



THE NATIONAL BOARD

OF BOILER AND PRESSURE VESSEL INSPECTORS

November 7, 2018

David Jones
Engineered Controls International, LLC
100 Rego Drive
Elon, NC 27244

Subject: Capacity Certification, Valve Type: A3149 (20% OP)
NB Cap Cert. No.: REG-M46291

Dear Mr. Jones:

We have reviewed the enclosed test results, referenced below, which were performed at the **National Board Testing Laboratory** on November 6, 2018 for the purpose of testing for capacity certification of the subject valve type as required by paragraph UG-136(c)(3) of Section VIII of the ASME Code.

Engineered Controls International, LLC is hereby granted capacity certification and authorization to apply the “NB” mark and ASME Certification mark with “UV” designator to the valve type listed in the scope of certification. This authorization is valid only for the above location and only while the organization is fully implementing its quality control system as accepted by the National Board.

SCOPE OF CERTIFICATION

Valve Type: A3149 (20% OP)

Organization Type: Manufacturer

Certified Rating Value/Sizes/Pressure Ranges: As listed in the NB-18

Certification Expiration Date: March 6, 2025

Sincerely,

Thomas P. Beirne, P.E.
Technical Manager, Pressure Relief Dept.

REFERENCING TEST NUMBERS: 48475A, 48477A, 48478A, 48476A, 48542A, 48545A
File:GF: 181107 REG-M46291 Pass

National Board Testing Laboratory

Nitrogen Test - Orifice Plate Flow Meter Method

Valve ID Data		Revision 2.4
1	Test Number	48475A
2	Test Sponsor	Engineered Controls International, LLC
3	Company Type	Manufacturer
4	Test Date	10/30/2018
5	Valve Type	A3149
6	Manufacturer	Engineered Controls International, LLC
7	Cap. Cert. ID No.	46291
8	Set Pressure	150 psig
9	Inlet Size	2 1/2 M
10	Outlet Size	Top
11	Stamped Capacity	6359. SCFM
12	Code Section	VIII
13	Serial Number	
14	Date Code	03B18
Operational Data and Measured Dimensions		
15	Warn Pressure	psig
16	Set Pressure	172.2 psig
17	Reset Set Pressure	psig
18	Blowdown	psi
19	Reset Blowdown	psi
20	Bore Diameter	1.640 inch
21	Lift	inch
Measured Data		
22	Flow Area	in ²
23	Line Pressure	psig
24	Differential Pressure	psid
25	Line Temp.	°F
26	Vessel Pressure	psig
27	Vessel Temp.	°F
28	P _b	14.34 psia
29	Plate ID Number	
Calculated Data		
	Line Pressure (absolute)	14.342 psia
32	Density @ Flow Condition _(w)	lbm/ft ³
33	Area Factor _(Fa)	
34	Trial Flow Rate	lbm/sec
35	Viscosity	lbm/ft-sec
36	Reynolds Number RD	
37	Theoretical Capacity _(WT)	
	WT=CKAP√M/T	#VALUE!
38	Measured Capacity at Std. Cond.	lbm/hr N2
39	Measured Capacity at Std. Cond.	SCFM AIR
40	Slope	SCFM/PSIA
41	Coefficient	
42	Rated Capacity For Measured Set	SCFM
43	Rated Slope	
44		

National Board Testing Laboratory

Air Test - Orifice Plate Method: Test Summary

Test Summary for test 48475A:

1. Valve tested for 6 Year Capacity Recertification as a Manufacturer.
2. Valve set pressure is above +10% tolerance

I certify that the data on the attached test data sheets was obtained under my supervision in accordance with the provisions of ASME PTC 25, the applicable sections of the ASME Boiler and Pressure Vessel Code, and the National Board Testing Laboratory Quality Control Manual. To the best of my knowledge and belief the objects tested were of the same type and design as indicated.

RYAN FORD
Authorized Observer: Ryan Ford

10-30-16
Date

Test Personnel

Company Representatives

Steve Bowman
Ryan Ford

National Board Testing Laboratory

Nitrogen Test - Orifice Plate Flow Meter Method

Valve ID Data		Revision 2.4	
1	Test Number	48476A	
2	Test Sponsor	Engineered Controls International, LLC	
3	Company Type	Manufacturer	Elon, NC
4	Test Date	10/30/2018	REG
5	Valve Type	A3149	
6	Manufacturer	Engineered Controls International, LLC	
7	Cap. Cert. ID No.	46291	
8	Set Pressure	150 psig	
9	Inlet Size	2 1/2 M	
10	Outlet Size	Top	
11	Stamped Capacity	6359. SCFM	
12	Code Section	VIII	
13	Serial Number		
14	Date Code	03B18	
Operational Data and Measured Dimensions			
15	Warn Pressure	161.7	psig
16	Set Pressure	163.5	psig
17	Reset Set Pressure		psig
18	Blowdown	44.8	psi
19	Reset Blowdown		psi
20	Bore Diameter	1.640	inch
21	Lift		inch
Measured Data			
22	Flow Area	2.11241	in ²
23	Line Pressure	187.7	psig
24	Differential Pressure	6.21	psid
25	Line Temp.	26	°F
26	Vessel Pressure	179.9	psig
27	Vessel Temp.	44	°F
28	P _b	14.34	psia
29	Plate ID Number	8	2.87 Plate Dia.
Calculated Data			
	Line Pressure (absolute)	202.036	psia
32	Density @ Flow Condition _(w)	1.0921	lbm/ft ³
33	Area Factor _(Fa)	0.999341	
34	Trial Flow Rate	8.5471	lbm/sec
35	Viscosity	1.1058E-05	lbm/ft-sec
36	Reynolds Number RD	3,258,798	
37	Theoretical Capacity _(WT)		
	WT=CKAP√M/T	34,422.6	lbm/hr N2
38	Measured Capacity at Std. Cond.	30,769.5	lbm/hr N2
39	Measured Capacity at Std. Cond.	6830.0	SCFM AIR
40	Slope	35.163	SCFM/PSIA
41	Coefficient	0.89387	
42	Rated Capacity For Measured Set	6343.7	SCFM
43	Rated Slope	32.66	
44			

National Board Testing Laboratory

Air Test - Orifice Plate Method: Test Summary

Test Summary for test 48476A:

1. Valve tested for 6 Year Capacity Recertification as a Manufacturer.
2. Valve tested as replacement for test number 48475A tested at The National Board Testing Lab.

I certify that the data on the attached test data sheets was obtained under my supervision in accordance with the provisions of ASME PTC 25, the applicable sections of the ASME Boiler and Pressure Vessel Code, and the National Board Testing Laboratory Quality Control Manual. To the best of my knowledge and belief the objects tested were of the same type and design as indicated.

RYAN FORD
Authorized Observer: Ryan Ford

10-30-18
Date

Test Personnel

Company Representatives

Tim Brown
Steve Bowman
Ryan Ford

National Board Testing Laboratory

Nitrogen Test - Orifice Plate Flow Meter Method

Valve ID Data		Revision 2.4	
1	Test Number	48478A	
2	Test Sponsor	Engineered Controls International, LLC	
3	Company Type	Manufacturer	Elon, NC
4	Test Date	10/30/2018	REG
5	Valve Type	A3149A150	
6	Manufacturer	Engineered Controls International, LLC	
7	Cap. Cert. ID No.	46291	
8	Set Pressure	150 psig	
9	Inlet Size	2 1/2 M	
10	Outlet Size	Top	
11	Stamped Capacity	6359 SCFM	
12	Code Section	VIII	
13	Serial Number		
14	Date Code	03B18	
Operational Data and Measured Dimensions			
15	Warn Pressure		psig
16	Set Pressure	165.4	psig
17	Reset Set Pressure		psig
18	Blowdown	41.2	psi
19	Reset Blowdown		psi
20	Bore Diameter	1.637	inch
21	Lift		inch
Measured Data			
22	Flow Area	2.10469	in ²
23	Line Pressure	187.6	psig
24	Differential Pressure	6.10	psid
25	Line Temp.	37	°F
26	Vessel Pressure	179.9	psig
27	Vessel Temp.	51	°F
28	P _b	14.31	psia
29	Plate ID Number	8	2.87 Plate Dia.
Calculated Data			
	Line Pressure (absolute)	201.912	psia
32	Density @ Flow Condition _(w)	1.0667	lbm/ft ³
33	Area Factor _(Fa)	0.999510	
34	Trial Flow Rate	8.3753	lbm/sec
35	Viscosity	1.1245E-05	lbm/ft-sec
36	Reynolds Number RD	3,139,991	
37	Theoretical Capacity _(WT)		
	WT=CKAP√M/T	34,058.7	lbm/hr N2
38	Measured Capacity at Std. Cond.	30,151.0	lbm/hr N2
39	Measured Capacity at Std. Cond.	6692.7	SCFM AIR
40	Slope	34.461	SCFM/PSIA
41	Coefficient	0.88526	
42	Rated Capacity For Measured Set	6343.0	SCFM
43	Rated Slope	32.66	
44			

National Board Testing Laboratory

Air Test - Orifice Plate Method: Test Summary

Test Summary for test 48478A:

1. Valve tested for 6 Year Capacity Recertification as a Manufacturer.
2. Valve tested as replacement for test number 48475A tested at The National Board Testing Lab.

I certify that the data on the attached test data sheets was obtained under my supervision in accordance with the provisions of ASME PTC 25, the applicable sections of the ASME Boiler and Pressure Vessel Code, and the National Board Testing Laboratory Quality Control Manual. To the best of my knowledge and belief the objects tested were of the same type and design as indicated.

RYAN FORD
Authorized Observer: Ryan Ford

10-30-18
Date

Test Personnel

Company Representatives

Steve Bowman
Ryan Ford

National Board Testing Laboratory

Nitrogen Test - Orifice Plate Flow Meter Method

Valve ID Data		Revision 2.4	
1	Test Number	48477A	
2	Test Sponsor	Engineered Controls International, LLC	
3	Company Type	Manufacturer	Elon, NC
4	Test Date	10/30/2018	REG
5	Valve Type	A3149A150	
6	Manufacturer	Engineered Controls International, LLC	
7	Cap. Cert. ID No.	46291	
8	Set Pressure	150 psig	
9	Inlet Size	2 1/2 M	
10	Outlet Size	Top	
11	Stamped Capacity	6359. SCFM	
12	Code Section	VIII	
13	Serial Number		
14	Date Code	03B18	
Operational Data and Measured Dimensions			
15	Warn Pressure		psig
16	Set Pressure	154.7	psig
17	Reset Set Pressure		psig
18	Blowdown		psi
19	Reset Blowdown		psi
20	Bore Diameter	1.639	inch
21	Lift		inch
Measured Data			
22	Flow Area		in ²
23	Line Pressure		psig
24	Differential Pressure		psid
25	Line Temp.		°F
26	Vessel Pressure		psig
27	Vessel Temp.		°F
28	P _b	14.32	psia
29	Plate ID Number		
Calculated Data			
	Line Pressure (absolute)	14.317	psia
32	Density @ Flow Condition _(w)		lbm/ft ³
33	Area Factor _(Fa)		
34	Trial Flow Rate		lbm/sec
35	Viscosity		lbm/ft-sec
36	Reynolds Number RD		
37	Theoretical Capacity _(WT)		
	WT=CKAP√M/T	#VALUE!	lbm/hr N2
38	Measured Capacity at Std. Cond.		lbm/hr N2
39	Measured Capacity at Std. Cond.		SCFM AIR
40	Slope		SCFM/PSIA
41	Coefficient		
42	Rated Capacity For Measured Set		SCFM
43	Rated Slope		
44			

National Board Testing Laboratory

Air Test - Orifice Plate Method: Test Summary

Test Summary for test 48477A:

1. Valve tested for 6 Year Capacity Recertification as a Manufacturer.
2. Valve failed to open at 20% over pressure of stamped set pressure.

I certify that the data on the attached test data sheets was obtained under my supervision in accordance with the provisions of ASME PTC 25, the applicable sections of the ASME Boiler and Pressure Vessel Code, and the National Board Testing Laboratory Quality Control Manual. To the best of my knowledge and belief the objects tested were of the same type and design as indicated.

RYAN FORD
Authorized Observer: Ryan Ford

10-30-18
Date

Test Personnel

Company Representatives

Steve Bowman
Ryan Ford

National Board Testing Laboratory

Nitrogen Test - Orifice Plate Flow Meter Method

Valve ID Data		Revision 2.4	
1	Test Number	48542A	
2	Test Sponsor	Engineered Controls International, LLC	
3	Company Type	Manufacturer	Elon, NC
4	Test Date	11/6/2018	REG
5	Valve Type	A3149A150	
6	Manufacturer	Engineered Controls International, LLC	
7	Cap. Cert. ID No.	46291	
8	Set Pressure	150 psig	
9	Inlet Size	2 1/2 M	
10	Outlet Size	Top	
11	Stamped Capacity	6359. SCFM	
12	Code Section	VIII	
13	Serial Number		
14	Date Code	03B18	
Operational Data and Measured Dimensions			
15	Warn Pressure		psig
16	Set Pressure	163.6	psig
17	Reset Set Pressure		psig
18	Blowdown	44.6	psi
19	Reset Blowdown		psi
20	Bore Diameter	1.642	inch
21	Lift		inch
Measured Data			
22	Flow Area	2.11756	in ²
23	Line Pressure	188.6	psig
24	Differential Pressure	6.24	psid
25	Line Temp.	41	°F
26	Vessel Pressure	180.0	psig
27	Vessel Temp.	52	°F
28	P _b	14.15	psia
29	Plate ID Number	8	2.87 Plate Dia.
Calculated Data			
	Line Pressure (absolute)	202.749	psia
32	Density @ Flow Condition _(w)	1.0625	lbm/ft ³
33	Area Factor _(Fa)	0.999570	
34	Trial Flow Rate	8.4528	lbm/sec
35	Viscosity	1.1312E-05	lbm/ft-sec
36	Reynolds Number RD	3,150,265	
37	Theoretical Capacity _(WT)		
	WT=CKAP√M/T	34,229.6	lbm/hr N2
38	Measured Capacity at Std. Cond.	30,430.1	lbm/hr N2
39	Measured Capacity at Std. Cond.	6754.6	SCFM AIR
40	Slope	34.791	SCFM/PSIA
41	Coefficient	0.88900	
42	Rated Capacity For Measured Set	6340.9	SCFM
43	Rated Slope	32.66	
44			

National Board Testing Laboratory

Air Test - Orifice Plate Method: Test Summary

Test Summary for test 48542A:

1. Valve tested for 6 Year Capacity Recertification as a Manufacturer.
2. Valve tested as replacement for test number 48477A tested at The National Board Testing Lab.

I certify that the data on the attached test data sheets was obtained under my supervision in accordance with the provisions of ASME PTC 25, the applicable sections of the ASME Boiler and Pressure Vessel Code, and the National Board Testing Laboratory Quality Control Manual. To the best of my knowledge and belief the objects tested were of the same type and design as indicated.

RYAN FORD
Authorized Observer: Ryan Ford

11-6-18
Date

Test Personnel

Company Representatives

Tim Brown
Ryan Ford

National Board Testing Laboratory

Nitrogen Test - Orifice Plate Flow Meter Method

Valve ID Data		Revision 2.4	
1	Test Number	48545A	
2	Test Sponsor	Engineered Controls International, LLC	
3	Company Type	Manufacturer	Elon, NC
4	Test Date	11/6/2018	REG
5	Valve Type	A3149A150	
6	Manufacturer	Engineered Controls International, LLC	
7	Cap. Cert. ID No.	46291	
8	Set Pressure	150 psig	
9	Inlet Size	2 1/2 M	
10	Outlet Size	Top	
11	Stamped Capacity	6359 SCFM	
12	Code Section	VIII	
13	Serial Number		
14	Date Code	03B18	
Operational Data and Measured Dimensions			
15	Warn Pressure	161.9	psig
16	Set Pressure	163.5	psig
17	Reset Set Pressure		psig
18	Blowdown	42.3	psi
19	Reset Blowdown		psi
20	Bore Diameter	1.640	inch
21	Lift		inch
Measured Data			
22	Flow Area	2.11241	in ²
23	Line Pressure	187.1	psig
24	Differential Pressure	5.72	psid
25	Line Temp.	39	°F
26	Vessel Pressure	179.7	psig
27	Vessel Temp.	53	°F
28	P _b	14.15	psia
29	Plate ID Number	8	2.87 Plate Dia.
Calculated Data			
	Line Pressure (absolute)	201.249	psia
32	Density @ Flow Condition _(w)	1.0587	lbm/ft ³
33	Area Factor _(Fa)	0.999541	
34	Trial Flow Rate	8.0861	lbm/sec
35	Viscosity	1.1280E-05	lbm/ft-sec
36	Reynolds Number RD	3,022,239	
37	Theoretical Capacity _(WT)		
	WT=CKAP√M/T	34,060.6	lbm/hr N2
38	Measured Capacity at Std. Cond.	29,110.0	lbm/hr N2
39	Measured Capacity at Std. Cond.	6461.6	SCFM AIR
40	Slope	33.333	SCFM/PSIA
41	Coefficient	0.85465	
42	Rated Capacity For Measured Set	6331.1	SCFM
43	Rated Slope	32.66	
44			

National Board Testing Laboratory

Air Test - Orifice Plate Method: Test Summary

Test Summary for test 48545A:

1. Valve tested for 6 Year Capacity Recertification as a Manufacturer.
2. Valve tested as replacement for test number 48477A tested at The National Board Testing Lab.

I certify that the data on the attached test data sheets was obtained under my supervision in accordance with the provisions of ASME PTC 25, the applicable sections of the ASME Boiler and Pressure Vessel Code, and the National Board Testing Laboratory Quality Control Manual. To the best of my knowledge and belief the objects tested were of the same type and design as indicated.

RYAN FORD
Authorized Observer: Ryan Ford

11-6-18
Date

Test Personnel

Company Representatives

Tim Brown
Ryan Ford