



# SENTRY GS

EXCESS FLOW VALVES FOR  
RESIDENTIAL INSTALLATION

**MAXITROL®**

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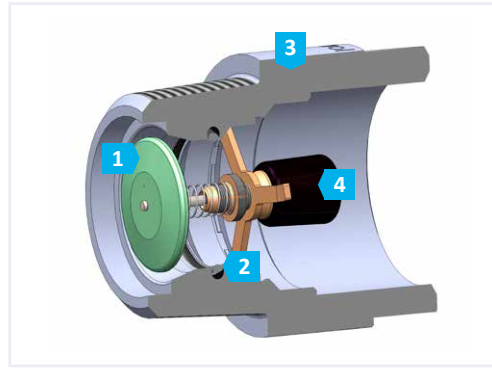
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## DESCRIPTION

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 Germany 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 the EFV to function, the gas piping must be properly sized.

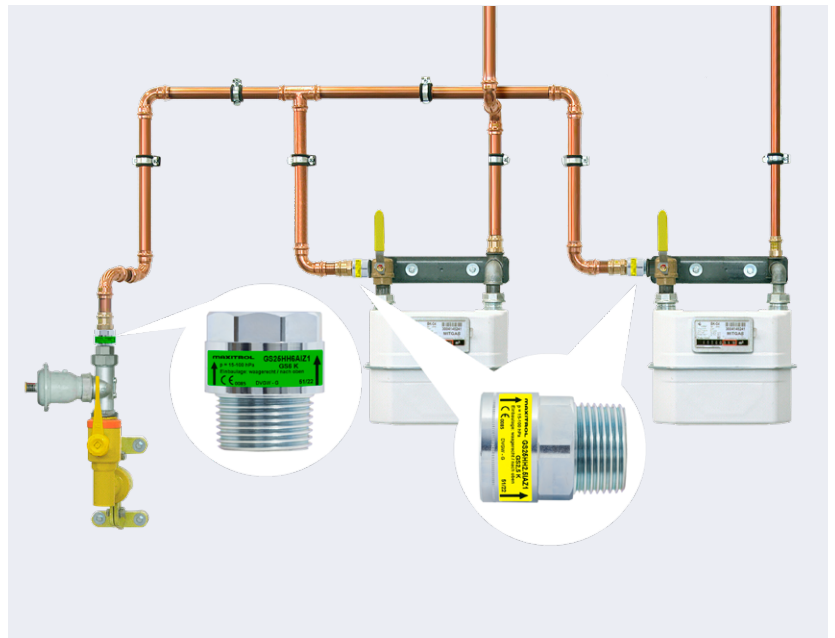


SENTRY GS cutaway (DN25)

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

SENTRY GS EFV 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](http://www.maxitrol.com).



Installation examples of SENTRY GS excess flow valves in a single-family dwelling (TRF, left) and in a multi-family dwelling (TRGI, right)

## FEATURES AND ADVANTAGES

### SENTRY GS Type K for all Mounting Positions

Type K EFV may be mounted either horizontally or vertically (horizontal or vertical upward gas flow code letter Z; downward gas flow code letter D). (See model numbering system page 4.)

### Maxitrol Patented Damping System

Potential peaks at start-up of a gas appliance can 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 natural gas output ranges up to 41 kW and LPG output ranges up to 67 kW.

### 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 a period of at least 45 minutes at temperatures up to 650 °C.

### Operating Pressure Range 15 to 100 hPa/mbar

By combining the pressure ranges, the excess flow valve can be installed either upstream or downstream of the gas pressure regulator.



## TECHNICAL DATA

### Approvals

- In compliance with the German requirements of the DVGW-TRGI 2018 and DVFG-TRF 2021\*.
- DIN 30652-1\*\* ("Excess Flow Valves for Gas Installation")
- Registration-No.: CE-0085B00402
- English General Gas Guidance IGE/G/5
- Pressure Equipment Directive (2014/68/EU)\*\*\*
- UKCA

### Fuel Gases

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

### Operating Pressure Range

- 15 to 100 hPa (mbar)

### Maximum Capacity

- 138 kW for natural gas
- 160 kW for LPG

### Pressure Drop

- $\leq 0.5$  hPa/mbar (see diagram page 5)

### Pressure Drop (at max. closing flow)

- 105 Pa (1.05 mbar)

### 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 (5 bar)

### 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

### Nominal Flow (VN)

- From 1.6 m³/hr natural gas to 16 m³/h

### Installation Point

- According to TRGI, downstream of the service regulator. If  $p \leq 100$  hPa/mbar, upstream of the service regulator
- According to TRF, upstream of the 2nd stage of the gas pressure regulation

### 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 25

\* **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.

\*\* **DIN 30652-1**

German standard for excess flow valves in residential 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.

## SIZING NOTES

SENTRY GS EFVs are selected by determining the total nominal load of all gas appliances. The nominal load  $Q_{NL}$  – as described in article 7.2 of TRGI 2018 and article 7.9.2 of TRF 2021 – is according to the gas appliance technical literature or the rating plate on the gas appliance. The SENTRY GS must be selected and the installation must be sized in accordance with the valid DVGW-TRGI and DVFG-TRF.

For plastic piping, the system manufacturer's specifications must be observed (NOTE: Plastic piping is only allowed in certain countries).

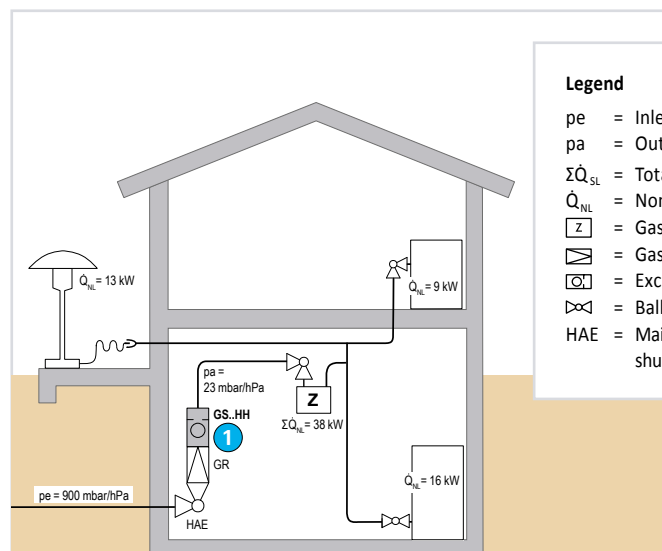
When using GS..K, no sizing is required for metal single supply lines, and when using GS2,5 K and GS4 K, no sizing is required for metal distribution lines.

For liquid gas (TRF), type K must always be used for GS selection. In addition, the minimum nominal size must be taken into account (see table 2, page 3, excerpt from TRF 2021).



# SELECTION OF SENTRY GS (ACCORDING TO TRGI 2018 AND TRF 2021)

## SENTRY GS in a Single-Family Dwelling (natural gas supplied)



### Legend

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

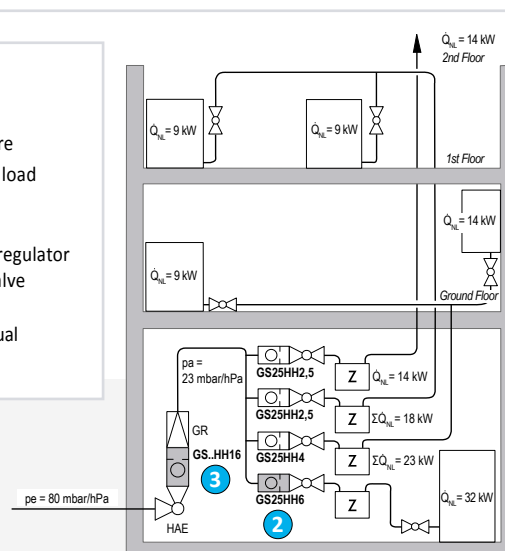
As a rule, a single GS EFV is required for an entire gas installation. It is recommended that the EFV be installed at the outlet of the gas pressure regulator (see ① above).

### Example

- Total nominal load of downstream appliances:  $\Sigma \dot{Q}_{SL} = 38 \text{ kW}$
- $p_e = 900 \text{ hPa/mbar}$ , EFV located downstream of the gas pressure regulator,  $p_a = 23 \text{ hPa/mbar}$

→ According to table 1 (see below), ① results in a GS..6. Most single-family dwellings in Germany use a main gas manual shut-off valve of a nominal diameter of DN25 with an internal thread as an outlet connection. The type to be installed is SENTRY GS25HH6AIZ when installed horizontally or upwards, and also SENTRY GS25HH6AIS when installed horizontally (see Model Numbering System, page 4).

## SENTRY GS in a Multi-Family Dwelling (natural gas supplied)



It is recommended that a GS EFV be installed at the main gas manual shut-off valve outlet (see ③ above). EFVs should also be installed at each gas meter, upstream of the gas meter ball valve (see ② above).

### Examples

- GS EFV located downstream of the main gas manual shut-off valve:
  - Total nominal load  $\Sigma \dot{Q}_{SL} = 87 \text{ kW}$  natural gas
  - $p_e = 80 \text{ hPa/mbar}$ , EFV located upstream of the gas pressure regulator
 → According to table 1, a SENTRY GS..16 (see ③) must be installed in the distribution line.
- GS EFV located upstream of the gas meters, downstream of the gas pressure regulator:
  - A GS25HH... must be installed in the supply line to the consumer  $\dot{Q}_{NL} = 32 \text{ kW}$  natural gas (see ②).

Table 1: Metal Piping (Excerpt from TRGI 2018)

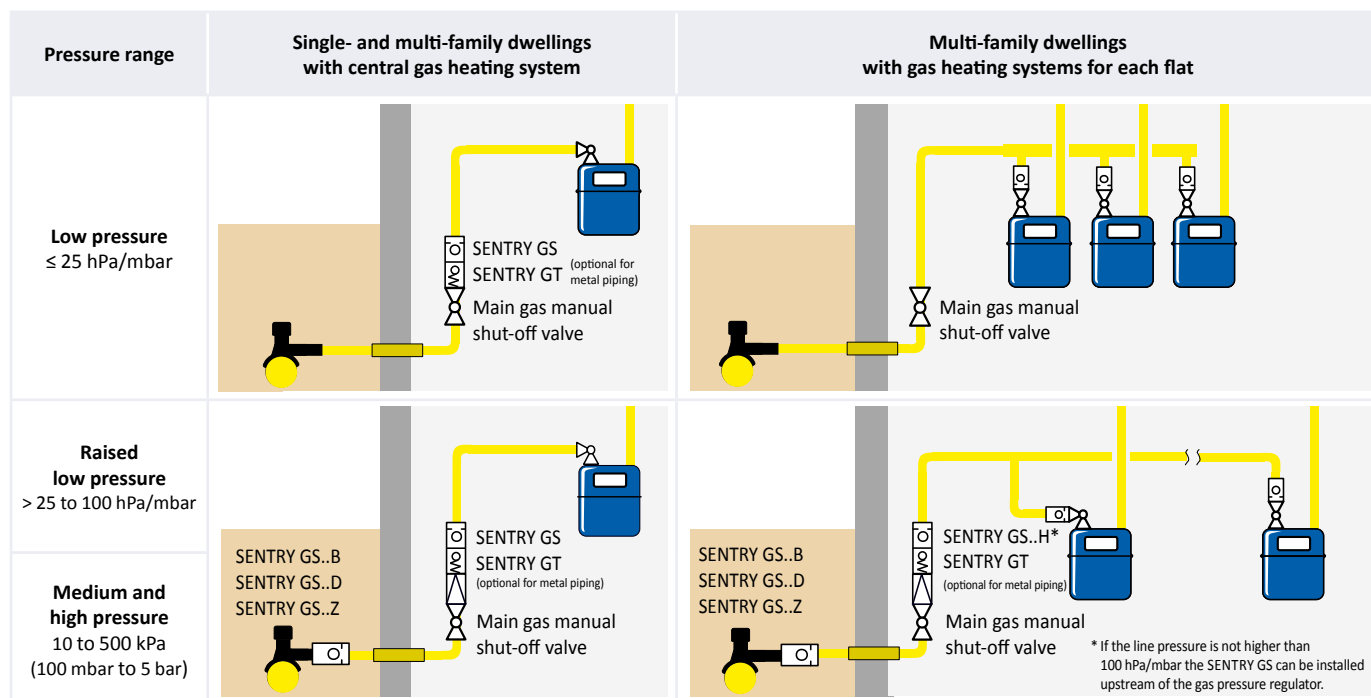
Selection SENTRY GS K	One gas appliance $\dot{Q}_{NL}$ [kW]	Several gas appliances $\Sigma \dot{Q}_{SL}$ [kW]	Minimum nominal size for GS K (maximal 10 m)			
			Cu, stain- less steel $d_s$	Steel pipe DN	Corrugated pipe DN	Appliance armature DN
GS..2,5	up to 17	up to 21	---	---	---	---
GS..4	18 – 27	22 – 34	---	---	---	---
GS..6	28 – 41	35 – 51	18	20	20	15
GS..10	42 – 68	52 – 86	22	20	25	20
GS..16	69 – 110	87 – 138	28	25	32	25

Table 2: LPG Installation (Excerpt from TRF 2021)

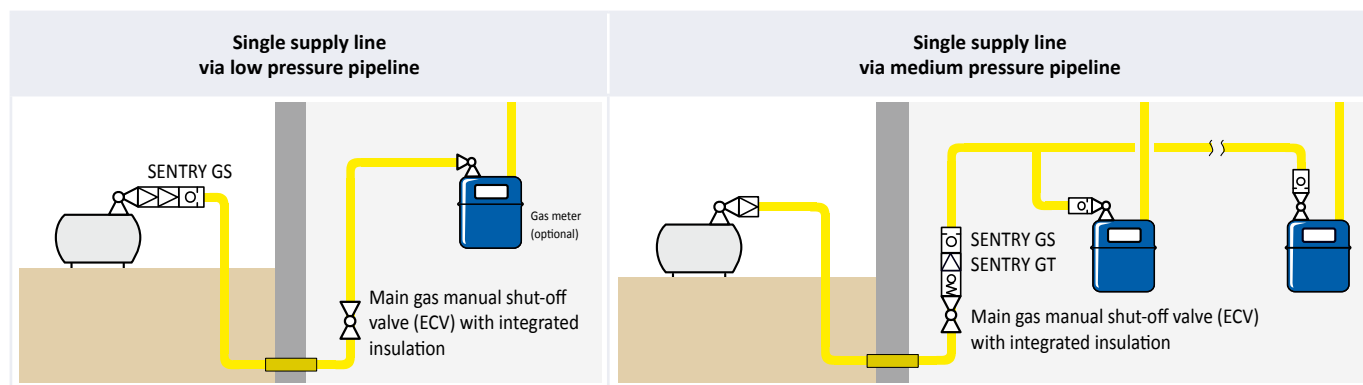
Selection SENTRY GS K	One gas appliance $\dot{Q}_{NL}$ [kW]	Several gas appliances $\Sigma \dot{Q}_{SL}$ [kW]	Minimum nominal size			
			Cu, stain- less steel $d_a$	Precision- steel pipe DN	Steel pipe DN	Appliance armature DN E D
GS..1,6	up to 18	up to 25	All dimensions			
GS..2,5	19 – 28	26 – 40	15	15 x 1,5	10	10 ---
GS..4	29 – 45	41 – 64	15	18 x 1,5	15	15 10
GS..6	46 – 67	65 – 96	18	22 x 1,5	20	20 15
GS..10	68 – 112	97 – 160	22	28 x 2	25	25 20



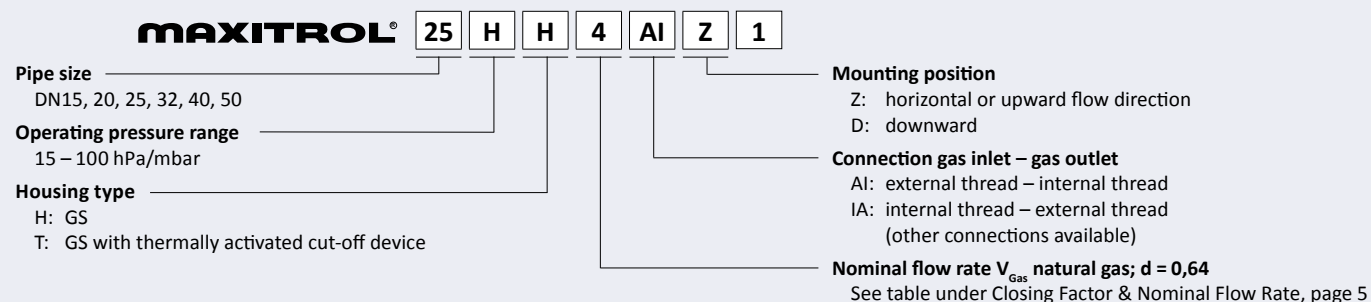
## INSTALLATION EXAMPLES ACCORDING TO TRGI 2018



## INSTALLATION EXAMPLES ACCORDING TO TRF 2021






## MODEL NUMBERING SYSTEM

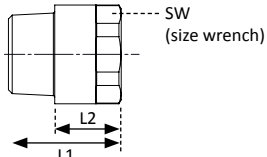
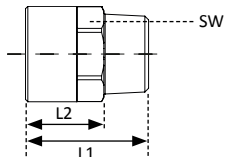
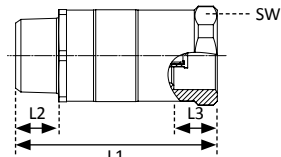




## CONFIGURATION

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	External thread A	Internal thread I	External thread A
	Gas outlet	Internal thread I	External thread A	Internal thread I

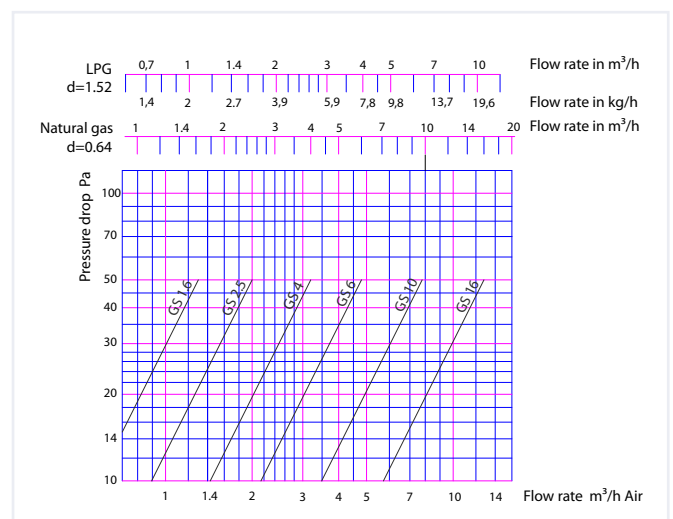
## DIMENSIONS

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			
$f_{s \max} \leq 1,45$	K	Horizontal or upward	GS..H..Z			
Max. closing flow Nominal flow		Downward	GS20H..D / GS25H..D			
Nominal flow rate	DN15	DN20	DN25	DN32	DN40	DN50
$V_{\text{Gas}}$ natural gas [m³/h]; d = 0,64	1,6 2,5	1,6 2,5 4	1,6 2,5 4 6	10	16	16

## PRESSURE DROP







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