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July 22, 2019

IMPORTANT PRODUCT SERVICE BULLETIN

PRODUCT TYPE SERIES COVERED BY BULLETIN

Brand: Crosby
Models: JBS-E, JLT JBS-E, JBSBP-E, JLT JBSBP-E, JBS, JLT JBS, JBSBP, JLT JBSBP
Orifice sizes: D, E, G, H, J, K, L, M, N, P, Q, R, T and T2

PRODUCTION DATES

Product manufactured prior to July 22nd, 2019

BACKGROUND

As a result of an engineering product review, Emerson Automation Solutions Final Control (Crosby) has recently re-evaluated the flow capacity of the J-series valves with a bellows configuration, that is used in gas or gas/liquid mixture services, and where there is back pressure in the discharge piping. Our evaluation showed that under certain conditions, the back pressure correction factor (K_b) values may be lower than those published in the Pressure Relief Valve Engineering Handbook (Technical Publication No. TP-V300) and used in PRV2SIZE software. The valve will open at the set pressure and, based on our testing, will flow a portion of the expected capacity at the selected overpressures (See CAPACITY ADJUSTMENT). The valve will always obtain the expected capacity at an overpressure of between 16% and 21% for all cases except for the J and R orifice valves. The J orifice valves will always obtain their expected capacity at an overpressure of 25% and the R orifice valves will always obtain its expected capacity at an overpressure of 35%.

The cause for this potential non-conformance is the spring used in these valves. The spring selection tables for the bellows configurations specified springs with spring rates which may be higher than what we have now found to be required.

RECOMMENDATION

If you have a pressure relief valve model listed above along with service conditions similar to that described in the CAPACITY ADJUSTMENT section shown below, we recommend that you check your required capacity versus the adjusted flow capacity to determine the amount of conservatism in each installation. In some cases, you may need to change out the springs to meet your requirement. See NO CHARGE REPLACEMENT PARTS section below for replacement parts.

Replace the valve spring if you have determined your application requires additional flow capacity to meet the required capacity.

Replace the valve spring for valves where "X" appears in Table 1, Table 2 and Table 3, if the additional overpressure to obtain the expected capacity is not acceptable.

CAPACITY ADJUSTMENT

The performance of the products covered in this bulletin are affected as outlined below.

The expected capacity, that was calculated using the back pressure correction factor (K_b) currently published in the Pressure Relief Valve Engineering Handbook (Technical Publication No. TP-V300) and also used in PRV2SIZE software, is to be adjusted by the capacity adjustment factor in Table 1, Table 2 and Table 3, when the combination of valve and operational characteristics listed below are satisfied.

a) Model designation – with bellows configuration,
b) Gas or gas/liquid mixture service (steam service and liquid service are not impacted)
c) Orifice of the valve,
d) Overpressure percentage – as originally sized (as percent of the set pressure),
e) Set pressure, and
f) Total back pressure percentage in the application (total of built-up and superimposed back pressures – as percent of the set pressure)

The capacity adjustment factor obtained from Table 1, Table 2 or Table 3 should be applied to the expected capacity calculated using the published K_b values and process parameters, to obtain the new adjusted capacity. This new adjusted capacity should be checked against the required capacity of the system for applications with back pressure in the discharge piping.

For valves set below 30psig, obtain the capacity adjustment factor corresponding to the valve orifice from Table 1. This capacity adjustment factor should be applied to the expected capacity calculated using the published K_b values and process parameters, to obtain the new adjusted capacity for single valve and multi valve applications.

Table 1 – Capacity adjustment at 10% overpressure condition or set pressures below 30 psig

Model Designations: JBS-E, JLT JBS-E, JBSBP-E, JLT JBSBP-E, JBS, JLT JBS, JBSBP, JLT JBSBP

	@ 10% Overpressure condition or set pressures below 30psig														
	Orifice	**D** [2]	**E** [2]	**F**	**G** [2]	**H** [2]	**J** [3]	**K** [2]	**L** [1]	**M** [2]	**N** [1]	**P** [2]	**Q** [1]	**R** [4]	**T** [2]	**T2** [2]
	Set Pressures	**15 - 500**	**15 - 500**		**15 - 300**	**15 - 500**	**15 - 300**	**15 - 400**	**15 - 100**	**15 - 200**	**15 - 150**	**15 - 150**	**15 - 150**	**15 - 150**	**15 - 50**	**15 - 50**
Total Backpressure %	0%	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	10%	M	M	M	M	M	M	M	M	M	M	M	M	0.88	0.94	0.94
	20%	M	M	M	M	M	M	M	M	0.93	M	M	0.91	0.77	0.87	0.87
	30%	0.87	0.87	M	0.86	0.42	X	0.94	M	0.77	M	M	0.91	0.65	0.84	0.84
	40%	0.53	0.53	M	0.40	X	X	0.84	M	0.59	0.94	0.90	0.94	0.53	0.88	0.88
	50%	X	X	M	0.40	X	X	0.65	0.91	X	0.86	0.82	M	X	0.88	0.88
	60%	X	X	M	X	X	X	0.40	0.88	X	0.73	0.66	M	X	0.93	0.93

Table 1 notes:

M Capacity meets expected values

X Capacity adjustment factor not available at 10% overpressure condition. Replace the valve spring.

[1] Valves will flow expected capacity at overpressure equal to 16% in same condition

[2] Valves will flow expected capacity at overpressure equal to 21% in same condition

[3] Valves will flow expected capacity at overpressure no more than 25% in same condition

[4] Valves will flow expected capacity at overpressure no more than 35% in same condition

- Valves set below 30psig will flow expected capacity at overpressure of 5psig over the set pressure
- The inlet and outlet sizes for each orifice do not affect the capacity adjustment factors. For example, under the same conditions, 1.5H3 has the same capacity adjustment factor as 2H3.
- For total back pressure percentages that fall between the given values, use an interpolated adjustment factor where M = 1.0. If interpolating between a number and X, replace the valve spring.

Table 2 - Capacity adjustment at 16% overpressure condition

Model Designations: JBS-E, JLT JBS-E, JBSBP-E, JLT JBSBP-E, JBS, JLT JBS, JBSBP, JLT JBSBP

	@ 16% Overpressure condition														
	Orifice	**D** [1]	**E** [1]	**F**	**G** [1]	**H** [1]	**J** [2]	**K** [1]	**L**	**M** [1]	**N**	**P** [1]	**Q**	**R** [3]	**T** [1]	**T2** [1]
	Set Pressures	**30 - 280**	**30 - 280**		**30 - 100**	**30 - 300**	**30 - 300**	**30 - 100**		**30 - 200**		**30 - 100**	**30 - 100**	**30 - 100**	**30 - 50**	**30 - 50**
Total Backpressure %	0%	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	10%	M	M	M	M	M	M	M	M	M	M	M	M	0.93	M	M
	20%	M	M	M	M	M	M	M	M	M	M	M	M	0.88	0.90	0.90
	30%	M	M	M	M	M	X	M	M	0.90	M	M	M	0.80	0.86	0.86
	40%	M	M	M	0.93	M	X	M	M	0.81	M	M	M	0.77	0.91	0.91
	50%	0.62	0.62	M	0.89	0.49	X	M	M	0.70	M	M	M	0.72	0.92	0.92
	60%	X	X	M	0.80	X	X	0.93	M	0.52	M	0.91	M	0.62	M	M

Table 2 notes:

M Capacity meets expected values

X Capacity adjustment factor not available at 16% overpressure condition. Replace the valve spring.

[1] Valves will flow expected capacity at overpressure equal to 21% in same condition

[2] Valves will flow expected capacity at overpressure no more than 25% in same condition

[3] Valves will flow expected capacity at overpressure no more than 35% in same condition

- The inlet and outlet sizes for each orifice do not affect the capacity adjustment factors. For example, under the same conditions, 1.5H3 has the same capacity adjustment factor as 2H3.
- For total back pressure percentages that fall between the given values, use an interpolated adjustment factor where M = 1.0. If interpolating between a number and X, replace the valve spring.
- For valves with set pressure below 30 psig, use Table 1 to obtain the capacity adjustment factor

Table 3 - Capacity adjustment at 21% overpressure condition

Model Designations: JBS-E, JLT JBS-E, JBSBP-E, JLT JBSBP-E, JBS, JLT JBS, JBSBP, JLT JBSBP

	@ 21% Overpressure condition															
	Orifice	**D**	**E**	**F**	**G**	**H**	**J** [1]	**K**	**L**	**M**	**N**	**P**	**Q**	**R** [2]	**T**	**T2**
	Set Pressures						**30 - 300**							**30 - 100**		
Total Backpressure %	0%	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	10%	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	20%	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	30%	M	M	M	M	M	X	M	M	M	M	M	M	0.91	M	M
	40%	M	M	M	M	M	X	M	M	M	M	M	M	0.93	M	M
	50%	M	M	M	M	M	X	M	M	M	M	M	M	0.93	M	M
	60%	M	M	M	M	M	X	M	M	M	M	M	M	M	M	M

Table 3 notes:

M Capacity meets expected values

X Capacity adjustment factor not available at 21% overpressure condition. Replace the valve spring.

[1] Valves will flow expected capacity at overpressure no more than 25% in same condition

[2] Valves will flow expected capacity at overpressure no more than 35% in same condition

- The inlet and outlet sizes for each orifice do not affect the capacity adjustment factors. For example, under the same conditions, 1.5H3 has the same capacity adjustment factor as 2H3
- For total back pressure percentages that fall between the given values, use an interpolated adjustment factor where M = 1.0. If interpolating between a number and X, replace the valve spring.
- For valves with set pressure below 30 psig, use Table 1 to obtain the capacity adjustment factor

NO CHARGE REPLACEMENT PARTS

If you need to replace the springs to meet your application requirements, contact your local Emerson sales office / Impact Partner / Local Business Partner listed in the attached report for a no-charge spring replacement kit (spring, spring washers, gaskets, adjusting bolt [if required]). Please have the following information ready so we can verify applicability and arrange for the shipment of the proper replacements.

a) Model number
b) Serial number
c) Valve shop or assembly number
d) Set pressure
e) Total backpressure
f) Spring material
g) Gasket material
h) Manufacturer's and/or assembler's name
i) Customer name
j) Plant location
k) PSV tag number
l) Requested by (name of company)
m) Customer shipping address

Figure 1: Nameplate Information