An Ovivo Company

VAREC BIOGAS 440 Series
PRESSURE RELIEF AND FLAME TRAP ASSEMBLY

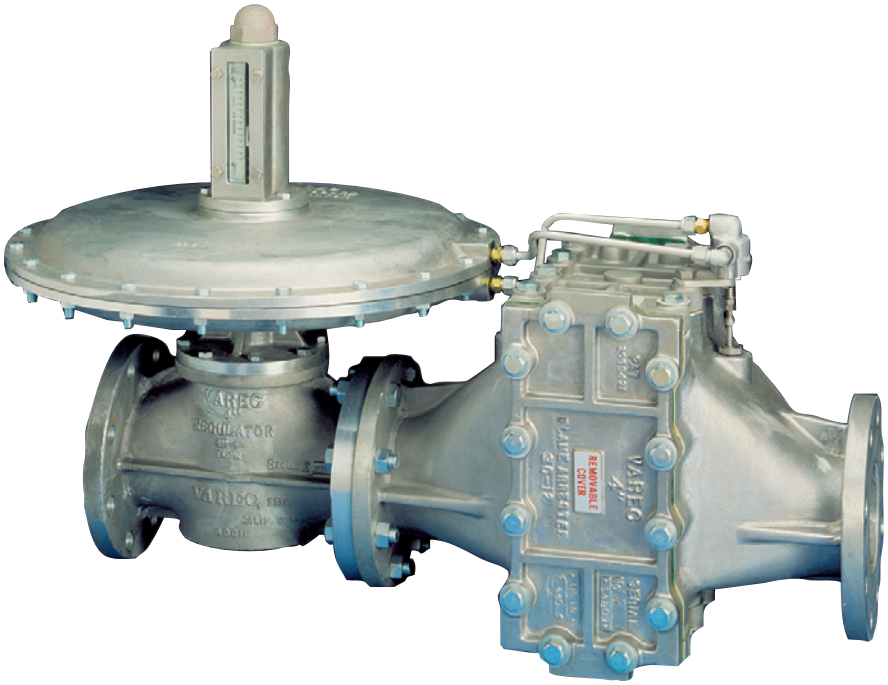
The 440 Series Pressure Relief Assembly is designed for use on relief lines to flares or other fired equipment.

Introduction

The Varec Biogas 440 Series Pressure Relief Assembly combines the 386 Series Back Pressure Relief Valve and the 5010 Series Flame Arrester with a thermal shut-off bypass valve integrated into the unit. The wide range of sizes allows use in many applications encountered in the typical tank farm, liquid storage facility or biogas control lines.

The Varec Biogas 440 Series is designed to control upstream pressure while protecting vapor recovery systems and waste gas piping systems from flashback fires. The assembly should be installed just upstream of a waste gas burner, in a horizontal section of pipe.

Flow curves are provided to assist you in selecting the proper size unit for your application requirements. In addition, Varec Biogas's applications engineering staff and factory-trained representatives are always available to assist you.



Operation

The diaphragm of the 440 Series constantly senses the upstream gas pressure. The back pressure valve will remain closed until the line pressure exceeds the set point, maintaining a predetermined back pressure throughout the system. When the pressure in the line exceeds the set point, the diaphragm will operate to open the valve, allowing flow. When the pressure in the line drops below the set point, the valve returns to the closed position.

While gas is flaring, the flame arrester and thermal by pass shut-off valve serve to inhibit a possible flashback of the flame into the gas piping.

If a flashback occurs downstream of the 440 assembly, the flame arrester prevents the propagation of flame by dissipating the heat, so that the temperature upstream of the unit remains below the ignition temperature of the gas.

Should the flame continue to burn, the fusible element in the thermal bypass shut-off valve will melt. This allows the pressure on the top and bottom of the diaphragm to equalize. The spring will then close the main valve, shutting off the gas supply and quenching the flame.

Design Features

- Large diaphragm for sensitive operation
- Spring loaded for easy adjustment
- Corrosion resistant low copper aluminum construction
- Easily adjustable setting for fine tuning in the field
- Unique design allows for cleaning of element
- Removable/ replaceable bank assembly without the use of jack screws
- Spring actuated thermal valve
- NPT drain plug available
- 3-Way Solenoid Valve option for added safety

Features

The 440 Series is designed for reliability and ease in maintenance. The thermal element is easily replaced, and the flame arrester bank assembly is uniquely designed for easy removal without requiring the use of jack screws or other mechanisms, which affect the piping stresses and renders maintenance difficulty. For details on the components of this assembly please refer to the data sheets for the 386 Series Back Pressure Regulator and 5010 Series Flame Arrester.

Optional Feature

A 3-Way Solenoid Valve can be installed in the 440 Series regulator (refer to dimensional drawing) to allow for quick opening and closing.

The back pressure regulator remains closed tight until a pilot flame on a waste gas burner is proven. The 3-Way Solenoid Valve maintains equal pressure on the relief valve diaphragm.

Upon confirmation of a pilot flame, the 3-Way Solenoid Valve is energized by an alarm contact or interposing relay in the waste gas burner control panel which then releases pressure from above the diaphragm and allows the regulator to open. When the 3-Way Solenoid Valve is de-energized, gas is relieved from the diaphragm, closing the regulator.

Specifications

Materials
Valve Body, Diaphragm Housing
356 T6 Cast Aluminum

Pallet Assembly
Low Copper Aluminum
304 SS Stem and Bushings

Diaphragm
BUNA-N with Nylon Reinforcement

Setting Spring
Zinc Plated Steel

Thermal Fuse
260 F Metal Aluminum
304 SS with BUNA-N “O”-Rings

Flame Arrester Housing
356 T6 Cast Aluminum

Flame Arrester Bank
Low Copper Aluminum Extensible Frame with Aluminum Bank Sheets

Low Copper Aluminum Extensible Frame with 316 SS Bank Sheets

Hardware
Zinc Plated (Standard)
Stainless Steel (Optional)

Flanged Connections
125 lbs. ANSI FF Flange

Pressure Rating
Leak Proof to 5 psi (34 kPa), Standard

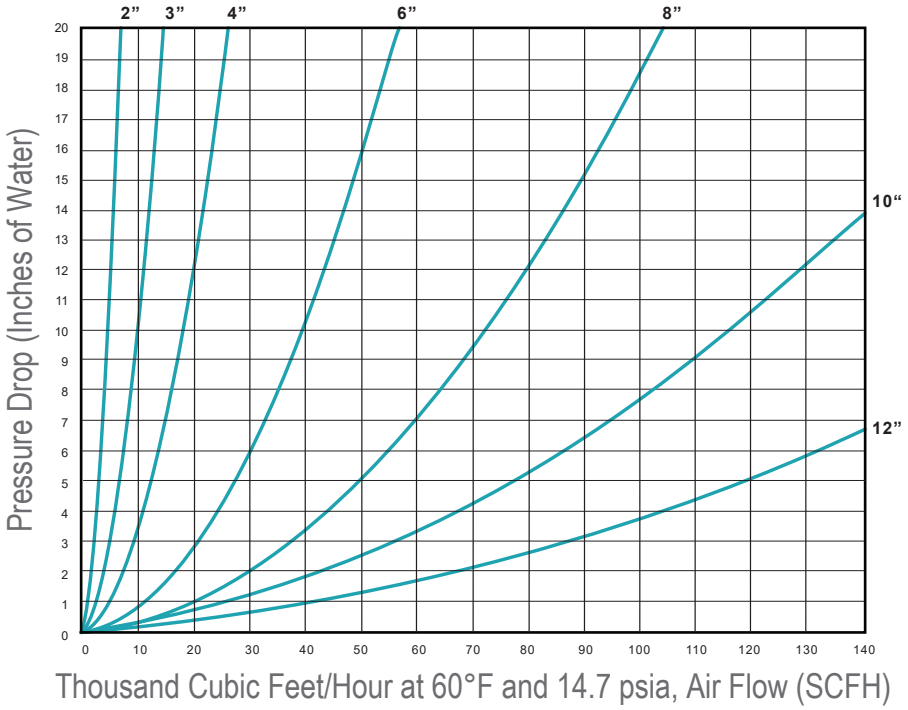
Flame Arrester Configuration
Net Free Area
Three to four times the corresponding size standard pipe.

Bank Assembly
Extensible bank frame with corrugated rectangular shaped bank Sheets.

Flame Arrester Configuration
$^1/_2$” NPT Connection

Location
Within 15 feet (4.6 m) of flame source

Flow Curves 440 SERIES



Specifications

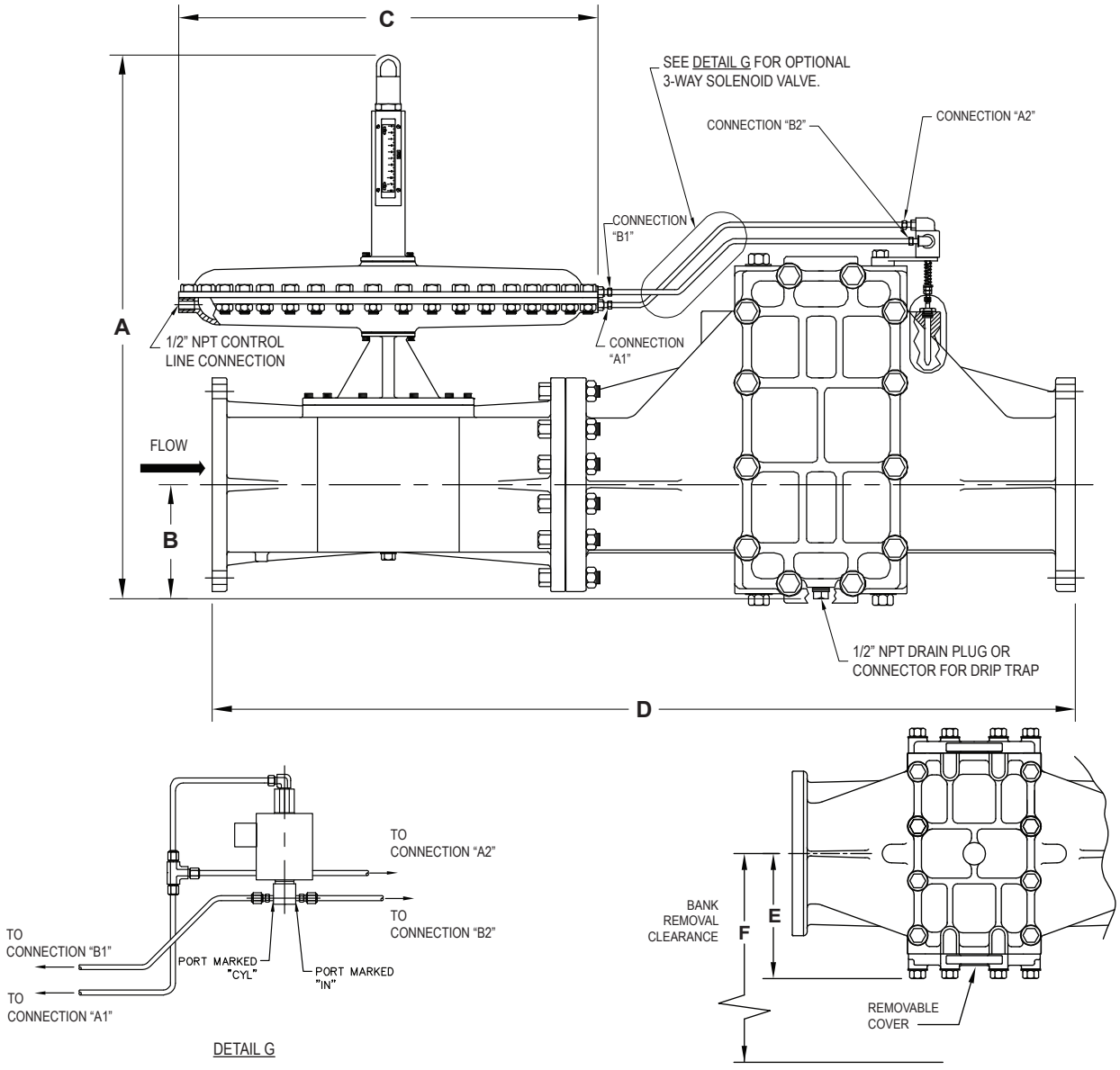
Dimensions and Weights, inches [mm] and lbs. (kg)

Size Code	02	03	04	06	08	10	12
Nominal Pipe Size	2 [50]	3 [75]	4 [100]	6 [150]	8 [200]	10 [250]	12 [300]
A	20 3/4 [527]	24 1/8 [613]	27 [686]	32 1/4 [819]	36 3/4 [933]	46 3/4 [1181]	50 5/8 [1286]
B	3 5/8 [92]	4 3/4 [114]	5 [127]	5 7/8 [149]	7 1/4 [184]	8 [203]	11 [279]
C	14 1/2 [368]	20 1/2 [521]	20 1/2 [521]	26 1/2 [673]	26 1/2 [673]	36 [914]	36 [914]
D[1]	23 1/4 [591]	26 [660]	31 3/8 [797]	39 3/8 [1000]	54 3/8 [1381]	63 1/4 [1607]	67 3/8 [1711]
E	4 5/16 [110]	5 5/8 [143]	7 [178]	8 1/4 [210]	10 3/4 [273]	11 7/8 [302]	14 1/2 [368]
F	19 [476]	23 1/4 [591]	28 1/8 [715]	31 1/8 [790]	38 5/8 [981]	41 5/8 [1057]	50 [1270]
Shipping Weight	65 (30)	95 (43)	120 (54)	210 (95)	420 (191)	520 (236)	775 (352)

Setting Range in WC, inches [mm]

Size	Standard	High Set
2”	2 - 12 [50 - 300]	3 - 25 [75 - 625]
3”	2 - 12 [50 - 300]	2 - 16 [50 - 400]
4”	2 - 12 [50 - 300]	2 - 16 [50 - 400]
6”	2 - 12 [50 - 300]	10 - 20 [250 - 500]
8”	2 - 12 [50 - 300]	10 - 20 [250 - 500]
10”	2 - 7 [50 - 175]	7 - 15 [175 - 350]
12”	2 - 7 [50 - 175]	7 - 15 [175 - 350]

NOTE 1: (±)1/4”



Ordering Information

Model	Description
440	Pressure Relief and Flame Trap Assembly

Code	Size	Standard Set Range [1]	High Set Range [1]
02	2”	2” - 12” (50 - 300mm) WC	3” - 25” (75 - 625mm) WC
03	3”	2” - 12” (50 - 300mm) WC	2” - 16” (50 - 400mm) WC
04	4”	2” - 12” (50 - 300mm) WC	2” - 16” (50 - 400mm) WC
06	6”	2” - 12” (50 - 300mm) WC	10” - 20” (250 - 500mm) WC
08	8”	2” - 12” (50 - 300mm) WC	10” - 20” (250 - 500mm) WC
10	10”	2” - 7” (50 - 175mm) WC	7” - 15” (175 - 350mm) WC
12	12”	2” - 7” (50 - 175mm) WC	7” - 15” (175 - 350mm) WC

Code	Pressure Setting Range [1]
1	Standard Set Range (See Table Above)
2	High Set (See Table Above)

Code	Flame Arrester Material
1	Aluminum
2	Aluminum, 316 SS Sheets

Code	Hardware Material
Z	Zinc
S	Stainless Steel

Code	Solenoid Valve Option
1	Not Required
2	110 VAC/ 50 Hz, 120 VAC/ 60 Hz
3	220 VAC/ 50 Hz, 240 VAC/ 60 Hz
4	Special - Specify with Purchase Order

440	02	1	1	S	2	(Example)

Example: 440 Series Pressure Relief and Flame Trap Assembly, 2” Size, Standard Setting, Aluminum Sheets, Stainless Steel Hardware, Solenoid Valve Included.
NOTE: 1 - Consult factory for special setting or variations in setting range requirements.