

INSTALLATION AND MAINTENANCE INSTRUCTIONS

# Graphite Bursting Discs

PRESSURE RELIEF



Doc. 8.8160.00.3

Rev. April, 2020

**Fike**®

## SOLUTIONS

- / Fire Protection
- / Explosion Protection
- / Overpressure Protection
- / Pressure Activation

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## REVISION HISTORY

ORIGINAL RELEASE DATE: .....June, 2017

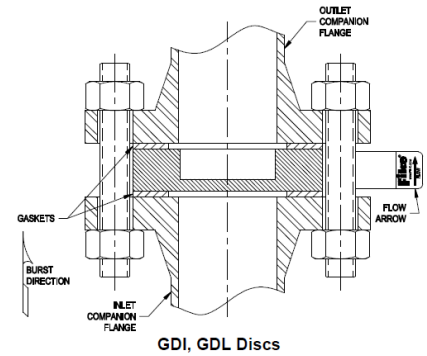
REVISION / DESCRIPTION OF CHANGE	REVISION DATE
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## 1. WARNING

1. Read these instructions carefully and completely before attempting to unpack, install or service the rupture disc.
2. THIS RUPTURE DISC WILL FRAGMENT. DO NOT install a graphite disc in a location where fragmenting particles can become lodged in a safety relief valve or otherwise hinder the operation of pressure relief equipment.
3. Provisions MUST be made to prevent possible injury to personnel or damage to equipment.
4. Install the rupture disc assembly in such a way that equipment in the area will not prevent rupture disc from opening or be damaged by system discharge.
5. A baffle plate on the outlet end of vent piping does NOT necessarily prevent potentially dangerous discharge.
6. Piping should be braced to absorb shock when the rupture disc ruptures.
7. Always handle the rupture disc with extreme caution. Handle the rupture disc by its edges only. Damage to the center membrane or seat area of the rupture disc may adversely affect the performance of the rupture disc. Read the rupture disc tag completely before installing to confirm that the size and type are correct for your system.



## 2. INSTALLATION

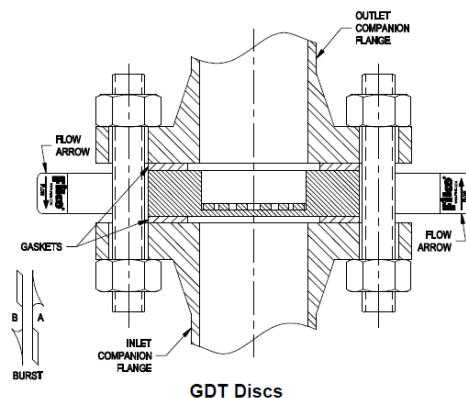
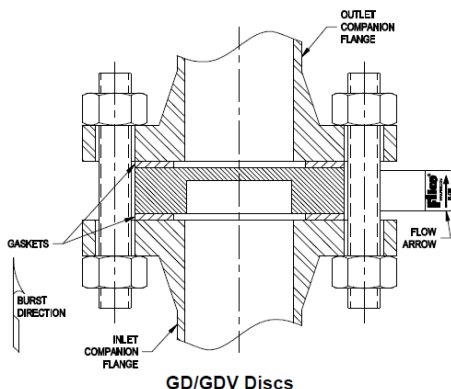
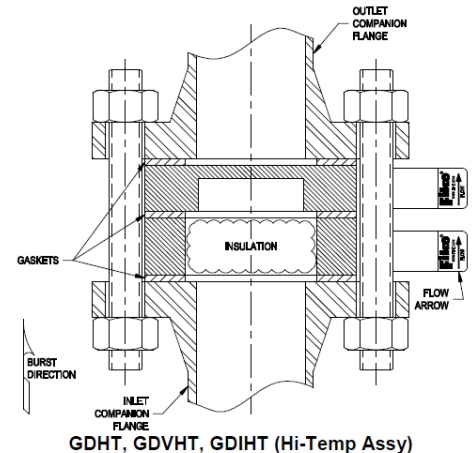
1. Carefully remove the rupture disc from its package container. Be sure the identification tag is firmly attached to the outside of the disc.
2. Clean the flange gasket faces. The flanges must be flat and parallel to each other to prevent damage to the disc when they are bolted together.
3. Gaskets are required on both sides of disc to provide the necessary geometry for proper disc function. These gaskets may or may not be preinstalled on the disc based on how the disc was specified. If discs are ordered without gaskets, see Table 1 for proper gasket dimensions.

**CAUTION:** Using incorrect gasket dimensions could affect the performance of the rupture disc.

**NOTE:** The specified inside gasket diameter provides proper clearance for disc operation. The outside gasket diameter is the same as the outside diameter of the disc to assist in placement of the disc within the flange bolt circle. Recommended gasket thickness is 1/8" (3 mm).

4. Center the disc and gaskets between the pipe flanges and install the flange bolts.

**CAUTION:** The disc must be installed with the name plate flow arrow pointing in the direction of flow. If the rupture disc is installed upside down, the burst pressure may exceed the nominal burst pressure. Pay close attention to the directional arrows on the rupture disc assembly.

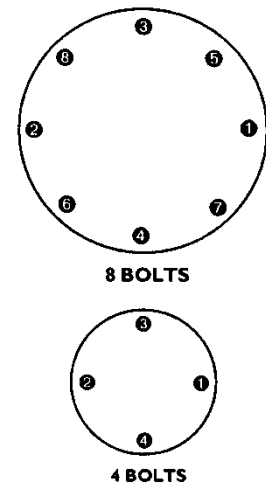


**Table 1 – Gasket Dimensions**

NOMINAL SIZE		ID (IN)		OD (IN)														
		ANSI, ISO PN 20 & PN 50	DIN, ISO, & JIS	ANSI			DIN & ISO					ISO ONLY		JIS				
NPS	DN			150	300	600	PN 6	PN 10	PN 16	PN 25	PN 40	PN 20	PN 50	5K	10K	16K	20K	30K
1/2	15	0.88	0.93	1.75	2.00	2.00	1.73	2.01	2.01	2.01	2.01	1.75	2.00	1.89	2.17	2.17	2.17	2.40
3/4	20	1.13	1.13	2.13	2.50	2.50	2.13	2.40	2.40	2.40	2.40	2.13	2.50	2.09	2.36	2.36	2.36	2.60
1	25	1.31	1.43	2.50	2.75	2.75	2.52	2.80	2.80	2.80	2.80	2.50	2.75	2.48	2.80	2.80	2.80	2.99
1 1/2	40	1.91	2.10	3.25	3.63	3.63	3.39	3.62	3.62	3.62	3.62	3.25	3.63	3.15	3.39	3.39	3.39	3.82
2	50	2.50	2.65	4.00	4.25	4.25	3.78	4.21	4.21	4.21	4.21	4.00	4.25	3.54	3.98	3.98	3.98	4.37
3	80	3.75	4.00	5.25	5.75	5.75	5.20	5.59	5.59	5.59	5.59	5.25	5.75	4.96	5.16	5.39	5.39	5.79
4	100	5.00*	5.00*	6.75	7.00	•	5.98	6.38	6.38	6.61	6.61	6.75	7.00	5.75	6.14	6.38	6.38	6.69
6	150	7.13	7.13	8.63	9.75	•	8.15	8.58	8.58	8.82	8.82	8.63	9.75	8.31	8.54	9.25	9.25	9.76
8	200	8.88*	9.00	10.88	12.00	•	10.31	10.75	10.75	11.18	11.42	10.88	12.00	10.12	10.51	11.02	11.02	11.54
10	250	11.63	11.38	13.25	•	•	12.48	12.91	12.95	•	•	•	•	12.68	12.99	13.90	•	•
12	300	13.75	13.25	16.00	•	•	14.69	14.88	15.12	•	•	•	•	14.45	14.76	15.87	•	•
14	350	14.50	15.31	17.63	•	•	16.65	17.24	17.48	•	•	•	•	16.14	16.54	17.60	•	•
16	400	17.00	17.41	20.13	•	•	18.62	19.25	19.49	•	•	•	•	18.50	19.02	19.96	•	•
18	450	19.50	19.50	21.50	•	•	20.79	21.22	21.85	•	•	•	•	20.87	21.18	22.52	•	•
20	500	21.75	21.53	23.75	•	•	22.76	23.39	24.29	•	•	•	•	22.83	23.35	24.69	•	•
24	600	25.00	25.00*	28.13	•	•	26.73	27.36	28.90	•	•	•	•	27.09	27.44	28.78	•	•

\*4" 300 ANSI and ISO PN 50, ID equals 4.75; 8" 300 ANSI and ISO PN 50, ID equals 9.00; 24" DIN PN 16 and JIS 16 K, ID equals 25.60

- If necessary, clean threads on studs and nuts. Wire brushing is usually sufficient. Oil studs with graphite oil. Do not use studs & nuts that show evidence of galling.
- Finger tighten flange bolt nuts.
- Refer to Table 2 to obtain torque value. Locate nominal disc size and flange class rating of rupture disc assembly. Follow the row across until you reach the column where your type of disc is located. This is the required torque for your rupture disc assembly.
- Using the crisscross pattern shown in Figure 1, apply torque in 4 steps of 25% increments. For example, if the torque required from Table 2 is 136 Nm, the torque should be applied in 34-Nm increments. Apply 34 Nm to each nut, then 68 Nm, then 102 Nm, etc.
- After the recommended torque has been achieved, perform a final tightening in a clock wise bolt-to-bolt fashion to ensure that all studs have equal loading.
- Experience has shown that in some installation conditions, it may be necessary to re-torque the flange bolting after the system has operated through normal pressure and temperature cycles.
- External stresses on the disc assembly from piping, supports and surrounding structures must be avoided.
- Piping must be supported to withstand forces generated during a blow-down condition.



**Figure 1 - Bolt Tightening Sequence**

**Note:** Rupture disc specifications and year of manufacture are listed on the rupture disc tag, per the first two digits of the Fike lot number.

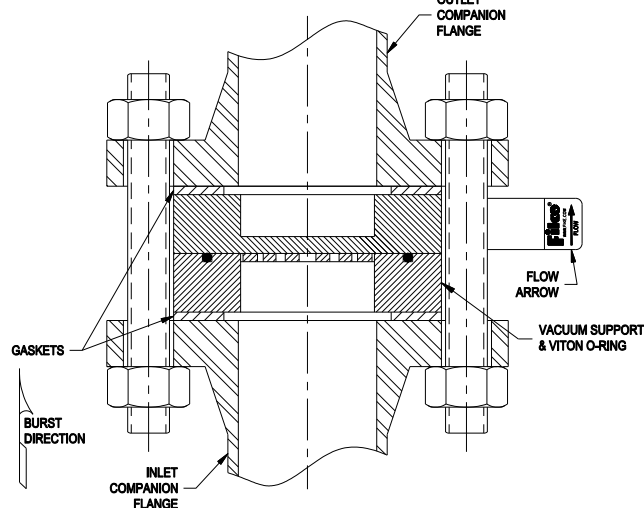
**Table 2 – Torque Values**

NOMINAL SIZE		TORQUE (FT-LB [N-m])														
		ANSI			DIN & ISO					ISO ONLY		JIS				
NPS	DN	150	300	600	PN 6	PN 10	PN 16	PN 25	PN 40	PN 20	PN 50	5K	10K	16K	20K	30K
1/2	15	5 [7]	7 [9]	13 [18]	6 [8]	10 [14]	10 [14]	10 [14]	17 [23]	5 [7]	10 [14]	8 [11]	14 [19]	14 [19]	5 [7]	8 [11]
3/4	20	7 [9]	13 [18]	23 [31]	10 [14]	17 [23]	17 [23]	17 [23]	27 [37]	7 [9]	17 [23]	9 [12]	16 [22]	16 [22]	7 [9]	12 [16]
1	25	8 [11]	20 [27]	30 [41]	14 [19]	22 [30]	22 [30]	22 [30]	35 [47]	9 [12]	25 [34]	13 [18]	28 [38]	28 [38]	12 [16]	16 [22]
1 1/2	40	17 [23]	45 [61]	73 [99]	25 [34]	35 [47]	35 [47]	37 [50]	59 [80]	19 [26]	60 [81]	20 [27]	34 [46]	34 [46]	24 [33]	32 [43]
2	50	29 [39]	22 [30]	22 [30]	26 [35]	41 [56]	41 [56]	45 [61]	63 [85]	34 [46]	25 [34]	19 [26]	42 [57]	21 [28]	21 [28]	35 [47]
3	80	45 [61]	44 [60]	44 [60]	48 [65]	30 [41]	30 [41]	35 [47]	49 [66]	51 [69]	50 [68]	41 [56]	26 [35]	31 [42]	31 [42]	53 [72]
4	100	28 [38]	59 [80]	•	46 [62]	32 [43]	32 [43]	53 [72]	73 [99]	32 [43]	71 [96]	18 [24]	32 [43]	40 [54]	41 [56]	71 [96]
6	150	50 [68]	59 [80]	•	32 [43]	53 [72]	53 [72]	104 [141]	129 [175]	65 [88]	67 [91]	46 [62]	53 [72]	55 [75]	59 [80]	102 [138]
8	200	69 [94]	99 [134]	•	51 [69]	76 [103]	51 [69]	107 [145]	171 [232]	96 [130]	114 [155]	54 [73]	46 [62]	65 [88]	77 [104]	131 [178]
10	250	54 [73]	•	•	37 [50]	55 [75]	68 [92]	•	•	•	•	52 [71]	68 [92]	98 [133]	•	•
12	300	68 [92]	•	•	60 [81]	66 [89]	93 [126]	•	•	•	•	52 [71]	55 [75]	86 [117]	•	•
14	350	99 [134]	•	•	66 [89]	64 [87]	88 [119]	•	•	•	•	42 [57]	53 [72]	122 [165]	•	•
16	400	79 [107]	•	•	50 [68]	88 [119]	118 [160]	•	•	•	•	52 [71]	79 [107]	141 [191]	•	•
18	450	101 [137]	•	•	60 [81]	75 [102]	113 [153]	•	•	•	•	74 [100]	73 [99]	176 [239]	•	•
20	500	81 [110]	•	•	49 [66]	85 [115]	152 [206]	•	•	•	•	63 [85]	85 [115]	159 [216]	•	•
24	600	143 [194]	•	•	93 [126]	136 [184]	219 [297]	•	•	•	•	107 [145]	135 [183]	193 [262]	•	•

Note: Torque values are based on the use of raised face flanges, well lubricated studs, gasket seating stress (Y) of 4,400 psi, gasket factor of 5.2, and the gasket dimensions in Table 1.

### 3. EXTERNAL VACUUM SUPPORT INSTALLATION (OPTIONAL)

- Carefully remove the rupture disc and vacuum support from its package container. Be sure the identification tag is firmly attached to the outside of the disc.
- Install the external vacuum support on the upstream side of the rupture disc as shown using the O-ring supplied.



**Figure 2 - GDL Disc w/ External Vacuum Support**

**NOTE:** No additional gasket is required between rupture disc and external support.

- Repeat steps 3 thru 12 above for standard disc installation.

## 4. INTEGRATED BURST INDICATOR (OPTIONAL)

### 4.1. DESCRIPTION

The Integrated Burst Indicator (BI) is a normally closed circuit that can carry a low energy electrical signal. During burst, the indicator is physically broken causing an open condition in the indication circuit. This open condition can then be detected by process control equipment. The Integral Burst Indicator is intrinsically safe for Class I, II, and III, Division 1 and 2, Groups A through G when used with an approved intrinsically safe safety barrier.

#### **WARNING:**

1. For hazardous location installation, an intrinsically safe power to the rupture disc indicator is required.
2. For services involving highly electrically conductive fluids, use a monitoring device that will detect change in resistance through the electrical circuit.

### 4.2. SPECIFICATIONS

Input Voltage: 24 VDC Maximum

Input Current: 20 mA Maximum

**CAUTION:** Exceeding the maximum voltage or current values shown can cause permanent damage to the Burst Indicator circuit.

### 4.3. INSTALLATION

Install rupture disc with Integrated Burst Indicator as shown in the above installation instructions.

**CAUTION:** Gaskets are supplied on rupture discs with Integrated Burst Indicators. The attached gaskets should not be removed or replaced. The rupture disc and Integrated Burst Indicator bracket shall not come in direct contact with companion flanges or studs. Contact with these components can cause incidental grounding of the assembly.



## 5. BC2 INSTALLATION (OPTIONAL)

1. Read the BC2 tag completely to verify that the size and type are correct for your system.
2. Check the BC2 to make sure there are no tears in the Teflon diaphragm or any breaks in the indicator circuit. Note that the Teflon diaphragm may have a small hole in the center. Sizes 4" and larger will have a slit in the Teflon actuator strip.
3. Install the BC2 with rupture disc in companion flanges as shown in Figure 2.  
Note: Rupture disc outlet gasket is mandatory for GD, GDV, GDHT, & GDVHT applications.

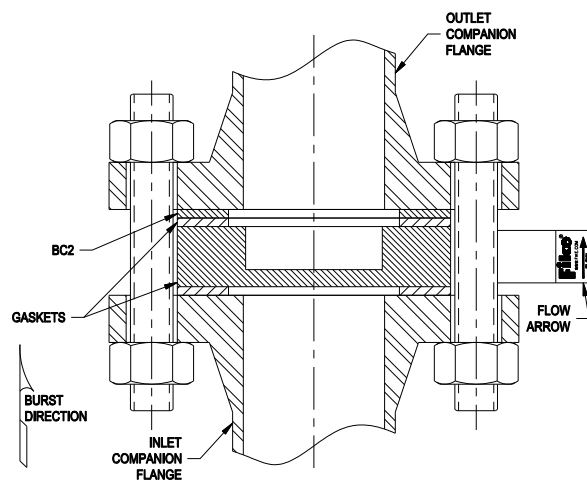


Figure 3 - Disc w/ BC2 Burst Indicator

4. Verify that the BC2 is downstream of the rupture disc.
5. Connect the BC2 receptacle to lead wire with electrical plug connector as shown in Figure 3.

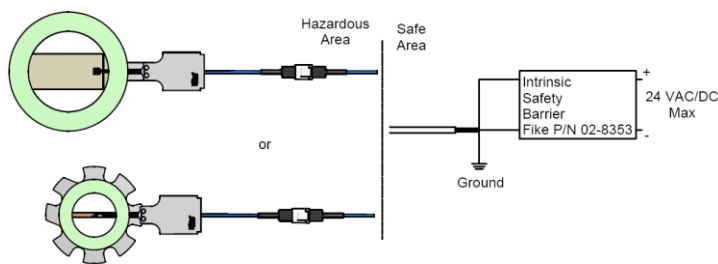


Figure 4 - BC2 Wiring Diagram



**Notes:**

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