A-T Controls, Inc.

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Engineer: CMB **No.:** DI00039
Date Created: 01/23/2019
Date Modified: 07/01/2021

Characteristic of Test	TA-LUFT VDI 2440[4]	API 641[3]	ISO 15848-1: 2015[1] Isolating	ISO 15848-2: 2015[2]
Number of cycles, Number of Thermal Cycles	Not defined	610, 3 Cycles	Endurance Class CO1: 205 cycles, 2 thermal cycles Endurance Class CO2: 1500 cycles, 3 thermal cycles Endurance Class CO3: 2500 cycles, 4 thermal cycles	5, none
Test gas	Helium	Methane	Helium (Class AH, BH, CH) or Methane (Class AM, BM, CM)	Helium
Test Pressure Required	Nominal (Varies)	**Group A**: 600 psig at elevated and ambient temperatures **Group B: Elevated:** valve pressure rating at 260 °C **Ambient:** valve pressure rating at ambient temperature or 600 psig, whichever is less **Group C: Elevated**: 100 psig **Ambient:** valve pressure rating at ambient temperature or 600 psig, whichever is less **Group D:** 600 psig at elevated and ambient temperatures **Group E**: **Elevated:** Valve pressure rating at maximum temperature rating of valve **Ambient**: valve pressure rating at ambient temperature or 600 psig, whichever is less **Group F**: **Elevated:** 100 psig **Ambient:** valve pressure rating at ambient temperature or 600 psig, whichever is less	ASME or PN Class maximum pressure at Temperature Class	87 psi
Test Temperature	250 °C	**Group A**: **Elevated:** 260 °C **Group B: Elevated:** 260 °C **Group C: Elevated**: maximum temperature rating of the valve at 100 psig or 260 °C, whichever is less **Group D:** Maximum temperature rating of valve **Group E**: Maximum temperature rating of valve **Group F**: Maximum temperature rating of valve at 100 psig	Temperature Class (t-196 °C): -196 °C Temperature Class (t-46 °C): -46 °C Temperature Class (tRT): -29 °C to 40 °C Temperature Class (t200 °C): 200 °C Temperature Class (t400 °C): 400 °C	N/A
Allowable Leakage Rate Stem	< 250 °C : $1*10^{-4}$ mbar*l/(s*m) ≥ 250 °C : $1*10^{-2}$ mbar*l/(s*m) after 24 hours	100 ppmv	Class AH: ≤ $1.78*10^{-7}$ mbar*l/(s*mm stem diameter) Class BH: ≤ $1.78*10^{-6}$ mbar*l/(s*mm stem diameter) Class CH: ≤ $1.78*10^{-4}$ mbar*l/(s*mm stem diameter) Class AM: ≤ 50 ppmv Class BM: ≤ 100 ppmv Class CM: ≤ 500 ppmv	Class A: ≤ 50 ppmv Class B: ≤ 100 ppmv Class C: ≤ 200 ppmv
Allowable Leakage Rate Body Seals	< 250 °C : 10^{-4} mbar*l/(s*m) ≥ 250 °C : 10^{-2} mbar*l/(s*m) after 24 hours	100 ppmv	Helium: ≤ 50 ppmv Methane: ≤ 50 ppmv	≤ 50 ppmv
Packing Adjustments Allowed	Not defined	None	Endurance Class CO1: ≤ 1 Endurance Class CO2: ≤ 2 Endurance Class CO3: ≤ 3	None

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	TA-LUFT VDI 2440	API 641	ISO 15848-1 Isolating
A-T Controls, Inc. valves that meet standard	Series 22, Series 33, Series 88, Series 90, Series DR, Series 91-F1, Series 91-F3, Series D9-F1, Series D9-F3, Series D9-F6	Series F90: 1/2" - 1" Series FD9-F1: 1/2" - 1" Series TS2/TS3 Trunnions	Series F90 Series FD9-F1 Series FD9-F3 Series FD9-F6 Series F9R-F1 Series F9R-F3
Performance of valves per standard	Met leakage rate of $1*10^{-4}$ mbar*l/(s*m) after 10,000 cycles @ 63 bar (914 psi)	Class F, T_e = 425 °F, P_e = 100 psig Maximum leakage = 13 ppmv	**Series F90:** 1/2" - 1" - ISO FE BH - CO3 - SSA 2 - t200C - CL150 - ISO 15848-1 1-1/2" - 2-1/2" - ISO FE BH - CO3 - SSA 1 - t200C - CL150 - ISO 15848-1 3" - 4" - ISO FE BH - CO3 - SSA 0 - t200C - CL150 - ISO 15848-1 **Series FD9-F1:** 1/2" - 1" - ISO FE BH - CO3 - SSA 2 - t200C - CL150 - ISO 15848-1 1-1/2" - 2-1/2" - ISO FE BH - CO3 - SSA 1 - t200C - CL150 - ISO 15848-1 3" - 6" - ISO FE BH - CO3 - SSA 0 - t200C - CL150 - ISO 15848-1 **Series FD9-F3 and 1/2" - 1-1/2" Series FD9-F6:** ISO FE BH-CO2-SSA0-t200CANSI Class 600 **2" Series FD9-F6:** ISO FE CH - CO3 - SSA 0 - t200C - ANSI Class 600 - ISO 15848-1 **Series F9R-F1 and F9R-F3:** ISO FE BH - CO3 - SSA 0 - t200C - ANSI Class 300 - ISO 15848-1

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Sources

1. International Standards Organization. (2015). *Industrial Valves –Measurement, test and qualification procedures for fugitive emissions—Part 1: Classification system and qualification procedures for type testing of valves.* (ISO 15848-1 1st Edition). Geneva, Switerland: ISO.

2. International Standards Organization. (2015). *Industrial Valves –Measurement, test and qualification procedures for fugitive emissions—Part 2: Production acceptance test of valves.* (ISO 15848-2 2nd Edition). Geneva, Switerland: ISO.

3. American Petroleum Institute. (2016). *Type Testing of Quarter-turn Valves for Fugitive Emissions* (API 641 1st Edition). Washington, DC: API.

4. Verband Deutscher Ingenieure/Association of German Enginners. (2000). *Emission control- Mineral Oil refineries* (VDI 2440). Dusseldorf, Germany: VDI.