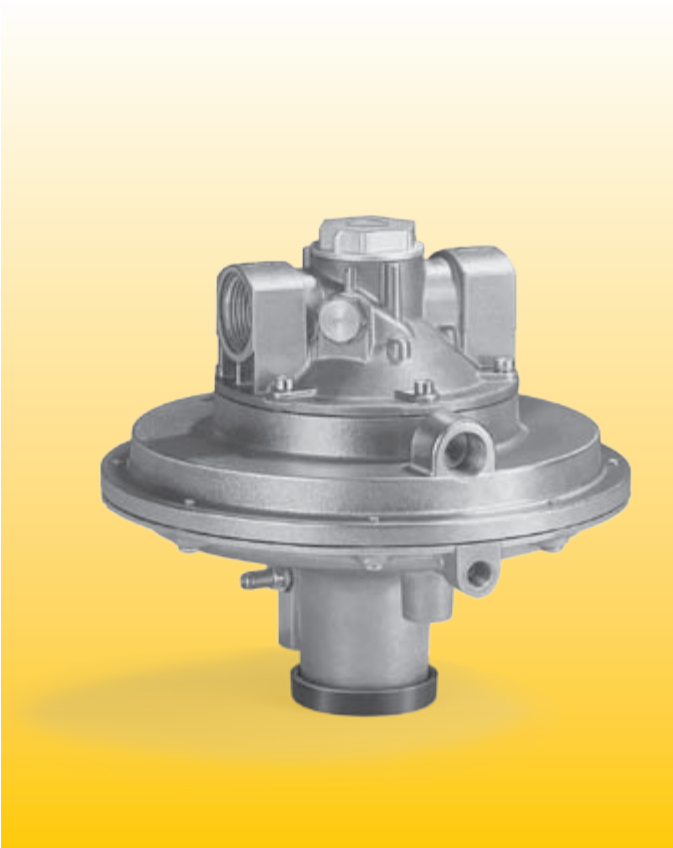


AIR/GAS REGULATORS GIKH, GIKH..B

Technical Information

T-Product 2005 April



- // For maintaining constant gas/air ratios on preheated air combustion systems
- // Precise pressure regulation over wide turndown ranges
- // Compensated for varying inlet pressures
- // Long life, low maintenance

krom //
schroder

Contents

Contents	2
Application	3
Sample Application - Propotional control/Small diameter piping	3
Sample Application - Propotional control/Large diameter piping	4
Sample Application - High/Low/Off control	4
Specifications	5
Operating Limits	5
Materials of Construction	5
Dimensions and weights	6
Sizing GIKH	7
Turndown	8
Installation	9
How to install the measuring orifice in the air line ..	10
Operation	11
To adjust the low fire position	11
GIKH..B for staged control (B = Bypass)	12
Function	13
Order Information	14
Trouble Shooting	15
Low fire flow too high?	15
Air control pressure too high?	15
Regulator is not responding?	15
Maintenance	16
Spare parts	17
Contact	18

Application

GIKH and GIKH..B regulators allow precise, repeatable control of gas/air ratios on preheated air combustion systems, where air density is affected by temperature changes. They can be used as direct gas pressure controllers or as loading signal generators for conventional gas/air ratio regulators. They are also suitable for cold air combustion systems where the available gas pressure is higher than the combustion air pressure, avoiding the necessity of troublesome, high maintenance bleeders. They are suitable for natural, LP and clean coke oven or bio-gas. Special models are available for controlling air pressure.

Sample Application - Proportional control/ Small diameter piping

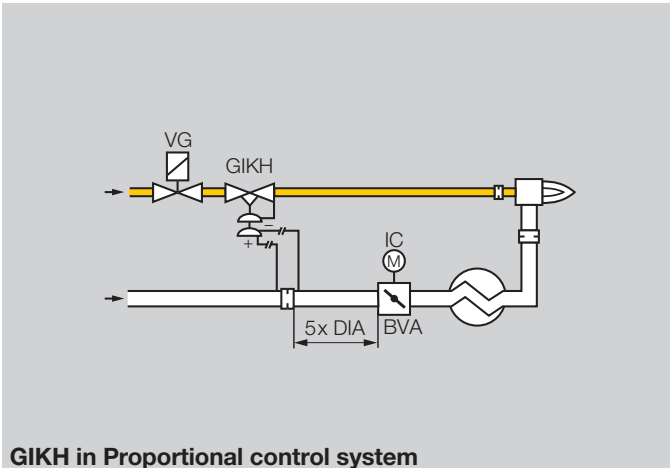
Continuous air/gas control for hot air operation for single or multiple burner applications. Burners fitted downstream of the measuring orifices must not be switched off individually.

Maximum Gas pipe size 1".

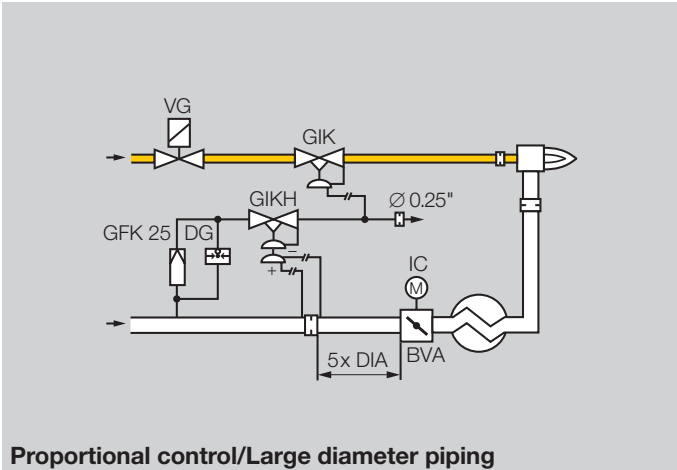
VG = Safety Shut off Valve

GIKH = Air/Gas Regulator

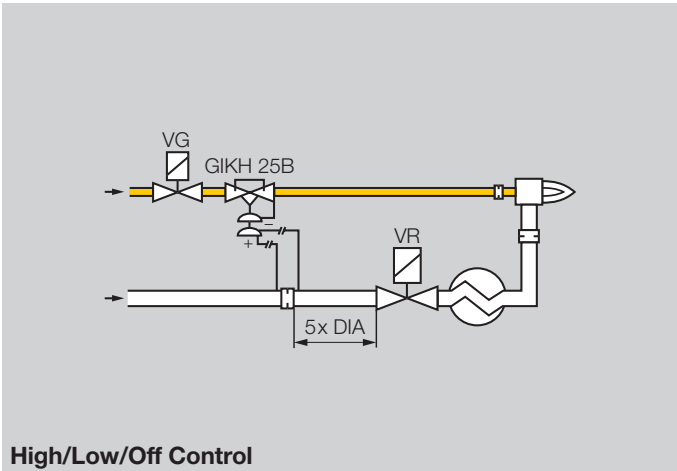
BVA = Butterfly Valve for Air with IC Actuator



GIKH in Proportional control system



Proportional control/Large diameter piping



High/Low/Off Control

Sample Application - Proportional control/ Large diameter piping

Continuous air/gas control for hot air operation for single or multiple burner applications. Burners fitted downstream of the measuring orifices must not be switched off individually. For piping size greater than 1".

VG = Safety Shut off Valve

GIK = Air/Gas Ratio Control up to size 4"

GIKH = Air/Gas Regulator

GFK = Filter for Gas

BVA = Butterfly Valve for Air with IC Actuator

Also used for cold air systems where gas pressure is lower than regulator impulse pressure.

Sample Application - High/Low/Off control

For hot air operation for single burner application. Further examples of applications on request.

Max. gas pipe size 1".

Specifications

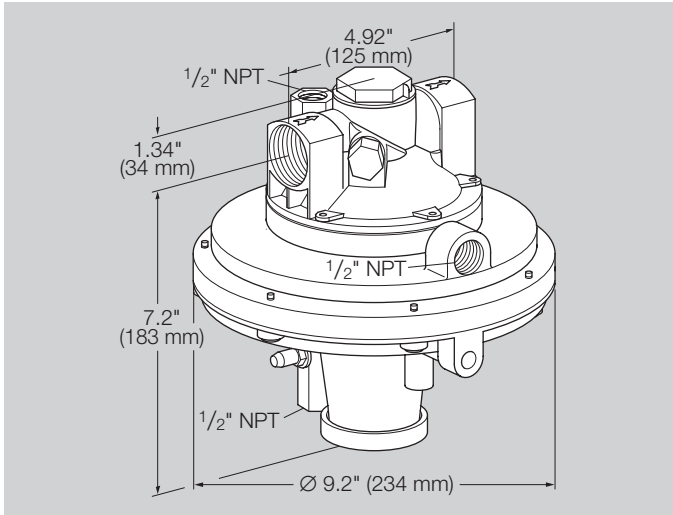
Operating Limits

Ambient temperature range:	-4° F to 158° F (-20° C to 70° C)
Maximum inlet pressure:	3 psig (200 mbar)
Maximum operational inlet-to-outlet differential pressure:	1.5 psig (100 mbar)
Combustion air loading(+) to air loading (-) pressure:	7" WC (17.5 mbar)
Outlet pressure range:	GIKH: Up to 28" WC (70 mbar) GIKH..B: Up to 27.8" WC (69.5 mbar), see turndown table

Materials of Construction

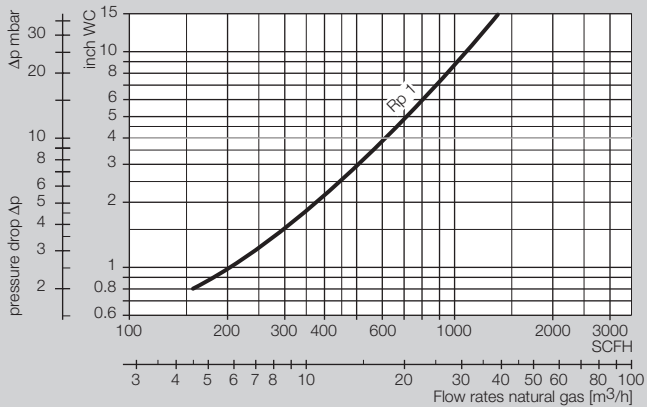
GIKH and GIKH..B regulators have pressure die-cast aluminum alloy valve bodies and diaphragm housings. Valve seats are precision-machined from aluminum, and valve discs are aluminium with vulcanized nitrile rubber seals. Diaphragms are nitrile rubber.

Dimensions and weights

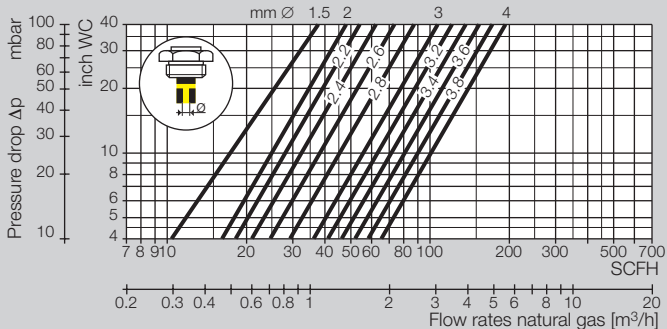


Weight: 7.59 lbs (3.45 kg).

Flow rate



Bypass screw GIKH..B



GIKH: bypass plug – standard no hole
 GIKH..B: bypass plug – standard: 0.06 inch (1.5 mm)

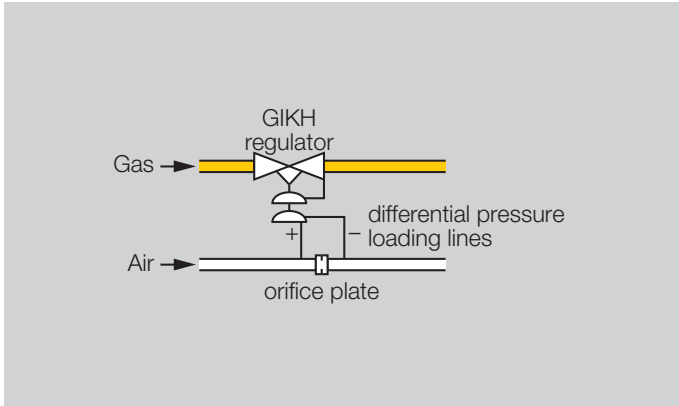
Sizing GIKH

Flow Correction Factors

Flows in the table are based on 1 psig, 60 °F at sea level (14.7 psia) and natural gas with a specific gravity of 0.62. Flows will decrease if the ambient temperature or altitude increases and if the specific gravity increases. To correct for conditions other than the ones used in the table divide the flow table by the factor.

Specific Gravity	Factor
Air (1.0 s. g.)	1.27
Propane (1.56 s. g.)	1.61
Butane (2.00 s. g.)	1.83
Propane/Air (1.29 s. g.)	1.47
Coke Oven (0.45 s. g.)	0.87

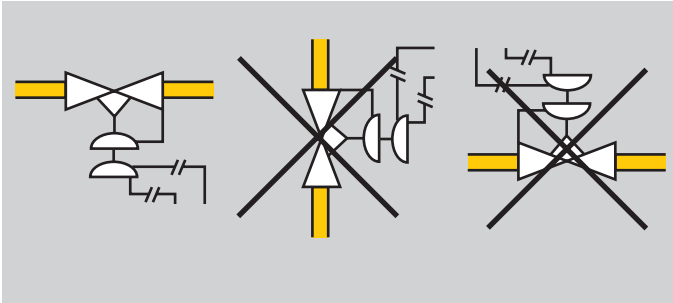
Temperature	Factor
60 °F (16 °C)	1.0
100 °F (38 °C)	0.96
120 °F (46 °C)	0.95



Turndown

The flow turndown range of GIKH regulators is determined by the high fire pressure drop across the orifice plate generating the differential pressure loading signal to the regulator. The higher this differential, the greater the turndown.

Orifice plate Differential pressure		Flow turndown Ratio	GIKH 25 Outlet pressure	
" WC	mbar		" WC	mbar
8.0	20	10 to 1	32.0	80
5.2	13	8 to 1	20.8	52
4.0	10	7 to 1	16.0	40
2.0	5	5 to 1	8.0	20



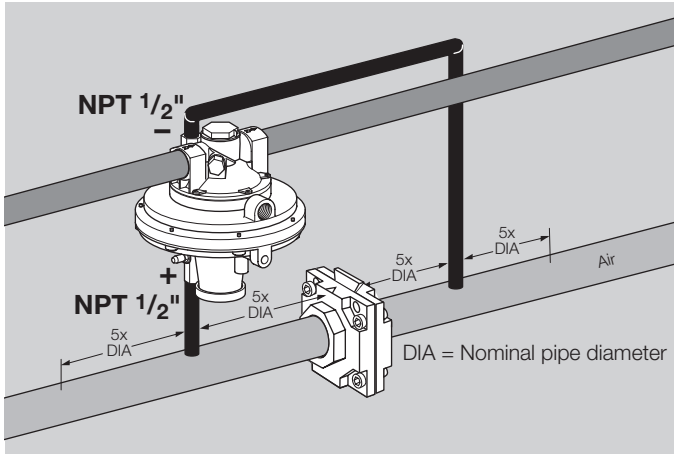
Installation

WARNING: Improper installation, adjustment, modification, operation or maintenance could lead to injury or damage. All adjustments must be made by a qualified technician.

Wiring must comply with local codes and National Electrical Codes. To prevent the possibility of property damage, turn off electrical power, depressurize installation, vent fluid to safe area before servicing.

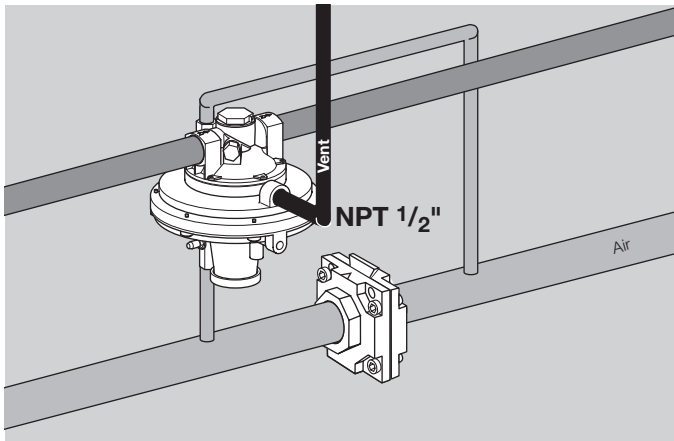
We recommend installing a gas filter in the main gas train of each system. Make sure pipes are free of any foreign matter before assembling the filters. Apply thread seal carefully, avoid getting excess into housing.

- Remove thread protectors.
- Observe direction of flow: arrow on housing.
- **Spring dome must point vertically downwards.**
- The housing must have clearance of $\frac{3}{4}$ " from any vertical surface. Allow access to spring adjustment.
- Use suitable sealant, apply sparingly, only to outer threads.
- Check for gas leaks. Apply pressure to regulator (do not exceed name plate rating) – measured at test point.
- Soap pipe joints and check for leaks.

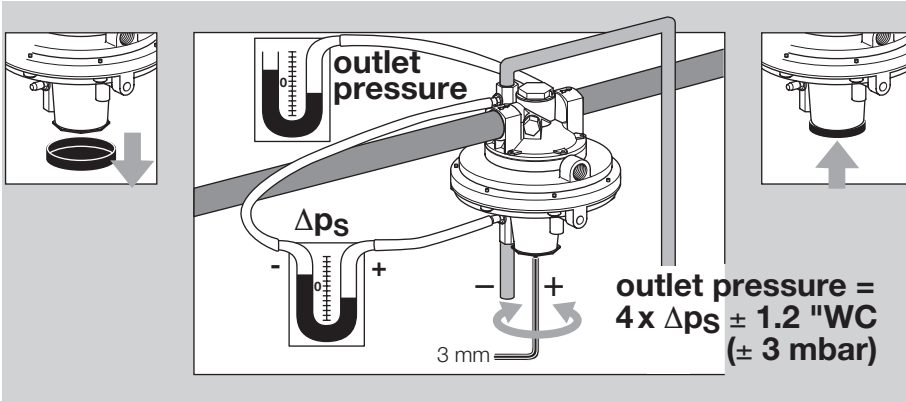


How to install the measuring orifice in the air line

Impulse line: The connection of the air line must be of a distance of 5x nominal diameter from the orifice plate
Air line should be 3/8" x 0.35" (12 x 1,5 mm)



Vent line: The connection of the vent line is NPT 1/2".
Vent the purge line into an approved vent location.



Operation

To adjust the low fire position

- Set the high-fire rate using restricting orifices or adjustment elements on the burner.
- At low-fire rate: Differential control pressure at least 0.08" WC (0.2 mbar).
- Factory setting: outlet pressure = approx. $4 \times p_s$ (differential pressure).

GIKH 25..B

The bypass screws and the housing have been marked since November 2000. Only marked screws may be used with marked housings.

1. Insert the bypass screw into the housing.

2. Tighten the bypass screw.

3. Turn the housing to the right.

4. Tighten the housing cap.

5. Final assembly check.

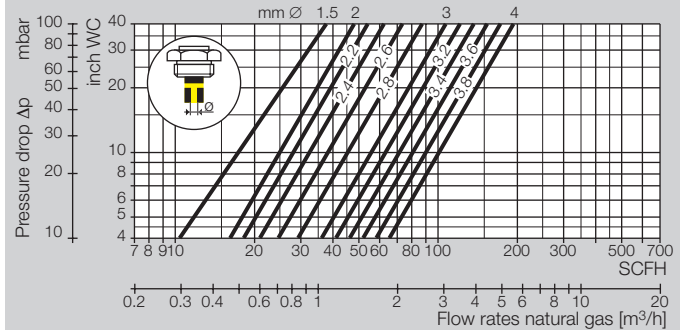
max. 4.35 psig (300 mbar)

Order-No. Bypass Screws

For GIKH 15 to 25 (1/2" to 1")

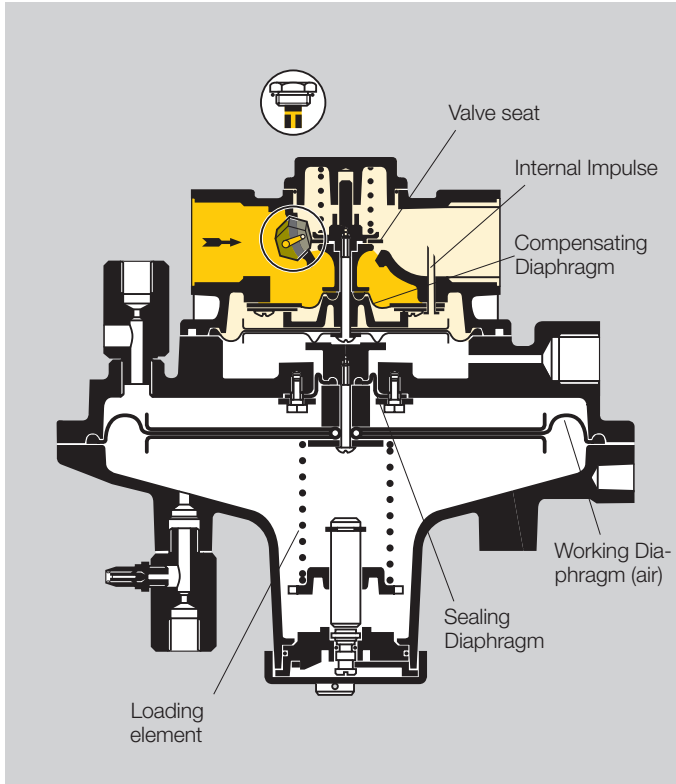
Bypass screw Ø 0.059" (1.5 mm)	03089217
Bypass screw without orifice	03089215
Bypass screw with custom orifice	74919820

Bypass screw GIKH..B



GIKH..B for staged control (B = Bypass)

- The air orifice differential must be less than 0.8" wc (2 mbar) at low fire position
- The bypass orifices determines the low fire rate: Standard = 0.059" (1.5 mm)
- Enlarge the orifice I.D for flow regulation (see chart above)



Function

The GIKH has 5 basic elements that allow it to operate. These are:

1 Valve seat

A valve seat or orifice through which the gas supply will flow. This has a disc that can close against the seat to limit the flow of gas. By moving the disc, the outlet flow and pressure can be altered from fully open to fully closed. The position of the disc will determine the flow and pressure at the regulator.

2 Internal/external impulse

Usually a tube located on the regulator outlet sense the outlet pressure. The working diaphragms are linked to the valve stem. A change in the sensed pressure above the diaphragm, will move the valve disc to alter it's position.

3 Measuring element working diaphragm (air)

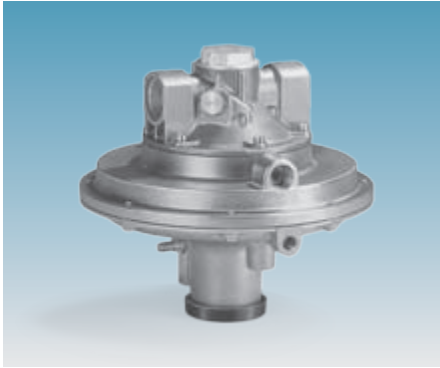
The sensed differential air pressure off the air orifice measures Air. At higher air flow (means higher differential pressure on the orifice) the valve seat opens, at lower flow the valve seat closes.

4 Compensating diaphragm

A secondary diaphragm is used in compensated regulators. This diaphragm has the same area as the valve, so it compensates the effect of varying inlet pressures on the valve.

5 Loading element

The air control pressure acts against the force of the working diaphragm. When state of equilibrium is achieved between the working diaphragm and loading element (Spring) the resulting position of the restricting element will determine the outlet pressure. The spring is for fine adjusting low fire.



Order Information

GIKH	air/gas ratio regulator
1" (DN 25)	nominal diameter
T	T-product
N	NPT-internal thread
02	max. inlet pressure 3 psig (200 mbar)
-5	pressure test point at the outlet
L	only for air
B	Bypass screw

Designation	Order no.
GIKH 25TN02-5	03155194

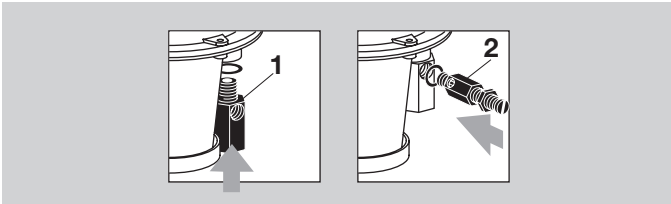
Trouble Shooting

Successful regulator troubleshooting depends on careful analysis and planning before taking action. Regulators are relatively simple devices with comparatively few faults. The most common faults are:

Low fire flow too high?

- Check for dirt at the valve seat or disc. These parts should be cleaned with suitable solvent.

Air control pressure too high?



- The maximum possible gas outlet pressure is lower than four times possible max. air differential pressure (air impulse line).
- Use a bleed orifice on positive air pressure connection. See figure.

Regulator is not responding?

- The working or compensating diaphragm could be broken. This could happen frequently if the material for the diaphragm is not suited for media used (special material for air), or if the regulator experience an over-pressure situation.

Maintenance

By carrying out a regular maintenance schedule, you can prevent problems from occurring. The regulator type and its service conditions will help you determine how often to conduct inspections. The more severe the working conditions, the more frequently you should examine the regulator.

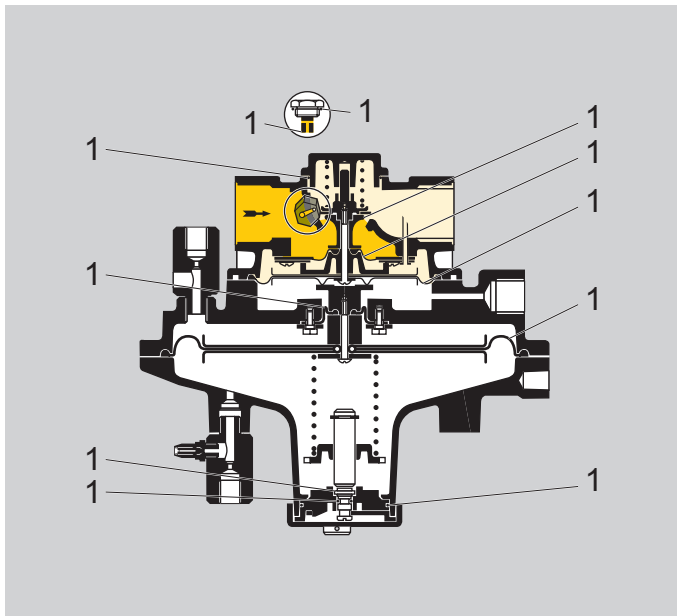
Generally, small, modern regulators can operate for considerable periods without attention, minimizing the need for periodic maintenance.

When a regulator is serviced, the following general procedure should be carried out.

- 1 Check that a shut off valve is located in the area of the regulator.
- 2 Try to ensure that there is a clear working area, and that you have somewhere to put the regulator components, once removed, so they will not be lost or damaged.
- 3 Always use the correct tools, in the proper sizes, to dismantle the regulator. Rough treatment can damage an otherwise useable component.
- 4 If available, follow the maintenance instructions issued by the manufacturer of the regulator.
- 4 Make careful note of the position of each component before removal to aid reassembly.
- 5 Take off the top cover and remove the loading spring.
- 6 Dismantle the regulator, removing the diaphragm(s) and valve.
- 7 Clean all parts of the body and casings.
- 8 Check the diaphragms and replace if necessary.
- 9 Clean the regulator valve. If it has a rubber seat, check

and replace if necessary.

- 10 Examine the orifice or valve seating. Check for burrs and replace if damaged or worn. Avoid the use of abrasives on valve or seats.
- 11 Valve spindles which run in guides should be lightly greased with a silicone grease (this should not be used when the unit is used on Oxygen). Any levers and fulcrums should work freely.
- 12 Reassemble the parts in reverse order.
- 13 When reassembling a ring of screws or bolts, tighten gradually and in opposing pairs.
- 14 Check the regulator for leakage.
- 15 Reset outlet pressure to the regulator.
- 16 Update maintenance records for the unit.



Spare parts

Spare part kit (1) contains the diaphragms and o-rings.

Type	For Gas	For Air
GIKH	03155195	03155196

Warning

Situations dangerous to personnel and property can result from the misapplication and incorrect operation of combustion equipment.

Kromschroder advises compliance with the National Fire Protection Association standards that apply for related equipment and Insurance Underwriters recommendation, and care of operation.

We reserve the right to make technical changes designed to improve our products without prior notice. For current product information, visit our website at www.kromschroder.com.

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