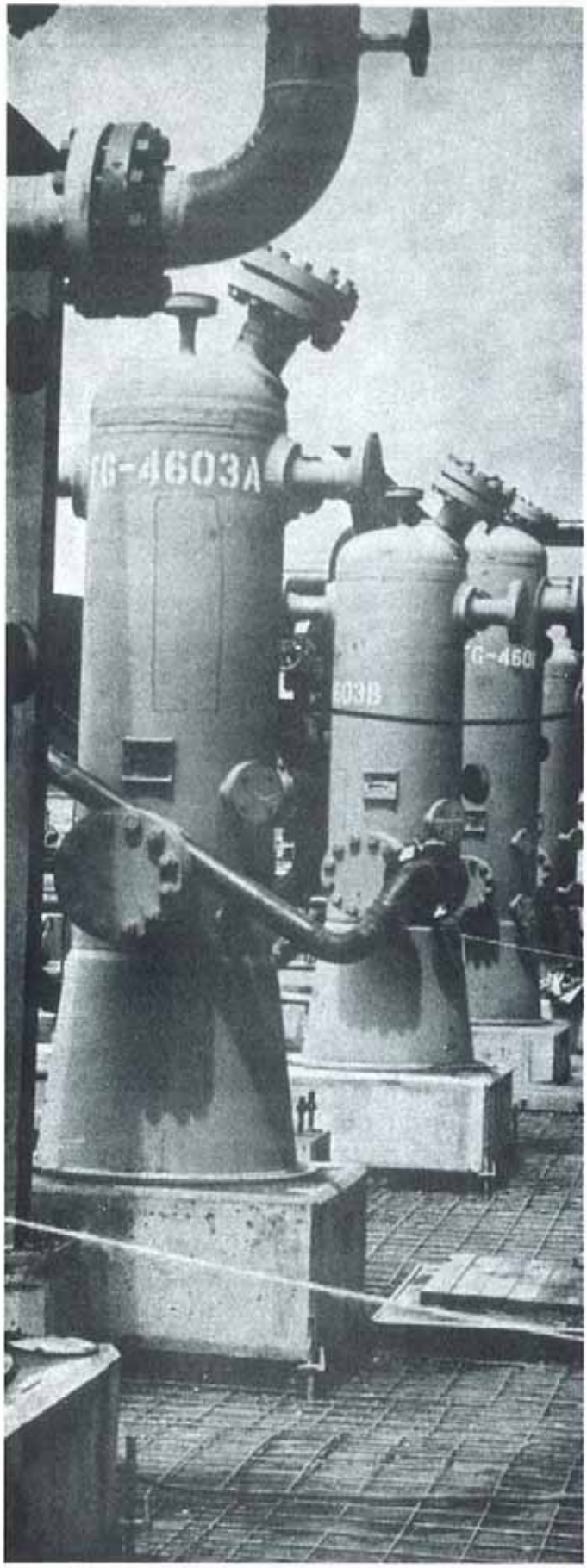


Burgess-Manning Vertical Gas Separators

BULLETIN 3100

Applications

The Burgess-Manning vertical gas separators are used in a variety of applications and are recommended for:

- Critical applications where high efficiency is essential such as removal of acids where small carryover will cause corrosion problems.
- The removal of light and/or low surface tension liquids where small carryover may cause catalyst poisoning or low product yield.
- The removal of large amounts of liquids from the gas streams where the liquid to gas ratio is greater than 5% by weight.
- Removal of viscous or sticky liquid, or when high turndown from the gas flow design point is required.
- Steam service, for the removal of condensate and lubricating oil.
- The chemical and petrochemical industries for the recovery of product and for pollution control.

BACKGROUND AND DESCRIPTION

Introduction

Burgess-Manning vertical gas separators are designed for the removal of large amounts of liquids, and will effectively arrest liquid slugs. It is a two stage separator consisting of a settling chamber and distilling baffles at the first stage, and the Burgess-Manning hookless vane element at the second stage.

The Burgess-Manning vane element is designed for maximum performance at low pressure drop. It consists of a patented aerodynamic flow concept which eliminates hooks extending into the flow stream by utilizing troughs which are flush with the side of walls of the vane plates. These troughs provide a high liquid removal capacity and positive isolation of the separated liquid.

Principle of operation

Burgess-Manning vanes consist of a labyrinth formed by parallel plates with side troughs for the collection of liquid residue. A high liquid to gas ratio two phase flow can be considered as a liquid saturated with gas system. As such small gas bubbles are entrained in the liquid, these bubbles must be released. If a high liquid/gas separation is desired, it is essential that adequate primary separation be provided so that the separating element is not overloaded.

The first step in primary separation is to control the momentum of these fluids. The Burgess-Manning vertical gas separator uses an inlet baffle which induces a weak centrifugal action which moves the liquid to the vessel wall while at the same time breaking out the gas bubbles. The liquid will flow downward where its momentum is reduced by a series of baffles which minimize splashing of the liquid while releasing the vapor into a low velocity chamber. This chamber is formed by a secondary row of baffles that causes a small flow resistance across them, aiding in the distribution of the gas across the entire vessel area and keeps the liquid quiescent. While the bulk of the liquid is removed the vapor will continue to carry small liquid droplets which cannot reach terminal velocity within the vessel.

The second stage Burgess-Manning hookless vane, which is located at the outlet of the separator and several feet above the liquid level, will remove the small droplets remaining in the gas stream.

This element consists of a series of parallel plates with side troughs for the collection of the liquid residue. See Fig. 1. The liquid-laden vapor approaching the vane plates are forced to change direction several times, with some degree of centrifugal action introduced as the change occurs. The heavier liquid droplets are then thrown against the wetted walls, converting the droplets to sheet flow. Coalescence of small particles is accomplished by two mechanisms — agitation and surface contact (the vane surface is wet and small particles striking it are absorbed). The agglomerated liquid then travels to the troughs which are perpendicular to the flow of the gas and from there is drained into the sump.

Efficiency

Burgess-Manning vertical gas separators are designed to perform at high efficiency while operating at a wide range of flows, and liquid loads will effectively arrest slugs and droplets as small as 5 microns. Efficiency is influenced by particle size distribution and liquid loading. See Figures 2 & 3 for typical performance.

When particle size is below 5 microns an agglomerator or coalescer may be installed. This element is an integral part of the separator and will remove up to 99.5% of particles 1 micron and larger.

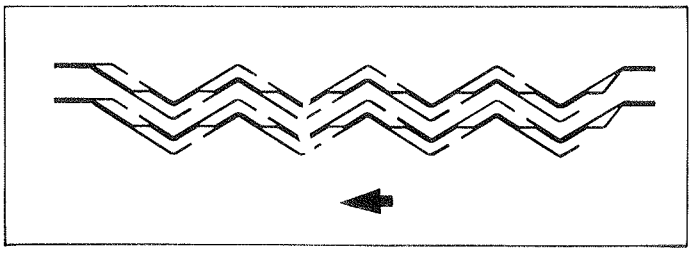


FIG. 1

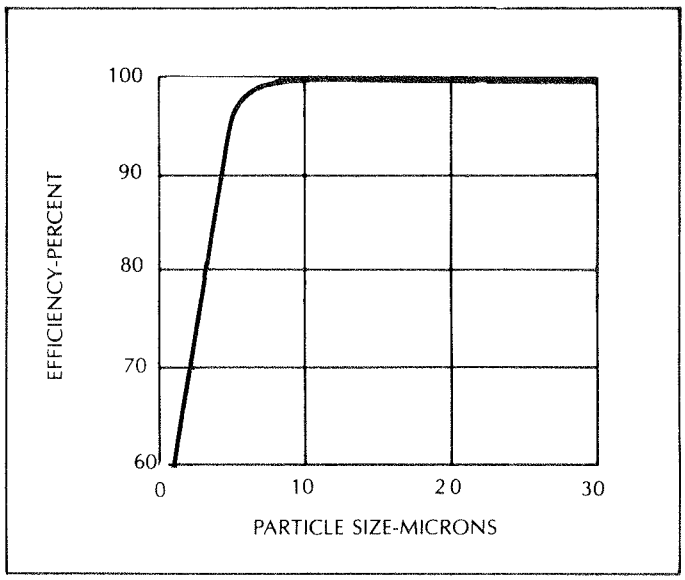


FIG. 2 Efficiency vs Particle Size

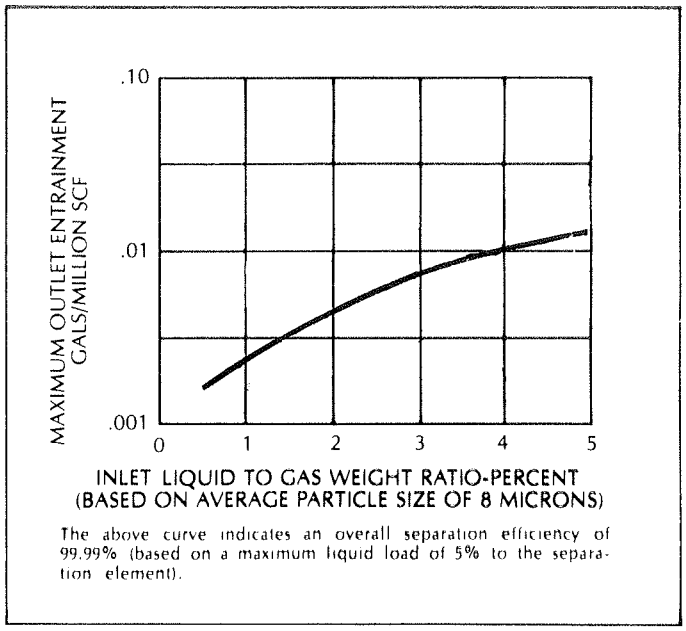
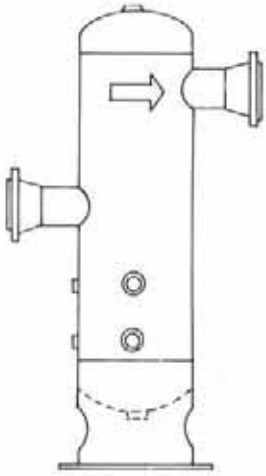


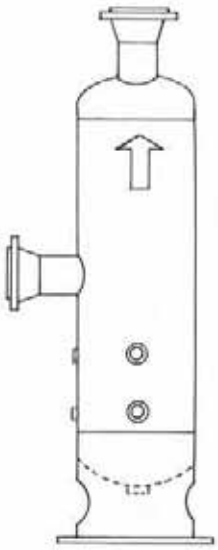
FIG. 3 Effluent vs Inlet Liquid Load

STANDARD CONFIGURATIONS

Burgess-Manning vertical gas separators are available in standard in-line (inlet & outlet 180° apart) configuration or side inlet top outlet as shown below. Other orientations may be used to fit piping arrangements.



VGS



ASTV

GENERAL SPECIFICATIONS

Construction and Materials

All Burgess-Manning separators are built in accordance with the ASME Code for unfired Pressure Vessels. National Board Stamp and Local, State and Province requirements as specified. Four (4) copies of complete Manufacturers Data Reports or one (1) copy and one reproducible will be furnished with each Vessel. Additional copies will be furnished at nominal cost.

"Design Pressures" separators, exclusive of flanges, are rated for a Design Temperature of -20°F to +650°F. Standard flanged units are furnished with ANSI B16.5 flanges which are rated for the Design Pressure at 100°F temperature. Refer to ANSI B16.5 Standard Flange Pressure Temperature rating.

Standard separators are of welded carbon steel bodies with either carbon steel or stainless steel separating elements.

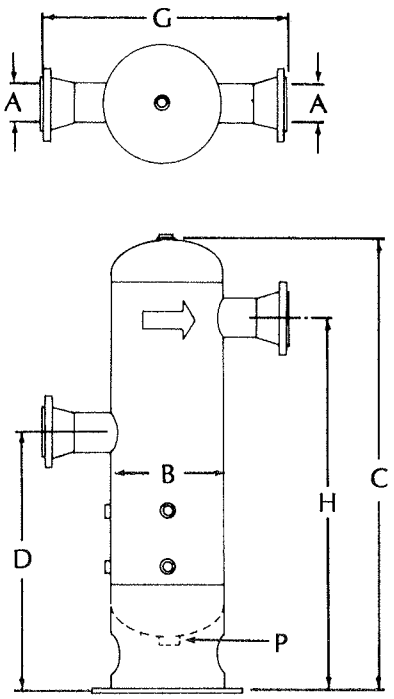
Custom Design Separators can be built from stainless steel, aluminum, monel and any other steel alloys, as well as other Codes such as ASME Section VIII Div. 2 for pressure up to 10,000 psig.

Consult your local Burgess-Manning representative for specifications and dimensions of separators.

Specify configuration type when ordering.

BURGESS-MANNING
Burgess-Manning, Inc.
Subsidiary of Niatram Energy, Inc.
227 Thorn Avenue
Orchard Park, New York 14127-2682
(716) 662-6540 Fax (716) 662-6548
www.burgess-manning.com

BURGESS-MANNING, INC./227 THORN AVENUE/ORCHARD PARK, NEW YORK 14127/716-662-6540/FAX: 716-662-6548/www.burgess-manning.com



VGS

Catalog Number	Dimensions in Inches							Est. Wgt. Lbs. Design Press. PSIG			
	A	B	C	D	G	H	P	275	500	720	1000
VGS-2	2	10¾	73	43	24	63	1½	265	367	353	433
VGS-3	3	12¾	79	44	24	67	1½	467	488	591	605
VGS-4	4	16	87	45	30	73	2	806	765	1004	1185
VGS-6	6	20	90	46	36	73	2	945	1216	1636	1967
VGS-8	8	24	99	48	44	79	2	1431	1665	2472	3170
VGS-10	10	30	113	51	50	88	2	2088	2375	3249	4151
VGS-12	12	36	120	53	56	94	2	2808	3658	4608	6328

Flanges 4" and smaller are welding neck type and 6" and larger are slip-on.

FLANGE RATING: 275 PSIG SERIES — 150 lb. R.F. / 500 and 720 PSIG SERIES — 300 lb. R.F. / 1000 PSIG SERIES — 600 lb. R.F. Design temperatures are in accordance with ASA B16.5 for flanges specified. Other vessel configurations and larger units are available upon request. Specifications are subject to change without notice.