

1133-1135 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

FEATURES

1133 and 1135 butterfly valves are intended for the automatic opening /closing of different usual fluid pipes. The valve body is made of grey cast iron. The different configurations of the butterfly materials and of the liner make it suitable for different applications. This lugged valve with threaded lugs is mounted between PN10/16 flanges. The long neck makes the mounting on heat-insulated pipe installations possible. The ISO 5211 mounting pad allows the actuator to be directly assembled. The AP RE (adjustable stops) pneumatic motorisation is available in double and spring-return with numerous options.

LIMITS OF USE

Fluid pressure: PS	16 bar up to DN 300
Fluid temperature: WT	According to the table below
Prohibited uses	Steam, natural gas
Ambient temperature	-10°C / +80°C
Motor compressed air	mini 6 bar / maxi 10 bar

AVAILABLE MODELS

DN 40 to DN 300.

PN10/16 wafer connections.

Double and spring-return actuator.



Ref.	Butterfly	Liner	Example of applications	WT° min	WT° max
1133	Stainless steel	EPDM	Demineralised water - alkalis	-10°C	+110°C
1135	cast iron	EPDM	Hot water - cold water	-10°C	+110°C

DIRECTIVES AND MANUFACTURING STANDARDS

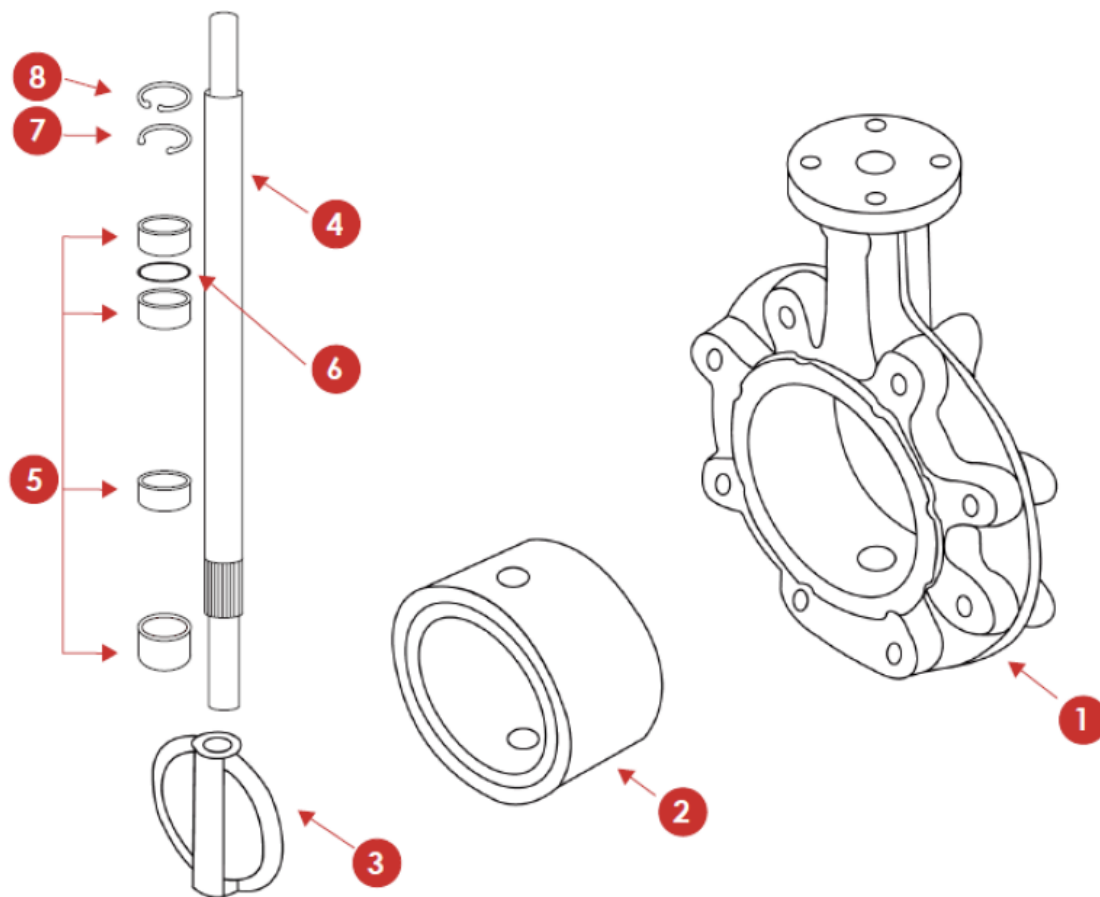
OBJECT	Standard	ON	OBJECT	Standard
Pressure Equipment Directive 2014/68/EC	Cat. III module H	0035	Final test	API 598
Face-to-face dimension	ISO 5752 series 20		Actuator pilot connection	NAMUR
Flange dimension	EN 1092-1		Switch box connection	VDI/VDE 3845
Connection Motorisation	ISO 5211		SIL 3 level (the actuator alone)	EN 61508

Information given as an indication only, and subject to possible modifications

	SECTORIEL S.A. 45 rue du Ruisseau 38290 SAINT QUENTIN-FALLAVIER – FRANCE Telephone: +33 4 74 94 90 70 – Fax: +33 4 74 94 13 95 www.sectoriel.fr / Email : sectoriel@sectoriel.fr	Pages	1/4
		Ref.	FT1135+AP-RE ENG
		Rev.	0
		Date	04/2017

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CONSTRUCTION



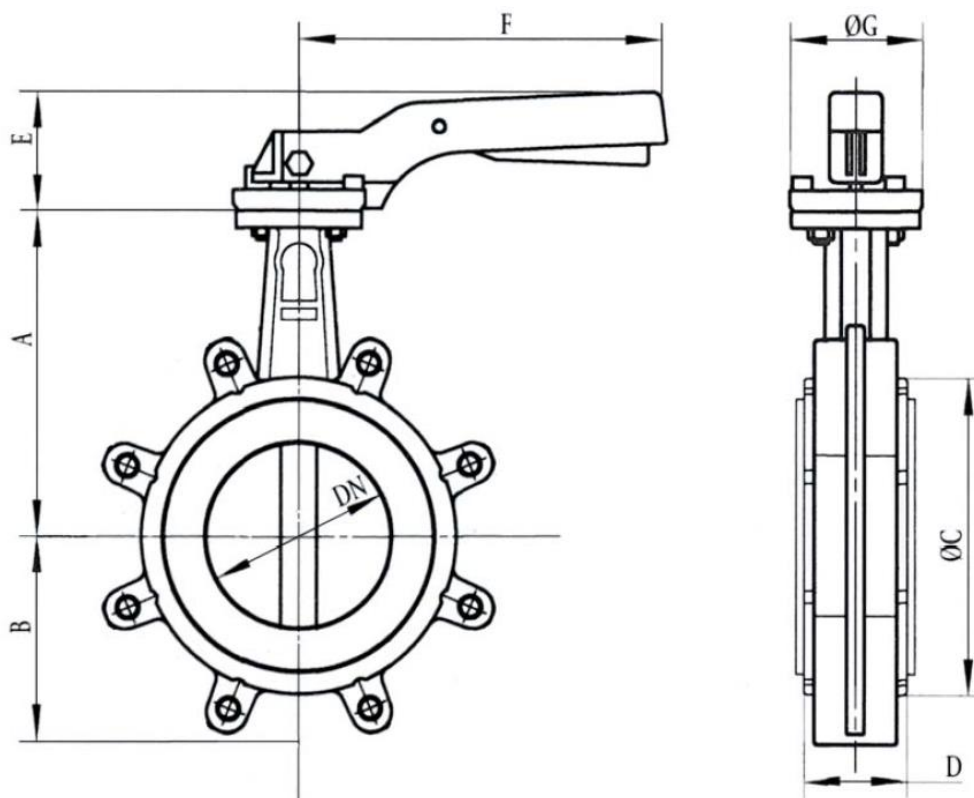
No.	Name	1133	1135
1	Body	EN GJL-250 grey cast iron	
2	Liner	EPDM	EPDM
3	Butterfly	1.4408 SS	EN GJS-400-15 nickel-plated cast iron
4	Crossing stem	416 SS	
5	Bearings	PTFE	
6	O-ring	NBR	NBR
7	Circlips	Steel	
8	Circlips	Steel	

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DIMENSIONS (mm)



DN	40	50	65	80	100	125	150	200	250	300
A	130	136.5	142	158	180	192	215	242	280	310
B	61	77	87.5	95	107	121	144	171	205	235
Ø C	82	95	109	127	152	180	207	260	315	370
D	33	43	46	46	52	56	56	60	68	78
E	74	74	74	74	74	79	79	37	37	37
F	200	200	200	200	200	278	278	355	507	507
Ø G	65	65	65	65	65	90	90	125	150	150
Weight (kg)	2.43	3.13	3.73	4.98	5.64	9.06	10.9	16.7	31.4	42

FLOW-RATE COEFFICIENT Kv (m³/h)

DN	40	50	65	80	100	125	150	200	250	300
Kv	78	98	167	258	512	872	1347	2675	4555	7037

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AP RE PNEUMATIC MOTORISATION

The ALPHAIR RE motorisation proposed as standard comprises:

- rack and pinion actuator of anodised aluminium.
- a safety coefficient of 1.3 minimum compared to the nominal torque of the valve.
- air non-lubricated dry motor, minimum 6 bar pressure.
- an upstream / downstream pressure difference $\Delta P=10$ bar max.

The actuator assembly is of the following types:

- direct assembly with DN 32 to DN 200 aluminium motorisation mounting pad.
- yoke + stainless steel drive according to the EN 15081 standard for DN 250 to 300.

DN	Double-effect	V (litres)	Time (s)*	Spring-return	V (litres)	Time (s)*
40	RE 51	0.23	1	RES 64/6	0.45	1
50	RE 51	0.23	1	RES 64/6	0.45	1
65	RE 64	0.45	1	RES 76/6	0.61	1
80	RE 64	0.45	1	RES 76/6	0.61	1
100	RE 76	0.61	1	RES 101/6	1.80	2
125	RE 76	0.61	1	RES 101/6	1.80	2
150	RE 86	0.98	2	RES 116/6	2.80	2
200	RE 101	1.80	2	RES 126/6	3.70	3
250	RE 116	2.80	2	RES 146/6	4.90	3
300	RE 126	3.70	3	RES 181/6	11.1	5

For any other operating conditions, please contact us.

*indicative time of the no-load actuator for opening or closing.

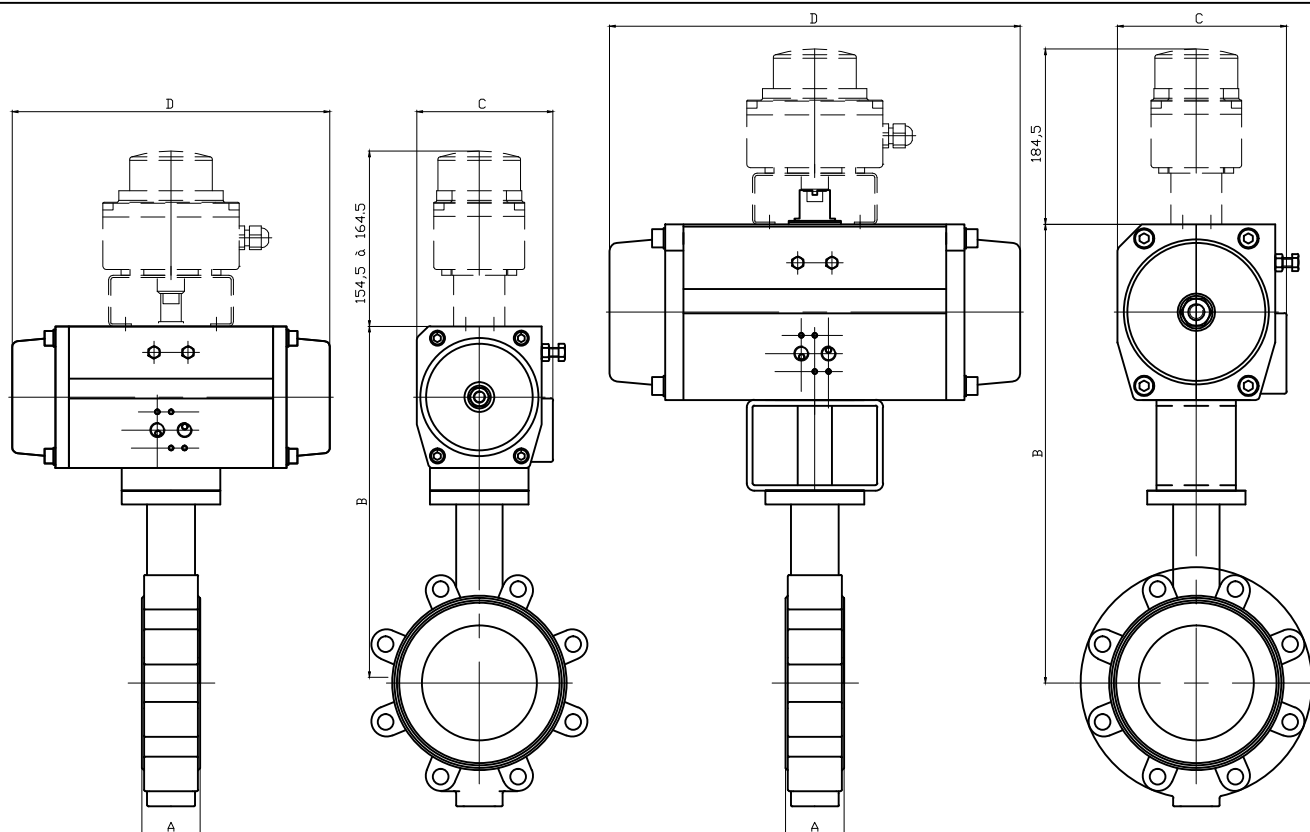
MOTORISATION OPTIONS

1	actuators dimensioned for a compressed air pressure of 3, 4 or 5 bar
2	actuator dimensioned for an upstream / downstream pressure difference ΔP greater than 10 bar
3	actuator with special coatings, stainless steel actuator
4	Actuator for very low (-60°C) or very high ($+150^{\circ}\text{C}$) ambient temperatures.
5	manual override with declutchable gear box
6	compressed air filter regulator
7	All types of piloting solenoid valves
8	all types of switch boxes
9	all types of positioner
10	rapid exhaust, flow-rate limiters - exhaust brakes



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* : montage avec platine H=80mm

DN	40		50		65		80		100	
ALPHAIR	51 RE	64 RES	51 RE	64 RES	64 RE	76 RES	64 RE	76 RES	76 RE	101RES
A	33		43		46		46		52	
B	219	236	226	243	248	264	264	280	302	327
C	75	86	75	86	86	94	86	94	94	120
D	138	155	138	155	155	203	155	203	203	261
KG	3.6	4.3	4.5	5.1	5.4	7.1	6.7	8.3	8.6	12.3

DN	125		150		200		250		300	
ALPHAIR	76 RE	101RES	86 RE	116RES	101 RE	126RES	116 RE	146RES	126 RE	181RES
A	56		56		60		68		78	
B	320	345	353	386	384	415	505*	537*	548*	610*
C	94	120	104	134	120	145	134	165	145	204
D	203	261	239	304	261	333	304	398	333	482
KG	12	15.7	14.8	19.7	22.5	29.6	42.3	50.3	55.4	68.1

Informations données à titre indicatif et sous réserve de modifications éventuelles
Data subject to alteration

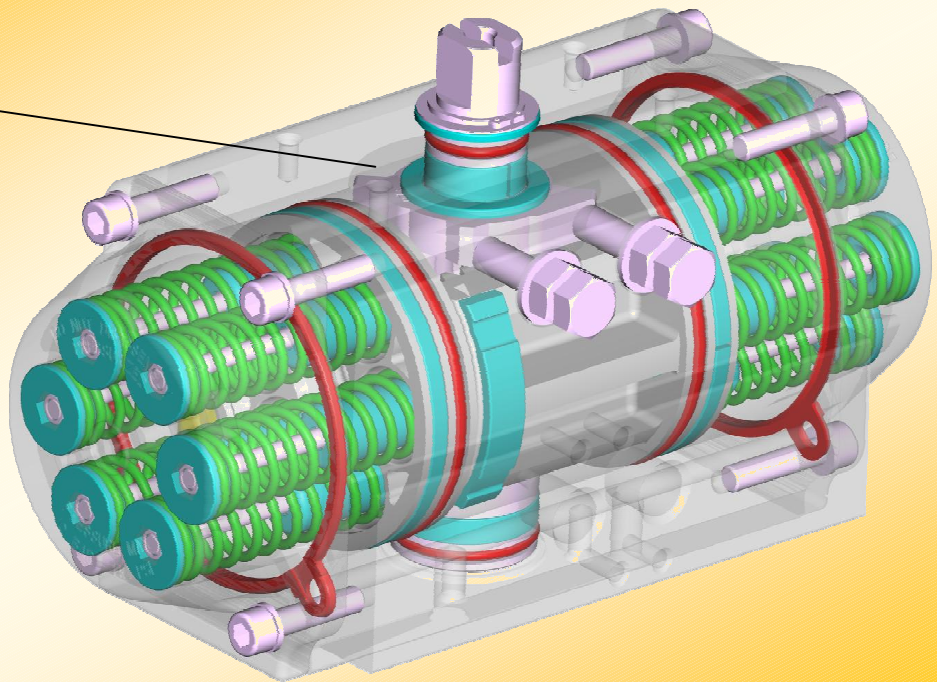
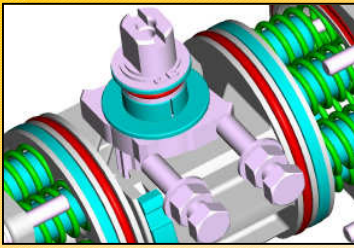
Ech:	Date :03/03/2017	Dessiné par : E.D.	Tolérances générales : +/- 0.2	Modifications	Date	REV.
ROBINET A PAPILLON 1133-1135/BUTTERFLY VALVE 1133-1135 + ACTIONNEUR ALPHAIR RE/PNEUMATIC ACTUATOR ALPHAIR RE + BFC/LIMIT SWITCH BOX				Matière :		
				Poids <Kg> :		
				Traitement : SANS		
 45, Rue du Ruisseau 38297 SAINT QUENTIN FALLAVIER				Plan n° Ens 1281		



ALPHAIR PNEUMATIC ACTUATORS

EXTERNAL ADJUSTMENT

New "RE" SERIES



The new series of ALPHAIR Pneumatic Actuators with special "External Adjustment" system meets every quality and precision requirement.

The new "External Adjustment" system guarantees maximum precision on rotation adjusting, for normal and heavy conditions, in any application field.

Suitable for every requirement, ALPHAIR Pneumatic Actuators with special "External Adjustment" system are carefully designed for maximum torque rating and maximum lifetime.

More compact, heavy and reliable, ALPHAIR Pneumatic Actuators with special "External Adjustment" system can be easily assembled on every kind of valve.

STANDARD VERSION FEATURES

- **ASTM 6063 extruded Aluminium Body**, inside surface finishing Ra= 0,4-0,6. 25 µ Hard Anodizing.
- **EN AB 46100 die-cast Aluminium alloy Pistons**, 15 micron Anodizing.
- **EN AB 46100 die-cast Aluminium alloy Covers**, painted with 60-80 µ polyester powder.
- **Carbon steel Shaft**, 20 µ nickel-plated. Stainless Steel AISI 304 (A2) or AISI 316 (A4) as Optional.
- **External adjusting gear**, in Stainless Steel AISI 316 (A4).
- Screws in Stainless Steel AISI 304 (A2).
- Seals in nitrile nubber NBR.
- Optional HIGH Temperature = FPM/FKM. Optional LOW Temperature = SILICONE.
- Bearings in low friction LAT-LUB acetalic resin, easily replaceable for maintenance.
- Optional HIGH/LOW Temperature = PA 66. Optional VERY LOW Temperature = LEXAN.
- Pre-compressed Spring Cartridges, easily replaceable for maintenance, 25-30 micron polyester painted.
- Standard grease: High performances Syntetic Grease. Optional: special grease for HIGH/LOW Temperature.
- Several special protections available for chemical, pharmaceutical, food and industrial environments.
 - Rotation adjustment $\pm 5^\circ$ in both opening and closing position. Assembly precision $\pm 1^\circ$, made by electronic devices.
 - Double lower drilling for valve fastening and centering, according to **ISO 5211-DIN 3337 Standards**.
 - Double square lower female shaft key (starlike), according to **ISO 5211-DIN 3337 Standards** for assembly on valves with square key on line (0°) and diagonal key (45°).
 - Solenoid connections according to **NAMUR VDI\VDE-3845 Standards**.
 - Top drilling for accessories fastening, and upper shaft end according to **NAMUR VDI\VDE-3845 Standards**.
 - Position indicator on request, enabling switch-box assembly on top.
 - Aluminium adhesive nameplates, with progressive serial number punched.
 - Lubrication carried out by the manufacturer, guaranteed for min. 1.000.000 operations.
 - Running test and 100% seal test carried out with electronic equipment and certification of every individual product.
 - Standard execution for temperatures from -20°C to $+80^\circ\text{C}$ (optional, special execution for extreme temperatures).
 - Conformity for use in explosive environment; Ex II 2 GD "c" protection type.
 - According to EN 15714-3 design and manufacture standard requirements.

AIR SUPPLY	TEMPERATURE RANGE	FEEDING PRESSURE	ROTATION ADJUSTING
Dry or lubricated filtered compressed air.	Standard HIGH Temperature LOW Temperature VERY LOW Temperature	8 bar/120 psi – CONTINUOUS 10 bar/142 psi - MAXIMUM	$\pm 5^\circ$
	$-20^\circ + 80^\circ\text{C} (-4 + 175^\circ\text{F})$ $-20^\circ + 150^\circ\text{C} (-4 + 300^\circ\text{F})$ $-40^\circ + 80^\circ\text{C} (-40 + 175^\circ\text{F})$ $-60^\circ + 80^\circ\text{C} (-76 + 175^\circ\text{F})$		

DOUBLE ACTING TORQUES IN Nm

RE Series = 90°

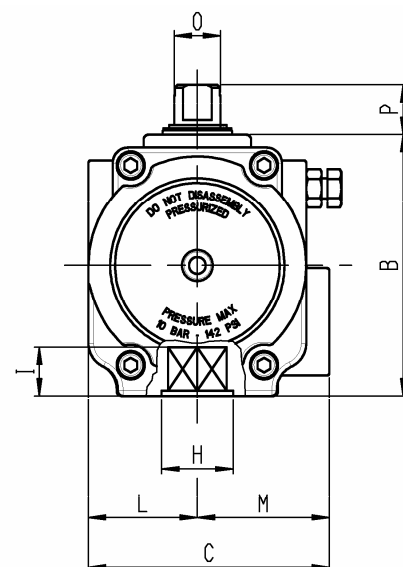
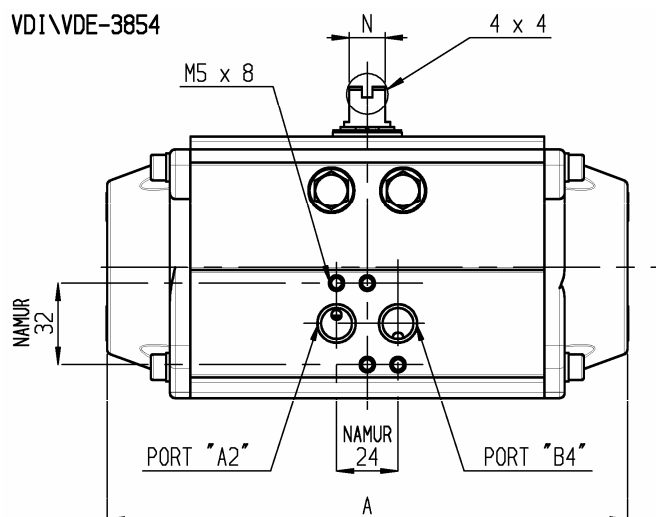
TYPE	AIR SUPPLY IN BAR									
	1	2	3	4	5	6	7	8	9	10
RE 043	-	-	6,5	8,7	10,9	13,0	15,2	17,3	19,5	21,7
RE 051	3,3	6,7	10,0	13,4	16,7	20,1	23,4	26,8	30,1	33,5
RE 064	5,9	11,8	17,8	23,7	29,6	35,5	41,4	47,4	53,3	59,2
RE 076	11,8	23,5	35,3	47,1	58,9	70,6	82,4	94,2	105,9	117,7
RE 086	17,2	34,5	51,7	68,9	86,1	103,4	120,6	137,8	155,0	172,3
RE 101	27,5	54,9	82,4	109,8	137,3	164,8	192,2	219,7	247,1	274,6
RE 116	43,7	87,4	131,1	174,9	218,6	262,3	306,0	349,7	393,4	437,1
RE 126	56,6	113,3	169,9	226,5	283,2	339,8	396,4	453,0	509,7	566,3
RE 146	88,4	176,7	265,1	353,4	441,8	530,1	618,5	706,9	795,2	883,6
RE 161	114,9	229,7	344,6	459,5	574,3	689,2	804,1	918,9	1034	1149
RE 181	156,6	313,1	469,7	626,3	782,9	939,4	1096	1253	1409	1565
RE 201	215,3	430,6	646,0	861,3	1077	1292	1507	1723	1938	2153
RE 241	372,5	745,0	1118	1490	1863	2235	2608	2980	3353	3725
RE 271	539,2	1078	1617	2157	2696	3235	3774	4314	4853	5392
RE 331	911,5	1823	2734	3646	4558	5469	6835	7292	8204	9115
RE 421	1671	3342	5013	6684	8354	10025	11696	13367	-	-

SINGLE ACTING TORQUES IN Nm

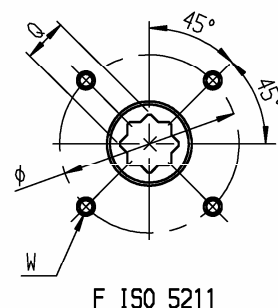
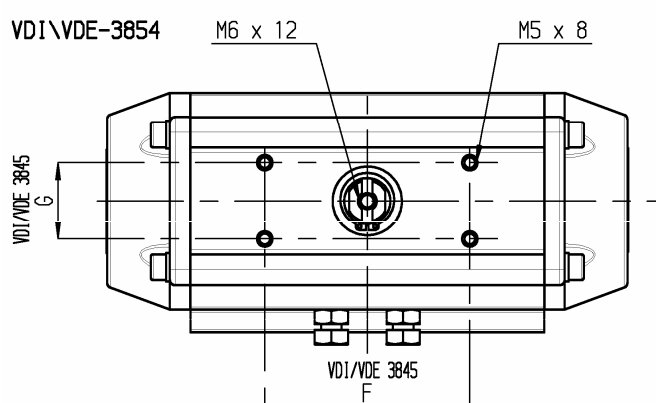
RE Series = 90°

TYPE	SPRINGS for each piston side	AIR SUPPLY IN BAR												SPRINGS TORQUE	
		3		4		5		6		7		8			
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°
RE 043	3	-	-			7,1	4,1	9,3	6,3	11,5	8,5	13,7	10,7	6,8	3,8
	4							8,1	4,1	10,2	6,2	12,4	8,4	9,0	5,0
RE 051	3	5,8	4,3	9,1	7,6	12,5	10,9	15,8	14,3	19,2	17,6	22,5	21,0	5,8	4,3
	4	4,4	2,3	7,8	5,7	11,1	9,0	14,4	12,3	17,8	15,7	21,1	19,0	7,8	5,7
	5			6,3	3,7	9,7	7,1	13,0	10,4	16,4	13,8	19,7	17,1	9,7	7,1
	6					8,2	5,1	11,6	8,5	14,9	11,8	18,3	15,2	11,6	8,5
RE 064	3	10,7	7,1	16,6	13,0	22,5	18,9	28,5	24,8	34,4	30,8	40,3	36,7	10,7	7,1
	4	8,4	3,5	14,3	9,4	20,2	15,4	26,1	21,3	32,0	27,2	38,0	33,1	14,3	9,4
	5			11,9	5,9	17,8	11,8	23,8	17,7	29,7	23,6	35,6	29,6	17,8	11,8
	6					15,5	8,2	21,4	14,1	27,3	20,1	33,2	26,0	21,4	14,1
RE 076	3	21,1	14,3	32,8	26,0	44,6	37,8	56,4	49,6	68,1	61,3	79,9	73,1	21,1	14,3
	4	16,3	7,2	28,1	19,0	39,8	30,8	51,6	42,5	63,4	54,3	75,2	66,1	28,1	19,0
	5			23,3	12,0	35,1	23,8	46,9	35,5	58,6	47,3	70,4	59,1	35,1	23,8
	6					30,3	16,7	42,1	28,5	53,9	40,3	65,6	52,0	42,1	28,5
RE 086	3	33,8	17,8	51,1	35,1	68,3	52,3	85,5	69,5	102,7	86,7	120,0	104,0	33,8	17,8
	4	27,9	6,6	45,1	23,8	62,3	41,0	79,6	58,2	96,8	75,5	114,0	92,7	45,1	23,8
	5			39,2	12,5	56,4	29,7	73,6	47,0	90,8	64,2	108,1	81,4	56,4	29,7
	6					50,4	18,5	67,7	35,7	84,9	52,9	102,1	70,1	67,7	35,7
RE 101	3	50,1	32,3	77,5	59,7	105,0	87,2	132,5	114,7	159,9	142,1	187,4	169,6	50,1	32,3
	4	39,3	15,6	66,8	43,0	94,2	70,5	121,7	98,0	149,2	125,4	176,6	152,9	66,8	43,1
	5			56,0	26,4	83,5	53,8	110,9	81,3	138,4	108,7	165,9	136,2	83,5	53,8
	6					72,7	37,1	100,2	64,6	127,6	92,0	155,1	119,5	100,2	64,6
RE 116	3	80,7	50,5	124,4	94,2	168,1	137,9	211,8	181,6	255,5	225,3	299,3	269,0	80,7	50,5
	4	63,9	23,5	107,6	67,3	151,3	111,0	195,0	154,7	238,7	198,4	282,4	242,1	107,6	67,3
	5			90,8	40,4	134,5	84,1	178,2	127,8	221,9	171,5	265,6	215,2	134,5	84,1
	6					117,7	57,2	161,4	100,9	205,1	144,6	248,8	188,3	161,4	100,9
RE 126	3	105,0	64,9	161,6	121,5	218,2	178,2	274,9	234,8	331,6	291,4	388,1	348,0	105,0	64,9
	4	83,3	29,9	140,0	86,5	196,6	143,2	253,2	199,8	309,9	256,4	366,5	313,0	140,0	86,6
	5			118,3	51,5	175,0	108,2	231,6	164,8	288,2	221,4	344,8	278,1	175,0	108,2
	6					153,3	73,2	210,0	129,8	266,6	186,4	323,2	243,1	210,0	129,8
RE 146	3	162,5	102,6	250,8	190,9	339,2	279,3	427,5	367,7	515,9	456,0	604,3	544,4	162,5	102,6
	4	128,3	48,4	216,6	136,8	305,0	225,1	393,3	313,5	481,7	401,9	570,1	490,2	216,6	136,8
	5			182,4	82,6	270,8	171,0	359,1	259,3	447,5	347,7	535,9	436,0	270,8	171,0
	6					236,6	116,8	324,9	205,2	413,3	293,5	501,7	381,9	325,0	205,2
RE 161	3	202,7	141,9	317,5	256,8	432,4	371,6	547,3	486,5	662,1	601,4	777,0	716,2	202,7	141,9
	4	155,3	74,3	270,2	189,2	385,1	304,1	499,9	418,9	614,8	533,8	729,7	648,7	270,2	189,2
	5			222,9	121,6	337,8	236,5	452,6	351,4	567,5	466,2	682,4	581,1	337,8	236,5
	6					290,4	168,9	405,3	283,8	520,2	398,6	635,0	513,5	405,3	283,8
RE 181	3	281,6	188,2	438,1	344,7	594,7	501,3	751,3	657,9	907,8	814,5	1064	971,0	281,5	188,2
	4	218,8	94,3	375,4	250,9	532,0	407,5	688,5	564,0	845,1	720,6	1002	877,2	375,4	250,9
	5			312,7	157,0	469,3	313,6	625,8	470,2	782,4	626,8	939,0	783,3	469,3	313,6
	6					406,5	219,8	563,1	376,3	719,7	532,9	876,2	689,5	563,1	376,3
RE 201	3	386,2	259,8	601,5	475,13	816,8	690,5	1032	905,8	1247	1121	1436	1336	386,2	259,8
	4	299,6	131,1	514,9	46,4	730,2	561,8	945,5	777,1	1160	992,4	1376	1208	514,9	346,4
	5			428,3	217,7	643,6	433,0	858,9	648,4	1074	863,7	1290	1079	643,6	433,0
	6					557,0	304,3	772,3	519,6	987,6	735,0	1203	950,3	772,3	519,6
RE 241	3	664,0	453,6	1037	826,2	1409	1199	1782	1571	2154	1944	2527	2316	664,0	453,6
	4			885,4	604,8	1258	977,4	1630	1350	2003	1722	2376	2095	885,4	604,8
	5					1107	756,0	1479	1129	1852	1501	2224	1874	1107	756,0
	6					955,5	534,7	1328	907,2	1701	1280	2073	1653	1328	907,2
RE 271	3	912,5	705,1	1452	1244	1991	1783	2530	2323	3069	2862	3608	3401	912,5	705,1
	4			1217	940,2	1756	1479	2295	2019	2834	2558	3373	3097	1217	940,1
	5					1521	1175	2060	1714	2599	2144	3138	2793	1521	1175
	6					1286	871,0	1825	1410	2364	1954	2903	2489	1825	1410
RE 331	3	1626	1108	2538	2020	3450	2931	4361	3843	5273	4755	6184	5666	1626	1108
	4			2168	1477	3080	2389	3992	3301	4903	4212	5815	5123	2168	1477
	5					2711	1847	3622	2759	4534	3670	5445	4582	2711	1847
	6					2341	1305	3253	2216	4165	3128	5076	4040	3253	2216
RE 421	3	2999	2014	4670	3685	6340	5356	8011	7026	9682	8697	11353	10368	2999	2014
	4	2327	1014	3998	2685	5669	4356	7340	6027	9011	7698	9369	8369	3998	2685
	5			3327	1685	4998	3356	6669	5027	8340	6698	8369	8369	4998	3356
	6					4327	2357	5997	4028	7668	5698	7369	7369	5997	4028
Torque by air														Torque by springs	

VDI/VDE-3854



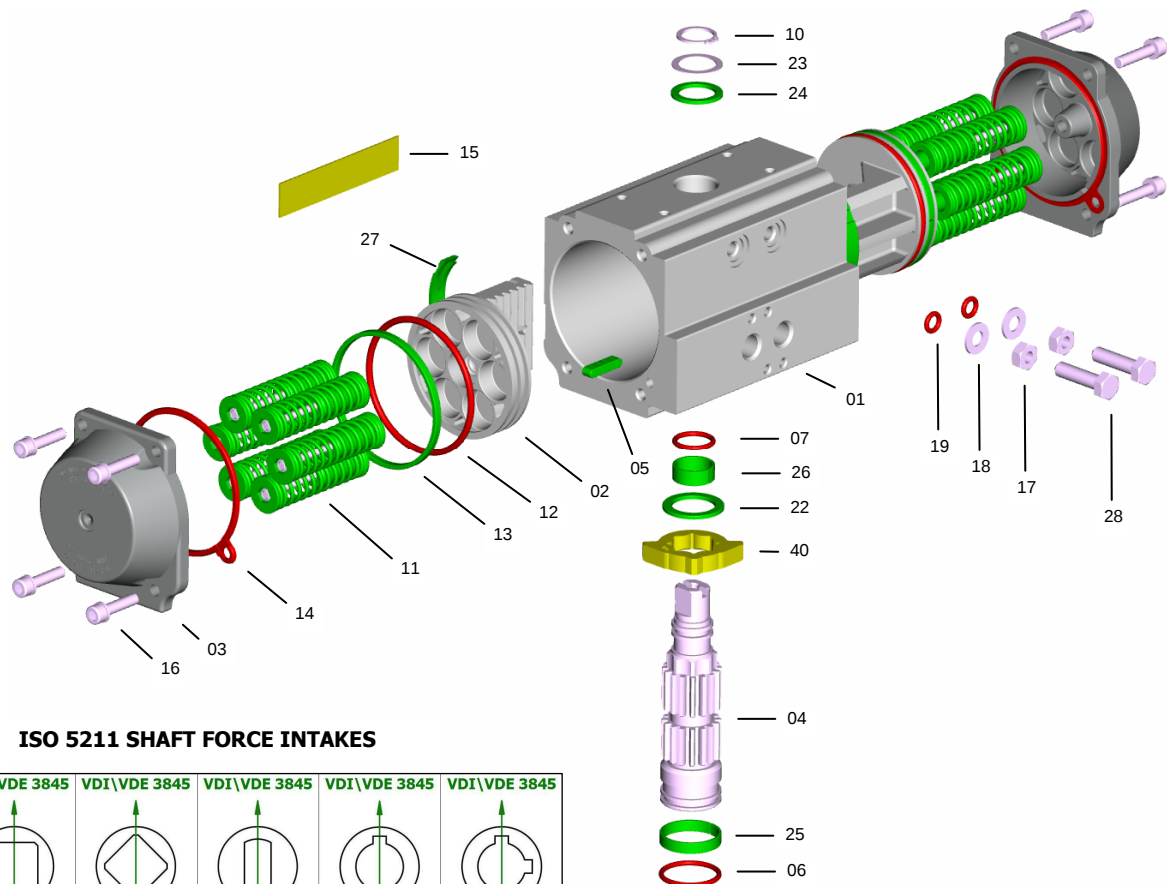
VDI/VDE-3854



POSITION	TYPE															
	RE 043	RE 051	RE 064	RE 076	RE 086	RE 101	RE 116	RE 126	RE 146	RE 161	RE 181	RE 201	RE 241	RE 271	RE 331	RE 421
A-90°	141	138	155	203	239	261	304	333	398	424	482	528	604	684	850	940
B	62	69	86	102	112	127	145,5	157,5	177	196	220	246	298	332	414	542
C	63,5	75	86	94	104	120	133,5	144,5	164,5	182	203,5	222	300	352	400	528
VDI/VDE 3845 F x G	50 x 25	80 x 30					80 x 30 130 x 30		130 x 30							200 x 50
L	27	33,5	38	42,5	49	55	63,5	69,5	80,5	89	99,5	110	150	176	190	234
M	36,5	41,5	48	51,5	55	65	70	75	84	93	104	112	150	176	210	294
Port A Port B DIN 259	1/8" GAS-NPT		1/4" GAS-NPT										1/2" GAS-NPT			
N x O	8 x 12			14 x 18			27 x 36				32 x 42		42 x 60	55 x 80		
P	20						30			50						80
Q x I	9 x 10 11 x 13	9 x 10 11 x 13	9 x 10 11 x 13 14 x 16	11 x 13 14 x 16 17 x 20	14 x 16 17 x 20	14 x 16 17 x 20 22 x 25	17 x 20 22 x 25	17 x 20 22 x 25 27 x 29	22 x 25 27 x 29	22 x 25 27 x 29	27 x 29 36 x 39	27 x 29 36 x 39	36 x 39 46 x 50	36 x 39 46 x 50	*46 x 50 55 x 60	*55 x 60 75 x 80
F ISO 5211	F04	F04	F05/07	F05/07	F05/07	F07/10	F07/10	F07/10	F10/12	F10/12	F10/12	F14	F14	F16	F16/25	F25/30
Optional	F03/05	F03/05	F3/5/7 F04			F5/7/10		F7/10/12			F14	F10/12	F(12)/16 F16	F(12)/16 F14		F(16) /25/30

POSITION	F ISO 5211											
	F03	F04	F03/05	F05	F05/07	F5/7/10	F07/10	F10/12	F14	F16	F25	F30
Ø (W)	Ø 36 (M5x8)	Ø 42 (M5x8)	Ø 36 (M5x8) Ø 50 (M6x9)	Ø 50 (M6x9)	Ø 50 (M6x9) Ø 70 (M8x12)	Ø 50 (M6x9) Ø 70 (M8x12) Ø 102 (M10x15)	Ø 70 (M8x12) Ø 102 (M10x15)	Ø 102 (M10x15) Ø 125 (M12x18)	Ø 140 (M16x24)	Ø 165 (M20x30)	Ø 254 (M16x24) N°8 FORI	Ø 298 (M20x35) N°8 FORI
H	25	30	25	35	35 (RE 086=40)	40	55	85 (RE 161=75)	100	130	200	200

CONSTRUCTION PARTS - SPECIFICATIONS



ISO 5211 SHAFT FORCE INTAKES

VDI\UDE 3845	VDI\UDE 3845	VDI\UDE 3845	VDI\UDE 3845	VDI\UDE 3845	VDI\UDE 3845
STANDARD ALPHAIR S = L\D	L	D	H	V	W

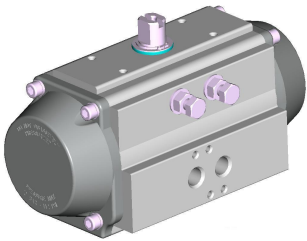
PART	QUANTITY	DESCRIPTION	MATERIAL	SPECIFICATION	PROTECTION
1	1	Body	Extruded aluminium alloy	EN AW 6063 T6	A - N - TF
2	2	Piston	Aluminium alloy	EN AB 46100 T6	A
3	2	Cover	Aluminium alloy	EN AB 46100 T6	N - V - TF
4	1	Shaft	Carbon steel optional S.S. AISI 304 (A2) optional S.S. AISI 316 (A4)	ASTM A105	N
5 *	2	Antiejection key	Acetalic resin - PA66 - PA66 - LEXAN		
6 *	1	Lower shaft O-Ring	NBR - FPM\FKM - Silicone		
7 *	1	Upper shaft O-Ring	NBR - FPM\FKM - Silicone		
10 *	1	Seeger ring	Carbon steel		N
11	0-12	Spring cartridge	Carbon steel, PA 66, S.S.	C-98	V
12 *	2	Piston O-Ring	NBR - FPM\FKM - Silicone		
13 *	2	Piston head bearing	Acetalic resin - PA66 - PA66 - LEXAN		
14 *	2	Cover gasket	NBR - FPM\FKM - Silicone		
15	1	Nameplate	Aluminium		
16	4+4	Cover fastening screw	Stainless Steel	AISI 304 (A2)	
17	2	Nut	Stainless Steel	AISI 304 (A2)	
18	2	Washer	Stainless Steel	AISI 304 (A2)	
19 *	2	O-Ring	NBR - FPM\FKM - Silicone		
22 *	1	Gear antifriction washer	Acetalic resin - PA66 - PA66 - LEXAN		
23 *	1	Shaft thrust washer	Stainless Steel	AISI 304 (A2)	
24 *	1	Shaft antifriction washer	Acetalic resin - PA66 - PA66 - LEXAN		
25 *	1	Lower shaft pilot ring	Acetalic resin - PA66 - PA66 - LEXAN		
26 *	1	Upper shaft pilot ring	Acetalic resin - PA66 - PA66 - LEXAN		
27 *	2	Piston bearing	Acetalic resin - PA66 - PA66 - LEXAN		
28	2	Adjusting gear screw	Stainless Steel	AISI 304 (A2)	
40	1	Adjusting gear	Stainless Steel	AISI 316 (A4)	

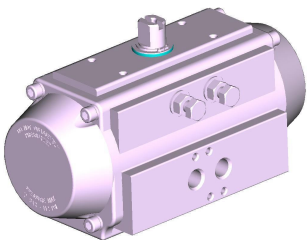
* SPARE PARTS SET: Standard, Special HIGH Temperatures, Special LOW Temperatures, Special EXTRA LOW Temperatures

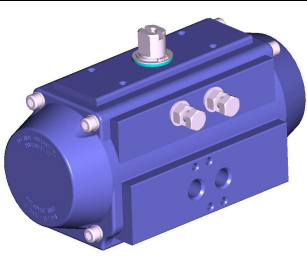
Protections

A = Anodizing N = chemical Nickel-plating V = Painting TF = Anodizing+PTFE

COATINGS – MATERIAL TREATMENTS

	AV	DESCRIPTION				USED FOR
		Body	Covers	Pistons	Shaft	
		Anodizing	Polyester painting	Anodizing	High phosphorous nickel-plating (12%) opt. AISI 304 (A2) opt. AISI 316 (A4)	
	Colour	Grey	Grey	Brown	Polished steel	- Industry, general use.
	Thickness	25 µ	60/80 µ	15 µ	20 µ	

	NN	DESCRIPTION				USED FOR
		Body	Covers	Pistons	Shaft	
		High phosphorous nickel-plating (12%)	High phosphorous nickel-plating (12%)	Anodizing	High phosphorous nickel-plating (12%) opt. AISI 304 (A2) opt. AISI 316 (A4)	
	Colour	Polished steel	Polished steel	Brown	Polished steel	- Industry, general use. - Caustic soda. - Detergents. - Low alkaline solutions.
	Thickness	20 µ	20 µ	15 µ	20 µ	

	TF TF	DESCRIPTION				USED FOR
		Body	Covers	Pistons	Shaft	
		Anodizing + PTFE coating	Anodizing + PTFE coating	Anodizing	High phosphorous nickel-plating (12%) opt. AISI 304 (A2) opt. AISI 316 (A4)	
	Colour	Blue	Blue	Brown	Polished steel	- Industry, general use. - Low alkaline and low acid solutions. - Marine environments. - High temperatures.
	Thickness	Anodizing 25 µ PTFE 15 µ	Anodizing 15 µ PTFE 15 µ	15 µ	20 µ	

ANODIZING

Anodizing is an electrolytic process that produces anodic coating on aluminum, called alumine, with high thickness. Alumine is one of the most hard known materials, with resistance values up to 400-600 HV (45-65 HRC); properties and features of Anodizing (alumine thickness 25 micron) are well known and appreciated both for mechanical and chemical resistance.

- **Best friction and corrosion resistance, best surface hardness, good thermic and electrical insulation.**

ELECTROLESS NICKEL-PLATING

Chemical nickel-plating is an electroless coating process that gives nickel layers at extremely constant thickness also on sharp angles, blind-holes, threads and grooves recess. During the process, nickel is combined with phosphor at a percentage of 12% (high-phosphor). The obtained surface hardness is about 400-480 HV (45-55 HRC).

- **Best friction and corrosion resistance, best surface hardness, best external appearance similar to S.S., increased resistance to alkali and detergents in sanitary and food applications.**

POLYESTER PAINTING

Polyester painting is obtained through powder coatings on polarized parts, by means of light differences in electrical potentials. After applications, parts are baked in order to polymerize and let the painting be spread to avoid micro-porosity. The best elasticity can be obtained at 60/80 micron thickness; a satisfactory adhesion can be assured by sandblasting or brushing, and by special degreasing baths of the rough pieces to be treated.

- **Better corrosion resistance, protection against crashes, better external appearance and several available colours, resistance to chemicals.**

ANODIZING + PTFE COATING

As further improvement of the hard anodizing treatment on aluminium alloys, protective coatings made of PTFE are used; this material is known for its particular chemical and physical features. On these double treated surfaces, oxide hardness and low roughness (internal slipping parts) is summed to the chemical resistance and the excellent qualities as a thermic barrier of PTFE (external surface, subject to corrosion).

- **Better corrosion resistance, protection against high temperatures and crashes, extreme resistance to chemicals and in marine environments.**

AISI 304 (A2) OR AISI 316 (A4) STAINLESS STEEL SHAFT - OPTIONAL

AISI 304 (A2) and AISI 316 (A4) Stainless Steel shafts, with their great corrosion resistance, are recommended for special applications such as: marine and chemical environments, food and pharmaceutical industry, high temperature applications.



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