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RSA-12...
ECONOMIC
DN15-32

RSA-12...Q
PT/T-PLUGS
DN15-32

RSA-12...
ECONOMIC
DN40-50

RSA-12...Q
PT/T-PLUGS
DN15-32

RSA-62...Q
PT/T-PLUGS
DN65-200

Pressure Independent Control Valves (PICV)
(PICV) DN 15-250

In ventilation and air air conditioning plants for control on the water side and automatic hydraulic balancing of terminal units, such as fan coils, air handling units, and in heat exchangers for heating orcooling.

- In heating zones like self-contained heating systems, apartments, ndividual rooms, etc.

Overviews:

- Combines an externally presettable adjustable valve, a differential pressure control valve and a full authority modulating control valve.
- DN15~200
- Pipe connections
  RSA12... (DN15~DN50):
  Internal thread BSP (ISO7/1) PN25
  RSA62... (DN65~DN200):
  Flanged (ISO7005-2) PN16 PN25
- Body materials:
  RSAT12...
  (DN15~DN32): hot-pressed brass
  (DN40~DN50): stainless steel
  RSAT62...
  (DN65~DN200): nodular cast iron
- The maximum flow can be preset arbitrarily according to the actual flow demand, making the control more precise and adjustment more convenient
- The presetting function has no impact on the stroke, regulation characteristic remains unchanged regardless of preset flow
- The flow control is only related to the electric control valve opening and is not affected by the fluctuation of the system pressure difference
- Optional with pressure test plugs (P/T plugs)
  (It must be selected before delivery)
- Can be quipped with linear electromotor actuators,such as: 3 point or DC0…10V or DC4…20mA

Application:

RSA.. Combi Valves pressure independent combi valve (PICV) is used in heating and cooling systems in applications with Air Handling Units, Heat Exhangers or Mixing Circuits. It combines a differential pressure control valve and a full authority modulating control valve.

Provides modulating control with full authority regardless of any fluctuations in the differential pressure of the system. RSA.. Combi Valves makes it simple to achieve 100% control of the water flow in the building, while creating high comfort and energy savings at the same time. An additional benefit is that no balancing is required if further stages are added to the system, or if the dimensioned capacity is changed.

The constant differential pressure across the modulating control component guarantees 100% authority. Energy saving due to optimal control, lower flow and pump pressure. Maximized △T due to faster response and increased system stability.

Types and Technical data:

Product number	DN	H_{100} mm	Q_{min} (m^3/h)	Q_{max} (m^3/h)	Connections		PN class	P/T plugs	ΔP_{min}~ΔP_{max} （KPa）	Medium temperature
RSA12.15.25	DN15	2.5	0.15	0.6	1/2 in	BSP	PN25	no	25...400	1...110°C
RSA12.20.25	DN20	2.5	0.25	1.1	3/4 in	BSP	PN25	no	30...400	
RSA12.25.25	DN25	5	0.3	1.5	1 in	BSP	PN25	no	30...400	
RSA12.32.25	DN32	6	0.6	3.1	1 1/4 in	BSP	PN25	no	30...400	
RSA12.40.25	DN40	10	1.5	7.5	1 1/2 in	BSP	PN25	no	30...400	
RSA12.50.25	DN50	15	2	10	2 in	BSP	PN25	no	30...400	
RSA62.65.16	DN65	18	4	24	Flanged	-	PN16	no	30...400	
RSA62.80.16	DN80	18	6.4	34	Flanged	-	PN16	no	30...400	
RSA62.100.16	DN100	25	8.4	48	Flanged	-	PN16	no	30...400	
RSA62.125.16	DN125	30	19	75	Flanged	-	PN16	no	30...400	
RSA62.150.16	DN150	40	30	120	Flanged	-	PN16	no	30...400	
RSA62.200.16	DN200	25	45	175	Flanged	-	PN16	no	30...400	
RSA12.15.25Q	DN15	2.5	0.15	0.6	1/2 in	BSP	PN25	yes	25...400	
RSA12.20.25Q	DN20	2.5	0.25	1.1	3/4 in	BSP	PN25	yes	30...400	
RSA12.25.25Q	DN25	5	0.3	1.5	1 in	BSP	PN25	yes	30...400	
RSA12.32.25Q	DN32	6	0.6	3.1	1 1/4 in	BSP	PN25	yes	30...400	
RSA12.40.25Q	DN40	10	1.5	7.5	1 1/2 in	BSP	PN25	yes	30...400	
RSA12.50.25Q	DN50	15	2	10	2 in	BSP	PN25	yes	30...400	
RSA62.65.16Q	DN65	18	4	24	Flanged	-	PN16	yes	30...400	
RSA62.80.16Q	DN80	18	6.4	34	Flanged	-	PN16	yes	30...400	
RSA62.100.16Q	DN100	25	8.4	48	Flanged	-	PN16	yes	30...400	
RSA62.125.16Q	DN125	30	19	75	Flanged	-	PN16	yes	30...400	
RSA62.150.16Q	DN150	40	30	120	Flanged	-	PN16	yes	30...400	
RSA62.200.16Q	DN200	25	45	175	Flanged	-	PN16	yes	30...400	

DN = nominal size

H_{100} = nominal stroke

Q_{min} = smallest volumetric flow through valve, so that the difference pressure regulator works reliably. When the volumetric flow decreases below **Q_{min}**,the RSAT operates with lower accuracy, so much asat much lower flow it enters into a static balancing zone.

Q_{max} = volumetric flow through fully open valve(H_{100})

Δp_{min} = “START UP Δp”, minimum differential pressure required across the valve’s control path, so that the difference pressure regulator works reliably. When the pressure loss decreases below Δp_{min},the RSAT operates with lower accuracy and at much lower differential pressure it enters into a static balancing zone.

Δp_{max} = maximum permissible differential pressure across the valve’s control path, so that the difference pressure regulator works reliably. Within this pressure loss range the valve will maintain a constant flow.

P/T-plugs = pressure test plugs, Self-sealing measuring points, for measuring and monitoring the differential pressure across the valve during commissioning, and measuring points for flow verification.

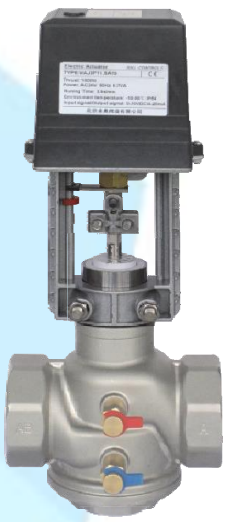
Types and operation data actuators:

Product number	DN	H_{100} mm	ΔP_{max} [KPa]	Matc the actuator [1] and ΔP_s	
				90N ΔP_s [KPa]	200N ΔP_s [KPa]
RSA12.15.25..	DN15	2.5	4 0	400	400
RSA12.20.25..	DN20	2.5	4 0	400	400
RSA12.25.25..	DN25	5	4 0	400	400
RSA12.32.25..	DN32	6	4 0	-	310

ΔP_s = maximum permissible differential pressure at which the motorized Combi valve will close securely against the pressure (close off pressure)

1) For detailed parameters of the actuator, see the relevant actuator data.

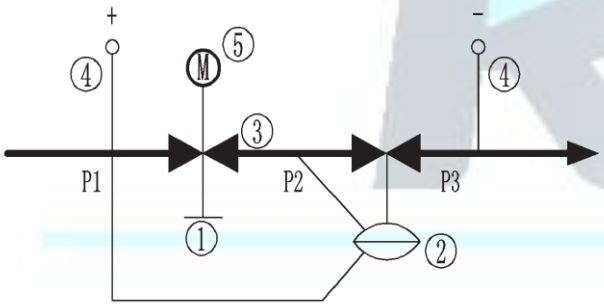
Product number	DN	H_{100} mm	Δ max [KPa]	M tch the actuator [1] and ΔP_s				
				RSAJ3.. 10 0N ΔP_s [KPa]	RSAJ3.. 1500N ΔP_s [KPa]	RSA 4.. 1800N ΔP_s KPa]	RSA .. 3000N ΔP_s [Pa]	RSAJ6.. 6500N ΔP_s [KPa]
RSA12.40.25..	DN40	10	400	4 0	-	-	-	-
RSA12.50.25..	DN50	15	400	4 0	-	-	-	-
RSA62.65.16..	DN65	18	400	-	400	-	-	-
RSA62.80.16..	DN80	18	400	-	310	370	400	-
RSA62.100.16..	DN100	25	400	-	-	250	400	-
RSA62.125.16..	DN125	30	400	-	-	-	400	-
RSA62.150.16..	DN150	40	400	-	-	-	400	-
RSA62.200.16..	DN200	25	400	-	-	-	240	400



Functional principle:

RSAT.. Combi Valves combine three functions:

- an presetting adjusting mechanism ①, with a dial for a presettable maximum volumetric flow
- a differential pressure controller ②, ensuring a constant differential pressure across control valves regardless of changes in pump speed or valve closures elsewhere in the system
- a modulating control valve ③, for controlling the volumetric flow across the valve's path, it can be used to equipped actuators.

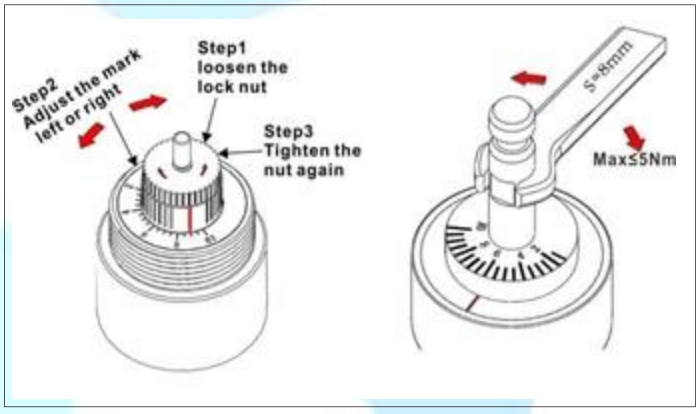


The mechanical series-connected differential pressure controller keeps the differential pressure (p1 – p2) constant across the control valve and thus the s t volumetric flow too. T e desired m aximum volumetric flow can be preset with the adjusting mechanism. The volumetric flow through the control valve opening to control. The controller (not shown) and the actuator regulate the volumetric flow and conse uently the desired temperature in buildings, rooms or zones.

The main components of the valve are:

① Differential pressure controller
② Differential pressure controller
③ Modulating control valve
④ Pressure test plugs (P/T plugs)
⑤ Actuator

Maximum flow preset



Flow data sheet *(Preset mark Corresponding Flow m³/h)*

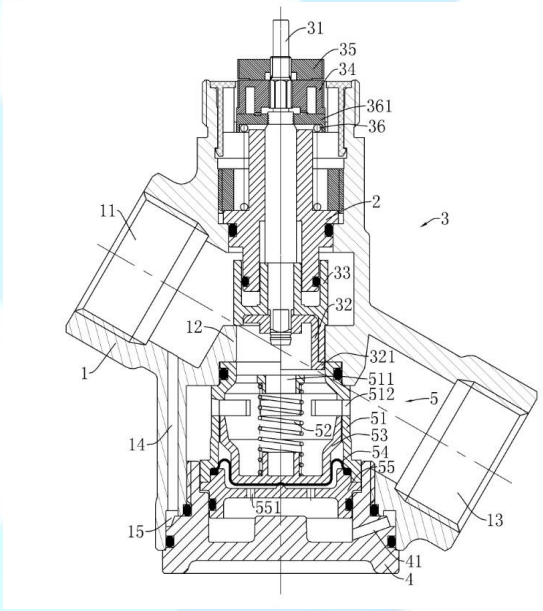
Type	Scale Value						
	1	1.5	2	4	6	8	10
RSA12.15.25	-	0.18	0.22	0.31	0.39	0.52	0.60
RSA12.20.25	-	0.30	0.34	0.50	0.66	0.83	1.00
RSA12.25.25	-	0.42	0.51	0.72	0.93	1.15	1.40
RSA12.32.25	-	1.08	1.17	1.83	2.53	3.22	3.60
RSA12.40.25	-	1.20	1.27	3.15	4.71	6.05	7.50
RSA12.50.25	-	2.87	3.17	5.13	6.60	8.20	10
RSA62.65.16/25	-	5.90	6.64	11.40	17.22	20.38	24
RSA62.80.16/25	-	8.63	9.45	14.54	19.56	22.94	32
RSA62.100.16/25	-	13.00	14.5	24.00	31.70	40.30	48
RSA62.125.16/25	-	20.3	22.5	37.5	49.50	63.00	75
RSA62.150.16/25	-	32.5	36	61	80	101	120

Structure

Differential pressure control valvewith rolling diaphragm and spring

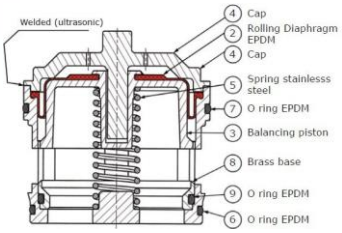
Full stroke Modulating Control valve

Diagonal slots provide variable orificeset to limit maximum flow (Manual balancing valve)



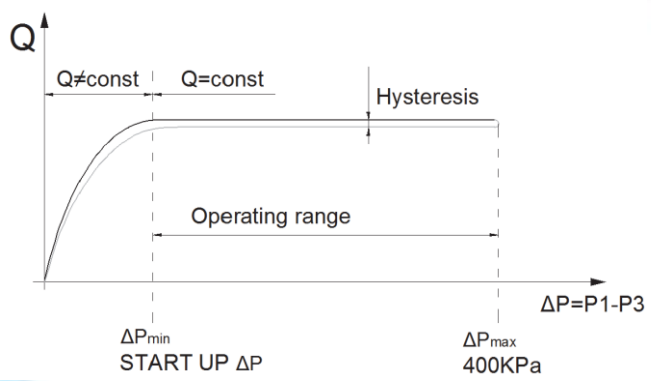
Dial under actuator used to set limit to maximum flow

The black control knob is ready fittedand facilitates manual control of the Combi valve during commissioning without mounted actuator.
Factory setting: the valve is fully open,thus making it possible to purge the system.



Details of ΔP valve

Dynamic curve:



Flow Rate versus Differential Pressure

If the differential pressure between p1 and p3 exceeds Δp_{min} value, means that the differ ntial pressure controller starts to work, so as to achieve the function f flow restrictions. In this zone, the flow is con tant.

When the pressure loss decreases below Δp_{min} the SMT.. op rates with lower accuracy and at much lower ifferential pressure it enters into a static balancing zone.

Optimization of the pump selection:

By measuring the differential pressure between p1 and p3 can be used to the Δp_{min} verification, enough and can test flow, at the same time can also be used to optimize the water pump pressure.

Make pump pressure to reduce gradually, until in the most unfavorable branch of differential pressure (p1 and p3) is not greater than Δp_{min} value, and when the pump lift and measuring the differential pressure of the ratio between the relationship will not exist, is the best point of pump lift.

Sizing:

Basis of design

5. Determine heat demand Rv [KW];
6. Determine temperature spread ΔT [℃];
7. Calculate volumetric flow:

$$Q = \frac{Rv[KW]}{1.16 \bullet \Delta T[℃]} [m^3/h];$$

8. Select suitable Combi valve.

Example

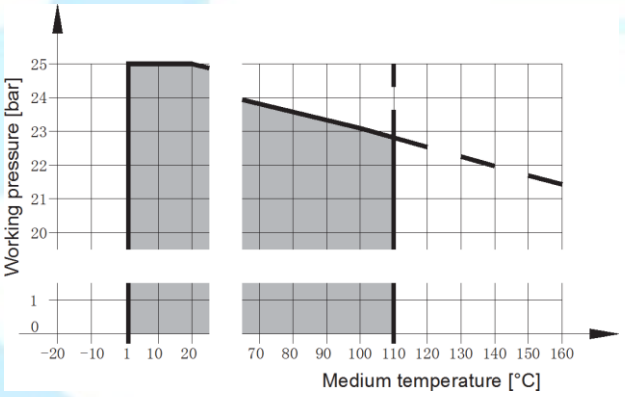
5. Heat demand Rv=200 KW;
6. Temperature spread ΔT=6℃;
7. Volumetric flow

$$Q = \frac{200}{1.16 \bullet 6} = 28.74\ m^3/h;$$

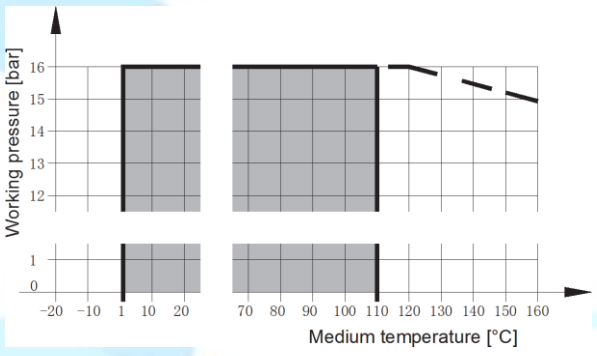
8. Ideally, Combi valves should be selected such that they operate at about 80% of their maximum flow, enabling them to deliver spare capacity, if required.
   Selection: RSA62.80.16

Working pressure and medium temperature

Fluids



Apply to:
RSA12.xx.25
RSA12.xx.25Q



Apply to:
RSA62.xx.16

Working pressure and medium temperature staged as per ISO 7005

Installation

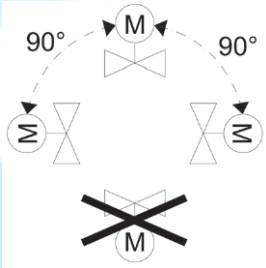
Preferably mount the valves at the return, as the temperature is lower there andthe strain on the stem sealing gland is lower.

Mount a dirt filter or dirt trap before the valve to ensure proper functioning, and a long service life of the valve. Remove dirt, welding beads, etc. from the valves and pipes.

Do not insulate the actuator bracket, as air circulation must be ensured!.

The valve should not be installed in places prone to knock, and impact and vibration, the ambient temperature is 2℃ to 50℃. In addition, it should not be installed in an environment with steam, water jet or water dripping.

Mounting positions



Medium flow direction

Installation must follow the medium flow direction on the valve body. →

Commissioning

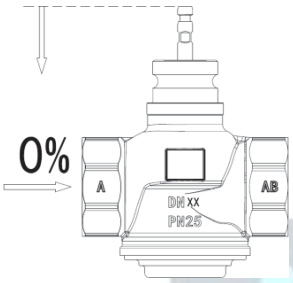
The valve may be put into operation only if actuator and valve are correctly assembled.

- The combi valves have to be open when flushing or pressure testing the system. Strong pressure impacts can damage closed combi valves.
- Differential pressure Δp_{max} across the valve's control path is not allowed to exceed 400 kPa. Strong pressure impacts can damage closed combi valves.
- The valves must be commissioned with the actuator correctly fitted.

Ensure that actuator stem and valve stem are rigidly connected in all positions.

Function check

valve	valve opening
Valve stem retracts	Closes
Valve stem extends	Opens



Maintenance

When performing service work on the valve or actuator:
- Switch off the pump and disconnect power supply.
- Close the shut-off valves in the piping network.
- Fully reduce pressure in the piping network and allow the pipes to cool down completely.

Remove the electrical connections only if necessary.

First, ensure that the actuator has been removed correctly, and then the valve for the following maintenance, and the correct installation of the actuator after the correct maintenance and commissioning of the whole machine

Sealing gland

Without wear on stem surface, stem seals can be replaced without removing the body. If the stem is found damaged, the whole valve must be replaced.

Disposal

Due to the different types of material used, the valve must be disassembled prior to disposal. Special handling of certain valve components may be required by law or may besensible from an ecological point of view.
Local and currently valid legislation must be observed.

Warranty

The technical parameters of the valve only apply to the actuators listed in this document. If actuators made by other manufacturers are used, all warranties will not be valid.

Technical data

Functional data	PN class	PN 16, PN25 as per ISO 7268
	Permissible operating pressure	as per ISO 7005, See previous page **"**Working pressure and medium temperature staged"
	Leakage rate	Class IV (0…0.01% of volumetric flow Q_{max}) as per DIN EN 1349
	Volumetric flow deviation	< ±10% within differential pressure range (Different flow, accuracy will be different)
	Permissible media	Low temperature hot water, medium temperature hot water, chilled water, water with antifreeze Recommendation: Water treatment
	Operating direction	Valve stem retracts will closed (push to close)
	Medium temperature	1...110°C
Materials	Valve body	DN15...DN32: Hot-pressed brass DN40...DN50: Stainless steel DN65...DN200: Nodular cast iron
	Stem,	Stainless steel
	Trim	Brass , Stainless steel, PPS
	Seals	EPDM (O-ring)
	Spring	Stainless steel
Dimensions / weight	Refer to "Dimensions"	
	Pipe connections	DN15...DN50: Internal thread BSP (ISO7/1) PN25 DN65...DN200: Flanged (ISO7005-2) PN16, PN25
	Pressure test plugs (P/T-plugs)	G 1/4'

Important note:

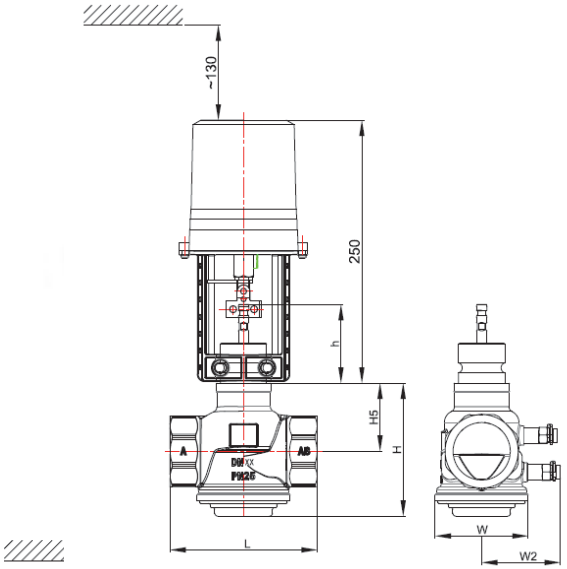
All data are temporary, manufacturers have the right to change please pay attention to the latest catalogues, company website and other information***!***

Dimensions:

Dimensions in mm, weight in kg

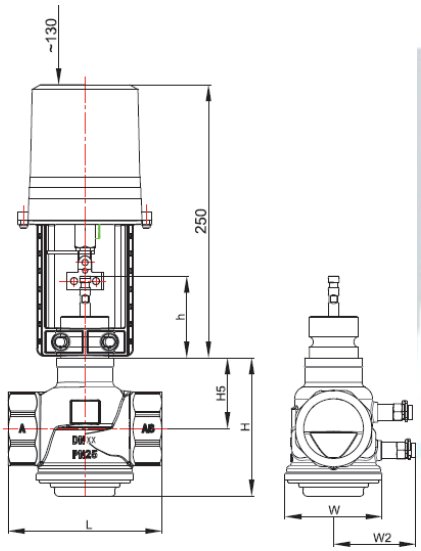
DN15-DN32

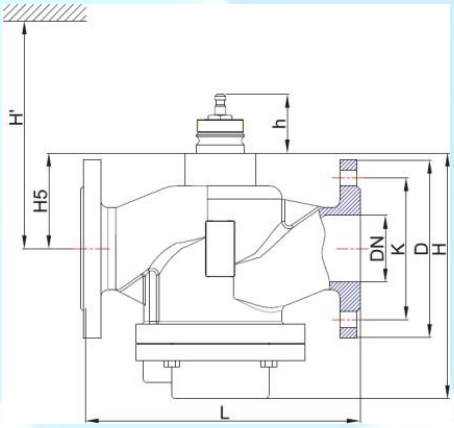
DN	PN25						weight
	L	W	W2	H6	H7	H8	
15	75	45	57	52	101	199	0.65
20	85	48	59	57	105	203	0.72
25	90	48	59	62	114	212	0.98
32	115	59	65	75	138	236	1.35

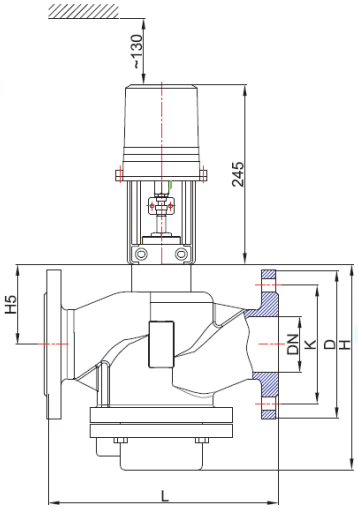


DN40-DN50

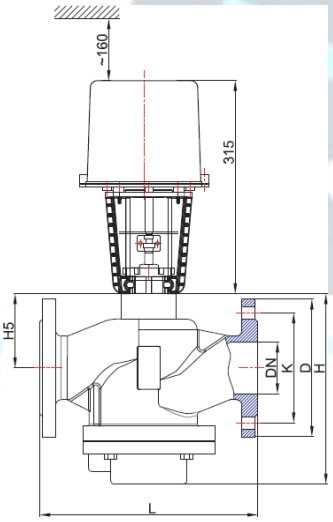
DN	PN25						weight
	L	W	W2	H5	H	h	
40	140	89	121	60	121	75	2.7
50	140	89	121	65	126	75	3.0







DN65-DN80
Equipped RSAJ3D..
actuator



DN65-DN200
Equipped RSAJ4..
actuator

DN65-DN200

DN	L	PN16			PN25			H	H5	h	H'				weight
		D	K	Bolts number and size	D	K	Bolts number and size				VAJ3A.. 1000N	VAJ3D.. 1500N	VAJ4.. 1800N	VAJ4.. 3000N	
65	290	185	145	4-M16	185	145	8-M16	248	90	66	-	578	708	-	25
80	310	200	160	8-M16	200	160	8-M16	252	101	66	-	582	712	-	32
100	350	220	180	8-M16	235	190	8-M20	296	111	66	-	-	-	756	43
125	400	250	210	8-M16	270	220	8-M24	339	127	66	-	-	-	799	65
150	480	285	240	8-M20	300	250	8-M24	370	141	66	-	-	-	830	83
200	495	340	295	12- M20	360	310	12- M24	448	145	66	-	-	-	840	115

DN = Nominal size

H5 = Dimension from the pipe center to install the actuator (upper edge)

H' = Total actuator height plus minimum distance to the wall or the ceiling for mounting, connection, operation, maintenance etc.