

- **Caution** Section 192.195 (b) (1) of the DOT Code Part 192 specifies..."Pressure regulation devices capable of meeting the pressure (conditions)...that will be experienced in normal operation...and in the event of failure of some portion of the system..." ASME Guide for Gas Piping Systems - 1973, defines 5 pressure ratings for regulators. The pressure ratings herein conform to these definitions. The pressure ratings listed are maximum conditions. The regulator bulletin must be referenced for orifice vs inlet pressure vs outlet pressure for recommended operating pressures.

REVISIONS

Revision	Date	Description
1	December 2019	This document was modified to include pressure rating types and descriptions, and new notes in Maximum Operating Inlet Pressure (PSIG) and Maximum Operating Outlet Pressure (PSIG) tables.

ROOTS Regulators defines pressure ratings as:

- Max Operating Inlet Pressure-** The maximum inlet pressure at which the regulator will perform in accordance with manufacturer's specifications. Under abnormal conditions where the maximum operating pressure is exceeded, the regulator internals will operate as expected and will not be compromised but the accuracy of the regulator's control performance such as high lockup, higher relief buildup pressures and a change in spring ranges will occur. As inlet pressure returns to the maximum operating pressure, the regulator's accuracy will be restored.
- Emergency Inlet pressure** - The maximum pressure to which the inlet may be subjected under abnormal conditions without causing regulator damage. Exceeding the Emergency Pressure will cause damage to the internal components of the regulator, rendering the regulator not acceptable for use and should be replaced.
- Max Operating Outlet pressure** - The maximum outlet pressure to which the regulator will perform in accordance with the manufacturer's specifications. If exceeded, the performance of the regulator will be affected with issues such as high lockup, lower capacity, higher relief buildup pressures and a change in spring ranges.
- Emergency Outlet pressure** - The maximum pressure to which the outlet may be subjected under abnormal conditions, without bursting or leakage. Normal relief action is not included in leakage. Damage to internal components can occur at this pressure, rendering the regulator not acceptable for use and should be replaced.
- Containment/No Damage pressure** - The maximum outlet pressure which can be safely contained by pressure carrying components such as diaphragm cases, actuators, pilots, and control lines (and others). If outlet pressure goes above this pressure but less than emergency pressure, the regulator should be carefully examined to determine if damage has occurred.

Regulator pressure ratings in this document include ROOTS B42, B31, B34S, B34, B38, B531, B838, CL31, CL34, CL38, CL838, B36, B35, and B56 regulators.

B42 N, R

Do not operate the "N" regulator above 60 PSIG without additional safety equipment. Internal relief and internal monitor regulators can be used up to 125 PSIG.

Maximum Operating Inlet Pressure (PSIG)

B42 Model Series	Type of Reg. PSIG to	Orifice Size						Notes
		1/8"	3/16"	1/4"	5/16"	3/8"	1/2"	
N, R	in. w.c.	125	125	60	35	20	10	Operating
		300	200	150	100	75	40	Emergency
	PSIG	125	125	60	35	20	10	Operating
		300	200	150	100	75	40	Emergency

Operating Outlet Pressure Range: 5" w.c. - 5 PSIG

Does not include normal relief function.

Maximum Operating Outlet Pressure (PSIG)

B42 Model Series	Type of Reg. PSIG to	Orifice Size						Notes
		1/8"	3/16"	1/4"	5/16"	3/8"	1/2"	
N, R	in. w.c.	60PSIG						Emergency
		30 PSIG						Containment-No Damage
	PSIG	60 PSIG						Emergency
		30 PSIG						Containment-No Damage

B31 N, R, RAS, IMN, AND IMR

Do not operate the "N" regulator above 60 PSIG without additional safety equipment. Internal relief and internal monitor regulators can be used up to 125 PSIG.

Maximum Operating Inlet Pressure (PSIG)

B31 Model Series	Type of Reg. PSIG to	Orifice Size						Notes
		1/8"	3/16"	1/4"	5/16"	3/8"	1/2"	
N, R, RAS, IMN, IMR	in. w.c.	125	125	125	100	65	40	Operating
		300	300	300	150	150	100	Emergency
	PSIG	175	175	125	100	60	40	Operating
		300	300	300	150	150	100	Emergency

Operating Outlet Pressure Range: 5" w.c. - 2 PSIG

Maximum Operating Outlet Pressure (PSIG)

Does not include normal relief function.

B31 Model Series	Type of Reg. PSIG to	Orifice Size						Notes
		1/8"	3/16"	1/4"	5/16"	3/8"	1/2"	
N, R, RAS, IMN, IMR	in.w.c.	60PSIG						Emergency
		18 PSIG						Containment-No Damage
	PSIG	60 PSIG						Emergency
		60 PSIG						Containment-No Damage

B34 SN AND SR

Do not operate the "N" regulator above 60 PSIG without additional safety equipment. Internal relief and internal monitor regulators can be used up to 125 PSIG.

Maximum Operating Inlet Pressure (PSIG)

B34 Model Series	Type of Reg. PSIG to	Orifice Size						Notes
		1/4 x 3/8"	3/8 x 1/2"	1/2 x 5/8"	5/8 x 3/4"	3/4 x 7/8"	7/8 x 1"	
N, R	in. w.c.	125	60	25	15	10	10	Operating
		150	150	100	60	40	40	Emergency
	PSIG	125	60	25	15	10	10	Operating
		150	150	100	60	40	40	Emergency

Operating Outlet Pressure Range: 5" w.c. - 2 PSIG

Maximum Operating Outlet Pressure (PSIG)

Does not include normal relief function.

B34S Model Series	Type of Reg. PSIG to	Orifice Size						Notes
		1/4 x 3/8"	3/8 x 1/2"	1/2 x 5/8"	5/8 x 3/4"	3/4 x 7/8"	7/8 x 1"	
N, R	in. w.c.	60PSIG						Emergency
		18 PSIG						Containment-No Damage
	PSIG	60 PSIG						Emergency
		60 PSIG						Containment-No Damage

B34 N, R, M, D, SO, IM, AND IMRV

(a) Part 192-197 (6) C for inlet pressure above 60 PSIG; (b) "M" used as a monitor regulator, both ratings apply to inlet and valve body outlet up to stem seal.

Maximum Operating Inlet Pressure (PSIG)

B34 Model Series	Type of Reg. PSIG to	Orifice Size							Notes
		1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	7/8 x 1"	
N, R, SO, IM,	in. w.c.	125	125	75	60	60	60	25	Operating
		300	300	300	300	300	230	170	Emergency
M, D (b)	in. w.c.	175	125	125	125	100	100	100	Operating
		300	300	300	300	300	230	170	Emergency
All series (b)	PSIG	175	175	150	150	150	150	150	Operating
		300	300	300	300	300	230	170	Emergency

Operating Outlet Pressure Range: 5" w.c. - 5.75 PSIG

Maximum Operating Outlet Pressure (PSIG)

Does not include normal relief function.

B34 Model Series	Type of Reg. PSIG to	Orifice Size							Notes
		1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	7/8 x 1"	
All series	in. w.c.	60 PSIG							Emergency
		60 PSIG							Containment-No Damage
	PSIG	60 PSIG							Emergency
		60 PSIG							Containment-No Damage

B38 N, R, M, D, IM, IMR, AND IMRV

(a) Part 192-197 (6) C for inlet pressure above 60 PSIG; (b) "M" used as a monitor regulator, both ratings apply to inlet and valve body outlet up to stem seal.

Maximum Operating Inlet Pressure (PSIG)

B38 Model Series	Type of Reg. PSIG to	Orifice Size							Notes	
		3/8"	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"		
N, R (a)	in. w.c.	125	125	75	60	65	40	25	Operating	
		300	300	300	300	170	125	100	Emergency	
M, D (b)		175	125	125	125	100	75	50	Operating	
		300	300	300	300	170	125	100	Emergency	
IM, IMR		125	125	60	60	30	--	--	Operating	
		300	300	300	300	170	--	--	Emergency	
All series (b)		PSIG	175	175	150	150	100	75	50	Operating
			300	300	300	300	170	125	100	Emergency

Maximum emergency outlet pressure - containment does not include relief action on "R" models.

Operating Outlet Pressure Range: 5" w.c. - 8.7 PSIG

Maximum Operating Inlet Pressure (PSIG)

B38 Model Series	Type of Reg. PSIG to	Orifice Size						Notes
		3/8"	1/2"	5/8"	3/4"	1"	1-1/4"	
All series	in. w.c.	8.7 PSIG						Emergency
		30 PSIG						Containment-No Damage
	PSIG	8.7 PSIG						Emergency
		30 PSIG						Containment-No Damage

B531 N, R, IM, IMR, AND IMRV

Do not operate the "N" regulator above 60 PSIG without additional safety equipment.

Internal relief and internal monitor regulators can be used up to 125 PSIG.

Maximum Operating Inlet Pressure (PSIG)

B531 Model Series	Type of Reg. PSIG to	Orifice Size						Notes
		1/8"	3/16"	1/4"	5/16"	3/8"	1/2"	
N, R IM	in. w.c.	125	125	125	75	60	30	Operating
		300	300	300	150	150	100	Emergency
	in. w.c.	125	125	60	60	--	--	Operating
		300	200	300	150	--	--	Emergency

Operating Outlet Pressure Range: 5" w.c. - 2.0 PSIG

Maximum Operating Outlet Pressure (PSIG)

Does not include normal relief function.

B531 Model Series	Type of Reg. PSIG to	Orifice Size						Notes
		1/8"	3/16"	1/4"	5/16"	3/8"	1/2"	
N, R IM	in. w.c.	60PSIG						Emergency
		60 PSIG						Containment-No Damage
	in. w.c.	60 PSIG						Emergency
		60 PSIG						Containment-No Damage

B838 N, R, M, D, IM, IMR, AND IMRV

"M" used as a monitor regulator. Both ratings apply to inlet and outlet valve body, up to the stem seal.

Maximum emergency outlet pressure - containment (does not include relief action of "R" models).

Maximum Operating Inlet Pressure (PSIG)

B838 Model Series	Type of Reg. PSIG to	Orifice Size							Notes
		3/8"	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	
N, R	in. w.c.	125	125	75	60	60	40	25	Operating
		300	300	300	300	175	125	100	Emergency
M, D	in. w.c.	175	125	125	125	100	75	50	Operating
		300	300	300	300	170	125	100	Emergency
IM	in. w.c.	125	125	60	60	30	--	--	Operating
		300	300	300	300	170	--	--	Emergency
All series	PSIG	175	175	150	150	100	75	50	Operating
		300	300	300	300	170	125	100	Emergency

Operating Outlet Pressure Range: 5" w.c. - 8.7 PSIG

Maximum Operating Outlet Pressure (PSIG)

Does not include normal relief function.

B838 Model Series	Type of Reg. PSIG to	Orifice Size							Notes
		3/8"	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	
All series	in. w.c.	30 PSIG							Emergency -
		30 PSIG							Containment-No Damage
	PSIG	30 PSIG							Emergency
		30 PSIG							Containment-No Damage

CL31 N, R, IM, IMN AND IMR

If inlet pressure exceeds 60 PSIG, use additional safety equipment to ensure outlet pressures do not exceed 60 PSIG.

Maximum Operating Inlet Pressure (PSIG)

CL31 Model Series	Type of Reg. PSIG to	Orifice Size				Notes
		1/8"	3/16"	1/4"	5/16"	
All series	PSIG	125	125	125	60	Operating
		175	175	175	90	Emergency

Operating Outlet Pressure Range: 1 PSIG to 20 PSIG

Maximum Operating Outlet Pressure (PSIG)

Does not include pilot internal relief valve action.

CL31 Model Series	Type of Reg. PSIG to	Orifice Size				Notes
		1/8"	3/16"	1/4"	3/8"	
All series	in. w.c.	60 PSIG				Emergency
		60 PSIG				Containment-No Damage
	PSIG	60 PSIG				Emergency
		60 PSIG				Containment-No Damage

CL34 M, D, N, R, IM, IMN, AND IMR

*The maximum emergency inlet pressure is based on 75% of twice the differential pressure shown in the Main Regulator Closing Spring Data.

Inlet pressures must never exceed 300 PSIG.

Maximum Operating Inlet Pressure (PSIG)

CL34 Model Series	Type of Reg. PSIG to	Orifice Size						Notes
		1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	
M-1	in. w.c.	175	175	175	175	175	175	Operating
		*See notes.						Emergency
D-1	in. w.c.	175	125	125	100	100	100	Operating
		See notes.						Emergency
M-1 and 2 D-1 and 2	PSIG	175	175	175	175	175	175	Operating
		See notes.						Emergency
IM-1	in. w.c.	100	100	75	50	50	N/A	Operating
		See notes.						Emergency
IM 1 and 2	PSIG	150	150	150	150	75	N/A	Operating
		See notes.						Emergency

Operating Outlet Pressure Range: CL-1 pilot = 5" w.c. - 5 PSIG

CL-2 pilot = 5 PSIG - 60 PSIG

Does not include pilot internal relief valve relief action.

Maximum Operating Outlet Pressure (PSIG)

CL34 Model Series	Type of Reg. PSIG to	Orifice Size						Notes
		1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	
All series	in. w.c.	66 PSIG						Emergency
		66 PSIG						Containment-No Damage
	PSIG	66 PSIG						Emergency
		66 PSIG						Containment-No Damage

CL38 N, R, IM, IMN, AND IMR

*The emergency inlet pressure is based on 75% of twice the differential shown in the Main Regulator Closing Spring Data.

Do not exceed inlet pressures of 200 PSIG.

Itron tests each regulator at 90 PSIG on the outlet side based on the same test requirement for meter (192.359) manufacturers shell test pressure. Normal burst pressure is 120 - 130 PSIG.

Maximum Operating Inlet Pressure (PSIG)

CL38 Model Series	Type of Reg. PSIG to	Orifice Size							Notes
		3/8"	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	
All series	in. w.c.	125	125	125	125	75	60	50	Operating
		*See notes.							Emergency
	PSIG	125	125	125	125	100	75	75	Operating
		*See notes.							Emergency

Operating Outlet Pressure Range:

CL-1 pilot = 5" w.c. - 5 PSIG

CL-2 pilot = 5 PSIG - 30 PSIG

Maximum Operating Outlet Pressure (PSIG)

Does not include pilot internal relief valve relief action.

CL38 Model Series	Type of Reg. PSIG to	Orifice Size							Notes
		3/8"	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	
All series	in. w.c.	40 PSIG							Emergency
		40 PSIG							Containment-No Damage
	PSIG	40 PSIG							Emergency
		40 PSIG							Containment-No Damage

CL838 N, R, IM, IMN, AND IMR

*The emergency inlet pressure is based on 75% of twice the differential shown in the Main Regulator Closing Spring Data.

Do not exceed inlet pressures of 200 PSIG.

Itron tests each regulator at 90 PSIG on the outlet side based on the same test requirement for meter (192.359) manufacturers shell test pressure. Normal burst pressure is 120 - 130 PSIG.

Maximum Operating Inlet Pressure (PSIG)

CL838 Model Series	Type of Reg. PSIG to	Orifice Size							Notes
		3/8"	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	
All series	in. w.c.	125	125	125	125	75	60	50	Operating
		*See notes.							Emergency
	PSIG	125	125	125	125	100	75	75	Operating
		*See notes.							Emergency

Operating Outlet Pressure Range: CL-1 pilot = 5" w.c. - 5 PSIG
 CL-2 pilot = 5 PSIG - 30 PSIG

Does not include pilot internal relief valve relief action.

Maximum Operating Outlet Pressure (PSIG)

CL838 Model Series	Type of Reg. PSIG to	Orifice Size							Notes
		3/8"	1/2"	5/8"	3/4"	1"	1-1/4"	1-3/8"	
All series	in. w.c.	40 PSIG							Emergency
		40 PSIG							Containment-No Damage
	PSIG	40 PSIG							Emergency
		40 PSIG							Containment-No Damage

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