

# CONOFLOW DIFFERENTIAL PRESSURE REGULATORS GH21 and GDH21 Series

Conoflow's Differential Pressure Regulators are used to maintain a constant pressure differential across a variable or fixed orifice, providing a constant flow rate regardless of variations in upstream or downstream pressure. Various forms of differential pressure regulators are available.

The GH21XT maintains a fixed differential of 3 PSI (21 kPa) across the bonnet connection and the body outlet. Adjustment of the flow rate is made downstream of the system. These units are normally used with flow rate indicators having built in needle valves.

These units are available in brass/aluminum construction (GH21XTXM), all stainless steel (GH21XTXKXK, GH21XTXKXS) or all aluminum construction (GH26/27FXM). The GH21 Series has 1/4" NPT connections and is rated for a 200 PSI (1379 kPa) maximum supply pressure, 300 PSI (2068 kPa) for stainless steel models. The GH26XF has 3/8" NPT connections with the GH27XF having 1/2" NPT (Signal Port 1/4" NPT). Both units (GH26/27) are rated for 200 PSI (1379 kPa) maximum supply pressure.

The GH21F maintains a fixed differential of 3 PSI (21kPa) across the bonnet connection and the body outlet, plus an integral needle valve is provided to allow flow rate adjustment within the regulator. This unit is normally used with flow rate indicators without needle valves. Construction of this unit is brass. The maximum supply pressure rating is 200 PSI (1379 kPa). Connections are 1/4" NPT.

The GH21AT provides an adjustable differential pressure across the bonnet connection and body outlet within the limits of the regulator range. The flow rate is controlled by adjusting the range spring to vary the pressure drop across a fixed orifice instead of using a needle valve.

These units are available in brass (GH21ATXEXXX\_) or stainless steel (GH21ATXKXKX\_, GH21ATXKXSX\_) construction. The brass units have a maximum supply pressure rating of 200 PSI (1379) with the stainless steel units being rated at 300 PSI (2068 kPa). The body connections are 1/4" NPT with a 1/8" NPT signal port connection. Regulated ranges are 0-5, 15, 25, 35, 50 and 0-125 PSI (0-35, 103, 172, 241, 345 and 862 kPa).

The GH31XT provides a 3 PSI (21 kPa) upstream differential pressure across a needle valve or other orifice to maintain a constant flow rate independent of line pressure variations.

These units are also available in brass (GH31XTXM) or stainless steel (GH31XTXKXK, GH31XTXKXS) construction. Connections are 1/4" NPT and both are rated at a maximum supply pressure rating of 100 PSI (690 kPa).



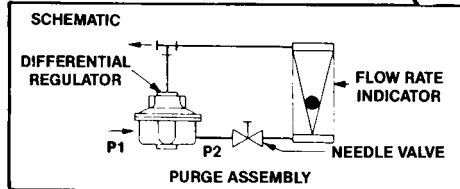
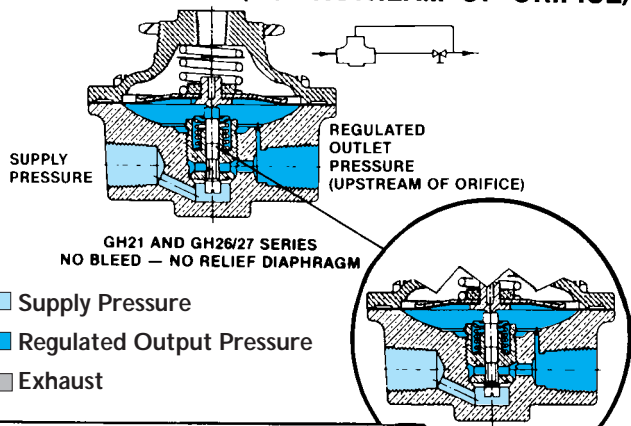
The brass or brass/aluminum combination units use Buna "N" diaphragms as standard with the stainless steel units having Teflon/Buna "N"/Teflon sandwich type diaphragms. Other diaphragm materials are available.

For purging systems using air, water or gas, the Conoflow GDH21 Differential Purge Assemblies are available. These units incorporate a GH21XT Regulator, needle valve and flow rate indicator, completely piped and ready for installation. A variety of ranges and styles of flow rate indicators is available. Refer to Charts 1 and 2 on Page 37.

## DIMENSIONAL DATA - ADVERTISING DRAWINGS:

GH21F: A17-17	GDH21 9 and 10: A13-7
GH21/31/41: A17-18	GDH21 7 and 8: A13-8
GH21AT: A17-19	GDH21 11 and 12: A13-9
GH26/27: A17-36	GDH214: A13-10
GDH21 1 and 2: A13-4	GDH213: A13-11
GDH21 5 and 6: A13-5	

## SIGNAL PRESSURE (DOWNSTREAM OF ORIFICE)



GH41XT SERIES  
NO BLEED - NO RELIEF  
SOFT SEAT NOZZLE

## PRINCIPLE OF OPERATION

The GH21XT, GH41XT and GH26/27XF are used to maintain a fixed differential pressure across a needle valve downstream from the regulator. The spring in the bonnet of the regulator exerts a force on the diaphragm assembly which requires approximately 3 PSI (21 kPa) underneath the diaphragm to balance with zero signal pressure. As signal pressure is applied to the bonnet connection, an increase in output pressure is required to keep the forces on the diaphragm assembly balanced. In equilibrium, the force due to the output pressure will be equal to the force from the spring plus the force due to the signal pressure. Since the spring force is equivalent to 3 PSI (21 kPa), the output pressure will always be a 3 PSI (21 kPa) *greater* than the signal pressure.

If the output pressure drops below the equilibrium point, there is a net downward force on the diaphragm assembly. This force causes the nozzle plug to open allowing supply pressure to flow downstream until the output pressure returns to its equilibrium value.

The operation of the GH41XT is the same as the GH21XT except that a molded rubber seat is provided on the nozzle plug for applications requiring positive shut-off. The GH26/27 models are not available with soft seat nozzles.

## PURGE ASSEMBLIES

Assembly consists of Conoflow Series GH21 Differential Regulators 3 PSI (21 kPa) fixed differential piped with metering device as listed. Needle valve for flow adjustment is integral with meter, except Model GDH21FR5 and 6; needle valve is integral with regulator.

CHART 1

MODEL	MOUNTING	RANGE*
GDH211	Line	20 to 200 cc/min. (Water)
GDH212	Line	0.25 to 2.5 SCFH
GDH213	Line	Sight Feed Bubbler
GDH214	Panel	Sight Feed Bubbler
GDH215	Line	25 to 250 cc/min. (Water)
GDH216	Line	0.1 to 2.0 SCFH
GDH217	Line	0.5 to 4.0 GPH
GDH218	Line	0.2 to 2.0 SCFH
GDH219	Panel	0.5 to 4.0 GPH
GDH2110	Panel	0.2 to 2.0 SCFH
GDH21FR5	Line	20 to 200 cc/min.
GDH21FR6	Line	0.1 to 2.0 SCFH
GDH2111	Line	0.4 to 4.0 GPH
GDH2112	Line	0.2 to 2.0 SCFH

\*For other ranges, consult factory

\*\*Maximum pressure rating is 50 PSIG

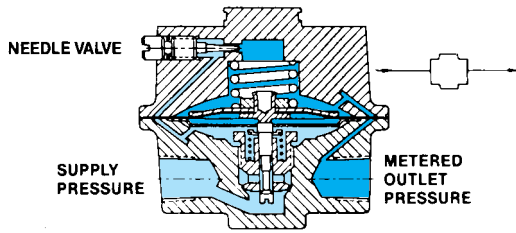
## STAINLESS STEEL PURGE ASSEMBLIES

(Wetted parts S.S. with Teflon diaphragm) (1)

CHART 2

GDH2113	Line	20 to 200 cc/min. (Water)
GDH2114	Line	0.2 to 2.0 SCFH
GDH2117	Line	25 to 250 cc/min. (Water)
GDH2118	Line	0.1 to 2.0 SCFH
GDH2119	Line	0.5 to 4.0 GPH
GDH2120	Line	0.2 to 2.0 SCFH
GDH2121	Panel	0.5 to 4.0 GPH
GDH2122	Panel	0.2 to 2.0 SCFH
GDH2123	Line	0.4 to 4.0 GPH
GDH2124	Line	0.2 to 2.0 SCFH

NOTE: 1. Maximum rating for flow meter is 100 PSI.

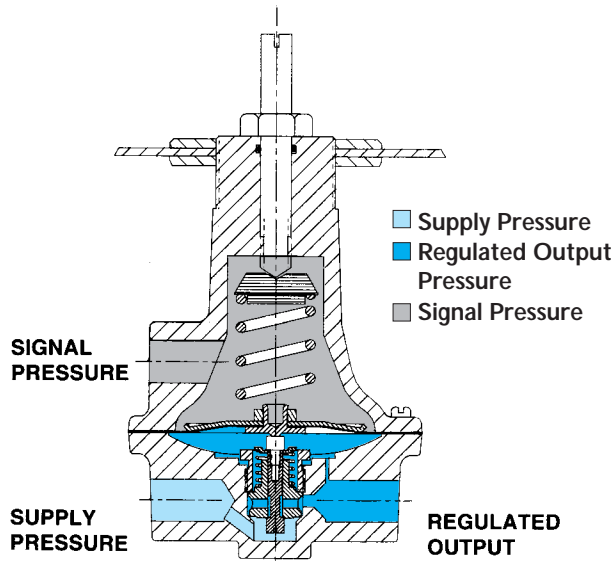


**GH21F**  
No Bleed - No Relief Diaphragm

- Supply Pressure
- Metered Outlet Pressure

## PRINCIPLE OF OPERATION

The GH21F maintains a 3 PSI (21kPa) differential pressure, but has an integral needle valve for flow rate adjustment.

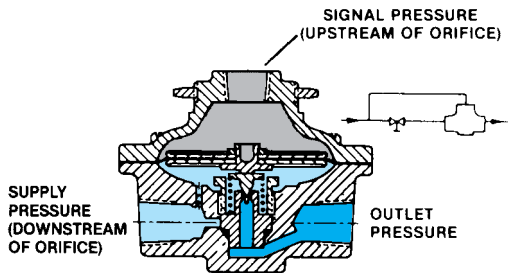


**GH21AT**  
No Bleed - No Relief Diaphragm

- Supply Pressure
- Regulated Output Pressure
- Signal Pressure

## PRINCIPLE OF OPERATION

The GH21AT is used to maintain a constant differential pressure across a needle valve downstream from the regulator. The spring in the bonnet of the regulator exerts a force on the diaphragm assembly which can be adjusted to provide the required differential. With zero signal pressure, the regulator output pressure will be equivalent to the force from the range spring. As signal pressure is applied to the bonnet connection, an increase in output pressure is required to keep the forces on the diaphragm assembly balanced. In equilibrium, the force due to the output pressure will be equal to the force from the spring plus the force due to the signal pressure. The output pressure will therefore always be *greater* than the signal pressure.



**GH31XT**  
No Bleed - No Relief Diaphragm

- Supply Pressure
- Output Pressure
- Signal Pressure

## PRINCIPLE OF OPERATION

The Conoflow Model GH31 regulator maintains a constant pressure differential across an external needle valve or other restriction, providing a constant flow rate, regardless of variations in upstream pressure. The pressure upstream of the needle valve is applied to the bonnet of the regulator and acts on the effective area of the diaphragm to create a downward force. This force is opposed by the pressure acting on the underside of the diaphragm and the compressed spring located under the plug which exerts an upward force equivalent to 3 PSI (21 kPa). Under operating conditions, the pressure downstream of the needle valve is always 3 PSI (21 kPa) less than the upstream pressure, thus the flow will remain constant for any setting of the needle valve.

### FLOW CAPACITY

	MINIMUM	MAXIMUM
Water	5cc/min.	100 cc/min.
Air	10 cc/min.	1000 cc/min.
Total Pressure Drop PSI (kPa)	2(14)	3(21)

# SPECIFICATIONS

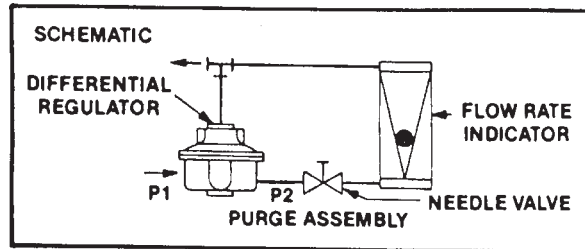
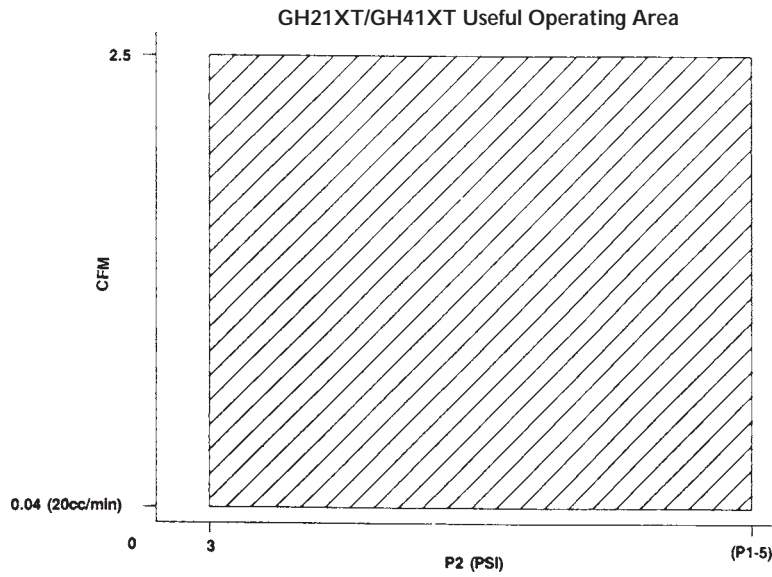
OPERATING CHARACTERISTICS	GH21XTXM GH41XTXM	GH21XTXKXK	GH21XTXKXS	GH26FXFM	GH27FXFM	GH21FXFM	GH21ATXMXXX*	GH21ATXKXKX*	GH21ATXKXSX*	GH31XTXM	GH31XTXKXK	GH31XTXKXS
Maximum Supply Pressure	200 PSI (1379 kPa)	300 PSI (2068 kPa)		200 PSI (1379 kPa)			300 PSI (2068 kPa)		100 PSI (690 kPa)			
Connections	1/4" NPT		3/8" NPT - 1/2" NPT 1/4" NPT Signal Port		1/4" NPT		1/4" NPT 1/8" NPT Signal Port		1/4" NPT			
Differential Pressure	3 PSI (21 kPa)			0-5, 0-15, 0-25, 0-35, 0-50 and 0-125 PSI 0-35, 0-103, 0-172, 0-241, 0-345 and 0-862 kPa)				3 PSI (21 kPa)				
Flow Capacity	Consult Factory											
Sensitivity	0.2 H <sub>2</sub> O (0.51 cm H <sub>2</sub> O)											
Ambient Temperature Range	-20°F to +150°F (-29°C to +66°C)											
Approx. Shipping Weight	1 lb. (0.45 Kg)	2 lbs. (0.91 Kg)	2 lbs. (0.91 Kg)	3 lbs. (1.36 Kg)	3 lbs. (1.36 Kg)	2 lbs. (0.91 Kg)	2.75 lbs. (1.25 Kg)	3 lbs. (1.36 Kg)	3 lbs. (1.36 Kg)	1.75 lbs. (0.79 Kg)	1.75 lbs. (0.79 Kg)	1.75 lbs. (0.79 Kg)

\*These units are adjustable differential models. Specify desired output pressure when ordering, refer to Page 40.

# MATERIALS OF CONSTRUCTION

Body	Brass	316 St. Stl.	316 St. Stl.	Aluminum	Aluminum	Brass	Brass	316 St. Stl.	316 St. Stl.	Brass	316 St. Stl.	316 St. Stl.
Bonnet	Aluminum	316 St. Stl.	316 St. Stl.	Aluminum	Aluminum	Brass	Brass	316 St. Stl.	316 St. Stl.	Aluminum	316 St. Stl.	316 St. Stl.
Diaphragm Assembly (1)	Buna "N"	Buna "N" Teflon Sandwich Type	Buna "N" Teflon Sandwich Type	Buna "N"	Buna "N"	Buna "N"	Buna "N"	Buna "N" Teflon Sandwich Type	Buna "N" Teflon Sandwich Type	Buna "N"	Buna "N" Teflon Sandwich Type	Buna "N" Teflon Sandwich Type
Nozzle Assembly	Brass Body St. Stl. Valve Plug GH41 Buna "N" Seat	302 St. Stl. 303 St. Stl.	316 St. Stl.	Brass Body St. Stl. Valve Plug	Brass Body St. Stl. Valve Plug	Brass Body St. Stl. Valve Plug	Brass Body St. Stl. Valve Plug	302 St. Stl. 303 St. Stl.	316 St. Stl. St. Cad. Pit.	Brass Body St. Stl. Valve Plug	302 St. Stl. 303 St. Stl.	316 St. Stl.
Range Spring	St. Cad. Pit.	St. Cad. Pit.	St. Cad. Pit.	St. Cad. Pit.	St. Cad. Pit.	St. Cad. Pit.	St. Cad. Pit.	St. Cad. Pit.	St. Cad. Pit.	St. Cad. Pit.	St. Cad. Pit.	St. Cad. Pit.

NOTE : 1. Other diaphragm materials are available, consult the factory. Note the only diaphragm selection for the GH26/27 Series is Buna "N".



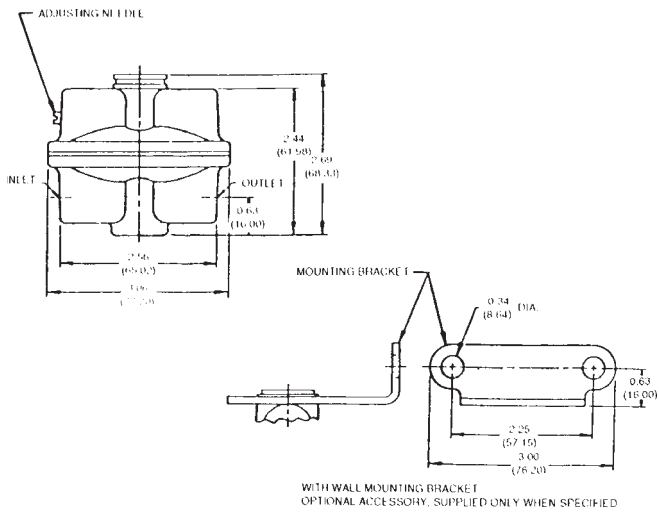
# CONTROL ENGINEERING DATA

Control Engineering Data is intended to provide a single source from which one can determine, in detail, the full scope of the product line. In addition to materials of construction and diaphragm selection, it also provides all necessary data, regarding adjustment options and range selections. Control Engineering Data also provides a means of communicating, by way of a code number, which is fully descriptive of the product selection.

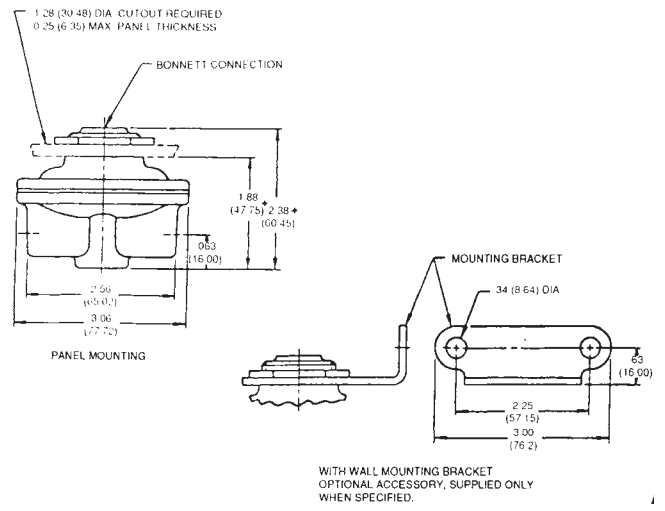
**NOTE: 1. Catalog numbers as received must contain twelve (12) characters.**

For Dimensional Data,  
Refer to Drawing:

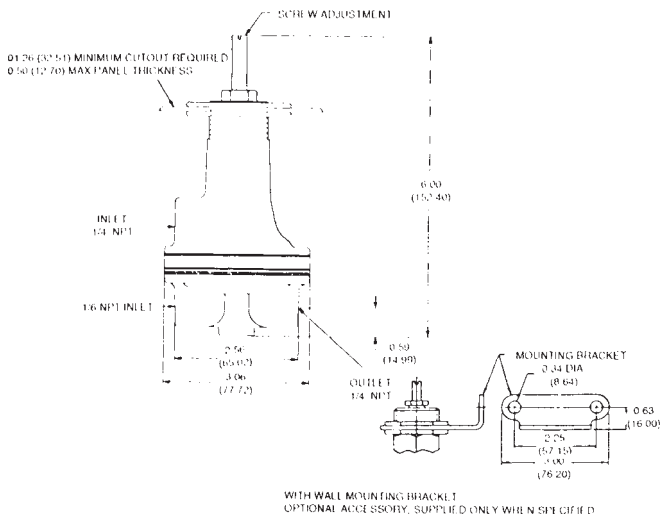
1-4 Models	<table border="0" style="width: 100%;"> <tr> <td style="width: 150px;">GH21 = Regulator - Differential</td> <td style="text-align: right;">A17-18</td> </tr> <tr> <td>GH26 = Regulator - Differential (3/8" NPT)</td> <td style="text-align: right;">A17-36</td> </tr> <tr> <td>GH27 = Regulator - Differential (1/2" NPT)</td> <td style="text-align: right;">A17-36</td> </tr> <tr> <td>GH31 = Regulator - Back Pressure - Differential</td> <td style="text-align: right;">A17-18</td> </tr> <tr> <td>GH41 = Regulator - Differential (Soft Seat)</td> <td style="text-align: right;">A17-18</td> </tr> </table>	GH21 = Regulator - Differential	A17-18	GH26 = Regulator - Differential (3/8" NPT)	A17-36	GH27 = Regulator - Differential (1/2" NPT)	A17-36	GH31 = Regulator - Back Pressure - Differential	A17-18	GH41 = Regulator - Differential (Soft Seat)	A17-18
GH21 = Regulator - Differential	A17-18										
GH26 = Regulator - Differential (3/8" NPT)	A17-36										
GH27 = Regulator - Differential (1/2" NPT)	A17-36										
GH31 = Regulator - Back Pressure - Differential	A17-18										
GH41 = Regulator - Differential (Soft Seat)	A17-18										
5 Operational Features	<p>A = Adjustable Differential (GH21/41 Only)          F = Flow Adjust (GH21 Only) -          X = Standard - Unless Option Code is Specified</p>										
6 Bonnet Options	<p>F = Tapped Bonnet for Flush Back Panel Mounting (Not Available on GH21F)  <b>NOTES: 1. This option is standard on the GH26 and GH27 (2 Hole).</b>          T = Threaded Bonnet - (Standard)          X = Standard for GH21F Series</p>										
7 Mounting Options	<p>R = Mounting Bracket ( GH21F Only)          X = Absence of Specification - Standard</p>										
8 Diaphragm Selections	<p>The catalog number(s) listed under each diaphragm option is the standard diaphragm used in that regulator. These options apply to all output ranges of that unit. For non-standard diaphragm price adders, refer to price list CP-5000.</p> <p>B = Silicone on Glass (No Bleed, No Relief) (See Note 1)          F = Viton on Nomex (No Bleed, No Relief) (See Note 1)          K = Teflon (Sandwich Type - No Bleed, No Relief)              GH21XTXKKK, GH21XTXKXS, GH21ATXKKX_, GH31XTXKKK and GH31XTXKXS          M = Buna "N" (No Bleed, No Relief)              GH21XTXM, GH41XTXM, GH21FXXM, GH21ATXMXXX_, GH26XFXM, GH27XFXM and GH31XTXM          N = Nordel on Nomex (EPDM) (No Bleed, No Relief) (See Note 1)          P = Neoprene (No Bleed, No Relief) (See Note 1)  <b>NOTES: 1. These options are not available on the GH26 and GH27 Series.</b></p>										
9 Seat Selections	<p>A = Buna "N"          B = Neoprene          C = Viton          D = Low Leak Nozzle w/Metal Seat GH21 - 20CC Air/Min.          F = Low Leak Nozzle w/Metal Seat GH21 - Less than 15CC Air/Min.          N = Nordel          X = Standard - Unless option code is specified</p> <p><b>NOTES: 1. All GH40 Models are standardly supplied with Buna "N" Soft Seats. If option B or C is required, specify accordingly. GH20 with soft seats are supplied as GH40.          2. Soft Seats cannot be supplied on the GH26 and GH27 Series.          3. Option "F" is not available in 316 Stainless Steel Construction.          4. For list price adders, refer to price list CP-5000.</b></p>										
10 Material Options	<p>K = Stainless Steel Construction (302/303 Stainless Steel Internals)          S = Stainless Steel Construction (316 Stainless Steel Internals)          X = Standard - Unless option code is specified.</p> <p><b>NOTES: 1. Options "K" and "S" are not available on the GH26 and GH27 Series.</b></p>										
11 Cleaning Options	<p>A = Cleaned for Oxygen Service          X = Standard - Unless option code is specified.</p>										
12 Range Selections	<p><b>These codes are applied to the GH21AT Series Regulator</b></p> <p>A = 0-5 PSI (0-35 kPa)          B = 0-15 PSI (0-103 kPa)          C = 0-25 PSI (0-172 kPa)          D = 0-35 PSI (0-241 kPa)          E = 0-50 PSI (0-345 kPa)          G = 0-125 PSI (0-862 kPa)</p>										



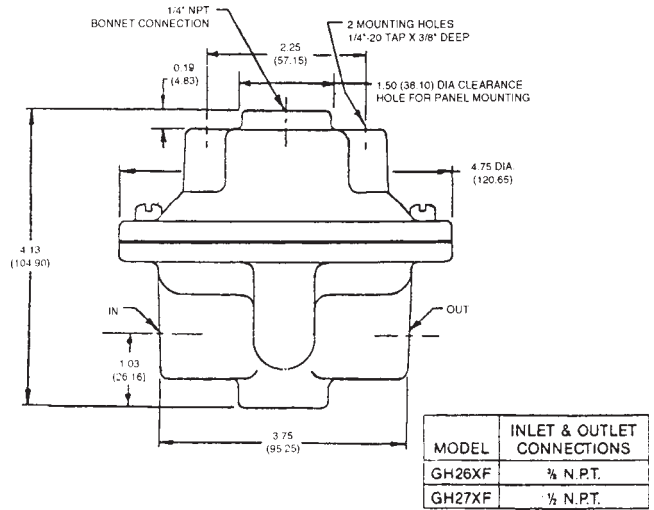
For Certified Dimensional Drawing, Refer to A17-17 (GH21F)



For Certified Dimensional Drawing, Refer to A17-18 (GH21/31/41)



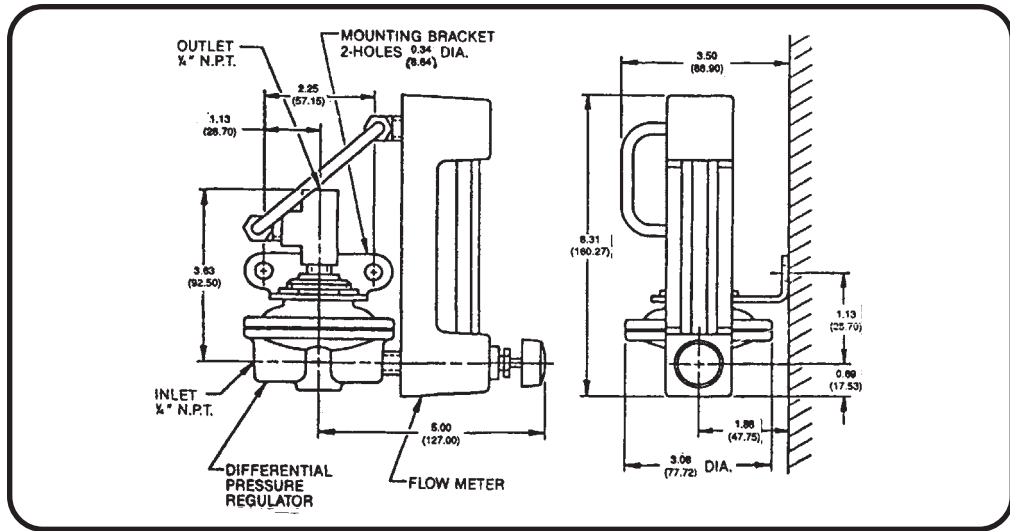
For Certified Dimensional Drawing, Refer to A17-19 (GH21AT)



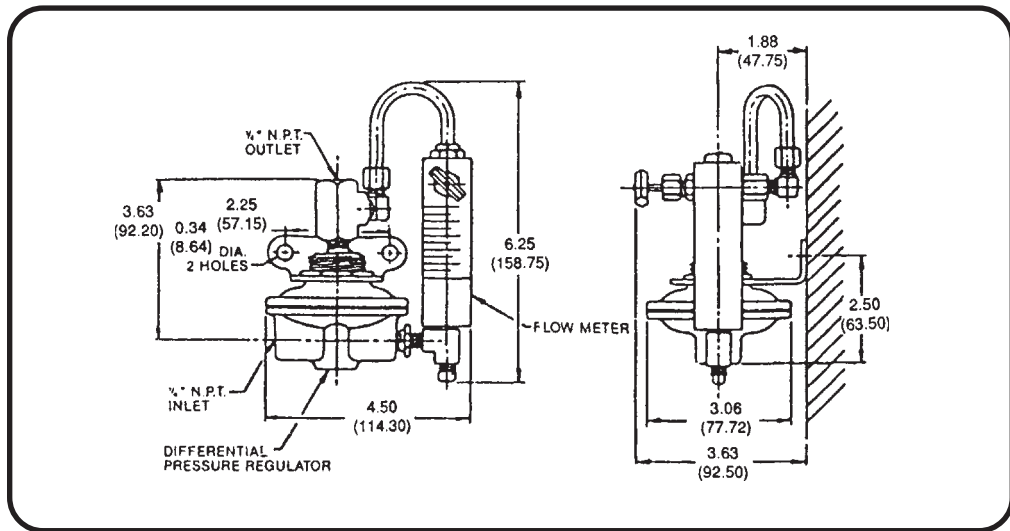
For Certified Dimensional Drawing, Refer to A17-36 (GH226/27)

MODEL	INLET & OUTLET CONNECTIONS
GH26XF	1/4 N.P.T.
GH27XF	1/2 N.P.T.

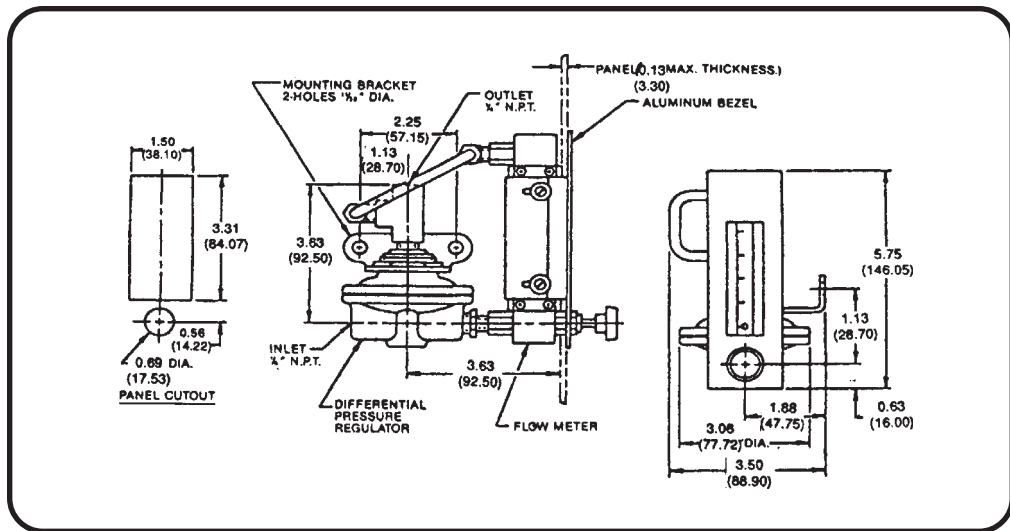
( ) DIMENSIONS IN MILLIMETERS



For Certified Dimensional Drawing, Refer to A13-4 (GDH211/212)

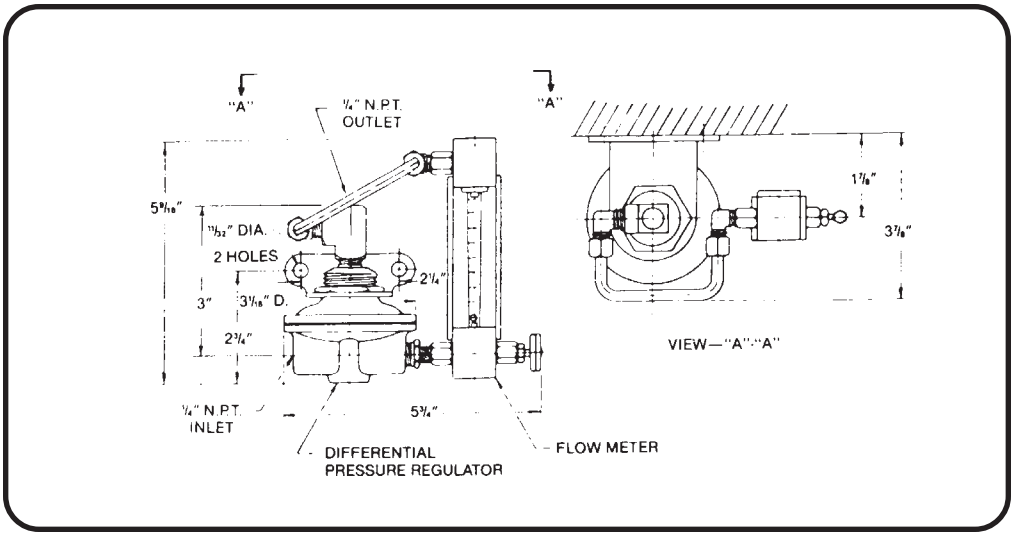


For Certified Dimensional Drawing, Refer to A13-5 (GDH215/216)

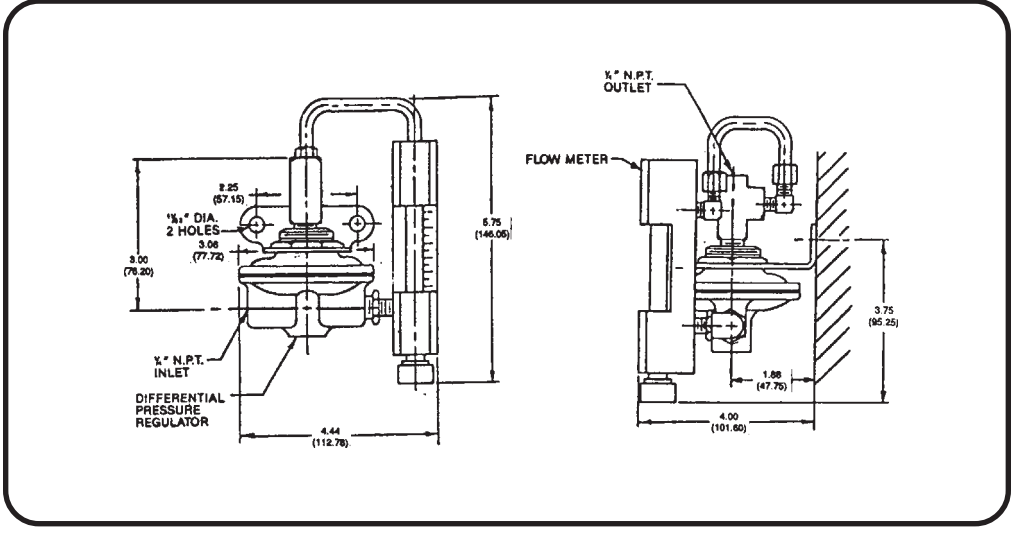


For Certified Dimensional Drawing, Refer to A13-7 (GDH219/2110)

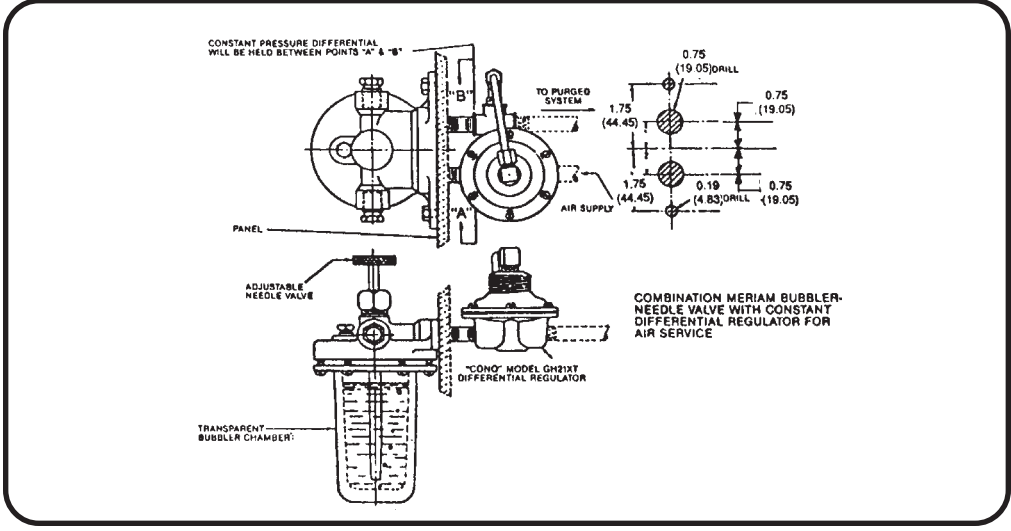
( ) Dimensions in Millimeters



For Certified Dimensional Drawing, Refer to A13-8 (GDH217/218)



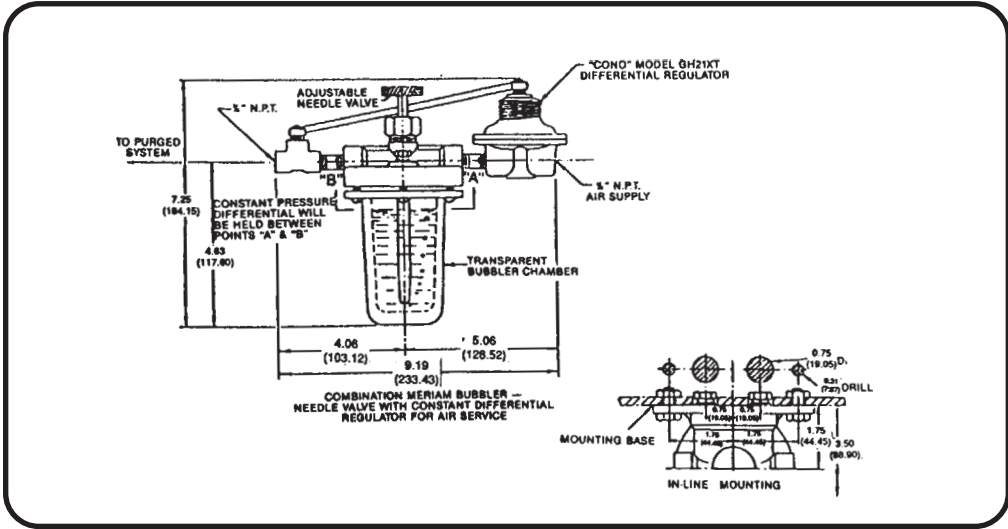
For Certified Dimensional Drawing, Refer to A13-9 (GDH2111/2112)



For Certified Dimensional Drawing, Refer to A13-10 (GDH214)

( ) Dimensions in Millimeters





For Certified Dimensional Drawing, Refer to A13-11 (GDH213)