



HIGH-ALTITUDE GAS FURNACE FIELD GUIDE · UTAH

High-Altitude Gas Furnace Installation & Orifice Replacement Guide

Manufacturer Kit Requirements · Orifice Sizing · Green Sticker vs. OEM Label
Utah Service Area — Wasatch Front & Mountain Communities

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This guide is produced by Polar Breeze LLC for field technicians and homeowners in Utah. All orifice sizes, elevation triggers, and procedures are sourced directly from manufacturer installation documents and kit instructions. **Always verify against the specific model's installation manual before proceeding — the manufacturer's high-altitude data governs.**

SECTION 1 — Why High Altitude Changes Everything

Utah's Wasatch Front sits between 4,265 ft (Salt Lake City) and 4,774 ft (Orem). That elevation is not a footnote — it fundamentally changes how a gas furnace burns.

City / Area	Elevation (ft)	Derate % (4% per 1,000 ft above 2,000 ft)	80K BTU → Derated Input
Salt Lake City	~4,265	~9.1%	~72,700 BTU/hr
Sandy / South Jordan	~4,450	~9.8%	~72,100 BTU/hr
Provo	~4,551	~10.2%	~71,840 BTU/hr
Orem	~4,774	~11.1%	~71,120 BTU/hr
Logan	~4,534	~10.1%	~71,920 BTU/hr
Tooele	~5,043	~12.2%	~70,240 BTU/hr
Heber City	~5,600	~14.4%	~68,480 BTU/hr
Park City	~6,980	~19.9%	~64,080 BTU/hr
Brian Head	~9,800	~31.2%	~55,040 BTU/hr

Formula: Derate % = (Elevation – 2,000 ft) ÷ 1,000 × 4% | Source: NFPA 54 / ANSI Z223.1 (National Fuel Gas Code) §10.21 — Adjustment for Altitude. Some manufacturers certify a different derate under their CSA design certification (see Carrier/ICP below) — the manufacturer's certification governs.

What Goes Wrong Without Altitude Treatment

- **Rich Combustion / Yellow Flames:** Too much gas relative to available oxygen produces yellow, sooty flames and dangerous CO.
- **Carbon Monoxide (CO) Risk:** In our field experience, incomplete combustion at altitude is the leading source of the CO problems we find in Utah homes.
- **Heat Exchanger Damage:** Localized rich-flame impingement causes hot spots, warping, and premature cracking.
- **Pressure Switch Lockouts:** The induced-draft blower generates less negative pressure in thin air — sea-level pressure switches trip constantly.
- **Shorter Equipment Life:** Fuel-rich operation causes sooting, fouled burners, and degraded igniter/sensor performance.
- **Code Violation:** NFPA 54 §10.21 and the manufacturer's high-altitude installation instructions — adopted and enforced through IFGC §305.1 (installation per the manufacturer's instructions) — require altitude adjustment. A furnace installed above 2,000 ft without the required altitude adjustment violates those provisions.

Enbridge Gas Utah (formerly Dominion Energy, formerly Questar) has measured natural gas heat content at ~1,044–1,050 BTU/ft³ (vs. the 1,000 BTU/ft³ table standard). This richer gas does NOT cancel the altitude derate — the oxygen deficit from thin air still drives over-rich combustion regardless of fuel BTU content.

SECTION 2 — Two Adjustment Methods: Orifices vs. Manifold Pressure

Every altitude derate must be accomplished by one of two methods. They are not interchangeable, and several manufacturers explicitly prohibit one of them.

	METHOD 1 — Manifold Pressure Reduction	METHOD 2 — Orifice Replacement (Preferred)
How it works	Lower gas valve regulator to reduce flow through existing orifice	Swap standard orifices for smaller drill-size orifices at same manifold pressure
Elevation range	Generally 2,000–4,500 ft only	Any elevation; required above ~4,500 ft by most brands
Hardware change?	No — pressure adjustment only	Yes — orifices must be physically replaced
Minimum pressure	Must stay ≥ 3.0 in. W.C. (NG)	Manifold stays at rated spec (NG: 3.5 in. W.C.)
Primary air aspiration	Reduced pressure = reduced venturi effect = risk of air starvation	Full venturi effect maintained = complete combustion
Goodman/Amana?	PROHIBITED — explicitly banned in kit docs	Required method for all Goodman units
Carrier/ICP?	Yes, with manifold pressure table	Required above 2,000 ft per Table 1
Trane?	Yes, per Installer's Guide	Required; calculated per NFGC Appendix F
Rheem?	Yes, per NFGC calculation	Field-calculated; order orifices separately
York?	Yes, per unit install table	Required per unit installation manual

GOODMAN / AMANA / DAIKIN CRITICAL WARNING: "Do not derate by adjusting the manifold pressure to a lower pressure setting than specified on the furnace nameplate. A lower air density in combination with a lower manifold pressure at the burner orifice will prevent the orifice from aspirating the proper amount of air into the burner required for complete combustion." — Goodman HASFK-2 Kit Manual

Orifice Drill Size Quick Reference — Natural Gas

COUNTER-INTUITIVE: Higher drill number = SMALLER hole diameter. A #54 orifice restricts MORE flow than a #44. This is the single most common field error — always verify the number stamped on the orifice face before installation.

Drill #	Diameter (inches)	Approx. BTU/hr @ 3.5 in. W.C. (NG)	Typical Use
#43	0.0890"	~20,800	Sea level / commercial
#44	0.0860"	~19,400	Factory NG, sea level–2,000 ft (ICP/Carrier)
#45	0.0820"	~17,600	Factory NG, Goodman/Amana (0–7,000 ft)
#47	0.0785"	~16,100	Low altitude derate, some Carrier/ICP
#48	0.0760"	~15,100	Carrier/ICP 4,001–5,000 ft (1,050 BTU/ft ³)
#49	0.0730"	~13,900	Carrier/ICP 5,001–6,000 ft; Rheem ~5,000 ft
#50	0.0700"	~12,800	Rheem ~5,000–6,000 ft (low BTU gas)
#51	0.0670"	~11,700	Rheem ~4,000–5,000 ft (1,044–1,050 BTU/ft ³) ← UTAH
#52	0.0635"	~10,500	Lennox unit heaters 7,001–10,000 ft
#54	0.0550"	~7,900	First Co. HA units 4,501–8,000 ft
#56	0.0465"	~5,400	LP gas conversions, high altitude

Sources: Century HVAC Distributing Orifice Flow Chart (used with attribution); manufacturer kit documents. Note: orifice flow scales with orifice area (diameter squared) — the #43 value here is computed on that basis from the #44 reference; always confirm final sizing against the manufacturer's own chart for the specific model.

SECTION 3 — Manufacturer-by-Manufacturer Requirements

The following section documents the kit requirements, orifice triggers, and procedures for each major residential furnace brand as published in their installation documents. Requirements are NOT identical across brands — confirm the specific model's IOM before any conversion.

GOODMAN / AMANA / DAIKIN (Kit Series: HASFK-1 through HASFK-6)

Parent company Daikin. All three brands use identical kits and documentation. The HASFK series covers 90%+ two-stage and variable-speed condensing furnaces.

Kit #	Applicable Models (NG)	Elevation Trigger	Orifice Change Required?	NG Orifice (above trigger)	LP Orifice (above trigger)
HASFK-1	GMEC960402, GMEC960603, GMVC960403–0803	Above 7,000 ft	YES — #49	#49	#56
HASFK-2	GMEC960803, GMEC961004, GMVC960804, GMVC961205	Above 7,000 ft	YES — #49	#49	#56
HASFK-3	GMEC961205, GMVC961005, GCVC961005/961205	Above 7,000 ft	YES — #49	#49	N/A — NG only
HASFK-4	GM9S/GC9S 90% single-stage (selected models)	Above 7,000 ft	YES — #49	#49	#56
HAPS27–31	Pressure switch only kits (specific model/elev combos)	Above 7,000 ft	Pressure switch only (separate orifice order)	Field calculate per NFGC	—

THE UTAH QUESTION (2,000–7,000 ft) — read carefully: Goodman ships furnaces certified to operate up to 7,000 ft WITHOUT an orifice kit. Under that certification, running the factory configuration is arguably a compliant installation — the manufacturer's certification governs under IFGC §305.1. **Polar Breeze takes a more conservative position:** the NFPA 54 / IFGC derate principle (4% per 1,000 ft above 2,000 ft) deserves a calculated check on every Wasatch Front install, and because Goodman prohibits manifold-pressure reduction, the way to apply a derate when combustion analysis says one is needed is to calculate the correct orifice per NFGC Appendix F and order orifices separately from Goodman/Daikin parts. Most installs we audit have no derate record either way — no calculation, no combustion analysis, no label. When in doubt, confirm with Goodman/Daikin tech support and your AHJ.

Kit contents (HASFK, above 7,000 ft): High-altitude NG orifices (#49), dual-stage pressure switch assembly (p/n 0130F00498, setpoints –.45/–.85 in. W.C.), conversion label, installation instructions.

Manifold pressure after orifice swap (two-stage NG): High stage 3.2–3.8 in. W.C. · Low stage 1.6–2.2 in. W.C.

CARRIER / BRYANT / PAYNE (Carrier Global family)

Elevation Band	NG Orifice Size	NG Manifold Pressure (in. W.C.)	Notes
0–2,000 ft	#44 (factory)	3.2	No change required
2,001–3,000 ft	#44	2.7	Pressure reduction only (limited)
3,001–4,000 ft	#48	3.7	Orifice change required
4,001–5,000 ft (UTAH)	#48	3.4	Orifice change required — Utah Wasatch Front
5,001–6,000 ft	#49	3.7	Orifice change required
6,001–7,000 ft+	Consult field guide	Consult field guide	Contact Carrier Tech Support

CARRIER-SPECIFIC: Carrier/ICP certifies NG derate at 2% per 1,000 ft (not 4%) per CSA design certification — making their orifice selections different from other brands. LP derate remains 4% per 1,000 ft. Kit KGAHA5801PSW (pressure switch only, no orifices) applies above 5,500 ft on specific 80% two-stage models. This is a live example of why the manufacturer's certification — not a blanket rule — governs the derate.

TRANE / AMERICAN STANDARD (Trane Technologies family)

Product Line	Elevation Trigger	Kit Part #	Kit Contents	Orifice Change?
95%+ Two-Stage/Variable (*UC, *DC, *UX, *DX, etc.)	Above 4,000 ft	BAYSWT01–12AHALTA (pressure switch series)	Pressure switch only	YES — order separately; calculate per NFGC
Trane L8 Series (L8X1B060/080)	Above 4,000 ft	BAYHALTMOD0001 (60K) · BAYHALTMOD0002 (80K)	ID plug (control board) + conversion label	YES — after plug change, calculate per NFGC
American Standard *UD-C-K0, *DD-C-F0 etc.	Above 4,000 ft	BAYHALT249 series	Pressure switch only	YES — per Installer's Guide Table
Commercial RTU (GCC/GDK180-300)	Above 2,000 ft	BAYHAKT300	Multiple orifice sizes: #31, #32, #34, 3.2mm	YES — included in kit; select per model table

TRANE SEAL WARNING: "The high altitude pressure switches are factory calibrated and sealed. Field adjustment is not permitted. If the factory seal is broken, the product warranty may be voided." — Trane Installation Guide 18-CH97D1-3A-EN.
Conversion label required: Trane part A343079P01 — affix to exterior furnace door.

LENNOX (various product lines — triggers vary significantly)

Product Line	Pressure Switch Trigger	Orifice Change Trigger	NG Orifice (high altitude)	LP Orifice (high altitude)
EL296UHV / EL296V (96% Two-Stage VSM)	Above 4,500 ft	Above 7,500 ft	Per altitude kit (model specific)	#56 at 4,000–10,000 ft
G61MPV (96% Two-Stage VSM)	Above 2,000 ft (2 switches per unit)	2,000–10,000 ft (select models)	Per altitude kit (–071/–091/–111 inputs)	—
A80 / G80 Series (80% Two-Stage)	Not specified	7,501–10,000 ft	0.055" diameter (12 orifices/kit)	—
UHRS/LF25 Unit Heaters (compact)	Not specified	Above 5,000 ft	#52 at 7,001–10,000 ft	#56 at 4,000–10,000 ft
UHCM/LS25 Unit Heaters (250–400 kBTU/h)	Not specified	Above 4,500 ft	Manifold pressure adjust per Table 2	—

Lennox orifice torque spec: 6.25 ft-lb on applicable models — do NOT overtighten. Conversion label must have both "Altitude" and "Orifice Size" boxes filled.

RHEEM / RUUD (Kit Series: RXGY-F04, F05, F06, F07)

Rheem's approach is unique: the kit contains the pressure switch assembly only. Orifices must be field-calculated and ordered separately using Rheem part 62-22175-(drill size). Use the table below — cross-reference elevation band with local gas BTU/ft³ content.

Elevation Band	850 BTU/ft ³	900 BTU/ft ³	1,000 BTU/ft ³	1,044–1,050 BTU/ft ³ (Utah / Enbridge)	1,075 BTU/ft ³
0–1,999 ft	#47	#48	#49	#49–#50	#50
2,000–2,999 ft	#48	#49	#50	#50	#51
3,000–3,999 ft	#48	#49	#50	#50–#51	#51
4,000–4,999 ft	#49	#49	#51	#51	#51
5,000–5,999 ft (PS kit)	#49	#50	#51	#51	#52
6,000–6,999 ft	#49	#50	#51	#52	#52
7,000–7,999 ft	#50	#50	#52	#52	#52
8,000–8,999 ft	#50	#51	#52	#52	#53

Table based on Rheem RXGY kit, 15,000 BTU/burner at sea level, 4% per 1,000 ft derate. Bold = Utah-specific recommendation (Enbridge Gas ~1,044–1,050 BTU/ft³).

Rheem LP Orifice Reference (10 in. W.C. manifold, 15,000 BTU/burner): 0–2,000 ft: 1.15mm · 3,001–4,000 ft: 1.10mm · 4,001–5,000 ft: #58 · 5,001–6,000 ft: #59 · 6,001–7,000 ft: #60 · 7,001–8,000 ft: #62

RHEEM 80% FURNACES: No factory high-altitude kit available. Orifice selection must be field-calculated per NFGC Appendix F. Pressure switch replacement not specified for 80% units. Trigger for pressure switch kit (RXGY): at or above 5,000 ft.

YORK / COLEMAN (Johnson Controls Unitary Products)

Product Series	Pressure Switch Trigger	Kit Part #	Orifice Change?	Notes
TM9Y — 96% AFUE Two-Stage ECM	Above 5,000 ft	S1-1PS3308	Orifice kit separate; calculate per NFGC	No kit change below 5,000 ft
TG8S / PS8 — 80% Single-Stage	Above 8,000 ft	Accessory kit 035-14446-001	Field-calculate per NFGC; certified to 8,000 ft	Only pressure switch above 8,000 ft; orifice per manual
TM9V — 96% AFUE Variable Speed	Above 5,000 ft	Model-specific	YES — per Table 5 in install manual	Manifold pressure must be verified after any change

ICP / HEIL / TEMPSTAR / COMFORTMAKER (Carrier Global subsidiary)

ICP uses a unique 2% NG derate per 1,000 ft (CSA design certification) — different from the standard 4% used by most other brands. LP derate remains 4%.

Elevation	Orifice (1,000 BTU/ft³)	Manifold Pressure	Orifice (1,050 BTU/ft³)	Manifold Pressure	NG Input Multiplier
0–2,000 ft	#44	3.2 in. W.C.	#44	2.9 in. W.C.	1.00
2,001–3,000 ft	#44	2.7 in. W.C.	#44	2.5 in. W.C.	0.95
3,001–4,000 ft	#44	2.5 in. W.C.	#48	3.7 in. W.C.	0.93
4,001–5,000 ft (Utah Wasatch Front)	#47	3.3 in. W.C.	#48	3.4 in. W.C.	0.91
5,001–6,000 ft	#48	3.5 in. W.C.	#49	3.7 in. W.C.	0.89
6,001–7,000 ft	#48	3.2 in. W.C.	—	—	0.87
7,001–8,000 ft	#49	3.4 in. W.C.	—	—	0.85

Based on ICP kit installation document. Bold = Utah gas (~1,050 BTU/ft³) at Orem/Provo elevation. Dashes (—) = not listed for that BTU content at that elevation; consult ICP Tech Support.

ICP LP at High Altitude (Two-Stage, 10 in. W.C.): 0–2,000 ft: #55 · 2,001–3,000 ft: #55 · 3,001–5,000 ft: #56 (field-supplied) · 5,001–7,000 ft: #56 · 7,001–9,000 ft: #57 · 9,001–10,000 ft: #57

FIRST CO. (Commercial / Fan-Coil Gas Units — Kit IOM848601)

Elevation	NG Orifice	Pressure Switch	Action Required
0–4,500 ft	1.55 mm (factory)	Standard (factory)	No conversion needed
4,501–8,000 ft	#54	GS-PS-5 (kit)	Orifice replacement + pressure switch — BOTH required

First Co. Note: Pressure switch change is required at all elevations above 4,500 ft "independent of the BTU content of the fuel utilized." Manifold pressure adjustment is NOT a permitted method on First Co. HA series units — orifice replacement is the only approved method.

SECTION 4 — The Green Sticker vs. Manufacturer Conversion Label

Utah contractors frequently confuse two completely different labeling requirements. Both are required. They serve different purposes and are NOT interchangeable.

	GREEN STICKER (Enbridge Gas Utah program — formerly Dominion / Questar)	MANUFACTURER CONVERSION LABEL (OEM Kit — Code Requirement)
What it is	An adhesive sticker applied by a licensed contractor verifying altitude inspection/adjustment	A factory-supplied label included in every manufacturer high-altitude kit
Who requires it	Enbridge Gas Utah (formerly Questar/Dominion Energy) — PSC-approved customer education program	Equipment manufacturer + IFGC §305.1 + NFPA 54 — required whenever a conversion is performed

Legal basis	Utah PSC proceedings (see PSC Docket 00-057-T04); Questar tariff §7.04; PSC Rule 746-320-2.B	2021 IFGC §305.1: "Equipment shall be installed in accordance with the conditions of listing, the manufacturer's instructions and this code"
What it proves	Appliance has been inspected and, if necessary, adjusted for altitude and local gas BTU content by a licensed contractor	Specific hardware conversion was performed; records exact orifice drill size, model, elevation, and manifold pressure
Part number / Source	Green sticker supplied by Enbridge Gas to licensed contractors; contact the Enbridge Gas Utah contractor line to obtain	Included in every high-altitude kit: Trane A343079P01, Rheem 92-101842-01, Hamilton 5H70857A, etc.
Required fields	Contractor name/license · Date · Inspection performed checkbox	Model # · Serial # · Elevation · Orifice drill size · Manifold pressure · Gas type · Contractor signature
Where placed	On the appliance — typically near the rating plate or gas valve area	Exterior of furnace door adjacent to original rating plate (per all manufacturer instructions)
Can one replace the other?	NO — the Green Sticker does not document hardware changes or orifice sizes	NO — the OEM label does not fulfill the Enbridge Gas program inspection requirement
New equipment (brand new install)	Still required — new furnaces are not pre-inspected for Utah altitude	Required any time orifice replacement or hardware conversion is performed

GREEN STICKER PROGRAM HISTORY (Utah-specific): In the late 1990s, the Utah Public Service Commission allowed Questar Gas (now Enbridge Gas Utah) to manage gas supplies within a new heat-content range. Because changing BTU content required appliance adjustments, Questar launched the Green Sticker program to educate customers and ensure furnaces, boilers, and water heaters in Utah were properly rated, with a PSC compliance deadline of July 2008 (see PSC Docket 00-057-T04). The program continues today under Enbridge Gas Utah — every space-heating and water-heating appliance in their service territory should carry a Green Sticker.

A sticker with blank fields documents nothing. The program is real and required — but a Green Sticker with no altitude, no orifice size, and no data recorded is not proof the adjustment work was actually done. Ask to see the filled-out OEM conversion label too.

What Must Be on Each Label — Side by Side

Field	Green Sticker (Enbridge)	Manufacturer OEM Label
Contractor license #	Required	Optional / recommended
Date of inspection	Required	Required
Elevation of installation	Not always specified	Required
Orifice drill size	May be noted	MANDATORY — stamped or written
Manifold pressure	May be noted	MANDATORY — documented
Gas type (NG or LP)	Implied	Required
Model & serial number	Sometimes	Required
Placed on unit?	On the appliance	Exterior of furnace door

FIELD RULE: Never leave a job with only a Green Sticker and no OEM conversion label, or with only the OEM label and no Green Sticker. Both are required. Both serve distinct compliance purposes. A home inspector will flag a missing Green Sticker. An AHJ will flag a missing conversion label.

SECTION 5 — Universal Installation Checklist

The following procedure steps are consistent across all major manufacturers. Brand-specific steps are noted in Section 3.

Pre-Installation

- Confirm job site elevation (use USU Extension Utah Altitude Chart by City or GPS).
- Calculate derate %: $(\text{Elevation} - 2,000 \text{ ft}) \div 1,000 \times 4\%$ — or the manufacturer's certified derate where it differs.

- Run Manual J with derated BTU output (not nameplate) for equipment selection.
- Order the manufacturer's high-altitude conversion kit for the specific model before install day.
- Verify local gas BTU/ft³ (Enbridge Gas Utah = ~1,044–1,050 BTU/ft³).
- Size gas piping using DERATED CFH values per 2021 IFGC §402.2 — not nameplate.

During Installation

- Shut off gas supply first, then disconnect electrical power.
- Verify all kit contents against the parts list before disassembly.
- Remove manifold/burner assembly; extract existing orifices with 7/16" box-end wrench.
- Verify drill number stamped on orifice face matches the kit specification before installation.
- DO NOT use Teflon tape on orifice threads. Finger-tighten at least 1 full turn to prevent cross-threading; finish with wrench.
- Replace pressure switch with high-altitude pressure switch from kit (if applicable for this brand/elevation).
- For Trane L8 series: swap ID plug on control board (no physical pressure switch replacement).
- Reconnect manifold, gas valve wiring, and gas supply.
- Leak-check all orifice threads with soap solution — NEVER an open flame.

Commissioning & Closeout

- Measure and verify manifold pressure with calibrated manometer (do not guess).
- Clock the gas meter: time one full dial revolution; convert to BTU/hr; compare to derated target.
- Check flame appearance: clean, soft, blue — no yellow tips, no lifting, no sooting.
- Run combustion analysis in flue gas after 5+ minutes at steady state: **CO (air-free) <100 ppm target** (100–400 ppm = investigate and correct; 400 ppm is the ANSI Z21.47 appliance limit — never leave a unit running there); O₂: 3–7%; CO₂: 8–10% for NG.
- Confirm temperature rise across heat exchanger is within nameplate range (typically 35–65°F).
- Confirm pressure switch operation: unit should ignite cleanly without hunting or lockout.
- Fill out ALL fields on the manufacturer's OEM conversion label; affix to exterior of furnace door.
- Apply Enbridge Gas Utah Green Sticker — document inspection, contractor license, and date.
- Leave copy of kit installation instructions with homeowner or in unit.

Field rule — clock the meter, every time. If the gas meter isn't clocked at commissioning, the actual input is unknown — and an unverified input at altitude is exactly how rich combustion gets left behind in a finished basement. No clock, no commissioning.

SECTION 6 — Common Field Errors & Consequences

Error	Consequence	Correct Practice
Using nameplate BTU for load calc	System undersized for actual derated heating output	Always use derated input × AFUE for output in Manual J
Forgetting pressure switch swap	Nuisance lockouts; CO risk from delayed ignition; callbacks	Always include pressure switch in altitude kit (where applicable)
Reducing Goodman manifold pressure (prohibited)	Poor primary air aspiration → rich burn → CO	Goodman requires orifice method only — no manifold pressure adjustment
Derating NG manifold pressure below 3.0 in. W.C.	Air starvation at burner throat; dangerous rich combustion	3.0 in. W.C. is the hard floor; switch to orifice method if more derate needed
Using sea-level orifice table without BTU correction	Orifice sized for 1,000 BTU/ft ³ when Utah gas is ~1,044–1,050 BTU/ft ³	Use Rheem's Table 1 or NFGC Appendix F with actual local BTU value
Installing sea-level orifice at altitude	Severe rich burn, CO, sooting, heat exchanger damage	Order manufacturer's altitude kit before scheduling the install
Skipping combustion analysis	Undetected CO hazard; liability exposure	Run a combustion analysis at every gas appliance commissioning

No OEM conversion label affixed	Code violation (IFGC §305.1); creates confusion for future techs; liability	Complete and affix OEM conversion label from kit — mandatory every time
No Green Sticker applied	Enbridge Gas program violation; flagged on home inspections; customer concern	Apply Green Sticker after inspection; get stickers from the Enbridge Gas contractor line
Sea-level pipe sizing table (no altitude derate)	Undersized gas piping; appliance starved at full load; nuisance errors	Apply altitude derate factor to CFH before sizing pipe per 2021 IFGC §402.2
Wrong LP orifice column used (using NG table)	Severe over-fire or under-fire on LP units	Always reference the LP-specific column; LP manifold pressure is 10–11 in. W.C.

About Polar Breeze

Polar Breeze LLC is an HVAC forensics, design, and consulting firm serving the Wasatch Front and surrounding Utah communities, specializing in high-altitude combustion diagnostics, altitude-conversion verification, Green Sticker program compliance checks, forensic audits, and system design. We do the work — service, installation, design, consults, second opinions — and teach while doing it: **measurement drives the diagnosis, never the sale.** On audits and second opinions our judgment is independent — findings never bend toward whoever pays. Field work is performed and reviewed by our lead technician, with 30 years in HVAC across Texas and Utah and a military HVAC background.

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Sources: Goodman HASFK-2 Kit Manual; Rheem RXGY-F04/F05/F06/F07 Kit Instructions; Trane 18-CH97D1-3A-EN / 18-CH102D1-1B-EN / ACC-SVN230C-EN; Carrier/ICP kit 44106108300; First Co. IOM848601; York 035-14446-001 / TM9Y Tech Guide; Lennox EL296UHV / G61MPV Engineering Handbooks; NFPA 54 / 2021 IFGC §402.2; Utah Code §15A-3-501; Enbridge Gas Utah / Utah PSC Docket 00-057-T04; Century HVAC Distributing Orifice Flow Chart; EIA Utah Natural Gas Heat Content Data. Always verify against the specific model's installation manual and your local AHJ.