



A-T Controls, Inc.

9955 International Blvd. • Cincinnati, Ohio 45246
 Phone: 513.247.5465 Fax: 513.247.5462
 www.atcontrols.com

Engineer: CMB **No.:** DI00039
Date Created: 01/23/2019
Date Modified: 02/07/2019

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)	<p>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</p>	ASME or PN Class maximum pressure at Temperature Class	87 psi
Test Temperature	250 °C	<p>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</p>	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	$< 250\text{ °C} : 1 \cdot 10^{-4} \text{ mbar} \cdot \text{l}/(\text{s} \cdot \text{m})$ $\geq 250\text{ °C} : 1 \cdot 10^{-2} \text{ mbar} \cdot \text{l}/(\text{s} \cdot \text{m})$ after 24 hours	100 ppmv	Class AH: $\leq 1.78 \cdot 10^{-7} \text{ mbar} \cdot \text{l}/(\text{s} \cdot \text{mm stem diameter})$ Class BH: $\leq 1.78 \cdot 10^{-6} \text{ mbar} \cdot \text{l}/(\text{s} \cdot \text{mm stem diameter})$ Class CH: $\leq 1.78 \cdot 10^{-4} \text{ mbar} \cdot \text{l}/(\text{s} \cdot \text{mm stem diameter})$ Class AM: $\leq 50 \text{ ppmv}$ Class BM: $\leq 100 \text{ ppmv}$ Class CM: $\leq 500 \text{ ppmv}$	Class A: $\leq 50 \text{ ppmv}$ Class B: $\leq 100 \text{ ppmv}$ Class C: $\leq 200 \text{ ppmv}$
Allowable Leakage Rate Body Seals	$< 250\text{ °C} : 10^{-4} \text{ mbar} \cdot \text{l}/(\text{s} \cdot \text{m})$ $\geq 250\text{ °C} : 10^{-2} \text{ mbar} \cdot \text{l}/(\text{s} \cdot \text{m})$ after 24 hours	100 ppmv	Helium: $\leq 50 \text{ ppmv}$ Methane: $\leq 50 \text{ ppmv}$	$\leq 50 \text{ ppmv}$
Packing Adjustments Allowed	Not defined	None	Endurance Class CO1: ≤ 1 Endurance Class CO2: ≤ 2 Endurance Class CO3: ≤ 3	None



Manual and Automated Quarter Turn Valves
 Complete Valve and Damper Automation





A-T Controls, Inc.

9955 International Blvd. • Cincinnati, Ohio 45246
 Phone: 513.247.5465 Fax: 513.247.5462
 www.atcontrols.com

Engineer: CMB **No.:** DI00039
Date Created: 01/23/2019
Date Modified: 02/07/2019

	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 F90: 1/2" - 4" Series FD9-F1: 1/2" - 6"
Performance of valves per standard	Met leakage rate of $1 \cdot 10^{-4}$ 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



Manual and Automated Quarter Turn Valves
 Complete Valve and Damper Automation





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.