



PNEUMATIC RACK & PINION ACTUATOR

series RA

SERVOVALVE spa

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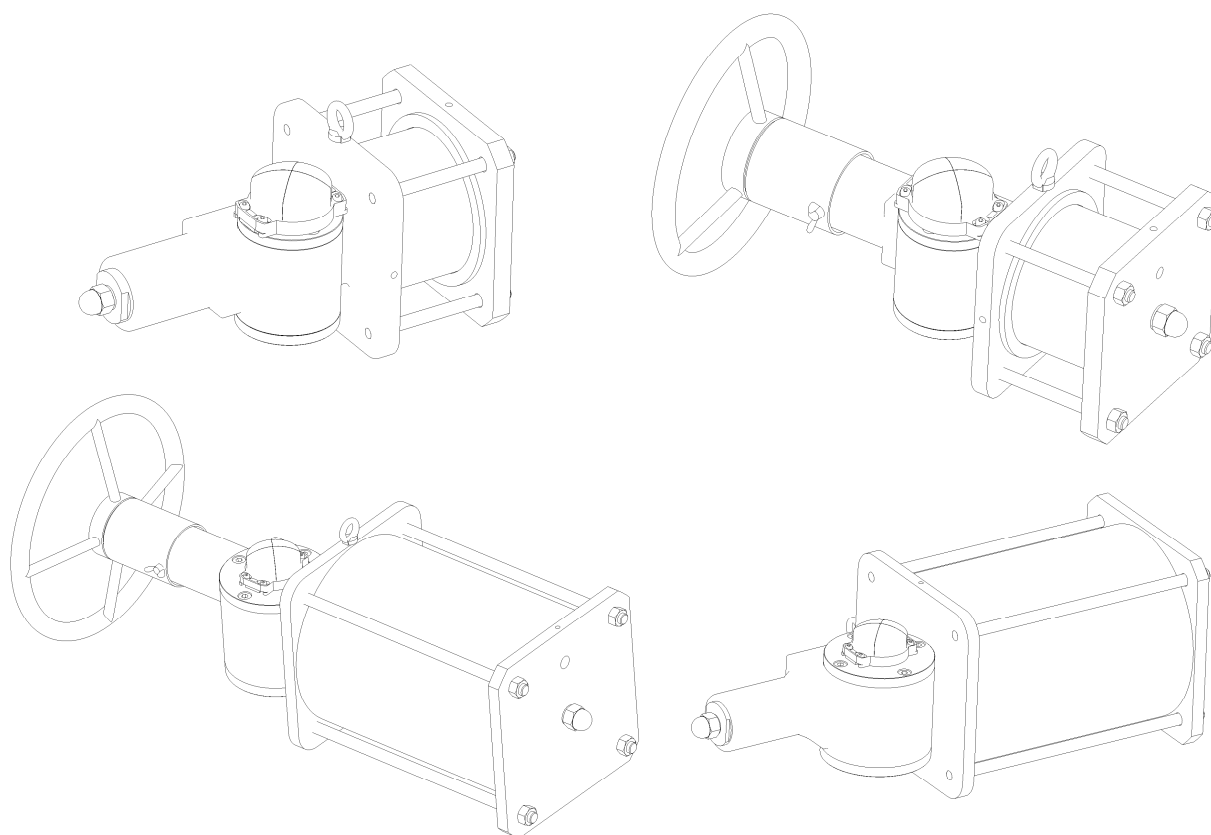
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TECHNICAL DESCRIPTION

RA or RAM is a quarter turn actuator to operate ball, butterfly or check valve.

The design, engineering and materials used in construction ensure optimum performances in the heaviest work condition in every environment according to the international standard specifications.

RA and RAM are designed in modular way to adopt common components for double or single acting execution.

The pneumatic cylinder produces the linear thrust transformed in an alternative rotation of the valve shaft by a rack and pinion kinematism.

The RA series is realized by a double acting cylinder totally separated from the central housing in which are located the rack and pinion. In the single acting RAM series, the linear thrust of the rack is alternatively supplied by the air or the spring.

The central housing is designed to accept different type of cylinders to allow the choice of the best actuator performance for every kind of valve.

Technical features

All moving parts are totally enclosed in a weather-proof housing, minimizes the possibility of injury to operating personnel.

Chromium plated rack-shaft is driven by two PTFE charged bushings to guarantee a perfect alignment and a uniform and regular movement for a long life.

The pneumatic cylinder are in refaced steel chromium plated to avoid environmental corrosion and to reduce the gaskets wear and stick-slip effects.

The housing is melted in spheroidal cast iron for minimizing the corrosion phenomenon; chromium plated shaft is driven by two special bushings to guarantee a perfect alignment, a uniform and smooth movement reducing friction and ensuring long life cycle.

For the single acting execution the screw that lock the piston to the rack is realized in such a way to release the preloaded spring before taking it off.

The spring can be replaced and preloaded in field with the utmost security without disassembling the actuator from the valve.

The piston is equipped with a PTFE charged slide to assure a linear drive and alignment under all load condition allowing a perfect tight of the o-ring gasket.

Field adjustable end travel-stop are available in both directions to optimize the required valve stroke.

The central cover is equipped with a standard valve position indicator.

Manual emergency handwheel

All series of actuator can be equipped with a manual emergency declutchable handwheel (RAV-RAMV)

Fail position

RAM actuator can be supplied in valve fail close or fail open execution.

Special execution

Units with particular materials for special environmental conditions (low or high temperature, aggressive medium, etc.) can be supplied on request.

Equipment

Each execution can be equipped with devices and weather-proof or explosion-proof accessories for a local and remote action or control as:

- limit switches
- solenoid valve
- flow control valve
- positioner and I/P converter
- position transmitter
- air tank for emergency
- special pneumatic and electric equipment

Test

Every detail has been designed and tested with care and checked during production process (from the receipt of the raw materials to final testing) against the strictest reliability criteria required under EN and ISO 9001 quality and safety standard.

Service

The Servovalve personnel guarantees prompt assistance to the customer during the start up of the plant and its normal working life.

TECHNICAL PERFORMANCE

Pressure range

- minimum working pressure: 3 bar
- maximum working pressure: see technical sheet
- design pressure: 1,5 max pressure
- cylinder test pressure: 1,5 max allowable pressure
- actuator test: 1,2 actuator working pressure

Angular stroke

- 90° +/-5°

Environmental temperature range

- min: - 20°C
- max: + 80°C
- lower or higher temperature execution on request

Operating medium

- air
- gas
- any medium compatible with standard materials

Actuator seals gaskets

- standard: N.B.R. (-20°C +80°C)
- low temp.: fluorosilicone
- high temp.: viton

Painting

Standard execution has surface protection with:

- sandblasting
- 1 primer layer
- 1 epoxy finish layer (Ral 5012)

Other painting procedure available on request

Fail standard rotation

Without other indication the spring fails clockwise (watching the actuator from the top).

Installation

Every actuator can be mounted and worked in every vertical or horizontal position.

Certification

All finished actuators are tested and certified by the quality department before being released according to Servovalve quality system and procedures in compliance with ISO 9001 standard.

RA – RAM actuators are according to European directives 97/23/CE (PED) and 94/9/CE (ATEX).

Warning

The RAM actuator contains a preloaded spring, follow carefully the installation and servicing instruction in operating book for the disassembling.

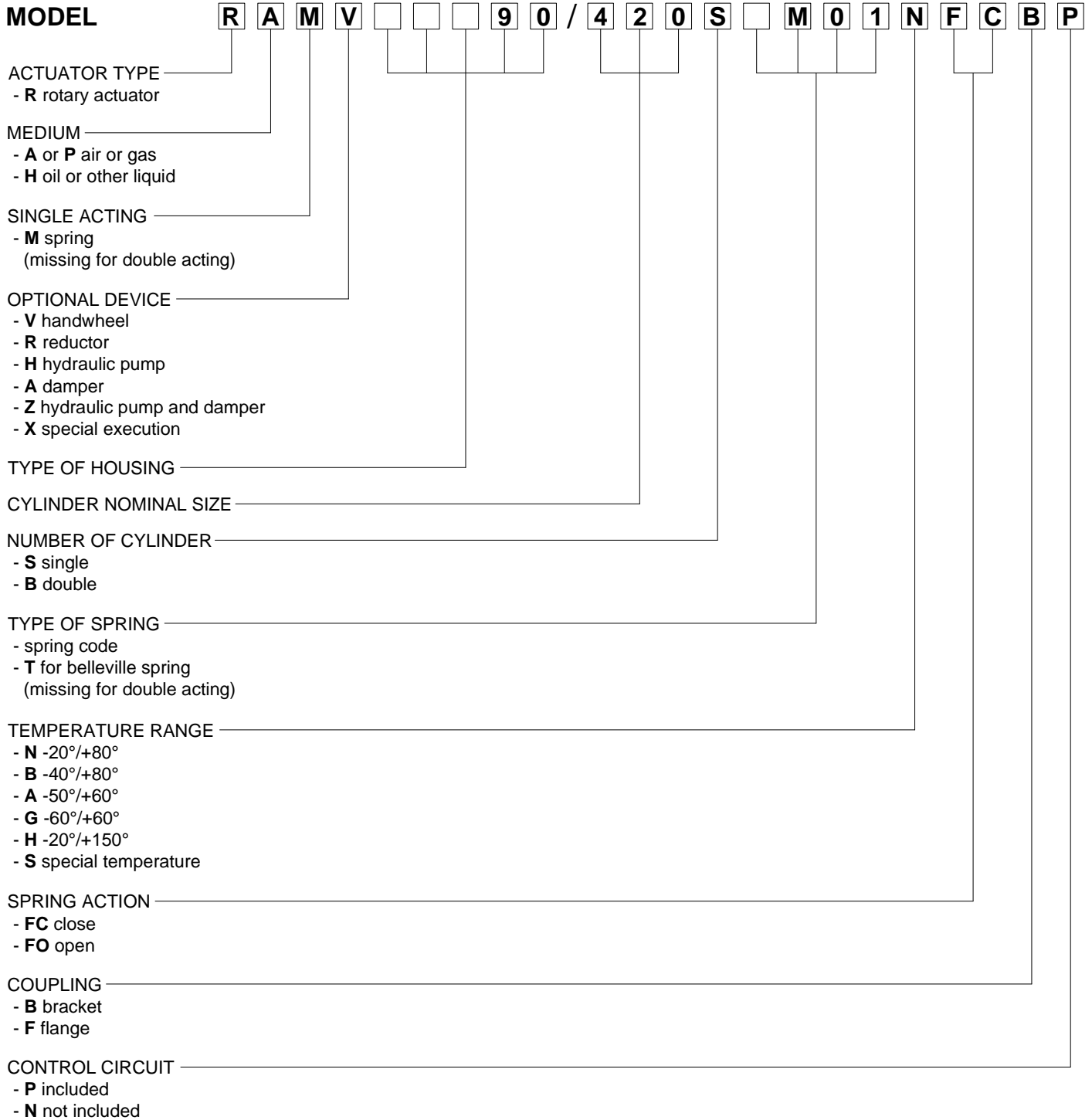
Maintenance

The inner parts of the actuator are life-lubricated, therefore only replacement of the rubber gaskets may become necessary after a long working time as pointed out in the operating book.

Pneumatic Quarter Turn Actuator Rack & Pinion Execution

SERIES RA - RAM

RACK AND PINION ACTUATOR CODE MODE



Pneumatic Quarter Turn Actuator Rack & Pinion Execution

SERIES RA - RAM

ACTUATORS TORQUE

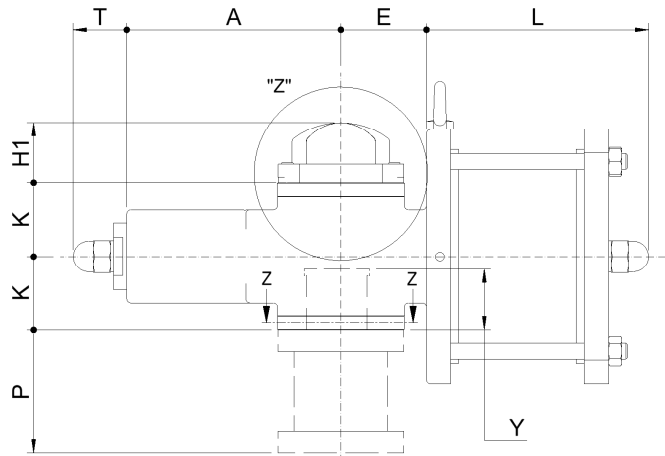
DOUBLE ACTING

ACTUATOR TYPE	MINIMUM AIR PRESSURE												PRESS. MAX. bar	AIR DISPLACE lt
	3 bar (43 psi)		3,5 bar (50 psi)		4 bar (58 psi)		5 bar (72 psi)		5,5 bar (80 psi)		6 bar (87 psi)			
	BREAK 0° Nm	END 90° Nm	BREAK 0° Nm	END 90° Nm	BREAK 0° Nm	END 90° Nm	BREAK 0° Nm	END 90° Nm	BREAK 0° Nm	END 90° Nm	BREAK 0° Nm	END 90° Nm		
RA 25/125	70	70	80	80	100	100	120	120	130	130	150	150	11	0,46
RA 25/160	120	120	140	140	160	160	200	200	220	220	240	240	7	0,76
RA 90/200	280	280	330	330	380	380	480	480	520	520	570	570	10	1,77
RA 90/250	450	450	520	520	600	600	750	750	820	820	900	900	7	2,77

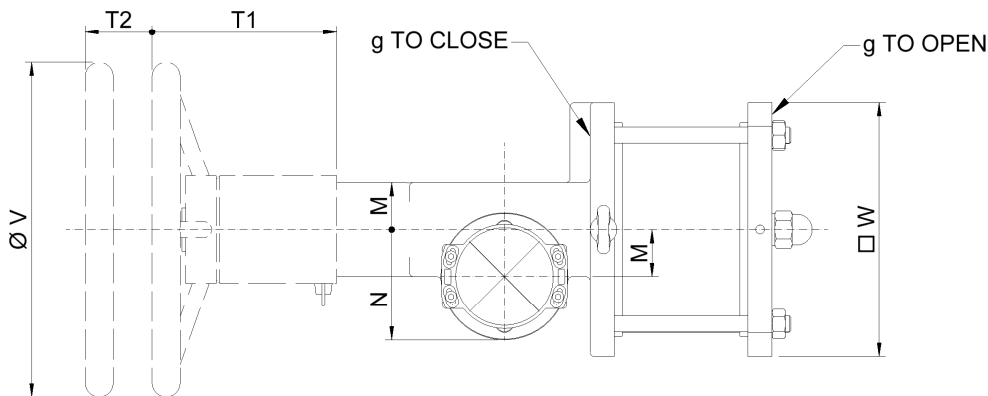
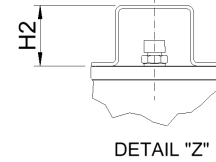
SINGLE ACTING

ACTUATOR TYPE	SPRING	SPRING		MINIMUM AIR PRESSURE												PRESS. MAX. bar	AIR DISPLACE lt
		BREAK	END	3 bar (43 psi)		3,5 bar (50 psi)		4 bar (58 psi)		5 bar (72 psi)		5,5 bar (80 psi)		6 bar (87 psi)			
		0° Nm	90° Nm	BREAK 0° Nm	END 90° Nm	BREAK 0° Nm	END 90° Nm	BREAK 0° Nm	END 90° Nm	BREAK 0° Nm	END 90° Nm	BREAK 0° Nm	END 90° Nm	BREAK 0° Nm	END 90° Nm		
RAM 25/125	L01	50	30	40	20	50	30	60	40	90	70	100	80	110	90	13	0,46
RAM 25/125	L02	60	40	30	10	40	10	50	30	80	50	90	60	100	70	13	0,46
RAM 25/125	L03	80	50	-	-	-	-	40	10	70	30	80	40	90	50	14	0,46
RAM 25/125	L04	100	60	-	-	-	-	-	-	60	10	70	30	80	40	14	0,46
RAM 25/160	L01	50	30	80	70	100	90	120	110	170	150	190	170	210	190	8	0,76
RAM 25/160	L02	60	40	70	50	90	70	110	90	160	130	180	150	200	170	8	0,76
RAM 25/160	L03	80	50	60	30	80	50	100	70	140	110	160	130	180	150	8	0,76
RAM 25/160	L04	100	60	50	10	70	30	90	50	130	90	150	110	170	130	9	0,76
RAM 25/160	L05	120	80	-	-	60	10	80	30	120	70	140	90	160	110	9	0,76
RAM 25/160	L06	140	90	-	-	-	-	60	10	110	50	130	70	150	90	10	0,76
RAM 25/160	L07	180	120	-	-	-	-	-	-	80	10	100	30	120	50	10	0,76
RAM 90/200	M03	130	80	190	140	240	190	290	230	390	330	430	370	480	420	11	1,77
RAM 90/200	M04	190	110	170	80	210	130	260	180	360	270	410	320	450	370	12	1,77
RAM 90/200	P05	280	160	-	-	160	40	210	80	300	180	350	220	400	270	12	1,77
RAM 90/200	P06	440	260	-	-	-	-	-	-	200	10	250	60	300	110	13	1,77
RAM 90/250	M03	130	80	350	300	430	370	500	450	650	590	730	670	800	740	7	2,77
RAM 90/250	M04	190	110	330	240	400	320	470	390	620	540	700	610	770	680	7	2,77
RAM 90/250	P05	280	160	270	150	340	220	420	300	570	440	640	520	720	590	8	2,77
RAM 90/250	P06	440	260	-	-	240	60	310	130	470	280	540	350	610	430	9	2,77
RAM 90/250	R01	560	330	-	-	-	-	240	10	390	150	470	230	540	300	9	2,77

Pneumatic Quarter Turn Actuator Rack & Pinion Execution series RA - RAV



MOUNTING BRACKET
ACC. TO. VDI-VDE 3845



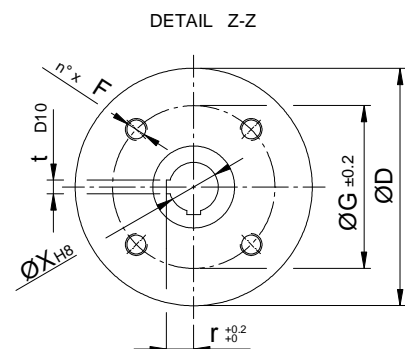
ACTUATOR DIMENSION (mm)															
TYPE	A	E	H1	H2	K	L	M	N	T	T1	T2	V	W	Y	g
RA - RAV 25	120	65	50	45	55	170	35	82.5	40	120	45	250	190	35	1/4" NPT
RA - RAV 90	180	85	50	45	75	250	50	125	45	170	65	350	275	45	1/2" NPT

FLANGE DIMENSION							
TYPE	Ø D	n° x F	Ø G	Ø X	r	t	ISO
RA - RAV 25	95	4 x M8	70	25	15.8	8	F07
RA - RAV 90	150	4 x M12	125	35	20.8	10	F12

ON REQUEST			
MIN	MAX	ØX min	ØX ma
F07	F12	10	25
F10	F14	16	40

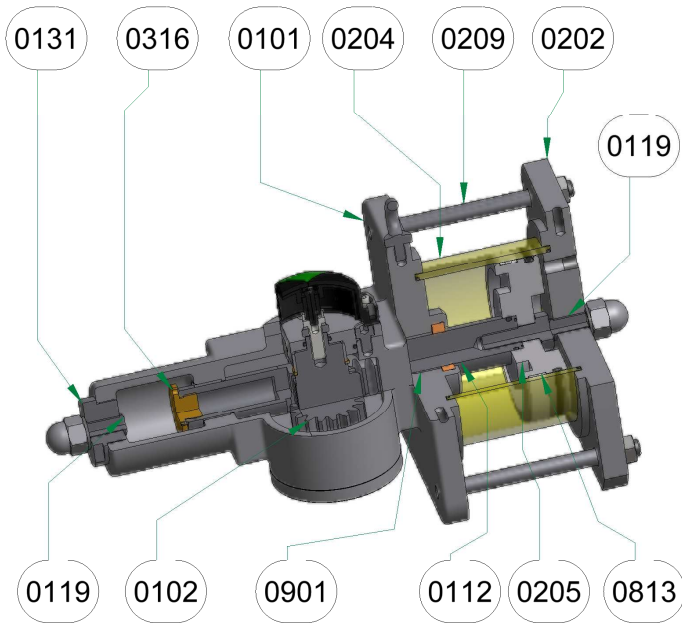
ACTUATOR WEIGHT (Kg)				
Ø CILINDER	RA 25	RAV 25	RA 90	RAV 90
125	24	27	//	//
160	29	32	//	//
200	//	//	55	62
250	//	//	60	67

"RA" WITH HANDWHEEL = "RAV"
 "H1" - STANDARD INDEX
 "H2" - MOUNTING KIT ACCORDING TO VDI-VDE 3845 (ON REQUEST)
 "P" - BRACKET ACCORDING TO CUSTOMER REQUIREMENT (ON REQUEST)



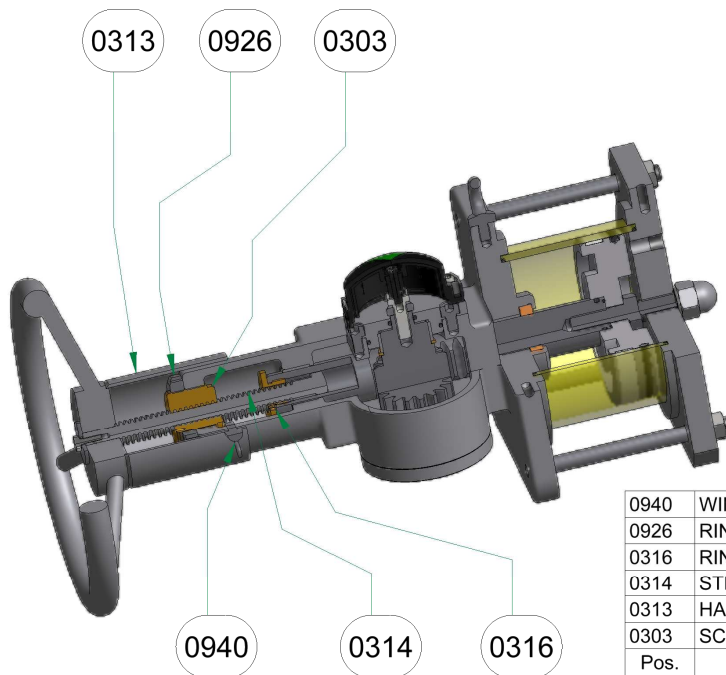
Pneumatic Quarter Turn Actuator Rack & Pinion Execution

series RA - RAV



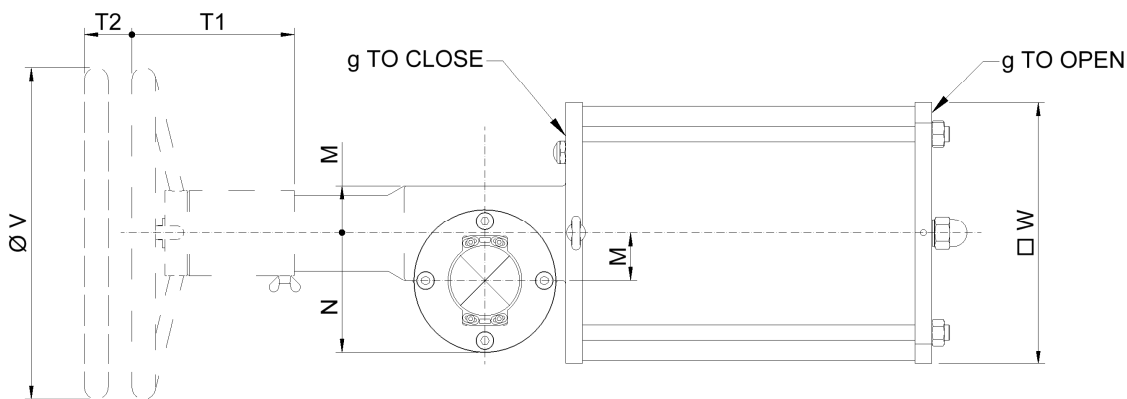
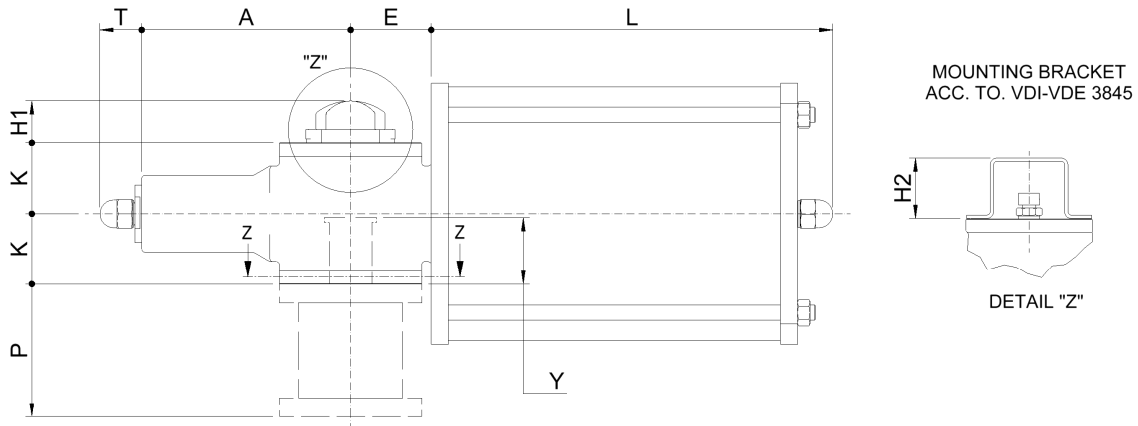
0901	BUSHING	BRONZE + PTFE
0813	PISTON DRIVE	PTFE+GRAPHITE
0316	RING NUT	CW 614 N EN 12164
0209	STAY BOLT	42CrMo4 EN 10083-3
0205	PISTON	EN-AW-2011 EN 573-3
0204	CYLINDER	E 355 EN 10297-1
0202	HEAD	S 275 JR EN 10025-2
0131	RING NUT	C40 EN 10083-2
0119	DOWEL	8.8 EN 20898-1
0112	CHROM. SHAFT	42CrMo4 EN 10083-3
0102	PINION	C40 EN 10083-2
0101	HOUSING	EN-GJS-400-15 EN 1563
Pos.	DESCRIPTION	MATERIAL

ALL O-RING AND GASKET MATERIAL			
AMB. TEMP.	GASKET	O-RING	TEMP.
STANDARD	-20 / +80	N.B.R.	POLYURETHANE
LOW TEMP.	-40 / +60	SILICON	SILICON
HIGH TEMP.	-20 / +120	VITON	VITON



0940	WING SCREW	8.8 EN 20898-1
0926	RING NUT	8.8 EN 20898-1
0316	RING NUT	CW 614 N EN 12164
0314	STEM	X20Cr 13 EN 10088-1
0313	HANDWHEEL	P 195 TR EN 10216-1
0303	SCREW THRESAD FLANGE	CW 614 N EN 12164
Pos.	DESCRIPTION	MATERIAL

Pneumatic Quarter Turn Actuator Rack & Pinion Execution series RAM - RAMV



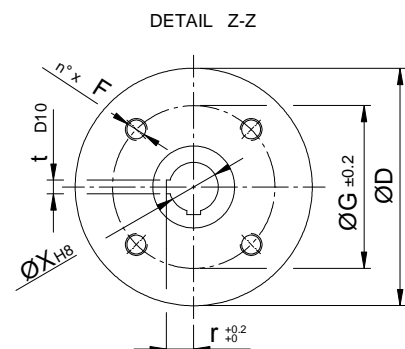
ACTUATOR DIMENSION (mm)															
TYPE	A	E	H1	H2	K	L	M	N	T	T1	T2	V	W	Y	g
RAM - RAMV 25	120	65	50	45	55	335	35	82.5	40	120	45	250	190	35	1/4" NPT
RAM - RAMV 90	180	85	50	45	75	425	50	125	45	170	65	350	275	45	1/2" NPT

FLANGE DIMENSION							
TYPE	Ø D	n° x F	Ø G	Ø X	r	t	ISO
RAM - RAMV 25	95	4 x M8	70	25	15.8	8	F07
RAM - RAMV 90	150	4 x M12	125	35	20.8	10	F12

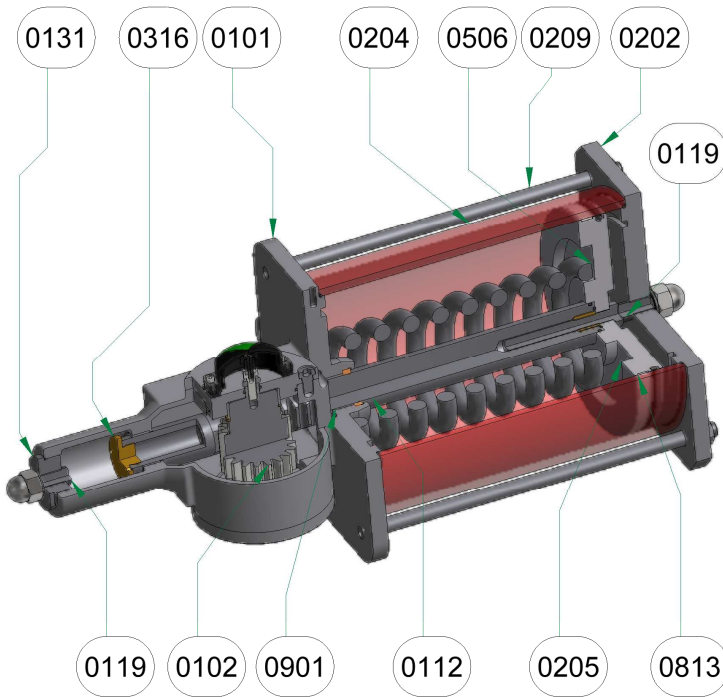
ON REQUEST			
MIN	MAX	ØX min	ØX max
F07	F12	10	25
F10	F14	16	40

ACTUATOR WEIGHT (Kg)				
Ø CILINDER	RAM 25	RAMV 25	RAM 90	RAMV 90
125	32 < 35	35 < 38	//	//
160	37 < 40	40 < 43	//	//
200	//	//	72 < 76	75 < 79
250	//	//	77 < 81	80 < 84

"RAM" WITH HANDWHEEL = "RAMV"
 "H1" - STANDARD INDEX
 "H2" - MOUNTING KIT ACCORDING TO VDI-VDE 3845 (ON REQUEST)
 "P" - BRACKET ACCORDING TO CUSTOMER REQUIREMENT (ON REQUEST)

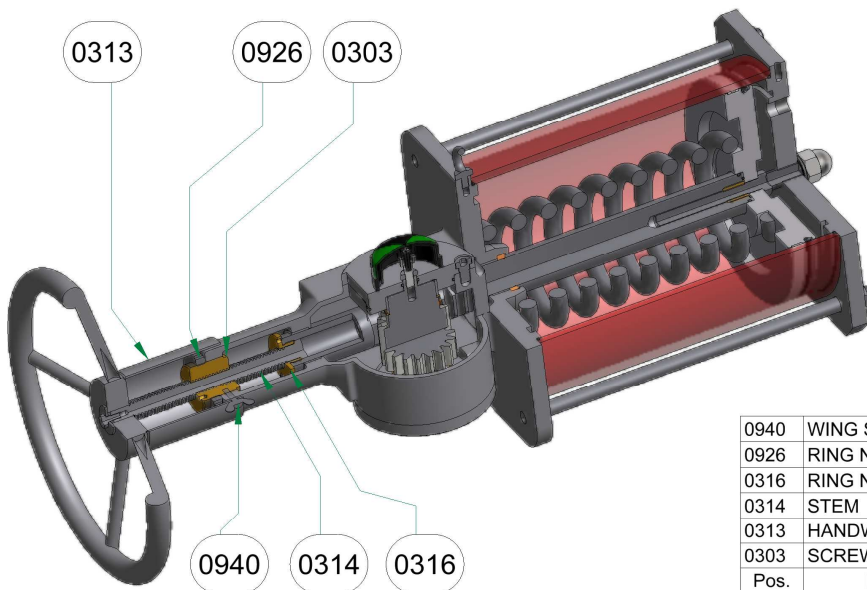


Pneumatic Quarter Turn Actuator Rack & Pinion Execution series RAM - RAMV



0901	BUSHING	BRONZE + PTFE
0813	PISTON DRIVE	PTFE+GRAPHITE
0506	SPRING	52SiCrNi5 EN 10089
0316	RING NUT	CW 614 N EN 12164
0209	STAY BOLT	42CrMo4 EN 10269
0205	PISTON	EN-AW-2011 EN 573-3
0204	CYLINDER	E 355 EN 10297-1
0202	HEAD	S 275 JR EN 10025-2
0131	RING NUT	C40 EN 10083-2
0119	DOWEL	8.8 EN 20898-1
0112	CHROM. SHAFT	42CrMo4 EN 10083-3
0102	PINION	C40 EN 10083-2
0101	HOUSING	EN-GJS-400-15 EN 1563
Pos.	DESCRIPTION	MATERIAL

ALL O-RING AND GASKET MATERIAL			
AMB. TEMP.	GASKET	O-RING	TEMP.
STANDARD	-20 / +80	N.B.R.	POLYURETHANE
LOW TEMP.	-40 / +60	SILICON	SILICON
HIGH TEMP	-20 / +120	VITON	VITON



0940	WING SCREW	8.8 EN 20898-1
0926	RING NUT	8.8 EN 20898-1
0316	RING NUT	CW 614 N EN 12164
0314	STEM	X20Cr 13 EN 10088-1
0313	HANDWHEEL	P 195 TR EN 10216-1
0303	SCREW THREAD FLANGE	CW 614 N EN 12164
Pos.	DESCRIPTION	MATERIAL

Pneumatic Quarter Turn Actuator Rack & Pinion Execution

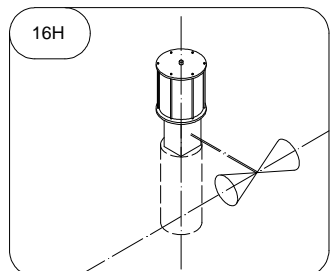
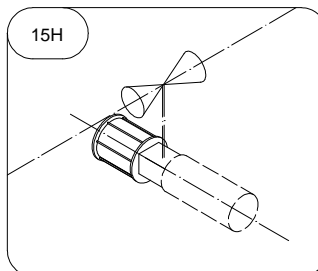
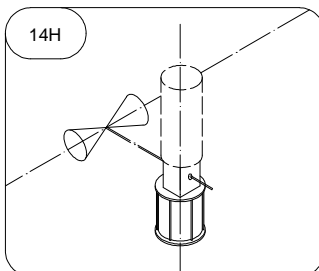
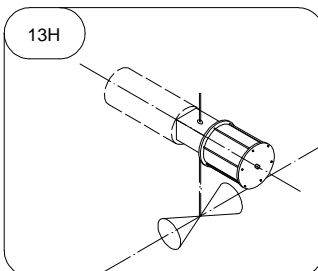
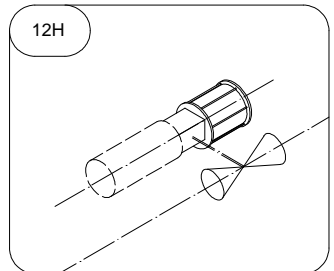
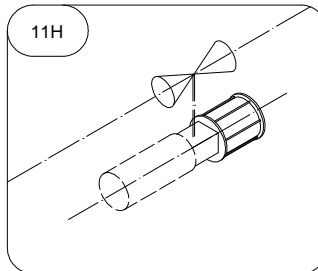
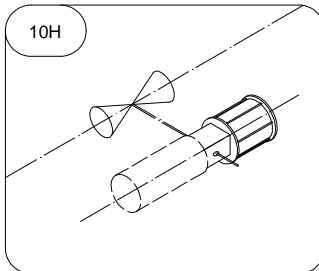
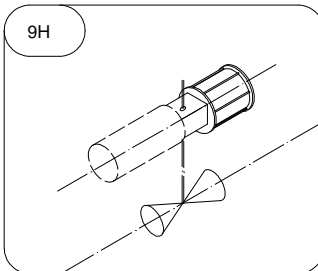
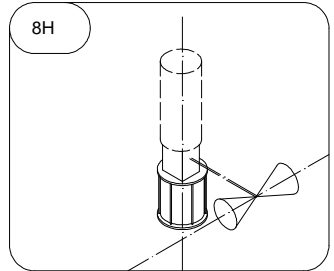
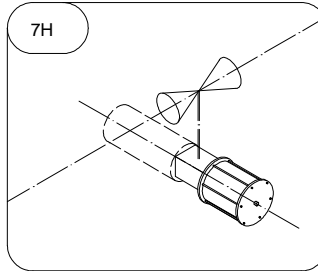
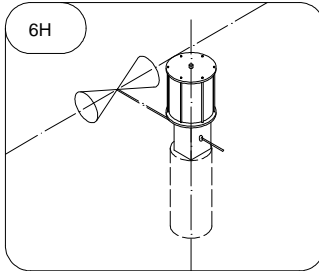
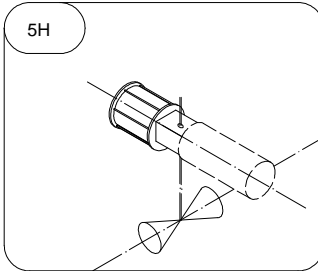
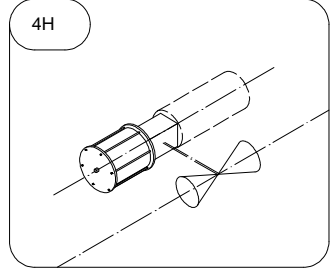
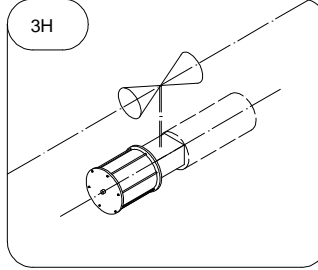
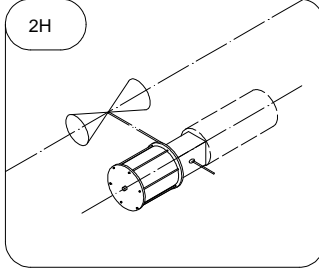
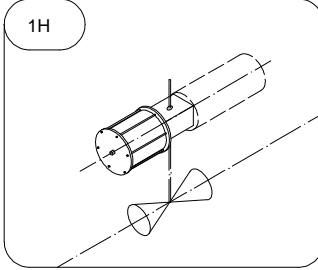
ACTUATOR MOUNTING POSITIONS

VALVE BOTTOM
ACTUATOR ABOVE

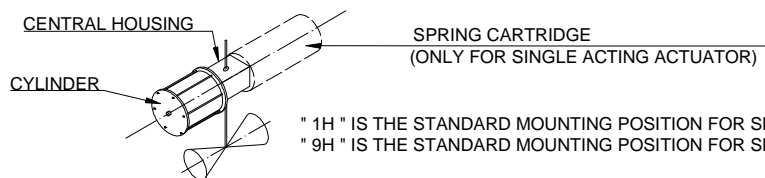
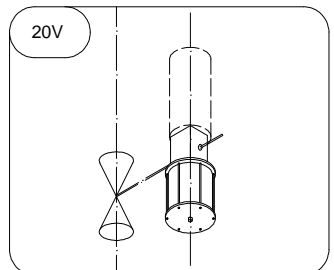
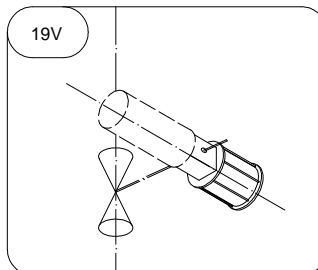
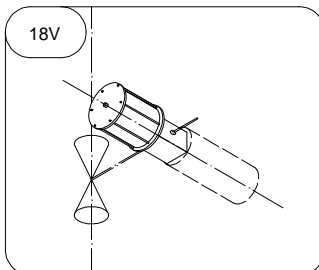
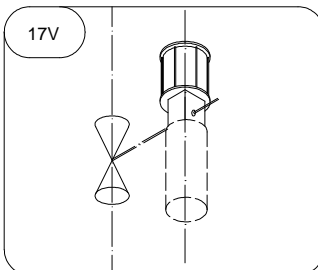
VALVE LEFT SIDE

VALVE ABOVE
ACTUATOR BOTTOM

VALVE RIGHT SIDE



VALVE VERTICAL PIPE



" 1H " IS THE STANDARD MOUNTING POSITION FOR SPRING TO OPEN.
" 9H " IS THE STANDARD MOUNTING POSITION FOR SPRING TO CLOSE.