



BS&B SAFETY SYSTEMS, L.L.C.

**BS&B Safety Systems, L.L.C.**  
**K<sub>R</sub>/Minimum Net Flow Area (MNFA) Table**  
**Updated January 16, 2003**

See page 1 for Notes

See page 2 for sizes 0.5" - 3.0"

See page 3 for sizes 4.0" - 14.0"

See page 4 for sizes 16.0" - 36.0"

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## NOTES

**General Note:** All K<sub>R</sub> testing is done using Schedule 40 pipe.

**General Note:** The data provided herein is valid only when the disk is installed in a safety head (holder) which was concurrently certified with the disk as a device.  
Contact BS&B for additional information.

**(Note 1)** Data Valid for Alloy 600 Material Of Construction Only  
(Contact BS&B for minimum burst pressures for which the data is valid).

(Values apply to disk with and without liners).

**(Note 2)** Data applies to GCR- and GFR- Series disks alone, with Fluoropolymer Liners and/or sensors (Contact BS&B for minimum burst pressures for which the data is valid).

**(Note 3)** Contact BS&B for minimum burst pressures for which the data is valid.

**(Note 4)** B-Series disks with Fluoropolymer Liners on one or both sides of the disk.  
(Consult BS&B for minimum pressures for which the data is valid).

**BS&B Safety Systems, L.L.C.**

**KR/Minimum Net Flow Area (MNFA) Table (MNFA in square inche)**

| Style  | Media      | 0.5"         | 0.6875"   | 0.75"     | 1.0"       | 1.5"      | 2.0"      | 3.0"       |
|--|------------|--------------|-----------|-----------|------------|-----------|-----------|------------|
| B, BR, BRR                                     | Liquid     | 1.47/0.18    |           |           | 1.47/0.80  | 1.47/1.76 | 1.47/3.33 | 1.47/6.51  |
| B, BR, BRR                                     | Gas        | 0.71/0.18    |           |           | 0.71/0.80  | 0.71/1.76 | 0.23/3.33 | 0.71/6.51  |
| B-Series w/liner <sup>(Note4)</sup>            | Liquid     | 1.47/0.18    |           |           | 1.47/0.80  | 1.47/1.76 | 1.47/3.33 | 1.47/6.51  |
| B-Series w/liner <sup>(Note4)</sup>            | Gas        | 0.71/0.18    |           |           | 0.71/0.80  | 0.71/1.76 | 0.71/3.33 | 0.71/6.51  |
| BV-Series                                      | Liquid     |              |           |           | 2.45/0.57  | 2.45/1.44 | 2.45/2.24 | 2.45/5.41  |
| BV-Series                                      | Gas        |              |           |           | 0.80/0.57  | 0.80/1.44 | 0.55/2.24 | 0.80/5.41  |
| BV-Series w/liner <sup>(Note4)</sup>           | Liquid     |              |           |           | 2.45/0.57  | 2.45/1.44 | 2.45/2.24 | 2.45/5.41  |
| BV-Series w/liner <sup>(Note4)</sup>           | Gas        |              |           |           | 0.80/0.57  | 0.80/1.44 | 0.55/2.24 | 0.80/5.41  |
| D, DR, DRR                                     | Liquid     |              |           |           | 1.3/0.80   | 1.3/1.76  | 1.3/3.33  | 1.3/6.51   |
| D, DR, DRR                                     | Gas        |              |           |           | 1.19/0.69  | 1.19/1.62 | 1.19/2.95 | 1.19/6.49  |
| DV, DRV, DSV, DRSV                             | Liquid     | (Not Tested) |           |           | 2.60/0.57  | 2.60/1.44 | 2.60/2.24 | 2.60/5.41  |
| DV, DRV, DSV, DRSV                             | Gas        |              |           |           | 1.19/0.69  | 1.19/1.62 | 1.19/2.94 | 1.19/6.49  |
| AV   | Liquid     |              |           |           | 4.35/0.86  | 4.35/2.03 | 4.35/3.35 | 4.35/7.39  |
| AV   | Gas        |              |           |           | 4.35/0.86  | 4.35/2.03 | 4.35/3.35 | 4.35/7.39  |
| CSR (w/o Liners)                               | Liquid     |              |           |           | 3.19/0.86  | 3.19/2.03 | 3.19/3.35 | 3.19/7.39  |
| CSR (w/o Liners)                               | Gas        |              |           |           | 1.0/0.86   | 1.0/2.03  | 1.0/3.35  | 1.0/7.39   |
| CSI (w/ or w/o Liners)                         | Liquid     |              |           |           | 6.92/0.86  | 6.92/1.89 | 6.92/3.35 | 6.92/7.29  |
| CSI (w/ or w/o Liners)                         | Gas        |              |           |           | 0.62/0.86  | 0.62/1.89 | 0.62/3.35 | 0.62/7.29  |
| Sigma (Series)                                 | Liquid     |              |           |           | 1.25/0.86  | 1.25/1.93 | 1.25/3.36 | 1.25/7.39  |
| Sigma (Series)                                 | Gas        |              |           |           | 0.38/0.86  | 0.38/1.93 | 0.38/3.36 | 0.38/7.39  |
| LPS  | Liquid     |              |           |           | 0.86/0.86  | 0.86/1.93 | 0.86/3.36 | 0.86/7.39  |
| LPS  | Gas        |              |           |           | 0.79/0.86  | 0.79/1.93 | 0.79/3.36 | 0.79/7.39  |
| S-90 (w/ or w/o Liners)                        | Gas        |              |           |           | 1.13/0.86  | 1.13/2.03 | 1.13/3.35 | 1.13/7.39  |
| S-90 <sup>(Note1)</sup>                        | Gas        |              |           |           | 0.23/0.86  | 0.23/2.03 | 0.23/3.35 | 0.23/7.39  |
| S-90 Double Disk Assembly                      | Gas        |              |           |           | 1.13/0.86  | 1.13/2.03 | 1.13/3.35 | 1.13/7.39  |
| MTB  | Gas        |              |           |           |            |           |           | 0.23/7.39  |
| SRC  | Gas        |              |           |           |            |           | 1.1/3.35  | 1.1/7.39   |
| JRS  | Gas        |              |           |           | 0.31/0.86  | 0.31/1.89 | 0.31/3.35 | 0.31/6.53  |
| JRS (w/Liners)                                 | Gas        |              |           |           |            |           | 0.31/3.35 | 0.31/6.53  |
| JRS Double Disk Assembly                       | Gas        |              |           |           | 0.68/0.86  | 0.68/1.89 | 0.68/3.35 | 0.68/6.53  |
| RLS  | Liquid     |              |           |           | 5.83/0.84  | 5.83/1.77 | 5.83/3.23 | 5.83/6.44  |
| RLS  | Gas        |              |           |           | 1.14/0.84  | 1.14/1.77 | 1.14/3.23 | 1.14/6.44  |
| RLS (w/ Liners)                                | Liquid     |              |           |           | 5.83/0.84  | 5.83/1.77 | 5.83/3.23 | 5.83/6.44  |
| RLS (w/ Liners)                                | Gas        |              |           |           | 1.14/0.84  | 1.14/1.77 | 1.14/3.23 | 1.14/6.44  |
| RLS Double Disk Assembly                       | Liquid     |              |           |           | 5.83/0.84  | 5.83/1.77 | 5.83/3.23 | 5.83/6.44  |
| RLS Double Disk Assembly                       | Gas        |              |           |           | 1.9/0.84   | 1.9/1.77  | 1.9/3.23  | 1.9/6.44   |
| SK <sub>a</sub>                                | Liquid     |              |           |           | 1.9/0.86   | 1.9/1.93  | 1.9/3.36  | 1.9/7.39   |
| SK <sub>a</sub>                                | Gas        |              |           |           | 0.37/0.86  | 0.37/1.93 | 0.37/3.36 | 0.37/7.39  |
| SK <sub>a</sub> -U                             | Liquid     |              |           | 1.10/0.53 | 2.20/0.60  |           |           |            |
| SK <sub>a</sub> -U                             | Gas        | 0.85/0.30    |           | 0.73/0.53 | 1.25/0.60  |           |           |            |
| FRS  | Gas        |              |           |           | 0.80/0.86  | 0.80/1.93 | 0.80/3.35 |            |
| FRS w/liner <sup>(Note3)</sup>                 | Gas        |              |           |           | 0.80/0.86  | 0.80/1.93 | 0.80/3.35 |            |
| ECR  | Liquid     | (Not Tested) |           |           |            |           |           |            |
| FCR <sup>(Note3)</sup>                         | Gas        |              |           |           | 0.58/0.86  | 0.58/2.03 | 0.58/3.35 | 0.58/7.30  |
| RB-90  | Gas        |              |           |           | 3.47/0.83  | 3.47/1.80 | 3.47/3.15 | 3.47/6.84  |
| GFN (w/ or w/o Liners)                         | Gas        |              |           |           | 0.55/0.86  | 0.55/2.03 | 0.55/3.35 | 0.55/7.39  |
| MB, AMB  | Liquid     | 0.19/0.30    |           | 0.19/0.53 | 0.19/0.86  | 0.19/2.03 | 0.19/3.35 | 0.19/7.39  |
| MB, AMB  | Gas        | 0.19/0.30    |           | 0.19/0.53 | 0.19/0.86  | 0.19/2.03 | 0.19/3.35 | 0.19/7.39  |
| MBV, AMBV (bar spt)                            | Liquid     |              |           |           | 1.9/0.63   | 1.9/1.66  | 1.9/2.69  | 1.9/5.92   |
| MBV, AMBV (bar spt)                            | Gas        |              |           |           | 1.9/0.63   | 1.9/1.66  | 1.9/2.69  | 1.9/5.92   |
| MBV, AMBV (dial spt)                           | Liquid     |              |           |           | 5.40/0.298 | 5.40/1.02 | 5.40/1.74 | 5.40/4.20  |
| MBV, AMBV (dial spt)                           | Gas        |              |           |           | 5.40/0.298 | 5.40/1.02 | 5.40/1.74 | 5.40/4.20  |
| IMB, AIMB                                      | Liquid     | 0.31/0.30    |           | 0.31/0.53 | 0.31/0.86  | 0.31/2.03 | 0.31/3.35 | 0.31/7.39  |
| IMB, AIMB                                      | Gas        | 0.31/0.30    |           | 0.31/0.53 | 0.31/0.86  | 0.31/2.03 | 0.31/3.35 | 0.31/7.39  |
| IMBL, AIMBL                                    | Liquid     | 0.31/0.30    |           | 0.31/0.53 | 0.31/0.86  | 0.31/2.03 | 0.31/3.35 | 0.31/7.39  |
| IMBL, AIMBL                                    | Gas        | 0.31/0.30    |           | 0.31/0.53 | 0.31/0.86  | 0.31/2.03 | 0.31/3.35 | 0.31/7.39  |
| RE, REA  | Liquid     |              |           |           | 0.15/0.86  | 0.15/2.03 | 0.15/3.35 | 0.15/7.39  |
| RE, REA  | Gas        |              |           |           | 0.15/0.86  | 0.15/2.03 | 0.15/3.35 | 0.15/7.39  |
| REV, REVA                                      | Liquid     |              |           |           | 3.15/0.69  | 3.15/1.76 | 3.15/3.09 | 3.15/6.29  |
| REV, REVA                                      | Gas        |              |           |           | 3.15/0.69  | 3.15/1.76 | 3.15/3.09 | 3.15/6.29  |
| REL, RELA                                      | Liquid     |              |           |           | 0.16/0.86  | 0.16/2.03 | 0.16/3.35 | 0.16/7.39  |
| REL, RELA                                      | Gas        |              |           |           | 0.16/0.86  | 0.16/2.03 | 0.16/3.35 | 0.16/7.39  |
| GFR-Series <sup>(Note2)</sup>                  | Liquid     |              |           |           |            | 11.5/0.79 | 4.76/1.77 |            |
| GFR-Series <sup>(Note2)</sup>                  | Gas        |              |           |           | 19.14/0.20 | 9.92/0.79 | 4.76/1.77 | 23.47/4.91 |
| GCR-Series <sup>(Note2)</sup>                  | Liquid     |              |           |           |            | 4.95/1.5  | 2.9/2.7   | 4.95/5.29  |
| GCR-Series <sup>(Note2)</sup>                  | Gas        |              |           |           |            | 1.95/1.5  | 1.25/2.7  | 1.95/5.29  |
| A-2 Sta-Kul w/ FRB disk                        | Gas        | 2.20/0.19    |           |           |            |           |           |            |
| A-6 Sta-Kul, FRB disk                          | Gas        | 2.19/0.19    |           |           |            |           |           |            |
| A-4 Sta-Kul w/ FRB Disk; 3/8"                  | Gas        | 6.9/0.09     |           |           |            |           |           |            |
| A-10 Sta-Kul w/ Scrd "B"                       | Gas        |              |           |           | 0.415/0.78 |           |           |            |
| Sta-Kul, B disk; 3/4"                          | Gas        |              | 3.85/0.44 |           |            |           |           |            |
| FRB WFT  | Gas        | 35.7/0.21    |           |           |            |           |           |            |
| A-6 Sta-Kul, "B"                               | Gas        |              | 6.44/0.19 |           |            |           |           |            |
| A-6 Sta-Kul, "B" (w/ liner) <sup>(Note4)</sup> | Gas        |              | 6.44/0.19 |           |            |           |           |            |
| A-19 Sta-Kul w/ Scored "B" <sup>(Note4)</sup>  | Gas        |              |           | 0.50/0.44 |            |           |           |            |
| FRB w/ 3/4" San'y Conn                         | Gas/Liquid | 12.0/0.22    |           |           |            |           |           |            |
| 1" Welded FRB w/ 1/2" VCR Conn.                | Gas        | 16.9/0.126   |           |           |            |           |           |            |

**BS&B Safety Systems, L.L.C.**

**KR/Minimum Net Flow Area (MNFA) Table (MNFA in square inche)**

| Style  | Media      | 4.0"      | 6.0"      | 8.0"      | 10.0"     | 12.0"      | 14.0"      |
|--|------------|-----------|-----------|-----------|-----------|------------|------------|
| B, BR, BRR                                     | Liquid     | 1.47/11.8 | 1.47/28.8 | 1.47/49.8 | 1.47/78.8 | 1.47/112.0 | 1.47/137.0 |
| B, BR, BRR                                     | Gas        | 0.71/11.8 | 0.71/28.8 | 0.71/49.8 | 0.71/78.8 | 0.71/112.0 | 0.71/137.0 |
| B-Series w/liner <sup>(NOBES)</sup>            | Liquid     | 1.47/11.8 | 1.47/28.8 | 1.47/49.8 | 1.47/78.8 | 1.47/112.0 |            |
| B-Series w/liner <sup>(NOBES)</sup>            | Gas        | 0.71/11.8 | 0.71/28.8 | 0.71/49.8 | 0.71/78.8 | 0.71/112.0 |            |
| BV-Series                                      | Liquid     | 2.45/9.62 | 2.45/23.7 | 2.45/44.1 | 2.45/70.8 | 2.45/101.0 | 2.45/130.0 |
| BV-Series                                      | Gas        | 0.80/9.62 | 0.80/23.7 | 0.80/44.1 | 0.80/70.8 | 0.80/101.0 | 0.80/130.0 |
| BV-Series w/liner <sup>(NOBES)</sup>           | Liquid     | 2.45/9.62 | 2.45/23.7 | 2.45/44.1 | 2.45/70.8 | 2.45/101.0 |            |
| BV-Series w/liner <sup>(NOBES)</sup>           | Gas        | 0.80/9.62 | 0.80/23.7 | 0.80/44.1 | 0.80/70.8 | 0.80/101.0 |            |
| D, DR, DRR                                     | Liquid     | 1.3/11.8  | 1.3/28.8  | 1.3/49.8  | 1.3/78.8  | 1.3/112.0  | 1.3/137.0  |
| D, DR, DRR                                     | Gas        | 1.19/11.0 | 1.19/25.9 | 1.19/47.1 | 1.19/74.6 | 1.19/106.0 | 1.19/135.0 |
| DV, DRV, DSV, DRSV                             | Liquid     | 2.60/9.62 | 2.60/23.7 | 2.60/44.1 | 2.60/70.8 | 2.60/101.5 | 2.60/130.2 |
| DV, DRV, DSV, DRSV                             | Gas        | 1.19/11.0 | 1.19/25.9 | 1.19/47.1 | 1.19/74.6 | 1.19/106.0 | 1.19/135.0 |
| AV   | Liquid     | 4.35/12.7 | 4.35/28.8 | 4.35/50.0 | 4.35/78.8 | 4.35/113.0 | 4.35/137.0 |
| AV   | Gas        | 4.35/12.7 | 4.35/28.8 | 4.35/50.0 | 4.35/78.8 | 4.35/113.0 | 4.35/137.0 |
| CSR (w/o Liners)                               | Liquid     | 3.19/12.7 | 3.19/28.8 | 3.19/50.0 |           |            |            |
| CSR (w/o Liners)                               | Gas        | 1.0/12.7  | 1.0/28.8  | 1.0/50.0  |           |            |            |
| CSI (w/ or w/o Liners)                         | Liquid     | 6.92/11.2 | 6.92/22.6 | 6.92/42.7 |           |            |            |
| CSI (w/ or w/o Liners)                         | Gas        | 0.62/11.2 | 0.62/22.6 | 0.62/42.7 |           |            |            |
| Sigma (Series)                                 | Liquid     | 1.25/12.7 | 1.25/28.8 | 1.25/50.0 |           |            |            |
| Sigma (Series)                                 | Gas        | 0.38/12.7 | 0.38/28.8 | 0.38/50.0 |           |            |            |
| LPS  | Liquid     | 0.86/12.7 | 0.86/28.8 | 0.86/50.0 |           |            |            |
| LPS  | Gas        | 0.79/12.7 | 0.79/28.8 | 0.79/50.0 |           |            |            |
| S-90 (w/ or w/o Liners)                        | Gas        | 1.13/12.7 | 1.13/28.8 | 1.13/50.0 | 1.13/78.8 | 1.13/111.0 | 1.13/135.0 |
| S-90 <sup>(NOBES)</sup>                        | Gas        | 0.23/12.7 | 0.23/28.8 | 0.23/50.0 | 0.23/75.8 | 0.23/111.0 | 0.23/135.0 |
| S-90 Double Disk Assembly                      | Gas        | 1.13/12.7 | 1.13/28.8 | 1.13/50.0 | 1.13/78.8 | 1.13/111.0 | 1.13/135.0 |
| MVB  | Gas        |           |           |           |           |            |            |
| SRC  | Gas        | 1.1/12.7  | 1.1/28.8  | 1.1/50.0  |           |            |            |
| JRS  | Gas        | 0.31/11.8 | 0.31/25.0 | 0.31/42.0 | 0.31/68.6 | 0.31/102.0 | 0.31/121.0 |
| JRS (w/Liners)                                 | Gas        | 0.31/11.8 | 0.31/25.0 | 0.31/42.0 | 0.31/68.6 | 0.31/102.0 | 0.31/121.0 |
| JRS Double Disk Assembly                       | Gas        | 0.68/11.8 | 0.68/25.0 | 0.68/42.0 | 0.68/68.6 | 0.68/102.0 | 0.68/121.0 |
| RLS  | Liquid     | 5.83/11.5 | 5.83/26.4 | 5.83/47.0 | 5.83/73.9 | 5.83/99.0  | 5.83/131.0 |
| RLS  | Gas        | 1.14/11.5 | 1.14/26.4 | 1.14/47.0 | 1.14/73.9 | 1.14/99.0  | 1.14/131.0 |
| RLS (w/Liners)                                 | Liquid     | 5.83/11.5 | 5.83/26.4 | 5.83/47.0 | 5.83/73.9 | 5.83/99.0  |            |
| RLS (w/Liners)                                 | Gas        | 1.14/11.5 | 1.14/26.4 | 1.14/47.0 | 1.14/73.9 | 1.14/99.0  |            |
| RLS Double Disk Assembly                       | Liquid     | 5.83/11.5 | 5.83/26.4 | 5.83/47.0 | 5.83/73.9 | 5.83/99.0  | 5.83/131.0 |
| RLS Double Disk Assembly                       | Gas        | 1.9/11.5  | 1.9/26.4  | 1.9/47.0  | 1.9/73.9  | 1.9/99.0   | 1.9/131.0  |
| SK <sub>R</sub>                                | Liquid     | 1.9/12.7  | 1.9/28.8  | 1.9/50.0  | 1.9/78.8  |            |            |
| SK <sub>R</sub>                                | Gas        | 0.37/12.7 | 0.37/28.8 | 0.37/50.0 | 0.37/78.8 |            |            |
| SK <sub>R</sub> -J                             | Liquid     |           |           |           |           |            |            |
| SK <sub>R</sub> -J                             | Gas        |           |           |           |           |            |            |
| FRS  | Gas        |           |           |           |           |            |            |
| FRS w/liner <sup>(NOBES)</sup>                 | Gas        |           |           |           |           |            |            |
| ECR  | Liquid     |           |           |           |           |            |            |
| ECR <sup>(NOBES)</sup>                         | Gas        | 0.58/12.1 | 0.58/25.4 | 0.58/43.6 | 0.58/66.3 | 0.58/94.7  | 0.58/118.0 |
| RB-90  | Gas        | 3.47/11.8 | 3.47/25.4 | 3.47/47.6 | 3.47/67.6 | 3.47/101.0 | 3.47/121.0 |
| GFN (w/ or w/o Liners)                         | Gas        | 0.55/12.7 | 0.55/28.8 | 0.55/50.0 | 0.55/78.8 | 0.55/111.0 | 0.55/137.0 |
| MB, AMB  | Liquid     | 0.19/12.7 | 0.19/28.8 | 0.19/50.0 | 0.19/78.8 | 0.19/113.0 | 0.19/137.0 |
| MB, AMB  | Gas        | 0.19/12.7 | 0.19/28.8 | 0.19/50.0 | 0.19/78.8 | 0.19/113.0 | 0.19/137.0 |
| MBV, AMBV (bar spt)                            | Liquid     | 1.9/10.4  | 1.9/23.1  | 1.9/40.9  | 1.9/63.7  | 1.9/91.5   | 1.9/110.0  |
| MBV, AMBV (bar spt)                            | Gas        | 1.9/10.4  | 1.9/23.1  | 1.9/40.9  | 1.9/63.7  | 1.9/91.5   | 1.9/110.0  |
| MBV, AMBV (dial spt)                           | Liquid     | 5.40/7.60 | 5.40/15.8 | 5.40/25.8 | 5.40/41.0 | 5.40/59.1  | 5.40/88.3  |
| MBV, AMBV (dial spt)                           | Gas        | 5.40/7.60 | 5.40/15.8 | 5.40/25.8 | 5.40/41.0 | 5.40/59.1  | 5.40/88.3  |
| IMB, AIMB                                      | Liquid     | 0.31/12.7 | 0.31/28.8 | 0.31/50.0 | 0.31/78.8 | 0.31/113.0 | 0.31/137.0 |
| IMB, AIMB                                      | Gas        | 0.31/12.7 | 0.31/28.8 | 0.31/50.0 | 0.31/78.8 | 0.31/113.0 | 0.31/137.0 |
| IMBL, AIMBL                                    | Liquid     | 0.31/12.7 | 0.31/28.8 | 0.31/50.0 | 0.31/78.8 | 0.31/113.0 | 0.31/137.0 |
| IMBL, AIMBL                                    | Gas        | 0.31/12.7 | 0.31/28.8 | 0.31/50.0 | 0.31/78.8 | 0.31/113.0 | 0.31/137.0 |
| RE, REA  | Liquid     | 0.15/12.7 | 0.15/28.8 | 0.15/50.0 | 0.15/78.8 | 0.15/113.0 | 0.15/137.0 |
| RE, REA  | Gas        | 0.15/12.7 | 0.15/28.8 | 0.15/50.0 | 0.15/78.8 | 0.15/113.0 | 0.15/137.0 |
| REV, REVA                                      | Liquid     | 3.15/10.2 | 3.15/20.9 | 3.15/37.1 | 3.15/56.5 | 3.15/77.5  | 3.15/99.1  |
| REV, REVA                                      | Gas        | 3.15/10.2 | 3.15/20.9 | 3.15/37.1 | 3.15/56.5 | 3.15/77.5  | 3.15/99.1  |
| REL, RELA                                      | Liquid     | 0.16/12.7 | 0.16/28.8 | 0.16/50.0 | 0.16/78.8 | 0.16/113.0 | 0.16/137.0 |
| REL, RELA                                      | Gas        | 0.16/12.7 | 0.16/28.8 | 0.16/50.0 | 0.16/78.8 | 0.16/113.0 | 0.16/137.0 |
| GFR-Series <sup>(NOBES)</sup>                  | Liquid     |           |           |           |           |            |            |
| GFR-Series <sup>(NOBES)</sup>                  | Gas        |           |           |           |           |            |            |
| GCR-Series <sup>(NOBES)</sup>                  | Liquid     | 4.95/9.78 |           |           |           |            |            |
| GCR-Series <sup>(NOBES)</sup>                  | Gas        | 1.95/9.78 |           |           |           |            |            |
| A-2 Sta-Kul w/ FRB disk                        | Gas        |           |           |           |           |            |            |
| A-6 Sta-Kul, FRB disk                          | Gas        |           |           |           |           |            |            |
| A-4 Sta-Kul w/ FRB Disk; 3/8"                  | Gas        |           |           |           |           |            |            |
| A-10 Sta-Kul w/ Scrd "B"                       | Gas        |           |           |           |           |            |            |
| Sta-Kul, B disk; 3/4"                          | Gas        |           |           |           |           |            |            |
| FRB WFT  | Gas        |           |           |           |           |            |            |
| A-6 Sta-Kul, "B"                               | Gas        |           |           |           |           |            |            |
| A-6 Sta-Kul, "B" (w/ liner) <sup>(NOBES)</sup> | Gas        |           |           |           |           |            |            |
| A-19 Sta-Kul w/ Scord "B" <sup>(NOBES)</sup>   | Gas        |           |           |           |           |            |            |
| FRB w/ 3/4" San'y Conn                         | Gas/Liquid |           |           |           |           |            |            |
| 1" Welded FRB w/ 1/2" VCR Conn.                | Gas        |           |           |           |           |            |            |

**BS&B Safety Systems, L.L.C.**

**KR/Minimum Net Flow Area (MNFA) Table (MNFA in square inches)**

| Style                              | Media      | 16.0"      | 18.0"      | 20.0"      | 24.0"      | 30.0"      | 36.0"      |
|------------------------------------|------------|------------|------------|------------|------------|------------|------------|
| B, BR, BRR                         | Liquid     | 1.47/182.0 | 1.47/233.0 | 1.47/291.0 | 1.47/424.0 | 1.47/671.0 | 1.47/975.0 |
| B, BR, BRR                         | Gas        | 0.71/182.0 | 0.71/233.0 | 0.71/291.0 | 0.71/424.0 | 0.71/671.0 | 0.71/975.0 |
| B-Series w/liner (Note4)           | Liquid     |            |            |            |            |            |            |
| B-Series w/liner (Note4)           | Gas        |            |            |            |            |            |            |
| BV-Series                          | Liquid     | 2.45/176.0 | 2.45/202.0 | 2.45/279.0 | 2.45/380.0 | 2.45/615.0 | 2.45/927.0 |
| BV-Series                          | Gas        | 0.80/176.0 | 0.80/202.0 | 0.80/279.0 | 0.80/380.0 | 0.80/615.0 | 0.80/927.0 |
| BV-Series w/liner (Note4)          | Liquid     |            |            |            |            |            |            |
| BV-Series w/liner (Note4)          | Gas        |            |            |            |            |            |            |
| D, DR, DRR                         | Liquid     | 1.3/182.0  | 1.3/233.0  | 1.3/291.0  | 1.3/424.0  | 1.3/671.0  | 1.3/975.0  |
| D, DR, DRR                         | Gas        | 1.19/176.0 | 1.19/223.0 | 1.19/277.0 | 1.19/397.0 | 1.19/661.0 | 1.19/907.0 |
| DV, DRV, DSV, DRSV                 | Liquid     | 2.60/176.7 | 2.60/202.3 | 2.60/279.9 | 2.60/380.1 | 2.60/615.7 | 2.60/927.0 |
| DV, DRV, DSV, DRSV                 | Gas        | 1.19/176.0 | 1.19/223.0 | 1.19/277.0 | 1.19/397.0 | 1.19/660.0 | 1.19/907.0 |
| AV                                 | Liquid     | 4.35/182.0 | 4.35/233.0 | 4.35/291.0 | 4.35/424.0 | 4.35/671.0 | 4.35/975.0 |
| AV                                 | Gas        | 4.35/182.0 | 4.35/233.0 | 4.35/291.0 | 4.35/424.0 | 4.35/671.0 | 4.35/975.0 |
| CSR (w/o Liners)                   | Liquid     |            |            |            |            |            |            |
| CSR (w/o Liners)                   | Gas        |            |            |            |            |            |            |
| CSI (w/ or w/o Liners)             | Liquid     |            |            |            |            |            |            |
| CSI (w/ or w/o Liners)             | Gas        |            |            |            |            |            |            |
| Sigma (Series)                     | Liquid     |            |            |            |            |            |            |
| Sigma (Series)                     | Gas        |            |            |            |            |            |            |
| LPS                                | Liquid     |            |            |            |            |            |            |
| LPS                                | Gas        |            |            |            |            |            |            |
| S-90 (w/ or w/o Liners)            | Gas        | 1.13/176.0 | 1.13/223.0 | 1.13/277.0 | 1.13/402.0 | 1.13/672.0 |            |
| S-90 (Note1)                       | Gas        | 0.23/176.0 | 0.23/223.0 | 0.23/277.0 | 0.23/402.0 | 0.23/672.0 |            |
| S-90 Double Disk Assembly          | Gas        | 1.13/176.0 | 1.13/223.0 | 1.13/277.0 | 1.13/402.0 | 1.13/672.0 |            |
| MVB                                | Gas        |            |            |            |            |            |            |
| SRC                                | Gas        |            |            |            |            |            |            |
| JRS                                | Gas        | 0.31/156.0 | 0.31/198.0 | 0.31/246.0 | 0.31/357.0 | 0.31/592.0 | 0.31/868.0 |
| JRS (w/Liners)                     | Gas        | 0.31/156.0 | 0.31/198.0 | 0.31/246.0 | 0.31/357.0 | 0.31/592.0 | 0.31/868.0 |
| JRS Double Disk Assembly           | Gas        | 0.68/156.0 | 0.68/198.0 | 0.68/246.0 | 0.68/357.0 | 0.58/592.0 | 0.68/868.0 |
| RLS                                | Liquid     | 5.83/172.0 | 5.83/219.0 |            |            |            |            |
| RLS                                | Gas        | 1.14/172.0 | 1.14/219.0 |            |            |            |            |
| RLS (w/ Liners)                    | Liquid     |            |            |            |            |            |            |
| RLS (w/ Liners)                    | Gas        |            |            |            |            |            |            |
| RLS Double Disk Assembly           | Liquid     | 5.83/172.0 | 5.83/219.0 |            |            |            |            |
| RLS Double Disk Assembly           | Gas        | 1.9/172.0  | 1.9/219.0  |            |            |            |            |
| SK <sub>R</sub>                    | Liquid     |            |            |            |            |            |            |
| SK <sub>R</sub>                    | Gas        |            |            |            |            |            |            |
| SK <sub>R</sub> -U                 | Liquid     |            |            |            |            |            |            |
| SK <sub>R</sub> -U                 | Gas        |            |            |            |            |            |            |
| FRS                                | Gas        |            |            |            |            |            |            |
| FRS w/liner (Note3)                | Gas        |            |            |            |            |            |            |
| ECR                                | Liquid     |            |            |            |            |            |            |
| ECR (Note3)                        | Gas        | 0.58/154.0 | 0.58/195.0 | 0.58/241.0 | 0.58/348.0 |            |            |
| RB-90                              | Gas        | 3.47/162.0 | 3.47/209.0 | 3.47/262.0 | 3.47/386.0 | 3.47/617.0 | 3.47/872.0 |
| GFN (w/ or w/o Liners)             | Gas        | 0.55/176.0 | 0.55/223.0 | 0.55/277.0 | 0.55/402.0 |            |            |
| MB, AMB                            | Liquid     | 0.19/182.0 | 0.19/233.0 | 0.19/291.0 | 0.19/424.0 |            |            |
| MB, AMB                            | Gas        | 0.19/182.0 | 0.19/233.0 | 0.19/291.0 | 0.19/424.0 |            |            |
| MBV, AMBV (bar spt)                | Liquid     | 1.9/146.0  | 1.9/186.0  | 1.9/232.0  | 1.9/339.0  |            |            |
| MBV, AMBV (bar spt)                | Gas        | 1.9/146.0  | 1.9/186.0  | 1.9/232.0  | 1.9/339.0  |            |            |
| MBV, AMBV (dial spt)               | Liquid     | 5.40/95.7  | 5.40/124.0 | 5.40/153.0 | 5.40/226.0 |            |            |
| MBV, AMBV (dial spt)               | Gas        | 5.40/95.7  | 5.40/124.0 | 5.40/153.0 | 5.40/226.0 |            |            |
| IMB, AIMB                          | Liquid     | 0.31/182.0 | 0.31/233.0 | 0.31/291.0 | 0.31/424.0 |            |            |
| IMB, AIMB                          | Gas        | 0.31/182.0 | 0.31/233.0 | 0.31/291.0 | 0.31/424.0 |            |            |
| IMBL, AIMBL                        | Liquid     | 0.31/182.0 | 0.31/233.0 | 0.31/291.0 | 0.31/424.0 |            |            |
| IMBL, AIMBL                        | Gas        | 0.31/182.0 | 0.31/233.0 | 0.31/291.0 | 0.31/424.0 |            |            |
| RE, REA                            | Liquid     | 0.15/182.0 | 0.15/233.0 | 0.15/291.0 | 0.15/424.0 |            |            |
| RE, REA                            | Gas        | 0.15/182.0 | 0.15/233.0 | 0.15/291.0 | 0.15/424.0 |            |            |
| REV, REVA                          | Liquid     | 3.15/125.0 | 3.15/158.0 | 3.15/190.0 | 3.15/269.0 |            |            |
| REV, REVA                          | Gas        | 3.15/125.0 | 3.15/158.0 | 3.15/190.0 | 3.15/269.0 |            |            |
| REL, RELA                          | Liquid     | 0.16/182.0 | 0.16/233.0 | 0.16/291.0 | 0.16/424.0 |            |            |
| REL, RELA                          | Gas        | 0.16/182.0 | 0.16/233.0 | 0.16/291.0 | 0.16/424.0 |            |            |
| GFR-Series (Note2)                 | Liquid     |            |            |            |            |            |            |
| GFR-Series (Note2)                 | Gas        |            |            |            |            |            |            |
| GCR-Series (Note2)                 | Liquid     |            |            |            |            |            |            |
| GCR-Series (Note2)                 | Gas        |            |            |            |            |            |            |
| A-2 Sta-Kul w/ FRB disk            | Gas        |            |            |            |            |            |            |
| A-6 Sta-Kul, FRB disk              | Gas        |            |            |            |            |            |            |
| A-4 Sta-Kul w/ FRB Disk; 3/8"      | Gas        |            |            |            |            |            |            |
| A-10 Sta-Kul w/ Scrd "B"           | Gas        |            |            |            |            |            |            |
| Sta-Kul, B disk; 3/4"              | Gas        |            |            |            |            |            |            |
| FRB WFT                            | Gas        |            |            |            |            |            |            |
| A-6 Sta-Kul, "B"                   | Gas        |            |            |            |            |            |            |
| A-6 Sta-Kul, "B" (w/liner) (Note4) | Gas        |            |            |            |            |            |            |
| A-19 Sta-Kul w/ Scored "B" (Note4) | Gas        |            |            |            |            |            |            |
| FRB w/ 3/4" San'y Conn             | Gas/Liquid |            |            |            |            |            |            |
| 1" Welded FRB w/ 1/2" VCR Conn.    | Gas        |            |            |            |            |            |            |