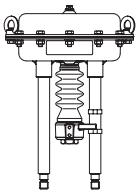
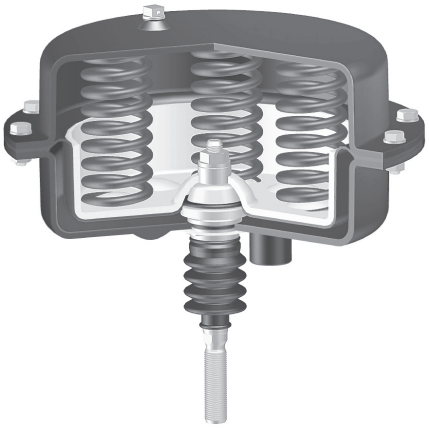
Pneumatic actuator ARI-DP

ARI-DP32 / DP33
Pneumatic actuator

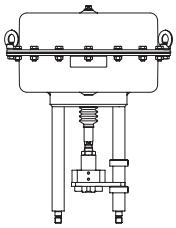


Page 2



DP-Actuator
Extended stem on air failure

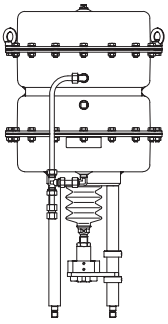
ARI-DP34
Pneumatic actuator



Page 2

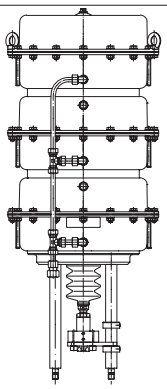
DP-Actuator
Retracted stem on air failure

ARI-DP34T
Pneumatic actuator



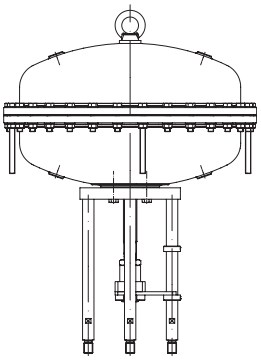
Page 6

ARI-DP34Tri
Pneumatic actuator



Page 8

ARI-DP35
Pneumatic actuator



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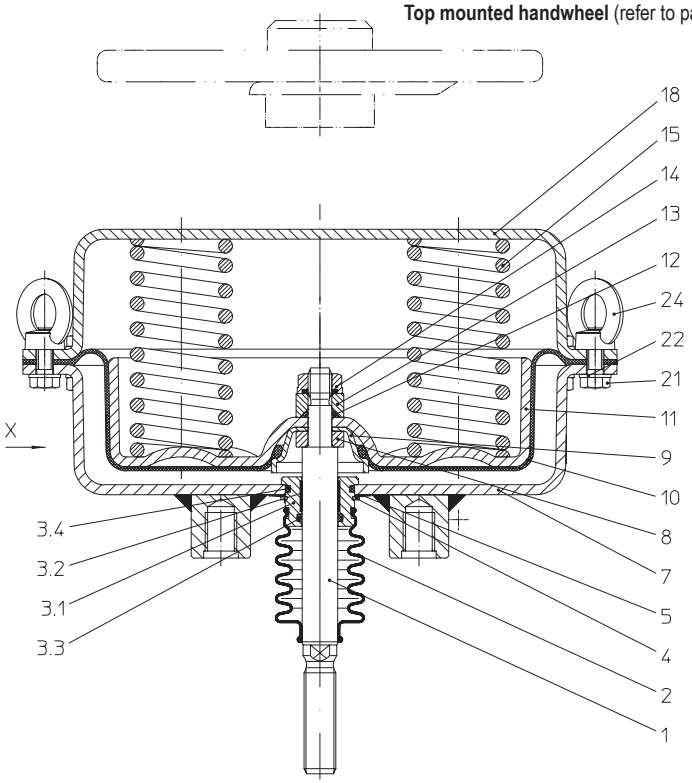
Features:

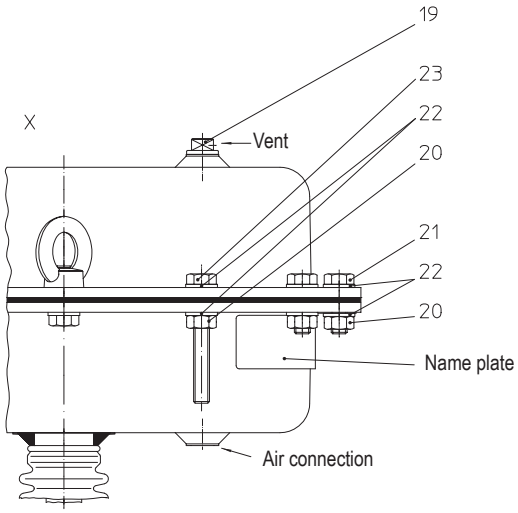
- Compact design
- Actuator with rolling diaphragm
- Actuator mountable in any position
- Travel up to 120 mm
- DP32-34: Direct or reverse acting
- Burnished stem protected by bellow
- Max. air supply pressure 6 bar
- High spring thrust
- Maintenance-free O-ring sealing with flexible guiding
- Assembly of additional devices acc. to DIN IEC 60534-6
- Operative ambient temperatures -10°C up to +100°C (optional:-40°C up to +100°C)
- Favourable size / performance ratio

Pneumatic actuator ARI-DP32 / 33 / 34

Operating mode: Extended stem on air failure

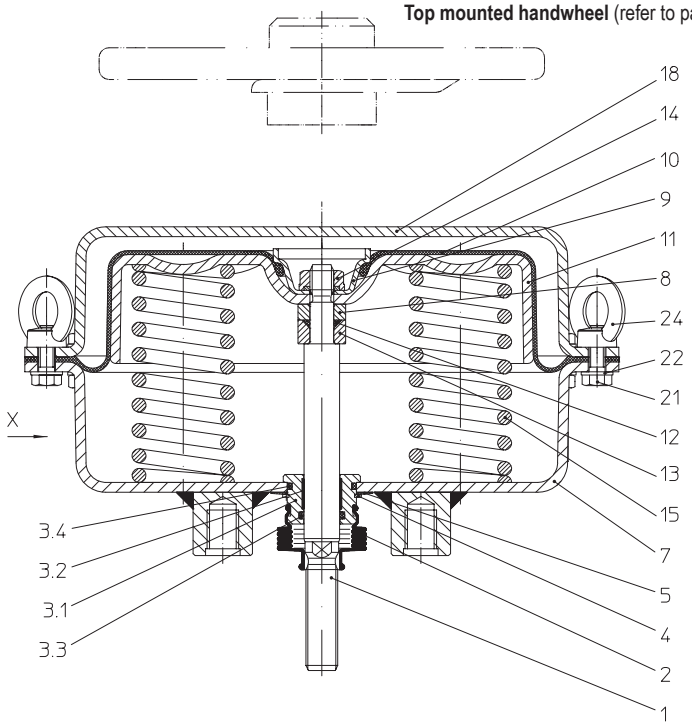
Top mounted handwheel (refer to page 3)

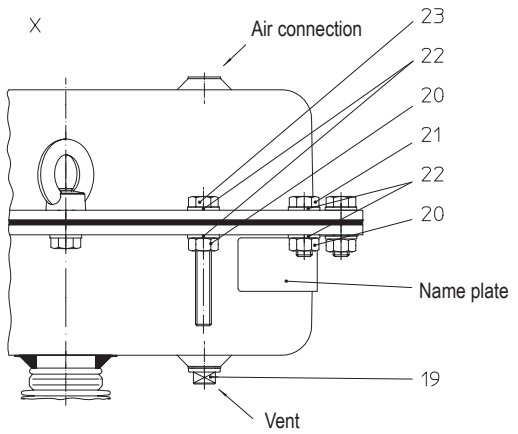




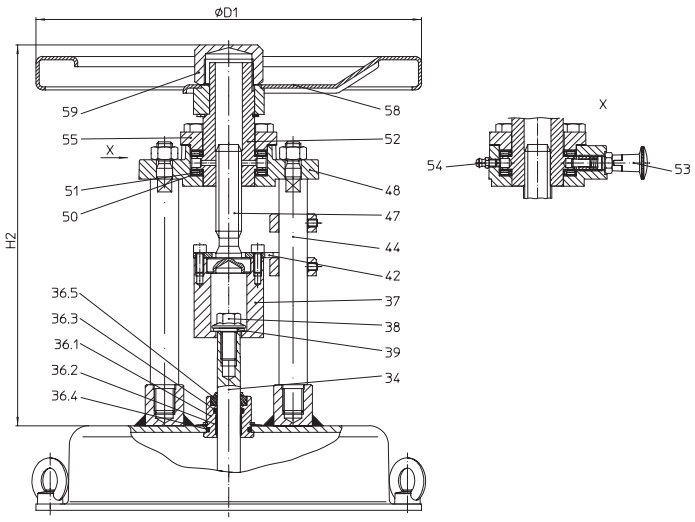
Operating mode: Retracted stem on air failure

Top mounted handwheel (refer to page 3)

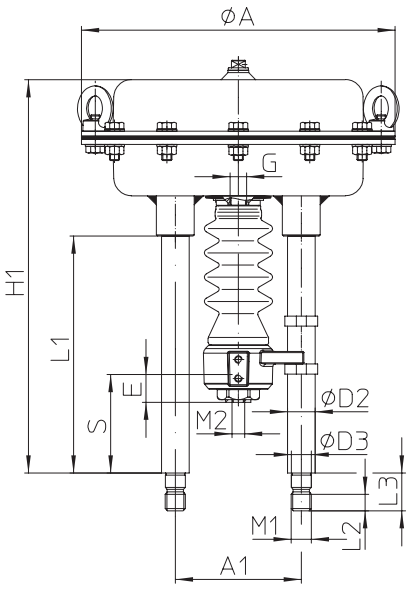




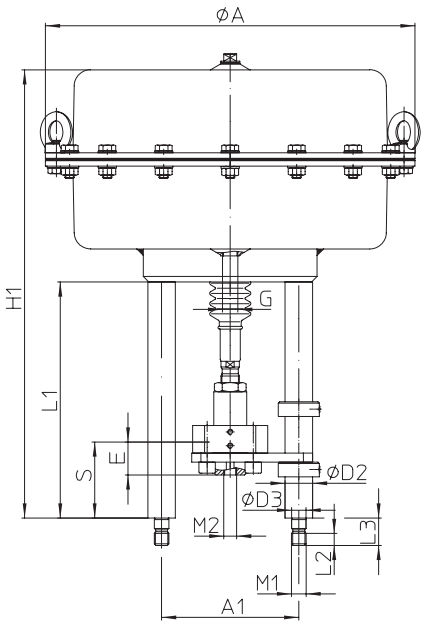
Accessories refer to page 13 and 14.



Top mounted handwheel



DP32 / DP33



DP34

Dimensions and weights

Type of actuator		ARI-DP32 2-column mounting				ARI-DP33 2-column mounting					ARI-DP34 2-column mounting										
Ø A	(mm)	250				300					405										
H1 *	(mm)	292	312	323	337	334	354	365	380	394	416	441	456	468	486	506	456	486	506	538	548
L1 *	(mm)	168	188	199	213	168	188	199	213	228	188	213	228	240	258	278	228	258	278	310	320
A1	(mm)	100				100					100						150				
Ø D2	(mm)	22				22					22						30				
M1	(mm)	M16				M16					M16										
L2	(mm)	14				14					14 (19)										
L3	(mm)	30				30					30 (45)										
Ø D3	(mm)	16				16					16										
M2	(mm)	M10 / M12 / M14x1,5 / M16 / M16x1,5									M10 / M12 / M14x1,5 / M16 / M16x1,5						M16 / M20				
E max. (Screw-in depth)	(mm)	22 / 21 / 21 / 19 / 20									28						36				
G	(inch)	1/4“				1/4“					3/8“										
Weight	(kg)	9				15					45										

* The construction heights H1 of the actuator units vary due to the different lengths of the distance columns L1, which results from the excess length of the stem (S = 83 mm, 98 mm, 130 mm), and the different spring ranges (bench settings) of the actuator units.

Top mounted handwheel		ARI-DP32	ARI-DP33	ARI-DP34
Ø D1	(mm)	225	300	397
H2	(mm)	284	297	458
Weight (with actuator)	(kg)	14	20	62

Actuators thrust: Extended stem on air failure (Thrust through spring setting)

ARI-DP32 (2-column mounting)		Effective diaphragm area 250 cm²				
Spring range	Air supply pressure min.	Quantity of springs	Travel 20 mm		Travel 30 mm	
			Thrust	Filling volume	Thrust	Filling volume
(bar)	(bar)	(pcs.)	(N)	(l)	(N)	(l)
0,2 - 1,0	1,2	4	490	1	490	1,2
0,4 -1,2	1,4	4	980	1,1	980	1,4
0,8 - 2,4	2,7	8	1960	1,1	1960	1,4
1,5 - 2,5	2,7	6	3675	1	--	--
2,0 - 3,3	3,6	8	4900	1,2	--	--

ARI-DP33 (2-column mounting)		Effective diaphragm area 400 cm²				
Spring range	Air supply pressure min.	Quantity of springs	Travel 20 mm		Travel 30 mm	
			Thrust	Filling volume	Thrust	Filling volume
(bar)	(bar)	(pcs.)	(N)	(l)	(N)	(l)
0,2 - 1,0	1,2	4	780	1,7	780	2,1
0,4 -1,2	1,4	4	1560	1,9	1560	2,4
0,8 - 2,4	2,7	8	3120	1,9	3120	2,4
1,5 - 3,0	3,3	6	--	--	5850	2,2
1,7 - 2,7	3,1	6	6630	2	--	--
2,0 - 4,0	4,5	8	--	--	7800	2,2
2,3 - 3,7	4	8	8970	2	--	--

ARI-DP34 (2-column mounting)		Effective diaphragm area 800 cm²						
Spring range	Air supply pressure min.	Quantity of springs	Travel 30 mm		Travel 50 mm		Travel 65 mm	
			Thrust	Filling volume	Thrust	Filling volume	Thrust	Filling volume
(bar)	(bar)	(pcs.)	(N)	(l)	(N)	(l)	(N)	(l)
0,2 - 1,0	1,2	4	1570	3,8	1570	5,5	1570	6,9
0,4 -1,2	1,4	4	3140	4,4	3140	6,6	3140	8,2
0,8 - 2,4	2,7	8	6280	4,4	6280	6,6	--	--
1,0 - 2,0	2,4	4	--	--	--	--	7850	6,8
1,5 - 3,0	3,3	6	--	--	11775	6,9	--	--
2,0 - 4,0	4,5	8	--	--	15700	6,9	15700	6,8
2,1 - 3,0	3,3	6	16485	6,9	--	--	--	--
2,4 - 3,6	4	8	18840	6,1	--	--	--	--

Actuators thrust: Retracted stem on air failure (Thrust through air supply pressure)

ARI-DP32 (2-column mounting)		Effective diaphragm area 250 cm²				
Spring range	Air supply pressure min.	Quantity of springs	Travel 20 mm		Travel 30 mm	
			Thrust	Filling volume	Thrust	Filling volume
(bar)	(bar)	(pcs.)	(N)	(l)	(N)	(l)
0,2 - 1,0	1,2	4	490	1	490	1,2
	1,4	4	980	1	980	1,2
	2	4	2450	1	2450	1,2
	3	4	4900	1	4900	1,2
	4	4	7350	1	7350	1,2
	5	4	9800	1	9800	1,2
	6	4	12250	1	12250	1,2

ARI-DP33 (2-column mounting)		Effective diaphragm area 400 cm²				
Spring range	Air supply pressure min.	Quantity of springs	Travel 20 mm		Travel 30 mm	
			Thrust	Filling volume	Thrust	Filling volume
(bar)	(bar)	(pcs.)	(N)	(l)	(N)	(l)
0,2 - 1,0	1,2	4	780 [1]	1,7	780 [1]	2,1
	1,4	4	1560 [1]	1,7	1560 [1]	2,1
	2	4	3900 [1]	1,7	3900 [1]	2,1
	3	4	7800 [1]	1,7	7800 [1]	2,1
	4	4	11700	1,7	11700	2,1
	5	4	15600	1,7	15600	2,1
	6	4	19500	1,7	19500	2,1

ARI-DP34 (2-column mounting)		Effective diaphragm area 800 cm²						
Spring range	Air supply pressure min.	Quantity of springs	Travel 30 mm		Travel 50 mm		Travel 65 mm	
			Thrust	Filling volume	Thrust	Filling volume	Thrust	Filling volume
(bar)	(bar)	(pcs.)	(N)	(l)	(N)	(l)	(N)	(l)
0,2 - 1,0	1,2	4	1570	3,8	1570	5,5	1570	6,9
	1,4	4	3140	3,8	3140	5,5	3140	6,9
	2	4	7850	3,8	7850	5,5	7850	6,9
	3	4	15700	3,8	15700	5,5	15700	6,9
	4	4	23550	3,8	23550	5,5	23550	6,9
	5	4	31400	3,8	31400	5,5	31400	6,9
	6	4	39250	3,8	39250	5,5	39250	6,9

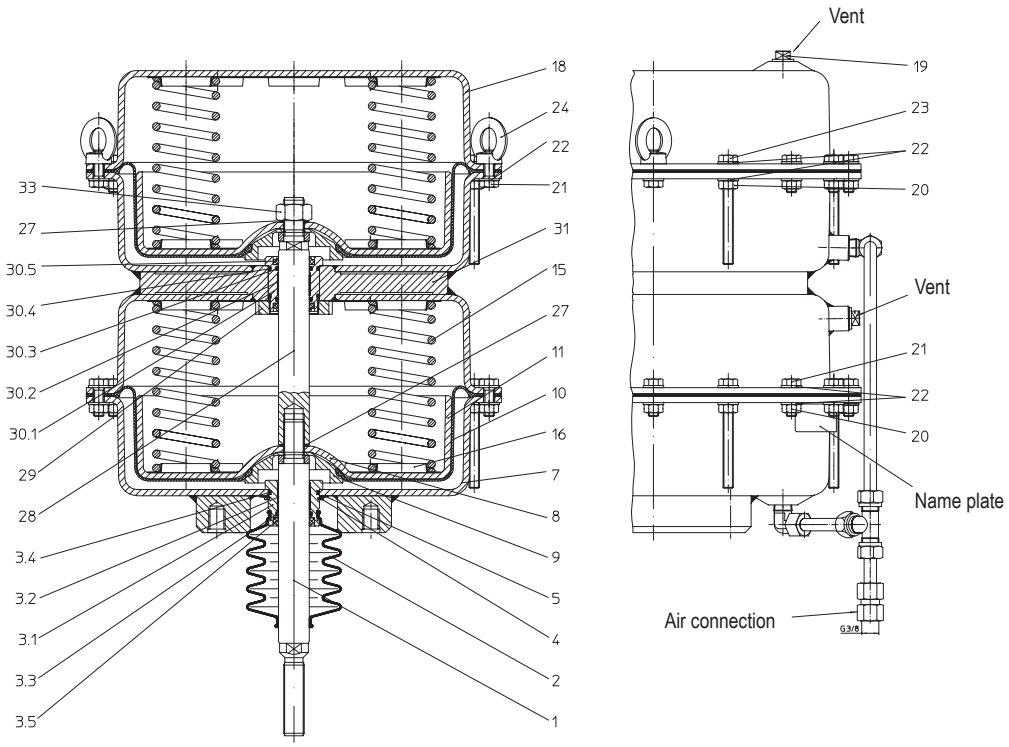
Air supply pressure max. to actuator 6 bar

[1] Air supply pressure max. to actuator 3,5 bar

Pneumatic actuator ARI-DP34T

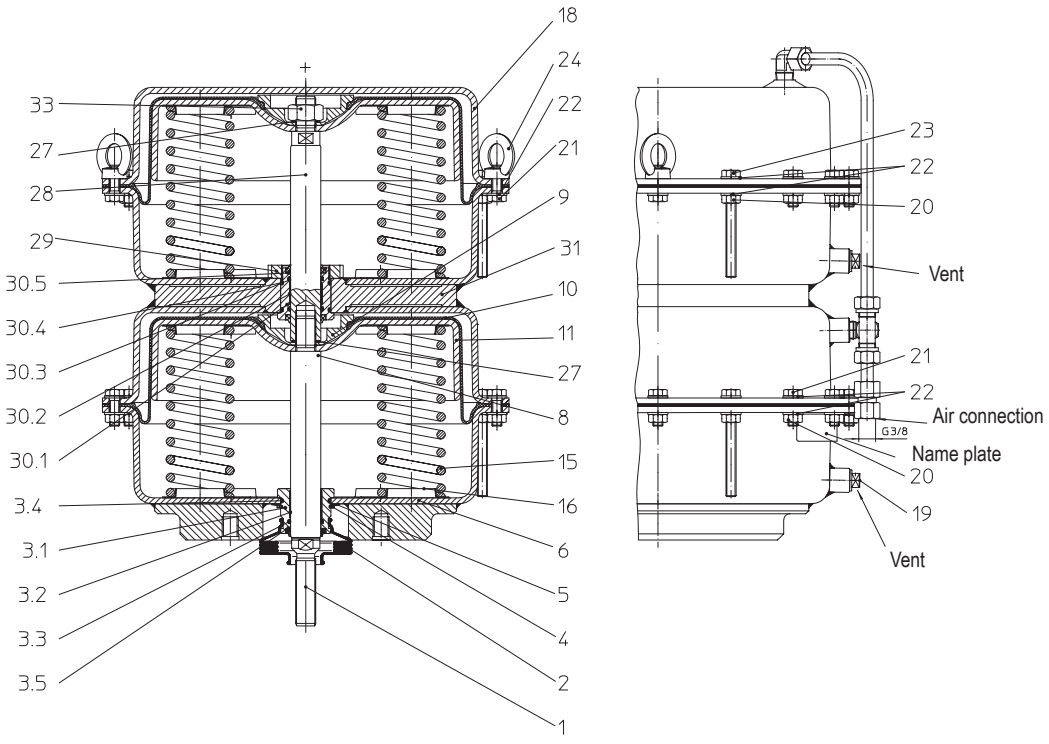
Operating mode: Extended stem on air failure

Top mounted handwheel (refer to page 7)

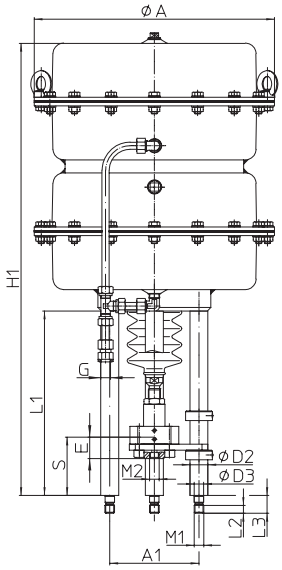


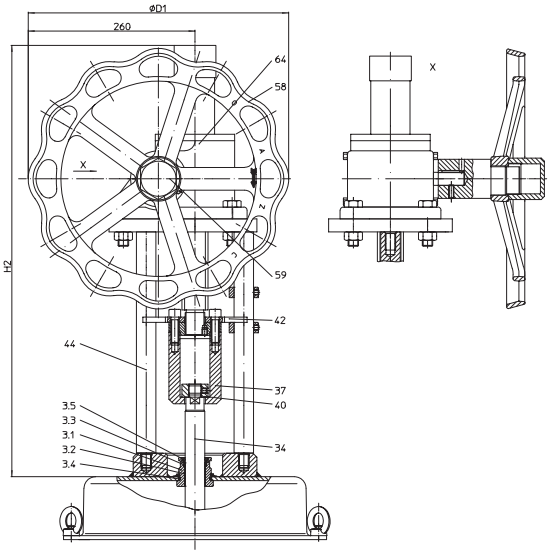
Operating mode: Retracted stem on air failure

Top mounted handwheel (refer to page 7)



Accessories refer to page 13 and 14.





Top mounted handwheel

Actuators thrust: Extended stem on air failure (Thrust through spring setting)

ARI-DP34T (4-column mounting)		Effective diaphragm area (2x800) 1600 cm²							
Spring range	Air supply pressure min.	Quantity of springs	Travel 30 mm		Travel 50 mm		Travel 65 mm	
			Thrust	Filling volume	Thrust	Filling volume	Thrust	Filling volume
(bar)	(bar)	(pcs.)	(N)	(l)	(N)	(l)	(N)	(l)
0,2 - 1,0	1,5	8	3140	7,6	3140	11	3140	13,8
0,4 -1,2	1,7	8	6280	8,8	6280	13,2	6280	16,4
0,8 - 2,4	2,9	16	12560	8,8	12560	13,2	--	--
1,0 - 2,0	2,5	8	--	--	--	--	15700	13,6
1,5 - 3,0	3,5	12	--	--	23550	13,8	--	--
2,0 - 4,0	4,5	16	--	--	31400	13,8	31400	13,6
2,1 - 3,0	3,5	12	32970	13,8	--	--	--	--
2,4 - 3,6	4,1	16	37680	12,2	--	--	--	--

Actuators thrust: Retracted stem on air failure (Thrust through air supply pressure)

ARI-DP34T (4-column mounting)		Effective diaphragm area (2x800) 1600 cm²						
Spring range	Air supply pressure min.	Quantity of springs	Travel 30 mm		Travel 50 mm		Travel 65 mm	
			Thrust	Filling volume	Thrust	Filling volume	Thrust	Filling volume
(bar)	(bar)	(pcs.)	(N)	(l)	(N)	(l)	(N)	(l)
0,2 - 1,0	1,5	8	7850	7,6	7850	11	7850	13,8
	2	8	15700	7,6	15700	11	15700	13,8
	3	8	31400	7,6	31400	11	31400	13,8
	4	8	47100	7,6	47100	11	47100	13,8
	5	8	62800	7,6	62800	11	62800	13,8
	6 [1)]	8	78500	7,6	78500	11	78500	13,8

Air supply pressure max. to actuator 6 bar

Dimensions and weights

Type of actuator		ARI-DP34T: 4-column mounting				
Ø A	(mm)	405				
H1 *	(mm)	678	708	728	760	770
L1 *	(mm)	228	258	278	310	320
A1	(mm)	150				
Ø D2	(mm)	30				
M1	(mm)	M16				
L2	(mm)	14 (19)				
L3	(mm)	30 (45)				
Ø D3	(mm)	16				
M2	(mm)	M16 / M20				
E max.	(mm)	36				
G	(inch)	3/8“				
Weight	(kg)	116				

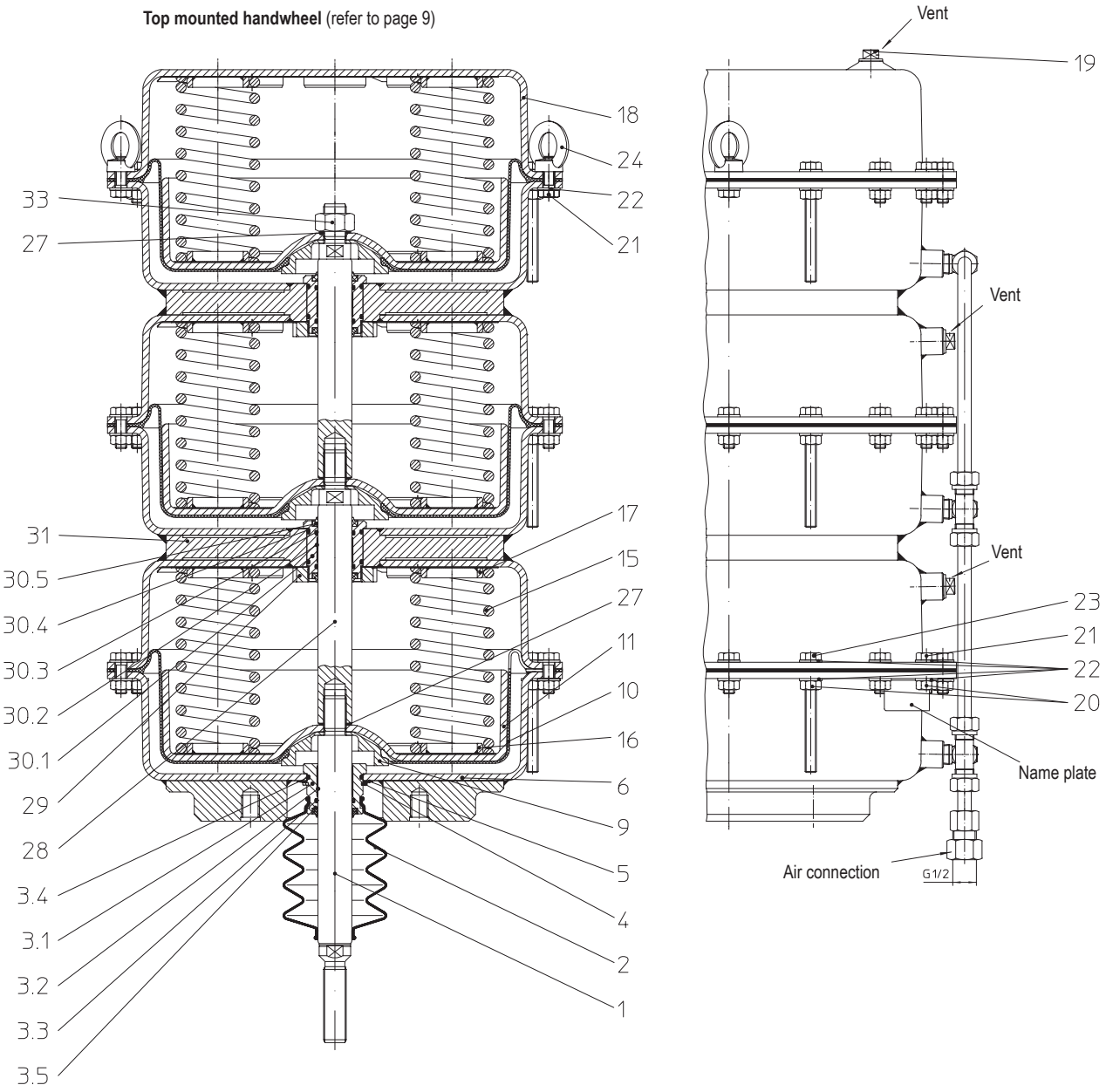
* The construction heights H1 of the actuator units vary due to the different lengths of the distance columns L1, which results from the excess length of the stem (S = 83 mm, 98 mm, 130 mm), and the different spring ranges (bench settings) of the actuator units.

Top mounted handwheel		ARI-DP34T
Ø D1	(mm)	400
H2	(mm)	613
Weight (with actuator)	(kg)	157

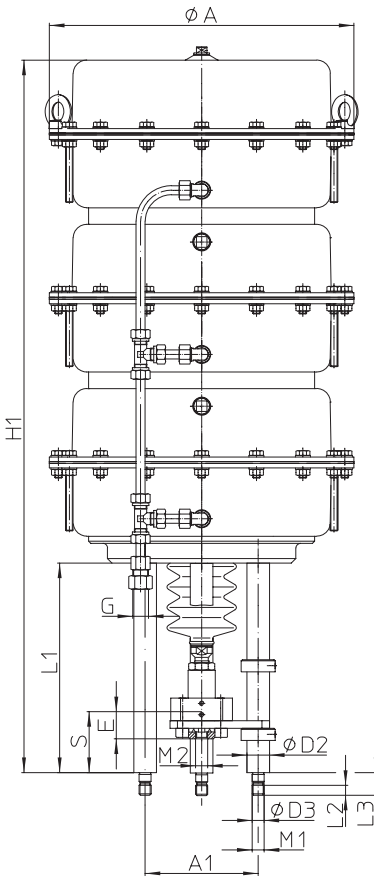
Pneumatic actuator ARI-DP34Tri

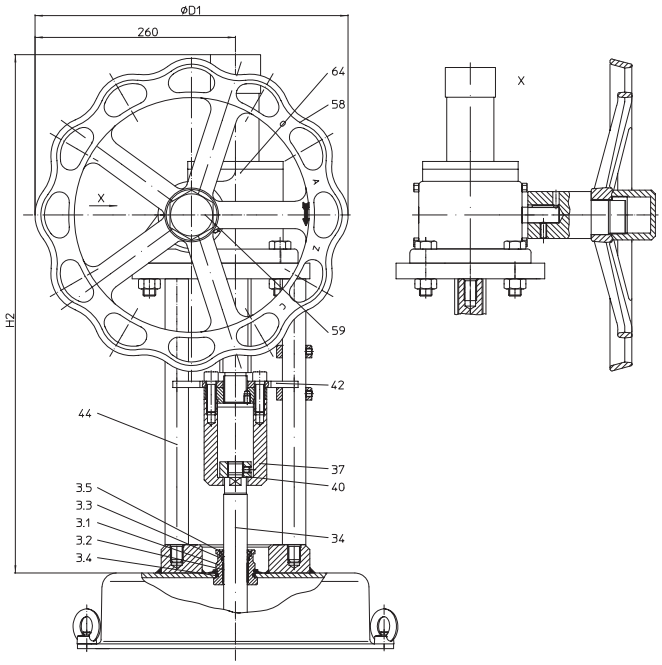
Operating mode: Extended stem on air failure

Top mounted handwheel (refer to page 9)



Accessories refer to page 13 and 14.





Top mounted handwheel

Actuators thrust: Extended stem on air failure (Thrust through spring setting)

ARI-DP34Tri (4-column mounting)		Effective diaphragm area (3x800) 2400 cm²								
Spring range	Air supply pressure min.	Quantity of springs	Travel 30 mm		Travel 50 mm		Travel 65 mm		Travel 75 mm	
			Thrust	Filling volume	Thrust	Filling volume	Thrust	Filling volume	Thrust	Filling volume
(bar)	(bar)	(pcs.)	(N)	(l)	(N)	(l)	(N)	(l)	(N)	(l)
0,2 - 1,0	1,5	12	4710	11,4	4710	16,5	4710	20,7	--	--
0,4 -1,2	1,7	12	9420	13,2	9420	19,8	9420	24,6	--	--
0,55 - 2,4	2,9	24	--	--	--	--	--	--	12950	24,6
0,8 - 2,4	2,9	24	18840	13,2	18840	19,8	18840	24,6	--	--
1,0 - 2,0	2,5	12	--	--	--	--	23550	20,4	--	--
1,5 - 3,0	3,5	18	--	--	35325	20,7	--	--	--	--
2,0 - 4,0	4,5	24	--	--	47100	20,7	47100	20,4	--	--
2,1 - 3,0	3,5	18	49455	20,7	--	--	--	--	--	--
2,4 - 3,6	4,1	24	56520	18,3	--	--	--	--	--	--

Air supply pressure max. to actuator 5 bar

Dimensions and weights

Type of actuator		ARI-DP34Tri 4-column mounting				
Ø A	(mm)	405				
H1 *	(mm)	900	930	950	982	992
L1 *	(mm)	228	258	278	310	320
A1	(mm)	150				
Ø D2	(mm)	30				
M1	(mm)	M16				
L2	(mm)	14 (19)				
L3	(mm)	30 (45)				
Ø D3	(mm)	16				
M2	(mm)	M20				
E max.	(mm)	36				
G	(inch)	3/8“				
Weight	(kg)	150				

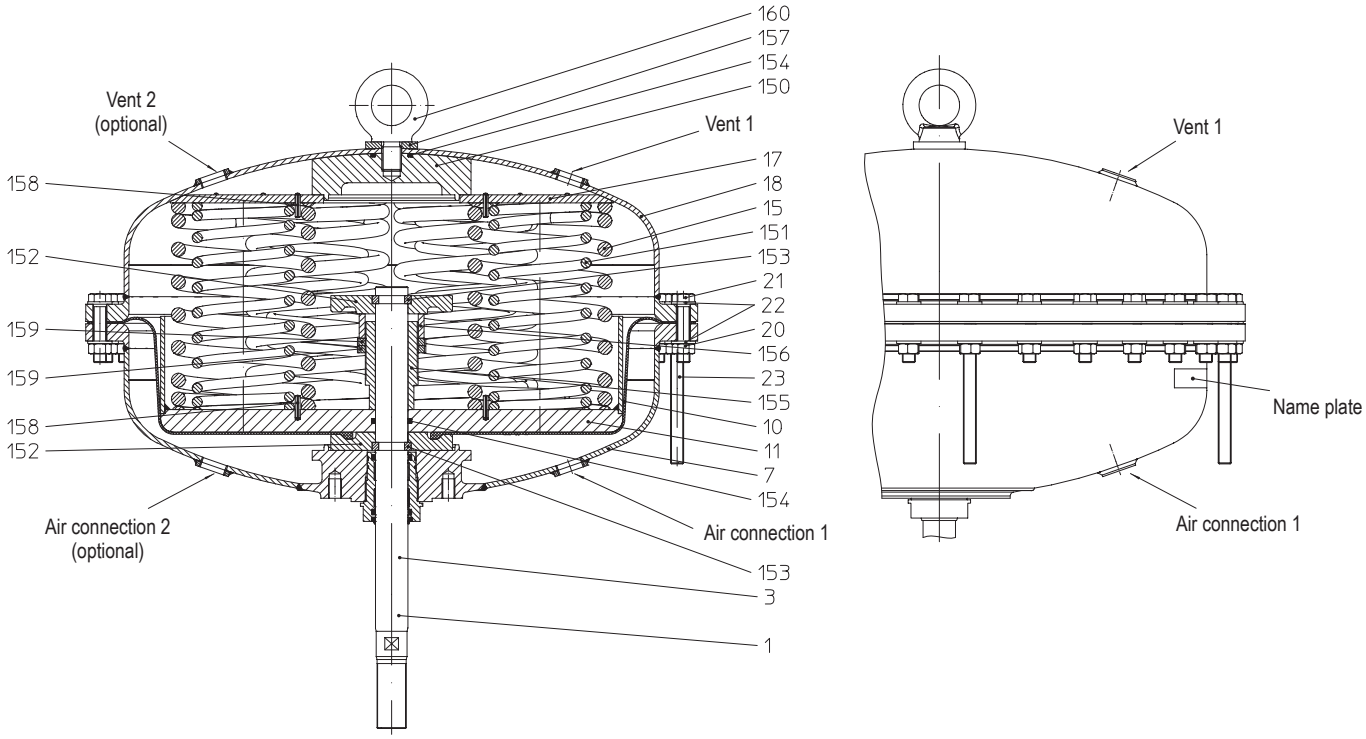
* The construction heights H1 of the actuator units vary due to the different lengths of the distance columns L1, which results from the excess length of the stem (S = 83 mm, 98 mm, 130 mm), and the different spring ranges (bench settings) of the actuator units.

Top mounted handwheel		ARI-DP34Tri
Ø D1	(mm)	400
H2	(mm)	613
Weight (with actuator)	(kg)	191

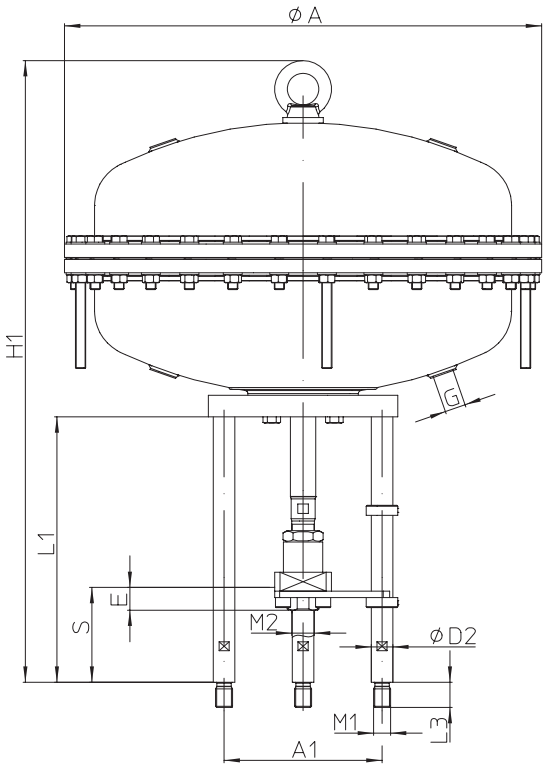
Pneumatic actuator ARI-DP35

Operating mode: Extended stem on air failure

Top mounted handwheel on request



Accessories refer to page 13 and 14.



Actuators thrust: Extended stem on air failure (Thrust through spring setting)

ARI-DP35 (4-column mounting)		Effective diaphragm area 2800 cm²									
Spring range	Air supply pressure min.	Quantity of springs (Stk.)	Thrust (N)	Travel 50 mm		Travel 65 mm		Travel 90 mm		Travel 120 mm	
				Dead vol. 3) (l)	Travel vol. 3) (l)	Dead vol. 3) (l)	Travel vol. 3) (l)	Dead vol. 3) (l)	Travel vol. 3) (l)	Dead vol. 3) (l)	Travel vol. 3) (l)
2,97 - 3,80	4,3 1)	12	83067	33,7	14,1	--	--	--	--	--	--
2,72 - 3,80	4,3 1)	12	76067	--	--	29,4	18,4	--	--	--	--
2,30 - 3,80	4,3 1)	12	64400	--	--	--	--	22,3	25,5	--	--
1,80 - 3,80	4,3 1)	12	50400	--	--	--	--	--	--	13,8	34,0

1) Air supply pressure max. to actuator 6 bar

3) When using accessories, the corresponding air consumption has to be observed.

Dimensions and weights

Type of actuator		ARI-DP35 4-column mounting
Ø A	(mm)	755
H1 *	(mm)	984
L1 *	(mm)	420
A1	(mm)	250
Ø D2	(mm)	34
M1	(mm)	M27
L3	(mm)	40
M2	(mm)	M27 / M36 x 1,5
E max.	(mm)	45
G	(inch)	1“
Weight	(kg)	315

* The construction heights H1 of the actuator units vary due to the different lengths of the distance columns L1, which results from the excess length of the stem (S = 98 mm, 130 mm), and the different spring ranges (bench settings) of the actuator units.

Pos.	Description	Material
1	Stem	X20Cr13+QT, 1.4021+QT
2	Bellow seal	EPDM50 or 42CR
3	Stem guiding *	X20Cr13+QT, 1.4021+QT
3.1	Stem guiding *	X20Cr13+QT, 1.4021+QT
3.2	Guiding band *	PTFE + 25%C
3.3	O-ring (stem) *	NBR
3.4	O-ring (guiding) *	NBR
3.5	Scraper *	NBR
4	Retaining ring	FSt - A3B
5	Spring plate	FSt (Fe/Zn12C)
6 / 7	Lower diaphragm casing (DP32-34Tri)	DD13+QT, 1.0335+QT (powder coated)
7	Lower diaphragm casing (DP35)	P265GH, 1.0425 / S235JR, 1.0037
8	Bushing	X20Cr13+QT, 1.4021+QT
9	Diaphragm flange	DD13+QT, 1.0335+QT (Fe/Zn12C) or X20Cr13+QT, 1.4021+QT
10	Rolling diaphragm *	NBR + webbing
11	Diaphragm plate (DP32-34Tri)	DD13+QT, 1.0335+QT (Fe/Zn12C)
11	Diaphragm plate (DP35) *	St 52-3 G 03 g, 1.0570 G 03 g
12	O-ring	NBR
13	Bushing	X20Cr13+QT, 1.4021+QT
14	Flange nut	8 - A4G
15	Compression spring *	FDSiCr
16	Spring centring	DC01, 1.0330 (Fe/Zn12C)
17	Spring centring	St 52-3 G 03 g, 1.0570 G 03 g
18	Upper diaphragm casing (DP32-34Tri)	DD13+QT, 1.0335+QT (powder coated)
18	Upper diaphragm casing (DP35)	P265GH, 1.0425 / S235JR, 1.0037
19	Screwed cap	Polyäthylen
20	Hexagon nut (DP32-34Tri) [1)]	8 - A4G
20	Hexagon nut (DP35) [1)]	C35E, 1.1181
21	Hexagon screw (DP32-34Tri) [1)]	8.8 - A4G
21	Hexagon screw (DP32-34Tri) [1)]	8.8 - A4G
22	Washer	St - A4G
23	Hexagon screw (DP32-34Tri) [1)]	8.8 - A4G
23	Hexagon screw (DP35) [1)]	10.9 - A2G
24	Eye nut [1)]	C15, 1.0401 - A4G
27	Usit-ring	St / NBR
28	Stem extension	X20Cr13+QT, 1.4021+QT
29	Slotted nut	St
30.1	Bellow seal *	X20Cr13+QT, 1.4021+QT
30.2	Guiding band *	PTFE 25%C
30.3	O-ring *	NBR
30.4	O-ring *	NBR
30.5	Scraper *	NBR
31	Intermediate housing	DD13+QT, 1.0335+QT (powder coated)
33	Hexagon nut	8-A4G
34	Stem extension	X20Cr13+QT, 1.4021+QT
36.1	Bellow seal *	X14CrMoS17+QT, 1.4104+QT
36.2	Guiding band *	PTFE +25%C
36.3	O-ring *	NBR
36.4	O-ring *	NBR
36.5	Scraper *	NBR

Pos.	Description	Material
37	Bushing	X20Cr13+QT, 1.4021+QT
38	Hexagon screw	8.8 - A4G
39	Washer	St - A4G
40	Nut	X20Cr13+QT, 1.4021+QT
42	Torsion lock	S235JR, 1.0037
43	Cylinder screw	8.8 - A4G
44	Distance column	11SMn30+C, 1.0715+C (Fe/Zn12C)
47	Stem	X20Cr13+QT, 1.4021+QT
48	Traverse	EN-JS1049, EN-GJS-400-18U-LT (Fe/Zn12C)
50	Axial-washer	St
51	Axial-dial ring	St
52	Threaded bush	CuZn35Ni3Mn2AlPb-R490, CW710R-R490
53	Catch pin	St, Cu
54	Lubricating nipple	5.8 - A4G
55	Covering for traverse	S235JR, 1.0037 (Fe/Zn12C)
58	Handwheel	Fe P01, 1.0330 (epoxy coating)
59	Safety cap	11SMn30+C, 1.0715+C (epoxy coating)
64	Worm gear	
150	Limit stopper	X20Cr13+QT, 1.4021+QT
151	Spring *	FDSiCr
152	Diaphragm flange	X20Cr13+QT, 1.4021+QT
153	Stem ring	X20Cr13+QT, 1.4021+QT
154	Quadring	EPDM
155	Clamp screw	X20Cr13+QT, 1.4021+QT
156	Clamping sleeve	X20Cr13+QT, 1.4021+QT
157	Spacer disc	X20Cr13+QT, 1.4021+QT
158	Grooved pin	A2
159	Slotted nut	17H - A2G
160	Ring bolt	C15E, 1.1141
* Spare parts		

[1)] Studs and nuts at temperatures below -10°C made of A4-70

Application

The single acting pneumatic actuators series DP are designed to be mounted directly on control valves and stop valves. They supply large forces for the valve operation with short (1-10 seconds) lifting times on air supply or on air failure.
Please contact the supplier or manufacturer if there are any questions.

Set up and operation mode

The pneumatic actuators series DP converts pneumatic pressure into a linear travel at the actuator stem. Depending on the air supply pressure and different control signals the actuator is producing appropriate forces at the stem.

Depending on the air supply pressure and different control signals the actuator is producing appropriate forces at the stem.

Thus following operating modes can be achieved: „Extended stem (on air failure) or „Retracted stem (on air failure).

The spring-opposed actuator can be reserved with common tools from direct-acting to reverse acting or vice-versa.
The compression springs and also the rolling diaphragm are laied out for approx. about one million double travels.

Accessories (Observe perm. ambient temperatures for the accessories!)

Valve positioner	The valve travel is alligned according to the signal from the controllers or PLC. - pneumatic - electro-pneumatic (refer to page 14)
Limit switch	For signalling the end-positions of the valve. - electric: electric limit switches (refer to page 14) - inductive: proximity sensors (refer to page 14)
Proximity sensors in housing	For signalling the end-positions of the valve.
Potentiometer in housing	For analogue travel indication. The resistance of the potentiometer is adjusted in proportion to the mechanical positioning of the actuator resp. the valve plug.
Position indicator in housing	For analogue control indication. Supplies a continuous output signal, which is in proportion to the mechanical positioning of the actuator resp. of the valve plug.
3/2-way solenoid valve	Upon loss of electrical power 3/2-way solenoid valves are switching off the air supply to pneumatic actuators whilst at the same function they are venting the air-pressure from the actuator to the atmosphere; thus a single acting pneumatic actuator drives the valve into the fail-safe position. 3/2-way solenoid valves for the reverse function ari available on request..
Lock-up valve	Locks valve in position on air failure until air supply is restored. (refer to page 14)
Air set including gauge	For conditioning the compressed air. (refer to page 14)
Mechanical travel limiter	On request.

Please indicate when ordering:

- Type of actuator
- Operating mode
- Spring range
- Nominal travel
- Connection dimensions of the valve
- Accessories

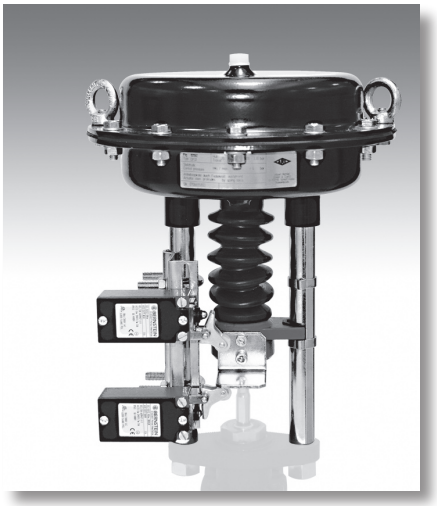
Example:

ARI-DP34, Actuators thrust for operating mode: extended stem on air failure, 1,5-3bar, Travel 50mm, A= 100mm, Valve stem excesslength= 83mm, M2= M12, E= 15mm.

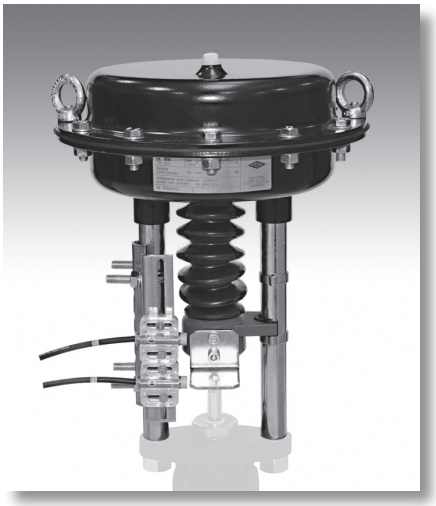
Dimensions in mm
Weights in kg
Pressures in barg (gauge)
1 bar ≙ 10^5 Pa ≙ 0,1 MPa

Smart electro-pneumatic positioner, directly mounted to the actuator

Electro-pneumatic positioner column mounted acc. to DIN IEC 60534 part 6



Limit switch (electric: electric limit switches)



Limit switch (inductive: proximity sensors)

Lock-up valve

Air set including gauge

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