



# automatic valve



**31 000 AND 32 000  
VALVE TYPES**

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# CONTROL VALVES

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## GENERALS

The "31 000" and "32 000" valve types are designed for a range of pneumatically controlled valves that are applicable in all industrial branches such as: textile, chemical, paper, metallurgical and food industry etc...

The "31 000" and "32 000" valve types have a simple construction and implement original designs and advanced technology components. They may carry all fluid within high temperature and pressure ranges.

The "31 000" and "32 000" valve types are built with 3 main parts:

- A reversible pneumatic actuator with simple or double action rolling diaphragm
- A cast valve body, straight type with 4 flanges, single or double seat
- A sealing unit made-up of the seat-plug assembly or of the cage-plug assembly

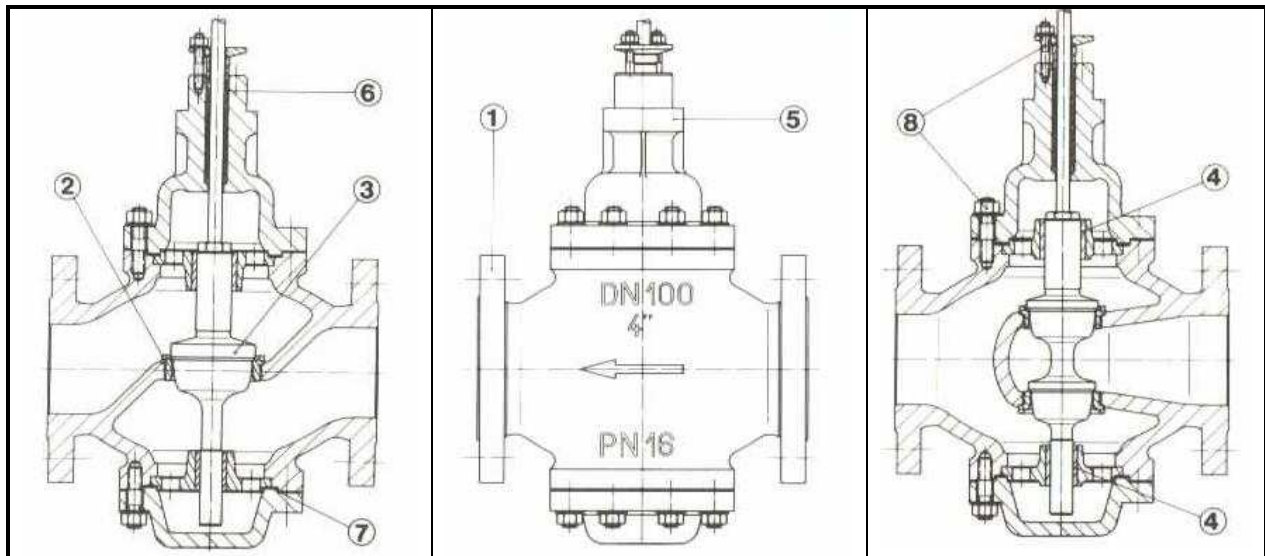
## FEATURES

<p><b>BODY ND</b></p> <p>15 to 250mm (1/2 to 10")</p> <p><b>CONNECTIONS</b></p> <ul style="list-style-type: none"><li>- Flange AFNOR PN 10-16-25-40-64 ANSI 150-300-600</li><li>- Socket SW 1/2 to 2" WN 1/2 to 2"</li><li>- Body length: cast iron NFE 29,355 – 29,358 Cast steel ANSI B 16-10</li></ul> <p><b>SPECIAL DESIGN</b></p> <ul style="list-style-type: none"><li>- Part boiling jacket</li><li>- Full boiling jacket</li><li>- Angle valve</li></ul> <p><b>SERVICE CONDITION</b></p> <p>According to temperature and pressure instructions of standards NFE 29,002 NP 10 to 64 ANSI B 16-1 – B 16-5 Serials 150 to 600 lbs</p> <p><b>TEMPERATURE CAPABILITIES</b></p> <ul style="list-style-type: none"><li>- See body and moving parts material table</li><li>- See stuffing material choice table</li></ul> <p><b>FLOW CHARACTERISTIC</b></p> <p>Linear "L" Equal percentage "= %" Quick opening "OR"</p> <p><b>FLOW COEFFICIENTS</b></p> <p>See CV table</p>	<p><b>LEAKAGE</b></p> <ul style="list-style-type: none"><li>- Single seated 31 000 valve types Metallic port: 0,05% maxi of nominal CV PTFE port: air bubble</li><li>- Double seated 32 000 valve types Metallic port: 0,5% maxi of nominal CV Leakage according to CACIRA test conditions.</li></ul> <p><b>BONNET WITH STUFFING</b></p> <p>Standard – Cold extension Hot extension – With bellow Double stuffing box.</p> <p><b>STUFFING</b></p> <p>Pneumatic actuator with rolling diaphragm and push-back spring.</p> <ul style="list-style-type: none"><li>- Direct action types 610-210 610-280 610-350 610-430</li><li>- Reverse action types 601-210 601-280 601-350 601-430</li></ul> <p><b>THROTTLE CONTROL FUNCTION</b></p> <ul style="list-style-type: none"><li>- Signal 0,2 – 1 bar , Supply 1,4 bars 0,4 – 2 bars, Supply 2,8 bars</li><li>- On-off control: Supply: 3 to 5 bars</li></ul>
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# 31 000 – 32 000 TYPES

## MATERIALS

R	VALVE PART	MATERIAL	MAXIMUM T °C
1	<b>BODY</b>	Bronze UE 12 P	0 +200°C
		Cast iron 25	0 +180°C
		Cast iron GS 42-12	-15 +350°C
		Cast steel A 42 CM	-30 +430°C
		Stainless steel 316 L	-100 +550°C
2	<b>SEATS</b>	Stainless steel Z 30 C 13	-30 +430°C
		Stainless steel 315 L	+550°C
		Grade 6 stellited port	
3	<b>PLUG</b>	Stainless steel Z 30 C 13	-100 +550°C
		Stainless steel 316 L	
		Grade 6 stellited port	
		Grade 6 stellited tails	
4	<b>GUIDES</b>	Bronze UE 12 P	0 +180°C
		Stainless steel Z 30 C 13	-30 +430°C
		Stainless steel 136 L	-30 +550°C
		Grade 6 stellited	
5	<b>BONNET</b>	Same as body	-100 +550°C
6	<b>STUFFING</b>	See stuffing choice table	
7	<b>GASKETS</b>	PTFE	-100 +200°C
		Asbestos	-30 +430°C
		Graphite	0 +550°C
8	<b>SCREW</b>	Steel class 8/8 galvanized	
		Stainless steel 304 L or 316 L	



31 000 valve type

32 000 valve type

# CONTROL VALVE

## BONNET WITH STUFFING BOX - STUFFS

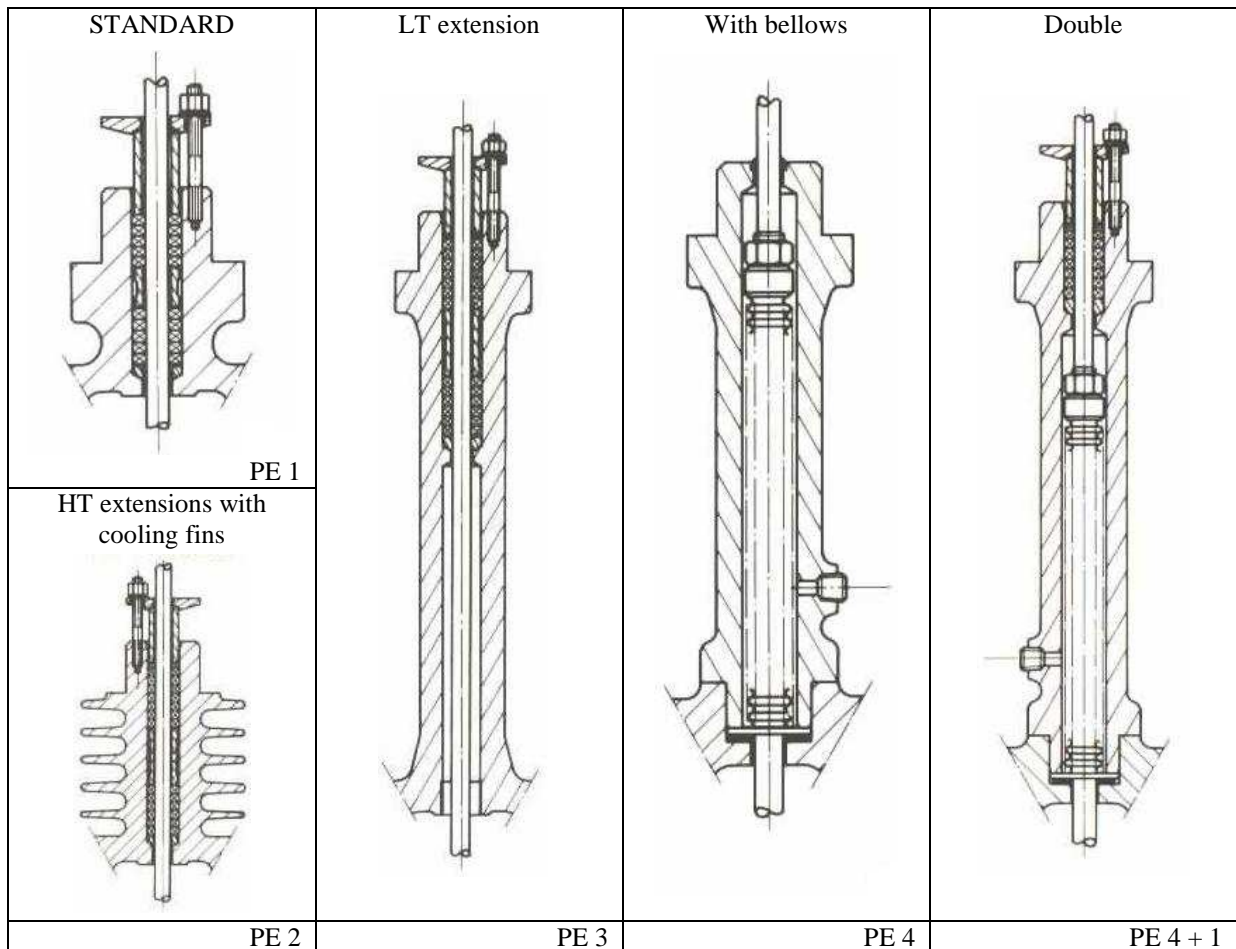
The bonnet and the stuffing box realise a single-block unit. It also supports the actuator which is fastened by mean of two studs for valves ND 15 to 100 and of a notched nut for valves ND 125 to 250.

All stuffing box bonnets can be equipped with a screw lubricator and isolating valve.

The stuffing box bellows bonnets are fitted with a pressure tapping threaded opening enabling to detect at any moment an accidental damage of the bellows. In order to suddenly make up for that damage, a safety packing can be installed on the bellows (construction 1 + 4).

Type	R	Stuffing	Temperature °C
Standard	1	PTFE	-100 ≤ 0 ≤ 200
		Asbestos-graphite	-300 ≤ 0 ≤ 250
		Graphite	0 ≤ 0 ≤ 350
HT extensions with cooling fins	2	Graphite	0 ≤ 0 ≤ 550
LT extensions	3	PTFE	-100 ≤ 0 ≤ 0
With bellows	4	Stainless steel 316 L	-30 ≤ 0 ≤ 550
Special assemblies : 2+4 or 3+4 or 1+4			

## DESIGNS



# 31 000 – 32 000 TYPES

## MOVING PARTS

We understand by "moving parts" the block constituted by the plug and the stem which directly control the fluid flow in the valve.

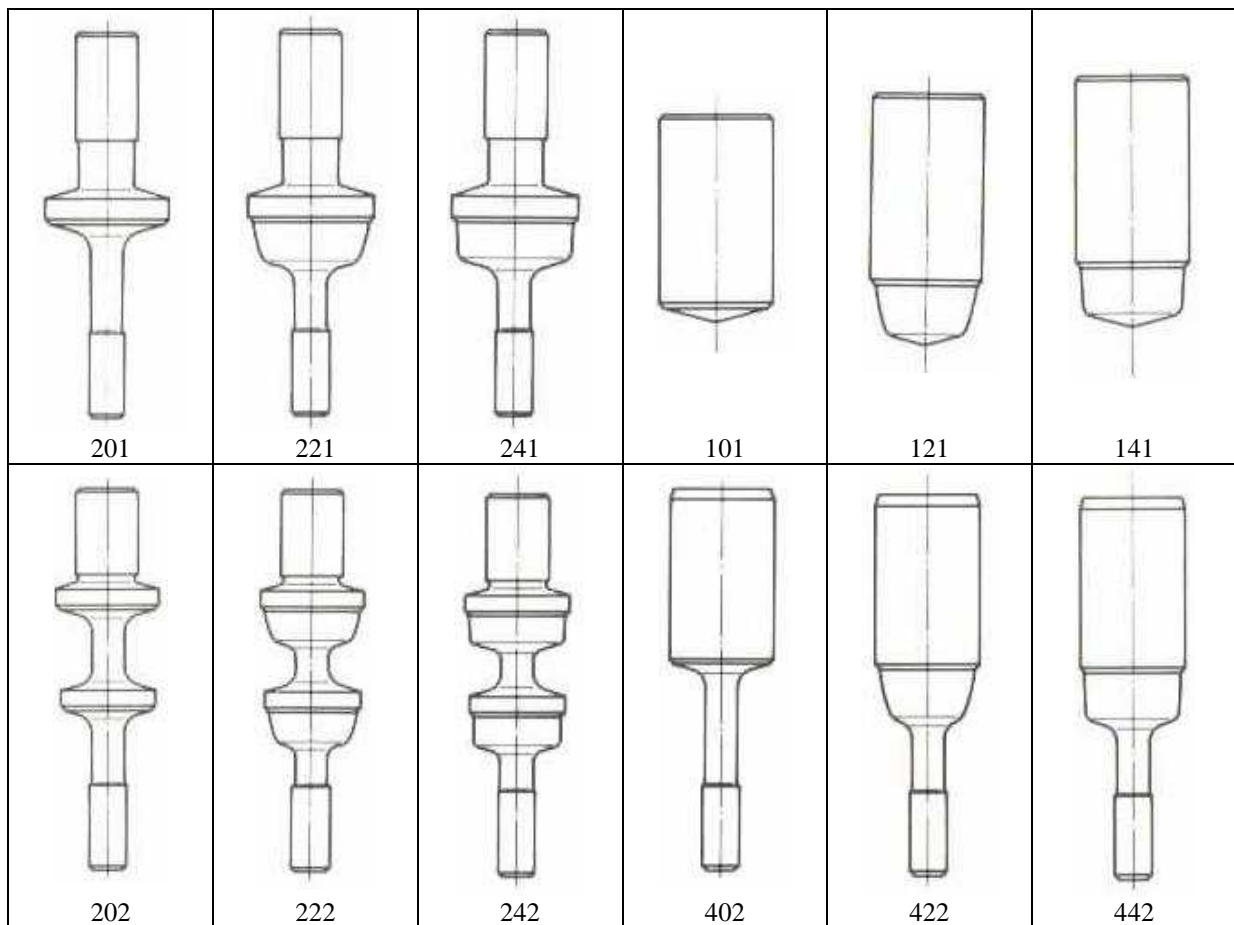
In a control valve the plug is an essential part as, according to its position with respect to the seat, it modifies the medium flow inside the valve.

In order to meet various flow characteristics, the three following plug contours are proposed:

- equal percentage characteristic
- linear characteristic
- quick opening

In order to meet various pressure requirements, the three flowing valve trims are proposed:

- unbalanced, tight, single seat for low differential pressures
- balanced, tight, single seat for high differential pressures
- balanced double seat with relative tightness for high differential pressures

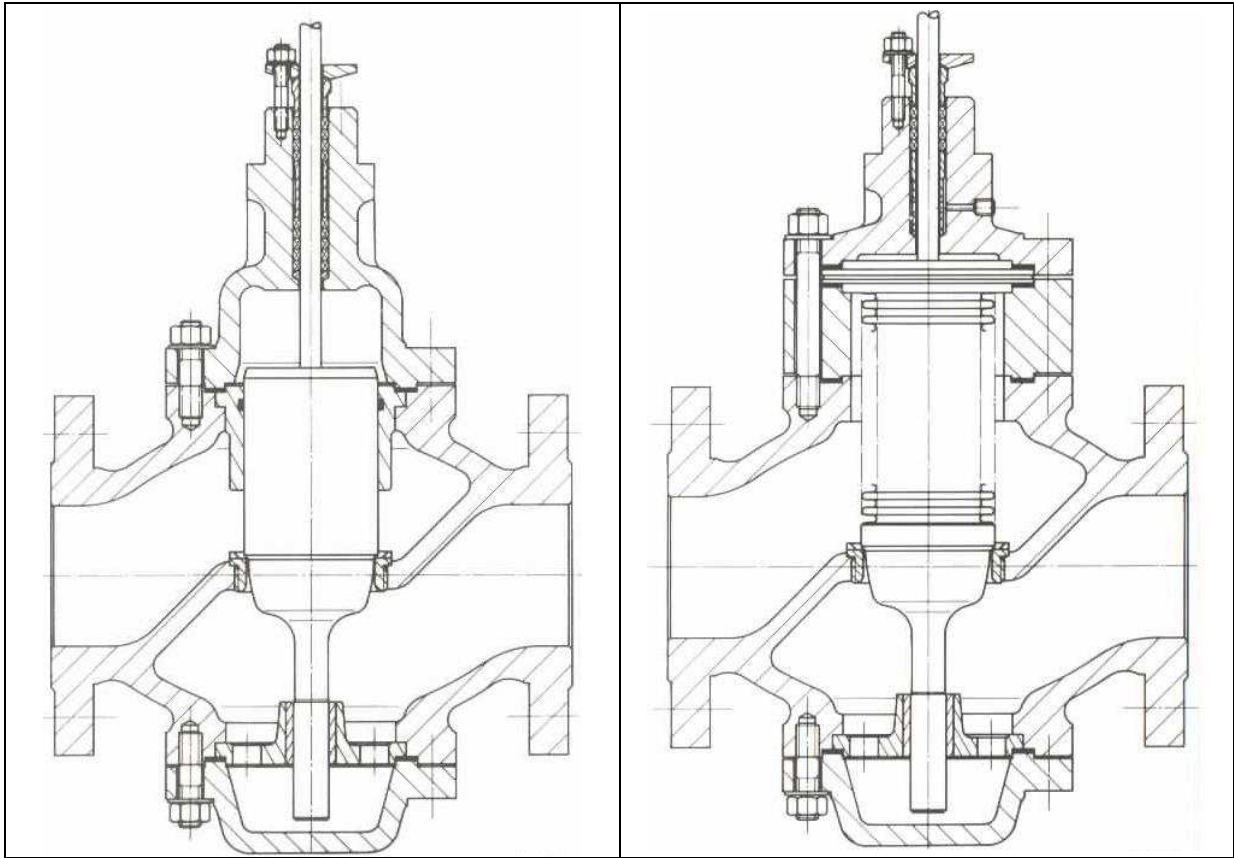


## PLUG CODES

Single seat unbalanced plug with tails		ND	Double seat balanced plug with tails		ND
201	OR	15	202	OR	15
221	L	to	222	L	to
241	= %	250	242	= %	250
Single seat unbalanced plug with skirt		ND	Single seat balanced plug with skirt and tail		
101	OR	15	402	OR	50
121	L	to	422	L	to
141	= %	100	442	= %	150

# CONTROL VALVES

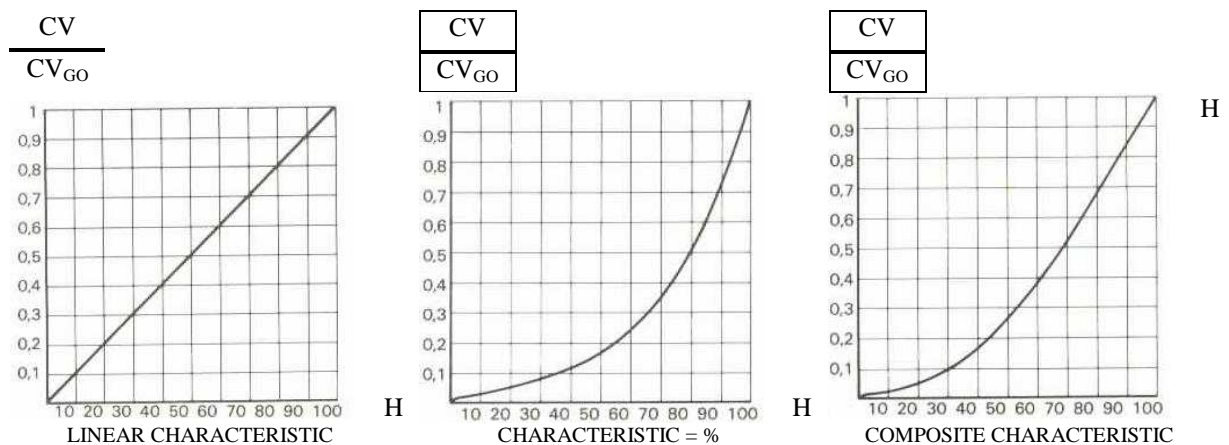
## SINGLE SEAT PLUG BALANCING



Service limits:

- Balancing by skirt and elastic restriction gasket type "TEC RING" for ND 15 to 150, used with clean media, temperature: -30 to +350°C.
- Balancing by bellows, ND 15 to 150, used with loaded media, temperature - 30 to 550°C.

## FLOW CHARACTERISTICS: CV



$CV_{Go}$  = Coefficient de flow coefficient valve full opened for  $A = 1$  with  $A = \frac{\text{Ø pipe}}{\text{Ø Valve}}$

$\frac{CV}{CV_{Go}}$  = relative flow coefficient

$H = \frac{H}{H 100}$  = relative plug stroke

# 31 000 – 32 000 TYPE

## FLOW COEFFICIENT: CV

### 31000 VALVE TYPE

Valve ND		Seat ND	Single port plug		Valve ND		Seat ND	Single port plug	
m/m	Inch.	m/m	L and = %	OR	m/m	Inch.	m/m	L and = %	OR
15	1/2	15	5	6	80	3	80	82	98
20	3/4	20	7	8			65	66	
		15	5				50	45	
25	1	25	11	12	100	4	100	132	180
		20	9				80	90	
		15	7				65	69	
32	1"1/4	32	16	18	125	5	125	210	285
		25	13				100	140	
		20	10				80	92	
40	1"1/2	40	24	28	150	6	150	300	395
		32	19				125	225	
		25	15				100	141	
50	2	50	39	49	200	8	200	520	670
		40	28				150	350	
		32	20				125	240	
65	2"1/2	65	61	70	250	10	250	825	1250
		50	43				200	600	
		40	28				150	350	

### 32 000 VALVE TYPE

Valve ND		Seat ND	Double port plug		Valve ND		Seat ND	Double port plug	
m/m	Inch.	m/m	L and = %	OR	m/m	Inch.	m/m	L et = %	OR
15	1/2	15	6	6	80	3	80	110	136
20	3/4	20	8	10			65	80	
		15	6				50	54	
25	1	25	13	14	100	4	100	180	250
		20	8				80	110	
		15	7				65	85	
32	1"1/4	32	20	22	125	5	125	270	380
		25	15				100	195	
		20	9				80	125	
40	1"1/2	40	31	34	150	6	150	400	530
		32	21				125	280	
		25	15				100	200	
50	2	50	49	58	200	8	200	700	990
		40	35				150	400	
		32	22				125	300	
65	2"1/2	65	78	93	250	10	250	110	1660
		50	50				200	720	
		40	35				150	450	

# 31 000 – 32 000 CONTROL VALVE TYPES

## MAXIMUM PRESSURE DROP ALLOWED IN VALVES

### ATO ASSEMBLY

ND		31 000 valve type								32 000 valve type			
		Unbalanced plugs				Balanced plug				Balanced plug			
		Supply 1,4b		Supply 2,8b		Supply 1,4b		Supply 2,8b		Supply 1,4b		Supply 2,8b	
m/m	Inch.	Signal 0,2-1		Signal 0,4-2		Signal 0,2-1		Signal 0,4-2		Signal 0,2-1		Signal 0,4-2	
15	1/2"	20	20	38	20	65	65	65	65	33	—	63	—
20	3/4"	12	12	23	20	55	65	65	65	29	—	55	—
25	1"	7	7	14	14	50	65	65	65	25	—	47	—
32	1"1/4	8	8	18	18	85	65	65	65	37	—	70	—
40	1"1/2	5	5	9	9	85	20	65	65	29	—	55	—
50	2"	3	3	5,5	5,5	28	65	65	20	24	—	45	—
65	2"1/2	3	3	6,5	6,5	22	50	65	65	24	—	45	—
80	3"	2,5	2,5	4,5	4,5	21	50	65	65	19	—	36	—
100	4"	1,3	1,3	2,5	2,5	15	15	50	65	19	—	36	—
125	5"	1,2	1,2	2,2	2,2	12	12	40	65	21	—	40	—
150	6"	0,9	0,9	1,7	1,7	9	9	30	65	18	—	34	—
200	8"	0,5	0,5	0,9	0,9	—	—	—	—	19	—	36	—
250	10"	0,3	0,3	0,5	0,5	—	—	—	—	9	—	17	—
		PM	PP	PM	PP	PM	PP	PM	PP	PM	—	PM	—

Special actuator assembly : multiplying coefficient 1,3 PM = Metallic port PP = PTFE port

### ATC ASSEMBLY

ND		31 000 VALVE TYPE								32 000 VALVE TYPE			
		Unbalanced plugs				Balanced plugs				Balanced plugs			
		Supply 1,4b		Supply 2,8b		Supply 1,4b		Supply 2,8b		Supply 1,4b		Supply 2,8b	
m/m	Inch.	Signal 0,2-1		Signal 0,4-2		Signal 0,2-1		Signal 0,4-2		Signal 0,2-1		Signal 0,4-2	
15	1/2"	37	20	72	20	100	100	100	100	60	—	100	—
20	3/4"	22	20	43	20	100	100	100	100	55	—	90	—
25	1"	13	13	25	20	100	100	100	100	50	—	100	—
32	1"1/4	15	15	29	20	64	100	100	100	70	—	100	—
40	1"1/2	9,5	9,5	18	18	64	100	100	100	55	—	100	—
50	2"	6	6	12	12	50	20	95	20	45	—	85	—
65	2"1/2	5,5	5,5	11	11	40	76	76	76	45	—	85	—
80	3"	4,7	4,7	9	9	40	76	76	76	35	—	68	—
100	4"	2,5	2,5	5	5	30	57	57	57	35	—	68	—
125	5"	2,4	2,4	4,5	4,5	25	47	47	47	40	—	75	—
150	6"	1,7	1,7	3,2	3,2	15	15	28	28	35	—	64	—
200	8"	0,9	0,9	1,7	1,7	—	—	—	—	35	—	68	—
250	10"	0,6	0,6	1,2	1,2	—	—	—	—	16	—	32	—
		PM	PP	PM	PP	PM	PP	PM	PP	PM	—	PM	—



## Generals

The pneumatic diaphragm actuators serial "L" are actuators with spring return rolling diaphragm designed for plug valves, cage-plug valves, diaphragm valves, angle valves and micro flow valves. They deliver the necessary force to actuate the valve plug.

## Characteristic

### ROBUSTNESS

The use of noble materials and large dimensions gives the actuator type "L" an exceptional stability in time. Except for the stainless steel part all the other metallic component undergo an appropriate surface treatment; thus ensuring an excellent corrosion resistance of the actuators.

### ASSEMBLY

On all conventional valves (plug valves, angle valves, etc...) and can be mounted in any position.

### ACTION

Direct action actuator :

Type 610\*any air pressure on diaphragm pulls the actuator stem out of the diaphragm case.

Reverse action actuator:

Type 601

Any air pressure on the diaphragm draws the actuator stem in the diaphragm case.

### FUNCTION

On-off: direct or reverse action for ATC or ATO valve.

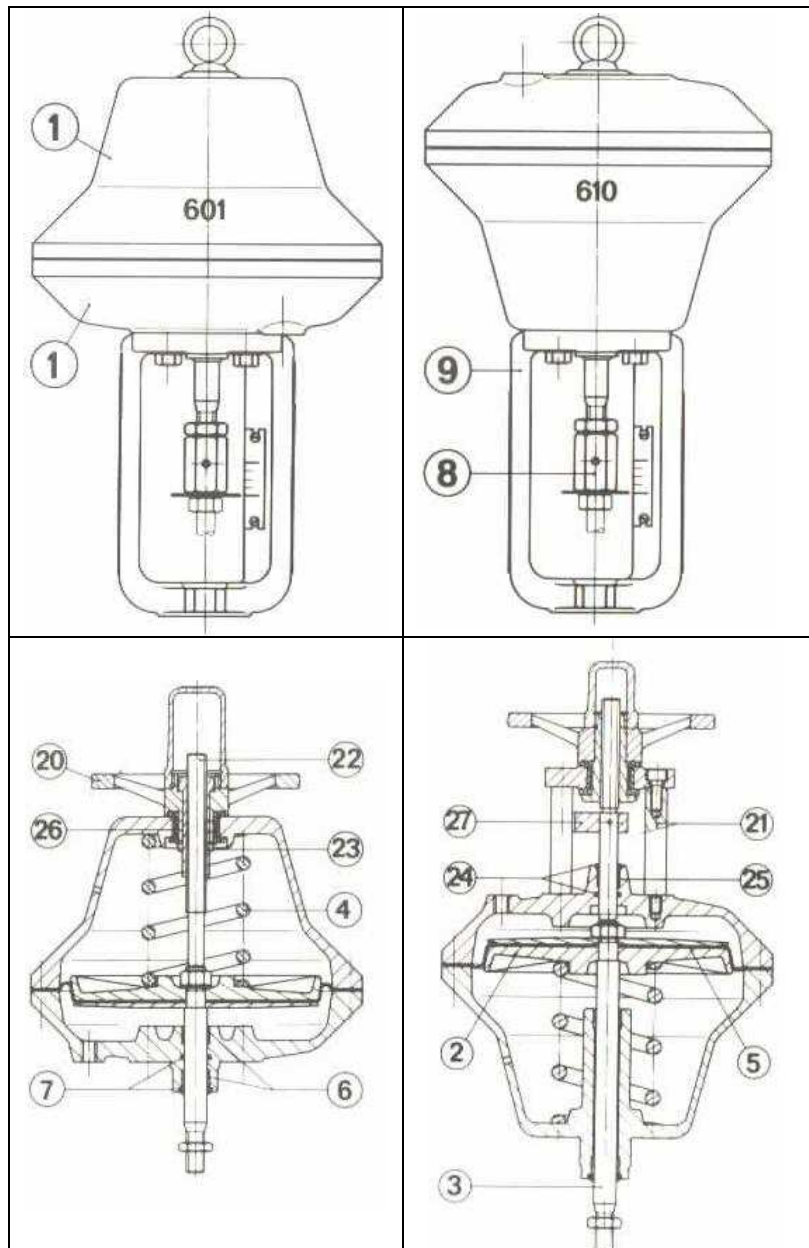
Throttling control: with positioner, direct or reverse action, for ATC or ATO.

### SECURITIES

A protection seal provided at the bottom of the diaphragm case prevents ingress of foreign materials and protects the actuator stem.

### Hysteresis

The use of springs belonging to a precise class and of a rolling diaphragm with constant effective cross-section result in an approximately linear characteristic of the actuator type "L". The linearity error is minimized by use of PTFE/graphite guide bushing for the actuator stem.



# PNEUMATIC ACTUATOR

## CONSTRUCTION

1	Diaphragm case	Alu AS 10 G	8	Adjusting screw	SS Z 2 CN 18-10
2	Diaphragm plates	Alu AS 10 G	9	Yoke	Cast iron FT 25
3	Actuator stem	SS Z 2 CN 18-10	10	Screws	Class 8/8 steel
4	Spring	XC 85 K Steel			
5	Diaphragm	Buna-Nylon 743NYG170	11	Paint	Epoxy zinc undercoating Acrylic over coating
6	Guide bushing	"DU" PTFE graphite			
7	seals	Buna – Viton			

## OPTIONAL HANDWHEEL ACTUATION

20	Handwheel	Cast iron Ft 25	24	Joints	Buna PC 851 – Viton
21	Columns	Galvanized steel	25	Bushing	"DU" PTFE / Graphite
22	Screw	SS Z 2 CN 18-10	26	Needle bearing	—
23	Nut	UE 12 P Brass	27	Guide stop	Galvanized steel

## SERVICE TEMPERATURE

Standard execution : -25 - +80°C

Special execution : -25 - +150 °C

## POSITION INDICATION

By mean of stainless steel washer fixed on the actuator stem and calibrated plate fixed on actuator yoke.

## AIR CONNECTION

1/4" G on the actuator

1/4" NPT on air pressure filter-reducer

Air connection between air pressure filter reducer, positioner, 3ways solenoid pilot valve, ASW... By PTFE or BUNA flexible pipes with metallic sheath. Galvanised or stainless steel pipes end connections.

## SPECIFICATIONS

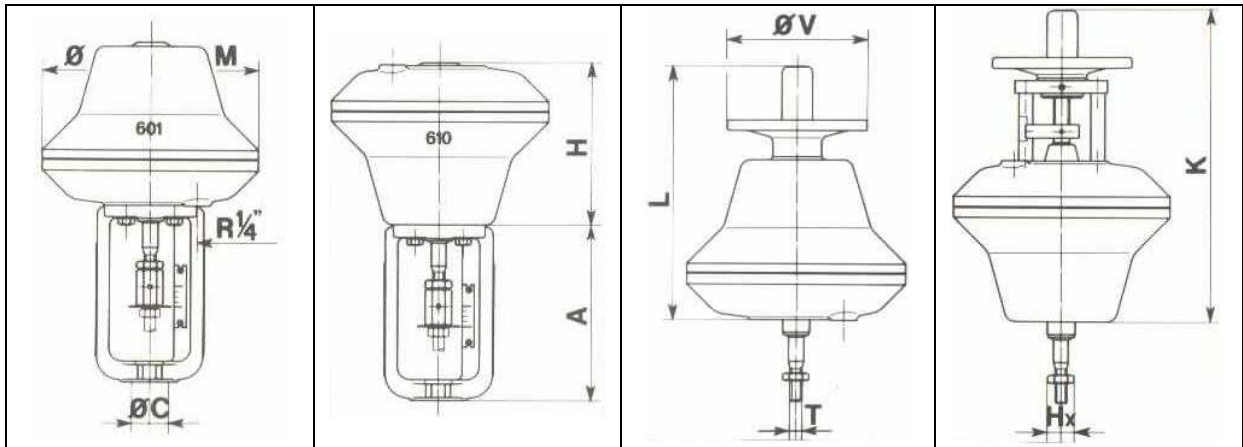
Actuator type	ND	Cross section	On-off supply	Control supply	Control signal	stroke	Max effort at 3 bars
601 – 210 610 – 210	174	197	5	1,4	0,2 – 1	15	394
2,8				0,4 – 2			
601 – 280 610 – 280	230	350	5	1,4	0,2 – 1	30	760
2,8				0,4 – 2			
601 – 350 610 – 350	280	530	4	1,4	0,2 – 1	45	1060
2,8				0,4 – 2			
601 – 430 610 – 430	335	795	3	1,4	0,2 – 1	67	1590
2,8				0,4 – 2			
"L" type	m/m	m/m <sup>2</sup>	Bar	Bar	Bar	m/m	daN

## VALVE FITTING

- **MERGENCY MANUAL HANDWHEEL:** on the pneumatic actuator: at actuator head, single acting, and reverse action by drawback spring.
- **SOLENOID 3 WAYS PILOT VALVE**
- **PNEUMATIC AND ELECTRO-PNEUMATIC POSITIONER**
- **ELECTRO-PEUMATIC CONVERTER**
- **3 WAYS TRIGGER ACTION PILOT WITH MANUAL REARMEMENT**
- **POSITION COPY POTENTIOMETER**
- **SECURITY AIR TANK**

# "L" TYPE 600 WITH DIAPHRAGM

## OVERALL DIMENSIONS



Standard overall dimension

Actuator type	M	H	A	C	T	Hx
600 - 210	210	162	160	35	M <sub>G</sub> 12x1,5	22
600 - 280	280	215	220	45	M <sub>G</sub> 16x1,5	24
600 - 350	350	285	290	65	M <sub>G</sub> 20x2	30
600 - 430	430	392	400	90	M <sub>G</sub> 24x2	26

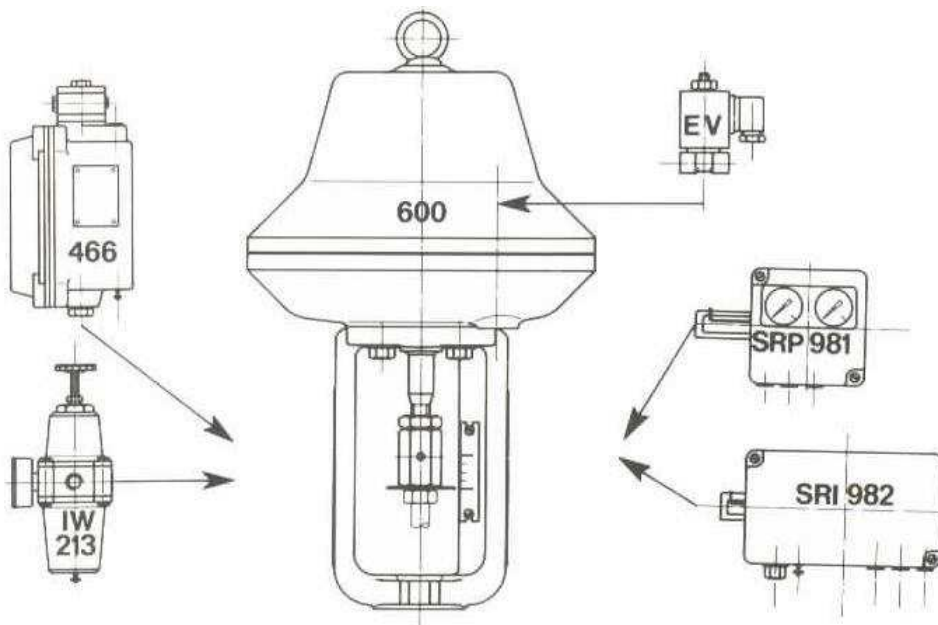
Optional handwheel

V	K	L
130	330	245
175	430	320
250	545	405
250	700	535

## ACTUATOR WEIGHT: KG

Actuator type	Standard	Manual command	P Positioner	EP Positioner
601 - 210 - L16	7,5	+ 1,5	+1,5 Kg	+3,5Kg
610 - 210 - L16	8	+ 3,5		
601 - 280 - L32	14,5	+ 2,8		
610 - 280 - L32	15	+ 4		
601 - 350 - L45	31	+ 5		
610 - 350 - L45	32,5	+ 7,5		
601 - 430 - L67	60	+ 8		
610 - 430 - L67	62	+ 11		

## FITTINGS



# 31 000 – 32 000 CONTROL VALVE TYPES

## ACTUATOR – VALVES ASSEMBLIES

DN	Montage Standard	Montage Particulier
15 à 25	600 – 210 – L 15	600 – 280 – L 15
32 à 50	600 – 280 – L 30	600 – 350 – L 30
65 à 100	600 – 350 – L 45	600 – 430 – L 45
125 à 200	600 – 430 – L 67	—

## OVERALL DIMENSION – VALVE WEIGHT – STANDARD ASSEM

DN	D	L <sub>F</sub>	L <sub>A</sub>	A	U	M	H	W	weight
15	According to NFE 29201 – NP 10 to 64 ANSI B 16 1-5 type 150 to 600 lbs standards	150	195	100	138	210	505	20	20
20		150	195	105	143	210	510	20	21
25		160	195	110	148	210	515	20	22
32		180	216	125	158	280	643	25	25
40		200	235	130	163	280	648	25	30
50		230	265	140	182	280	667	25	35
65		290	290	155	218	350	862	35	50
80		310	310	165	227	350	982	35	60
100		350	360	190	292	350	937	35	90
125		400	400	310	307	430	1179	40	110
150		480	470	250	357	430	1229	40	160
200		600	600	300	395	430	1450	40	230
250		600	600	325	450	430	1800	40	270

LF : Cast iron body length  
LA : Cast iron body length

### VALVE FITTINGS

- **MANUAL HANDWHEEL:**
  - o On pneumatic actuator: at actuator head, single acting, reverse action by drawback spring.
- **SOLENOID 3 WAYS PILOT VALVE**
- **PNEUMATIC AND ELECTRO-PNEUMATIC POSITIONER**
- **END OF TRAVEL SWITCHES**
- **POSITION COPY POTENTIOMETER**
- **3 WAYS TRIGGER ACTION PILOT WITH MANUAL REARMAMENT**
- **SECURITY AIR TANK**
- **TRAVEL INDICATING POTENTIOMETER**
- **ELECTRO-PNEUMATIC CONVERTER 466**

The drawing shows a side view of the valve assembly. It includes a handwheel at the top with diameter ØM and width ØW. Below it is the actuator body with a height H and a radius R¼. The valve body below has a height U and a diameter ØD. The valve body has a diameter ØDN and a length L. The distance from the top of the valve body to the bottom of the actuator is A.