Air Source Heat Pump Webinar

Lennox

Today's Speaker

Douglas Smiley
Lennox
HVAC Technical Trainer

Heat Pump Technical Training

CORE VALUES

INTEGRITY

We behave in an **honest** and **straightforward** way.

RESPECT

We **respect** our employees, customers, suppliers, competitors and the communities where we work and live.

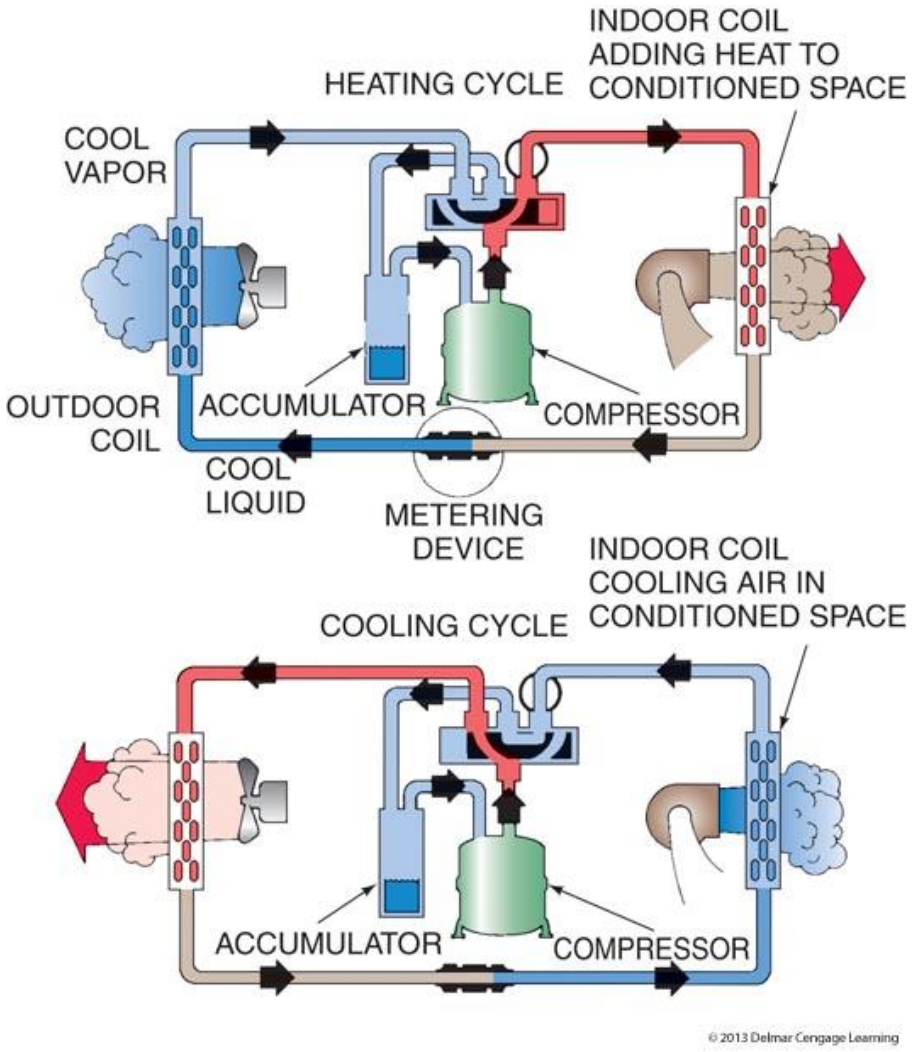
EXCELLENCE

We value **high performance** from our employees and suppliers and quality in our products and services. We deliver value to our shareholders.

How heat pumps work

Definition

Heat Pump will reverse the flow of refrigerant to move the heat from the outdoor air to inside the home



Energy Efficient

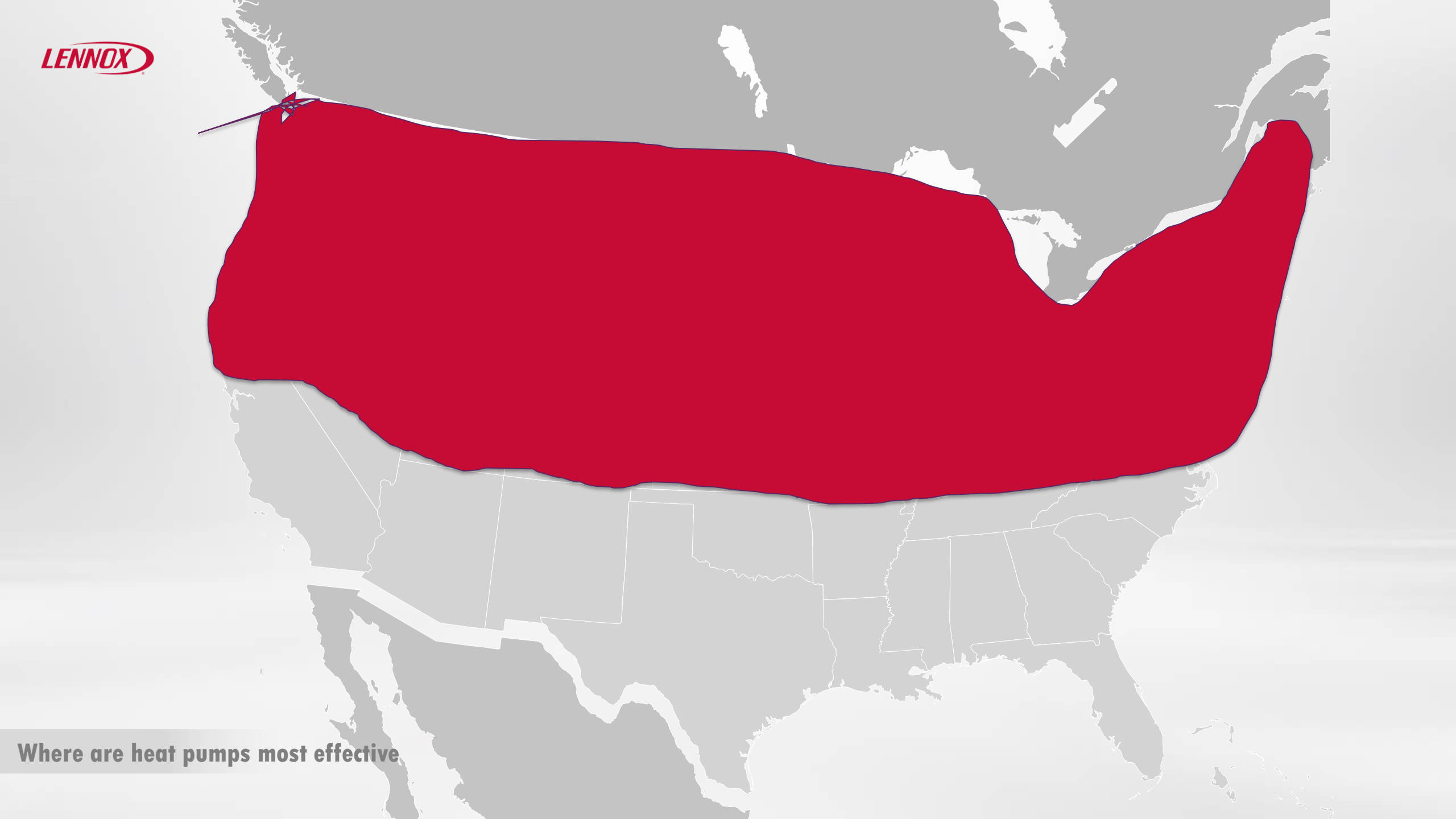
Cooling Capacity

Heating Capacity

Operates in cold climates

Improved capability

Why heat pumps


LENNOX
Where are heat pumps most effective

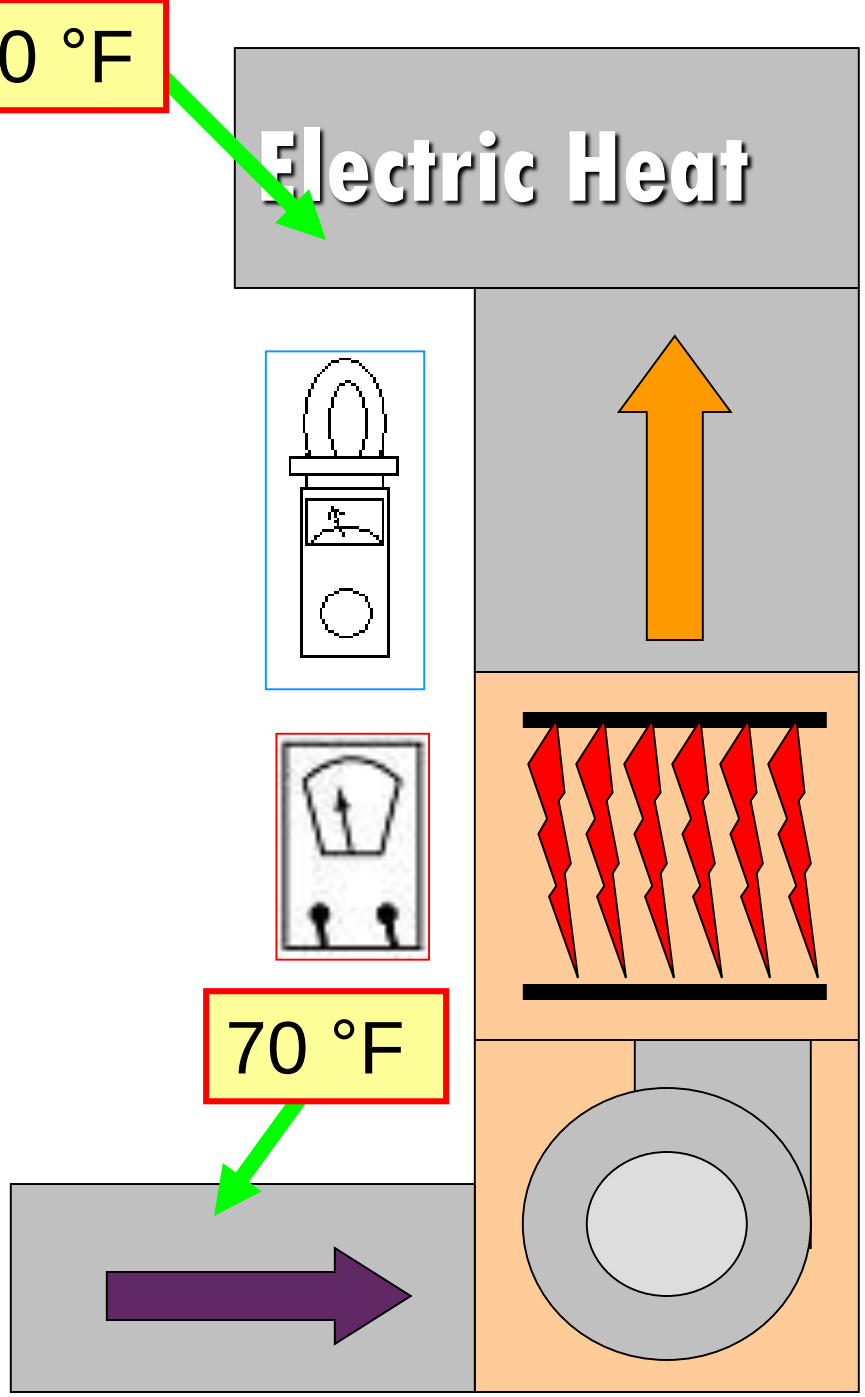
$$CFM = \frac{Volts \times Amps \times 3.414}{1.08 \times TD}$$

$$CFM = \frac{235 \times 75 \times 3.414}{1.08 \times TD}$$

$$CFM = \frac{235 \times 75 \times 3.414}{54}$$

$$CFM = \frac{60171.75}{54}$$

CFM = 1114



Thermal Balance Point

What issues might arise with improperly matched systems?

High Utility bills

Cycling on HPCO

Capacity Loss

Comfort Loss

Ultimately Premature Failures

This could be Your Customer

Thermal Balance Point

- Why does a mismatched system cause us so many problems?

When we run a heat pump in heating mode where does all the refrigerant that was in that huge, high efficiency outdoor unit go?

What happens when that indoor coil cannot hold all of the refrigerant the outdoor unit had?

Thermal Balance Point

So….Where do I go to find the proper matches??

Thermal Balance Point

ARI Matches with Coils, Air Handlers, or Furnace & Coils Found in the Product Specifications

ODU	CBTU	SEER	EER	47F	17F	47F	17F	HSPF	IDU/COIL	FURNACE	ARI#
XP17-030-230	29,400	16.00	13.50	25,600	16,800	3.60	2.54	8.50	C33-43	SL280UH090V36B	3894618
XP17-030-230	29,600	16.00	13.50	25,600	16,800	3.62	2.56	8.50	C33-43	SL280UH090V48B	3894619
XP17-030-230	29,600	16.00	13.50	25,600	16,800	3.62	2.56	8.50	C33-43	SL280UH090XV48B	4041760
XP17-030-230	29,000	15.00	12.50	25,800	17,100	3.42	2.44	8.50	C33-43	SLO185UF79/105V42	7087750
XP17-030-230	29,400	16.00	13.50	25,600	16,800	3.56	2.52	8.50	C33-43	SLP98UH070XV36B	5137329
XP17-030-230	29,600	16.00	14.00	25,600	16,700	3.64	2.56	8.50	C33-43	SLP98UH090XV36C	5137330
XP17-030-230	28,800	14.70	12.20	26,200	17,300	3.34	2.36	8.20	C33-43		3839804
XP17-030-230	29,200	16.00	13.50	26,800	17,300	3.62	2.60	9.00	CBX27UH-030		3839841
XP17-030-230	29,200	16.00	13.50	26,800	17,200	3.64	2.60	9.00	CBX27UH-036		3839842
XP17-030-230	28,800	15.50	12.70	27,000	17,500	3.48	2.52	8.70	CBX32M-030		3839766
XP17-030-230	28,800	15.20	12.70	27,200	17,700	3.46	2.50	8.70	CBX32M-036		3839767
XP17-030-230	29,000	16.20	13.50	26,800	17,300	3.58	2.60	9.00	CBX32MV-024/030		3839761
XP17-030-230	29,200	16.00	13.50	26,800	17,300	3.60	2.58	9.00	CBX32MV-036		3839762
XP17-030-230	29,000	16.00	13.50	26,600	17,200	3.56	2.58	9.00	CBX40UHV-024		3839763
XP17-030-230	29,200	16.00	13.50	26,800	17,300	3.60	2.58	9.00	CBX40UHV-030		3839764
XP17-030-230	29,200	16.00	13.50	26,800	17,200	3.62	2.58	9.00	CBX40UHV-036		3839765

Coefficient Of Performance

What is COP?

AHRI SYSTEM MATCHES

Model No.	Cooling Capacity	SEER	EER	Heat Capacity		Heat COP		HSPF
				High	Low	High	Low	(IV)
XP17-024-230	24,200	17.00	14.00	21,200	14,100	3.56	2.52	8.50
XP17-024-230	24,600	17.00	14.00	21,400	14,100	3.66	2.56	9.00
XP17-024-230	24,200	17.00	14.00	21,200	14,100	3.56	2.52	8.50
XP17-024-230	24,600	17.00	14.00	21,400	14,100	3.66	2.56	9.00
XP17-024-230	24,600	16.00	14.00	21,400	14,100	3.70	2.58	9.00
XP17-024-230	24,600	16.00	14.00	21,400	14,100	3.70	2.58	9.00
XP17-024-230	24,200	16.00	14.00	21,200	14,000	3.62	2.56	9.00
XP17-024-230	24,200	15.10	13.50	21,400	14,100	3.58	2.52	8.50
XP17-024-230	24,200	16.00	13.50	21,400	14,300	3.48	2.46	8.50
XP17-024-230	24,000	17.00	14.00	21,400	14,100	3.70	2.58	9.00
XP17-024-230	24,000	15.00	12.50	22,000	14,700	3.40	2.38	8.50

Coefficient Of Performance

How Efficient is Electric Strip Heat??

100% We do not lose any heat up a flue

Resistance Heat COP = 1 : 1 ratio

1KW Energy = 1KW of Heat 3,413BTU

COP =HP Heat Produced/Equivalent Electric Heat Comparison

Coefficient Of Performance

Heat Pump COP = Amount HP Heat/ Electric Heat Comparison

@47F 25,600 / 7200 (2.11KW x 3413) = 3.56

So at 47F Outdoor Temp this Heat Pump puts out 3.56 times as it would for same electric if resistant heat was being used

@ 17F 16,800 @ 2.52 COP

Is it safe to say @ 47F this Heat Pump is 3.56 times OR 356% as efficient to run??

INDOOR AIR TD

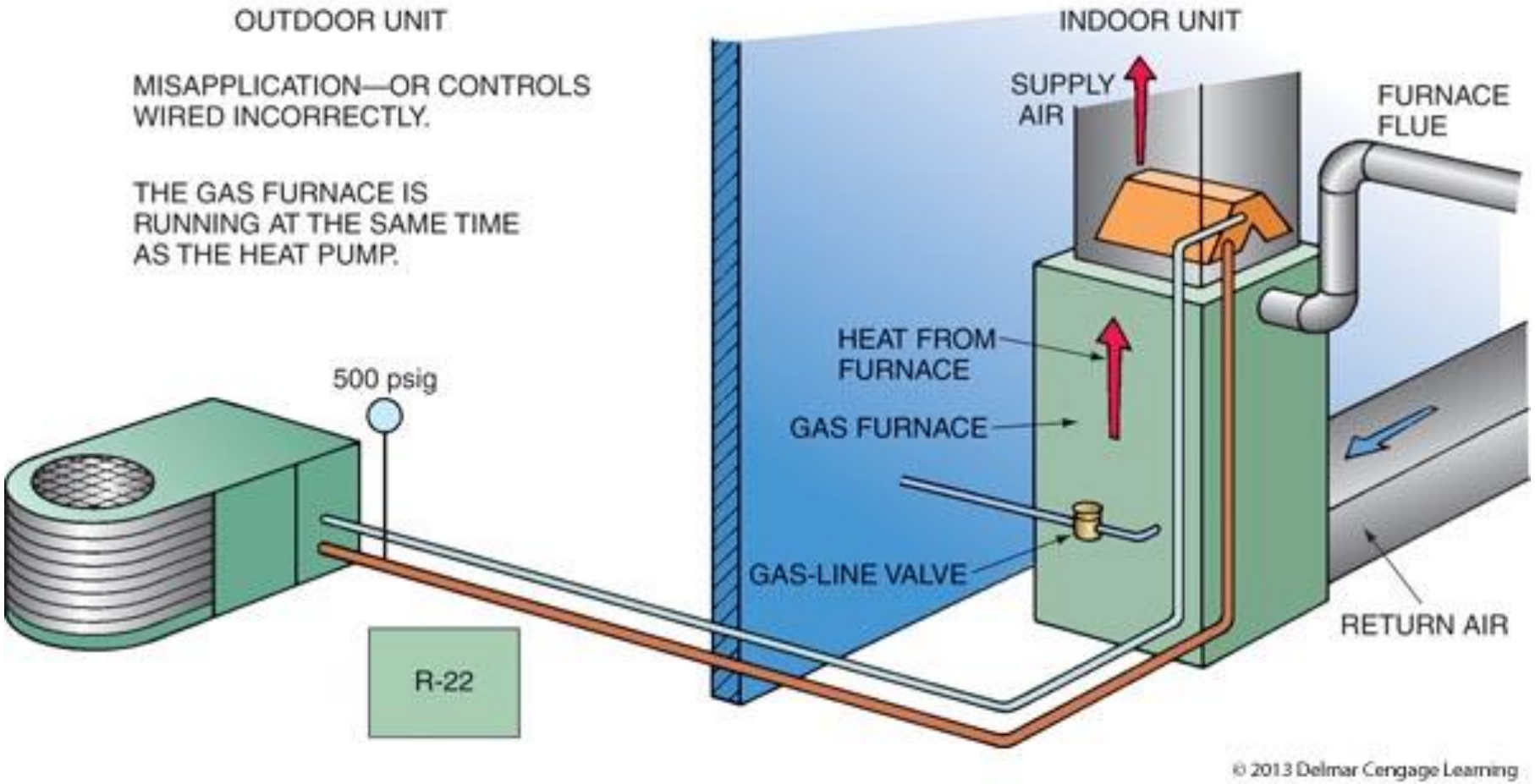
Due to design differences and airflows, The Indoor TD is approximate

Outdoor Ambient Temperature ˚F	Temperature Rise ΔT ˚F Across Indoor Coil
57˚	29-32˚
52˚	27-30˚
47˚	25-28˚
42˚	23-26˚
37˚	21-24˚
32˚	20-23˚
27˚	18-21˚
22˚	16-19˚
17˚	15-18˚
12˚	13-17˚
7˚	12-16˚
2˚	9-13˚
-3˚	8-12˚

Heat pump Myth Busters

Heat pump sizing

Duel Fuel Applications



SL25XPV Series Heat Pump

DAVE LENNOX signature® COLLECTION

iComfort®

So simple. So smart. So comfortable.

LENNOX QUANTUM™ COIL

* iComfort® S30
Ultra-Smart Wi-Fi
Communicating Thermostat

ENERGY STAR

Q & A