

UBS Series

Direct operated pressure relief/backpressure valve



Suitable for:



Air & process gases



Liquids



Steam

Markets:



Oil & gas



Blanketing systems



General industry



Power

Threaded or Flanged Connections Carbon Steel, Stainless Steel & Alloy Construction

Valve ID card

Function	Relief / Backpressure
Seat type	Single
Inlet / Outlet diameters	From ½" up to 2"
Body material	Carbon steel, Stainless steel and Exotic materials
End connections	Threaded (F-NPT or GAS/BS) and Flanged (ANSI or PN)
Max rating	ANSI 600
CV	From 0,031 up to 35
Trim materials	Stainless steel (std.) and Exotic materials
Diaphragms	Polychloroprene, EPDM, FKM, Stainless steel, other

The UBS series are spring loaded, direct-operated, pressure relief valves used downstream of pressure regulators to protect the downstream system from over pressure. Their main function is to regulate the inlet pressure.

They can be used also as backpressure regulators as they have good throttling characteristics. They are available in ½ up to 2 inches (DN15 through DN50) body sizes. These regulators have a compact design and construction such to sustain rugged use and their construction makes them easy to install and to maintain.

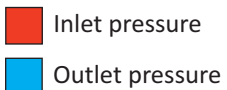
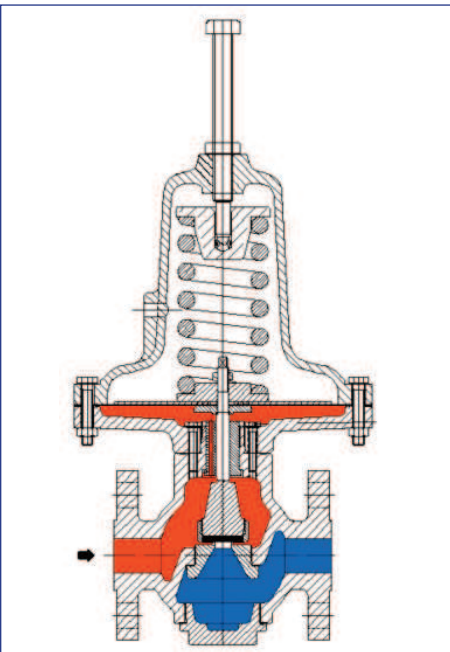
General features:

- Flow to close design
- Available with ISA Face to face dimensions
- From 5 to 9 different CV's for each size to assure high accuracy in regulation
- Metal or Soft Seat (featuring leakage from II to VI, according to Carraro Technical Instruction based on ANSI/FCI 70-3)
- Internal pressure sensing (external on request)
- Packingless construction (available only with internal pressure sensing)
- Wide range of actuators according to the requested regulation range
- Wide range of elastomeric diaphragms or in AISI 316
- Fully sealed construction available (suitable for dangerous medium; ATEX compliant)

Special constructions:

UBS regulators are also available in special configurations:

- Exotic materials in short lead times (e.g. duplex, superduplex, alloy steel, monel, inconel etc.)
- Differential versions (with single or double diaphragm) for applications where the differential pressure between two spots has to be controlled and maintained constant
- Vacuum breaker



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- Body Sizes and End Connections • see table 15
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Tab. [1] - Fluid applications

Gas	Air, inert gas, CO ₂ , CO, hydrocarbons, O ₂ , H ₂ , F, NH ₃ , frigorific gas.
Steam	Steam H ₂ O, alcoholic steams, organic steam, sulphuric acid.
Liquids	Water, aqueous solutions, hydrocarbons, alcohol, lubricating oils, diathermic oils, solvents, frigorific fluids, acrylic compounds.

Tab. [2] - Capacities

Nozzle	Body Size									
	½" (DN15)		¾" (DN20)		1" (DN25)		1½" (DN40)		2" (DN50)	
1	0,031	0,031	0,031	0,031	0,031	0,031	0,031	0,031	0,031	0,031
5	0,60	0,20	0,60	0,20	0,60	0,20	0,60	0,20	0,60	0,20
8	1,7	0,33	1,7	0,33	1,7	0,33	1,7	0,33	1,7	0,33
10	2,5	0,40	2,5	0,40	2,5	0,40	2,5	0,40	2,5	0,40
12	3,4	0,50	3,4	0,50	3,4	0,50	3,4	0,50	3,4	0,50
16			6,5	0,90	6,5	0,90	7,0	0,90	7,0	0,90
20					8,7 (7,5*)	1,4	9,0 (7,7*)	1,4	9,0 (7,7*)	1,4
35							19 (15*)	3,0	19 (15*)	3,0
45									35 (28*)	5,5

Cv for all body sizes with **elastomer diaphragm**

Cv for all body sizes with **metal diaphragm**

* Reduced Cv for actuator 100

Tab. [3] - Actuators operating range

Actuators	Actuators spring ranges	Maximum allowable pressure
100	4.5 to 46.0 Barg	52 Barg
120	2.6 to 29.5 Barg	33 Barg
130	1.7 to 22.1 Barg	25 Barg
140	0.7 to 9.2 Barg	10 Barg
220	0,094 to 2,7 Barg	3 Barg
360	0,0025 to 0,84 Barg	1 Barg
515	0,0012 to 0,23 Barg	0,25 Barg

Tab. [4] - Material Combination

Body				
	Carbon steel (AF1/AS1)	Full Carbon steel (AF2/AS2)	316 SS (IF2/IS2)	Full 316 SS (IF3/IS3)
	0°C ≤ T ≤ 200°C (32°F ≤ T ≤ 392°F)	-29°C ≤ T ≤ 300°C (-20°F ≤ T ≤ 572°F)	-29°C ≤ T ≤ 300°C (-20°F ≤ T ≤ 572°F)	-196°C ≤ T ≤ 300°C (-320°F ≤ T ≤ 572°F)
Body	ASME SA-216 WCC	ASME SA-216 WCC	ASME SA-351 CF8M	ASME SA-351 CF8M
Blinhead	ASME SA-216 WCC	ASME SA-216 WCC	ASME SA-351 CF8M	ASME SA-351 CF8M
Gaskets set	See Tab. [5]			
Trim				
Disc (standard)	See Tab. [6]			
Seat	ASME A-479 316	ASME A-479 316	ASME A-479 316	ASME A-479 316
Plug	ASME A-479 316	ASME A-479 316	ASME A-479 316	ASME A-479 316
Guide	17-4 PH	17-4 PH	ASME A-479 304	ASME A-479 304
Actuator				
Spring case	ASME SA-278 35	ASME SA-216 WCC	ASME SA-216 WCC	ASME SA-351 CF8M
Actuator diaphragm case	ASME SA-216 WCC	ASME SA-216 WCC	ASME SA-351 CF8M	ASME SA-351 CF8M
Spring	ASTM A 401	ASTM A 401	ASTM A 401	ASTM A-313 316
Diaphragm	See Tab. [7]			

NOTE:

SS = Stainless steel

Tab. [5] - Temperature range for flat Gaskets

Materials	Temperature limits
Polytetrafluoroethylene (PTFE)	-200 to 250°C (-328 to 482°F)
No asbestos	-50 to 200°C (-58 to 392°F)
Graphite + AISI 316	-200 to 500°C (-328 to 1022°F)

Tab. [6] - Temperature range and inlet pressure limits for Disc material

Materials	Temperature limits	Maximum pressure
Fluoroelastomer (FKM-FPM)	-10 to 200°C (-14 to 392°F)	40barg (580psig)
Polytetrafluoroethylene (PTFE)	-200 to 250°C (-328 to 482°F)	200barg (2900psig)
Stainless Steel	-196 to 455°C (-321 to 851°F)	280barg (4060psig)

Tab. [7] - Temperature range for Diaphragms

Materials	Temperature limits
Chloroprene (CR)	-20 to 90°C (-4 to 194°F)
NBR	-25 to 90°C (-13 to 194°F)
HNBR	-15 to 120°C (5 to 248°F)
Fluorocarbon (FKM-FPM)	-10 to 200°C (14 to 392°F)
Ethylene-Propylene (EPDM)	-35 to 160°C (-31 to 320°F)
Tetrafluoroethylene/propylene (TFE/P)	5 to 200°C (41 to 392°F)
Silicone (VMQ)	-50 to 150°C (-58 to 300°F)
Fluorosilicone (FVMQ)	-50 to 150°C (-58 to 300°F)
Stainless Steel	-196 to 455°C (-321 to 851°F)

Tab. [8] - Temperature range for O-Rings

Materials	Temperature limits
Polytetrafluoroethylene (PTFE)	-200 to 250°C (-328 to 482°F)
Fluorocarbon (FKM-FPM)	-10 to 200°C (14 to 392°F)

Tab. [9] - Temperature range for Metal part

Materials	Temperature limits
Cast Iron	0 to 232°C (32 to 449,6°F)
Carbon Steel	-29 to 425°C (-20 to 797°F)
Stainless Steel	-196 to 455°C (-321 to 851°F)



Gauge



Safety device on actuator



Bolts & Nuts PTFE coated

Optionals:

- Bolts & Nuts PTFE coated or other
- Gauge
- Safety device on actuator
- External pressure sensing
- Bug screen

Special configurations:

- Exotic materials
- Differential valves:
 - D1 single Diaphragm
 - D2 double Diaphragm
- Special weldings:
 - Butt-weld
 - Socket-weld
- Vacuum breaker

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Spring ranges are based on the following assumptions:

- Stroke from setpoint is $\pm 3\text{mm}$
- Offset max 20% for minimum set pressure
- Low unbalancing forces on the plug

If different operating conditions are required please contact Carraro Technical Dept.

* Thin diaphragm (FKM 0,18mm) and upside down installation.

Upright installation

Upsidedown installation

Tab. [10] - Spring ranges

Actuator	Spring	Spring ranges			
		minimum set pressure		maximum set pressure	
	Name	barg	psig	barg	psig
100	4BIS	4,5	65	8,7	126
	6	7,2	105	14,0	203
	7	10,4	151	21,6	314
	8	14,6	211	23,0	334
	9	22,0	319	34,6	502
	9BIS	27,4	397	37,9	550
	10	34,1	494	41,7	604
	10BIS	37,8	548	46,0	667
120	4BIS	2,6	37	4,1	59
	6	3,8	56	6,6	95
	7	5,3	77	10,1	147
	8	7,3	105	10,8	156
	9	10,8	156	16,2	235
	9BIS	13,3	193	17,8	258
	10	16,4	238	19,5	283
130	4BIS	1,7	25	3,0	44
	6	2,7	39	4,9	71
	7	3,8	55	7,6	110
	8	5,2	76	8,0	116
	9	7,8	113	12,1	175
	9BIS	9,7	141	13,2	192
	10	12,0	174	14,5	211
140	4BIS	0,7	10	1,3	19
	6	1,1	16	2,1	31
	7	1,6	23	3,3	47
	8	2,2	32	3,5	50
	9	3,3	48	5,2	75
	9BIS	4,1	60	5,7	83
	10	5,1	74	6,3	91
220	10BIS	5,7	82	9,2	133
	2bis	0,094	1,36	0,12	1,8
	3	0,106	1,54	0,20	3,0
	4	0,127	1,84	0,24	3,4
	4bis	0,144	2,1	0,37	5,4
	6	0,26	3,8	0,60	8,7
	7	0,40	5,8	0,93	13,4
	8	0,58	8,4	0,99	14,3
	9	0,89	13	1,5	21,5
	9bis	1,1	16	1,6	23,6
360	10	1,4	20	1,8	25,9
	10bis	1,6	23	2,7	38,7
	1*	0,0025	0,036	0,014	0,21
	1bis	0,015	0,22	0,018	0,25
	2bis	0,019	0,27	0,039	0,56
	3	0,023	0,33	0,063	0,92
	4	0,029	0,42	0,073	1,1
	4bis	0,035	0,50	0,12	1,7
	6	0,071	1,0	0,19	2,7
	7	0,11	1,6	0,29	4,2
	8	0,17	2,4	0,31	4,4
	9	0,27	3,9	0,46	6,7
515	9bis	0,34	4,9	0,50	7,3
	10	0,43	6,2	0,55	8,0
	10bis	0,48	6,9	0,84	12,2
	1*	0,0012	0,017	0,0077	0,11
	1bis	0,0059	0,09	0,010	0,14
	2bis	0,0080	0,12	0,021	0,30
	3	0,0100	0,15	0,034	0,50
	4	0,014	0,20	0,04	0,6
	4bis	0,016	0,24	0,06	0,9
6	0,036	0,5	0,10	1,5	
7	0,06	0,9	0,16	2,3	
8	0,09	1,3	0,17	2,4	
9	0,14	2,1	0,23	3,3	

Tab. [11] - Weights | Actuators: 100, 120, 130, 140.

	NPT/GAS	Class 150 RF	PN 16/25/40	Class 300 RF	Class 600 RF
DN15 (½")	16,7kg (36,8lbs)	16,5kg (36,4lbs)	17,5kg (38,6lbs)	18,5kg (40,8lbs)	21,5kg (47,4lbs)
DN20 (¾")	16,7kg (36,8lbs)	17kg (37,5lbs)	18kg (39,7lbs)	19,5kg (43lbs)	22,5kg (49,6lbs)
DN25 (1")	16,6kg (36,6lbs)	17,5kg (38,6lbs)	18,5kg (40,8lbs)	20kg (44,1lbs)	23kg (50,7lbs)
DN40 (1½")	16,5kg (36,4lbs)	20,1kg (44,3lbs)	21,5kg (47,4lbs)	24kg (52,9lbs)	27kg (59,5lbs)
DN50 (2")	18,5kg (40,8lbs)	22kg (48,5lbs)	23,1kg (50,9lbs)	26,3kg (58lbs)	30kg (66,1lbs)

Tab. [12] - Weights | Actuator: 220.

	NPT/GAS	Class 150 RF	PN 16/25/40	Class 300 RF	Class 600 RF
DN15 (½")	18,6kg (41lbs)	18,5kg (40,8lbs)	19,5kg (43lbs)	20,5kg (45,2lbs)	23,5kg (51,8lbs)
DN20 (¾")	18,6kg (41lbs)	19kg (41,9lbs)	20kg (44,1lbs)	21,5kg (47,4lbs)	24,5kg (54lbs)
DN25 (1")	18,5kg (40,8lbs)	19,5kg (43lbs)	20,5kg (45,2lbs)	22kg (48,5lbs)	26kg (57,3lbs)
DN40 (1½")	20,6kg (45,4lbs)	22,1kg (48,7lbs)	23,5kg (51,8lbs)	26kg (57,3lbs)	29kg (64lbs)
DN50 (2")	20,5kg (45,2lbs)	24kg (52,9lbs)	25,1kg (55,3lbs)	28,3kg (62,4lbs)	31kg (68,3lbs)

Tab. [13] - Weights | Actuator: 360.

	NPT/GAS	Class 150 RF	PN 16/25/40	Class 300 RF	Class 600 RF
DN15 (½")	33,5kg (73,9lbs)	33,4kg (73,6lbs)	34,4kg (75,8lbs)	35,4kg (78lbs)	38,4kg (84,6lbs)
DN20 (¾")	33,5kg (73,9lbs)	33,9kg (74,7lbs)	34,9kg (76,9lbs)	36,4kg (80,3lbs)	39,4kg (86,9lbs)
DN25 (1")	33,4kg (73,6lbs)	34,4kg (75,8lbs)	35,4kg (78lbs)	36,9kg (81,4lbs)	40kg (88,2lbs)
DN40 (1½")	35,5kg (78,3lbs)	37kg (81,6lbs)	38,4kg (84,7lbs)	40,9kg (92,2lbs)	43,9kg (96,8lbs)
DN50 (2")	35,4kg (78lbs)	38,9kg (85,8lbs)	40kg (88,2lbs)	43,2kg (95,2lbs)	46,2kg (101,8lbs)

Tab. [14] - Weights | Actuator: 515.

	NPT/GAS	Class 150 RF	PN 16/25/40	Class 300 RF	Class 600 RF
DN15 (½")	23,8kg (52,5lbs)	23,7kg (52,3lbs)	24,7kg (54,5lbs)	25,7kg (56,7lbs)	28,7kg (63,3lbs)
DN20 (¾")	23,8kg (52,5lbs)	24,2kg (53,4lbs)	25,2kg (55,6lbs)	26,7kg (58,9lbs)	29,7kg (65,5lbs)
DN25 (1")	23,7kg (52,3lbs)	24,7kg (54,5lbs)	25,7kg (56,7lbs)	27,2kg (60lbs)	30,2kg (66,6lbs)
DN40 (1½")	25,8kg (56,9lbs)	27,3kg (60,2lbs)	28,7kg (63,3lbs)	31,2kg (68,8lbs)	34,2kg (75,4lbs)
DN50 (2")	25,7kg (56,7lbs)	29,2kg (64,4lbs)	30,3kg (66,8lbs)	33,5kg (73,9lbs)	36,5kg (80,5lbs)

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Parts list:

- 1 - Blindhead
- 2 - (a-b) Gaskets set (*)
- 3 - Body
- 4 - Guide
- 5 - Actuator diaphragm case
- 6 - Ball
- 7 - Diaphragm plate (Upper)
- 8 - Diaphragm (*)
- 9 - Protection (if requested) + O-ring (*)
- 10 - Spring case
- 11 - Spring
- 12 - Adjusting screw
- 13 - Adjusting screw locknut
- 14 - Spring button (Upper)
- 15 - Nut
- 16 - Spring button (Lower)
- 17 - Screw
- 18 - Nut
- 19 - Little plate
- 20 - Screw
- 21 - Guide
- 22 - Plug
- 23 - Ring
- 24 - Disc (*)
- 25 - Seat

(*) Recommended spare parts

2 Years spare part kit:

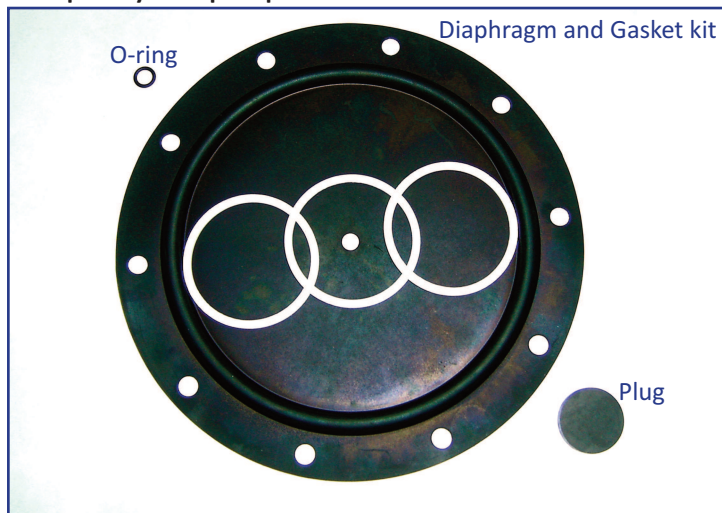
- Gasket Kit (3 pcs)
- Plug disc
- Diaphragm kit (Diaphragm + o-ring)

5 Years spare part kit:

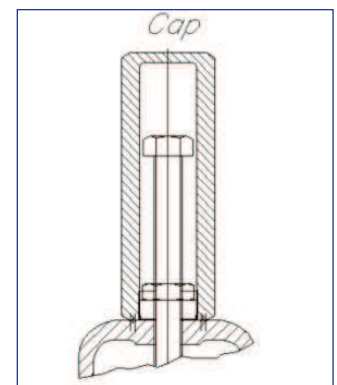
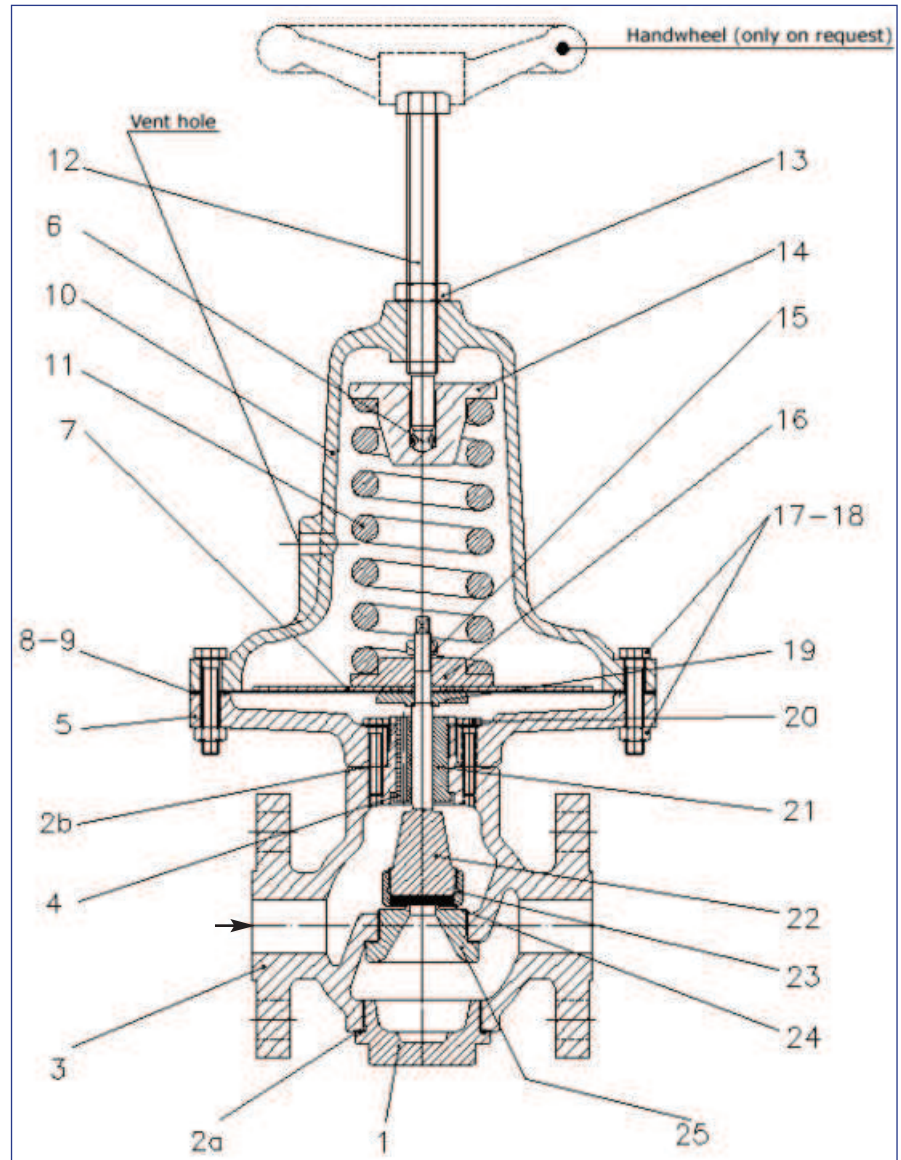
- Gasket Kit (3 pcs)
- Plug
- Plug disc
- Diaphragm kit (Diaphragm + o-ring)

For threaded and flanged construction

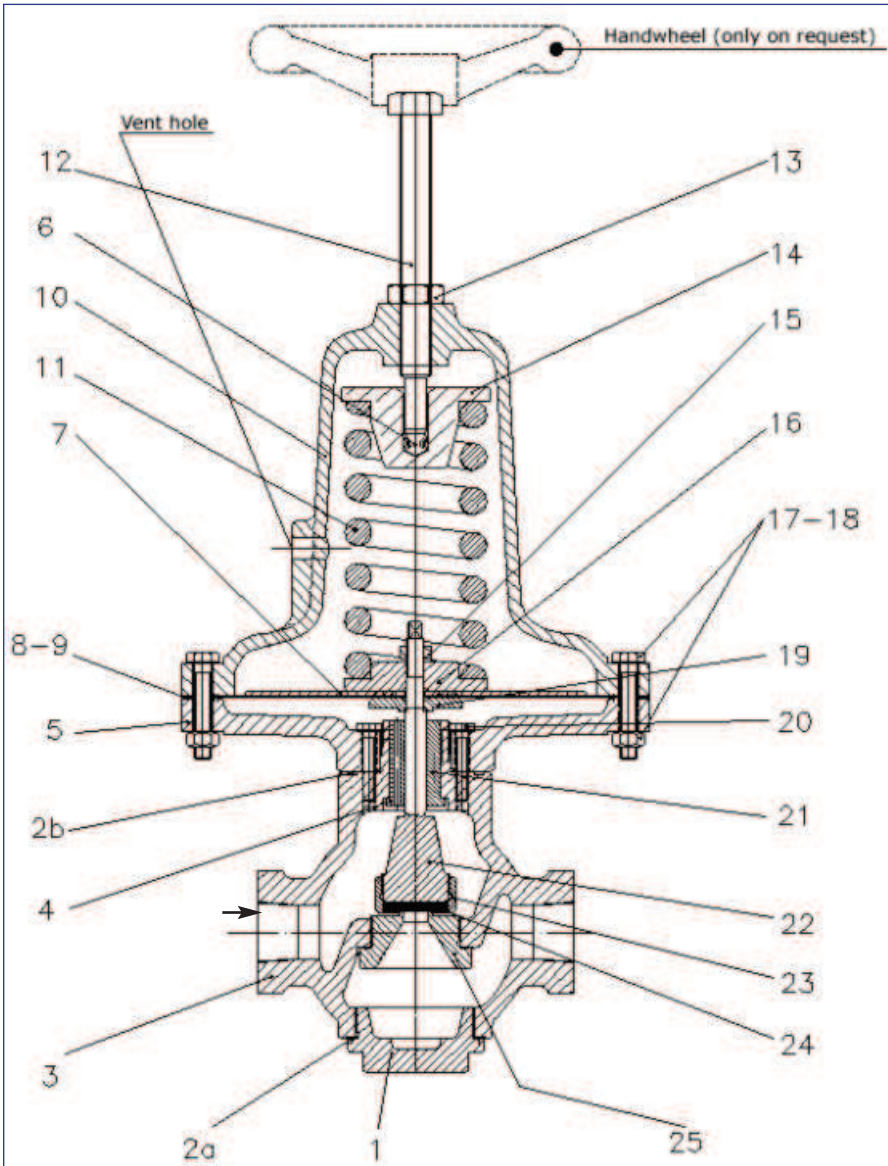
Example: 2 years spare parts kit



UBS flanged valve section drawing



UBS threaded valve section drawing



Parts list:

- 1 - Blindhead
- 2 - (a-b) Gaskets set (*)
- 3 - Body
- 4 - Guide
- 5 - Actuator diaphragm case
- 6 - Ball
- 7 - Diaphragm plate (Upper)
- 8 - Diaphragm (*)
- 9 - Protection (if requested) + O-ring (*)
- 10 - Spring case
- 11 - Spring
- 12 - Adjusting screw
- 13 - Adjusting screw locknut
- 14 - Spring button (Upper)
- 15 - Nut
- 16 - Spring butto (Lower)
- 17 - Screw
- 18 - Nut
- 19 - Diaphragm plate (Lower)
- 20 - Screw
- 21 - Guide
- 22 - Plug
- 23 - Ring
- 24 - Disc (*)
- 25 - Seat

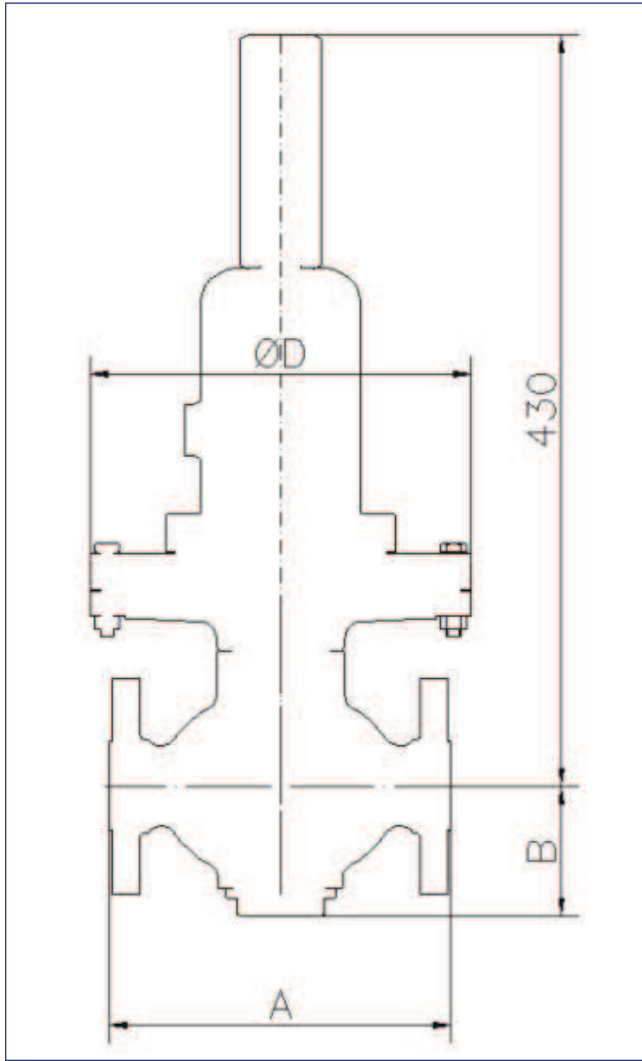
(*) Recommended spare parts

Threaded UBS

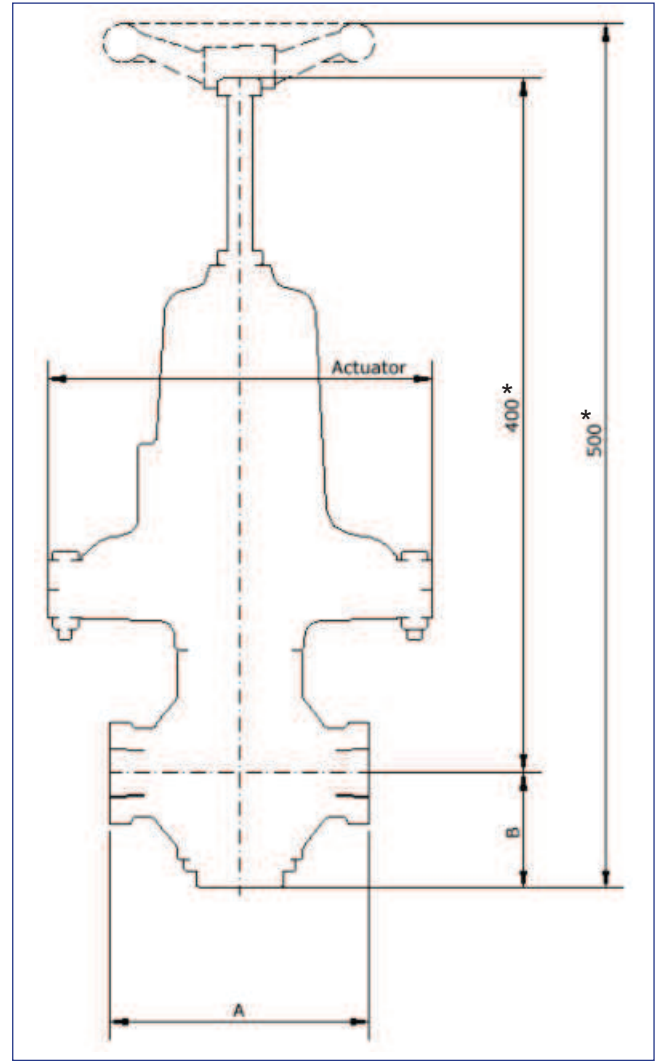


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UBS flanged valve dimensional drawing



UBS threaded valve dimensional drawing

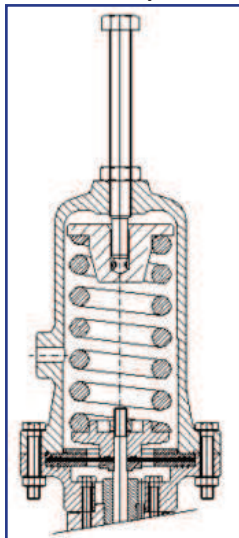


* The dimension may change according to setting

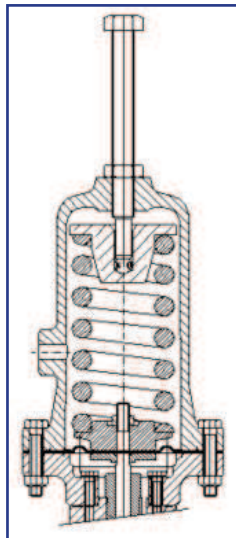
Tab. [15] - Body sizes and face to face dimensions

Size (DN)	Flanged					Threaded		
	Face to face dimensions					NPT-F GAS-F Con. BSP-F		
	ANSI Connections			CARRARO Connections				
	150	300	600	150 / 300 / 600	PN 16			
	A			B	A	B	A	B
½" (DN15)	184 (7¼")	190 (7½")	203 (8")	75 (3")	160mm (6¼")	66mm (3¾")	130mm (5½")	66mm (2¾")
¾" (DN20)	184 (7¼")	194 (7½")	206 (8½")					
1" (DN25)	184 (7¼")	197 (7¾")	210 (8¼")					
1½" (DN40)	222 (8¾")	235 (9½")	251 (10")					
2" (DN50)	254 (10")	267 (10½")	267 (10½")		185mm (7¼")	82mm (3¼")	170mm (6¾")	88mm (3½")

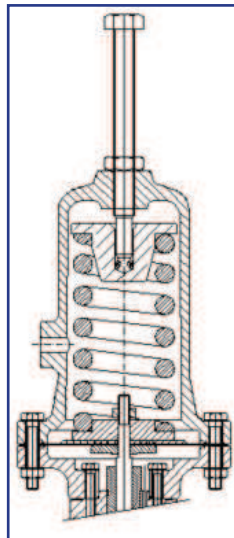
Actuator 100/120



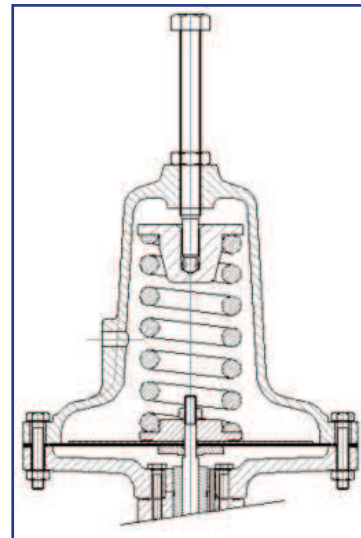
Actuator 130



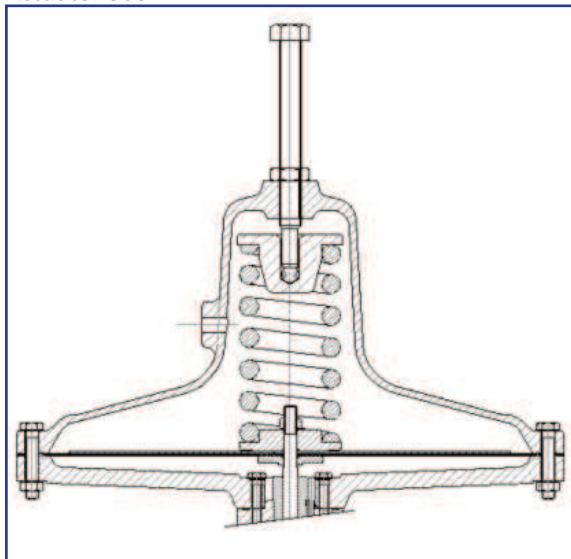
Actuator 140



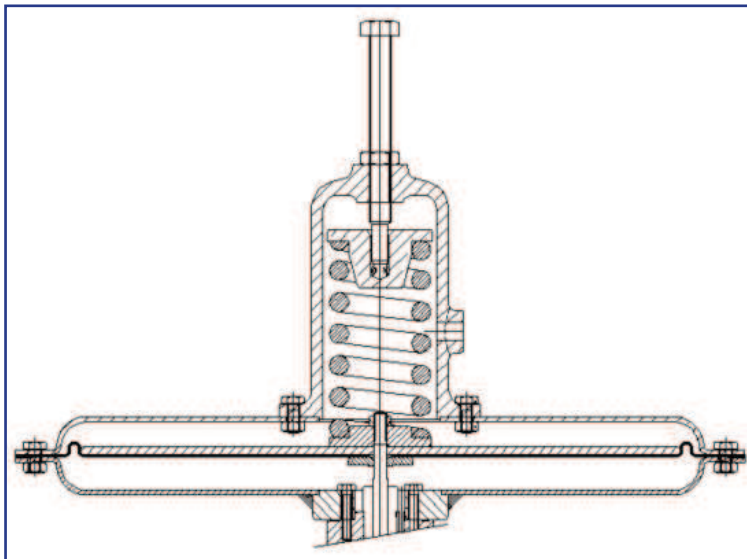
Actuator 220



Actuator 360



Actuator 515



UBS actuators:

The above drawings show all our available actuators, which are perfectly interchangeable the one with the others according to the desired pressure regulation (please refer also to Tab. 3 on page 3). The table below shows the actuators dimensions.

Tab. [16] - Actuators dimension

Actuator	Outer diameter	Surface
	mm	cm ² (in ²)
100	132	9,7 (1,5)
120	132	20,7 (3,2)
130	132	27,8 (4,3)
140	140	64,5 (10)
220	220	226,5 (35,1)
360	360	730,1 (113,2)
515	480	1346 (208,6)

About Carraro

Carraro Srl is a private independent company, operative since 1924 in the field of industrial valves. The firm produces and commercializes worldwide a broad range of industrial pressure regulators, desuperheaters and safety valves for fluids such as steam, process gases and liquids.

The flexible organization of Carraro allows a great customization of the products and the production of “taylor made” constructions. Most of the Carraro’s product range can be realized also in “exotic” materials such as e.g. duplex, superduplex, monel, hastelloy, aluminum bronze and others. Supported by a global network of sales offices, representatives and distributors, Carraro offers a wide range of solutions for the Oil&Gas, the Power industry and all other diversified industrial applications.

Carraro: product range

UB Regulators: direct-operated pressure regulators with compact design

Maxomatic Series: multifunction pilot-operated regulators for liquids

MM-BPM series: direct-operated, spring pressure regulators

AT series: direct-operated temperature regulators

M51 series: direct-operated, weight and lever pressure regulators

CS series: safety valves for vapours, gas, liquids

CSV series: safety valves for steam and gases

VRE series: electrically operated control valves

MCP - ACP series: pneumatically operated control valves

AIRMATIC series: electropneumatic safety valves

DSH series: desuperheaters

Approvals and certifications

UNI EN ISO 9001: 2008	✓
UNI EN ISO 14001: 2004	✓
97 / 23 / CE (PED)	✓
94 / 09 / CE (ATEX)	✓
RINA	✓
GOST R+RTN	✓
CRN Canada	✓

Cooperations with notified bodies

LLOYD’s REGISTER	✓
ABS	✓
BV	✓
DNV	✓

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