SENTRY GS

EXCESS FLOW VALVES FOR RESIDENTIAL INSTALLATION (Australia / New Zealand)

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CONTENT

NOTICE

- SENTRY GS EFVs max. closing flow rate must NOT exceed the gas meter maximum flow rate capacity.
- All SENTRY GS excess flow valve installations to be installed by a licensed gas fitter in accordance with National standard (AS/NZS5601.1-2022).
- Main-Line EFV at Gas Meter outlet to be sized by: Total Home Gas Appliance Rating (Total MJ/hr)
- Additional In-Line OR Branch-Line EFV's may be required. All excess flow valve sizing must take into account the pressure drop through the SENTRY GS when considering the multilayer pipe manufacturers' pipe sizing charts.

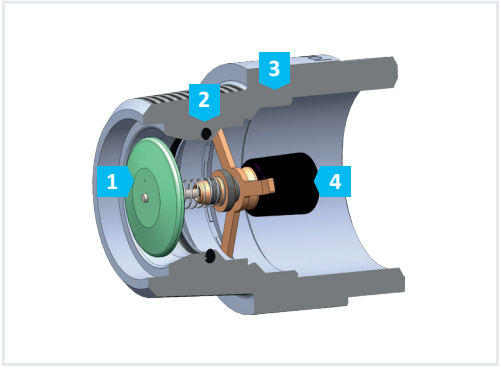
DESCRIPTION

SENTRY GS excess flow valves (EFV) have been used successfully for many years in residential installations and underground gas service lines throughout the world.* Gas installation regulations in Australia require the use of excess flow valves.

Maxitrol's factory adjustment (100 %) provides a precise and reliable closing flow rate. Excess flow valves close, shutting off the gas flow between 30 and 45 % above the nominal flow ($f_{s\ min}$ = 1.3 and $f_{s\ max}$ = 1.45) as required for type K. In the nominal flow range (VN), the EFV remains in a stable, open position. For EFV to function, the gas piping must be properly sized.

SENTRY GS EFVs are installed downstream of the regulator and prior to any multilayer pipe. SENTRY GS EFVs with a by-pass orifice reopen automatically after the downstream line has been repaired and repressurized. Close the nearest gas manual shut-off valve to speed resetting of the EFV.

* For more information refer to "SENTRY GS Excess Flow Valves for Underground Gas Service Lines" available at: www.maxitrol.com



◀ SENTRY GS cutaway (DN25)

1. Closing disc with by-pass orifice
2. O-Ring
3. Housing
4. Damping system

FEATURES & ADVANTAGES

SENTRY GS Type K for all Mounting Positions
Type K EFV may be mounted either horizontally or vertically (horizontally or vertically upward gas flow code letter Z; downward gas flow code letter D). (See label example page 5.)

Combination with a Thermally Activated Cut-Off Device (TCO)
A SENTRY GS EFV can be used in combination with a SENTRY GT TCO. The SENTRY GS..HT combines an EFV and a TCO. The TCO shuts off the gas flow at temperatures between 92 °C and 100 °C and allows no more than 30 l/hr measured in air to pass through the device for at least 45 minutes at temperatures up to 650 °C.

Maxitrol Patented Damping System
Potential peaks at start-up of a gas appliance could potentially close the EFV. Maxitrol's SENTRY GS EFV with its patented damping system will greatly reduce the number of nuisance shut-offs.
This damping system is available for SENTRY GS..1.6 up to GS..7.5 (DN15 to DN25).

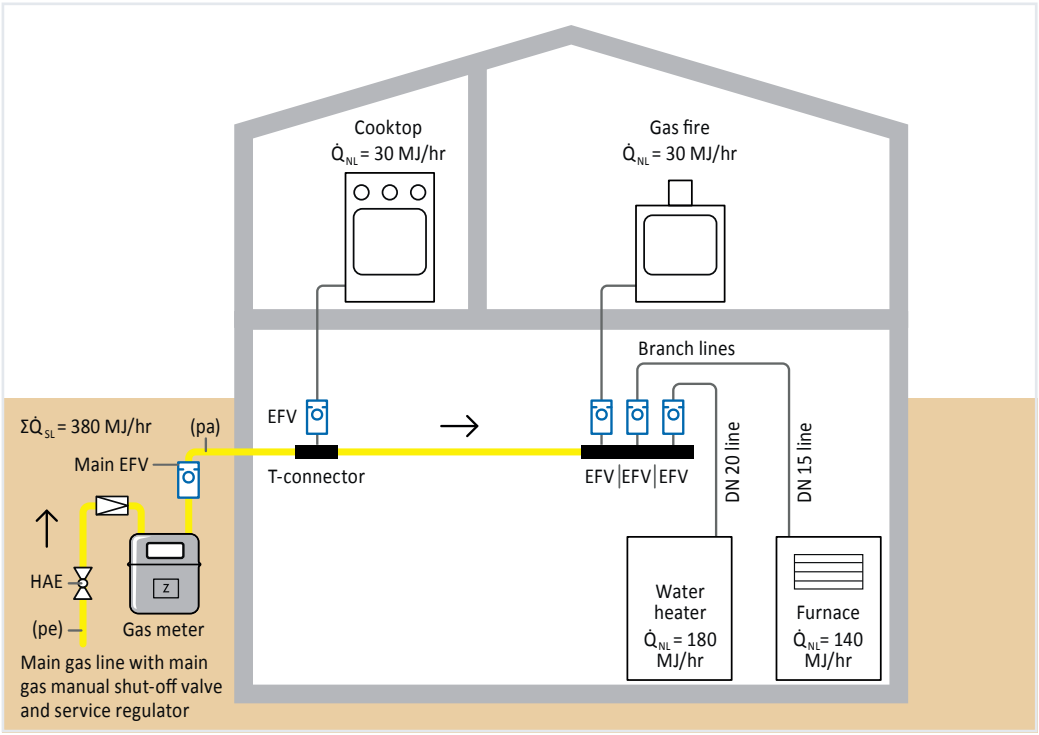
Operating Pressure Range EU 1.5 to 10 kPa (AU/NZ 1.25 to 10 kPa)
By combining the pressure ranges, the excess flow valve can be installed either upstream or downstream of the gas pressure regulator.
This significantly reduces the number of GS models required.

SIZING NOTES

SENTRY GS EFV are selected by determining the total nominal load of all gas appliances. The downstream pipe installation must be sized to ensure the effectiveness of the SENTRY GS.

When only one gas appliance is connected a SENTRY GS should only be loaded to 80 % of the nominal flow. When multilayer piping is used, it is important to recalculate the GS function.

INSTALLATION EXAMPLE



Installation example of SENTRY GS excess flow valves for LPG installations

Legend

pe = Inlet pressure
pa = Outlet pressure
$\Sigma\dot{Q}_{SL}$ = Total nominal load
$\dot{Q}_{NL}$ = Nominal load
Z = Gas meter
= Gas pressure regulator
= Excess flow valve (EFV)
= Ball valve
HAE = Main gas manual shut-off valve

SELECTION TABLES

SENTRY GS type	VN with NG	One gas appliance ($\dot{Q}_{NL}$) (with max. 80 % VN)		Several gas devices ($\Sigma\dot{Q}_{SL}$) added up to max. load		max. closing flow
	[m³/hr]	[kW]	[MJ/hr]	[kW]	[MJ/hr]	[m³/hr]
GS..1.6	1.7	14	50	17	61	2.5
GS..2.5	2.6	22	79	27	97	3.8
GS..4	4.1	34	122	43	155	6.0
GS..6	6.2	52	187	65	234	9.0
GS..7.5	7.7	65	234	81	292	11.3
GS..10	10.3	87	313	109	392	15.0
GS..12.5	12.9	109	392	136	490	18.7
GS..16	16.5	139	500	174	626	24.0

Table 1: NG Australia
Rel. Density: 0.6

SENTRY GS type	VN with LPG (propane)	One gas appliance (with max. 80 % VN)		Several gas devices added up to max. load		max. closing flow
	[m³/hr]	[kW]	[MJ/hr]	[kW]	[MJ/hr]	[m³/hr]
GS..1.6	1.1	20	72	28	101	1.6
GS..2.5	1.6	30	108	43	155	2.4
GS..4	2.6	48	173	69	248	3.8
GS..6	3.9	73	263	104	374	5.7
GS..7.5	4.9	91	328	130	468	7.1
GS..10	6.5	122	439	174	626	9.5
GS..12.5	8.2	152	547	217	781	11.9
GS..16	10.4	195	702	278	1001	15.2

Table 2: LPG (propane) Australia
Rel. Density: 1.5

SENTRY GS type	VN with LPG (butane)	One gas appliance (with max. 80 % VN)		Several gas devices added up to max. load		max. closing flow
	[m³/hr]	[kW]	[MJ/hr]	[kW]	[MJ/hr]	[m³/hr]
GS..1.6	0.9	22	79	31	112	1.4
GS..2.5	1.4	34	122	48	173	2.1
GS..4	2.2	54	194	77	277	3.3
GS..6	3.3	81	292	116	418	4.9
GS..7.5	4.2	102	367	145	522	6.1
GS..10	5.5	136	490	194	698	8.1
GS..12.5	6.9	169	608	242	871	10.1
GS..16	8.9	217	781	310	1116	12.9

Table 3: LPG (butane) New Zealand
Rel. Density: 2.08

SPECIFICATIONS

Approvals
- In compliance with AS/NZS5601.1 (Clause 5.2.11) Installation Codes (mandatory 31 March 2023)
- In compliance with the German requirements of the DVGW-TRGI 2018 and DVFG-TRF 2021 (except GS7.5K and GS12.5K)
- Registration-No.: CE-0085BO0402
- Pressure Equipment Directive (2014/68/EU)
- DIN 30652-1 (except GS7.5K and GS12.5K)

Fuel Gases
- Suitable for the three gas families according to DVGW-Code of Practice DIN EN 437

Operating Pressure Range **
- EU 1.5 to 10 kPa (AU/NZ 1.25 to 10 kPa)

Maximum Capacity (several gas devices)
- 174 kW (626 MJ/hr) for natural gas
- 278 kW (1001 MJ/hr) for LPG (propane)
- 310 kW (1116 MJ/hr) for LPG (butane)

Pressure Drop
- ≤ 80 Pa for GS7.5 and GS12.5; all others ≤ 50 Pa (see diagram on page 5)

Pressure Drop (at max. closing flow)
- 165 Pa for GS7.5 and GS12.5; all others 105 Pa

Overflow Volume
- Max. 30 l/hr air at 10 kPa

Pipe Sizes
- DN15, DN20, DN25, DN32, DN40, DN50

Thermal Resistance of the Housing
- 650 °C up to 500 kPa

Ambient Temperature Range
- -20 °C to 60 °C

Thread Connections
- According to DIN EN 10226-1 (ISO 7-1) tapered external and straight internal threads.
- BS 746 Connection Available

Closing Factor f_S
- $f_{S\ min} = 1.3$; $f_{S\ max} = 1.45$

Nominal Flow (VN)
- From 1.6 m³/hr natural gas to 16 m³/h

Closing Flow (VS)
- $V_S = f_S \times VN$

Type "K"
- Closing flow: 30 to 45 % above nominal flow (Closing factor: between 1.3 and 1.45) This EFV (as per definition in the Standard DIN30652-1) has been deemed an acceptable solution and complies with AS/NZS5601.1 (Clause 5.2.11) when installing multilayer pipe

Installation Point
- Main EFV installation point is downstream of the regulator and prior to any multilayer pipe.

Mounting Position
- Mounting position indicated on product label
- SENTRY GS "Z" model: For horizontal and upward flow direction
- SENTRY GS "D" model: For downward flow direction only.

By-pass Orifice
- Overflow volume: 2 to 30 l/h air

Maxitrol Patented Damping System
- DN15 to DN25

DVGW-TRGI 2018 and DVFG-TRF 2021:
German mandatory technical regulation for the planning, construction, modification and servicing of natural gas (TRGI) and liquid gas (TRF) installations.

Pressure Equipment Directive (2014/68/EU):
European regulation to harmonize national laws of Member States regarding the design, manufacture, testing, and conformity assessment of pressure equipment and assemblies.

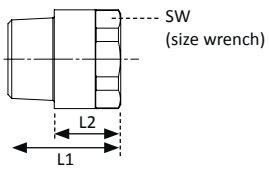
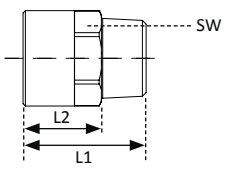
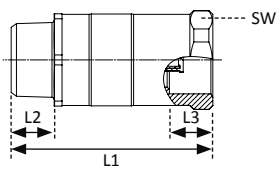
DIN 30652-1:
"Excess Flow Valves for Gas Installation" Excerpt of DVGW-TRGI 2018 that prescribe the German standard for excess flow valves in residential installations.

** A lower operating pressure range of 1.25 to 10 kPa, is supported for AU/NZ. (The overflow volume can be slightly higher in this case due to lower pressure.

CONFIGURATION

SENTRY GS	GS..H..AI.	GS..H..IA.	GS..HT..AI. in combination with a thermally activated cut-off device
			
Nominal Size	DN15, DN20, DN25, DN32, DN40, DN50	DN20, DN25, DN32, DN40, DN50	DN20, DN25
Gas Inlet	A – External thread (conical)	I – Internal thread (parallel)	A – External thread (conical)
Gas Outlet	I – Internal thread (parallel)	A – External thread (conical)	I – Internal thread (parallel)

DIMENSIONS

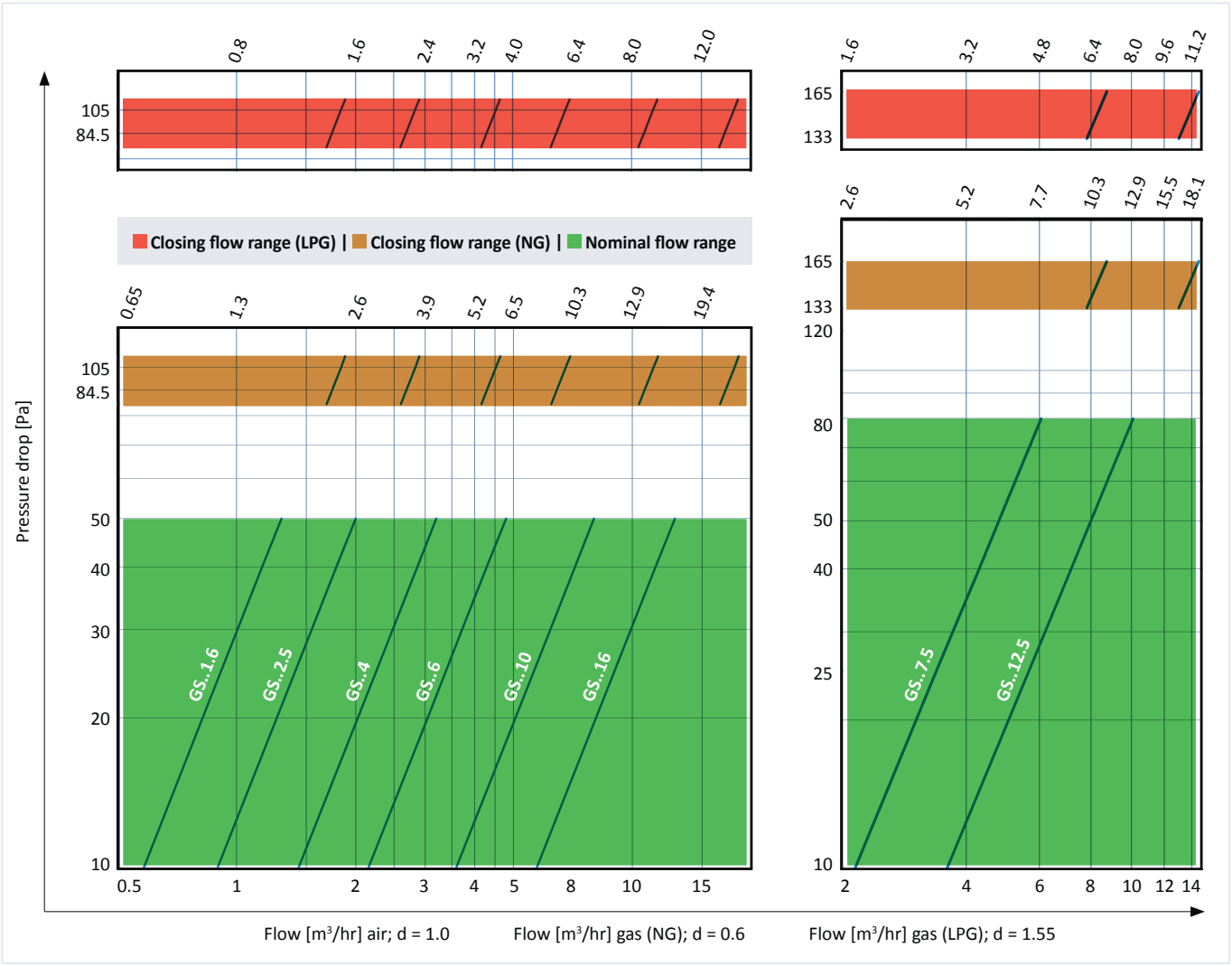
DN	Threads according to DIN EN 10226-1 (ISO 7-1)		Version GS..H..AI.			Version GS..H..IA.			Version GS..HT..AI.		
	External	Internal	SW	L1	L2	SW	L1	L2	L1	L2	L3
15	R ½	Rp ½	27	58	43	---	---	---	---	---	---
20	R ¾	Rp ¾	32	43	27	32	50	34	ca. 72.5	16.3	16.5
25	R 1	Rp 1	38	46.5	27.5	36	52.5	33.5	ca. 89.5	19.1	19.3
32	R 1 ¼	Rp 1 ¼	46	65	41	46	70	46	---	---	---
40	R 1 ½	Rp 1 ½	50	71	47	50	73	49	---	---	---
50	R 2	Rp 2	65	82	54	65	82	54	---	---	---
											

CLOSING FACTOR & NOMINAL FLOW RATE

Closing Factor	Type to DIN 30652-1	Mounting Position	SENTRY GS Configuration
$1.3\ (f_{S\ min}) \leq \mathbf{f_S} \leq 1.45\ (f_{S\ max})$ $\mathbf{f_S} = \frac{\text{Closing flow (VS)}}{\text{Nominal flow (VN)}}$	K	Horizontal or upward	GS..H..Z
		Downward	GS 20 H..D GS 25 H..D GS 32 H..D

Nominal Flow Rate	DN15	DN20	DN25	DN32	DN40	DN50
Nominal flow rate V_{Gas} natural gas [m³/hr]; d = 0.64	1.6 2.5	1.6 2.5 4	1.6 2.5 4 6 7.5	10 12.5	16	16

PRESSURE DROP



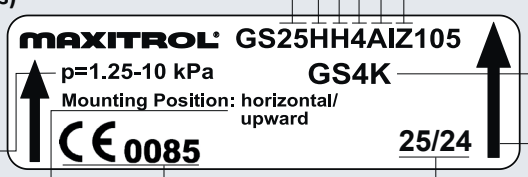
LABEL EXAMPLE

Nominal Flow Rate V_{Gas} Natural Gas; d=0.64
1.6 - 16 m³/hr

Model
H: GS
T: GS with integrated TCO

Operating Pressure Range
H: EU 1.5 to 10 kPa (AU/NZ 1.25 to 10 kPa)

Nominal Diameter (Pipe Sizes)
DN15, 20, 25, 32, 40, 50



Operating Pressure Range

Mounting Position

Approval (except GS7.5K and GS12.5K)

Connection Gas Inlet – Gas Outlet
(DIN EN 10226-1 / ISO 7-1)
AI: Extern. thread – Intern. thread
IA: Intern. thread – Extern. thread
(other connections available)

Mounting Position
Z: horizontal or upward flow direction
D: downward only

Nominal Flow Rate V_{Gas} Natural Gas; d = 0.64
See table Closing Factor & Nominal Flow Rate
(see page 4)

Gas Flow Direction

Manufacturing Date
(e. g. 25 = week / 24 = year 2024)

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