

## 1150-1153-LT10 BUTTERFLY VALVES WITH AP RE & RES PNEUMATIC ACTUATOR

### FEATURES

1150-1153-LT10 butterfly valves are intended for the automatic opening /closing of very diverse fluid pipes. The valve body is made of GS cast iron. The different configurations of the butterfly materials and of the liner make it suitable for many applications. Wafer mounting with centring ears between PN10/16 and ANSI 150 flanges. 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.


 Lloyd's  
 Register  
 PED/2014/68/UE

 Bureau  
 Veritas  
 Marine & Offshore  
 Division

 ISO  
 9001

 3.1  
 Cert.


### LIMITS OF USE

Fluid pressure: PS	10 bar
Test pressure: PT	30 bar
Fluid temperature: WT	According to the table below
Ambient temperature	-15°C / +80°C
Motor compressed air	Mini 6 bar / maxi 10 bar



### AVAILABLE MODELS

DN 32-40 to DN 300.

Connection between flanges PN10/16 and ANSI 150 RF.

Double and spring-return actuator.

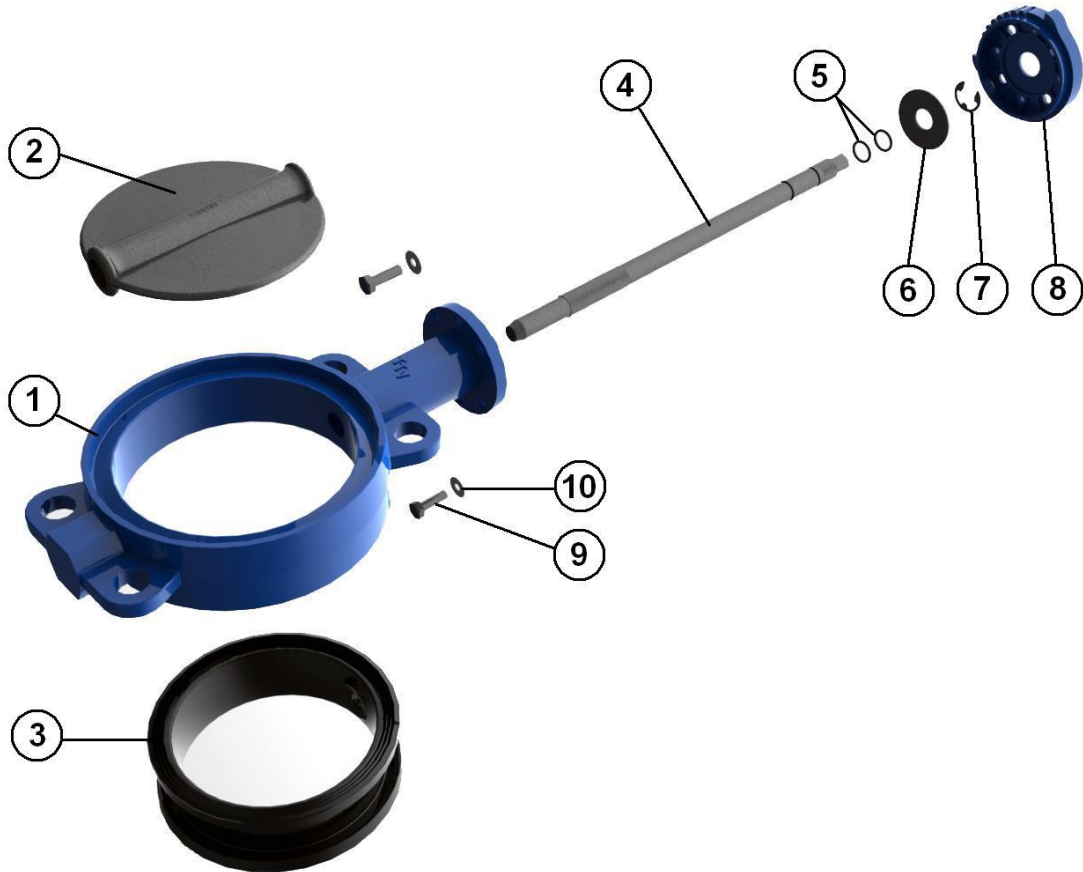
Ref.	Butterfly	Liner	Example of applications	WT° min	WT° max
1150	316 SS / GS cast iron	EPDM	Cold water – warm water (110°C at peak) - ACS	-10°C	+110°C
1153	316 SS	EPDM	Demineralised water – alkalis (110°C at peak) - ACS	-10°C	+110°C

### DIRECTIVES AND MANUFACTURING STANDARDS

OBJECT	Standard	ON	OBJECT	Standard
Pressure Equipment Directive 2014/68/EC	Cat. III modules B+C1	0094	Final test	ISO 5208
ATEX Directive	II 2G/D Tx zones 1,2,21 and 22	0038	Face-to-face dimension	ISO 5752 series 20
Flange dimension	EN 1092-1		Actuator pilot connection	NAMUR
Connection Motorisation	ISO 5211:		Switch box connection	VDI/VDE 3845
Sanitary conformity	ACS No. 07 ACC LY 504		Pneumatic actuator	EN 12517-3
SIL 3 level (Valve)	IEC 61508	TÜV	SIL 3 level (the actuator alone)	NKS 61508

## 1150-1153-LT10 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

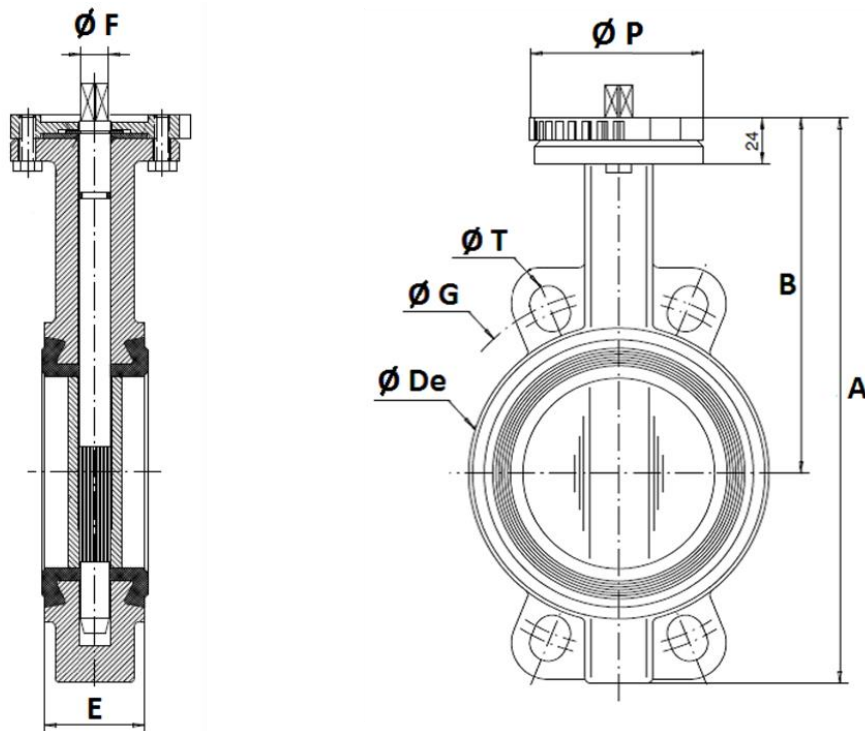
### CONSTRUCTION



No°	Name	1150	1153
1	Body	GS EN GJS-500-7 cast iron	
2	Butterfly DN32-100	1.4408 SS	
3	Butterfly DN125-400	GS EN GJS-500-7 cast iron	1.4408 SS
3	Liner	EPDM	EPDM
4	Stem	420 SS	304 SS
5	O-ring	EPDM	EPDM
6	Ring	Steel	
7	Circlips	Steel	
8	ISO mounting pad	aluminium	
9	Screw	5.6 Steel	
10	Washer	Steel	

## 1150-1153-LT10 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

### DIMENSIONS (mm)



DN	32-40	50	65	80	100	125	150	200	250	300
A	206	228	248	265	298	331	349	430	461	524
B	140	156	161	169	187	206	215	255	248	280
$\varnothing De$	82	102	119	135	155	185	208	270	328	381
E	33	43	46	46	52	56	56	60	68	78
$\varnothing F$	9.5	9.5	12.5	14	14	17	17	21	23	26.5
$\varnothing G$	110	125	145	160	180	210	240	295	350	400
$\varnothing P$	88	88	88	88	88	105	105	105	150	150
$\varnothing T$	18	18	18	18	18	18	23	23	23	23
Weight (kg)	2,46	3,66	4,40	4,60	6	7,60	9,20	14,7	24,7	33

### FLOW-RATE COEFFICIENT Kv (m<sup>3</sup>/h)

DN	32-40	50	65	80	100	125	150	200	250	300
Kv	70	109	200	334	551	901	1427	2383	3825	5659

## 1150-1153-LT10 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

### 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 DN 300.

DN	Double-effect	V (litres)	Time (s)*	Spring-return	V (litres)	Time (s)*
32-40	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 86/6	0.98	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.

### INSTALLATION IN AN ATEX ZONE

For 1150-LT10+AP RE automatic valves to be installed in ATEX 1, 2, 21 or 22 zones, this has to be specified when ordering. Our services will check of the assembly, the installation of an earthing braid, and will issue an assembly certificate. Our authorised technicians carry out these operations in the workshop. Please contact us.

The special assembly and maintenance instructions for motorised valves in the ATEX zones must be followed.

### 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 $\Delta P$ greater than 10 bar
3	actuator with special coatings, stainless steel actuator
4	Actuator for very low (-60°C) or very high (+150°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



### OPTIONS ON THE VALVE

1	Carbon steel body, 304 and 316 SS, bronze and aluminium
2	Carbon steel butterfly, 304 and 316 SS, copper-alu, Uranus, Hastelloy
3	Hypalon liner, silicone steam, white EPDM, natural rubber, neoprene, vulcanised
4	Stems of 420, 304, 316 SS, Hastelloy

## 1150-1153-LT10 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

### 114x, 115x AND 116x VALVES + AP ACTUATOR ASSEMBLY AND MAINTAINANCE INSTRUCTIONS

#### 1 / CAUTION

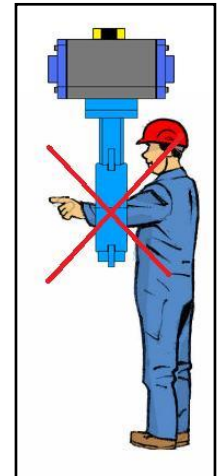


##### 1.1 - Cutting or crushing hazard

Never operate an automatic butterfly valve before its full assembly on the pipe installation. The accidental operation of the butterfly could lead to crushing or cutting of the operator's hand or arm.

##### 1.2 - Burn hazard

114x, 115x and 116x +AP automatic valves can include a pilot-operated solenoid valve coil. The coil is intended to be permanently powered. In such a case, the coil could become very hot, hence you should not touch the coil to avoid a burn hazard.



#### 2 / CHECKS AT ACCEPTANCE

##### 2.1 - order number check

The valve code is shown on the SECTORIEL label affixed on the actuator. Check that the code is identical with that shown on the delivery slip and the acknowledgement of receipt of your order.

##### 2.2 - valve diameter check

The valve code is also shown on the SECTORIEL label affixed on the actuator. Check that the diameter matches that of your pipe installation.

##### 2.3 - flange standard check

114x and 115x +AP valves have smooth lugs for mounting between PN10/16 flanges as per the EN 1092-1 standard and ANSI 150 as per the ANSI B16.5 standard. Check that the flanges of the pipe installation correspond to one of these standards.

The 1160-61-62-63-64 valves have internally threaded lugs. They are compatible with PN10/16 flanges up to DN150 and PN10 from DN200 to DN300 as per the EN 1092-1 standard. Check that the pipe installation is as per the standard.

##### 2.4 - power supply voltage check

The power supply voltage of the pilot solenoid valve is shown on the coil. Check that the voltage matches that expected for the control of the automatic valve.

##### 2.5 - compressed air supply pressure check

The supply pressure of the actuator is shown on the actuator's plate. Check that the compressed air network feeding the valve is indeed at this pressure. If need be, install a regulator filter upstream.

##### 2.6 - fluid and ambient temperature parameter check

The pressure and temperature limits for the valve in service are shown in the table below. Check that, for your service, the pressure and temperature are compatible with the limits.

**SECTORIEL**  
38290 - FRANCE

SERIAL NUMBER  VALVE

CODE  DN

ACTIO  MO

Read the mounting and servicing instructions carefully

## 1150-1153-LT10 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

Fluid pressure: WP	16 bar up to DN 200 10 bar up to DN 400
Fluid temperature: WT	According to the table below
Ambient temperature	-15°C / +80°C
Motor compressed air	minimum 6 bar / maximum 10 bar

### 3 / STORAGE INSTRUCTIONS

Follow our "IMESTOCK" instructions for storage.

### 4 / ASSEMBLY INSTRUCTIONS

#### 4.1 - Place of installation

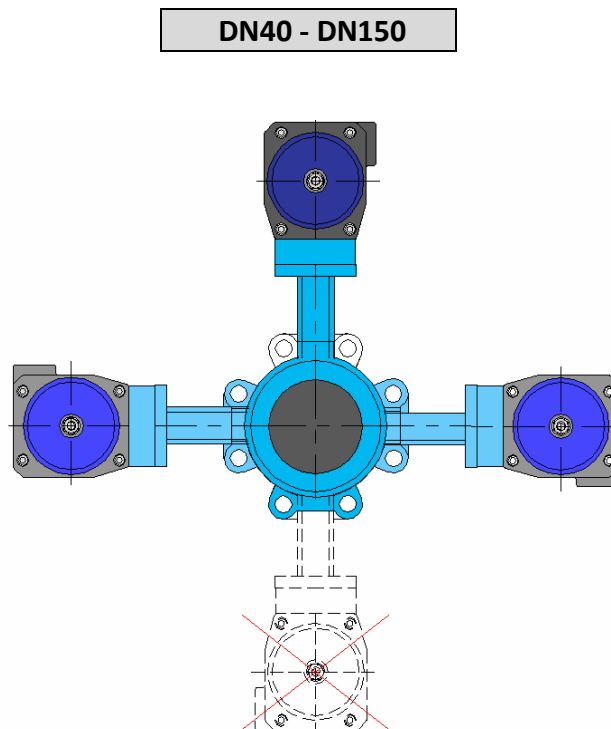
The **114x**, **115x** and **116x** +AP automatic valves can be installed both indoors and outdoors, while complying with the limit temperatures given in § 3.6.

If the valve is equipped with accessories (switch box, pilot solenoid valve), check their service temperatures and their IP code depending upon the place of installation.

#### 4.2. - Connection to the pipe installation

##### 4.2.1 - Mounting positions

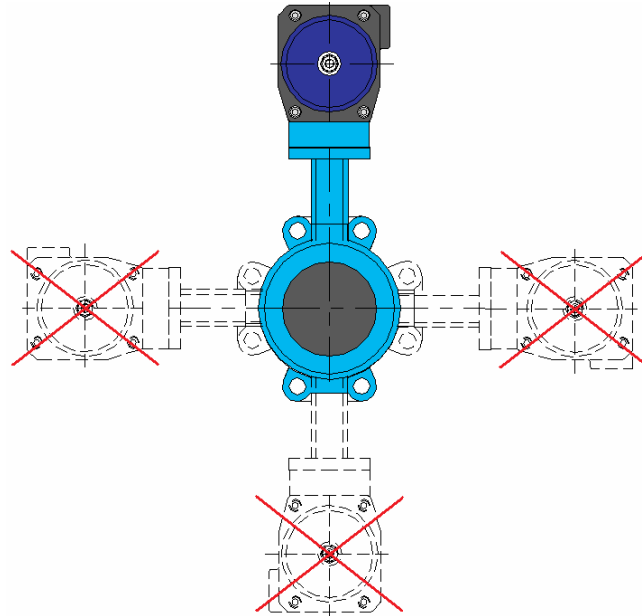
The automatic valve has to be mounted either vertically or horizontal ly with an actuator, as shown in the diagram below:



## 1150-1153-LT10 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

DN200 - DN400

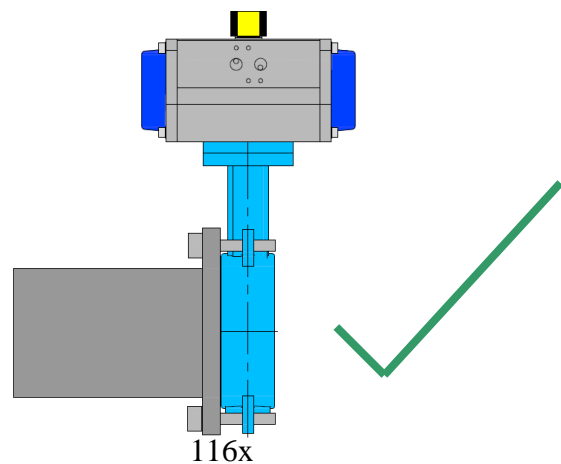
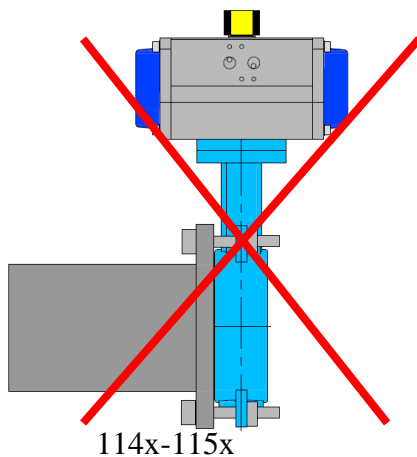
Authorised with  
suitable support



Authorised with  
suitable support

### 4.2.2 - Mounting at the end of a line

114x and 115x butterfly valves must not be installed at the end of a line. Only the 116x valves can be installed at the end of a line.



Possible blocking of the butterfly: protruding length.

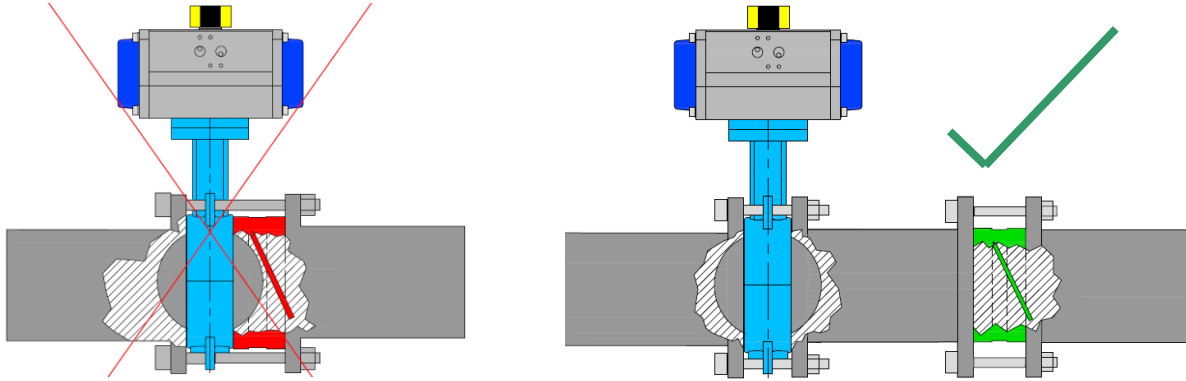
At valve opening, the butterfly protrudes from the body according to the lengths shown in the table below.

DN	40	50	65	80	100	120	150	200	250	300	350	400
Protrusion (mm)	3,5	3,5	9,5	17	24	33,5	45,5	69	90	110,5	131	148



## 1150-1153-LT10 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

You must take it into account at mounting and not abut another valve element immediately upstream and downstream which could block the movement of the butterfly (e. g. a swing valve).



### 4.2.3 - Mounting precautions:

Before any intervention on the valve, please follow the following indications:

Before installing the valve, clean the piping (brazing residues, metal swarf, sealing material, etc.).

Isolate the pipe installation upstream and downstream.

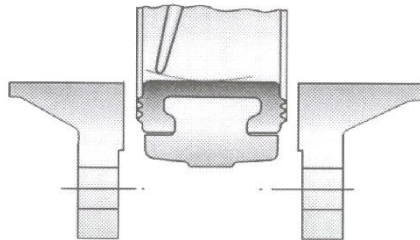
Bleed the pipe installation in order to bring it to ambient temperature and pressure.

Do not force the piping to align it so as to prevent applying stress on the valve body.

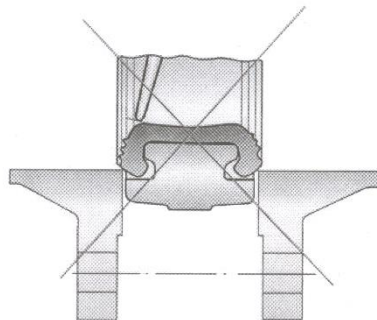
Wear the safety equipment required for this type intervention (gloves and goggles).

### 4.2.4 - Valve installation on the piping

For all asymmetrical devices, check their orientation with regard to the normal direction of flow, and you must mount them in their operating position.



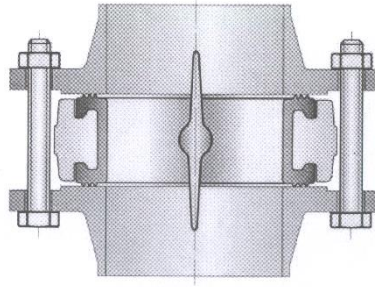
The gap in-between flanges has to be large enough to allow the valve be inserted without the elastic liner getting caught. The butterfly has to be in an almost closed position.



The liner can get damaged if the counter-flanges are not sufficiently spaced.

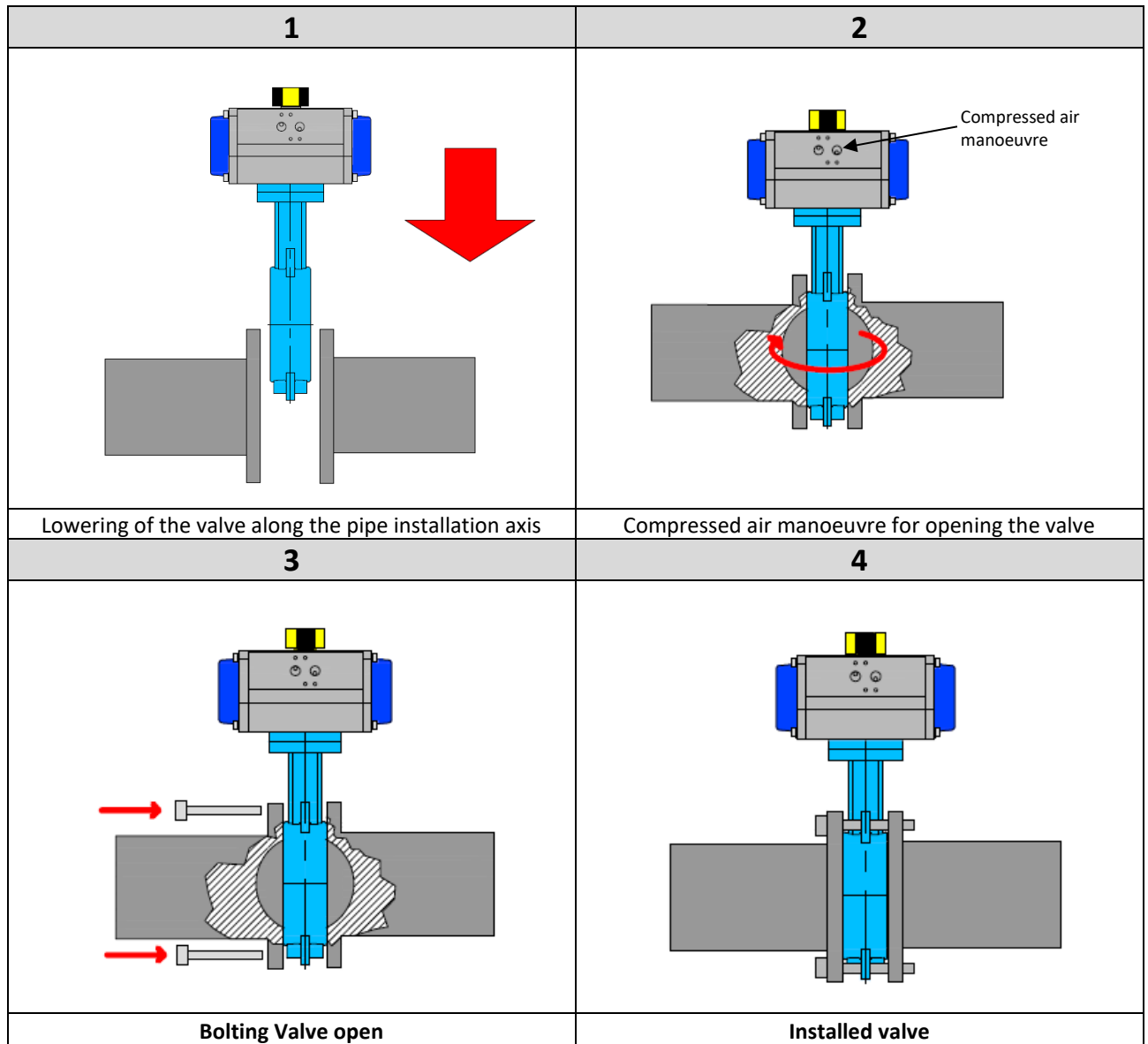


## 1150-1153-LT10 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR



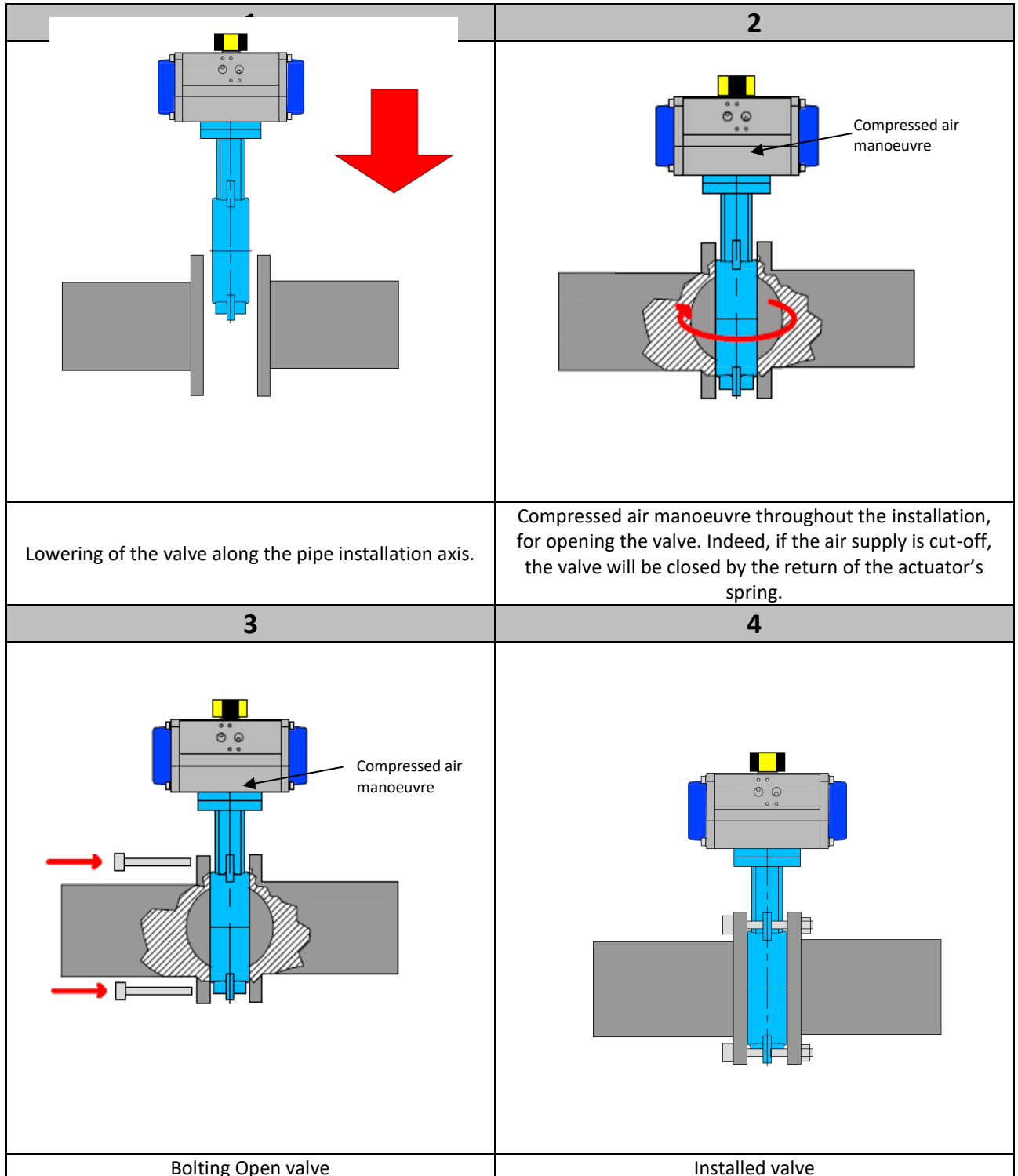
The butterfly has to be in the fully open position after positioning the valve in-between the counter-flanges and before tightening the bolts, otherwise the elastic liner might be deformed or deteriorated during the tightening of the first manoeuvre.

### 4.2.5 - Installation of the double acting AP version



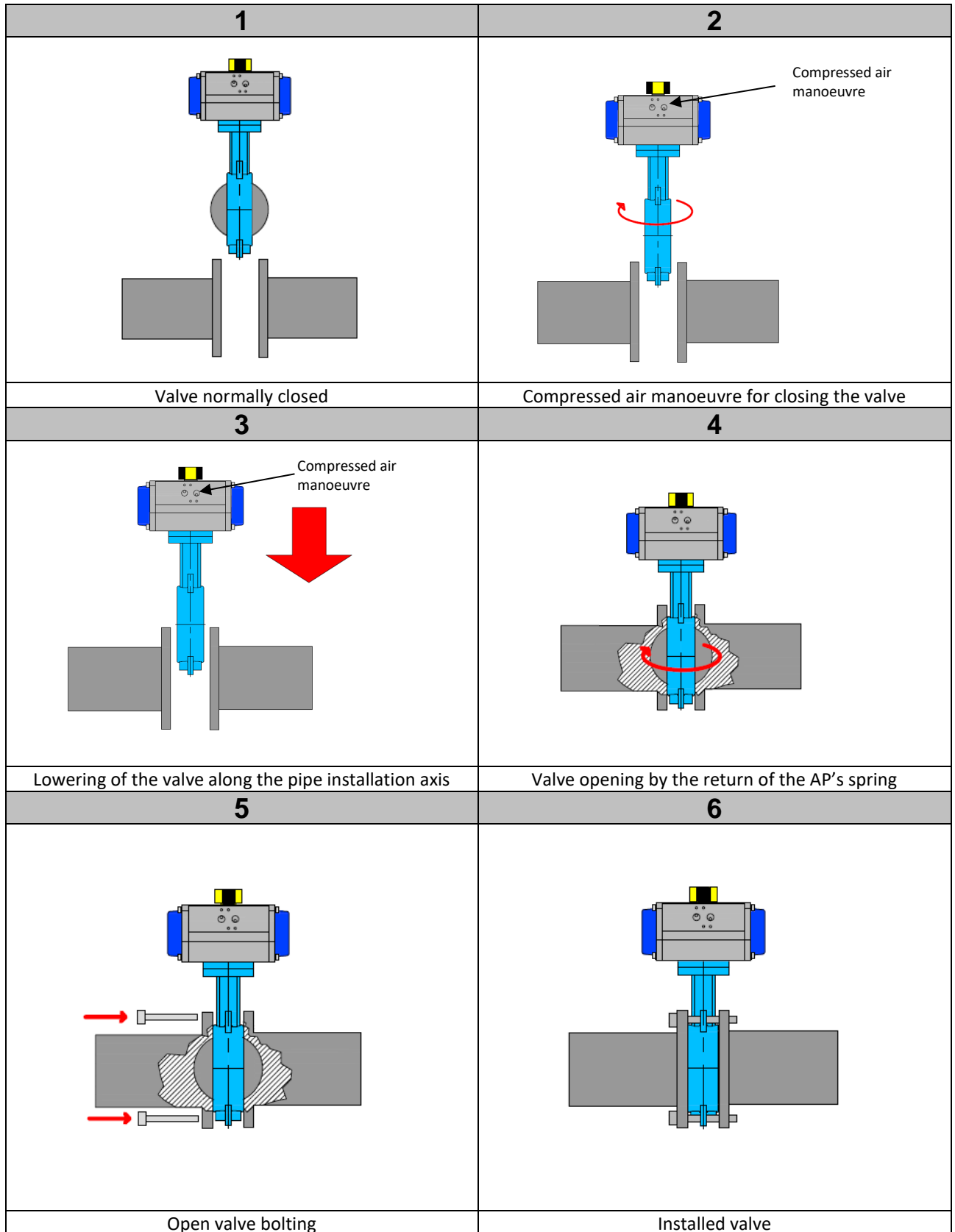
## 1150-1153-LT10 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

### 4.2.6 - Installation of the single acting NC (normally closed) AP version



## 1150-1153-LT10 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

### 4.2.7 – Installation of the single acting NO (normally open) AP version



## 1150-1153-LT10 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

### 4.2.8 - connection to the pipe installation

Nuts and bolts for PN10/16 114x and smooth lug 115x

DN	ØD		ØK		Hole number		Nuts and bolts	
	PN10	PN16	PN10	PN16	PN10	PN16	PN10	PN16
40	150		110		4		M16x90	
50	165		125		4		M16x100	
65	185		145		4		M16x110	
80	200		160		8		M16x110	
100	220		180		8		M16x120	
125	250		210		8		M16x130	
150	285		240		8		M20x140	
200	340		295		8	12	M20x140	
250	395	405	350	355	12	12	M20x160	M24x
300	445	460	400	410	12	12	M20x160	M24x
350	505	520	460	470	16	16	M20x170	\
400	565	580	515	525	16	16	M24x200	\

Nuts and bolts for PN10/16 116x and threaded lug 118x

DN	ØD		ØK		Hole number		Nuts and bolts	
	PN10	PN16	PN10	PN16	PN10	PN16	PN10	PN16
40	150		110		4		Zinc-plated M16x30 steel screw	
50	165		125		4		VAZ M16x35	
65	185		145		4		VAZ M16x35	
80	200		160		8		VAZ M16x40	
100	220		180		8		VAZ M16x40	
125	250		210		8		VAZ M16x45	
150	285		240		8		VAZ M20x45	
200	340		295		8	12	VAZ M20x45	
250	395	405	350	355	12	12	VAZ 20x45	VAZ 24x
300	445	460	400	410	12	12	VAZ 20x60	VAZ 24x
350	505	520	460	470	16	16	VAZ 20x	\
400	565	580	515	525	16	16	VAZ 24x	\

### 4.3 - connection to the compressed air supply network

The compressed air connection is performed through the port 1 – G 1/4" threaded – of the pilot solenoid valve. Exhausts 3 and 5 - G 1/8" threaded - are factory equipped with silencer filters.

## 1150-1153-LT10 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

### 4.4 - pilot solenoid valve connection to the electrical control network

The electrical connection shall be performed by qualified personnel, as per the standards in vigour.

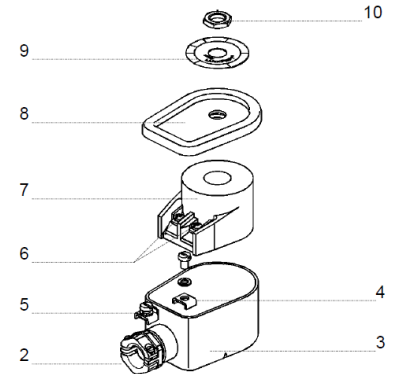
Depending upon the supply voltage, the components have to earthed as per the standards and local regulations in vigour.

The coil must be wired with the power off.

Remove the coil of the pilot solenoid valve by unscrewing the upper nut.

Slip the cable through the cable clamp and the associated cable gland (M20x1.5)

Connect the cable wires to the coil terminals and to the earth crimp connector. When the coil is well centred, tighten the cable gland and the cable holding jaws.



### 4.5 - switch box connection to the electrical control network

The electrical connection shall be performed by qualified personnel, as per the standards in vigour.

Depending on the supply voltage, the components



### 4.6 - operating test

Perform an operating test as follows after having made the pneumatic and electrical connections:

A / opening test

- power the coil of the pilot solenoid valve,
- visually check that the valve is open: the switch box indicator must show the OPEN position,

b / closing test

- turn off the power supply to the coil of the pilot solenoid valve,
- visually check that the valve closes instantaneously: the switch box indicator must show the CLOSED position.

## 5 / MAINTENANCE INSTRUCTIONS

### 5.1 - Before any intervention

5.1.1 - Depressurize, drain and bring to ambient temperature, the pipe installation on which the valve is mounted.

5.1.2 - Close the compressed air supply to the actuator and depressurize the actuator. The valve will then close automatically.

5.1.3 - Turn off the electrical supply to the pilot solenoid valve.

5.1.4 - Wear suitable protective equipment.

5.1.5 - Provide means of lifting and support appropriate for the maintenance operation.

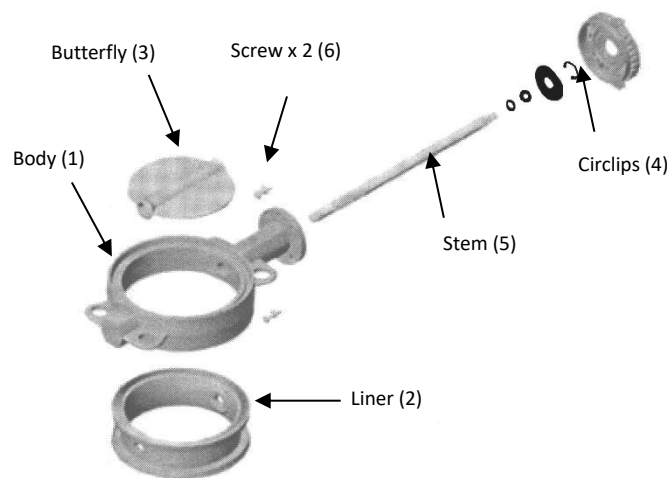
## 1150-1153-LT10 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR

### Maintenance:

The absence of leak at the liner and at the valve stem should be regularly checked. If a leak occurs at the stem, replace the o-ring, if it occurs at the liner, the liner has to be replaced.

Important: All maintenance and servicing operations must be performed under the best safety conditions. Before any intervention, the valve has to be removed taking the above-mentioned precautions which apply both to mounting and removal.

### Worn part replacement:



Remove the motor actuator. Unscrew the screws (6), remove the circlips (4). This frees the shaft (5), thus enabling the liner (2) and the butterfly (3) to be taken out of the body (1). Replace the worn parts: To obtain the list of spare parts for every valve, please contact our technical department at: +33 (0)474 94 90 70

### 5.2 - Valve maintenance

In the event of a leak on the line, check the state of the butterfly (1) and of the liner (4). If need be, replace them.

### Codes of spare parts:

DN	Liner					Butterfly		Stem
	EPDM	EPDM C	NBR	SILICONE	FKM	cast iron	Stainless steel	
40	985946	985966	985986		986026	9865030	9865020	9865040
50	985947	985967	985987	986007	986027	9865031	9865021	9865041
65	985948	985968	985988	986008	986028	9865032	9865022	9865042
80	985949	985969	985989	986009	986029	9865033	9865023	9865043
100	985950	985970	985990	986010	986030	9865034	9865024	9865044
125	985951	985971	985991	986011	986031	9865035	9865025	9865045
150	985952	985972	985992	986012	986032	9865036	9865026	9865046
200	985953	985973	985993	986013	986033	9865037	9865027	9865047
250	985954	985974	985994	986014	986034	9865038	9865028	9865048
300	985955					9865039	9865029	9865049

In the event of a leak at the stem, check the state of the o-rings of the stem.

## **1150-1153-LT10 BUTTERFLY VALVES WITH AP RE PNEUMATIC ACTUATOR**

### **5.3 - Actuator maintenance**

Refer to the actuator's IME.

### **6 / HELP TO TROUBLESHOOTING**

The valve stays in the closed position	Check the electrical power supply to the pilot solenoid valve
	Check the state of the coil of the pilot solenoid valve
	Check the compressed air supply
	Check the actuator's sealing
The valve stays in the open position	Check the absence of power supply to the pilot solenoid valve
	Check the absence of foreign bodies inside the slides of the pilot solenoid valve
No fluid flows in the open position	Check for clogging of the filter
	Check the upstream pressure on the pipe installation
Leak on the line when the valve is in position	Check the state of the valve seats.
Leak at the valve packing gland	Check the state of gaskets of the packing gland

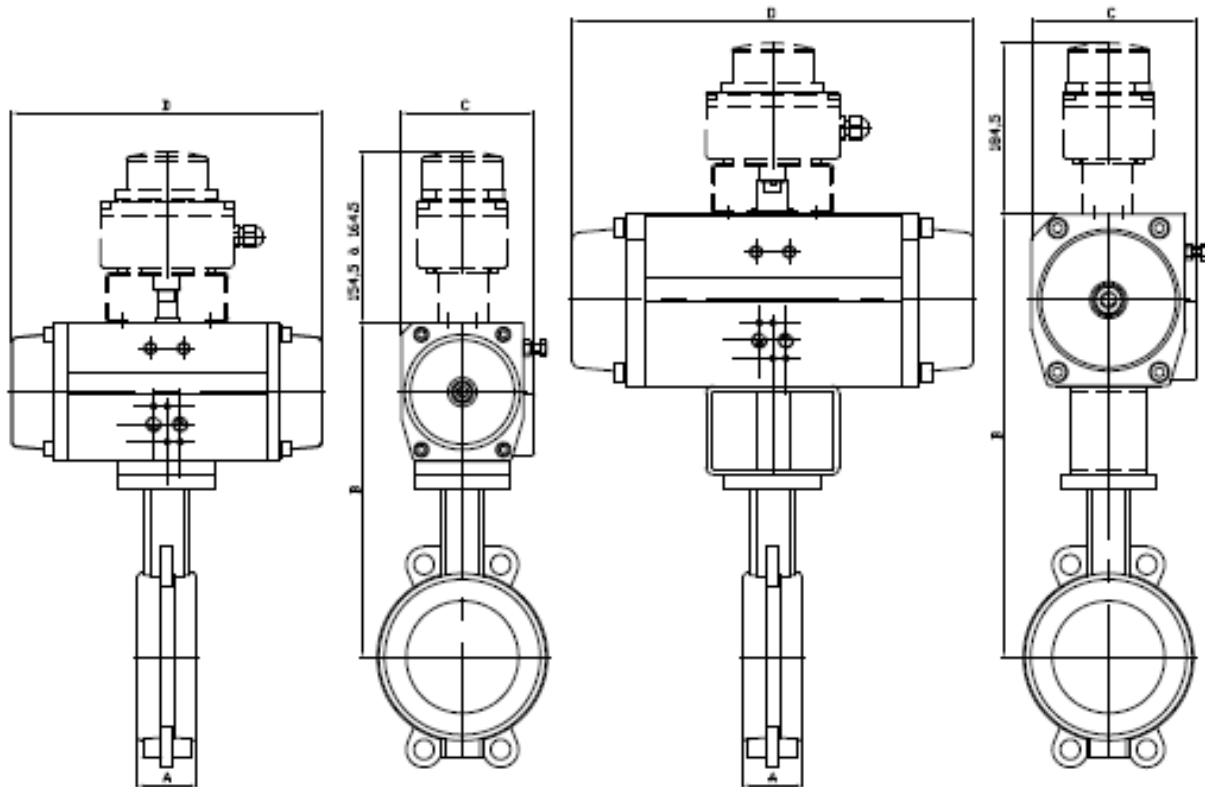
### **7 / INSTRUCTION ON OUR PRODUCT DISPOSAL AND RECYCLING**

Our valve does not contain any hazardous substance. At the valve end of life, after removing the equipment, the user's obligation is to call a scrap metal collector who will sort and recycle the different parts of the equipment. For your information, the following families of metal are present in our product: steel, stainless steel and aluminium.

With regard to the electrical parts of the equipment, they have to be separated from the rest of the valve and given to a company specialised in recycling waste from electrical and electronic equipment, as per the directive 2002/96/EC.







\* : montage avec platine H=80mm

DN	32-40		50		65		80		100		125	
ALPHAIR	51 RE	64 RES	51 RE	64 RES	64 RE	76 RES	64 RE	76 RES	76 RE	86 RES	76 RE	101RES
A	33		43		46		46		52		56	
B	209	226	225	242	247	263	255	271	289	299	308	333
C	75	86	75	86	86	94	86	94	94	104	94	120
D	138	155	138	155	155	203	155	203	203	239	203	261
KG	3.7	4.4	4.9	5.6	6.1	7.7	6.3	7.9	8.9	10.7	10.5	14.3

DN	150		200		250		300		350		400	
ALPHAIR	86 RE	116RES	101 RE	126RES	116 RE	146RES	126 RE	181RES	161 RE	201RES	201 RE	271RES
A	56		60		68		78		78		102	
B	327	361	382	413	394	425	438	580*	576*	520	560	752*
C	104	134	120	145	134	165	145	204	182	222	222	352
D	239	304	261	333	304	398	333	482	424	528	528	684
KG	13.3	19.2	20.5	27.6	33.3	41.3	44.1	56.8	58.7	84.7	88.8	165



# RE SERIES

**PNEUMATIC ACTUATORS  
WITH EXTERNAL ADJUSTMENT**

**ROTATION 90°**



**Alphaair**



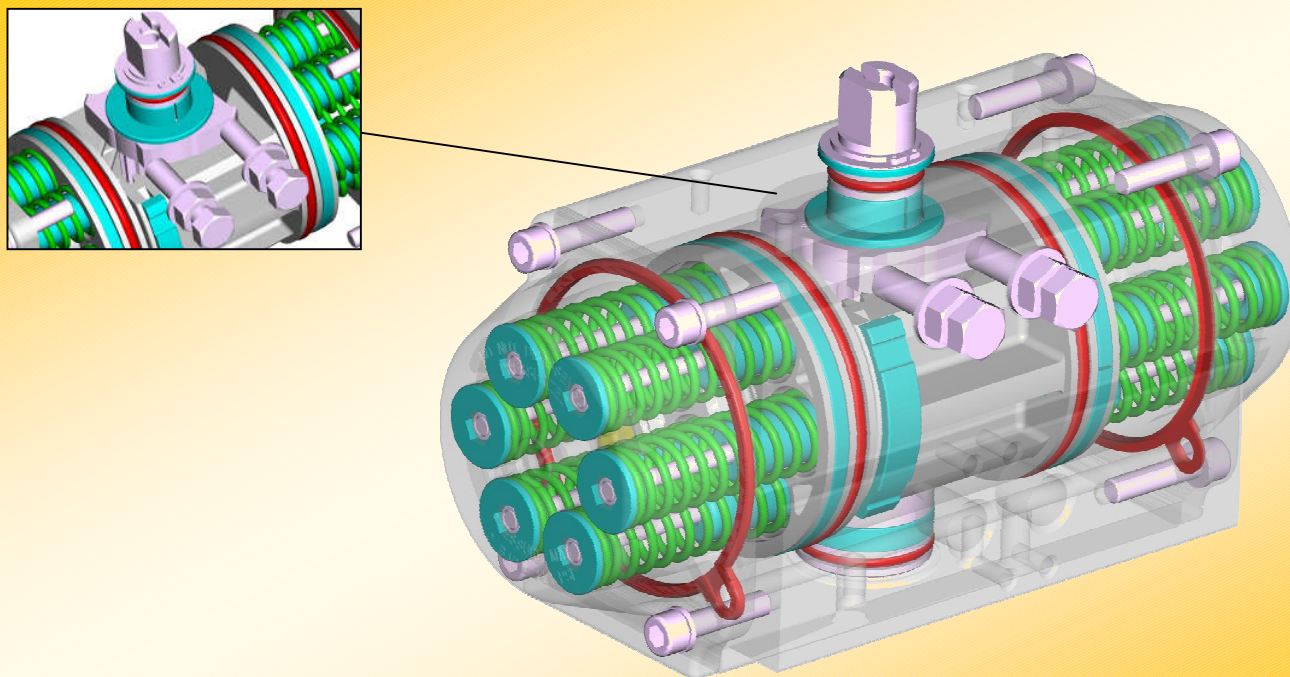
English edition



# ALPHAIR PNEUMATIC ACTUATORS EXTERNAL ADJUSTMENT

## New "RE" SERIES

Merxtrade B.V.



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

- **EN AW 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, made of Stainless Steel AISI 316 (A4).**
- **AISI 316 (A4) Stainless Steel Screws.**
- **NBR nitrile nubber seals.** FPM/FKM or SILICONE on request.
- Acetalic resin + 20% PTFE bearings, for low friction, easily replaceable for maintenance. PA66 or LEXAN on request.
- Pre-compressed Spring Cartridges, easily replaceable for maintenance, 60-80 micron polyester painted.
- High performances Syntetic Grease as standard grease. Special grease supplied for HIGH/LOW/VERY LOW temperatures.
- 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 ( $0^\circ$ ) and diagonal key ( $45^\circ$ ).
- 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  $-20^\circ\text{C}$  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.

FEEDING	TEMPERATURE RANGE	SUPPLY PRESSURE	ROT. ADJUSTMENT
Dry or lubricated 50 um filtered compressed air	Standard $-20^\circ +80^\circ\text{C}$ ( $-4 +175^\circ\text{F}$ ) HIGH Temperature $-20^\circ +150^\circ\text{C}$ ( $-4 +300^\circ\text{F}$ ) LOW Temperature $-40^\circ +80^\circ\text{C}$ ( $-40 +175^\circ\text{F}$ ) VERY LOW Temperature $-60^\circ +$ <a href="http://www.merxtrade.com">www.merxtrade.com</a>	8 bar/120 psi Continuous working - 10 bar/142 psi MAXIMUM	$\pm 5^\circ$ in both OPENING and CLOSING position

Information provided as an indication and subject to possible modification Colours and details can be different then shown in data sheets or pictures

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## DOUBLE ACTING TORQUES IN Nm

TYPE	1150LT & 1153LT AIR SUPPLY PRESSURE (bar)										Merxtrade B.V.
	1	2	3	4	5	6	7	8	9	10	
RE 043	-	-	6,5	8,7	10,9	<b>13,0</b>	15,2	17,3	19,5	21,7	
RE 051	3,3	6,7	10,0	13,4	16,7	<b>20,1</b>	23,4	26,8	30,1	33,5	
RE 064	5,9	11,8	17,8	23,7	29,6	<b>35,5</b>	41,4	47,4	53,3	59,2	
RE 076	11,8	23,5	35,3	47,1	58,9	<b>70,6</b>	82,4	94,2	105,9	117,7	
RE 086	17,2	34,5	51,7	68,9	86,1	<b>103,4</b>	120,6	137,8	155,0	172,3	
RE 101	27,5	54,9	82,4	109,8	137,3	<b>164,8</b>	192,2	219,7	247,1	274,6	
RE 116	43,7	87,4	131,1	174,9	218,6	<b>262,3</b>	306,0	349,7	393,4	437,1	
RE 126	56,6	113,3	169,9	226,5	283,2	<b>339,8</b>	396,4	453,0	509,7	566,3	
RE 146	88,4	176,7	265,1	353,4	441,8	<b>530,1</b>	618,5	706,9	795,2	883,6	
RE 161	114,9	229,7	344,6	459,5	574,3	<b>689,2</b>	804,1	918,9	1034	1149	
RE 181	156,6	313,1	469,7	626,3	782,9	<b>939,4</b>	1096	1253	1409	1565	
RE 201	215,3	430,6	646,0	861,3	1077	<b>1292</b>	1507	1723	1938	2153	
RE 241	372,5	745,0	1118	1490	1863	<b>2235</b>	2608	2980	3353	3725	
RE 271	539,2	1078	1617	2157	2696	<b>3235</b>	3774	4314	4853	5392	
RE 331	911,5	1823	2734	3646	4558	<b>5469</b>	6835	7292	8204	9115	
RE 421	1671	3342	5013	6684	8354	<b>10025</b>	11696	13367	-	-	

## SINGLE ACTING TORQUES IN Nm

TYPE	SPRING SET	AIR SUPPLY PRESSURE (bar)												SPRING TORQUE	
		3		4		5		6		7		8			
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°
RE 043	SR 3/3	-	-	-	-	<b>7,1</b>	<b>4,1</b>	9,3	6,3	11,5	8,5	13,7	10,7	<b>6,8</b>	<b>3,8</b>
	SR 4/4	-	-	-	-	<b>8,1</b>	<b>4,1</b>	10,2	6,2	12,4	8,4	<b>9,0</b>	<b>5,0</b>		
RE 051	SR 3/3	<b>5,8</b>	<b>4,3</b>	9,1	7,6	12,5	10,9	15,8	14,3	19,2	17,6	22,5	21,0	<b>5,8</b>	<b>4,3</b>
	SR 4/4	4,4	2,3	<b>7,8</b>	<b>5,7</b>	11,1	9,0	14,4	12,3	17,8	15,7	21,1	19,0	<b>7,8</b>	<b>5,7</b>
	SR 5/5			6,3	3,7	<b>9,7</b>	<b>7,1</b>	13,0	10,4	16,4	13,8	19,7	17,1	<b>9,7</b>	<b>7,1</b>
	SR 6/6			8,2	5,1	<b>11,6</b>	<b>8,5</b>	14,9	11,8	18,3	15,2	<b>11,6</b>	<b>8,5</b>		
RE 064	SR 3/3	<b>10,7</b>	<b>7,1</b>	16,6	13,0	22,5	18,9	28,5	24,8	34,4	30,8	40,3	36,7	<b>10,7</b>	<b>7,1</b>
	SR 4/4	8,4	3,5	<b>14,3</b>	<b>9,4</b>	20,2	15,4	26,1	21,3	32,0	27,2	38,0	33,1	<b>14,3</b>	<b>9,4</b>
	SR 5/5			11,9	5,9	<b>17,8</b>	<b>11,8</b>	23,8	17,7	29,7	23,6	35,6	29,6	<b>17,8</b>	<b>11,8</b>
	SR 6/6			15,5	8,2	<b>21,4</b>	<b>14,1</b>	27,3	20,1	33,2	26,0	<b>21,4</b>	<b>14,1</b>		
RE 076	SR 3/3	<b>21,1</b>	<b>14,3</b>	32,8	26,0	44,6	37,8	56,4	49,6	68,1	61,3	79,9	73,1	<b>21,1</b>	<b>14,3</b>
	SR 4/4	16,3	7,2	<b>28,1</b>	<b>19,0</b>	39,8	30,8	51,6	42,5	63,4	54,3	75,2	66,1	<b>28,1</b>	<b>19,0</b>
	SR 5/5			23,3	12,0	<b>35,1</b>	<b>23,8</b>	46,9	35,5	58,6	47,3	70,4	59,1	<b>35,1</b>	<b>23,8</b>
	SR 6/6			30,3	16,7	<b>42,1</b>	<b>28,5</b>	53,9	40,3	65,6	52,0	<b>42,1</b>	<b>28,5</b>		
RE 086	SR 3/3	<b>33,8</b>	<b>17,8</b>	51,1	35,1	68,3	52,3	85,5	69,5	102,7	86,7	120,0	104,0	<b>33,8</b>	<b>17,8</b>
	SR 4/4	27,9	6,6	<b>45,1</b>	<b>23,8</b>	62,3	41,0	79,6	58,2	96,8	75,5	114,0	92,7	<b>45,1</b>	<b>23,8</b>
	SR 5/5			39,2	12,5	<b>56,4</b>	<b>29,7</b>	73,6	47,0	90,8	64,2	108,1	81,4	<b>56,4</b>	<b>29,7</b>
	SR 6/6			50,4	18,5	<b>67,7</b>	<b>35,7</b>	84,9	52,9	102,1	70,1	<b>67,7</b>	<b>35,7</b>		
RE 101	SR 3/3	<b>50,1</b>	<b>32,3</b>	77,5	59,7	105,0	87,2	132,5	114,7	159,9	142,1	187,4	169,6	<b>50,1</b>	<b>32,3</b>
	SR 4/4	39,3	15,6	<b>66,8</b>	<b>43,0</b>	94,2	70,5	121,7	98,0	149,2	125,4	176,6	152,9	<b>66,8</b>	<b>43,1</b>
	SR 5/5			56,0	26,4	<b>83,5</b>	<b>53,8</b>	110,9	81,3	138,4	108,7	165,9	136,2	<b>83,5</b>	<b>53,8</b>
	SR 6/6			72,7	37,1	<b>100,2</b>	<b>64,6</b>	127,6	92,0	155,1	119,5	<b>100,2</b>	<b>64,6</b>		
RE 116	SR 3/3	<b>80,7</b>	<b>50,5</b>	124,4	94,2	168,1	137,9	211,8	181,6	255,5	225,3	299,3	269,0	<b>80,7</b>	<b>50,5</b>
	SR 4/4	63,9	23,5	<b>107,6</b>	<b>67,3</b>	151,3	111,0	195,0	154,7	238,7	198,4	282,4	242,1	<b>107,6</b>	<b>67,3</b>
	SR 5/5			90,8	40,4	<b>134,5</b>	<b>84,1</b>	178,2	127,8	221,9	171,5	265,6	215,2	<b>134,5</b>	<b>84,1</b>
	SR 6/6			117,7	57,2	<b>161,4</b>	<b>100,9</b>	205,1	144,6	248,8	188,3	<b>161,4</b>	<b>100,9</b>		
RE 126	SR 3/3	<b>105,0</b>	<b>64,9</b>	161,6	121,5	218,2	178,2	274,9	234,8	331,6	291,4	388,1	348,0	<b>105,0</b>	<b>64,9</b>
	SR 4/4	83,3	29,9	<b>140,0</b>	<b>86,5</b>	196,6	143,2	253,2	199,8	309,9	256,4	366,5	313,0	<b>140,0</b>	<b>86,6</b>
	SR 5/5			118,3	51,5	<b>175,0</b>	<b>108,2</b>	231,6	164,8	288,2	221,4	344,8	278,1	<b>175,0</b>	<b>108,2</b>
	SR 6/6			153,3	73,2	<b>210,0</b>	<b>129,8</b>	266,6	186,4	323,2	243,1	<b>210,0</b>	<b>129,8</b>		
RE 146	SR 3/3	<b>162,5</b>	<b>102,6</b>	250,8	190,9	339,2	279,3	427,5	367,7	515,9	456,0	604,3	544,4	<b>162,5</b>	<b>102,6</b>
	SR 4/4	128,3	48,4	<b>216,6</b>	<b>136,8</b>	305,0	225,1	393,3	313,5	481,7	401,9	570,1	490,2	<b>216,6</b>	<b>136,8</b>
	SR 5/5			182,4	82,6	<b>270,8</b>	<b>171,0</b>	359,1	259,3	447,5	347,7	535,9	436,0	<b>270,8</b>	<b>171,0</b>
	SR 6/6			236,6	116,8	<b>324,9</b>	<b>205,2</b>	413,3	293,5	501,7	381,9	<b>325,0</b>	<b>205,2</b>		
RE 161	SR 3/3	<b>202,7</b>	<b>141,9</b>	317,5	256,8	432,4	371,6	547,3	486,5	662,1	601,4	777,0	716,2	<b>202,7</b>	<b>141,9</b>
	SR 4/4	155,3	74,3	<b>270,2</b>	<b>189,2</b>	385,1	304,1	499,9	418,9	614,8	533,8	729,7	648,7	<b>270,2</b>	<b>189,2</b>
	SR 5/5			222,9	121,6	<b>337,8</b>	<b>236,5</b>	452,6	351,4	567,5	466,2	682,4	581,1	<b>337,8</b>	<b>236,5</b>
	SR 6/6			290,4	168,9	<b>405,3</b>	<b>283,8</b>	520,2	398,6	635,0	513,5	<b>405,3</b>	<b>283,8</b>		
RE 181	SR 3/3	<b>281,6</b>	<b>188,2</b>	438,1	344,7	594,7	501,3	751,3	657,9	907,8	814,5	1064	971,0	<b>281,6</b>	<b>188,2</b>
	SR 4/4	218,8	94,3	<b>375,4</b>	<b>250,9</b>	532,0	407,5	688,5	564,0	845,1	720,6	1002	877,2	<b>375,4</b>	<b>250,9</b>
	SR 5/5			312,7	157,0	<b>469,3</b>	<b>313,6</b>	625,8	470,2	782,4	626,8	939,0	783,3	<b>469,3</b>	<b>313,6</b>
	SR 6/6			406,5	219,8	<b>563,1</b>	<b>376,3</b>	719,7	532,9	876,2	689,5	<b>563,1</b>	<b>376,3</b>		
RE 201	SR 3/3	<b>386,2</b>	<b>259,8</b>	601,5	475,13	816,8	690,5	1032	905,8	1247	1121	1436	1336	<b>386,2</b>	<b>259,8</b>
	SR 4/4	299,6	131,1	<b>514,9</b>	<b>46,4</b>	730,2	561,8	945,5	777,1	1160	992,4	1376	1208	<b>514,9</b>	<b>346,4</b>
	SR 5/5			428,3	217,7	<b>643,6</b>	<b>433,0</b>	858,9	648,4	1074	863,7	1290	1079	<b>643,6</b>	<b>433,0</b>
	SR 6/6			557,0	304,3	<b>772,3</b>	<b>519,6</b>	987,6	735,0	1203	950,3	<b>772,3</b>	<b>519,6</b>		
RE 241	SR 3/3	<b>664,0</b>	<b>453,6</b>	1037	826,2	1409	1199	1782	1571	2154	1944	2527	2316	<b>664,0</b>	<b>453,6</b>
	SR 4/4	521,8	232,3	<b>885,4</b>	<b>604,8</b>	1258	977,4	1630	1350	2003	1722	2376	2095	<b>885,4</b>	<b>604,8</b>
	SR 5/5			734,2	383,5	<b>1107</b>	<b>756,0</b>	1479	1129	1852	1501	2224	1874	<b>1107</b>	<b>756,0</b>
	SR 6/6			955,5	534,7	<b>1328</b>	<b>907,2</b>	1701	1280	2073	1653	<b>1328</b>	<b>907,2</b>		
RE 271	SR 3/3	<b>912,5</b>	<b>705,1</b>	1452	1244	1991	1783	2530	2323	3069	2862	3608	3401	<b>912,5</b>	<b>705,1</b>
	SR 4/4	677,5	400,8	<b>1217</b>	<b>940,2</b>	1756	1479	2295	2019	2834	2558	3373	3097	<b>1217</b>	<b>940,1</b>
	SR 5/5			981,7	635,8	<b>1521</b>	<b>1175</b>	2060	1714	2599	2144	3138	2793	<b>1521</b>	<b>1175</b>
	SR 6/6			1286	871,0	<b>1825</b>	<b>1410</b>	2364	1954	2903	2489	<b>1825</b>	<b>1410</b>		
RE 331	SR 3/3	<b>1626</b>	<b>1108</b>	2538	2020	3450	2931	4361	3843	5273	4755	6184	5666	<b>1626</b>	<b>1108</b>
	SR 4/4	1257	565,8	<b>2168</b>	<b>1477</b>	3080	2389	3992	3301	4903	4212	5815	5123	<b>2168</b>	<b>1477</b>
	SR 5/5			1799	935,2	<b>2711</b>	<b>1847</b>	3622	2759	4534	3670	5445	4582	<b>2711</b>	<b>1847</b>
	SR 6/6			2341	1305	<b>3253</b>	<b>2216</b>	4165	3128	5076	4040	<b>3253</b>	<b>2216</b>		
RE 421	SR 3/3	<b>2999</b>	<b>2014</b>	4670	3685	6340	5356	8011	7026	9682	8697	11353	10368	<b>2999</b>	<b>2014</b>
	SR 4/4	2327	1014	<b>3998</b>	<b>2685</b>	5669	4356	7340	6027	9011	7698	9369	8369	<b>3998</b>	<b>2685</b>
	SR 5/5			3327	1685	<b>4998</b>	<b>3356</b>	6669	5027	8340	6698	8369	8369	<b>4998</b>	<b>3356</b>
	SR 6/6			4327	2357	<b>5997</b>	<b>4028</b>	7668	5698	7369	7369	<b>5997</b>	<b>4028</b>		

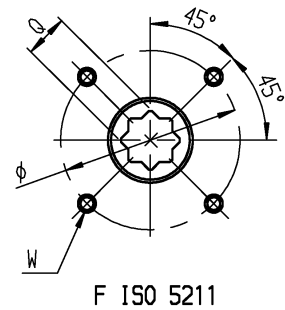
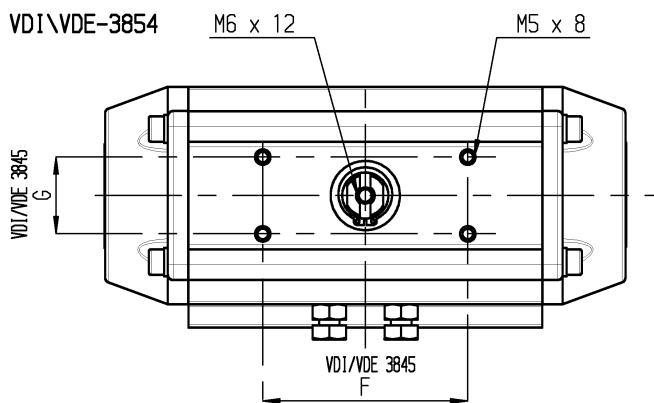
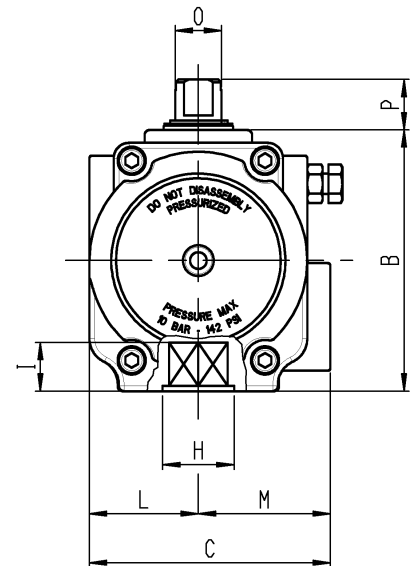
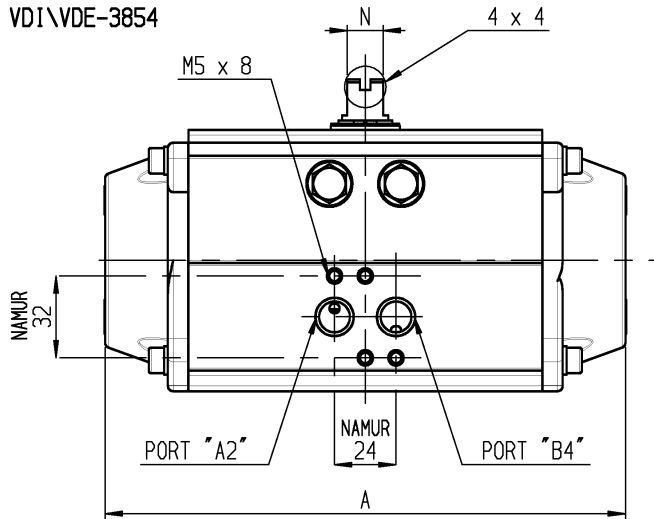
Torque by air      Torque by springs

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**DIMENSIONS – European Sizes in millimetres**

1150LT & 1153LT

Merxtrade B.V.



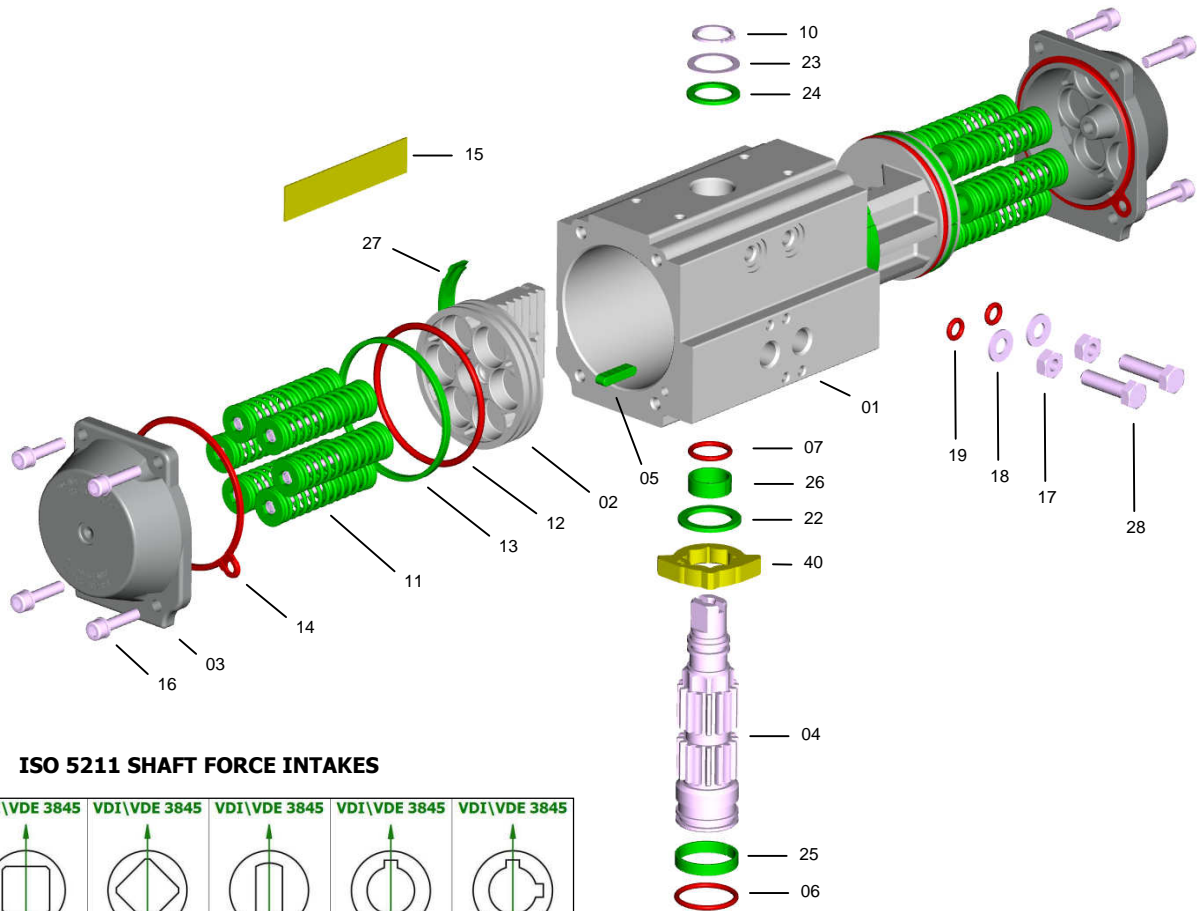
POSITION	TYPE															
	RE 043	RE 051	RE 064	RE 076	RE 086	RE 101	RE 116	RE 126	RE 146	RE 161	RE 181	RE 201	RE 241	RE 271	RE 331	RE 421
<b>A</b>	141	138	155	203	239	261	304	333	398	424	482	528	604	684	850	940
<b>B</b>	62	69	86	102	112	127	145,5	157,5	177	196	220	246	298	332	414	542
<b>C</b>	63,5	75	86	94	104	120	133,5	144,5	164,5	182	203,5	222	300	352	400	528
<b>VDI/VDE 3845 F x G</b>	80 x 30 50 x 25	80 x 30					80 x 30 130 x 30			130 x 30						200 x 50
<b>L</b>	27	33,5	38	42,5	49	55	63,5	69,5	80,5	89	99,5	110	150	176	190	234
<b>M</b>	36,5	41,5	48	51,5	55	65	70	75	84	93	104	112	150	176	210	294
<b>Port A Port B DIN 259</b>	1/8" GAS-NPT			1/4" GAS-NPT									1/2" GAS-NPT			
<b>N x O</b>	8 x 12			14 x 18			27 x 36			32 x 42		42 x 60	55 x 80			
<b>P</b>	20						30			50						80
<b>Q x I</b>	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
<b>F ISO 5211</b>	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
<b>Optional</b>	F03/05	F03/05	F3/5/7			F5/7/10		F7/10/12			F14	F10/12	F(12)/16	F(12)/16		F(16)
<b>Volume DE</b>	0,180 lt	0,300 lt	0,500 lt	0,700 lt	1,000 lt	1,800 l	2,900 lt	3,700 lt	6,100 lt	7,900 lt	11,2 lt	14,4 lt	19,2 lt	32,2 lt	62,8 lt	131 lt
<b>Volume SE</b>	0,072 lt	0,120 lt	0,200 lt	0,280 lt	0,400 lt	0,720 l	1,160 lt	1,480 lt	2,440 lt	3,160 lt	4,480 lt	5,760 lt	7,680 lt	12,9 lt	25,1 lt	52,4 lt

POSITION	F ISO 5211											
	F03	F04	F03/05	F05	F05/07	F5/7/10	F07/10	F10/12	F14	F16	F25	F30
<b>Ø (W)</b>	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
<b>H</b>	25	30	25	35	35 (RE 086=40)	40	55	85 (RE 161=75)	100	130	200	200

# CONSTRUCTION PARTS – SPECIFICATIONS

1150LT & 1153LT

Merxtrade B.V.



### ISO 5211 SHAFT FORCE INTAKES

VDI\ VDE 3845	VDI\ VDE 3845	VDI\ VDE 3845	VDI\ VDE 3845	VDI\ VDE 3845	VDI\ VDE 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 Stainless Steel – optional	ASTM A-105 AISI 304 (A2) AISI 316 (A4)	N
5 *	2	Antiejection key	Acetalic resin – PA66 – PA66 – LEXAN		
6 *	1	Lower shaft O-Ring	NBR – FPM\FKM – Silicone – Silicone		
7 *	1	Upper shaft O-Ring	NBR – FPM\FKM – Silicone – Silicone		
10 *	1	Seeger ring	Carbon steel		N
11	0 ... 12	Spring cartridge	Carbon steel, PA 66, Stainless Steel	C-98	V
12 *	2	Piston O-Ring	NBR – FPM\FKM – Silicone – Silicone		
13 *	2	Piston head bearing	Acetalic resin – PA66 – PA66 – LEXAN		
14 *	2	Cover gasket	NBR – FPM\FKM – Silicone – 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 – 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

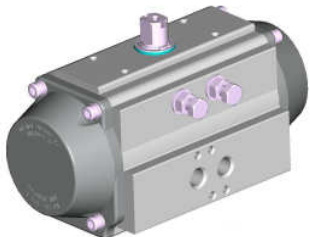
[www.merxtrade.com](http://www.merxtrade.com)

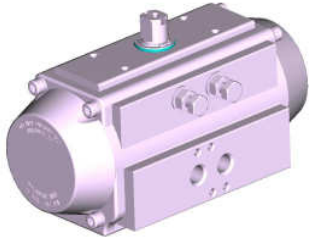


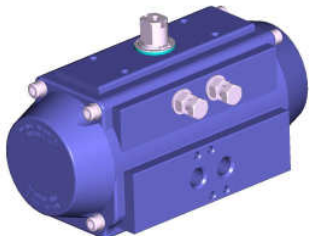
## COATINGS – MATERIAL TREATMENTS

1150LT & 1153LT

Merxtrade B.V.

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

	<b>NN</b>	DESCRIPTION				APPLICATION FIELD
		Body	Covers	Pistons	Shaft	
	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	
	High phosphorous nickel-plating (12%)	High phosphorous nickel-plating (12%)	Anodizing	High phosphorous nickel-plating (12%) opt. AISI 304 (A2) opt. AISI 316 (A4)		

	<b>TF TF</b>	DESCRIPTION				APPLICATION FIELD
		Body	Covers	Pistons	Shaft	
	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 + PTFE coating	Anodizing + PTFE coating	Anodizing	High phosphorous nickel-plating (12%) opt. AISI 304 (A2) opt. AISI 316 (A4)		

### 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 know 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 alcali 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 anodising 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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COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV GL = ISO 9001 =						
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