



VRF...



VRH...

## Valves for Biogases and Recycling Gases

**VRF10...**  
**VRH10...**

- Single valves (class A) for installation in gas trains
- Safety shutoff valves in connection with actuators (conforming to EN161)
- Suited for use with gases of gas families I...III, air and slightly aggressive biogases and recycling gases
- Valves in connection with actuators open slowly and close rapidly
- 2-port valves of the normally closed type
- VRF10...: DN40...DN80
- VRH10...: DN80...DN125
- Driven by actuator type SKP..., SKL... or SQX...
- Supplementary Data Sheet on actuators (refer to «Mechanical Design»)

The VRF10... / VRH10..... and this Data Sheet are intended for use by OEMs which integrate the valves in their products.

The valves are designed for use with slightly aggressive and dry gases:

- Maximum 60 °C
- Gases of gas families I...III (conforming to G260 of DVGW and to EN437)
- Biogases
- Waste gases
- Digester gases
- Other recycling gases
- Air

The valves are used primarily

- for application at gas-fired combustion plant
- for gas trains at forced draft burners

The valve is used as:

Shutoff valve (in connection with SKP1...)

- Control valve with shutoff feature (in connection with SKP2..., SKP5... or SKP7...)

The chemical composition and aggressiveness of each type of biogas or recycling gas is different and depends on various factors.

Aggressiveness of the gas augments especially

- as the hydrogen sulfide content H<sub>2</sub>S increases
- as the moisture content of the gas increases, if condensation occurs inside the valve

If the valves are used with gases other than those of gas families I...III, Siemens assumes no responsibility for the valve's durability and life expectancy. The user must decide after consultation with Siemens whether the valve materials are suited for the relevant type of recycling gas.

For safety reasons, we strongly recommend to

- install 2 valves in series
- install a gas valve proving device
- visually inspect the valves at 6- to 12-month intervals

All types of gas valves can be combined with any of these actuators / regulating device.

## Warning notes

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**To avoid injury to persons, damage to property or the environment, the following warning notes must be observed!**

- Do not open, interfere with or modify the valves except when installing the service replacement kit
- Any opening of the valve, replacement of parts or modifications to the original product is the user's responsibility and is done at his own risk
- All activities (mounting, installation and service work, etc.) must be performed by qualified staff
- When used in connection with gases, the valves constitute part of the safety equipment
- In connection with SQX... or SKL... actuators, the valves must **not** be used as safety devices
- Fall or shock can adversely affect the safety functions. Such valves must not be put into operation, even if they do not exhibit any damage
- Not suitable gases or gas components causes loss of the safety shutoff function
- It may not join contaminant / particles in the valve, because that could adversely affect the safety shutoff function

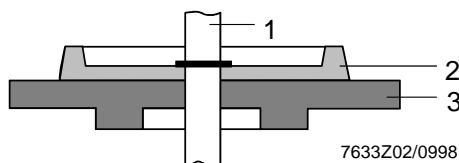
## Engineering notes

Profile  
(only VRF...)

Owing to the profile of valve disc, the VRF... valves are especially suited for control functions.

### **Benefit:**

Good control performance and hardly prone to hunting in low-fire operation.



Legend

- 1 Stem
- 2 Profile
- 3 Valve disc

## Mounting notes

- Ensure that the relevant national safety regulations are complied with
- The actuator can be mounted or replaced while the valve is under pressure
- Refer also following Mounting Instructions:

AGA66	M7643.2	74 319 0421 0
VRF... DN40...80	M7636.1 / M7633	4 319 2050 0
VRF... / VRH...	M7633	4 319 2168 0

Sealing / tightness

- Check to make certain that the bolts of the flanges are properly tightened and afterwards check to ensure that the valve is tight when all components are connected
- Check to ensure that the gaskets between the flanges and the valve must be fitted

Mounting position

The permissible mounting positions of the used actuator must be observed, (refer to the relevant Data Sheet).

Direction of flow

The direction of gas flow must be in accordance with the direction of the arrow on the valve body.

Function

The inactive valve is closed and opens when the actuator opens.

## Standards and certificates



Conformity to EEC directives  
- Electromagnetic compatibility EMC (immunity)  
- Directive for gas appliances  
- Directive for pressure devices

2004/108/EC  
90/396/EEC  
97/23/EEC



ISO 9001: 2000  
Cert. 00739



ISO 14001: 2004  
Cert. 38233



## Service notes

- Each time a valve has been replaced, check to ensure that the valve operates correctly as well as the internal and external tightness
- Siemens valves may only be repaired by Siemens HVAC Repair Centers

## Life cycle

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The combination valve VR... and actuator have a designed lifetime\* of 100,000 burner startup cycles which, under use of gases to EN437 (or DVGW specification G260). This lifetime is based on the endurance tests specified in standard EN161 and the table containing the relevant test documentation as published by the European Association of Component Manufacturers (Afecor) ([www.afecor.org](http://www.afecor.org)).

The designed lifetime is based on use of the valve VR... and actuator according to the manufacturer's Data Sheet. After reaching the designed lifetime in terms of the number of burner startup cycles, or the respective time of usage, the valve VR... and actuator are to be replaced by authorized personnel.

\* The designed lifetime is not the warranty time specified in the Terms of Delivery

## Disposal notes

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Local and currently valid legislation must be observed.

## Mechanical design

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### VRF...

The valves are dead closed in combination with actuator.

#### Stem

The stem is guided on both sides of the flap, ensuring precise axial stroke and tight shutoff.

#### Strainer

A strainer made of stainless steel is fitted in the valve's inlet and protects the valve, the seat and flap as well as downstream devices against dirt.

#### Valve seat

The valve disc of VRF... valve has a profile.

### VRH...

#### Dirt strainer

A strainer type AGA... is available as an accessory item (refer to «Accessories»). The valves are supplied **without** dirt strainer (refer to «Engineering notes»). They are of the normally closed one-way high-flow type.

#### Valve seat

The swiveling disc of valve VRH... has no profile.

### Actuators

The valves can be combined with the following types of actuators:

- SKP15... (refer to Data Sheet N7643)
- Other actuators on request

## Type summary (other types of valves on request)

DN (mm)	Type reference without stroke limitation		Perm. operating pressure mbar	Air flow rate m³/h at $\Delta p = 1 \text{ mbar}$	Number of test points Rp ¼ ¹)	Number of pilot gas connections G ¾ ²)
	Without profile	With profile				
40	---	VRF10.404	600	32.3	4	---
50	---	VRF10.504	600	47.4	4	---
65	---	VRF10.654	600	74	2	2
80	---	VRF10.804	600	85.4	2	2
Flap type valves: High-flow with swing disc of valve						
80	VRH10.805	---	300	128.4	4	1
100	VRH10.905	---	300	199.5	4	1
125 ³)	VRH10.915	---	250	277.6	4	1

¹) Both sides, inlet and outlet side

²) Inlet side, VRF... with one connection on each side

³) Only for SKPx5.xxxFxx

## Ordering

When ordering, please give complete valve type reference.

Actuator and valve are supplied as single packs.

### Example:

1 piece VRF10.504 flanged valve DN50 for biogas

1 piece actuator

## Accessories



**Manual adjuster**

**AGA61**



**Adapter for actuators SQX...**

**AGA60**

- Consisting of 2 stem parts and one connecting flange



**Gasket kit to SKP... / SKL25...**

**AGA66**

- Between actuator SKP... / SKL25... and valve VR...
- For increasing of degree of protection from IP54 up to IP65
- Refer to Mounting Instruction M7643.2 (74 319 0421 0)

**VRH...  
strainer**

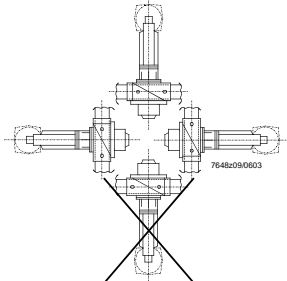
With circlip and 1 mm mesh size



Type reference of valve	Type reference of strainer
VRH10.805 / DN80	AGA80
VRH10.905 / DN100	AGA90
VRH10.915 / DN125	AGA91

The strainer inserts can be fitted in the flange sections of the valves, either on the gas inlet or outlet side.

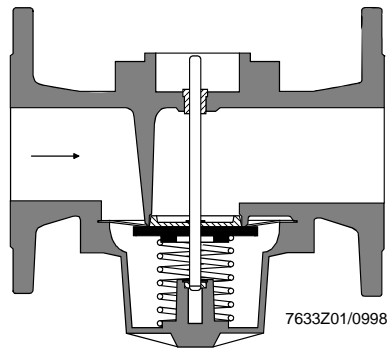
## Technical data

General unit data	Valve class in connection with actuator	A conforming to EN161 (except with SQX... / SKL...)
	Group	2 (EN161)
	Perm. medium temperature	0...60 °C
	Weight	Refer to «Dimensions»
	Connecting flanges	PN16 to ISO 7005-2
	Required flow rate	Refer to «Flow chart»
	Perm. mounting position	
Environmental conditions		Refer to «Mounting notes»
	Operating pressure	Refer to «Type summary»
	Types of gases	Refer to «Use»
	Strainer (only for VRF...)	Built-in, mesh size 0.9 mm
	<b>Storage</b>	DIN EN 60721-3-1
	Climatic conditions	Class 1K3
	Mechanical conditions	Class 1M2
	Temperature range	-20...+60 °C
	Humidity	<95 % r.h.
	<b>Transport</b>	DIN EN 60721-3-2
	Climatic conditions	Class 2K2
	Mechanical conditions	Class 2M2
	Temperature range	-15...+60 °C
	Humidity	<95 % r.h.
	<b>Operation</b>	DIN EN 60721-3-3
	Climatic conditions	Class 3K5
	Mechanical conditions	Class 3M2
	Temperature range	-10...+60 °C
	Humidity	<95 % r.h.

## Function

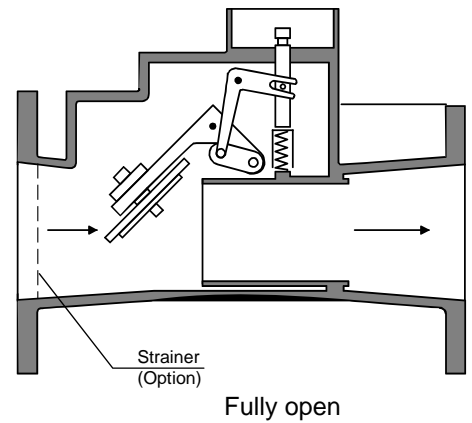
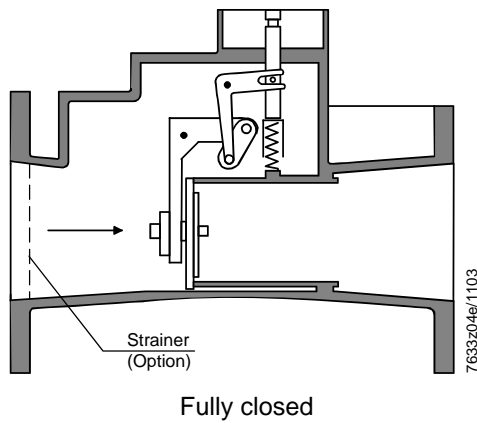
Functioning principle

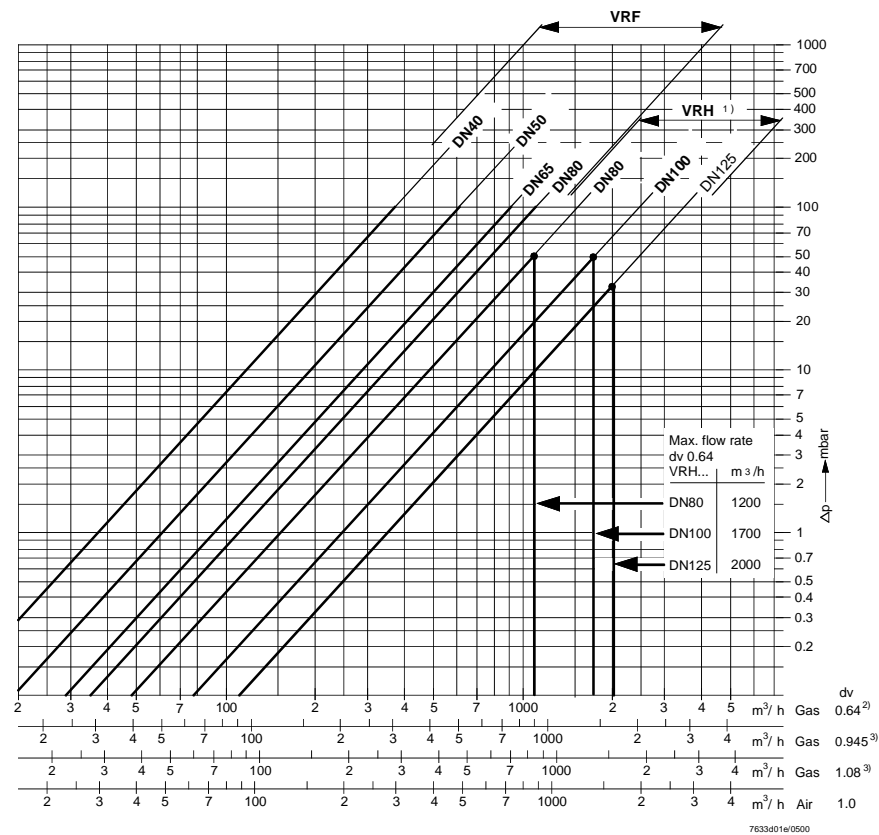
Sectional view of VRF...valve



Functioning principle

Sectional view of VRH... valve





#### Legend

— Maximum flow (valve fully open)

Determination of pressure drop for gases with a density ratio «dv» other than that of the chart scales above:

#### Required variables

p(gas) Gas density in kg/m<sup>3</sup>  
V(gas) Gas volume in m<sup>3</sup>/h

#### Procedure

– Calculate the gas density ratio «dv(gas)»:

$$dv(Gas) = \frac{\text{Density (gas) in kg / m}^3}{1.22 \text{ kg / m}^3 (= \text{density of air})}$$

– Determine the air volume «V(air)» that produces the same pressure drop «Δp» as «V(gas)»

$$V(air) = \frac{V(gas) \text{ in m}^3 / h}{\sqrt{\frac{1}{dv(gas)}}} = m^3 / h$$

– Determine the gas pressure drop Δp with the help of the flow chart, based on the calculated «V(air)» of the chart scale.

Practical experience shows that applications outside the range confined by the bold characteristics could produce significant noise

#### Attention

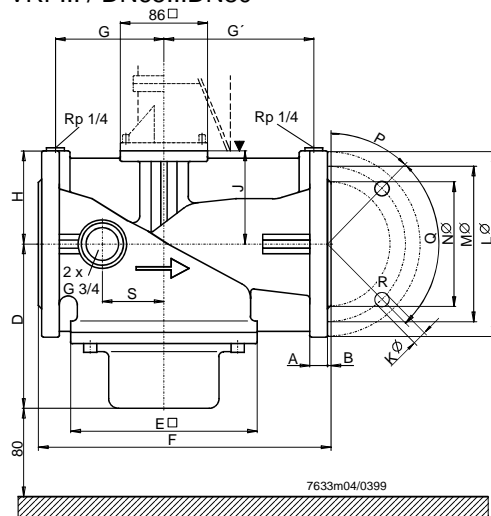
When used in connection with burners having a small low-fire rate, the selected nominal valve size should not be too large (refer to Data Sheet on actuators). If the available gas pressure exceeds the maximum permissible operating pressure, lower it with a pressure controller fitted upstream of the valve. The pressure drop (lines of maximum flow) is based on a fully open valve.



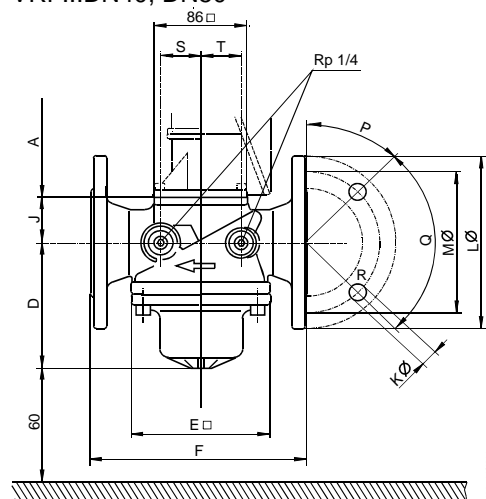
## Dimensions

Dimensions in mm

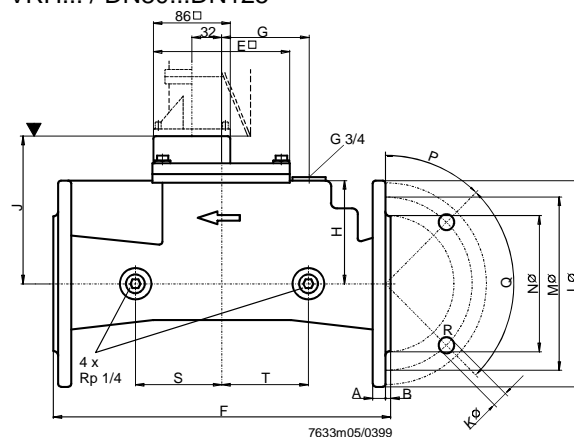
VRF... / DN65...DN80



VRF...DN40, DN50



VRH... / DN80...DN125



▼ Mounting surface valve

Table of dimensions

Type	DN <sup>1)</sup>	A	B	D	E□	F	G	G'	H	J	KØ	LØ	MØ	NØ	P	Q	R	S	T	kg
VRF...	40	13	---	102	126	200	---	---	---	41	19	150	110	88	45°	90°	4	36	36	6
	50	13	---	107	126	230	---	---	---	50	19	165	125	102	45°	90°	4	42	42	7.5
	65	16,5	3	163	185	290	108	148	95	92	19	185	145	120	45°	90°	4	62	---	15.3
	80	19	3	163	185	310	118	158	102	100	19	200	160	131	22.5°	45°	8	62	---	17,9
VRH...	80	15	3	---	160	310	102	---	105	159	19	200	160	131	22.5°	45°	8	95	95	16.3
	100	16	3	---	160	350	102	---	105	166	19	220	180	157	22.5°	45°	8	95	95	18.6
	125	17	3	---	160	400	102	---	121	174	19	250	210	187	22.5°	45°	8	95	95	23.4

A From mounting surface for actuator (refer to Data Sheet of the relevant actuator)

DN Nominal width, dimension connection of medium)

R Number of boreholes in the flange

1) Flanges to ISO 7005-2