating DC(0) 2...10V
- Position feedback DC 2...10V



# Technical data

Nominal voltage range         AC 19.228.8V / DC 21.628.8V           Power         In operation         4.5W @ nominal torque           consumption         At rest         1.5W           For wire sizing         6.5VA           Connection         Cable 1m, 4.v.0.75mm <sup>2</sup> Parallel operation         Possible, note the performance data           Torque (nominal torque)         Min.40Nm @ nominal voltage           Control Control signal Y         DC (0)210V, typical input impedance 100kΩ           Operating range Y         DC 210V           Position feedback         DC 210V, max. 1mA           Position accuracy         ±5%           Manual override         Gearing latch disengaged with pushbutton, can be locked           Running time         150s / 90°           Sound power level         Max. 45dB(A)           Position indication         Mechanical, pluggable           Protection class IEC/EN         III Safety extra-low voltage           Protection class UL         UL Class 2 Supply           Degree of protection IEC/EN         IP54           Degree of optotection IEC/EN	Electrical data	Nominal voltage		AC 24V, 50/60 Hz / DC 24V
Power consumption         In operation At rest         4.5W @ nominal torque           For wire sizing         6.5VA           Connection         Cable 1m, 4 x 0.75mm <sup>2</sup> Parallel operation         Possible, note the performance data           Functional data         Torque (nominal torque)         Min. 40Nm @ nominal voltage           Control         Control signal Y Operating range Y         DC (0)210V, typical input impedance 100kΩ           Position feedback         DC 210V         Manual override           Position accuracy         ±5%           Manual override         Gearing latch disengaged with pushbutton, can be locked           Running time         150s / 90°           Sound power level         Max 45dB(A)           Position indication         Mechanical, pluggable           Protection class IEC/EN         III Safety extra-low voltage           Protection class UL         UL Class 2 Supply           Degree of protection IEC/EN         IP54           Degree of protection IEM/UL         NEMA2, UL Enclosure Type 2           EMC         CE in accordance with 2004/108/EU           Certification         Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14           Mode of operation         Type 1           Rated impulse voltage         0.8kV		Nominal voltage range		AC 19.228.8V / DC 21.628.8V
consumption         At rest For wire sizing         1.5W 6.5VA           Connection         Cable 1nn, 4 x 0.75mm <sup>2</sup> Parallel operation         Possible, note the performance data           Torque (nominal torque)         Min. 40Nm @ nominal voltage           Control         Control signal Y Operating range Y         DC (0)210V, typical input impedance 100kΩ           Position feedback         DC 210V, max. 1mA           Position accuracy         ±5%           Manual override         Gearing latch disengaged with pushbutton, can be locked           Running time         150s / 90°           Sound power level         Max. 45dB(A)           Position indication         Mechanical, pluggable           Protection class UL         UL Class 2 Supply           Degree of protection IEC/EN         III Safety extra-low voltage           Protection class UL         UL Class 2 Supply           Degree of protection IEC/EN         IP54           Degree of protection EMA/UL         NEMA 2, UL Enclosure Type 2           EMC         CE in accordance with 2004/108/EU           Certification         Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14           Mode of operation         Type 1           Rated impulse voltage         0+50°C           Ambient temperature         0		Power	In operation	4.5W @ nominal torque
For wire sizing       6.5VA         Connection       Cable 1m, 4 x 0.75mm <sup>2</sup> Parallel operation       Possible, note the performance data         Torque (nominal torque)       Min. 40Nm @ nominal voltage         Control       Control signal Y         Do (0)210V, typical input impedance 100kΩ         Position feedback       DC 210V         Position accuracy       ±5%         Manual override       Gearing latch disengaged with pushbutton, can be locked         Running time       150s / 90°         Sound power level       Max. 45dB(A)         Position indication       Mechanical, plugable         Protection class IEC/EN       III Safety extra-low voltage         Protection class UL       UL Class 2 Supply         Degree of protection IEC/EN       IP54         Degree of protection EMA/UL       NEMA 2, UL Enclosure Type 2         EMC       Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage       0.8kV         Control pollution degree       3         Ambient temperature       0+60°C         Non-operating temperature       -40+80°C         Non-operating temperature       -40+80°C         Non-operating temperature		consumption	At rest	1.5W
Connection         Cable 1m, 4 x 0.75mm <sup>2</sup> Parallel operation         Possible, note the performance data           Functional data         Torque (nominal torque)         Min. 40Nm @ nominal voltage           Control         Control signal Y Operating range Y         DC (0)210V, typical input impedance 100kΩ           Position feedback         DC 210V         DC 210V           Position feedback         DC 210V, max. 1mA           Position accuracy         ±5%           Manual override         Gearing latch disengaged with pushbutton, can be locked           Running time         150s / 90°           Sound power level         Max. 45dB(A)           Position indication         Mechanical, pluggable           Protection class IEC/EN         III Safety extra-low voltage           Protection class UL         UL Class 2 Supply           Degree of protection IEC/EN         IP54           Degree of protection EMA/UL         NEMA 2, UL Enclosure Type 2           EMC         CE in accordance with 2004/108/EU           Certification         Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14           Mode of operation         Type 1           Rated impulse voltage         0.8kV           Control pollution degree         3           Ambient temperature			For wire sizing	6.5VA
Parallel operation         Possible, note the performance data           Functional data         Torque (nominal torque)         Min. 40Nm @ nominal voltage           Control         Control signal Y         DC (0)210V, typical input impedance 100kΩ           Operating range Y         DC 210V           Position feedback         DC 210V, max. 1mA           Position accuracy         ±5%           Manual override         Gearing latch disengaged with pushbutton, can be locked           Running time         150s / 90°           Sound power level         Max. 45dB(A)           Position indication         Mechanical, pluggable           Protection class IEC/EN         III Safety extra-low voltage           Protection class UL         UL Class 2 Supply           Degree of protection IEC/EN         IP54           Degree of protection EC/EN         IP54           Degree of protection EC/EN <td< th=""><th></th><th>Connection</th><th></th><th>Cable 1m, 4 x 0.75mm<sup>2</sup></th></td<>		Connection		Cable 1m, 4 x 0.75mm <sup>2</sup>
Functional data         Torque (nominal torque)         Min. 40Nm @ nominal voltage           Control         Control signal Y Operating range Y         DC (0)210V, typical input impedance 100kΩ           Position feedback         DC 210V, max. 1mA           Position accuracy         ±5%           Manual override         Gearing latch disengaged with pushbutton, can be locked           Running time         150s / 90°           Sound power level         Max. 45dB(A)           Position indication         Mechanical, pluggable           Protection class IEC/EN         III Safety extra-low voltage           Protection class UL         UL Class 2 Supply           Degree of protection IEC/EN         IP54           Degree of protection EC/EN         IP54           Degree of protection EC/EN         IP54           Degree of protection EC/EN         IP54           Degree of operation         Type 1           Rated impulse voltage         0.8kV           Control pollution degree         3           Ambient temperature         0+50°C           Non-operating temperature         -40+80°C           Ambient humidity         95% r.h., non-condensating           Maintenance         Maintenance-free           Mechanical data         Connection f		Parallel operation		Possible, note the performance data
Control         Control signal Y Operating range Y         DC (0)210V, typical input impedance 100kΩ           Position feedback         DC 210V, max. 1mA           Position accuracy         ±5%           Manual override         Gearing latch disengaged with pushbutton, can be locked           Running time         1505 / 90°           Sound power level         Max. 45dB(A)           Position indication         Mechanical, pluggable           Protection class IEC/EN         III Safety extra-low voltage           Protection class UL         UL Class 2 Supply           Degree of protection EMA/UL         NEMA 2, UL Enclosure Type 2           EMC         Ce trificat to IEC/EN 60730-1 and IEC/EN 60730- 2-14           Mode of operation         Type 1           Rated impulse voltage         0+50°C           Non-operating temperature         0+50°C           Non-operating temperature         0+50°C           Non-operating temperature        +50°C           Mointenance         Maintenance-free           Mechanical data         Connection flange GR24A-SR-5 GR24A-SR-7         F07           Dimensions / Weight         Dimensions         See «Dimensions»	Functional data	Torque (nominal to	orque)	Min. 40Nm @ nominal voltage
Operating range Y         DC 210V           Position feedback         DC 210V, max. 1mA           Position accuracy         ±5%           Manual override         Gearing latch disengaged with pushbutton, can be locked           Running time         150s / 90°           Sound power level         Max. 45dB(A)           Position indication         Mechanical, pluggable           Protection class IEC/EN         III Safety extra-low voltage           Protection class UL         UL Class 2 Supply           Degree of protection IEC/EN         IP54           Degree of protection EMA/UL         NEMA 2, UL Enclosure Type 2           EMC         CE in accordance with 2004/108/EU           Certification         Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14           Mode of operation         Type 1           Rated impulse voltage         0.8kV           Control pollution degree         3           Ambient temperature         0+50°C           Non-operating temperature         -40+80°C           Ambient humidity         95% r.h., non-condensating           Maintenance         Maintenance-free           Mointenance         Maintenance-free           Grave4A-SR-7         F07           Dimensions / Weight         Approx. 2.5		Control	Control signal Y	DC (0)210V, typical input impedance $100k\Omega$
Position feedback     DC 210V, max. 1mA       Position accuracy     ±5%       Manual override     Gearing latch disengaged with pushbutton, can be locked       Running time     150s / 90°       Sound power level     Max. 45dB(A)       Position indication     Mechanical, pluggable       Protection class IEC/EN     III Safety extra-low voltage       Protection class UL     UL Class 2 Supply       Degree of protection IEC/EN     IP54       Degree of protection EMA/UL     NEMA 2, UL Enclosure Type 2       EMC     CE in accordance with 2004/108/EU       Certification     Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14       Mode of operation     Type 1       Rated impulse voltage     0.8kV       Control pollution degree     3       Ambient temperature     0+50°C       Non-operating temperature     -40+80°C       Ambient temperature     Maintenance-free       Maintenance     Maintenance-free       Maintenance     F05       GR24A-SR-5     F05       GR24A-SR-5     F07       Dimensions / Weight     Dimensions			Operating range Y	DC 210V
Position accuracy       ±5%         Manual override       Gearing latch disengaged with pushbutton, can be locked         Running time       150s / 90°         Sound power level       Max. 45dB(A)         Position indication       Mechanical, pluggable         Protection class IEC/EN       III Safety extra-low voltage         Protection class UL       UL Class 2 Supply         Degree of protection IEC/EN       IP54         Degree of protection EMA/UL       NEMA 2, UL Enclosure Type 2         EMC       CE in accordance with 2004/108/EU         Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14         Mode of operation       Type 1         Rated impulse voltage       0.8kV         Control pollution degree       3         Ambient temperature       0+50°C         Non-operating temperature       -40+80°C         Maintenance       Maintenance-free         Maintenance       Maintenance-free         GR24A-SR-5       F05         GR24A-SR-7       F07         Dimensions / Weight       Dimensions       See «Dimensions»		Position feedback		DC 210V, max. 1mA
Manual override     Gearing latch disengaged with pushbutton, can be locked       Running time     150s / 90°       Sound power level     Max. 45dB(A)       Position indication     Mechanical, pluggable       Protection class IEC/EN     III Safety extra-low voltage       Protection class UL     UL Class 2 Supply       Degree of protection IEC/EN     IP54       Degree of protection EMA/UL     NEMA 2, UL Enclosure Type 2       EMC     CE in accordance with 2004/108/EU       Certification     Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14       Mode of operation     Type 1       Rated impulse voltage     0.8kV       Control pollution degree     3       Ambient temperature     0+50°C       Non-operating temperature     -40+80°C       Maintenance     Maintenance-free       Mechanical data     Connection flange GR24A-SR-5 GR24A-SR-7     F05       Dimensions / Weight     Dimensions     See «Dimensions»		Position accuracy		±5%
Running time150s / 90°Sound power levelMax. 45dB(A)Position indicationMechanical, pluggableProtection class IEC/ENIII Safety extra-low voltageProtection class ULUL Class 2 SupplyDegree of protection IEC/ENIP54Degree of protection EMA/ULNEMA 2, UL Enclosure Type 2EMCCE in accordance with 2004/108/EUCertificationCertified to IEC/EN 60730-1 and IEC/EN 60730-Mode of operationType 1Rated impulse voltage0.8kVControl pollution degree3Ambient temperature0+50°CNon-operating temperature-40+80°CAmbient humidity95% r.h., non-condensatingMaintenanceMaintenance-freeMechanical dataConnection flangeOperationGR24A-SR-7F07DimensionsWeightApprox. 2.5kg		Manual override		Gearing latch disengaged with pushbutton, can be locked
Sound power level       Max. 45dB(A)         Position indication       Mechanical, pluggable         Safety       Protection class IEC/EN       III Safety extra-low voltage         Protection class UL       UL Class 2 Supply         Degree of protection IEC/EN       IP54         Degree of protection EMA/UL       NEMA 2, UL Enclosure Type 2         EMC       CE in accordance with 2004/108/EU         Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14         Mode of operation       Type 1         Rated impulse voltage       0.8kV         Control pollution degree       3         Ambient temperature       0+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Mechanical data       Connection flange GR24A-SR-5 GR24A-SR-7       F07         Dimensions / Weight       Dimensions       See «Dimensions»		Running time		150s / 90°
Position indication     Mechanical, pluggable       Safety     Protection class IEC/EN     III Safety extra-low voltage       Protection class UL     UL Class 2 Supply       Degree of protection IEC/EN     IP54       Degree of protection EMA/UL     NEMA 2, UL Enclosure Type 2       EMC     CE in accordance with 2004/108/EU       Certification     Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14       Mode of operation     Type 1       Rated impulse voltage     0.8kV       Control pollution degree     3       Ambient temperature     0+50°C       Non-operating temperature     -40+80°C       Ambient humidity     95% r.h., non-condensating       Maintenance     Maintenance-free       Mechanical data     Connection flange     GR24A-SR-5       GR24A-SR-7     F07       Dimensions / Weight     Dimensions     See «Dimensions»		Sound power leve		Max. 45dB(A)
Safety       Protection class IEC/EN       III Safety extra-low voltage         Protection class UL       UL Class 2 Supply         Degree of protection IEC/EN       IP54         Degree of protection EMA/UL       NEMA 2, UL Enclosure Type 2         EMC       CE in accordance with 2004/108/EU         Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage       0.8kV         Control pollution degree       3         Ambient temperature       0+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Mechanical data       Connection flange       GR24A-SR-5         GR24A-SR-7       F07         Dimensions / Weight       Dimensions       See «Dimensions»		Position indication	1	Mechanical, pluggable
Protection class UL     UL Class 2 Supply       Degree of protection IEC/EN     IP54       Degree of protection EMA/UL     NEMA 2, UL Enclosure Type 2       EMC     CE in accordance with 2004/108/EU       Certification     Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14       Mode of operation     Type 1       Rated impulse voltage     0.8kV       Control pollution degree     3       Ambient temperature     0+50°C       Non-operating temperature     -40+80°C       Ambient humidity     95% r.h., non-condensating       Maintenance     Maintenance-free       Mechanical data     Connection flange     GR24A-SR-5 GR24A-SR-7       Dimensions / Weight     Dimensions     See «Dimensions»       Weight     Approx. 2.5kg	Safety	Protection class IE	EC/EN	III Safety extra-low voltage
Degree of protection IEC/EN       IP54         Degree of protection EMA/UL       NEMA 2, UL Enclosure Type 2         EMC       CE in accordance with 2004/108/EU         Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14         Mode of operation       Type 1         Rated impulse voltage       0.8kV         Control pollution degree       3         Ambient temperature       0+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Mechanical data       Connection flange GR24A-SR-5 GR24A-SR-7       F05         Dimensions / Weight       Dimensions       See «Dimensions»		Protection class U	IL	UL Class 2 Supply
Degree of protection EMA/UL       NEMA 2, UL Enclosure Type 2         EMC       CE in accordance with 2004/108/EU         Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage       0.8kV         Control pollution degree       3         Ambient temperature       0+50°C         Non-operating temperature       -40+80°C         Motent humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Mechanical data       Connection flange       GR24A-SR-5       F05         GR24A-SR-7       F07         Dimensions / Weight       Dimensions       See «Dimensions»		Degree of protecti	on IEC/EN	IP54
EMC       CE in accordance with 2004/108/EU         Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage       0.8kV         Control pollution degree       3         Ambient temperature       0+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Mechanical data       Connection flange       GR24A-SR-5         GR24A-SR-7       F07         Dimensions / Weight       Dimensions       See «Dimensions»		Degree of protecti	on EMA/UL	NEMA 2, UL Enclosure Type 2
Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1         Rated impulse voltage       0.8kV         Control pollution degree       3         Ambient temperature       0+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Mechanical data       Connection flange       GR24A-SR-5         GR24A-SR-7       F07         Dimensions / Weight       Dimensions       See «Dimensions»		EMC		CE in accordance with 2004/108/EU
2-14         Mode of operation       Type 1         Rated impulse voltage       0.8kV         Control pollution degree       3         Ambient temperature       0+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Mechanical data       Connection flange       GR24A-SR-5         GR24A-SR-7       F07         Dimensions / Weight       Dimensions       See «Dimensions»		Certification		Certified to IEC/EN 60730-1 and IEC/EN 60730-
Mode of operation       Type 1         Rated impulse voltage       0.8kV         Control pollution degree       3         Ambient temperature       0+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Mechanical data       Connection flange       GR24A-SR-5       F05         Dimensions / Weight       Dimensions       See «Dimensions»				2-14
Rated impulse voltage       0.8kV         Control pollution degree       3         Ambient temperature       0+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Mechanical data       Connection flange       GR24A-SR-5         GR24A-SR-7       F05         GR24A-SR-7       F07         Dimensions / Weight       Dimensions       See «Dimensions»		Mode of operation		Туре 1
Control pollution degree       3         Ambient temperature       0+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Mechanical data       Connection flange       GR24A-SR-5         Dimensions / Weight       Dimensions       See «Dimensions»		Rated impulse vol	tage	0.8kV
Ambient temperature     0+50°C       Non-operating temperature     -40+80°C       Ambient humidity     95% r.h., non-condensating       Maintenance     Maintenance-free       Mechanical data     Connection flange     GR24A-SR-5       Dimensions / Weight     Dimensions     See «Dimensions»		Control pollution d	legree	3
Non-operating temperature     -40+80°C       Ambient humidity     95% r.h., non-condensating       Maintenance     Maintenance-free       Mechanical data     Connection flange     GR24A-SR-5       Connection flange     GR24A-SR-7     F05       Dimensions / Weight     Dimensions     See «Dimensions»		Ambient temperat	ure	0+50°C
Ambient humidity     95% r.h., non-condensating       Maintenance     Maintenance-free       Mechanical data     Connection flange     GR24A-SR-5       Dimensions / Weight     Dimensions     See «Dimensions»       Weight     Approx. 2.5kg		Non-operating ten	nperature	-40+80°C
Maintenance     Maintenance-free       Mechanical data     Connection flange     GR24A-SR-5     F05       Dimensions / Weight     Dimensions     See «Dimensions»       Weight     Approx. 2.5kg		Ambient humidity		95% r.h., non-condensating
Mechanical data     Connection flange     GR24A-SR-5 GR24A-SR-7     F05 F07       Dimensions / Weight     Dimensions     See «Dimensions»       Weight     Approx. 2.5kg		Maintenance		Maintenance-free
GR24A-SR-7     F07       Dimensions / Weight     Dimensions     See «Dimensions»       Weight     Approx. 2.5kg	Mechanical data	Connection flange	GR24A-SR-5	F05
Dimensions / Weight         Dimensions         See «Dimensions»           Weight         Approx. 2.5kg		-	GR24A-SR-7	F07
Weight Approx. 2.5kg	Dimensions / Weight	Dimensions		See «Dimensions»
		Weight		Approx. 2.5kg

#### Safety notes

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 The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during assembly.
- The switch for changing the direction of rotation may only be operated by authorised personnel. The direction of rotation must not be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cable must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



# **Product features**

Mode of operation	The actuator is controlled with a standard modulating signal of DC (0)210V and travels to the position defined by the control signal. Measuring voltage U serves for the electrical display of the actuator position 0100% and as slave control signal for other actuators.
Simple direct mounting	Simple direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.
High functional reliability	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.
Combination valve/actuator	For valves with the following mechanical specifications in accordance with ISO 5211 F05: - Square stem head SW = 14mm for form-fit coupling of the rotary actuator. - Hole circle d = 50mm
	For valves with the following mechanical specifications in accordance with ISO 5211 F07: - Square stem head SW = 17mm for form-fit coupling of the rotary actuator. - Hole circle d = 70mm

# Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

Wiring diagram

V8.6 05.2017 • Subject to modification



# GR24A-SR-5 / -7



# Dimensions [mm]

GR24A-SR-5





GR24A-SR-7






# GR230A-5 Rotary actuator for rotary valves GR230A-7 Rotary actuator for rotary valves

- Nominal torque 40Nm
- Nominal voltage AC 230V
- Control Open/Close



Technical data				
Electrical da	ta Nominal voltage		AC 230V	
	Nominal voltage free	quency	50/60Hz	
	Nominal voltage rar	ige	AC 85265V	
	Power consumption	in operation	5W	
	Power consumption	at rest	2W	
	Power consumption	for wire sizing	9VA	
	Connection supply /	control	Cable 1m, 3 x 0.75mm <sup>2</sup>	
	Parallel operation		Yes (note the performance data)	
Functional da	ta Torque motor	GR230A-5	min. 40Nm	
		GR230A-7	min. 40Nm	
	Manual override		Gear disengagement with push-button, can be locked	
	Running time motor		150s / 90°	
	Sound power level r	motor max.	45dB(A)	
	Position indication		Mechanical, pluggable	
Safe	ty Protection class IEC	C/EN	Il protective insulated	
	Protection class UL		Il protective insulated	
	Degree of protection	n IEC/EN	IP54	
	Degree of protection	n NEMA/UL	NEMA 2, UL Enclosure Type 2	
	Electromagnetic cor	mpatibility	CE according to 2004/108/EC	
	Low-voltage directiv	/e	CE according to 2006/95/EC	
	Certification IEC/EN	l	Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14	
	Mode of operation		Туре 1	
	Rated current voltage	ge motor	4kV	
	Control pollution de	gree	3	
	Ambient temperatur	e	-3050°C	
	Non-operating temp	erature	-4080°C	
	Ambient humidity		95% r.h., non-condensing	
	Maintenance		Maintenance-free	
Mechanical da	ta Connection flange	GR230A-5 GR230A-7	F05 F07	
Weig	ht Weight		Approx. 1.85kg	

Safety notes



 This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cables must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product features			
Manual override	Manual override with push-button possible (the gear is dise is pressed or remains locked).	engaged for as long as the button	
High functional reliability	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.		
Simple direct mounting	Simple direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.		
Combination valve/actuator	For valves with the following mechanical specifications in accordance with ISO 5211 F05: - Square stem head SW = 14mm for form-fit coupling of the rotary actuator. - Hole circle d = 50mm		
	For valves with the following mechanical specifications in a - Square stem head SW = 17mm for form-fit coupling of the - Hole circle d = 70mm	accordance with ISO 5211 F07: e rotary actuator.	
A			
Accessories			
Accessories	Description	Туре	
Electrical accessories	Description Auxiliary switch, add-on, 1 x SPDT	Type S1A	
Electrical accessories	<b>Description</b> Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT	Type S1A S2A	
Electrical accessories	<b>Description</b> Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT Feedback potentiometer 140 Ohm, add-on	<b>Type</b> S1A S2A P140A	
Electrical accessories	Description Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT Feedback potentiometer 140 Ohm, add-on Feedback potentiometer 200 Ohm, add-on	<b>Type</b> S1A S2A P140A P200A	
Electrical accessories	Description Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT Feedback potentiometer 140 Ohm, add-on Feedback potentiometer 200 Ohm, add-on Feedback potentiometer 500 Ohm, add-on	<b>Type</b> S1A S2A P140A P200A P500A	
Electrical accessories	Description Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT Feedback potentiometer 140 Ohm, add-on Feedback potentiometer 200 Ohm, add-on Feedback potentiometer 500 Ohm, add-on Feedback potentiometer 1 kOhm, add-on	<b>Type</b> S1A S2A P140A P200A P500A P1000A	
Electrical accessories	Description Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT Feedback potentiometer 140 Ohm, add-on Feedback potentiometer 200 Ohm, add-on Feedback potentiometer 500 Ohm, add-on Feedback potentiometer 1 kOhm, add-on Feedback potentiometer 2.8 kOhm, add-on	<b>Type</b> S1A S2A P140A P200A P500A P1000A P2800A	
Electrical accessories	DescriptionAuxiliary switch, add-on, 1 x SPDTAuxiliary switch, add-on, 2 x SPDTFeedback potentiometer 140 Ohm, add-onFeedback potentiometer 200 Ohm, add-onFeedback potentiometer 500 Ohm, add-onFeedback potentiometer 1 kOhm, add-onFeedback potentiometer 2.8 kOhm, add-onFeedback potentiometer 5 kOhm, add-on	Type           S1A           S2A           P140A           P200A           P500A           P1000A           P2800A           P5000A	
Electrical accessories	Description Auxiliary switch, add-on, 1 x SPDT Auxiliary switch, add-on, 2 x SPDT Feedback potentiometer 140 Ohm, add-on Feedback potentiometer 200 Ohm, add-on Feedback potentiometer 500 Ohm, add-on Feedback potentiometer 1 kOhm, add-on Feedback potentiometer 2.8 kOhm, add-on Feedback potentiometer 5 kOhm, add-on Feedback potentiometer 10 kOhm, add-on	Type           S1A           S2A           P140A           P200A           P500A           P1000A           P2800A           P5000A           P1000A           P2000A	

### Wiring diagram

## GR230A-5

AC 230V, Open/Close







Y2	
$\sim$	A – AB = 0%



### Wiring diagram



• Caution: Power supply voltage!

Parallel connection of other actuators possible. Observe the performance data. • •

Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

GR230A-7 AC 230V, Open/Close





Notes



### Dimensions [mm]

GR230A-5





GR230A-7







- Torque 4Nm
- Nominal voltage AC/DC 24V
- Control: Open/Close
- Running time 9s





### Technical data

Electrical data	Nominal voltage		AC 24V, 50/60Hz / DC 24V	
	Nominal voltage r	ange	AC/DC 19.2 28.8V / DC 21.6 28.8V	
	Power	In operation	12W @ nominal torque	
	consumption	At rest	1.5W	
		For wire sizing	18VA (I max. 20A @ 5ms)	
	Connection		Cable 1m, 3 x 0.75mm <sup>2</sup>	
	Parallel connectio	n	Possible, note the performance data	
Functional data	Torque (nominal to	orque)	Min. 4Nm @ nominal voltage	
	Manual override		Gearing latch disengaged with push-button, can be locked	
	Running time		9s / 90°	
	Sound power leve		Max. 52dB(A)	
	Position indication		Mechanical, pluggable	
Safety	Protection class		III Safety extra-low voltage	
	Degree of protection		IP54 in any mounting position, UL/NEMA 2	
	EMC		CE according to 2004/108/EC	
	Certification		Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14	
	Mode of operation	ו	Type 1	
	Rated impulse vol	Itage	0.8kV	
	Control pollution of	legree	3	
	Ambient temperat	ure	0 +40°C (no restrictions)	
		Δ	+40 +50°C (Caution: can only be used with restrictions. Please contact your Belimo representative.)	
	Non-operating ten	nperature	-40 +80°C	
	Ambient humidity		95% r.H., non-condensating	
	Maintenance		Maintenance-free	
Dimensions / Weight	Dimensions		See «Dimensions»	
-	Weight		Approx. 0.95kg	

#### Safety notes



- The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during assembly.
- The switch for changing the direction of rotation may only be operated by authorised personnel. The direction of rotation must not be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cable must not be removed from the device.
- Self adaptation is necessary when the system is commissioned and after each adjustment of the angle (press the adaptation push-button)
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product features			
Simple direct mounting	Straightforward direct mounting on the ball valve with only one screw. The assemply tool is integrated in the plug-on position indicator. The mounting position in relation to the fitting can be selected in 90° steps.		
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).		
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.		
High functional reliability	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.		
Home position	When the supply voltage is switched on for the first time, i.e. at commissioning or after pressing the «gear disengagement» switch, the actuator moves to the home position. Factory setting: Y2 (counter-clockwise rotation)		
	Rotary actuator	Rotary valve	
	<b>√</b> ¥2	A – AB = 0%	
	Y1.	A-AB = 100%	

The actuator then moves into the position defined by the control signal.

### Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

### **Electrical installation**





### **Dimensions** [mm]





### **Operating controls and indicators**



#### (1) Direction of rotation switch

Switching over: Direction of rotation changes

### (2) Push-button and green LED display

Off: No voltage supply or fault On: In operation

Press button: Switches on angle of rotation adaptation followed by standard operation

### **③** Push-button and yellow LED display

Off:	Standard operation
On:	Adaptation or synchronising process active
Press button:	No function

### (4) Gear disengagement switch

Press button: Gear disengaged, motor stops, manual override possible Release button: Gear engaged, synchronisation starts, followed by standard operation

Check voltage supply connection

a) (2) Off and (3) On

b)

- Check the supply connections.
- (2) Blinking and (3) Blinking  $\int$  Possibly  $\pm$  and  $\sim$  are swapped over.



### Modulating rotary actuator for 2 and 3 way control ball valves

F

- Torque 4Nm
- Nominal voltage AC/DC 24V
- Control: modulating DC (0)2...10V
- Position feedback DC 2...10V
- Running time 9s
- Running time 55



### **Technical data**

Electrical data	Nominal voltage	9	AC 24V, 50/60Hz / DC 24V	
	Nominal voltage range		AC 19.228.8V / DC 21.628.8V	
	Power	In operation	12W @ nominal torque	
	consumption	At rest	1.5W	
		For wire sizing	18VA (I max. 20A @ 5ms)	
	Connection		Cable 1m, 4 x 0.75mm <sup>2</sup>	
	Parallel connect	tion	Possible, note the performance data	
unctional data	Torque (nomina	l torque)	Min. 4Nm @ nominal voltage	
	Control	Control signal Y Operating range	DC (0)210V, input impedance 100kΩ DC 210V	
	Position feedbar voltage)	ck (Measuring	DC 210V, max. 0.5mA	
	Position accurate	су	±5%	
	Manual override	9	Gearing latch disengaged with push-button, can be locked	
	Running time		9s / 90°	
	Automatic adjust range and meast match the mech rotation	stment of operating suring signal U to anical angle of	Manual triggering of the adaption by pressing the «Adaption» button	
	Override control	I	MAX (maximum position)= 100%MIN (minimum position)= 0%ZS (intermediate position, only= 50%AC)	
	Sound power le	vel	52dB(A)	
	Position indicati	on	Mechanical, pluggable	
Safety	Protection class	;	III Safety extra-low voltage	
2	Degree of prote	ction	IP54 in any mounting position, UL/NEMA 2	
	EMC		CE according to 2004/108/EC	
	Certification		Certified to IEC/EN 60730-1 and IEC/EN 60730-2- 14	
	Mode of operati	on	Туре 1	
	Rated impulse v	voltage	0.8kV	
	Control pollution	n degree	3	
	Ambient temper	ature	-30+40°C (no restrictions)	
			▲ +40+50°C (Caution: can only be used	
			with restrictions. Please contact your Belimo	
	New years the set		representative.)	
	Non-operating to			
	Ampient numidi	ıy	Som I.H., non-condensating	
sions / Weight	Dimensions		See «Dimensions»	
	vveignt		Арргох. U.95Kg	

### Safety notes

Dimen



- The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during assembly.
- The switch for changing the direction of rotation may only be operated by authorised personnel. The direction of rotation must not be reversed in a frost protection circuit.



Safety notes			
	<ul> <li>The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.</li> <li>The cable must not be removed from the device.</li> <li>Self adaptation is necessary when the system is commissioned and after each adjustment of the angle (press the adaptation push-button)</li> <li>The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.</li> </ul>		
Product features			
Mode of operation	The actuator is controlled with a standard modulating signal of DC (0)210V and moves to the position defined by the control signal. The measuring voltage U serves for the electrical display of the damper position 0100% and as slave control signal for other actuators.		
Simple direct mounting	Straightforward direct mounting on the ball valve with only one screw. The assembly tool is integrated in the plug-on position indicator. The mounting position in relation to the fitting can be selected in 90° steps.		
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).		
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.		
High functional reliability	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.		
Position feedback U5	Operation of the ball valve is optimised by a limiting ring. This ring reduces the angle of rotation from 95° to 90°, i.e. U5 will deviate from Y by approximately 0.3V when the valve is closed.		
Home position	When the supply voltage is switched on for the first time, i.e. at commissioning or after pressing the «gear disengagement» switch, the actuator moves to the home position. Factory setting: Y2 (counter-clockwise rotation) Rotary actuator Rotary valve 4 - AB = 0% 11 - A - AB = 100%		

The actuator then moves into the position defined by the control signal.

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

### **Electrical installation**





#### **Electrical installation**

**Cable lengths** 



= Actuator Α = С Control unit

= Belimo connecting cable, 1m (4 x 0.75mm<sup>2</sup>)  $L_1$ 

L<sub>2</sub> = Customer cable

Ltot = Maximum cable length

Cross section L <sub>2</sub>	Max. cable length $L_{tot} = L_1 + L_2$		Example for DC
1/~	AC	DC	
0.75 mm²	≤30 m	≤5 m	1 m (L <sub>1</sub> ) + 4 m (L <sub>2</sub> )
1.00 mm²	≤40 m	≤8 m	1 m (L <sub>1</sub> ) + 7 m (L <sub>2</sub> )
1.50 mm²	≤70 m	≤12 m	1 m (L <sub>1</sub> ) + 11 m (L <sub>2</sub> )
2.50 mm <sup>2</sup>	≤100 m	≤20 m	1 m (L <sub>1</sub> ) + 19 m (L <sub>2</sub> )

#### **Dimensions** [mm]





### **1** Direction of rotation switch Switching over: Direction of rotation changes

(2) Push-button and green LED display

No voltage supply or fault Off: On: In operation Press button: Switches on angle of rotation adaptation followed by standard operation

- (3) Push-button and yellow LED display
  - Off: Standard operation On:
  - Adaptation or synchronising process active Press button: No function
- (4) Gear disengagement switch

Press button: Gear disengaged, motor stops, manual override possible Release button: Gear engaged, synchronisation starts, followed by standard operation

Check voltage supply connection

a) (2) Off and (3) On

b)

Check the supply connections. (2) Blinking and (3) Blinking Possibly  $\perp$  and  $\widetilde{+}$  are swapped over.

UL marked actuators is optional, please contact your local Sales Representative for details.

Rotary actuator for 2 and 3 way control ball valves

- Torque 8Nm
- Nominal voltage AC/DC 24V
- Control: Open/Close
- Running time 9s





### Technical data

Electrical data	Nominal voltage		AC 24V, 50/60Hz / DC 24V	
	Nominal voltage range		AC/DC 19.2 28.8V / DC 21.6 28.8V	
	Power	In operation	12W @ nominal torque	
	consumption	At rest	1.5W	
	O a man anti-a m	For wire sizing	18VA (I max. 20 A @ 5ms)	
	Connection Barallol connor	otion	Cable III, 3 X 0.75000	
Functional data	Iorque (nomina	al torque)	Min. 8Nm @ nominal voltage	
	Nanual overrid	е		
	Running ume	avol.	95790 Max 52dP(A)	
	Position indicat	tion	Mechanical pluggable	
Safaty	Protoction clas	6		
Salety	Protection clas	s	III Salety extra-low voltage	
	EMC		CE according to 2004/108/EC	
	Certification		Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14	
	Mode of operat	tion		
	Rated impulse	voltage	0.8kV	
	Control pollutio	n degree	3	
	Ambient tempe	erature	0+40°C (no restrictions)	
			A +40+50 °C (Caution: can only be used with restrictions.	
			Please contact your Belimo representative.)	
	Non-operating	temperature	-40+80°C	
	Ambient humid	lity	95% r.H., non-condensating	
	Maintenance		Maintenance-free	
Dimensions / Weight	Dimensions		See «Dimensions»	
	Weight		Approx. 1.8kg	
Safety notes				
Δ	The actuator	has been designe	d for use in stationary heating, ventilation and air conditioning	
	systems and is not allowed to be used outside the specified field of app		be used outside the specified field of application, especially	
		n any other alloo	the means of transport.	
	<ul> <li>It may only b issued by aut</li> </ul>	horities must be	ably trained personnel. Any legal regulations or regulations bserved during assembly. tion of rotation may only be operated by authorised personnel	
	The switch for	changing the dire		
	The direction	of rotation must	not be reversed in a frost protection circuit.	
	The device m	ay only be opene	d at the manufacturer's site. It does not contain any parts that	
	can be replac	ed or repaired by	the user.	
	<ul> <li>The cable mu</li> </ul>	ist not be remove	d from the device.	
	<ul> <li>Self adaptation</li> <li>Self adaptation</li> </ul>	on is necessary w	when the system is commissioned and after each adjustment	
	The device co	press the adapta	and electronic components and is not allowed to be disposed	
	of as household refuse. All locally		ally valid regulations and requirements must be observed.	
Product features				
FIGUELIEatures				
Simple direct mounting	Straightforward	I direct mounting	on the ball valve with only one screw.	
	The assemply	tool is integrated	in the plug-on position indicator. The mounting position in	
	The assemply relation to the f	tool is integrated itting can be sele	the plug-on position indicator. The mounting position in cted in 90° steps.	
Manual override	The assemply relation to the f Manual overrid is pressed or re	tool is integrated itting can be sele e with push-butto emains locked).	in the plug-on position indicator. The mounting position in cted in 90° steps. In possible (the gear is disengaged for as long as the button	
Manual override Adjustable angle of rotation	The assemply relation to the f Manual overrid is pressed or re Adjustable ang	tool is integrated itting can be sele e with push-butto emains locked). le of rotation with	In the plug-on position indicator. The mounting position in cted in 90° steps. In possible (the gear is disengaged for as long as the button mechanical end stops.	

end stop is reached.



#### Product features

**Home position** When the supply voltage is switched on for the first time, i.e. at commissioning or after pressing the «gear disengagement» switch, the actuator moves to the home position. Factory setting: Y2 (counter-clockwise rotation)

Rotary actuator	Rotary valve
<b>→</b> ¥2	A – AB = 0%
۷۱ 🌔	A-AB = 100%

The actuator then moves into the position defined by the control signal.

#### Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

#### **Electrical installation**



#### **Dimensions** [mm]

**Dimensional drawings** 





### **Operating controls and indicators**



#### (1) Direction of rotation switch

Switching over: Direction of rotation changes

(2) Push-button and green LED display

Press bullon.	Switches on angle of rotation adaptation followed by standard operation
Droop button:	Switches on angle of rotation adaptation followed by standard operation
On:	In operation
Off:	No voltage supply or fault

### **③** Push-button and yellow LED display

 Off:
 Standard operation

 On:
 Adaptation or synchronising process active

 Press button:
 No function

#### (4) Gear disengagement switch

Press button: Gear disengaged, motor stops, manual override possible Release button: Gear engaged, synchronisation starts, followed by standard operation

### Check voltage supply connection

- a) (2) Off and (3) On
- b) (2) Blinking and (3) Blinking

Check the supply connections. Possibly  $\underline{L}$  and  $\widehat{\Upsilon}$  are swapped over.

### Modulating rotary actuator for 2 and 3 way control ball valves

- Torque 8Nm
- Nominal voltage AC/DC 24V
- Control: modulating DC (0)2...10V
- Position feedback DC 2...10V
- Running time 9s



BELIN

### Technical data

Electrical data	Nominal voltage		AC 24V, 50/60Hz / DC 24V	
	Nominal voltage	range	AC 19.2 28.8V / DC 21.6 28.8V	
	Power	In operation	12W @ nominal torque	
	consumption	At rest	1.5W	
		For wire sizing	18VA (I max. 20 A @ 5ms)	
	Connection		Cable 1m, 4 x 0.75mm <sup>2</sup>	
	Parallel connection	on	Possible, note the performance data	
Functional data	Torque (nominal t	orque)	Min. 8Nm @ nominal voltage	
	Control	Control signal Y	DC (0)210V, input impedance 100kΩ	
		Operating range	DC 210V	
	Position feedback	(Measuring	DC 210V, max. 0.5mA	
	voltage)		. 50/	
	Position accuracy	/	±5%	
	Manual override		locked	
	Running time		9s / 90°	
	Automatic adjustment of operating		Manual triggoring of the adaption by pressing the	
	range and measu	iring signal U to	«Adaption» button	
	match the mechanical angle of			
	rotation		MAX//	
	Override control		MAX (maximum position) = 100%	
			ZS (intermediate position only = 50%	
			AC)	
	Sound power leve	el	52dB(A)	
	Position indication	n	Mechanical, pluggable	
Safety	Protection class		III Safety extra-low voltage	
-	Degree of protect	tion	IP54 in any mounting position, UL/NEMA 2	
	EMC		CE according to 2004/108/EC	
	Certification		Certified to IEC/EN 60730-1 and IEC/EN 60730-2-	
			14	
	Mode of operation	n	Туре 1	
	Rated impulse vo	ltage	0.8kV	
	Control pollution	degree	3	
	Ambient tempera	ture	-30+40°C (no restrictions)	
		4	$\underline{A}$ +40+50°C (Caution: can only be used	
			With restrictions. Please contact your Bellmo	
	Non-operating ter	mperature	_40 +80°C	
	Ambient humidity		95% r H_ non-condensating	
	Maintenance		Maintenance-free	
Dimensions / Weight	Dimensions		See «Dimensions»	
0	Weight		Approx. 1.8kg	
			-	

### Safety notes

- $\underline{\mathbb{N}}$
- The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
  - It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during assembly.
  - The switch for changing the direction of rotation may only be operated by authorised personnel. The direction of rotation must not be reversed in a frost protection circuit.
    - The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.

V8.6 05.2017 • Subject to modification



Safety notes			
	<ul> <li>The cable must not be removed from the device.</li> <li>Self adaptation is necessary when the system is commissioned and after each adjustment of the angle (press the adaptation push-button)</li> <li>The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.</li> </ul>		
Product features			
Mode of operation	The actuator is controlled with a standard modulating signal of DC $(0)210V$ and moves to the position defined by the control signal. The measuring voltage U serves for the electrical display of the damper position $0100\%$ and as slave control signal for other actuators.		
Simple direct mounting	Straightforward direct mounting on the ball valve with only one screw. The assembly tool is integrated in the plug-on position indicator. The mounting position in relation to the fitting can be selected in 90° steps.		
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).		
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.		
High functional reliability	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.		
Position feedback U5	Operation of the ball valve is optimised by a limiting ring. This ring reduces the angle of rotation from 95° to 90°, i.e. U5 will deviate from Y by approximately 0.3 V when the valve is closed.		
Home position	When the supply voltage is switched on for the first time, i.e. at commissioning or after pressing the «gear disengagement» switch, the actuator moves to the home position. Factory setting: Y2 (counter-clockwise rotation) Rotary actuator Rotary valve 1 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 +		
	$\Pi \neq \Lambda - AD = IUU\%$		

The actuator then moves into the position defined by the control signal.

Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

### **Electrical installation**

### Wiring diagram

#### Standard connection

Override control (frost protection circuit)



= Actuator

Control unit

=



### **Electrical installation**

### (continued) Cable lengths



Cross section L <sub>2</sub>	Max. cable length L <sub>tot</sub> = L <sub>1</sub> + L <sub>2</sub>		Example for DC
1/~	AC	DC	
0.75 mm²	≤30 m	≤5 m	1 m (L <sub>1</sub> ) + 4 m (L <sub>2</sub> )
1.00 mm <sup>2</sup>	≤40 m	≤8 m	1 m (L <sub>1</sub> ) + 7 m (L <sub>2</sub> )
1.50 mm <sup>2</sup>	≤70 m	≤12 m	1 m (L <sub>1</sub> ) + 11 m (L <sub>2</sub> )
2.50 mm <sup>2</sup>	≤100 m	≤20 m	1 m (L <sub>1</sub> ) + 19 m (L <sub>2</sub> )

Note

When several actuators are connected in parallel, the maximum cable length must be divided by the number of actuators.

### **Dimensions** [mm]



### **Operating controls and indicators**



- (1) Direction of rotation switch
  - Switching over: Direction of rotation changes
- (2) Push-button and green LED display
  - Off: No voltage supply or fault
  - In operation On:

Press button: Switches on angle of rotation adaptation followed by standard operation

#### (3) Push-button and yellow LED display

Off:	Standard operation
On:	Adaptation or synchronising process active

- Press button: No function
- (4) Gear disengagement switch

Press button: Gear disengaged, motor stops, manual override possible Release button: Gear engaged, synchronisation starts, followed by standard operation

### Check voltage supply connection

a) (2) Off and (3) On

b)

Check the supply connections. (2) Blinking and (3) Blinking Possibly  $\perp$  and  $\cong$  are swapped over.



Rotary actuator for ball valves

- Torque 16Nm
- Nominal voltage AC/DC 24V
- Control: Open/Close
- Running time 9s



Technical data			
Electrical data	Nominal voltage		AC 24V, 50/60Hz / DC 24V
	Nominal voltage range		AC/DC 19.228.8V / DC 21.628.8V
	Power	In operation	15W @ nominal torque
	consumption	At rest	2W
		For wire sizing	25VA (Imax 20 A @ 5ms)
	Connection		Cable 1m, 3 x 0.75mm <sup>2</sup>
	Parallel connecti	ion	Possible, note the performance data
Functional data	Torque (nominal	torque)	Min. 16Nm @ nominal voltage
	Manual override		Gearing latch disengaged with push-button, can be
			locked
	Running time		9s / 90°
	Sound power lev	vel	Max. 52dB(A)
	Position indication		Mechanical, pluggable
Safety	Protection class		III Safety extra-low voltage
			UL Class 2 Supply
	Degree of protection		IP54 in any mounting position
			NEMA 2, UL Enclosure Type 2
	EMC		CE according to 2004/108/EC
	Certification		Certified to CAN/CSA E60730-01:02
	Mode of operation	on	Туре 1
	Rated impulse v	oltage	0.8kV
	Control pollution	degree	3
	Ambient tempera	ature	0+40°C (no restrictions)
			$\underline{A}$ +40+50°C (Caution: can only be used
			with restrictions. Please contact your Belimo
	New executive to		
	Ambient burnidit	emperature	-40+00°C
		у	
	waintenance		iviaintenance-free
Dimensions / Weight	Dimensions		See «Dimensions»
	Weight		Approx. 2.4kg

Safety notes



- The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during assembly.
- The switch for changing the direction of rotation may only be operated by authorised personnel. The direction of rotation must not be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cable must not be removed from the device.
- Self adaptation is necessary when the system is commissioned and after each adjustment of the angle (press the adaptation push-button)
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product features			
Simple direct mounting	Straightforward direct mounting on the ball valve with only one screw. The assemply tool is integrated in the plug-on position indicator. The mounting position in relation to the fitting can be selected in 90° steps.		
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).		
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.		
High functional reliability	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.		
Home position	When the supply voltage is switched on for the first time, i.e. at commissioning or after pressing the «gear disengagement» switch, the actuator moves to the home position. Factory setting: Y2 (counter-clockwise rotation)		
	Rotary actuator Rotary valve		
	✓ ¥Y2 A – AB = 0%		
	v1 ▶ A - AB = 100%		

The actuator then moves into the position defined by the control signal.

### **Electrical installation**



Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A



### **Operating controls and indicators**



- (1) **Direction of rotation switch** Switching over: Direction of rotation changes
- (2) Push-button and green LED display
  - Off:
     No voltage supply or fault

     On:
     In operation

     Press button:
     Switches on angle of rotation adaptation followed by standard operation
- (3) Push-button and yellow LED display
  - Off:
     Standard operation

     On:
     Adaptation or synchronising process active

     Press button:
     No function
- (4) Gear disengagement switch Press button: Gear disengaged, motor stops, manual override possible Release button: Gear engaged, synchronisation starts, followed by standard operation

Check voltage supply connection

a) (2) Off and (3) On

b)

- Check the supply connections.
- (2) Blinking and (3) Blinking  $\int$  Possibly  $\pm$  and  $\sim$  are swapped over.

#### **Dimensions** [mm]

Dimensional drawings



### Modulating rotary actuator for 2 and 3 way control ball valves

- Torque 16Nm
- Nominal voltage AC/DC 24V
- Control: modulating DC (0)2...10V
- Position feedback DC 2...10V
- Running time 9s



### Technical data

Electrical data	Nominal voltage		AC 24V, 50/60Hz / DC 24V	
	Nominal voltage range		AC 19.2 28.8V / DC 21.6 28.8V	
	Power In operation		15W @ nominal torque	
	consumption	At rest	2W	
		For wire sizing	26VA (I max. 20 A @ 5ms)	
	Connection		Cable 1m, 4 x 0.75mm <sup>2</sup>	
	Parallel connectio	n	Possible, note the performance data	
Functional data	Torque (nominal t	orque)	Min. 16Nm @ nominal voltage	
	Control	Control signal Y	DC (0)210V, input impedance $100k\Omega$	
		Operating range	DC 210V	
	Position feedback voltage)	(Measuring	DC 210V, max. 0.5mA	
	Position accuracy	,	±5%	
	Manual override		Gearing latch disengaged with push-button, can be locked	;
	Running time		9s / 90°	
	Automatic adjustn	nent of operating	Manual triggering of the adaption by pressing the	
	range and measu	ring signal U to	«Adaption» button	
	match the mechan	nical angle of		
	rotation Override control		MAN/ / · · · · · · · · · · · · · · · · · ·	
			MAX (maximum position) = $100\%$	
			7S (intermediate position only = 50%	
			AC)	
	Sound power leve	el	63dB(A)	—
	Position indication	า	Mechanical, pluggable	
Safety	Protection class		III Safety extra-low voltage	
			UL Class 2 Supply	
	Degree of protect	ion	IP54 in any mounting position	
			NEMA 2, UL Enclosure Type 2	
	EMC		CE according to 2004/108/EC	
Certification			Certified to IEC/EN 60730-1 and IEC/EN 60730-2- 14	
	Mode of operation	า	Туре 1	
	Rated impulse vo	Itage	0.8kV	
Control pollution degree		3		
	Ambient temperature           Mon-operating temperature           Ambient humidity		–30+40°C (no restrictions)	
			+40+50°C (Caution: can only be used	
			with restrictions. Please contact your Belimo	
			-40TOU U	
			95% r.H., non-condensating	
Dimonsions / Waight	Dimensions			—
			See «DIMENSIONS»	
	Weight		Αμμιύχ. 2.4Kg	

#### Safety notes

 $\underline{\mathbb{N}}$ 

- The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during assembly.

• The switch for changing the direction of rotation may only be operated by authorised personnel. The direction of rotation must not be reversed in a frost protection circuit.



Safety notes	
	<ul> <li>The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.</li> <li>The cable must not be removed from the device.</li> <li>Self adaptation is necessary when the system is commissioned and after each adjustment of the angle (press the adaptation push-button)</li> <li>The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.</li> </ul>
Product features	
Mode of operation	The actuator is controlled with a standard modulating signal of DC (0)210V and moves to the position defined by the control signal. The measuring voltage U serves for the electrical display of the damper position 0100% and as slave control signal for other actuators.
Simple direct mounting	Straightforward direct mounting on the ball valve with only one screw. The assembly tool is integrated in the plug-on position indicator. The mounting position in relation to the fitting can be selected in 90° steps.
Manual override	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.
High functional reliability	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.
Position feedback U5	Operation of the ball valve is optimised by a limiting ring. This ring reduces the angle of rotation from 95° to 90°, i.e. U5 will deviate from Y by approximately 0.3 V when the valve is closed.
Home position	The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out an adaption, which is when the operating range and position feedback adjust themselves to the mechanical setting range. The detection of the mechanical end stops enables a gentle approach to the end positions, thus protecting the actuator mechanics. The actuator then moves into the position defined by the positioning signal. Factory setting: Y2 (counter-clockwise rotation).
Adaption and synchronisation	An adaption can be triggered manually by pressing the "Adaption" button. Both mechanical end stops are detected during the adaption (entire setting range). Automatic synchronisation after pressing the gearbox disengagement button is configured. The synchronisation is in the home position (0%).

### Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A

#### Electrical installation

### Wiring diagram



- Connect via safety isolation transformer.
   Parellel connection of others actuators possible.
- Note the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2

Direction of rotation  $\mathbf{N}_{\gamma_2}^{\gamma_1}$ 



Standard connection

Override control (frost protection circuit)



Note





Technical data



### **Product features**

Simple direct mounting Simple direct mounting on the Ball Valve using only one screw.

Manual operation No manual operation.

High function reliability

The actuator is overload-proof, needs no limit switches and stops automatically at the end stops.

#### Wiring diagram

Notes:

Notes:

TRF24-SR



### TRF24-2

<u>/</u>!\



2 3 Δ

L

T Т Т Т

C

L ~ ÷

Ν

~ AC 24V

а

 $Y_1$ Y<sub>2</sub>

**Open/Close control** 

AC 24V

DC 24V

L AC 100...240V

A. F



•Connection via safety isolating transformer.

•Other actuators can be connected in parallel. Please note the performance data.

### TRF24(-S) TRF230(-S)

#### I Τ 1 2 /!\ •Caution: Power supply voltage! •Connection via safety isolating transformer. •Other actuators can be connected in parallel. M) Please note the performance data.



Т

T

TRF24-2

Direction of rotation

		TRF24-2	
		Reversing switch	
a (Y1)	b (Y2)		
Ľ	∕-	1)	A – AB = 100%
<u> </u>	$\langle$	stop	
/-	Ľ		A AB = 0%
Ľ	ľ	$\frown$	A - AB - 0%

TRF24-S

TRF230-S



- Mechanical Fail-Safe Rotary Actuators for:
- Torque:
- Modulating control:
- 3-point control:
- Open/Close control:

2-way DN25 3-way DN25...32 CCV 4Nm L(R)F24-SR (AC/DC 24V) LF24-3 (AC/DC 24V) LRF24(-S) (AC/DC 24V) LRF230(-S) (AC 230V)



L(R)F.

## Technical data

Basic technical data	Torque	Min. 4Nm @ nominal voltage	
	Angle of rotation	90°	
	Direction of rotation-motor	Selected by mounting side of L/R	
	-spring return	Selected by mounting side of L/R or reversing	
	Sound power level	Motor: max. 45dB(A), spring return: max. 62dB(A)	
	Position indicator	Mechancial	
	Running time -motor	~150s (L(R)F24-SR) ; 4075s (LF24-3, LRF24(-S), LRF230(-S))	
	-spring return	~20s (-5+50°C) / ~ 60s (-30°C)	
	Ambient temp.	-30+50°C	
	Non-operation temp.	-40+80°C	
	Temp. of medium	+5+100°C (in control ball valve)	
	Humidity	595% RH, non-condensing	
	Degree of protection	IP54	
	EMC	CE according to 2004/108/EC	
	Maintenance	Maintenance-free	
	Linkage	Linkage included in LRF.	
L(R)F24-SR	Nominal voltage range	AC 19.228.8V, 50/60Hz / DC 21.628.8V	
	Power consumption -running	2.5W @ nominal torque	
	-holding	1W	
	For transformer sizing	5VA	
	Connecting cable	Cable 1m, 4x0.75mm <sup>2</sup>	
	Control signal Y	DC (0)210V @ input impedance 100kΩ	
	Position feedback signal U	DC 210V	
	Protection class	III (Extra-low voltage)	
	Weight	1.4kg	
LF24-3	Nominal voltage range	AC 19.228.8V, 50/60Hz / DC 21.628.8V	
	Power consumption -running	2.5W @ nominal torque	
	-holding	1W	
	For transformer sizing	5VA	
	Connecting cable	Cable 4m, 3x0.75mm <sup>2</sup>	
	Protection class	III (Extra-low voltage)	
	Weight	1.4kg	
LRF24(-S)	Nominal voltage range	AC 19.228.8V, 50/60Hz / DC 21.628.8V	
	Power consumption -running	5W @ nominal torque	
	-holding	2.5W	
	For transformer sizing	7VA	
	Connecting cable -motor	Cable 1m, 2x0.75mm <sup>2</sup>	
	S	Cable 1m, 6x0.75mm <sup>2</sup>	
	Protection class	III (Extra-low voltage)	
	Auxiliary switch (LRF24-S)	2XSPDT, 1mA3(0.5)A, AC 250V, fixed at 10°⊄, 85°⊄	
	Weight	1.4kg	
LRF230(-S)	Nominal voltage range	AC 198264V, 50/60Hz	
	Power consumption -running	5W @ nominal torque	
	-holding	3W	
	For transformer sizing	7VA	
	Connecting cable -motor	Cable 1m, 2x0.75mm <sup>2</sup>	
	S	Cable 1m, 6x0.75mm <sup>2</sup>	
	Protection class	II (Totally insulated)	
	Auxiliary switch (LRF230-S)	2XSPDT, 1mA3(0.5)A, AC 250V, fixed at 10°⊲, 85°⊲	
	Low voltage directive	CE according to 2006/95/EC	
	Weight	Approx. 1.4kg	







Rotary actuator with emergency function for 2- and 3-way ball valves

- Torque 10Nm
- Nominal voltage AC 24...240V / DC 24...125V
- Control: Open/Close
- NRFA: Deenergised NC



### **Technical data**

Electrical data	Nominal voltage		AC 24240V, 50/60Hz / DC 24125V
	Nominal voltage range	е	AC 19.2264V / DC 21.6137.5V
	Power consumption	In operation	6W @ nominal torque
		At rest	2.5W
		For wire sizing	9.5VA
	Connection		Cable 1m, 2 x 0.75mm <sup>-</sup>
	Parallel connection		Yes (Note performance data for supply!)
Functional data	Torque	Motor Spring return	Min. 10Nm @ nominal voltage Min. 10Nm
	Direction of rotation	Spring return – NRFA	Deenergised NC, ball valve closed (A – AB = 0%)
	Manual override		With hand crank and interlocking switch
	Angle of rotation		Max. 90°
	Running time	Motor	75s / 90°
		Spring return	≤20s @ –2050°C / max. 60s @ –30°C
	Sound power level	Motor	≤45dB(A)
		Spring return	<62dB(A)
	Position indication		Mechanical
Safety	Protection class		III Extra low voltage
	Degree of protection		IP54 NEMA 2, UL Enclosure Type 2
	EMC		CE according to 2004/108/EC
	Low-voltage directive		CE according to 2006/95/EC
	Certification		Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14
	Mode of operation		Type 1.AA
	Rated impulse voltage	e	4kV
Control pollution degree Ambient temperature		3	
		-30+50°C	
	Non-operating temperature		-40+80°C
	Ambient humidity		95% r.h., non-condensating
	Maintenance		Maintenance-free
Dimensions / Weight	Dimensions		See «Dimensions»
	Weight		Approx. 2kg (without ball valve)

### Safety notes



The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
Caution: Power supply voltage possible!

- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during installation.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cable must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product features	
Mode of operation	The actuator is equipped with a universal power module and can process supply voltages from AC 24240V plus DC 24125V. The actuator moves the ball valve to the operating position at the same time as tensioning the return spring. The ball valve is turned back to the safety position by spring force if the supply voltage is interrupted.
Simple direct mounting	Straightforward direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° steps.
Manual override	Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stop.
High operational reliability	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.
Combination valve actuators	Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.

### **Electrical installation**



### Dimensions [mm]





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Modulating rotary actuator with emergency function for 2- and 3-way ball valves

- Torque 10Nm
- Nominal voltage AC/DC 24V
- Control: modulating DC (0)2...10V
- Position feedback DC 2...10V
- NRF24A-SR: Deenergised NC



Technical data			
Electrical data	Nominal voltage		AC 24V, 50/60Hz / DC 24V
	Nominal voltage ran	ge	AC 19.228.8V / DC 21.628.8V
	Power consumption	In operation At rest	3.5W @ nominal torque 2.5W
	Connection	For wre sizing	$\frac{0}{2}$
	Connection Parallel connection		Cable 1m, 4 X 0.75mm
Functional data	Iorque	Motor Spring return	Min. 10Nm @ nominal voltage Min. 10Nm
	Control	Control signal Y	DC (0)210V, input impedance $100k\Omega$
	Desition feedback (a	Operating range	
	Position feedback (n	neasuring voltage U)	DC 210V, max. 0.5mA
	Position accuracy		±5%
	Direction of rotation	Motor Spring return	Reversible with switch ( ) / ( )
		– NRF24A-SR	Deenergised NC, ball valve closed (A – AB = 0%)
	Manual override		With hand crank and interlocking switch
	Angle of rotation		Max. 90°
	Running time	Motor Spring return	90s / 90° ≤20s @ –2050°C / max. 60s @ –30°C
	Sound power level	Motor Spring return	≤45dB(A)
	Position indication	Spring return	Mechanical
Safetv	Protection class		III Extra low voltage / UL Class 2 Supply
	Degree of protection	l	IP54 NEMA 2. UL Enclosure Type 2
	EMC		CE according to 2004/108/EC
	Certification		Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14
	Mode of operation		Type 1.AA
	Rated impulse voltage	ge	0.8kV
	Control pollution dec	gree	3
	Ambient temperature	9	–30+50°C
	Non-operating temp	erature	-40+80°C
	Ambient humidity		95% r.h., non-condensating
	Maintenance		Maintenance-free
Dimensions / Weight	Dimensions		See «Dimensions»

Weight

/!\

### Safety notes

· The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport. • It may only be installed by suitably trained personnel.

- All applicable legal or institutional installation regulations must be complied with.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.

Approx. 2kg (without ball valve)

- The cable must not be removed from the device.
- · The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product features			
Mode of operation	The actuator is controlled with a standard signal of DC (0)210V and moves the ball valve to the operating position at the same time as tensioning the return spring. The ball valve is turned back to the emergency position by spring force if the supply voltage is interrupted.		
Simple direct mounting	3 Straightforward direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° steps.		
Manual override	de Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.		
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stop.		
High operational reliability	Y The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.		
Combination valve actuators	Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.		
Electrical installation			
Wiring diagram	$ \begin{array}{c}                                     $		

#### Notes

⚠ · Connect via safety isolation transformer. • Parallel connection of other actuators possible. Note the performance data.

### **Direction of rotation**



I I

2 3 5

1

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### **Dimensions** [mm]

**Dimensional drawings** 





Cable colours:

1 = black 2 = red 3 = white 5 = orange



Rotary actuator with emergency function for 2- and 3-way ball valves

- Torque 10Nm
- Nominal voltage AC 24...240V / DC 24...125V
- Control: Open/Close
- Two integrated auxiliary switches
- NRFA-S2: Deenergised NC



### **Technical data**

Electrical data	data Nominal voltage		AC 24240V / DC 24125V
	Nominal voltage range		AC 19.2264V / DC 21.6137.5V
	Power consumption	In operation	6W @ nominal torque
		At rest	2.5W
		For wire sizing	9.5VA
	Auxiliary switch		2 x SPDT, 1 x 10% / 1 x 1190%
	Connection	Motor	Cable 1m, 2 x 0.75mm <sup>2</sup>
		Auxiliary switch	Cable 1m, 6 x 0.75mm <sup>2</sup>
	Parallel connection		Yes (Note performance data for supply!)
Functional data	Torque	Motor	Min. 10Nm @ nominal voltage
		Spring return	Min. 10Nm
	Direction of rotation	Spring return	
		– NRFA-S2	Deenergised NC, ball valve closed (A – AB = 0%)
	Manual override		With hand crank and interlocking switch
	Angle of rotation		Max. 90°
	Running time	Motor	75s / 90°
		Spring return	≤20s @ –2050°C / max. 60s @ –30°C
	Sound power level	Motor	≤45dB(A)
		Spring return	≤62dB(A)
	Position indication		Mechanical
Safety	Protection class		II Protective insulated
	Degree of protection		IP54
			NEMA 2, UL Enclosure Type 2
	EMC		CE according to 2004/108/EC
	Low-voltage directive		CE according to 2006/95/EC
	Certification		Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14
	Mode of operation		Type 1 AA B
	Rated impulse	Actuator	4kV
	voltage	Auxiliary switch	2.5kV
	Control pollution dear	ee	3
	Ambient temperature		_30+50°C
Media temperature		+5+100°C (in ball valve)	
	Non-operating temperature Ambient humidity		-10°C with stem heating upon request
			_40+80°C
			95% r.h., non-condensating
	Maintenance		Maintenance-free
Dimensions / Weight	Dimensions		See «Dimensions»
	Weight		Approx. 2.3kg (without ball valve)

### Safety notes



- The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Caution: Power supply voltage!
- It may only be installed by suitably trained personnel.
  - All applicable legal or institutional installation regulations must be complied with.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cable must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product features	
Mode of operation	The actuator moves the ball valve to the operating position at the same time as tensioning the return spring. The ball valve is turned back to the safety position by spring force if the supply voltage is interrupted.
Simple direct mounting	Straightforward direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° steps.
Manual override	Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stop.
High operational reliability	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.
Flexible signalisation	The actuator has one auxiliary switch with a fixed setting and one adjustable auxiliary switch. They permit a 10% or 1190% angle of rotation to be signalled.
Combination valve actuators	Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.

### **Electrical installation**



### **Dimensions [mm]**







Rotary actuator with emergency function for ball valves

- Torque 20Nm
- Nominal voltage AC 24...240V / DC 24...125V
- Control: Open/Close
- SRFA: Deenergised NC



### **Technical data**

Nominal voltage range         AC 19.2264V / DC 21.6137.5V           Power consumption         In operation At rest         3.5W           For wire sizing         18VA           Connection         Cable 1m, 2 x 0.75mm <sup>2</sup> Parallel connection         Yes (Note performance data for supply!)           Torque         Motor Spring return         Min. 20Nm @ nominal voltage           Direction of rotation         Spring return         Min. 20Nm           - SRFA         Deenergised NC, ball valve closed (A – AB = 0%)           Manual override         With hand crank and interlocking switch           Angle of rotation         Max. 90°           Running time         Motor         75s / 90°           Sound power level         Motor         45dB(A)           Position indication         MexA2, UL Enclosure Type 2           EMC         CE according to 2004/108/EC           Low-voltage directive         CE according to 2004/108/EC           Certification         Certified to IEC/EN 60730-1 and IEC/EN 60730-2-214           Mode of operation         Type 1.AA           Rated impulse voltage         4kV           Control pollution degree         3           Ambient temperature         -30+50°C           Non-operating temperature         -40+80°C<	Electrical data	Nominal voltage		AC 24240V, 50/60Hz / DC 24125V
Power consumption Ar rest For wire sizing       TW @ nominal torque 3.5W         For wire sizing       18VA         Connection       Cable 1m, 2 x 0.75mm²         Parallel connection       Yes (Note performance data for supply!)         Functional data       Torque       Motor Spring return - SRFA       Min. 20Nm @ nominal voltage Spring return - SRFA         Direction of rotation       Spring return - SRFA       Deenergised NC, ball valve closed (A – AB = 0%)         Manual override       With hand crank and interlocking switch         Angle of rotation       Max. 90°         Running time       Motor Spring return       s20s @ –2050°C / max. 60s @ –30°C         Sound power level       Motor       75s / 90°         Sound power level       Motor       S26 / 2050°C / max. 60s @ –30°C         Sound power level       Motor       S26 / 2050°C / max. 60s @ –30°C         Sound power level       Motor       S26 / 2050°C / max. 60s @ –30°C         Sound power level       Motor       S26 / 2050°C / max. 60s @ –30°C         Sound power level       Motor       S26 / 2050°C / max. 60s @ –30°C         Sound power level       Motor       S26 / 2050°C / max. 60s @ -30°C         Suffer       Protection class       II totally insulted II         Degree of protection       IP54 <th></th> <th>Nominal voltage ran</th> <th>ge</th> <th>AC 19.2264V / DC 21.6137.5V</th>		Nominal voltage ran	ge	AC 19.2264V / DC 21.6137.5V
At rest For wire sizing       3.5W For wire sizing         2000       Connection       Cable 1m, 2 x 0.75mm²         Parallel connection       Yes (Note performance data for supply!)         Parallel connection       Yes (Note performance data for supply!)         Functional data       Torque       Motor Spring return       Min. 20Nm @ nominal voltage         Direction of rotation       Spring return       Min. 20Nm         Direction of rotation       Spring return       Manual override         Angle of rotation       Max. 90°         Running time       Motor       Spring return         Sound power level       Motor       Spring return         Sound power level       Motor       Supring return         Position indication       Mechanical         Position indication       Mechanical         Degree of protection       IP54         Degree of protection       IP54         NEMA 2, UL Enclosure Type 2       EMC         Cortrification       Certified to IEC/EN 60730-1 and IEC/EN 60730-2:14         Mode of operation       Type 1.AA         Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature		Power consumption	In operation	7W @ nominal torque
For wire sizing       18VA         Connection       Cable 1m, 2 x 0.75mm <sup>2</sup> Parallel connection       Yes (Note performance data for supply!)         Functional data       Torque       Motor       Min. 20Nm @ nominal voltage         Direction of rotation       Spring return       Min. 20Nm         Direction of rotation       Spring return       - SRFA       Deenergised NC, ball valve closed (A – AB = 0%)         Manual override       With hand crank and interlocking switch         Angle of rotation       Max. 90°         Running time       Motor       55/90°         Sound power level       Motor       45dB(A)         Sound power level       Motor       45dB(A)         Position indication       Mechanical         Position indication       Mechanical         Degree of protection       IP54         EMC       Cet according to 2004/108/EC         Low-voltage directive       Cet according to 2004/108/EC         Cortrol pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Mointenance       Maintenance-free         Dimensions / Weight       Dimensions			At rest	3.5W
Functional data     Connection     Cable 1m, 2 x 0.75mm <sup>e</sup> Parallel connection     Yes (Note performance data for supply!)       Functional data     Torque     Motor Spring return     Min. 20Nm       Direction of rotation     Spring return – SRFA     Deenergised NC, ball valve closed (A – AB = 0%)       Manual override     With hand crank and interlocking switch       Angle of rotation     Max. 90°       Running time     Motor     75s / 90°       Sound power level     Motor     ≤20s @ -2050°C / max. 60s @ -30°C       Sound power level     Motor     ≤245dB(A)       Sound power level     Motor     ≤45dB(A)       Position indication     Mechanical       Position indication     Mechanical       Degree of protection     IP54       MC     Cetrified to IEC/EN 60730-1 and IEC/EN 60730- 2-14       Mode of operation     Type 1.AA       Rated impulse voltage     4kV       Control pollution degree     3       Ambient temperature     -30+50°C       Non-operating temperature     -40+80°C       Ambient temperature     -40+80°C       Maitenance     Maitenance-free       Dimensions / Weight     Dimensions			For wire sizing	18VA
Parallel connection     Yes (Note performance data for supply!)       Functional data     Torque     Motor     Min. 20Nm @ nominal voltage       Direction of rotation     Spring return     - SRFA     Deenergised NC, ball valve closed (A – AB = 0%)       Manual override     With hand crank and interlocking switch     Angle of rotation     Max. 90°       Running time     Motor     75s / 90°       Sound power level     Motor     \$45dB(A)       Position indication     Mechanical       Position indication     II totally insulated I       Degree of protection     IP54       Degree of protection     CE according to 2004/108/EC       Low-voltage directive     CE according to 2004/108/EC       Low-voltage directive     CE according to 2006/95/EC       Certification     Type 1.AA       Rated impulse voltage     4kV       Control pollution degree     3       Ambient temperature     -30+50°C       Non-operating temperature     -40+80°C       Ambient humidity     95% r.h., non-condensating       Maintenance     Maintenance-free       Dimensions / Weight     Dimensions		Connection		Cable 1m, 2 x 0.75mm <sup>2</sup>
Functional data     Torque     Motor Spring return     Min. 20Nm @ nominal voltage Min. 20Nm       Direction of rotation     Spring return - SRFA     Deenergised NC, ball valve closed (A – AB = 0%)       Manual override     With hand crank and interlocking switch       Angle of rotation     Max. 90°       Running time     Motor       Sound power level     Motor       Sound power level     Motor       Sound power level     Motor       Sering return     ≤62dB(A)       Position indication     Mechanical       Degree of protection     IP54       Degree of protection     IP54       EMC     CE according to 2006/95/EC       Certification     Certification       Mode of operation     Type 1.AA       Rated impulse voltage     4kV       Control pollution degree     3       Ambient temperature     -30+50°C       Non-operating temperature     -40+80°C       Ambient humidity     95% r.h., non-condensating       Maintenance-free     Maintenance-free       Dimensions / Weight     Dimensions>		Parallel connection		Yes (Note performance data for supply!)
Direction of rotation       Spring return - SRFA       Deenergised NC, ball valve closed (A - AB = 0%)         Manual override       With hand crank and interlocking switch         Angle of rotation       Max. 90°         Running time       Motor       75s / 90°         Spring return       ≤20s @ -2050°C / max. 60s @ -30°C         Sound power level       Motor       45dB(A)         Spring return       ≤62dB(A)         Position indication       Mechanical         Degree of protection       II totally insulated I         Degree of protection       IP54         Degree of protection       IP54         Cetrified to 1EC/EN 60730-1 and IEC/EN 60730-2-14       Cetrified to 1EC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1.AA         Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient numidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions>	Functional data	Torque	Motor Spring return	Min. 20Nm @ nominal voltage Min. 20Nm
Manual override       With hand crank and interlocking switch         Angle of rotation       Max. 90°         Running time       Motor       75s / 90°         Spring return       ≤20s @ -2050°C / max. 60s @ -30°C         Sound power level       Motor       ≤45dB(A)         Spring return       ≤62dB(A)         Position indication       Mechanical         Protection class       II totally insulated □         Degree of protection       IP54         NEMA 2, UL Enclosure Type 2       EMC         Certification       Cet according to 2004/108/EC         Low-voltage directive       Cet according to 2006/95/EC         Certification       Cetrified to IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1.AA         Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions»		Direction of rotation	Spring return – SRFA	Deenergised NC, ball valve closed (A – AB = 0%)
Angle of rotation       Max. 90°         Running time       Motor       75s / 90°         Spring return       ≤20s @ -2050°C / max. 60s @ -30°C         Sound power level       Motor       ≤45dB(A)         Spring return       ≤62dB(A)         Position indication       Mechanical         Protection class       II totally insulated I         Degree of protection       IP54         Degree of protection       IP54         NEMA 2, UL Enclosure Type 2       EMC         Cow-voltage directive       CE according to 2004/108/EC         Cow-voltage directive       CE according to 2006/95/EC         Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1.AA         Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions>		Manual override		With hand crank and interlocking switch
Running time     Motor Spring return     75s / 90°       Sound power level     Motor Spring return     ≤20s @ -2050°C / max. 60s @ -30°C       Sound power level     Motor Spring return     ≤45dB(A)       Position indication     Mechanical       Position indication     Mechanical       Degree of protection     II totally insulated ID       Degree of protection     IP54       Degree of protection     IP54       CE according to 2004/108/EC       Low-voltage directive     CE according to 2006/95/EC       Certification     Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14       Mode of operation     Type 1.AA       Rated impulse voltage     4kV       Control pollution degree     3       Ambient temperature     -30+50°C       Non-operating temperature     -40+80°C       Ambient humidity     95% r.h., non-condensating       Maintenance     Maintenance-free       Dimensions / Weight     Dimensions		Angle of rotation		Max. 90°
Spring return       ≤20s @ -2050°C / max. 60s @ -30°C         Sound power level       Motor       ≤45dB(A)         Sound indication       Mechanical         Position indication       Mechanical         Protection class       II totally insulated □         Degree of protection       IP54         Degree of protection       IP54         CE according to 2004/108/EC         Low-voltage directive       CE according to 2006/95/EC         Certification       2-14         Mode of operation       Type 1.AA         Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions       See «Dimensions»		Running time	Motor	75s / 90°
Sound power level       Motor Spring return       \$45dB(A) \$62dB(A)         Position indication       Mechanical         Protection class       II totally insulated ID         Degree of protection       IP54 NEMA 2, UL Enclosure Type 2         EMC       CE according to 2004/108/EC         Low-voltage directive       CE according to 2006/95/EC         Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14         Mode of operation       Type 1.AA         Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions			Spring return	≤20s @ –2050°C / max. 60s @ –30°C
Spring return       ≤62dB(A)         Position indication       Mechanical         Position indication       Mechanical         Protection class       II totally insulated □         Degree of protection       IP54         NEMA 2, UL Enclosure Type 2       EMC         Low-voltage directive       CE according to 2004/108/EC         Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1.AA         Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions       See «Dimensions»		Sound power level	Motor	≤45dB(A)
Position indication       Mechanical         Safety       Protection class       II totally insulated ID         Degree of protection       IP54         Degree of protection       IP54         Degree of protection       IP54         Degree of protection       IP54         EMC       CE according to 2004/108/EC         Low-voltage directive       CE according to 2006/95/EC         Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1.AA         Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions       See «Dimensions»			Spring return	≤62dB(A)
Safety       Protection class       II totally insulated II         Degree of protection       IP54         NEMA 2, UL Enclosure Type 2         EMC       CE according to 2004/108/EC         Low-voltage directive       CE according to 2006/95/EC         Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14         Mode of operation       Type 1.AA         Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions>		Position indication		Mechanical
Degree of protection       IP54 NEMA 2, UL Enclosure Type 2         EMC       CE according to 2004/108/EC         Low-voltage directive       CE according to 2006/95/EC         Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14         Mode of operation       Type 1.AA         Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions       See «Dimensions»         Weight       Approx. 2kg	Safety	Protection class		II totally insulated
NEMA 2, UL Enclosure Type 2         EMC       CE according to 2004/108/EC         Low-voltage directive       CE according to 2006/95/EC         Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14         Mode of operation       Type 1.AA         Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions		Degree of protection	1	IP54
EMC       CE according to 2004/108/EC         Low-voltage directive       CE according to 2006/95/EC         Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1.AA         Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions       See «Dimensions»				NEMA 2, UL Enclosure Type 2
Low-voltage directive       CE according to 2006/95/EC         Certification       Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1.AA         Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions       See «Dimensions»		EMC		CE according to 2004/108/EC
Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14         Mode of operation       Type 1.AA         Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions       See «Dimensions»		Low-voltage directive	e	
Mode of operation       Type 1.AA         Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions       See «Dimensions»		Certification		2-14
Rated impulse voltage       4kV         Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions       See «Dimensions»         Weight       Approx. 2kg		Mode of operation		Туре 1.АА
Control pollution degree       3         Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions       See «Dimensions»         Weight       Approx. 2kg		Rated impulse voltage	ge	4kV
Ambient temperature       -30+50°C         Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions       See «Dimensions»         Weight       Approx. 2kg		Control pollution degree Ambient temperature		3
Non-operating temperature       -40+80°C         Ambient humidity       95% r.h., non-condensating         Maintenance       Maintenance-free         Dimensions / Weight       Dimensions         Weight       Approx. 2kg				-30+50°C
Ambient humidity     95% r.h., non-condensating       Maintenance     Maintenance-free       Dimensions / Weight     Dimensions       Weight     Approx. 2kg		Non-operating temperature		-40+80°C
Dimensions / Weight         Maintenance         Maintenance-free           Dimensions / Weight         Dimensions         See «Dimensions»           Weight         Approx. 2kg		Ambient humidity		95% r.h., non-condensating
Dimensions / Weight         Dimensions         See «Dimensions»           Weight         Approx. 2kg		Maintenance		Maintenance-free
Weight Approx. 2kg	Dimensions / Weight	Dimensions		See «Dimensions»
		Weight		Approx. 2kg

### Safety notes



• The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- Caution: Power supply voltage possible!
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during installation.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cable must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product features	
Mode of operation	The actuator is equipped with a universal power module and can process supply voltages from AC 24240V plus DC 24125V. The actuator moves the ball valve to the operating position at the same time as tensioning the return spring. The ball valve is turned back to the safety position by spring force if the supply voltage is interrupted.
Simple direct mounting	Straightforward direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° steps.
Manual override	Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stop.
High operational reliability	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.
Combination valve actuators	Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.

### **Electrical installation**



### Dimensions [mm]







Rotary actuator with emergency function for ball valves

- Torque 20Nm
- Nominal voltage AC 24...240V / DC 24...125V
- Control: Open/Close
- Two integrated auxiliary switches
- SRFA-S2: Deenergised NC



### **Technical data**

Electrical data	Nominal voltage		AC 24240V, 50/60Hz / DC 24125V
	Nominal voltage rang	ge	AC 19.2264V / DC 21.6137.5V
	Power consumption	In operation	7W @ nominal torque
		At rest	3.5W
		For wire sizing	18VA
	Auxiliary switch		2 x SPDT, 1 x 10% / 1 x 1190%
	Connection	Motor	Cable 1m, 2 x 0.75mm <sup>2</sup>
		Auxiliary switch	Cable 1m, 6 x 0.75mm <sup>2</sup>
	Parallel connection		Yes (Note performance data for supply!)
Functional data	Torque	Motor Spring return	Min. 20Nm @ nominal voltage Min. 20Nm
	Direction of rotation	Spring return – SRFA-S2	Deenergised NC, butterfly valve closed $(A - AB = 0\%)$
	Manual override		With hand crank and interlocking switch
	Angle of rotation		Max. 90°
	Running time	Motor	75s / 90°
	_	Spring return	≤20s @ –2050°C / max. 60s @ –30°C
	Sound power level	Motor	≤45dB(A)
		Spring return	≤62dB(A)
	Position indication		Mechanical
Safety	Protection class		II totally insulated 🗆
	Degree of protection		IP54
			NEMA 2, UL Enclosure Type 2
	EMC		CE according to 2004/108/EC
	Low-voltage directive		CE according to 2006/95/EC
	Certification		Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14
	Mode of operation		Type 1.AA.B
	Rated impulse	Actuator	4kV
	voltage	Auxiliary switch	2.5kV
	Control pollution degree		3
	Ambient temperature		–30+50°C
	Non-operating temperature Ambient humidity		-40+80°C
			95% r.h., non-condensating
	Maintenance		Maintenance-free
Dimensions / Weight	Dimensions		See «Dimensions»
-	Weight		Approx. 2.2kg (without butterfly valve)

Safety notes

 The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- Caution: Power supply voltage possible!
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during installation.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cable must not be removed from the device.
- The integrated switches of this actuator have to be connected either to Power supply voltage or safety extra low voltage. The combination Power supply voltage / safety extra low voltage is not allowed.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product features	
Mode of operation	The actuator is equipped with a universal power module and can process supply voltages from AC 24240V plus DC 24125V.
	The actuator moves the ball valve to the operating position at the same time as tensioning the return spring. The ball valve is turned back to the safety position by spring force if the supply voltage is interrupted.
Simple direct mounting	Straightforward direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in 90° steps.
Manual override	Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stop.
High operational reliability	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.
Flexible signalisation	The actuator has one auxiliary switch with a fixed setting and one adjustable auxiliary switch. They permit a 10% or 1190% angle of rotation to be signalled.
Combination valve actuators	Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.

### **Electrical installation**



### **Dimensions** [mm]

**Dimensional drawings** 







#### Modulating rotary actuator with emergency function for ball valves

- Torque 20Nm
- Nominal voltage AC/DC 24V
- Control: modulating DC (0)2...10V
- Position feedback DC 2...10V
- SRF24A-SR: Deenergised NC



### **Technical data**

Electrical data	Nominal voltage		AC 24V, 50/60Hz / DC 24V	
	Nominal voltage rang	ge	AC 19.228.8V / DC 21.628.8V	
	Power consumption	In operation	5.5W @ nominal torque	
		At rest	3W	
		For wire sizing	8.5VA	
	Connection		Cable 1m, 4 x 0.75mm <sup>2</sup>	
	Parallel connection		Yes (Note performance data for supply!)	
Functional data	Torque	Motor Spring return	Min. 20Nm @ nominal voltage Min. 20Nm	
	Control	Control signal Y Operating range	DC (0)210V, input impedance $100k\Omega$ DC 210V	
	Position feedback (n	neasuring voltage U)	DC 210V, max. 0.5mA	
	Position accuracy		±5%	
	Direction of rotation	Spring return – SRF24A-SR	Deenergised NC, ball valve closed (A – AB = 0%)	
	Manual override		With hand crank and interlocking switch	
	Angle of rotation		Max. 90°	
	Running time	Motor Spring return	90s / 90° ≤20s @ –2050°C / max. 60s @ –30°C	
	Sound power level	Motor Spring return	≤45dB(A) ≤62dB(A)	
	Position indication		Mechanical	
Safety	Protection class		III Extra low voltage / UL Class 2 Supply	
	Degree of protection		IP54 NEMA 2. UL Enclosure Type 2	
	EMC		CE according to 2004/108/EC	
	Certification		Certified to IEC/EN 60730-1 and IEC/EN 60730- 2-14	
	Mode of operation		Type 1.AA	
	Rated impulse voltage		0.8kV	
	Control pollution degree		3	
	Ambient temperature		–30+50°C	
	Non-operating temperature		-40+80°C	
	Ambient humidity		95% r.h., non-condensating	
	Maintenance		Maintenance-free	
Dimensions / Weight	Dimensions		See «Dimensions»	
	Weight		Approx. 2kg	

### Safety notes



• The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

• It may only be installed by suitably trained personnel.

All applicable legal or institutional installation regulations must be complied with.

- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cable must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.

SRF24A-SR	Modulating rotary actuator with emergency function for ball valves, AC/DC 24V, 20Nm	BELIMO
Product features		
Mode of operation	The actuator is controlled with a standard signal of DC (0)210V and moves the ball valve to the operating position at the same time as tensioning the return spring. The ball valve is turned back to the emergency position by spring force if the supply voltage is interrupted.	
Simple direct mounting	Straightforward direct mounting on the ball valve with only one scr position in relation to the ball valve can be selected in 90° steps.	ew. The mounting
Manual override	Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.	
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stop.	
High operational reliability	The actuator is overload-proof, requires no limit switches and auto end stop is reached.	matically stops when the
Combination valve actuators	Refer to the valve documentation for suitable valves, their permitte and closing pressures.	ed media temperatures

### **Electrical installation**



### Dimensions [mm]






Rotary actuator with emergency function for rotary valves

- Torque 20Nm
- Nominal voltage AC 24...240V / DC 24...125V
- Control: Open/Close
- SRFA-5: Deenergised NC



#### **Technical data**

Electrical data	Nominal voltage		AC 24240V, 50/60Hz / DC 24125V
	Nominal voltage ran	ge	AC 19.2264V / DC 21.6137.5V
	Power	In operation	7W @ nominal torque
	consumption	At rest	3.5W
		For wire sizing	18VA
	Connection		Cable 1m, 2 x 0.75mm <sup>2</sup>
	Parallel connection		Yes (Note performance data for supply!)
Functional data	Torque	Motor Spring return	Min. 20Nm @ nominal voltage Min. 20Nm
	Direction of rotation	Spring return – SRFA-5	Deenergised NC, valve closed (A – AB = 0%)
	Manual override		With hand crank and interlocking switch
	Angle of rotation		Max. 90°
	Running time	Motor	75s / 90°
		Spring return	≤20s @ –2050°C / max. 60s @ –30°C
	Sound power level	Motor	≤45dB(A)
		Spring return	≤62dB(A)
	Position indication		Mechanical
Safety	Protection class		II totally insulated 🗆
	Degree of protection	1	IP54
			NEMA 2, UL Enclosure Type 2
	EMC		CE according to 2004/108/EC
	Low-voltage directive	e	
	Certification		2-14
	Mode of operation		Type 1.AA
	Rated impulse voltage	ge	4kV
	Control pollution deg	gree	3
	Ambient temperature	e	–30+50°C
	Non-operating temp	erature	–40+80°C
	Ambient humidity		95% r.h., non-condensating
	Maintenance		Maintenance-free
Mechanical data	Connection flange		F05
Dimensions / Weight	Dimensions		See «Dimensions»
	Weight		Approx. 2kg

#### Safety notes



• The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- Caution: Power supply voltage possible!
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during installation.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cable must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product features	
Mode of operation	The actuator is equipped with a universal power module and can process supply voltages from AC 24240V plus DC 24125V. The actuator moves the valve to the operating position at the same time as tensioning the return spring. The valve is turned back to the safety position by spring force if the supply voltage is interrupted.
Simple direct mounting	Straightforward direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.
Manual override	Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stop.
High operational reliability	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.
Combination valve actuators	Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.

#### **Electrical installation**



## Dimensions [mm]







Rotary actuator with emergency function for rotary valves

- Torque 20Nm
- Nominal voltage AC 24...240V / DC 24...125V
- Control: Open/Close
- Two integrated auxiliary switches
- SRFA-S2-5: Deenergised NC



#### **Technical data**

Electrical data	Nominal voltage		AC 24240V, 50/60Hz / DC 24125V
	Nominal voltage ran	ige	AC 19.2264V / DC 21.6137.5V
	Power	In operation	7W @ nominal torque
	consumption	At rest	3.5W
		For wire sizing	18VA
	Auxiliary switch		2 x SPDT, 1 x 10% / 1 x 1190%
	Connection	Motor	Cable 1m, 2 x $0.75$ mm <sup>2</sup>
	Parallal connection	Auxiliary switch	Cable 1m, 6 X 0.75mm
			res (Note performance data for suppry!)
Functional data	Torque	Motor Spring return	Min. 20Nm @ nominal voltage Min. 20Nm
	Direction of	Spring return	
	rotation	– SRFA-S2-5	Deenergised NC, valve closed (A – AB = 0%)
	Manual override		With hand crank and interlocking switch
	Angle of rotation		Max. 90°
	Running time	Motor	75s / 90°
		Spring return	≤20s @ –2050°C / max. 60s @ –30°C
	Sound power	Motor	≤45dB(A)
	level Resition indication	Spring return	S020B(A)
Ostatu	Position indication		
Safety	Protection class		
	Degree of protection	1	NEMA 2 III Enclosure Type 2
	FMC		CE according to 2004/108/EC
	Low-voltage directiv	'e	CE according to 2006/95/EC
	Certification		Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation		Type 1.AA.B
	Rated impulse	Actuator	4kV
	voltage	Auxiliary switch	2.5kV
	Control pollution deg	gree	3
	Ambient temperatur	e	-30+50°C
	Non-operating temp	erature	–40+80°C
	Ambient humidity		95% r.h., non-condensating
	Maintenance		Maintenance-free
Mechanical data	Connection flange		F05
Dimensions / Weight	Dimensions		See «Dimensions»
	Weight		Approx. 2.2kg

#### Safety notes



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- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cable must not be removed from the device.
- The integrated switches of this actuator have to be connected either to Power supply voltage or safety extra low voltage. The combination Power supply voltage / safety extra low voltage is not allowed.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product features	
Mode of operation	The actuator is equipped with a universal power module and can process supply voltages from AC 24240V plus DC 24125V.
	The actuator moves the valve to the operating position at the same time as tensioning the return spring. The valve is turned back to the safety position by spring force if the supply voltage is interrupted.
Simple direct mounting	Straightforward direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.
Manual override	Manual operation of the valve with the hand crank, locking in any position with the interlocking switch. Unlocking is manual or automatic by applying the operating voltage.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stop.
High operational reliability	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.
Flexible signalisation	The actuator has one auxiliary switch with a fixed setting and one adjustable auxiliary switch. They permit a 10% or 11100% angle of rotation to be signalled.
Combination valve actuators	Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.

#### **Electrical installation**



### **Dimensions** [mm]

**Dimensional drawings** 







#### Modulating rotary actuator with emergency function for rotary valves

- Torque 20Nm
- Nominal voltage AC/DC 24V
- Control: modulating DC (0)2...10V
- Position feedback DC 2...10V
- SRF24A-SR-5: Deenergised NC



#### **Technical data**

Electrical data	Nominal voltage		AC 24V, 50/60Hz / DC 24V
	Nominal voltage rang	ge	AC 19.228.8V / DC 21.628.8V
	Power consumption	In operation	5.5W @ nominal torque
		At rest	3W
		For wire sizing	8.5VA
	Connection		Cable 1m, 4 x 0.75mm <sup>2</sup>
	Parallel connection		Yes (Note performance data for supply!)
Functional data	Torque	Motor Spring return	Min. 20Nm @ nominal voltage Min. 20Nm
	Control	Control signal Y Operating range	DC (0)210V, input impedance 100k $\Omega$ DC 210V
	Position feedback (n	neasuring voltage U)	DC 210V, max. 0.5mA
	Position accuracy		±5%
	Direction of rotation	Spring return – SRF24A-SR-5	Deenergised NC, valve closed (A – AB = 0%)
	Manual override		With hand crank and interlocking switch
	Angle of rotation		Max. 90°
	Running time	Motor	90s / 90°
		Spring return	≤20s @ –2050°C / max. 60s @ –30°C
	Sound power level	Motor	≤45dB(A)
	Desition indication	Spring return	SozuB(A)
	Position indication		Mechanical
Safety	Protection class		III Extra low voltage / UL Class 2 Supply
	Degree of protection		
	510		NEMA 2, UL Enclosure Type 2
	ENIC		
			2-14
	Mode of operation		Туре 1.АА
	Rated impulse voltage	ge	0.8kV
	Control pollution deg	jree	3
	Ambient temperature	9	-30+50°C
	Non-operating tempe	erature	-40+80°C
	Ambient humidity		95% r.h., non-condensating
	Maintenance		Maintenance-free
Mechanical data	Connection flange		F05
Dimensions / Weight	Dimensions		See «Dimensions»
	Weight		Approx. 2kg

#### Safety notes



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- It may only be installed by suitably trained personnel.
- All applicable legal or institutional installation regulations must be complied with.The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cable must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.

SRF24A-SR-5	Modulating rotary actuator with emergency function for rotary valves, AC/DC 24V, 20Nm		
Product features			
Mode of operation	The actuator is controlled with a standard signal of DC (0)210V ar the operating position at the same time as tensioning the return spri back to the emergency position by spring force if the supply voltage	id moves the valve to ng. The valve is turned is interrupted.	
Simple direct mounting	Straightforward direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.		
Manual override	Manual operation of the valve with the hand crank, locking in any po interlocking switch. Unlocking is manual or automatic by applying th	sition with the eoperating voltage.	
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stop.		
High operational reliability	The actuator is overload-proof, requires no limit switches and autor end stop is reached.	atically stops when the	
Combination valve actuators	Refer to the valve documentation for suitable valves, their permitted and closing pressures.	media temperatures	

# **Electrical installation**



### **Dimensions** [mm]







SuperCap rotary actuator with emergency setting function and extended functionalities for rotary valves with mounting flange ISO 5211-F07

- Torque 40Nm
- Nominal voltage AC/DC 24V
- Control: Open/Close
- Design lifeSuperCaps 15 years



#### **Technical data**

Electrical data	Nominal voltage		AC 24V, 50/60 Hz / DC 24V
	Nominal voltage range	9	AC 19.228.8V / DC 21.628.8V
	Power consumption	In operation	11W @ nominal torque
		At rest	3W
		For wire sizing	21VA (Imax 20A @ 5ms)
	Connection		Cable 1m, 2 x 0.75mm <sup>2</sup>
	Parallel operation		Yes (note the performance data)
Functional data	Torque		min. 40Nm @ nominal voltage
	Emergency setting pos	sition (POP)	NC / NO
	Position accuracy		±5%
	Manual override		Gearing latch disengaged with push button
	Running time	Motor	150s / 90°
		Emergency setting	35s @ 050°C
		TUNCTION	
	Sound power level	WOLDI Emorgonov sotting	≤520B(A) @ 1508
		function	
	Position indication		Mechanical
Safety	Protection class		III Safety extra-low voltage
			UL Class 2 Supply
	Degree of protection		IP54
			NEMA 2, UL Enclosure Type 2
	EMC		CE according to 2004/108/EC
	Certification		Certified to IEC/EN 60730-1 and IEC/EN
			60730-2-14
	Principle of operation		Туре 1.АА
	Rated impulse voltage		0.8kV
	Control pollution degre	e	3
	Ambient temperature		-30+50°C
	Non-operating temperating	ature	-40+80°C
	Ambient humidity		95% r.h., non-condensing
	Maintenance		Maintenance-free
Mechanical data	Connection flange		F07
Dimensions / Weight	Dimensions		See «Dimensions»
	Weight		Approx. 2.8kg

#### Safety notes



 The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.

- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during installation.
- The switch for changing the direction of rotation may only be operated by authorised personnel. The direction of rotation must not in particular be reversed in a frost protection circuit.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- The cable must not be removed from the device.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.



Product fe	eature	es				
Mode of operation Pre-charging time (start up) Typical pre-charging times			of ope ne (sta narging	art up)	The actuator moves the valve to the desired operating position at the same time as the integrated capacitors are loaded. Interrupting the supply voltage causes the valve to be rotated back integrated the emergency setting position by means of stored electrical energy. The capacitor actuators require a pre-charging time. This time is used for charging the capacitors up to a usable voltage level. This ensures that, in the event of an electricity interruption, the actuator can be moved at any time from its current position into the preset emergency setting position (POP). The duration of the pre-charging time depends mainly on how long the power was interrupted.	
Duration of voltage interruption			e interr	uption	25 20 20 15 10 5 5 10 10 10 5 10 10 5 10 10 10 10 10 10 10 10 10 10	
	0	1	[Days]	7	≥10	
Pre-charging time [s]	6	9	11	16	20	Duration of voltage interruption [Days]
Delivery condition (capacitors) Simple direct mounting Manual override High functional reliability Direction of rotation switch Rotary knob emergency setting position			(capa ct mor ual ov nal reli ation s ency s pc	citors) unting verride iability switch setting osition	The actuator is completely discharged after delivery from the factory, which is why the actuator requires approximately 20s pre-charging time before initial commissioning in order to bring the capacitors up to the required voltage level. Simple direct mounting on the rotary valve with ISO 5211-F07 mounting flange. The mounting position in relation to the fitting can be selected in 90° steps. Manual override with push button possible (the gear is disengaged for as long as the buttor remains pressed down). The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached. When actuated, the direction of rotation switch changes the running direction in normal operation The direction of rotation switch has no influence on the emergency setting position (POP which has been set. In case of changing the emergency position from NC to NO, it is mandatory necessary to also change the direction of rotation switch. The «Emergency setting position» rotary button can be used to adjust the desired emergency setting position (POP). The POP range is in reference to the maximum angle of rotation c the actuator. In the event of an voltage interruption, the actuator will move into the selected emergency setting position, taking into account the bridging time (PF) of 2s which was set ex-works. For valves with the following mechanical specifications in accordance with ISO 5211 F07: - Square stem head SW = 17mm for form-fit coupling of the rotary actuator.	
Accessori	06					

-	
Δηγρα	Ories
ACCESS	01163

	Description	т	уре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S	1A
	Auxiliary switch, add-on, 2 x SPDT	S	2A
	Feedback potentiometer 140 Ohm, add-on	Р	140A
	Feedback potentiometer 200 Ohm, add-on	Р	200A
	Feedback potentiometer 500 Ohm, add-on	Р	500A
	Feedback potentiometer 1 kOhm, add-on	Р	1000A
	Feedback potentiometer 2.8 kOhm, add-on	Р	2800A
	Feedback potentiometer 5 kOhm, add-on	Р	5000A
	Feedback potentiometer 10 kOhm, add-on	Р	10000A

# Wiring diagram





# **Operating controls and indicators**



# Setting the POP Power off position



214

# Dimensions [mm]

<u>8</u>

99 124

# GRK24A-MF-7



Modulating SuperCap rotary actuator with emergency control function and extended functionalities for rotary valves

- Nominal torque 40Nm
- Nominal voltage AC/DC 24V
- Control Modulating DC (0)2...10V
- Position feedback DC 2...10V
- Design life SuperCaps: 15 years



Technical data		
Electrical data	Nominal voltage	AC/DC 24V
	Nominal voltage frequency	50/60Hz
	Nominal voltage range	AC 19.228.8V / DC 21.628.8V
	Power consumption in operation	11W
	Power consumption in rest position	3W
	Power consumption for wire sizing	21VA
	Power consumption for wire sizing note	Imax 20A @ 5ms
	Connection supply / control	Cable 1m, 4 x 0.75mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 40Nm
	Positioning signal Y	DC (0) 210V
	Positioning signal Y note	Input impedance 100kΩ
	Operating range Y	DC 210V
	Operating range Y variable	Start point DC 0.530V
		End point DC 2.532V
	Position feedback U	DC 210V
	Position feedback U note	Max. 0.5mA
		End point DC 0.58V End point DC 2.510V
	Setting emergency position (POP)	NC / NO or adjustable 0100% (POP rotary button)
	Bridging time (PF) variable	110s
	Position accuracy	±5%
	Manual override	Gear disengagement with push-button
	Running time motor	150s / 90°
	Running time emergency control position	35s / 90°
	Adaption setting range	manual (automatic on first power-up)
	Sound power level motor	52dB(A)
	Sound power level emergency control position	61dB(A)
	Position indication	Mechanical
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Type 1.AA
	Rated impulse voltage supply / control	0.8kV
	Control pollution degree	3
	Ambient temperature	-3050°C
	Non-operating temperature	-4080°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
Mechanical data	Connection flange	F07
Weight	Weight	Approx. 2.9kg
Terms	Abbreviations	POP = Power off position / emergency setting position CPO = Controlled power off / controlled emergency control function PF = Power fail delay time / bridging time



Safety notes				
$\underline{\wedge}$	<ul> <li>This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.</li> </ul>			
	<ul> <li>Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.</li> </ul>			
	<ul> <li>The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.</li> </ul>			
	<ul> <li>The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.</li> </ul>			
	<ul> <li>Cables must not be removed from the device.</li> <li>The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.</li> </ul>			
Product features				
Mode of operation	The actuator moves the valve to the desired operating position at the same time as the integrated capacitors are loaded. Interrupting the supply voltage causes the valve to be moved to the selected emergency setting position (POP) by means of stored electrical energy.			
Pre-charging time (start up)	The capacitor actuators require a pre-charging time. This time is used for charging the capacitors up to a usable voltage level. This ensures that, in the event of an electricity interruption, the actuator can move at any time from its current position into the preset emergency setting position (POP). The duration of the pre-charging time depends mainly on following factors: - Duration of the electricity interruption = Duration = Duration of the electricity interruption = Duration =			
[d] = Electricity interruption in days [s] = Pre-charging time in seconds PF[s] = Bridging time Calculation example: Given an electricity interruption of 3 days and a bridging time (PF) set at 5s, the actuator requires a pre- charging time of 14s after the electricity has been reconnected (see graphic).	$ \begin{array}{ c c c c c c c c } & & & & & & & & & & & & & & & & & & &$			



Product features			
Delivery condition (capacitors)	The actuator is completely discharged after delivery from the factory, which is why the actuator requires approximately 20s pre-charging time before initial commissioning in order to bring the capacitors up to the required voltage level.		
Parameterisable actuators	The factory settings cover the most common applications. Input and output signals and other parameters can be altered with the PC-Tool MFT-P or with the Service tool ZTH AP.		
Simple Direct mounting	Simple direct mounting on the rotary valve with mounting flange. The mounting position in relation to the fitting can be selected in 90° steps.		
Manual override	Manual control with push-button possible - temporary. The gear is disengaged and the actuator decoupled for as long as the button is pressed.		
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.		
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops.		
Combination valve/actuator	For valves with the following mechanical specifications in accordance with ISO 5211 F07: - Square stem head SW = 17mm for form fit coupling of the rotary actuator. - Hole circle d = 70mm		
Home position	The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out an adaption, which is when the operating range and position feedback adjust themselves to the mechanical setting range. The actuator then moves into the position defined by the positioning signal. Factory setting: Y2 (counter-clockwise rotation).		
Direction of rotation switch	When actuated, the direction of rotation switch changes the running direction in normal operation. The direction of rotation switch has no influence on the emergency setting position (POP) which has been set.		
Adaption and synchronisation	An adaption can be triggered manually by pressing the "Adaption" button or with the PC- Tool. Both mechanical end stops are detected during the adaption (entire setting range). Automatic synchronisation after pressing the gearbox disengagement button is configured. The synchronisation is in the home position (0%). The actuator then moves into the position defined by the positioning signal. A range of settings can be adapted using the PC-Tool (see MFT-P documentation)		
Rotary knob emergency setting position	The «Emergency setting position» rotary knob can be used to adjust the desired emergency setting position (POP). In the event of an electricity interruption, the actuator will move into the selected emergency setting position, taking into account the bridging time (PF) of 2s which was set ex-works. Settings: The rotary knob must be set to the «Tool» position for retroactive settings of the emergency setting position with the BELIMO service tool MFT-P. Once the rotary knob is set back to the range 0100%, the manually set value will have positioning authority		
Bridging time (PF)	Electricity interruptions can be bridged up to a maximum of 10s. In the event of an electricity interruption, the actuator will remain stationary in accordance with the set bridging time. If the electricity interruption is greater than the set bridging time, then the actuator will move into the selected emergency setting position (POP). The bridging time set ex-works is 2s. This can be modified on site in operation with the use of the BELIMO service tool MFT-P. Settings: The rotary knob must not be set to the «Tool» position! Only the values need to be entered for retroactive adjustments of the bridging time with the BELIMO service tool MFT-P.		

# Accessories

	Description	Туре
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 10 kOhm, add-on	P10000A
	Description	Туре
Service Tools	Service Tool, for MF/MP/Modbus/LonWorks actuators and VAV- Controller	ZTH AP
	Belimo PC-Tool, software for adjustments and diagnostics	MFT-P



#### **Electrical installation**

 Notes
 • Connection via safety isolating transformer.

 • Parallel connection of other actuators possible. Observe the performance data.

 • Direction of rotation switch Factory setting: Direction of rotation Y2.

Wiring diagrams





# Functions

#### Functions with basic values (conventional mode)

Override control with AC 24V with relay contacts



Control Open/Close

Control 3-point

T



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#### Override control with AC 24V with rotary switch





# **Operating controls and indicators**



0	Direction	of rotation	switch
_			

- 2 Cover, POP button
- 3 POP button
- **4** Scale for manual adjustment
- **5** Position for adjustment with tool
- 6 Tool socket
- **7** Disengagement button

LED displays green		Meaning / function
Off	On	Operation OK / without fault
Off	Flashing	POP function active
On	Off	Fault
Off	Off	Not in operation
On	On	Adaptation procedure running
Flashing	On	Communication with programming tool

9 Press button: Triggers angle of rotation adaption, followed by standard operation



# **Dimensions** [mm]

**Dimensional drawings** 







# Standard directions of flow



#### Flow characteristics of Characterised Control Valves

Between 0° and 12.5° angle of rotation, 2way and 3-way Characterised Control Valves function as tight-sealing shut-off devices. Between 12.5° and 90° angle of rotation, Control Ball Valves operate as regulating devices. In case of the 3-way Characterised Control Valve, the bypass flow rate (B-AB) is 70% of the nominal flow rate (A-AB).



#### Note:

Due to its spherical design, the 3-way Characterised Control Valve is of limited application for conventional supply temperature control systems only. Therefore, it is recommended that supply temperature control systems are of the double-mixing circuit type (see diagram below). There are no restrictions when using mixing-type circuits for air preheaters and for injection circuits.



#### Mounting, installation and commissioning

#### Separate supply

When Ball Valve and Rotary Actuator are supplied separately, they can be assembled on-site.

**Recommended straight pipe installation** It is a general recommendation to keep minimum 2xDN of straight piping distance before the CCV installation in the pipe, to perform the best control function.For the outlet side of the CCV, there is no requirement to keep the minimum distance of straight pipe.



#### **Recommended mounting positions**

The Ball Valves can be mounted vertically (Fig. 1) or horizontally (Fig. 2). However, mounting the Ball Valves with the spindle pointing downwards, i.e. upside down (Fig. 3), is not recommended.



No special tools are needed for assembly. Instructions will be found packed with the valve and actuator.

# Commissioning

Must not be carried out until the Ball Valve and Rotary Actuator have been assembled in accordance with the instructions.





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## DN15...50 CCV

- 1. Clean pipe by compressed air or steam
- 2. Teflon tape or other sealing filler is recommended for pipe and valve thread end, pipe dope is not allowed on thread
- 3. Make sure the correct wrench position (fig.1)
- 4. Support pipeline to avoid pipe distortion



## DN65...150 CCV

1. Clean the joint

2.



3. Insert the rest of the bolts, tighten all of the bolts evenly by the cross-over method to eliminate concentrated stresses.





#### Maintenance

- · Ball Valves and Rotary Actuators are both maintenance free.
- Before any kind of service work is carried out on control devices of this type, it is essential to isolate the actuator from the power supply (by unplugging the power lead). Any pumps in the particular part of the piping system concerned must also be switched off and the appropriate isolating fittings closed (also allow everything to cool down first if necessary and reduce the pressure in the system to atmospheric).

The systems must not be returned to service until the Ball Valve and the Actuator have been properly re-installed and connected and the pipe work has been refilled in the proper manner.

#### Subsequent removal

In the case of applications where subsequent removal of Ball Valve will be necessary, it is advisable to make appropriate preparations beforehand.

#### Disposal

When a control device (Ball Valve and Actuator) has come to the end of its service life, the two parts must be dismantled and sorted into different materials before being disposed of

#### **Project design**

#### Installing R2..xx-S.., R6..AO CCV, 2-way

The R2..xx-S.. Characterised Control Valve is a throttling device, installed in the return line of systems in order to ensure less thermal stress on the seals of the device. The direction of flow specified must be adhered to.

#### Installing R3..xx-S.. CCV, 3-way

The R3..xx-S.. Characterised Control Valve is Dirt filters recommended a mixing device. Whatever type of installation Characterised Control Valves are relatively sen- sure  $\triangle P_{v_{100}}$  across the valve, i.e. with adequate is employed, it is essential to adhere to the di- sitive control devices and in order to ensure that valve authority (Pv>0.5). The differential presrections of flow specified. Whether a valve is they give long service life, the fitting of dirt filters sure  $\triangle P_{v_{100}}$  depends on the type of hydraulic installed in the supply or the return of a system is recommended. depends on the type of hydraulic circuit being

employed. No balancing valve is needed in the Sufficient isolating valves bypass line of a diverting circuit because of the It is essential to ensure that sufficient isolating reduced flow in the bypass.

#### Water quality requirements

The water quality requirements specified in VDI2035 must be adhered to.

valves are provided.

#### Correct rating and sizing

In order to ensure that the control device (Characterised Control Valve and Rotary Actuator) achieves a long service life, it is essential for the valve to be rated for the correct differential pres-

#### Differential pressures $riangle P_{v_{100}}$ with Characterised Control Valves full open





# Mounting instructions: TR..



# Mounting instructions: LR.. / NR..











# **SR..-5 Mounting Instructions**











# **GR..-7 Mounting Instructions**









# Mounting instructions: TRF..



# Mounting instructions: L(R)F..





# **NRF.** Mounting Instructions









# **SRF..-5 Mounting Instructions**



















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