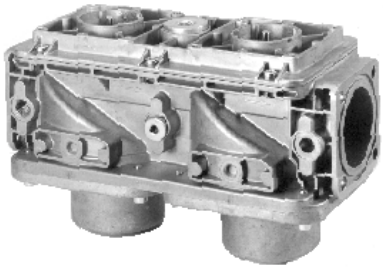
SIEMENS

7631

ISO 9001



VGD20...

VGD40...

Double Gas Valves

VGD20...
VGD40...

Double gas valves for use on gas trains, consisting of 2 safety shut-off valves of class A.
Suited for use with gases of gas families I...III.

The double gas valve is to be combined with 2 actuators of the SKP… line (e.g. to provide the functions of 2 safety shut-off valves in series, complete with gas pressure governor).

The VGD20... / VGD40... and this Data Sheet are intended for use by OEMs which integrate the double gas valves in their products.

Use

The double gas valves are used primarily on gas trains for burners.

In combination with appropriate SKP… actuators, the valve also serves as a:
- shut-off valve (in connection with SKP10...)
- control valve with shut-off function (in connection with SKP20..., SKP27..., SKP50... or SKP70...).

For description and function of the SKP... actuators, refer to the relevant Data Sheets:

SKP10... / SKP20...	Data Sheet 7641
SKP11...	Data Sheet 7639
SKP27...	Data Sheet 7644
SKP50...	Data Sheet 7648
SKP70...	Data Sheet 7651

Siemens Building Technologies
Landis & Staefa Division

Warning notes

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

It is not permitted to open, interfere with or modify the double gas valve VGD40....

Fall or shock can adversely affect the safety functions. Such valves may not be put into operation, even if they do not exhibit any damage.

Mounting notes

- The relevant national safety regulations must be complied with
- The double gas valve can be mounted either vertically or horizontally (spring housing either horizontally or pointing downward)
- The direction of gas flow must be in accordance with the arrow on the valve body

When used in combination with the SKP20..., SKP27..., SKP50... or SKP70... actuator, the minimum gas pressure switch must always be mounted upstream of the double gas valve!

VGD20...

- The electrohydraulic SKP10... actuator, which is used for shut-off functions, must always be mounted on the inlet side while the actuators with integrated governor (SKP20..., SKP27..., SKP50... or SKP70...) must always be mounted on the outlet side of the valve (with a contoured disk)
- To mount the double gas valve, 2 flanges type AGA41... / AGA51... are required
- To prevent cuttings from getting inside the valve, first mount the flanges to the piping and then clean the associated parts
- Ensure that the O-rings are fitted between the flanges and the valve body

VGD40...

- Ensure that the gaskets are fitted between the flanges
- Check to ensure the bolts on the flanges are properly tightened
- Check to ensure the connections with all components are tight

Installation notes

Installation work must be carried out by qualified staff.

Commissioning notes

Commissioning work must be carried out by qualified staff.

Disposal

The unit contains hydraulic oil, it is not allowed throwing into household garbage.
Pay attention to the local and actualize law.

Mechanical design

VGD20...

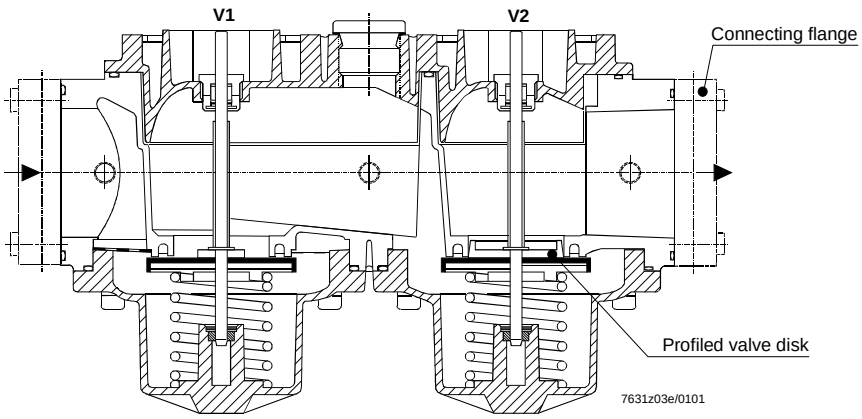
The double gas valves VGD20... are of the normally closed type and have 2 disks, one non-contoured disk on the inlet side and one contoured disk on the outlet side.

The stems are guided on both sides of the disks, thus ensuring precise alignment and tight shut-off. The closing force of the return spring is supported by the prevailing gas pressure (class A to EN 161). A removable strainer on the inlet side protects the valve and downstream controls against dirt. Valve body and connecting flanges are made of die-cast aluminium, the seals of nitril rubber, and the stems of stainless steel. The double gas valves feature a pilot gas connection Rp¾" (refer to «Type summary» and «Dimensions»). Gas valve, flanges and actuators are supplied as separate items. No special tools are required for assembly.

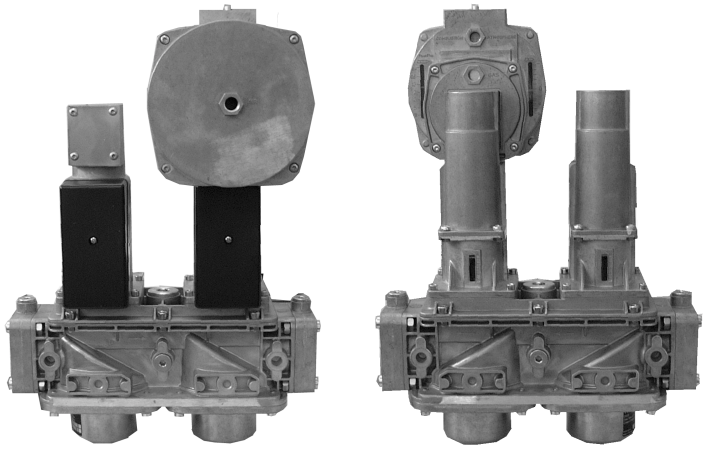
Connecting flanges AGA41 / AGA51 for VGD20...

The connecting flanges are provided with a test point.
They are **internally threaded** and supplied as separate items, together with the necessary accessories, such as bolts, nuts, seals, etc.
The overall flange dimensions and bore-holes are identical so that all types of flanges can be fitted to the valve body, irrespective of their nominal size.
This means that a 1½" flange can be fitted to a 2" VGD... valve, and vice versa.
Each double gas valve requires 2 connecting flanges, which are to be ordered as **separate** items.

Sectional view of VGD20...



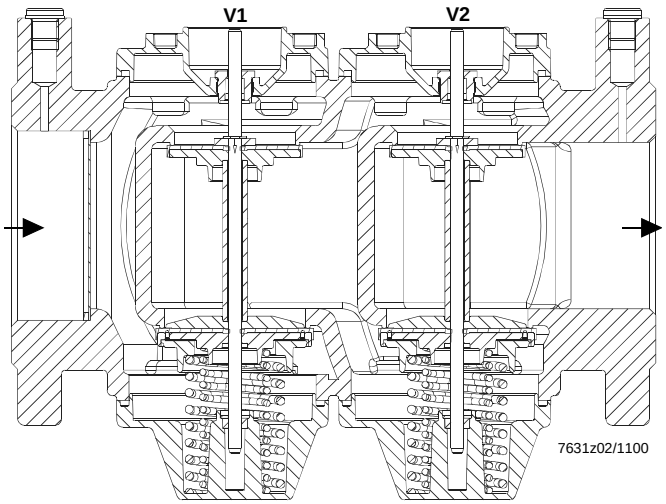
Application example
VGD20... with SKP10... and SKP70... (mounted on «V2»)



VGD40...

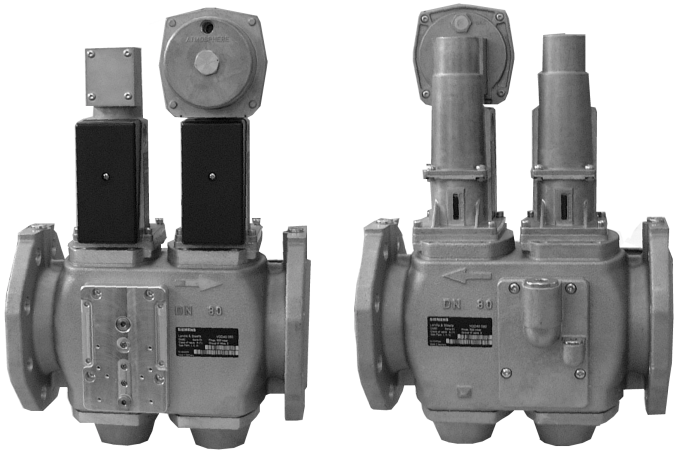
The VGD40... double gas valves are double seat disk valves of the normally closed type.
The stems are guided on both sides. The patented double seats are closed by 2 springs. The spring of each stem exerts a pressure on the disk so that there is a defined closing force acting on each disk. The surface area proportions of the 2 valve disks per stem are such that the closing force increases as the inlet pressure increases (class A valve to EN 161).
A removable strainer on the inlet side protects the valve and downstream controls against dirt.
The double gas valves DN65…150 correspond to the standard valve sizes of single valves (conforming to EN 558).

Sectional view of VGD40...



The VGD40... are supplied with a pilot gas flange having a ¾“ connection for the pilot gas line and a ¼“ connection for an impulse line.
This impulse line connection between the 2 valves and another impulse line connection on the outlet flange can be connected directly to the SKP20… constant pressure governor fitted to «V1» or «V2».
A universal mounting plate facilitates attachment of a number of commercially available pressure switches or valves proving devices.
Both the pilot gas flange and the universal mounting plate are exchangeable and can be fitted on either side of the valve.

Application example
VGD40.080 with SKP10... and SKP20... (mounted on «V2»).



Type summary

Double gas valves

DN	Flow rate at Δp = 10 mbar m³ / h air[1])	Type reference
1 ½“	85	**VGD20.403**
2“	100	**VGD20.503**
40	85	**VGD40.040**
50	100	**VGD40.050**
65	160	**VGD40.065**
80	250	**VGD40.080**
100	400	**VGD40.100**
125	580 (630 [2]))	**VGD40.125**
150	700 (800 [2]))	**VGD40.150**

[1]) Flow rate to EN 161

[2]) Flow rate with future SKP...line (available from 2002)

Flanges

For use with VGD20... with test point Rp ¼“
(to be ordered as separate items)

Type	DN [1])	For double gas valve
AGA41	1 ½“	**VGD20.403**
AGA51	2“	**VGD20.503**

[1]) Internally threaded to ISO R 7/1

Service replacement sets
(for VGD20... only)

Consisting of:
Stems, disks, strainer and screws, washers and seals:

For double gas valve	Part number
VGD20.40...	**4 679 1550 0**
VGD20.50...	**4 679 1550 0**

Ordering

VGD20... only

When ordering, please give type references of double gas valve and flanges.

Example:
Double gas valve 2“ with 2 connecting flanges
1 VGD20.503
2 AGA51
The SKP... actuators are to be ordered as separate items.

VGD40... only

When ordering, please give type reference of double gas valve.

Example:
Double gas valve DN80
1 VGD40.080
The 2 lateral mounting plates for the pilot gas connection and a universal adapter plate are included and ready fitted.

The SKP... actuators are to be ordered as separate items.

Technical data

General data

Class	A (EN 161)
Group	2 (EN 161)
Types of gases	gas families I, II, III (to G260 of DVGW) air
Built-in strainer, mesh size	0.9 mm
Flow rates	refer to «Flow chart»
Perm. medium temperature	-15...+60 °C
Mounting	spring housing horizontal or vertical, pointing downward
Flanges VGD40...	to ISO 7005; PN16
Materials	
- VGD20...	die-cast aluminium
- VGD40...	sand-cast aluminium
Net weight	
- VGD...	refer to the table below
- AGA41	approx. 266 g
- AGA51	approx. 264 g

Max. permissible operating pressure:

Double gas valve	**Static pressure / mbar** (with double gas valves closed)	**Dynamic / mbar**	**Weight** (approx.)	**Volume between V1 / V2 (dm³)**
VGD20.403	1200	600	3.2 kg	0.75
VGD20.503		600	3.15 kg	0.8
VGD40.040		1000	7 kg	0.8
VGD40.050		1000	7,2 kg	0.8
VGD40.065		700	8.4 kg	1.3
VGD40.080		700	9.6 kg	1.53
VGD40.100		700	12.9 kg	3
VGD40.125		700	18.2 kg	5.175
VGD40.150		700	24.1 kg	8.7

Environmental conditions

Transport	IEC 721-3-2
Climatic conditions	class 2K2
Mechanical conditions	class 2M2
Temperature range	-15...+60 °C
Humidity	< 95 % r.h.
Operation	IEC 721-3-3
Climatic conditions	class 3K5
Mechanical conditions	class 3M2
Temperature range	-15...+60 °C
Humidity	< 95 % r.h.

⚠ **Condensation, formation of ice and ingress of water are not permitted!**

VGD20... / VGD40...

Simplified sizing example

VGD... with SKP70...

Prerequisites	Gas outlet of burner toward combustion chamber
Simplified example Combustion chamber pressure constant	= 0 mbar
Required control ratio	RV = 4:1
Gas inlet pressure	20 mbar

1.	Nominal load Burner pressure at nominal load 16 mbar Volumetric flow at nominal load 200 m³ / h natural gas, corresponding to 156 m³ / h air - $\Delta p_{VGD40.080}$ at nominal load 20-16 = 4 mbar → Point «PA» in the chart Point «PA» placed on the characteristic line or on the right side of the characteristic line.
2.	Low-flame
	$PG\min = \frac{PG\max}{RV^2} = \frac{16\,mbar}{16} = 1\,mbar$
	$VG\min = \frac{VGas\max}{RV} = \frac{200\,m^3/h}{4} = 50\,m^3\ corresponding\ to\ \ h = 39\,m^3/h\ air$
	→ Point «PB» in the chart - Selected valve size: VGD40.080 Point «PB» placed on the characteristic line or on the left side of the characteristic line.

Conversion of air volume to a corresponding gas volume (natural gas)

Basis for scale

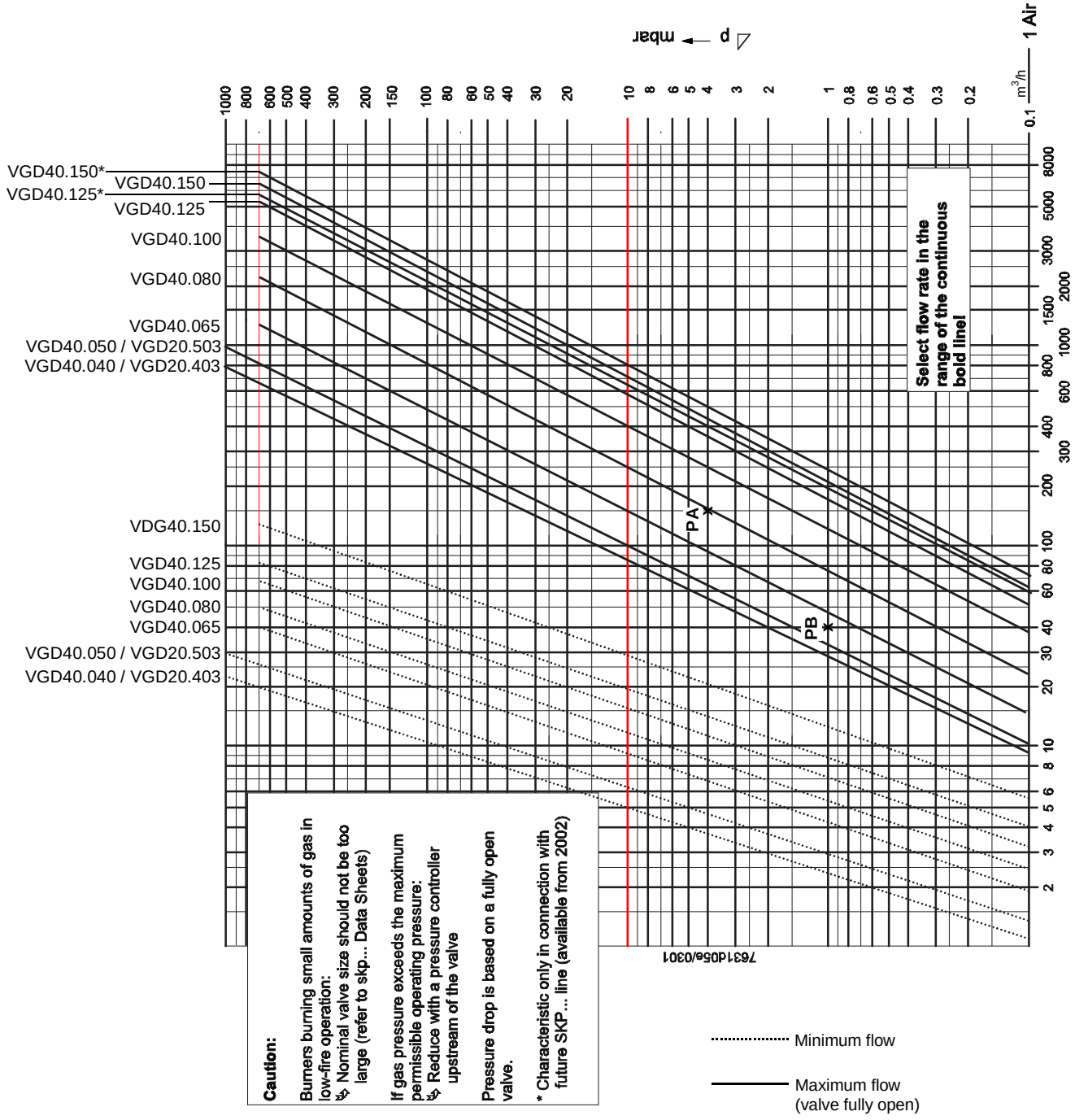
Abscissa	**Medium volumetric flow Q_G in m³ / h**	**Density ratio dv to air**	**Conversion factor** $f = \sqrt{\frac{1}{d_v}}$
1	Natural gas	0.61	1.28
2	Propane	1.562	0.8
3	Town gas	0.46	1.47
4	Air	1	1

Conversion to air (m³ / h) from other types of gases:

$$QL = \frac{QG}{f}$$

Q_L = air volume in m³ / h that produces the same pressure drop as «Q_G».

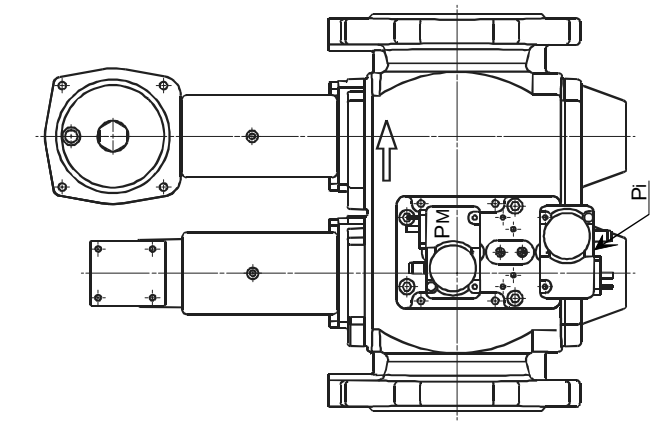
Sizing flow chart for VGD...

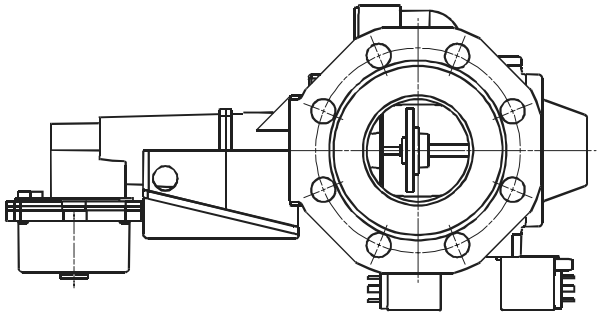


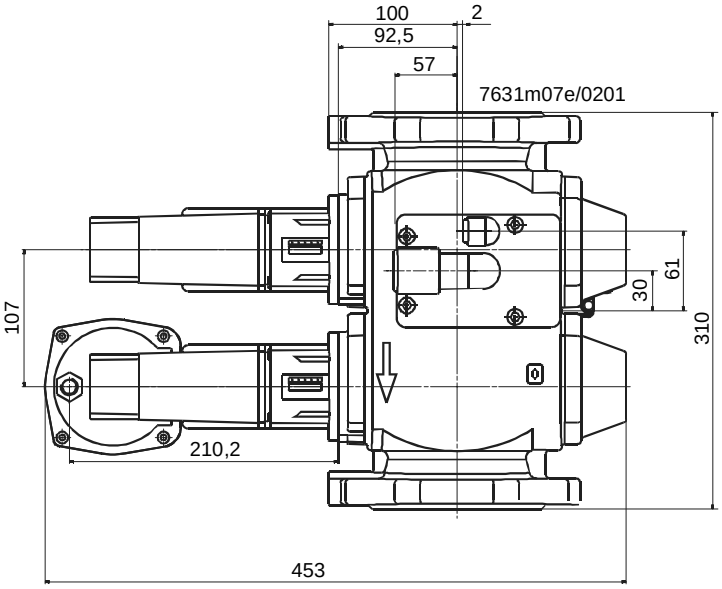
Points "PA / PB", refer to chapter Function "Simplified sizing example"

PA / PB = Operating points

Combinations of VGD40... and actuator (here with SKP10... and SKP20...)

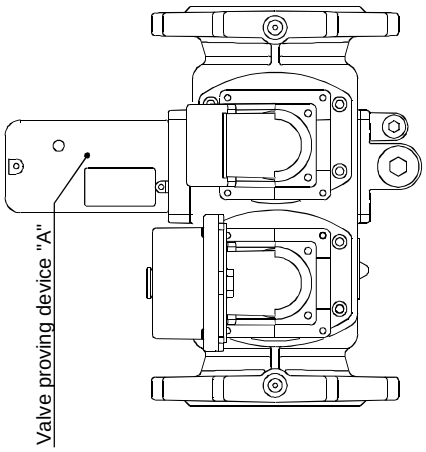




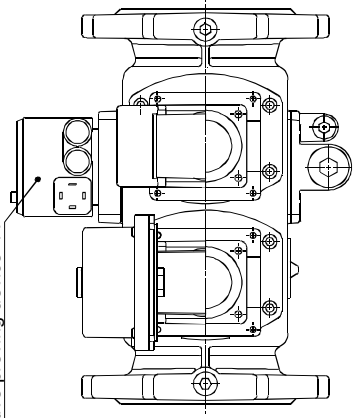


Ancillary units

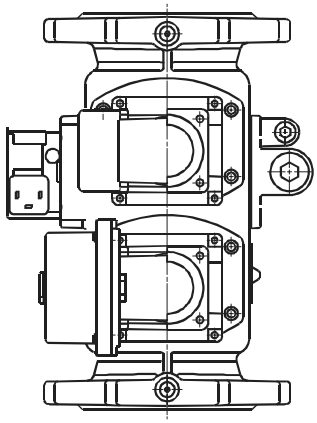
Valve proving device "A" and pressure switch (Pi)



Valve proving device "A" and pressure switch (Pi)



2 pressure switches (PM, Pi)



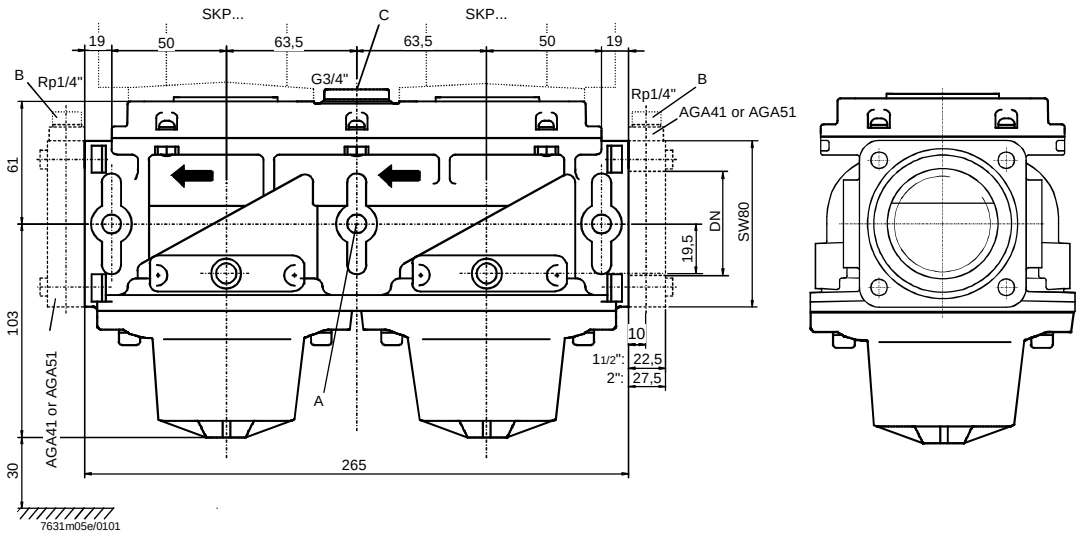
Legend

Pi Inlet pressure upstream of valve 1

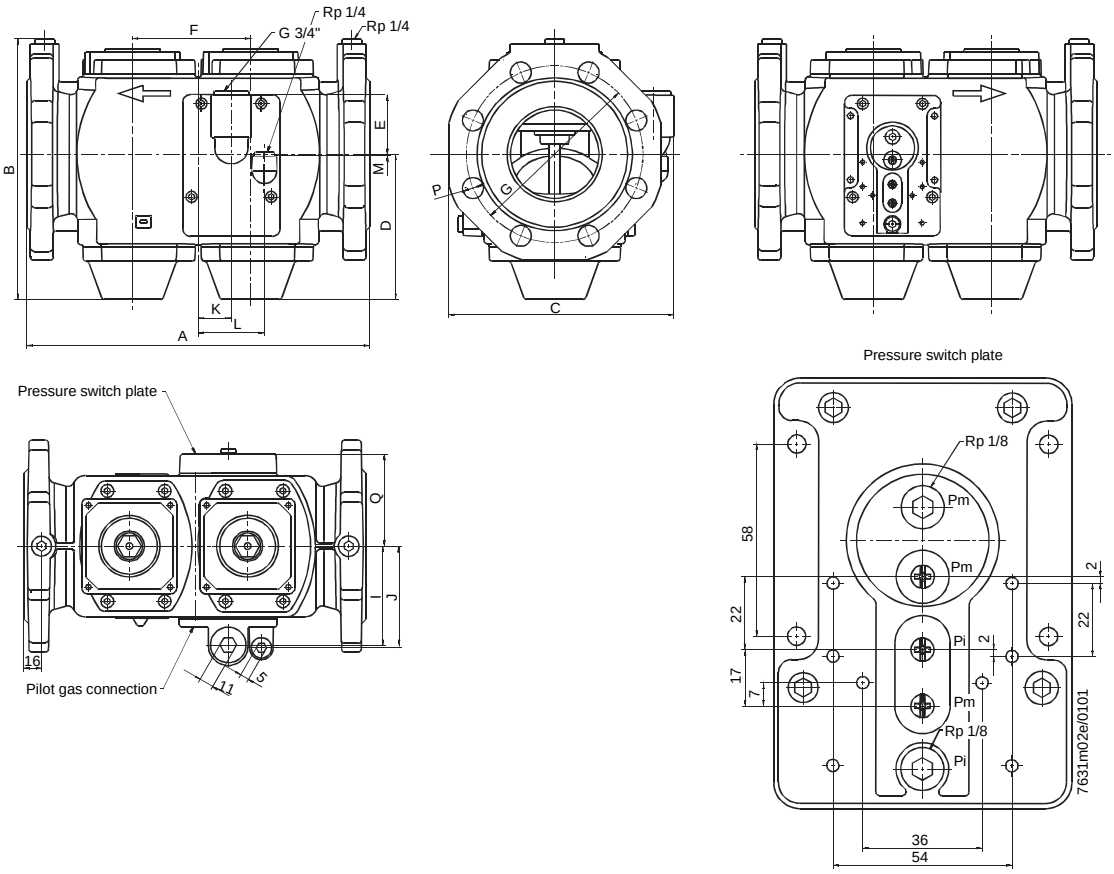
PM Intermediate chamber pressure upstream of valve 2

Dimensions

VGD20...



VGD40...



Dimensions

Type reference	DN	A	B	C	D	E	F	G	I	J	K	L	M	P	Q
VGD40.040	40	240	195	168	115	58	88	110	77	79	20	50	2	19	70
VGD40.050	50	240	202	174	115	58	88	125	77	79	20	50	2	19	70
VGD40.065	65	290	215	194	118	60	102	145	87	90	30	60	4	19	81
VGD40.080	80	310	236	204	132	54	107	160	90	92	30	60	2	19	88
VGD40.100	100	350	259	227	145	43	131	180	105	108	41	71	13	19	99
VGD40.125	125	400	305	255	175	31	150	210	119	122	41	71	25	19	113
VGD40.150	150	480	335	293	188	20	168	240	140	143	39	69	36	23	134