VRA
VLA
VTA

Solenoid valves for combustion Air regulation DN20 … DN80

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Solenoid valves for combustion Air regulation

Contents

Description

The VRA/VLA/VTA types are normally closed solenoid valves for cold combustion air regulation (open when energized). This type of device is suitable for high/low control of combustion air in industrial gas burners.

Features

The valves are made of aluminum alloy die-cast, with a wide range for inlet/outlet connections from DN 20 up to DN 80.

Pipe connections meet group 2, according to EN161 requirements.

Suitable for use with cold combustion air (not for safety purposes).

Provided with two flow adjustments: minimum and maximum flow rate, for high/low operation.

Suitable for heavy duty cycle operation and for continuous service (100% ED).

The whole range can be provided in Ex-proof execution, for use in Zones 2 and 22, according to 94/9/EC Directive (ATEX).

The valve is supplied without an internal filter, because in many applications the air is very dirty and it should clog the filter in short time. It is provided with a special dust cover able to protect mechanical moving parts.

Provided with G1/4 pressure gauge on two sides in the inlet chamber, to connect manometers, pressure switches or other equipments. Flanged models are provided with gauges also in the outlet chamber.

The coils are provided with terminal box or with ISO 4400 plug (optional). Both systems are provided with suitable cable gland to avoid water and dirty contamination.

All components are designed to withstand any mechanical, chemical and thermal condition occurring during typical service. Effective impregnation and surface treatments have been used to improve mechanical sturdiness, sealing and resistance to corrosion of the components.

Valves are 100% tested by computerized testing machineries and are fully warranted.

WARNING

This control must be installed in compliance with the rules in force.

Functioning and application

The VRA type valve is a fast opening/closing solenoid valve. The VLA type is a slow opening an fast closing solenoid valve. The VTA type is a slow opening/closing solenoid valve.
Both Min./Max. can be set from 0 to100%.

When not energized the spring works on the disc keeping the minimum passage of air. When powering the coil the valve opens, moving the disc to the maximum open position. When power is switched off the valve moves to the minimum position.

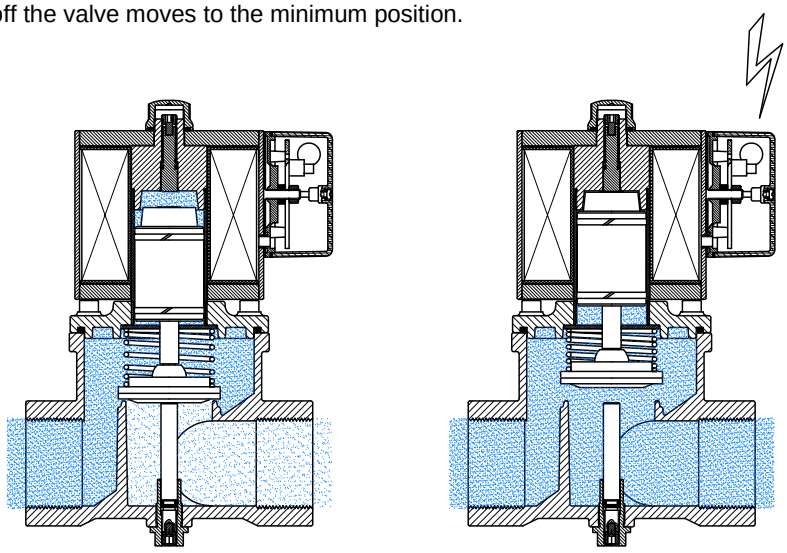


Fig.1

Figure 2 shows an example of installation.

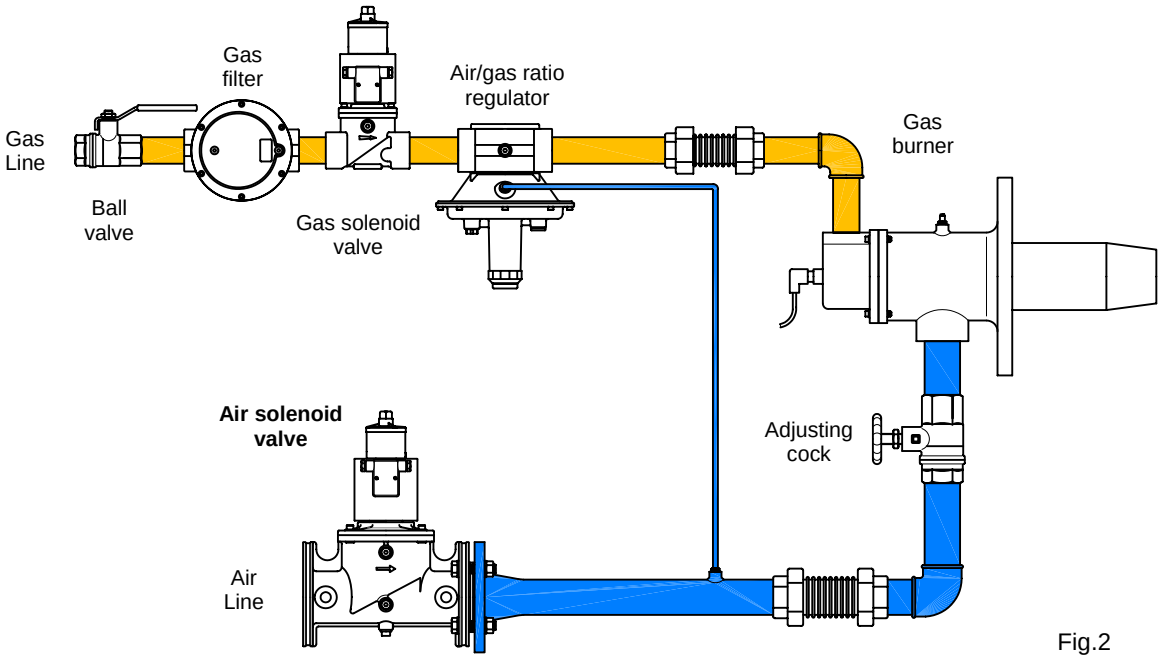


Fig.2

WARNING

This is not a safety valve.

Location and mode of installation must be in compliance with local rules in force.

Technical specifications

Tab. 1

Connections	Gas threaded ISO 7-1 from Rp3/4 to Rp2½ Flanged PN16 – ISO 7005 from DN40 to DN80
Voltage rating	230 VAC 50/60 Hz 110 VAC 50/60 Hz 24 VAC/DC 12 VAC/DC
Voltage tolerance	-15% / +10%
Power consumption	see charts
Ambient temperature	-15℃ / +60℃
Media temperature	+60℃ Max.
Max. operating pressure	200 mbar (20 kPa)
Flow capacity	see charts
Operating time	VRA: 1s opening/closing VLA: ~4s opening / 1s closing VTA: ~4s opening/closing
Protection class	IP54 (EN 60529) (optional IP65)
Cable gland	M20x1,5 (EN 50262) for terminal box PG 9 for standard plug
Coil winding insulation	Class H (200℃)
Coil thermal resistance	Class F (155℃)
Materials in contact with media	Aluminium alloy Brass Stainless steel Plated steel Anaerobic adhesive Nitrile rubber (NBR) Polytetrafluoroethylene (PTFE)

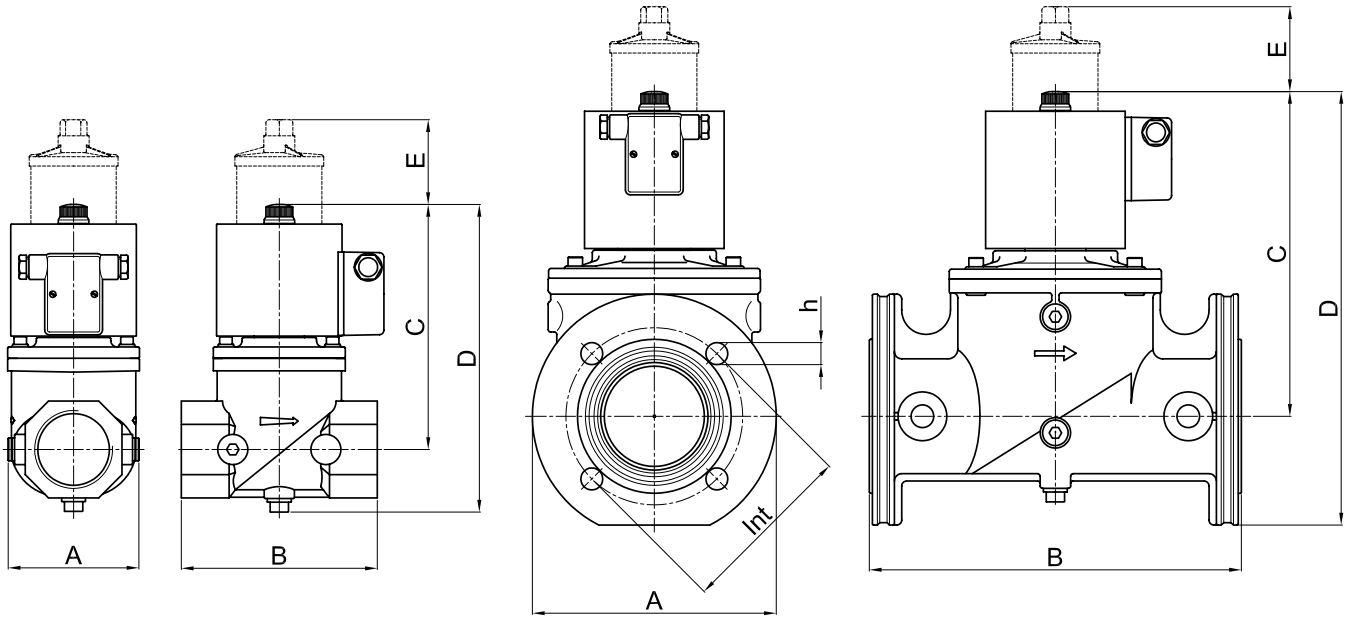


Fig.3

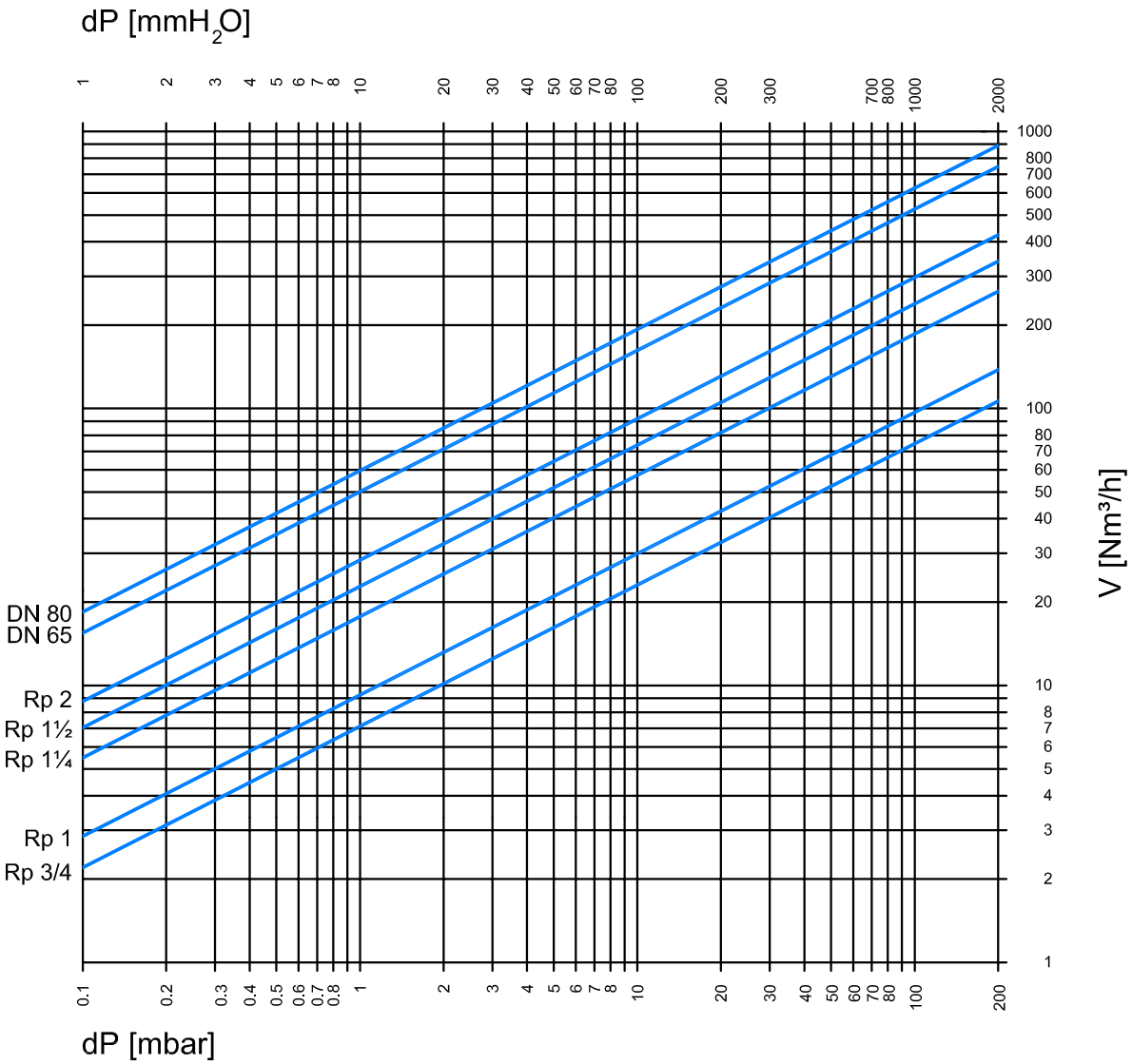
Tab. 2

Connections	Power Consump. @230VAC [W]	Flow factor Kvs [m³/h]	Overall dimensions (4) [mm]							Weight (3) [Kg]
			A	B	C	D	E	Int	h	
Rp 3/4	25	8,3	88	96	145	179	54	-	-	2,5 / 2,7
Rp 1	25	10,5	88	96	145	179	54	-	-	2,5 / 2,7
Rp 11/4	45/180 (2)	20,0	120	153	191	235	70	-	-	5,7 / 6,0
Rp 11/2	45/180 (2)	26,0	120	153	191	235	70	-	-	5,7 / 6,0
Rp 2	45/180 (2)	32,0	106	156	195	245	70	-	-	6,0 / 6,3
Rp 2½	45/180 (2)	56,0	180	218	254	315	70	-	-	12 / 12,5
DN 40 (1)	45/180 (2)	26,0	150	193	191	266	70	110	4x18	7,4 / 7,7
DN 50 (1)	45/180 (2)	32,0	165	196	195	278	70	125	4x18	8,0 / 8,3
DN 65	45/180 (2)	56,0	200	305	266	355	70	145	4x18	14,0 / 14,5
DN 80	45/180 (2)	66,0	200	305	266	355	70	160	8x18	14,0 / 14,5

(1) Optional Kit (2) Working/Opening (3) VRA/VLA (4) VTA type: E+10

Air flow chart

(Pressure drop)



1,25 Kg/ m^3, 15°C, 1013 mbar, dry

If requested, the valves can be supplied with a bypass bore in the valve body for low fire.
The diameter must be chosen according to the min. flow rate required. The approximate formula to calculate the flow rate is the following:

$$V_{min} = 0.024 \cdot d^2 \sqrt{\frac{p_1}{\rho}}$$

where:

V_{min} = min. flow rate [Nm^3/h]
d = diameter of bypass bore [mm]
ρ = density [Kg/m^3]
p_1 = relative inlet pressure [mbar]

When the flow read on the diagram is referred to operating pressure instead of standard conditions, the pressure drop Δp read on the diagram must be multiplied for the factor (1+ relative pressure in bar).

Example:

In the VRA62 2" solenoid valve with 70 Nm^3/h of airflow the pressure drop is Δp = 6 mbar.
If we consider that 70 m^3/h is the flow at 200 mbar of inlet pressure, then the pressure drop to be consider is:

Δp = 6x(1+0,2) = 7,2 mbar

Normally, pressure drop and flow rate for the valves are read from the air flow diagram.
However, the valves can also be chosen in accordance with the characteristic "Kvs value" which is shown in table 2.
The selection of the valve requires the calculation of the Kv under the operating conditions.

Considering only subcritical pressure drops:

$$\Delta p < \frac{p_1}{2}$$

Kv can be calculated with the formula:

$$Kv = \frac{V}{514}\sqrt{\frac{\rho(t+273)}{\Delta p \cdot p_2}}$$

where

V = flow rate [Nm^3/h]
Kv = flow factor [m^3/h]
ρ = density [Kg/m^3]
p_1 = absolute inlet pressure [bar]
p_2 = absolute outlet pressure [bar]
Δp = differential pressure p_1-p_2 [bar]
t = media temperature [℃]

To the Kv value calculated from operating conditions we add an allowance of 20%, to obtain the minimum Kvs value which the valve should have:

Kvs > 1,2 Kv

Valve must be selected considering the following:

- Pressure drops $\Delta p \leq 0{,}1p_1$ are recommended and $\Delta p > p_1/2$ are always unadvisable
- Flow velocities w ≤ 15 m/s are recommended and w > 50 m/s are always unadvisable.

Ordering information

Tab.4

Designation (230VAC)			Connections	Additional code for special voltages		
VRA	VLA	VTA		110VAC	24V AC/DC	12V AC/DC
VRA22	VLA22	-	Rp 3/4	B	C	D
VRA32	VLA32	-	Rp 1			
VRA352	VLA352	VTA352	Rp 11/4			
VRA42	VLA42	VTA42	Rp 11/2			
VRA62	VLA62	VTA62	Rp 2			
VRA42F	VLA42F	VTA42F	DN 40 ([1])			
VRA62F	VLA62F	VTA62F	DN 50 ([1])			
VRA72T	VLA72T	VTA72T	Rp 2½		-	-
VRA72	VLA72	VTA72	DN 65		-	-
VRA82	VLA82	VTA82	DN 80		-	-

([1]) Optional kit

Different voltage than 230V may be order adding to the standard designation the additional code as shown above. Other optionals (standard plug, bypass) must be order with their ordering code.

Example:

VRA62F**.B** for a valve with fast opening, DN50 flanged connections and 110VAC

Manufacturer reserves the right to update or make technical changes without prior notice.

Special versions e optionals

The sizes 1"¼, 1"½ and 2" can be provided with G1/4 gauges also in the outlet chamber.

Protection class can be increased up to IP65. The valves will be provided with a sealed terminal box and cable set.

The whole range can be provided with a special cable gland and Ex-proof marking for use in Zones 2 and 22, according to 94/9/EC Directive (ATEX):

category	II 3 G,D
protection mode	Ex n A II T4 X
	Ex tD A 22 IP54 T135 X

Whole range can be provided with electrical connection made by standard plug ISO 4400 (optional with LED indicator).

The threaded models Rp11/2 and Rp2 can be provided with flanged connections using an optional kit (version F).

The valves can be supplied with a bypass bore in the valve body for low fire.

Design, installation and servicing

To assure a proper and safe operation, as well as a long service life of the valve, consider the following recommendations during the design of the system where the valve will be installed:

- ✓ Ensure that all the features of your system comply with the specifications of the valve (media type, operating pressure, flow rate, ambient temperature, electrical voltage, etc.).
- ✓ Valve may be mounted with coil in horizontal or vertical position, not upside down. Coil may be oriented 360 degrees in any direction.
- ✓ In the event of vertical pipe, the flow direction should be from bottom to top.
- ✓ After removing the end caps make sure no foreign body will enter into the valve during handling or installation (e.g. swarf or excessive sealing agent).
- ✓ Ensure that installing area is protected from rain and water splashes or drops.
- ✓ Perform functional test after mounting (max. testing pressure 1,5 Pmax).
- ✓ This type of valve is not a safety device.
- ✓ The continuous service (100% ED) causes inevitable coil heating, depending on working environment. Never install the valve close to walls or other equipments. To improve the coil cooling, install the valve allowing free air circulation.
- ✓ Perform maintenance according to service instructions at least once a year.
- ✓ This control must be installed in compliance with the rules in force.
- ✓ Make sure all works are performed by qualified technicians only and in compliance with local and national codes.
- ✓ To prevent product damage and dangerous situations, read carefully the instructions supplied with the product before use.

Standards and approvals

The valve design meets current European approval requirements regarding electrical safety.

The following standards/technical specifications have been fulfilled:

- Electromagnetic Compatibility (2004/108/EC)
- Low Voltage Directive (2006/95/EC)

Quality Management System is certified according to UNI EN ISO 9001 and the monitoring is carried out by the notified body:

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