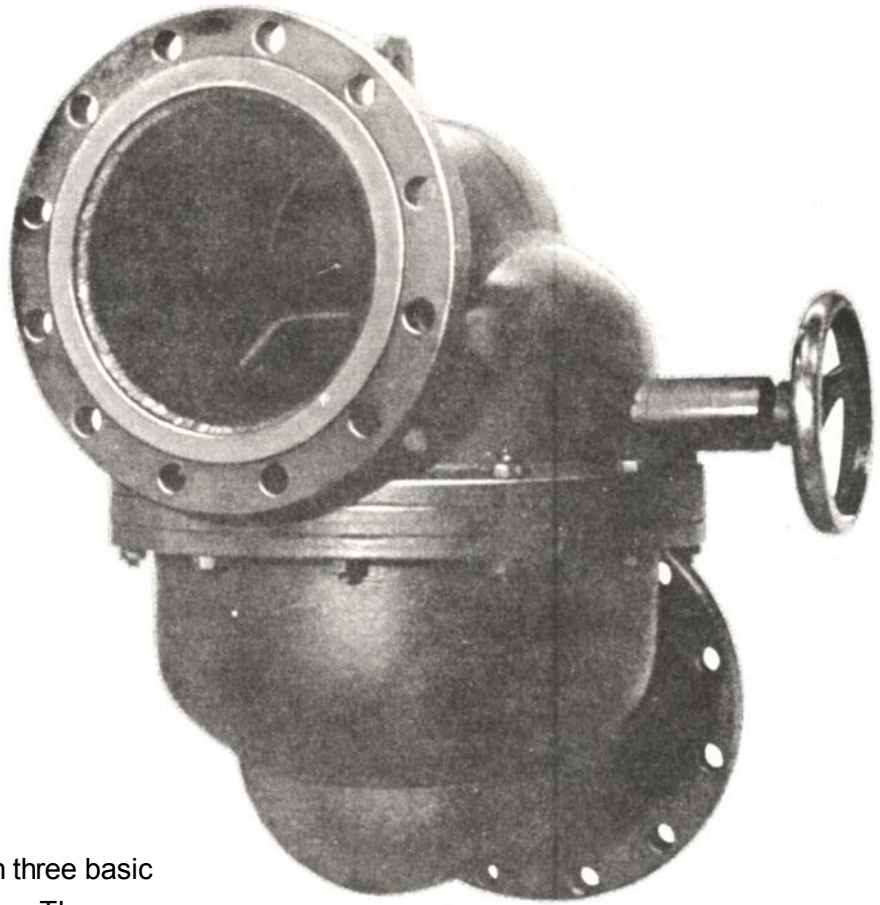


GRAHAM
ENGINEERING ANSWERS



RELIEF VALVES

FOR CONDENSER SERVICE



General Description

Graham Viking Valves are produced in three basic designs: Horizontal, Vertical and Angle. The Horizontal and Angle valves are available with various angular relationships between the inlet and outlet flanges to facilitate piping. Fabrication is achieved by welding procedures and welders qualified to Section IX of the ASME Boiler and Pressure Vessel Code. All valves are tested to ASA standards and are vacuum tight; all valves also receive in-process inspection as well as inspection prior to shipment to assure proper operation at the site.

UNIVERSAL VALVE CLOSURE

Specifically designed for condenser service, Graham Viking Valves feature a universal valve closure. This novel design permits us to offer high performance characteristics at lower costs and – most important – with less lead time from receipt of your order to delivery at your job site, ready for inspection.

DESIGNED FOR LONG TROUBLE-FREE SERVICE

Viking Valves are designed and built with uncompromising quality so that they can be installed with complete assurance that they are equal to any emergency. Seating surfaces are stainless steel with “O” ring seal or stainless metal-to-metal. Bronze, Monel or other special alloys may be specified, depending upon corrosion problems.

In operation, the valve remains tight under full vacuum and opens automatically above atmospheric pressure. After releasing excess pressure, the valve will reseal itself and remain tight.

To provide faultless operation, all moving parts are machined to close tolerances and are designed with adequate guidance. Graham valves are also designed to provide a water seal around the valve disc if desired.

OFF-THE-SHELF AVAILABILITY

Graham Viking Valves are available in standard sizes from 4” to 36”, with larger sizes available on request. Standard construction features ASA standard flanges and drilling, steel construction, and stainless steel trim. Special materials of construction are available for unusual services. The 6”, 8”, 10”, and 12” valves are available off the shelf. Larger sizes – 14”, 16”, 18”, and 20” valves are available for delivery on short notice. The 4” valve, and the larger sizes – up to 36” or more – are available for delivery within six weeks.



Horizontal unit with top removed exposes valve seal and seat facing. Handwheel, integral with top section, activates lift mechanism.

HOW TO SELECT PROPER SIZE

The table below indicates the correct valve size based on the throughput of steam. These recommendations are based on the Standards for the Heat Exchanger Institute.

SIZE SELECTION GUIDE

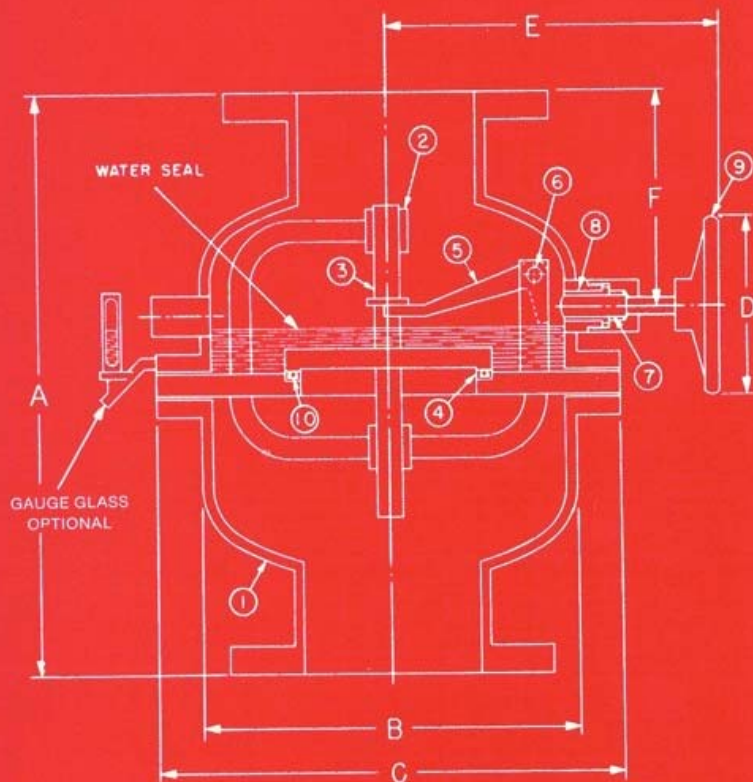
Size	Maximum Relief Flow (pounds per hour)*
6	7,500
8	20,000
10	30,000
12	45,000
14	62,000
16	82,000
18	120,000
20	170,000
24	250,000
30	380,000
36	550,000

Sizes with flows listed are for reference only**

*If it is desired to operate the turbine temporarily non-condensing at its maximum non-condensing capacity, it is suggested that in lieu of an atmospheric relief valve being sized for this flow, a relief valve for protection be provided and a separate gate or butterfly valve be provided for additional flow for non-condensing operation.

The above ratings are applicable to surface condenser service. For ratings of the 4” and 5” size valves, and for applying the above valves to other relief applications, consult your Graham Sales Representative.

VERTICAL RELIEF VALVE



LIST OF MATERIALS		
NO	DESCRIPTION	MATERIAL
1	BODY	STEEL
2	GUIDE BUSHING	ST. STEEL
3	SEAL SHAFT	ST. STEEL
4	SEAL & SEAT FACING	ST. STEEL
5	LIFT LEVER	STEEL
6	PIN	ST. STEEL
7	LIFT SHAFT	ST. STEEL
8	SHAFT BUSHING	TEFLON
9	HANDWHEEL	ALUM.
10	"O" RING SEAL	BUNA "N"
11	SEAL DISC	STEEL
12	BEARING PLATE	STEEL
13	GUIDE BARS	STEEL
14	GASKETS	COMP. ASB.

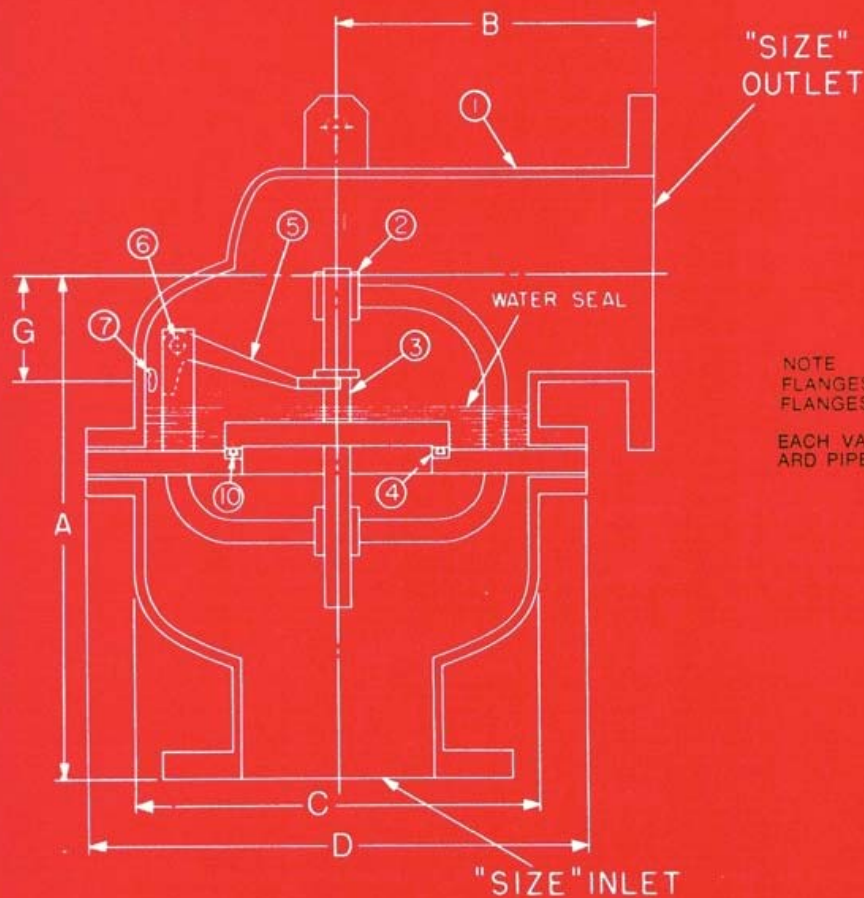
NOTE:
FLANGES ON 4" THRU 14" VALVES ARE 150° A.S.A. (F.F.)
FLANGES ON 16" THRU 36" VALVES ARE 125° LIGHT WT.

EACH VALVE HAS TWO GASKETS, BOTH ARE ASA STANDARD PIPE FLANGE GASKETS OF THE NOMINAL BODY SIZE.

TABLE OF DIMENSIONS ALL IN INCHES									
SIZE	A	B	C	D	E	F	J	K	EST. WT. LBS.
4	16 7/8	10 3/4	13 3/4	6	10 1/4	5 7/8	3/4	3/8	140
5	17 7/8	10 3/4	13 3/4	6	10 1/4	6 1/4	3/4	3/8	150
6	19 1/2	12 3/4	15 3/4	6	11 1/4	7 3/8	3/4	3/8	190
8	22 1/4	16	19	8	15 3/4	8 3/8	3/4	3/8	290
10	25 1/8	18	21	8	16 3/4	9 1/8	3/4	3/8	390
12	28 1/4	20	23 1/4	8	17 3/4	10 1/8	3/4	3/8	560
14	30 3/8	24	27 1/2	8	19 3/4	11 1/8	3/4	3/8	760
16	29 3/4	24	27 1/2	8	19 3/4	11 1/8	3/4	3/8	700
18	39 1/2	28	31 1/2	10	24 1/4	15 1/8	3/4	3/8	820
20	39 1/4	28	31 1/2	10	24 1/4	15 1/8	3/4	3/8	970
24	43 3/8	32	35 1/2	10	26 1/4	16 1/8	1	1/2	1320
30	51	40	43 3/4	10	30 3/4	19 3/8	1	1/2	2050
36	59 3/8	48	51 3/4	10	34 1/4	23 1/8	1	1/2	3130

J: PIPE THREAD-OVERFLOW CONNECTION
K: PIPE THREAD-WATER SEAL CONNECTION

ANGLE RELIEF VALVE



LIST OF MATERIALS		
NO	DESCRIPTION	MATERIAL
1	BODY	STEEL
2	GUIDE BUSHING	ST. STEEL
3	SEAL SHAFT	ST. STEEL
4	SEAL & SEAT FACING	ST. STEEL
5	LIFT LEVER	STEEL
6	PIN	ST. STEEL
7	LIFT SHAFT	ST. STEEL
8	SHAFT BUSHING	TEFLON
9	HANDWHEEL	ALUM.
10	"O" RING SEAL	BUNA "N"
11	SEAL DISC	STEEL
12	BEARING PLATE	STEEL
13	GUIDE BARS	STEEL
14	GASKETS	COMP. ASB.

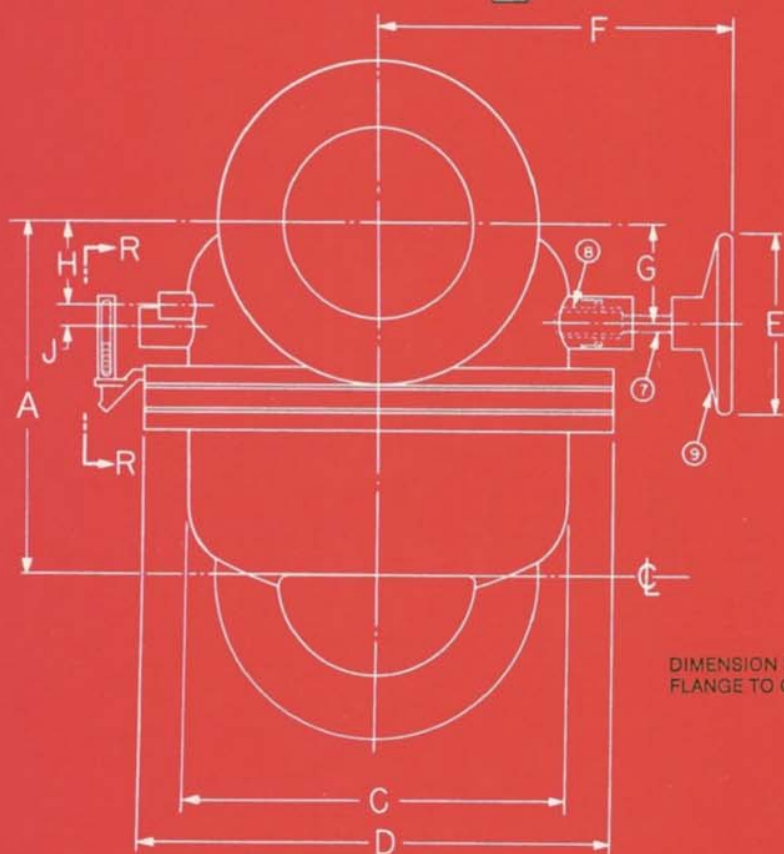
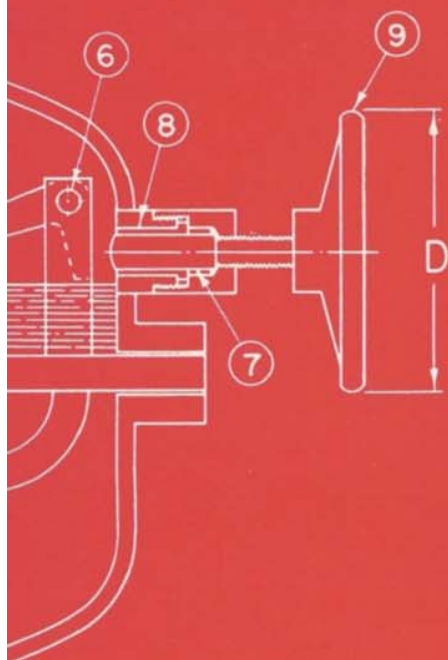
NOTE:
FLANGES ON 4" THRU 14" VALVES ARE 150° A.S.A. (F.F.)
FLANGES ON 16" THRU 36" VALVES ARE 125° LIGHT WT.

EACH VALVE HAS TWO GASKETS, BOTH ARE ASA STANDARD PIPE FLANGE GASKETS OF THE NOMINAL BODY SIZE.

TABLE OF DIMENSIONS ALL IN INCHES									
SIZE	A	B	C	D	G	K	L	EST. WT. LBS.	
4	13 3/8	8 3/4	10 3/4	13 3/4	2 3/8	3/4	3/8	145	
5	13 3/4	8 3/4	10 3/4	13 3/4	2 3/8	3/4	3/8	155	
6	15 3/8	10	12 3/4	15 3/4	3 1/4	3/4	3/8	210	
8	17 7/8	11 3/4	16	19	3 3/8	3/4	3/8	320	
10	21 1/4	13	18	21	5 3/8	3/4	3/8	420	
12	23 3/8	14 1/4	20	23 1/2	5 3/8	3/4	3/8	600	
14	25 3/8	17	24	27 1/2	5 3/8	3/4	3/8	805	
16	25 3/8	17	24	27 1/2	6 3/8	3/4	3/8	760	
18	33 3/8	18 1/2	28	31 1/2	9 3/8	3/4	3/8	890	
20	32 3/8	18 1/2	28	31 1/2	8 3/8	3/4	3/8	1080	
24	37 3/8	21	32	35 1/2	10 3/8	1	1/2	1450	
30	44 3/8	25	40	43 3/4	13 3/8	1	1/2	2280	
36	52 3/8	30	48	51 3/4	16 3/8	1	1/2	3500	

K: PIPE THREAD-OVERFLOW CONNECTION
L: PIPE THREAD-WATER SEAL CONNECTION

HORIZONTAL RELIEF VALVE



DIMENSION B IS
FLANGE TO C

LIST OF MATERIALS

NO	DESCRIPTION	MATERIAL
1	BODY	STEEL
2	GUIDE BUSHING	ST. STEEL
3	SEAL SHAFT	ST. STEEL
4	SEAL & SEAT FACING	ST. STEEL
5	LIFT LEVER	STEEL
6	PIN	ST. STEEL
7	LIFT SHAFT	ST. STEEL
8	SHAFT BUSHING	TEFLON
9	HANDWHEEL	ALUM.
10	"O" RING SEAL	BUNA "N"
11	SEAL DISC	STEEL
12	BEARING PLATE	STEEL
13	GUIDE BARS	STEEL
14	GASKETS	COMP. ASB.

NOTE

FLANGES ON 4" THRU 14" VALVES ARE 150° A.S.A. (F.F.)
FLANGES ON 16" THRU 36" VALVES ARE 125° LIGHT WT.
EACH VALVE HAS TWO GASKETS, BOTH ARE ASA STAND-
ARD PIPE FLANGE GASKETS OF THE NOMINAL BODY SIZE.

TABLE OF DIMENSIONS ALL IN INCHES

SIZE	A	B	C	D	E	F	G	H	K	L	WT. LBS.
4	10 3/8	8 3/4	10 3/4	13 3/4	6	10 1/4	2 3/8	2 3/8	3/4	3/4	150
5	9 3/8	8 3/4	10 3/4	13 3/4	6	10 1/4	2 3/8	2 1/8	3/4	3/4	160
6	11 3/8	10	12 3/4	15 3/4	6	11 1/4	3 1/4	3	3/4	3/4	285
8	13 1/2	11 3/4	16	19	8	15 3/4	3 3/4	4	3/4	3/4	390
10	16 3/8	13	18	21	8	16 3/4	5 3/8	5 3/8	3/4	3/4	455
12	18	14 1/4	20	23 1/4	8	17 3/4	5 3/8	5 3/8	3/4	3/4	650
14	19 3/8	17	24	27 1/2	8	19 3/4	5 3/8	6 3/8	3/4	3/4	855
16	20 3/8	17	24	27 1/2	8	19 3/4	6 3/8	7	3/4	3/4	825
18	27 1/2	18 1/2	28	31 1/2	10	24 1/4	9 3/8	9 3/8	3/4	3/4	990
20	26	18 1/4	28	31 1/2	10	24 1/4	8 3/8	8 3/8	3/4	3/4	1185
24	31 1/2	21	32	35 1/2	10	26 1/4	10 1/8	11 1/8	1	1 1/2	1620
30	38 1/2	25	40	43 1/2	10	30 1/4	13 3/8	14 1/2	1	1 1/2	2520
36	45 1/2	30	48	51 1/2	10	34 1/4	16 3/8	17 3/4	1	1 1/2	3870

K: PIPE THREAD-OVERFLOW CONNECTION
L: PIPE THREAD-WATER SEAL CONNECTION

HOW TO ORDER

When ordering or requesting specific information, please include the following particulars for either a replacement valve or spare parts:

- A. A complete description of whether horizontal, vertical or angle is required.
- B. Specify size.
- C. Specify special materials of construction, if any.
- D. Advise if water seal is wanted and gauge glass required.
- E. State number of valves required and delivery schedule.

Spare parts are available for immediate delivery on any size valve. Please state serial number of valve and parts required, indicating item numbers from drawing.

FINISHED WEIGHTS BY TYPES AND SIZES

Condenser Service Relief Valves

Size	Vertical	Angle	Horizontal
4"	106	122	139
5"	117	134	152
6"	154	178	202
8"	234	276	318
10"	312	372	431
12"	449	537	625
14"	580	683	787
16"	515	631	748
18"	732	893	1055
20"	791	980	1169
24"	1074	1352	1630
30"	1517	1915	2313
36"	2509	3054	3598

gauge glass for above valves if required



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