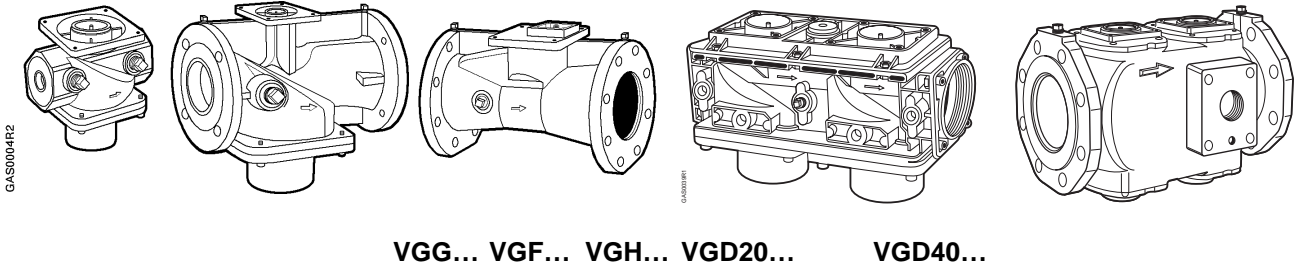


VG Series

VGD..., VGF..., VGG..., VGH... Gas Valves for Use with Electro-hydraulic Actuators SKP...



GAS0001R1

ISO 9001
REGISTERED FIRM



Description

The spring loaded, normally closed VG... series of modular single and double-body gas valves combined with SKP... Series Electro-hydraulic Actuators to provide safety shut-off, gas pressure regulation and air/gas ratio control for commercial and industrial gas burners.

Table 1. Legend.

Model Numbers	Body Style	Connection
VGD...	Double	Threaded or flanged
VGF...	Single	Flanged
VGG...	Single	Threaded
VGH...	Single	Flanged

Features

- UL listed, FM approved, CSA certified, IRI approvable, ISO 9001 certified. European, Australian and Japanese approved versions available.

All Models

- Inlet and outlet 1/4-inch NPT plugged pressure taps standard on all models. Additional plugged taps provided on some models (See Table 2 for details).
- 3/4-inch NPT plugged port for pilot or vent line connection available on VGG..., VGF... and VGH... valves. One-inch NPT plugged port for pilot or vent line connection available on VGD20... Connection plates for vent line connection available on VGD40... valves (See Table 2).

**VGG... and
VGF... Models**

- Dual stem guides ensure precise disc alignment and tight shut-off.
- Contoured valve disc provides smooth release of gas and stable regulating control.
- Easy to service stainless steel mesh filter protects the valve seat and disc as well as downstream components.

**VGD20...
Models**

- Compact VGD20... double-valve bodies consist of two safety shut-off valves in series. The first (inlet) valve has a flat valve disc applicable for safety shut-off function only. The second (outlet) valve has a contoured valve disc for use with pressure regulating actuators (SKP20..., SKP50..., SKP70...).
- Easy to service stainless steel mesh filter in the inlet valve protects the valve seats and discs as well as downstream components.
- One-inch NPT vent connection between the valves.
- For installation, each VGD20... double valve requires two AGA..U threaded mounting flanges. The flanges are supplied together with the necessary installation hardware, bolts, nuts and seals. Each mounting flange has a 1/4-inch NPT plugged pressure tap. The flanges can be threaded independently onto a pipe, separate from the VGD20... gas valve body. This feature permits union free installation, allowing the gas valve assembly to be easily removed from a gas train without the use of pipe wrenches.
- The overall dimensions of both the 1-1/2 inch and 2-inch AGA..U flanges are identical. Either flange type can be fitted to both the 1-1/2-inch and 2-inch VGD20... valve bodies. This permits a 1-1/2-inch flange to be mounted on a 2-inch valve body or vice versa.

NOTE: VGD20... valves and AGA..U threaded flanges are supplied as separate items (See Table 2 for ordering information).

**VGD40...
Models**

- Compact VGD40... double-valve bodies consist of two safety shut-off valves in series. Each individual valve has double seats to achieve high flow.
- Patented seat construction with a closing spring for each seat assures independent shut-off.
- Stainless steel mesh filter at the inlet protects the valve seats and discs as well as downstream components.
- Vent line connection plates are available.

NOTE: VGD40... valves and AGA..U vent connection plates are supplied as separate items (See Table 2 for ordering information).

**Features,
Continued**

VGH... Models

- VGH... valves are high capacity, straight-through flow, levered flap-type valves. A progressive opening characteristic provides a smooth release of gas and stable pressure regulating control.
- A stainless steel mesh filter is available. (See Table 2 for ordering information).

Application

All VG... valves can be combined with any SKP... Series actuator by using the four bolts **contained in the terminal box of the actuator**. The actuator can be mounted while the valve is installed and under pressure. Sealing material is not required when mounting actuators.

SKP... regulating actuators are applicable for both low and high supply gas pressure applications, eliminating excessive regulator inventories. Maximum pressure capacities vary with valve size (See Table 2).

All VG... valves perform these functions in combination with each of the following actuators:

- SKP10...U..; Safety shut-off
- SKP20...U..; Safety shut-off and constant pressure regulation. Regulation output range 0 to 100" w.c., or zero governor.
- SKP50...U..; Safety shut-off, pressure regulation and differential pressure air/gas ratio control.
- SKP70...U..; Safety shut-off, pressure regulation and variable air/gas ratio control.

Since more than one function can be performed by a single valve, fewer components and fittings are required to assemble a gas train, significantly reducing both the size and weight of the gas train. The total pressure drop across the gas train arrangement is reduced, allowing the use of smaller diameter gas trains in most applications. For details on valve sizing see the Flow Charts (Figures 5 and 6).



CAUTION:

Do not oversize valves equipped with a regulating SKP... actuator. Oversizing may limit turndown and could cause oscillations.

**Ordering
Information**

Gas valves and actuators are ordered separately. For additional SKP... actuator information, see the following Technical Instructions:

- SKP10...U..; 155-513P25
- SKP20...U..; 155-514P25
- SKP50...U..; 155-515P25
- SKP70...U..; 155-516P25

Accessories

Manual adjusting throttle attachment AGA61 permits VG... series valves to be used as hand operated adjusting throttles. Once adjusted the AGA61 has a provision to be sealed from further adjustment (See Table 2).

Adapter plate AGA60 permits VG... series valves to be used for modulating flow control when fitted with SQX... series modulating actuators (See Table 2).

NOTE: The VG... /SQX... valve/actuator combination does not provide safety shut-off function.

Table 2. Product Numbers.

Product Number	Size	Maximum Operating Pressure psi	Close-off Pressure psi	Capacity CFH Natural Gas at $\Delta P=1$ " W.C.	Number of Test Points, 1/4" NPT		3/4" NPT Port	Valve Body Material
					Inlet	Outlet		
VGG10.154U	1/2" NPT	20	75	334	2	2	—	Aluminum
VGG10.204U	3/4" NPT	20	75	627	2	2	—	Aluminum
VGG10.254U	1" NPT	20	75	933	2	2	—	Aluminum
VGG10.404U	1-1/2" NPT	20	75	2,250	2	2	—	Aluminum
VGG10.504U	2" NPT	15	75	3,511	2	2	—	Aluminum
VGG10.654U	2-1/2" NPT	10	25	5,085	1	1	2-inlet	Cast Iron
VGG10.804U	3" NPT	10	25	6,158	1	1	2-inlet	Cast Iron
VGF10.654U	2-1/2" Flanged	10	25	5,085	1	1	2-inlet	Cast Iron
VGF10.804U	3" Flanged	10	25	6,158	1	1	2-inlet	Cast Iron
VGH10.804U	3" Flanged	10	30	8,449	1	1	2-inlet	Cast Iron
VGH10.904U	4" Flanged	10	30	14,398	1	1	2-inlet	Cast Iron
VGH10.914U	5" Flanged	5	5	19,685	1	1	2-inlet	Cast Iron
*VGD20.403U	1-1/2"	20	30	1,890	Two 1/4-inch and one 1-inch port between valves		—	Aluminum
*VGD20.503U	2"	15	30	2,300			—	Aluminum
*AGA41U	Single 1-1/2" connecting flange with 1/4-inch port for VGD 20.403U						Two (2) needed per valve. Order separately	
*AGA51U	Single 2" connecting flange with 1/4-inch port for VGD 20.503U							
VGD40.065U	2-1/2" NPT	10	75	3,880	1	1	Two 1/4-inch NPT ports between the valves	Aluminum
VGD40.080U	3" NPT	10	75	5,370	1	1		Aluminum
VGD40.100U	4" Flanged	10	30	9,220	1	1		Aluminum
VGD40.150U	6" Flanged	10	30	15,900	1	1		Aluminum
AGA40.6580U	Vent connection plate with 1-1/4" NPT vent connection and 1/4" NPT test port						Order separately. For use with VGD40... only.	
AGA40.0100U	Vent connection plate with 2" NPT vent connection and 1/4" NPT test port							
AGA40.0150U	Vent connection plate with 2-1/2" NPT vent connection and 1/4" NPT test port							
AGA60	Adapter for use with SQX... actuators							
AGA61	Manual operation kit, allows VG... valves to be used as manually adjustable sealable orifice or throttle							
AGA80	Filter with clamping ring for VGH10.804U, 3-inch valve.							
AGA90	Filter with clamping ring for VGH10.904U, 4-inch valve.							
AGA91	Filter with clamping ring for VGH10.914U, 5-inch valve.							

* VGD20... double valves require 2 AGA...U threaded flanges for installation.

Specifications	Agency approvals/standards	UL/429, FM/7400, CSA/ANSI Z21.21/CGA 6.5 Commercial/Industrial IRI approvable
Approvals		
Operating Environment	Maximum operation pressure Maximum back pressure (differential) Close-off pressure Permissible gases Permissible gas temperature Permissible operating temperature Mounting	See Table 2 2.5 psi (150 mbar) See Table 2 Natural gas, manufactured gas, LPG, air 15°F to 140°F (-10°C to 60°C) 15°F to 140°F (-10°C to 60°C) Any position except upside down
Physical Characteristics	Body materials Weight	See Table 2 See Tables 3 through 6 and 8
Connections	Pipe connections Pressure and vent taps	NPT or ANSI Class 150 flange (See Table 2) See Table 2
Operation	<p>All VG... gas valves are normally closed, two-way valves. The VGG..., VGF..., and VGD... valves have a standard, built-in, stainless steel mesh filter in the inlet to protect the downstream components against contamination.</p> <p>Optional stainless steel mesh filters (order separately, see Table 2) can be installed in the inlet flange section of the VGH... valves.</p> <p>VGG... and VGF... series gas valves have a contoured valve disc for stable regulating control and smooth release of gas (see Figure 1).</p> <p>VGD20... double valves consist of two valves in series. The first (inlet) valve has a flat valve disc suitable for the safety shut-off function only. The second (outlet) valve has a contoured valve disc and is normally used in conjunction with actuators having additional control functions (SKP20..., SKP50..., and SKP70...) (see Figure 3).</p> <p>VGD40... double valves consist of two valves in series. Each valve has a double seat to achieve high flow (see Figure 4).</p> <p>VGH... valves are levered flap-type valves. Due to the absence of bends, the flow capacity is high. The progressive opening mode provides a smooth release of gas with stable control (See Figure 2).</p> <p>All valves have plugged 1/4-inch NPT ports for pressure test connection. On the 2-1/2-inch and 3-inch VGG..., VGF..., and VGH... series, additional 3/4-inch NPT ports are provided for pilot or vent line connection. The VGD20... valves have a one-inch NPT port for pilot or vent line connection. The VGD40... valves can be equipped with a full size vent connection plate.</p> <p>See Table 1 for details on ports and vent connection plates.</p>	

Operation, Continued

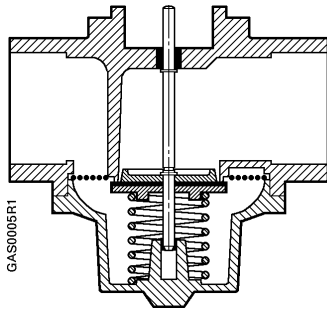


Figure 1. VGG... Models.

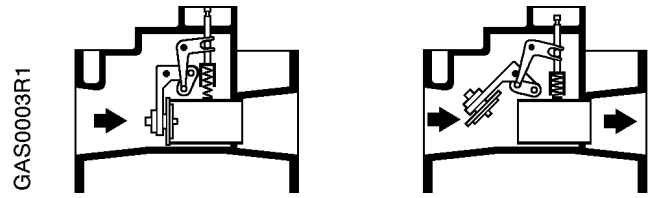


Figure 2. VGH... Models.

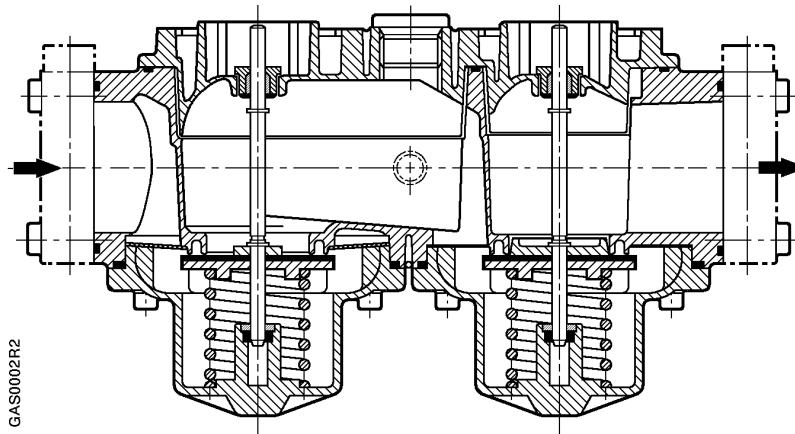


Figure 3. VGD20... Models.

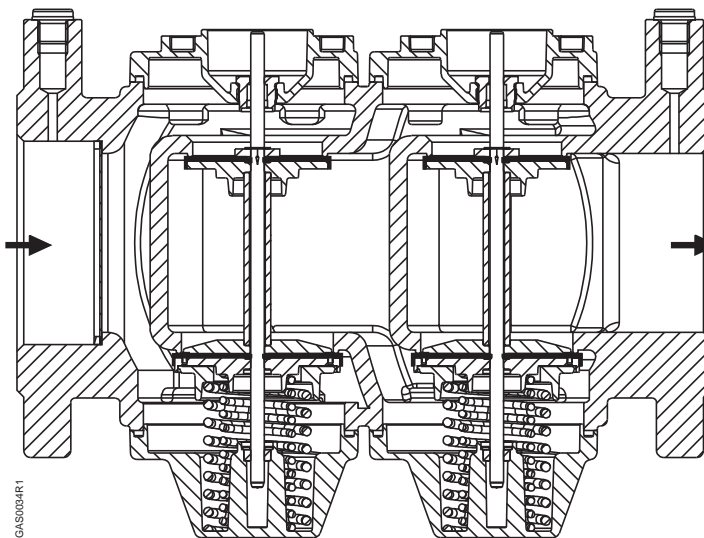


Figure 4. VGD40... Models.

Gas Flow Charts

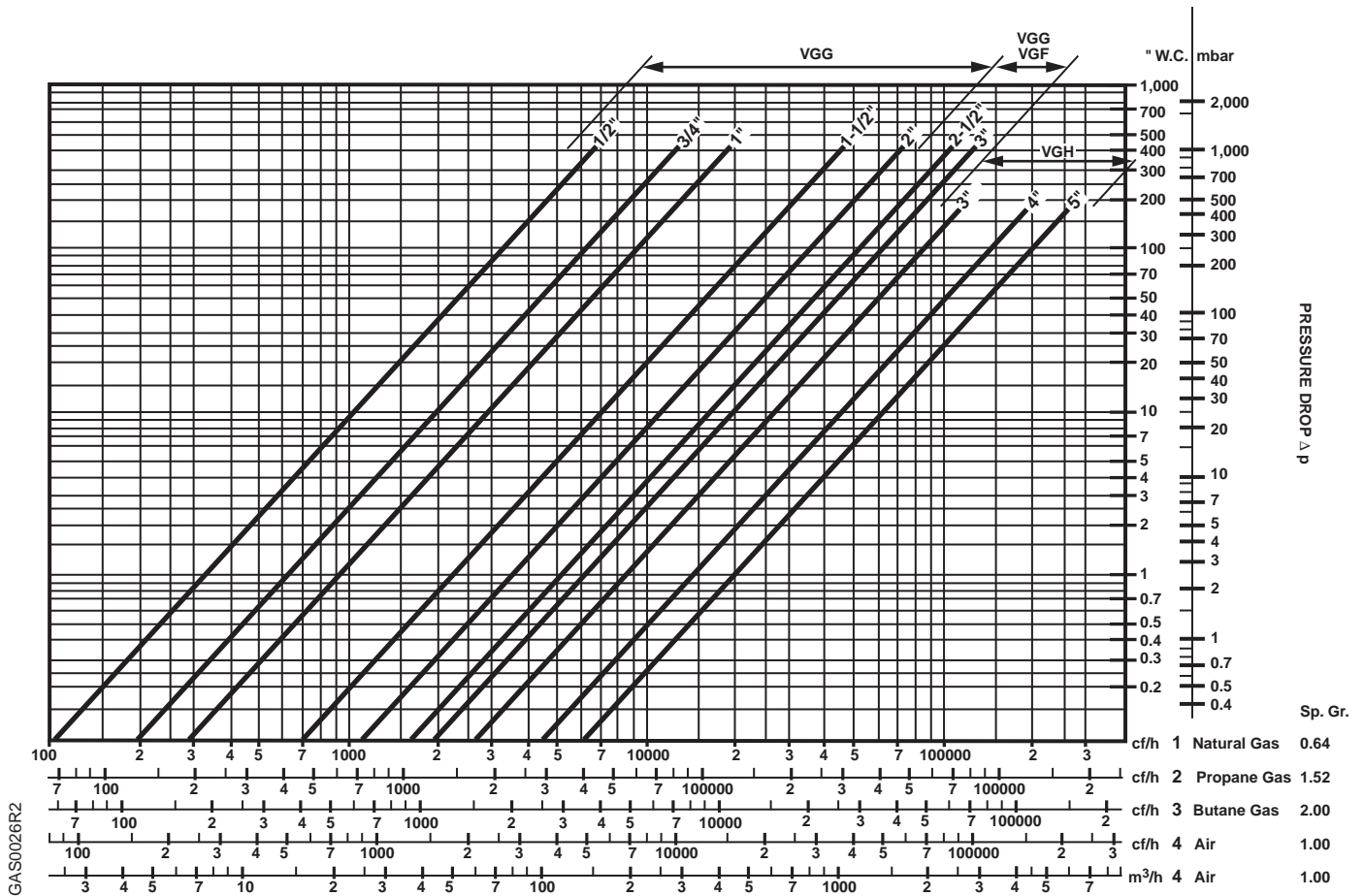


Figure 5. Sizing Single Valves.

NOTE: Pressure drop is for one valve.



CAUTION:

Do not oversize valves equipped with regulating actuators SKP20..., SKP50... or SKP70... Oversizing may limit turndown and could cause oscillations.

Gas Flow Charts, Continued

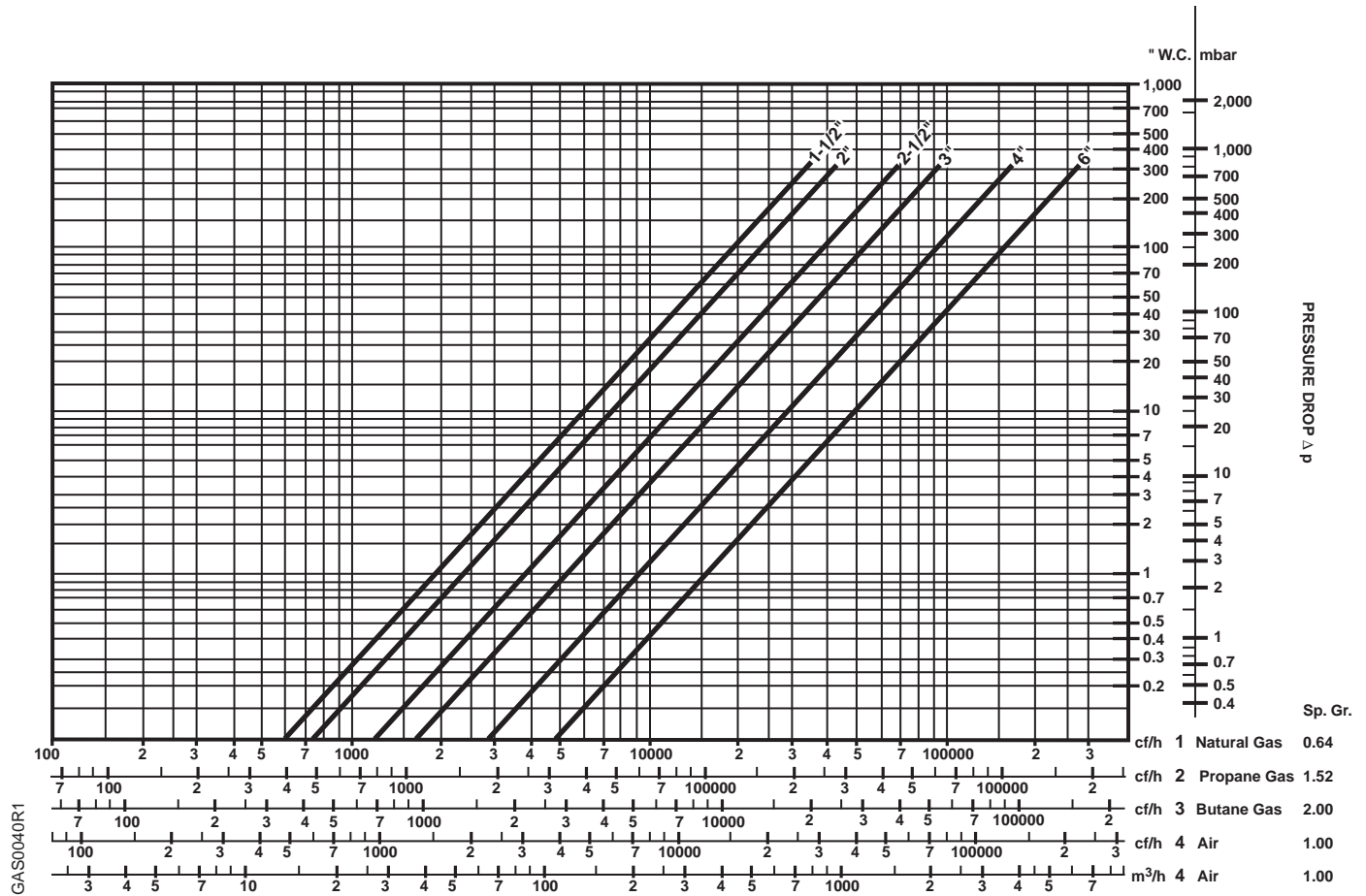


Figure 6. Sizing Double Valves.

NOTE: Pressure drop is total drop across both valves.



CAUTION:

Do not oversize valves equipped with regulating actuators SKP20..., SKP50... or SKP70... Oversizing may limit turndown and could cause oscillations.

Dimensions

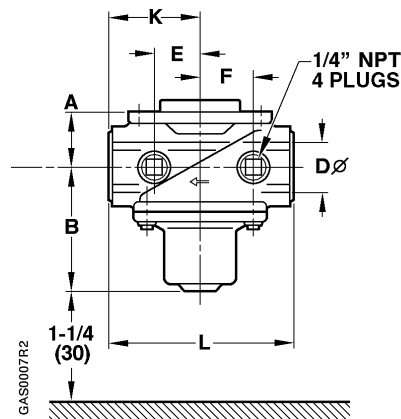


Table 3. VGG... Models.

Valve Model	Nominal Size D Inches	A Inches (mm)	B Inches (mm)	E Inches (mm)	F Inches (mm)	K Inches (mm)	L Inches (mm)	Weight Pounds (kg)
VGG...	1/2	1-1/4 (32)	3-1/8 (79)	1-1/8 (28)	1-7/32 (31)	2-3/16 (55)	4-3/8 (110)	1.65 (0.75)
	3/4	1-1/4 (32)	3-1/8 (79)	1-1/8 (28)	1-7/32 (31)	2-3/16 (55)	4-3/8 (110)	1.65 (0.75)
	1	1-1/4 (32)	3-18 (79)	1-1/8 (28)	1-7/32 (31)	2-3/16 (55)	4-3/8 (110)	1.5 (0.7)
	1-1/2	1-5/8 (41)	4 (102)	1-5/16 (34)	1-5/16 (34)	3 (75)	5-15/16 (150)	3.3 (1.5)
	2	2 (50)	4-1/4 (107)	1-5/16 (34)	1-5/16 (34)	3-3/8 (85)	6-3/4 (170)	4.0 (1.8)
	2-1/2	3-5/8 (92)	6-7/16 (163)	—	2-7/16 (62)	5-11/16 (145)	11-7/16 (290)	32.5 (14.8)
	3	3-15/16 (100)	6-7/16 (163)	—	2-7/16 (62)	6-1/16 (155)	12-3/16 (310)	34 (15.5)

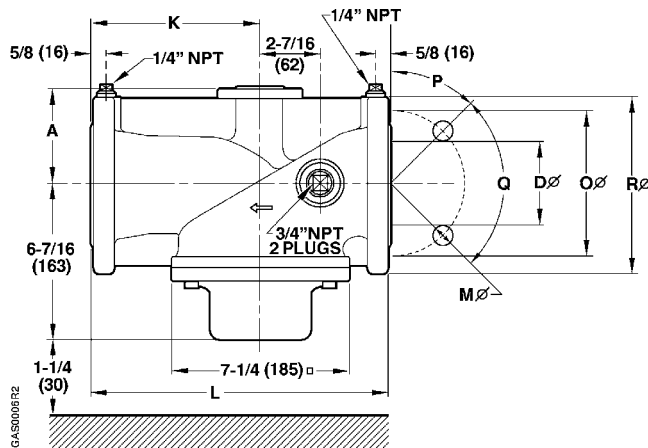


Table 4. VGF... Models.

Valve Model	Nominal Size D Inches	A Inches (mm)	K Inches (mm)	L Inches (mm)	M Inches (mm)	Number of Bolts	O Inches (mm)	P	Q	R Inches (mm)	Weight Pounds (kg)
VGF...	2-1/2	3-5/8 (92)	6-1/2 (165)	11-7/16 (290)	3/4 (19)	4	5-1/2 (140)	45°	90°	7 (178)	46 (20.9)
	3	3-15/16 (100)	6-7/8 (175)	12-3/16 (310)	3/4 (19)	4	6.0 (152)	45°	90°	7-1/2 (191)	46.6 (21.2)

Dimensions, Continued

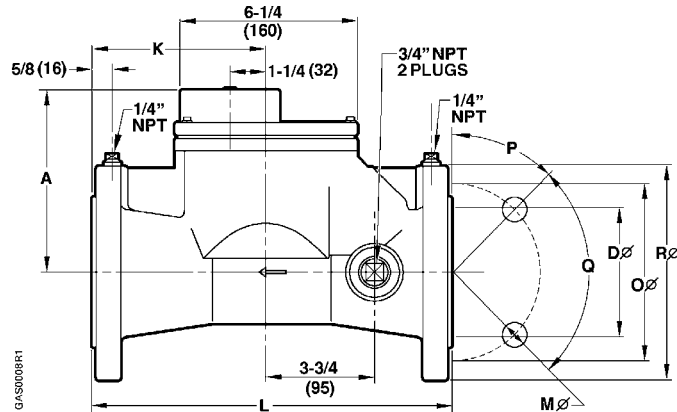


Table 5. VGH... Models.

Valve Model	Nominal Size D Inches	A Inches (mm)	K Inches (mm)	L Inches (mm)	M Inches (mm)	Number of Bolts	O Inches (mm)	P	Q	R Inches (mm)	Weight Pounds (kg)
VGH...	3	6-1/4 (159)	5-15/16 (150)	12-3/16 (310)	3/4 (19)	4	6 (914)	45°	90°	7-1/2 (190)	41.4 (18.8)
	4	6-1/2 (166)	6-1/2 (165)	13-3/4 (350)	3/4 (19)	8	701/2 (190)	22.5°	45°	9 (229)	57 (25.9)
	5	6-7/8 (174)	7-1/2 (190)	15-3/4 (400)	3/4 (19)	8	8-1/2 (216)	22.5°	45°	10 (254)	77 (35.0)

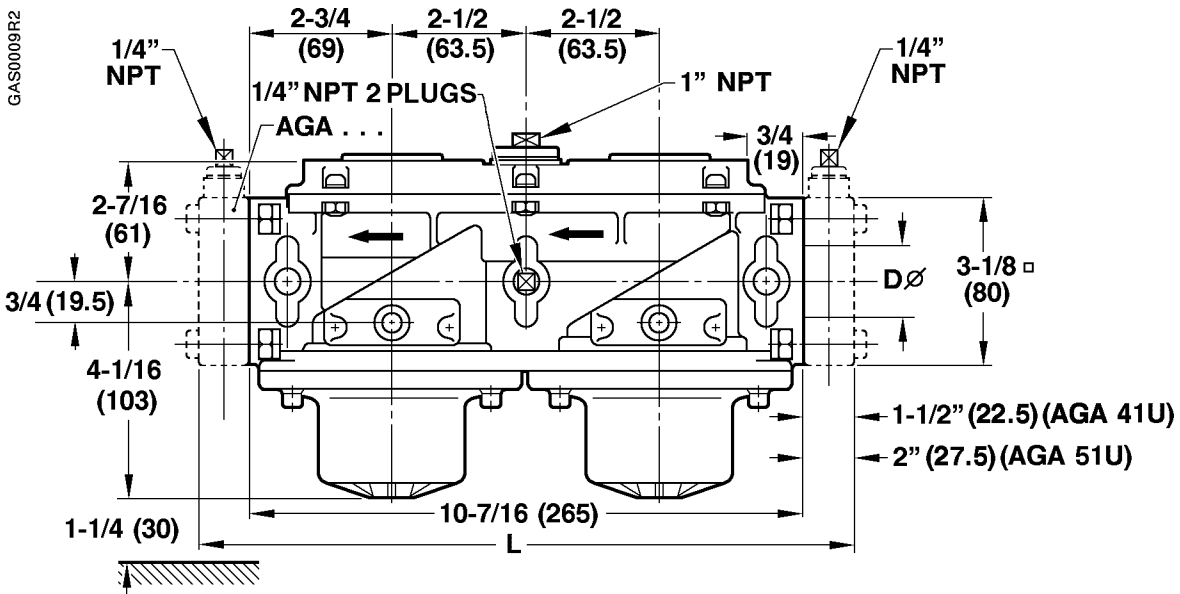


Table 6. VGD20... Models.

Valve Model	Nominal Size D Inches	L Inches (mm)	Weight Pounds (kg)
VGD20...	1-1/2	12-3/16 (310)	7 (3.2)
	2	12-5/8 (320)	6 (3.15)

Dimensions, Continued

Dimensions in Inches (mm)

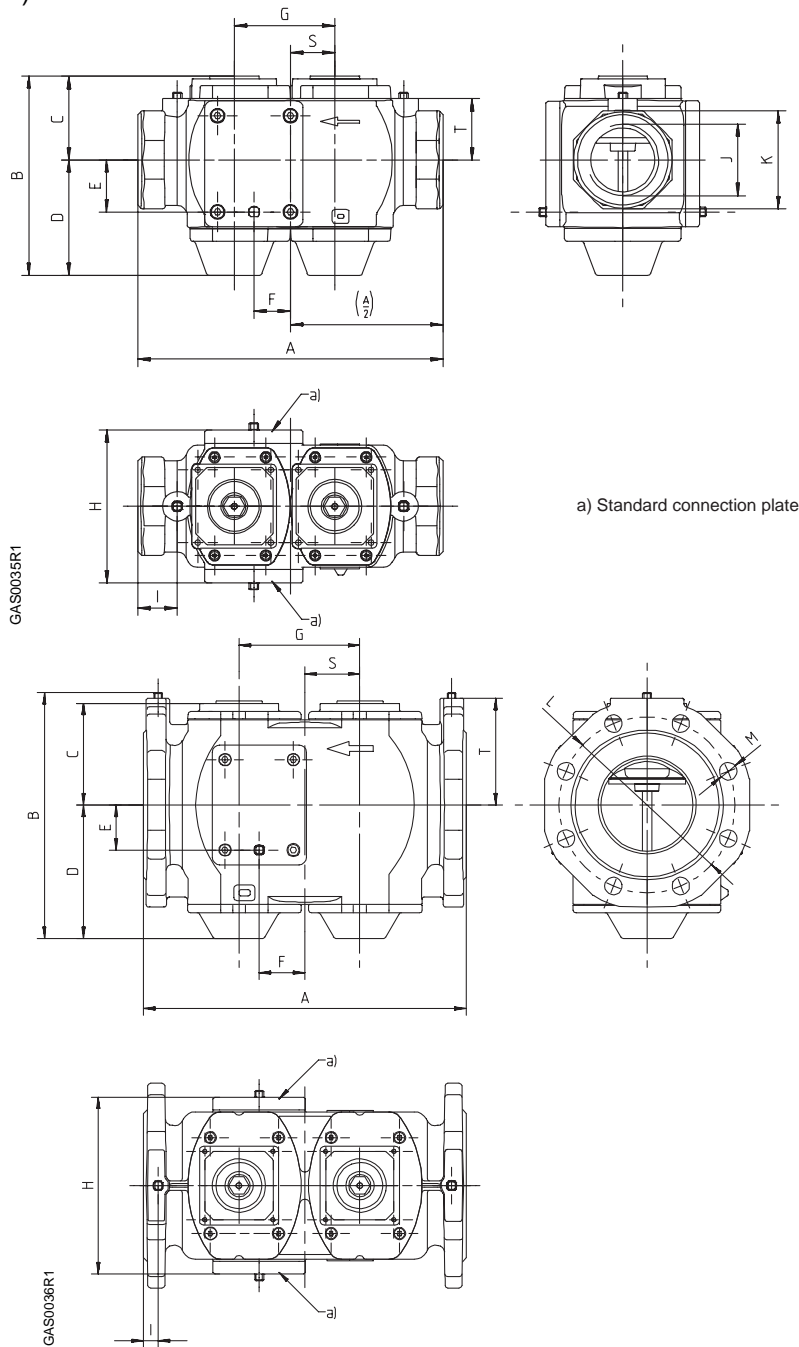


Table 7. VGD40... Models.

Valve Model	A	B	C	D	E	F	G	H	I	J	K *	L	M	S	T
VGD40.065U	12.09 (307)	7.00 (203)	3.25 (83)	4.63 (118)	2.09 (53)	1.46 (37)	4.02 (102)	6.14 (156)	1.57 (40)	2-1/2" NPT	SW 100	—	—	1.77 (45)	2.44 (62)
VGD40.080U	12.87 (327)	8.94 (227)	3.64 (93)	5.18 (132)	1.85 (47)	0.79 (20)	4.21 (107)	6.30 (160)	1.85 (47)	3" NPT	SW 120	—	—	2.34 (60)	2.83 (72)
VGD40.100U	13.78 (350)	10.50 (267)	4.33 (110)	5.70 (145)	1.93 (49)	1.95 (50)	5.16 (131)	7.56 (192)	0.63 (16)	—	—	d=7.50 (191)	d=0.75 (19)	2.34 (60)	4.55 (116)
VGD40.150U	18.90 (480)	13.29 (338)	5.71 (145)	7.40 (188)	2.09 (53)	2.30 (59)	6.61 (168)	10.31 (262)	0.63 (16)	—	—	d=9.49 (241)	d=0.91 (23)	3.54 (90)	5.61 (143)

* Spanner width in millimeters

Dimensions, Continued

- Option a) Connection plate with 1/4" NPT plugged pressure test port
 b) Vent connection plate with vent line connection and 1/4" NPT plugged pressure test port

Note: Plates a) and b) are interchangeable

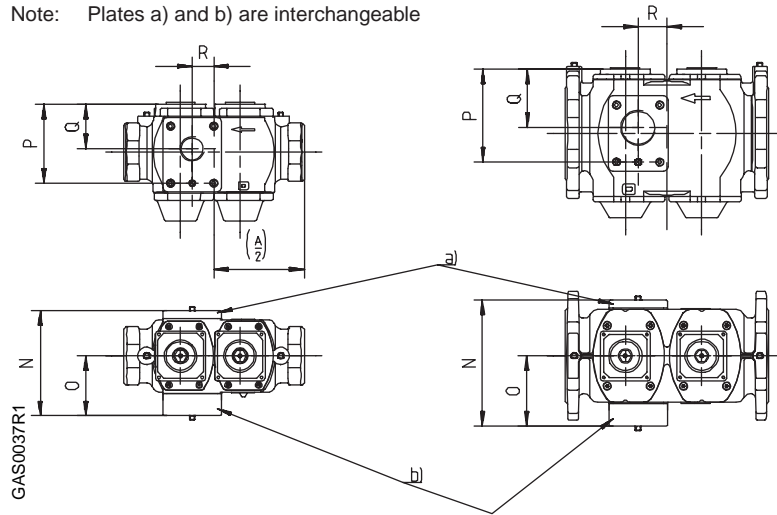
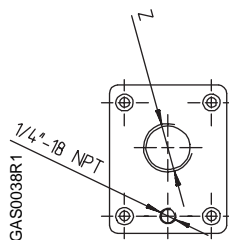


Table 8. VGD40... Dimensions in Inches (Millimeters).

Valve Model	N	O	P	Q	R	Weight Pounds (kg)
VGD40.065U	7.13 (181)	4.06 (103)	5.34 (136)	3.02 (77)	1.46 (37)	16 (7)
VGD40.080U	7.28 (185)	4.13 (105)	5.49 (140)	3.17 (81)	0.79 (20)	19 (3)
VGD40.100U	8.54 (217)	4.76 (121)	6.26 (159)	3.94 (100)	1.95 (50)	29 (13)
VGD40.150U	11.30 (287)	6.14 (156)	7.80 (198)	5.47 (139)	2.30 (59)	53 (24)

Table 9. Vent Connection Plate Dimensions.



	VGD40.065U	VGD40.080U	VGD40.100U	VGD40.150U	Thread Vent Connection Size
AGA40.6580U	X	X			1-1/4" NPT
AGA40.0100U			X		2" NPT
AGA40.0150U				X	2-1/2" NPT

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