



## 2023 Equipment – Northern California

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STEVE SMALL  
JON MALKOVICH  
ERIC DOYLE

1

### Introduction

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- Who we are...
  - Steve Small, [ssmall@siglers.com](mailto:ssmall@siglers.com), 916.995.1247
  - Jon Malkovich, [jmalkovich@siglers.com](mailto:jmalkovich@siglers.com), 415.786.9277
  - Eric Doyle, [edoyle@siglers.com](mailto:edoyle@siglers.com), 623.670.1365
- How we can help...
  - Carrier provides the easiest and best solution for meeting new regional efficiency standards
  - Sigler provides the link between you, the contractor and the builder



2

## Agenda

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- 2023 minimum efficiency standards
- 2023 (and 2029) ultra low NOx regulations
- 2025 refrigerant regulations
- Additional Resources

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## The Big Picture

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- Every 6 years, the Department of Energy updates their policies for the HVAC industry
  - Evaluates energy usage
  - Sets minimum efficiency requirements
  - Updates testing standards
- With a refrigerant change on the horizon, now is a good time to revamp the product line.

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## Is Carrier Ready for 2023?

- Optimize the system
  - Condensing Unit + Coil + Furnace
- New technology
  - Aluminum coils in the condensing units
  - New microchannel evaporator coils
  - Compressor upgrades
  - Furnace blower motor upgrades
- Factory investments
  - Additional test rooms and engineers
  - Increased manufacturing capacity
  - Additional suppliers



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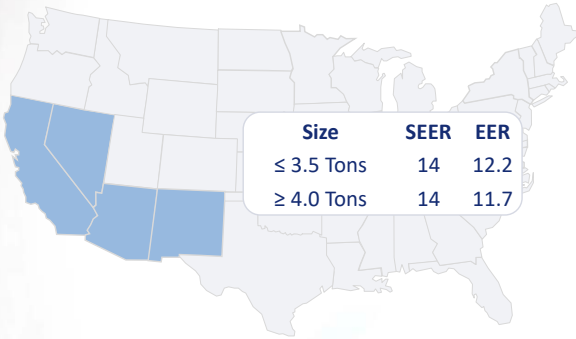
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Split Air Conditioners

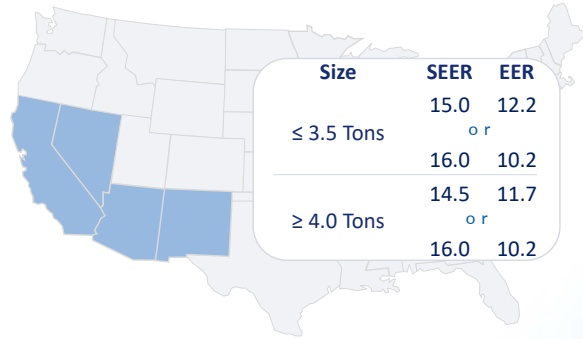
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## 2023 Minimum Efficiency Change – Split System AC

**Current**  
(EFFECTIVE JAN 2015)



**2023**  
(EFFECTIVE JAN 2023)

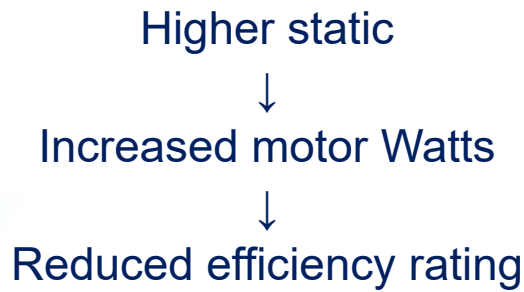


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## 2023 Minimum Efficiency Change – Split System AC

- Updated Test Procedure
  - Was tested using 0.1" ESP
  - Will be tested using 0.5" ESP

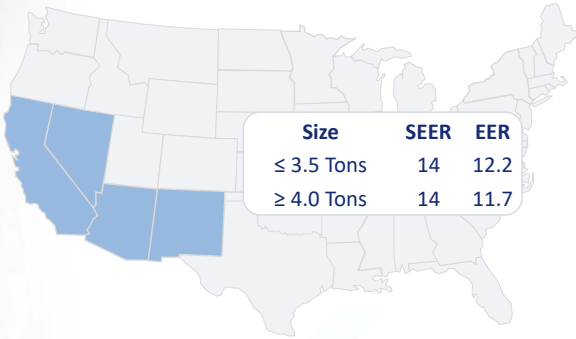


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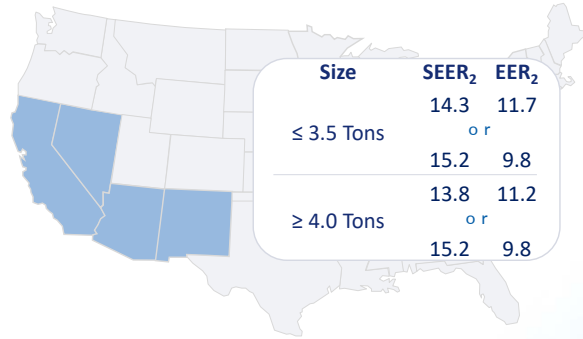
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## 2023 Minimum Efficiency Change – Split System AC

**Current**  
(EFFECTIVE JAN 2015)



**2023**  
(EFFECTIVE JAN 2023)



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## 2023 Minimum Efficiency Change – Split System AC

- Effective Date = **Installed** by 12/31/2022
  - Connected to the lineset, or
  - Connected to electricity

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10

## Builder's Model (minimum efficiency)

Current	New	Height	Base Pan	Weight	MCA	MOCP	Sound
CA15NA01800G	GA5SAN41800W	3" taller	same	less	less	same	same
CA15NA02400G	GA5SAN42400W	3" taller	same	less	less	same	2dB more
CA15NA03000G	GA5SAN43000W	3" taller	same	less	less	same	same
CA15NA03600G	GA5SAN43600W	3" taller	same	less	less	30 → 25	same
CA15NA04200G	GA5SAN44200W	3" taller	same	less	more	35 → 50	1dB more
CA15NA04800G	GA5SAN44800W	3" taller	same	same	more	35 → 50	same
CA15NA06000G	GA5SAN46000W	7" taller	same	less	more	40 → 50	same

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11

## Builder's Model (high efficiency)

Current	New	Height	Base Pan	Weight	MCA	MOCP	Sound
CA16NW03000G	GA5SAN43000W	3" taller	same	more	less	same	1dB less
CA16NW03600G	GA5SAN43600W	3" shorter	same	less	less	30 → 25	1dB less
CA16NW04200G	GA5SAN44200W	3" taller	same	less	more	35 → 50	1dB more
CA16NW04300G							
CA16NW04800G	GA5SAN44900W	7" taller	same	less	same	same	3dB more
CA16NW05400G							
CA16NW061B0G	GA5SAN46100W	same	same	less	more	same	1dB more

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## Builder's Model (two stage)

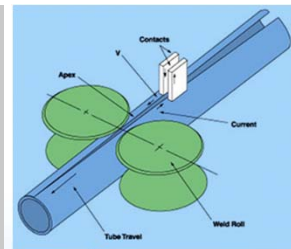
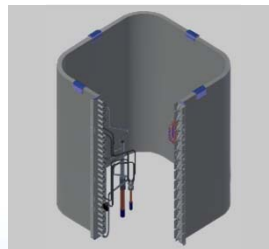
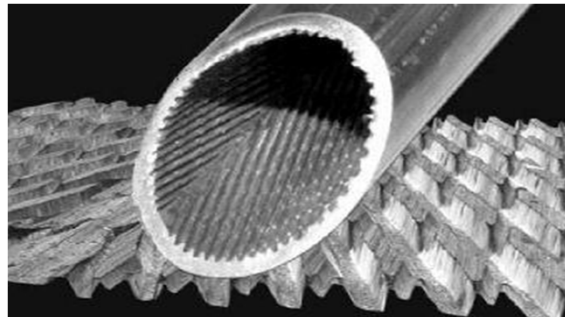
Current	New	Height	Base Pan	Weight	MCA	MOCP	Sound
CA17NA02400G	GA7TAN42400W	same	same	less	less	same	same
CA17NA03600G	GA7TAN43600W	3" shorter	larger	same	same	same	same
CA17NA04800G	GA7TAN44800W	same	same	less	less	same	same
CA17NA06000G	GA7TAN46000W	same	same	less	less	60 → 50	same

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## Aluminum Coil AC and HP

- Welded aluminum tubes with internal grooves and zinc cladding
- 70% thicker wall than copper tube
- Copper braze joints
- Up to 50% lighter than a copper coil



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14

14

## 2023 Minimum Efficiency Change – Split System AC

- Corrosive environments near seacoast
  - Standard copper tube and aluminum fin units degrade in coastal environments
  - Aluminum fin in contact with copper tube causes galvanic corrosion causing degradation of aluminum fins



Beachfront Exposure, 4 Years

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## 2023 Minimum Efficiency Change – Split System AC

- New aluminum coil / aluminum fin outdoor units
  - Up to 81% percent better projected life of aluminum vs copper
  - Testing showed no degradation of fins after 6 years (and counting)



Beachfront Exposure, 5.7 Years

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16

# Evaporator Coils

17

## 2023 Evaporator Coil Lineup

### VERTEX™ Technology

- Replacing the CNPV and CNPH
- Microchannel coil
- Only for use in cooling only applications



### A-Coils CAPMP

- No Changes



### Advanced Distributor Products® Leading By Example

- No Changes



18

# Is it rated?

- [www.SiglerNorCal.com/engineer](http://www.SiglerNorCal.com/engineer)
  - Ratings and Match-Ups
  - Sigler Combination Ratings Tool
- [www.AHRIdirectory.org](http://www.AHRIdirectory.org)
- [www.MyCarrierRatings.com](http://www.MyCarrierRatings.com)



# Suggested Ratings and Match-Ups

[www.SiglerNorCal.com/engineer](http://www.SiglerNorCal.com/engineer)

Carrier

Turn to the experts

Sigler Wholesale Distributors  
Ratings and Match-Ups for Engineers and Energy Consultants  
Effective August 17, 2022

RNC System Selections: 3.0 Ton AC with 80% Furnaces

Furnace Model	Maximum Airflow at 1" SP	Air Conditioner Model	Coil Model	Wet ESP @ 1200 CFM	System Price	SEER / EER <sub>1</sub> / SEER <sub>2</sub> / EER <sub>2</sub>	Capacity Capacity	AHR# Number	Notes
88SB1A070E1716	1140 (Y)	GASSAN435**WA*	CAPMP3617ALA	0.32	16.50/13.00	13,400	207976672		
88SB1A070E2116	1135 (Y)	GASSAN435**WA*	CAPMP4321ALA	0.16	15.20/12.50	13,000	207965738		
88SUD0A0E1716	1160 (Y)	GASSAN435**WA*	CAPMP3617ALA	0.32	16.50/13.00	14,300	207976644	Ultra Low NOx Spacer Required	
88SUD0A0E1716	1160 (Y)	GASSAN435**WA*	CAPMP4321ALA	0.16	15.20/12.50	13,400	207969038	Ultra Low NOx Spacer Required	
88TP1A070V1716	1365	GAT7AN435**WA*	CAPMP3617ALA	0.32	16.50/12.50	13,400	207838107	Two Stage	
88SB1A070E1716	1140 (Y)	84SCA536W**30P	CAPMP3617ALA	0.32	15.20/12.50	13,400	208558014	"Slimline"	
88SB1A070E1716	1140 (Y)	GASSAN435**WA*	C38H17SP149	0.31	16.50/13.00	14,300	208128895		
88SB1A070E1716	1140 (Y)	GASSAN435**WA*	C38H17SP159	0.26	15.20/12.50	13,400	208128897		
88SUD0A0E1716	1160 (Y)	GASSAN435**WA*	C38H17SP149	0.31	16.50/13.00	14,300	208131888	Ultra Low NOx	
88SUD0A0E1716	1160 (Y)	GASSAN435**WA*	C38H17SP159	0.26	15.20/12.50	13,400	208131888	Ultra Low NOx	
88TP1A070V1716	1365	GAT7AN435**WA*	C38H17SP149	0.31	16.50/12.50	13,400	208129796	Two Stage	
88SB1A070E1716	1140 (Y)	84SCA536W**30P	C38H17SP149	0.31	16.50/13.00	14,300	208229620	"Slimline"	
88SB1A070E1716	1140 (Y)	GASSAN435**WA*	FL36H17SP15805	0.26	16.50/13.00	14,300	208128896		
88SUD0A0E1716	1160 (Y)	GASSAN435**WA*	FL36H17SP15805	0.26	15.20/12.50	13,400	208131887	Ultra Low NOx	
88TP1A070V1716	1365	GAT7AN435**WA*	FL36H17SP15805	0.26	17.00/12.00	14,400	208129787	Two Stage	
88SB1A070E1716	1140 (Y)	84SCA536W**30P	FL36H17SP15805	0.26	16.50/13.00	14,300	208229621	"Slimline"	

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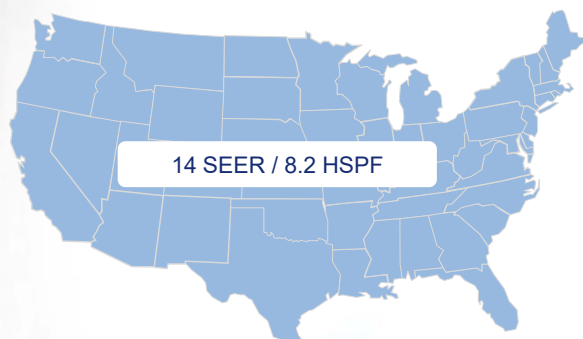
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## Split Heat Pumps

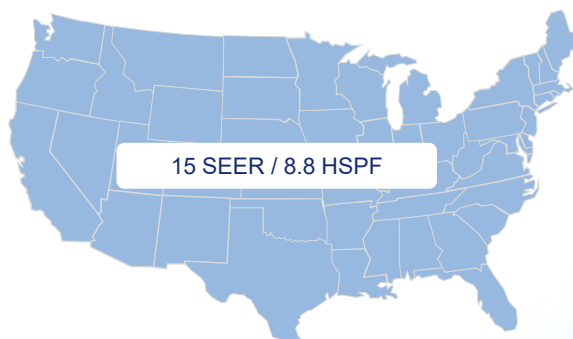
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## 2023 Minimum Efficiency Change – Split System HP

**Current**  
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**2023**  
(EFFECTIVE JAN 2023)

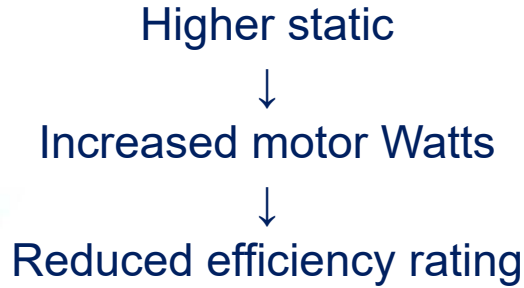


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22

## 2023 Minimum Efficiency Change – Split System HP

- Updated Test Procedure
  - Was tested using 0.1" ESP
  - Will be tested using 0.5" ESP

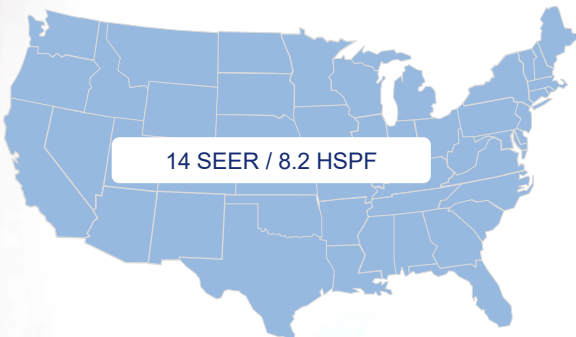


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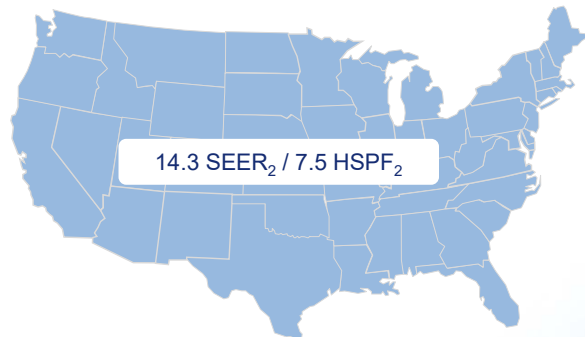
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## 2023 Minimum Efficiency Change – Split System HP

**Current**  
(EFFECTIVE JAN 2015)



**2023**  
(EFFECTIVE JAN 2023)



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## 2023 Minimum Efficiency Change – Split System HP

- Effective Date = **Manufactured** by 12/31/2022

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## Builder's Model (minimum efficiency)

Current	New	Height	Base Pan	Weight	MCA	MOCP	Sound
CH14NB01800G	GH5SAN41800W	7" shorter	larger	more	more	same	2 dB more
CH14NB02400G	GH5SAN42400W	4" shorter	larger	more	more	same	same
CH14NB03000G	GH5SAN43000W	3" shorter	same	more	same	same	1 dB less
CH14NB03600G	GH5SAN43600W	same	same	more	more	same	1 dB less
CH14NB04200G	GH5SAN44200W	7" shorter	same	more	more	same	same
CH14NB04800G	GH5SAN44800W	7" taller	same	more	more	40 → 50	3 dB less
CH14NB06000G	GH5SAN46000W	7" taller	larger	more	more	same	3 dB more

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26

## Builder's Model (high efficiency)

Current	New	Height	Base Pan	Weight	MCA	MOCP	Sound
CH16NA01800G	GH5SAN41800W	7" shorter	same	less	same	same	3 dB more
CH16NA02400G	GH5SAN42400W	same	smaller	less	same	same	4 dB more
CH16NA03000G	GH5SAN43000W	4" shorter	smaller	less	same	same	4 dB more
CH16NA03600G	GH5SAN43600W	4" shorter	smaller	less	same	35 → 30	4 dB more
CH16NA04200G	GH5SAN44200W	same	smaller	less	same	same	8 dB more
CH16NA04800G	GH5SAN44800W	3" taller	smaller	less	more	45 → 50	3 dB more
CH16NA06000G	GH5SAN46000W	7" shorter	same	less	same	same	6 dB more

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27

## Builder's Model (two stage)

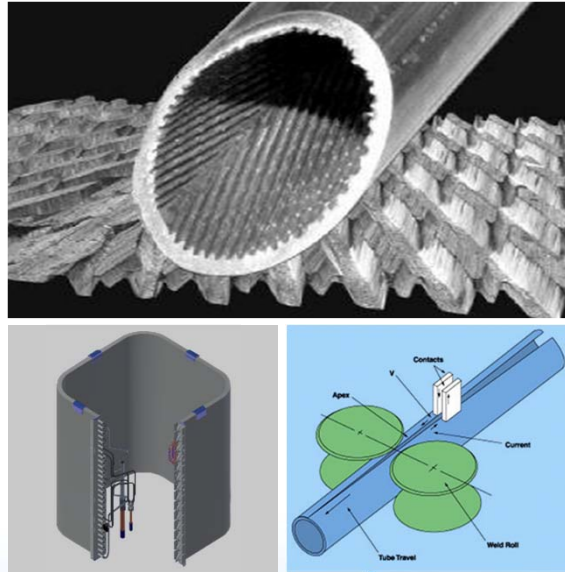
Current	New	Height	Base Pan	Weight	MCA	MOCP	Sound
CH17NA02400G	GH7TAN42400A	3" shorter	same	less	more	same	same
CH17NA03600G	GH7TAN43600A	same	same	less	less	same	same
CH17NA04800G	GH7TAN44800A	7" taller	same	less	less	same	same
CH17NA06000G	GH7TAN46000A	same	same	less	less	same	same

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28

## Aluminum Coil AC and HP

- Welded aluminum tubes with internal grooves and zinc cladding
- 70% thicker wall than copper tube
- Copper braze joints
- Up to 50% lighter than a copper coil



29

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## Fan Coil Units

30

## Comfort Series Fan Coil

- Combine FB and FX into FJ
- Minor Product Improvements
  - Filter bracket for normal filter dimensions
  - Bolt-on TXV
  - Cabinet knockouts replaced with plugs
  - Improved blower housing/wheel design



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31

## 2023 Fan Coil Unit Lineup

### Performance SERIES

- No changes
- FV4
- VCA Motor



### Comfort SERIES

- Combining FX4 and FB4
- FJ4
- FCT Motor



### Multifamily

- No Changes
- FMC4Z
- FCT motor



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32



## Is Carrier Ready for 2023?

- Optimize the system
  - Condensing Unit + Coil + Furnace

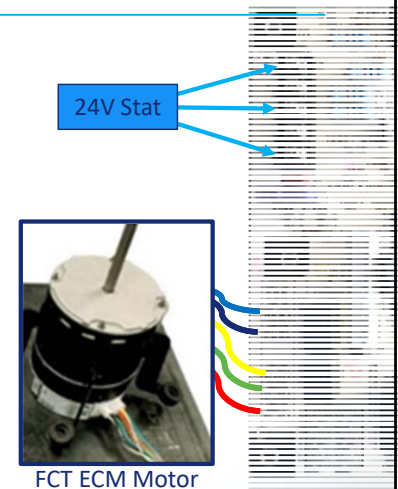


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35

## Fixed Speed Constant Torque (FCT) Motor

- Non-communicating
- 5 speeds, programmed into motor
- Low voltage from control board to motor
- 80% or 85% electrical efficiency
- Airflow reductions as ESP increases

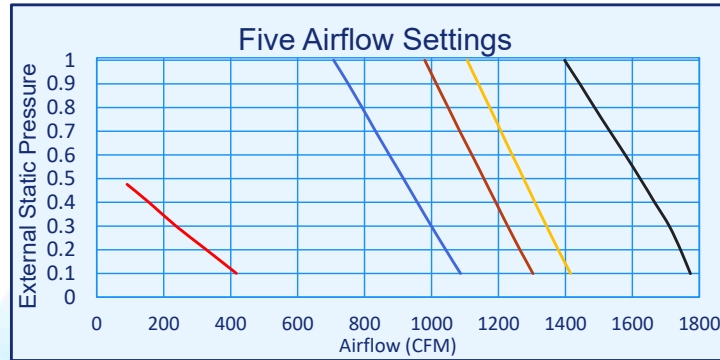


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36

## 59SC5B Example

UNIT SIZE	RETURN-AIR CONNECTION	SPEED TAPS <sup>2</sup>	EXTERNAL STATIC PRESSURE (IN. W.C.) <sup>6</sup>									
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
080-16	SIDE OR BOTTOM	Black	1870	1810	1740	1670	1600	1525	1440	<b>1355</b>	<b>1270</b>	<b>1180</b>
		Yellow	1525	1495	1460	1415	1365	1305	1240	1170	1090	990
		Orange	1375	1355	1330	1300	1260	1210	1155	1090	1025	940
		Blue	1045	1040	1030	1010	985	960	920	875	825	745
		Red <sup>5</sup>	880	865	850	835	810	785	750	715	665	605

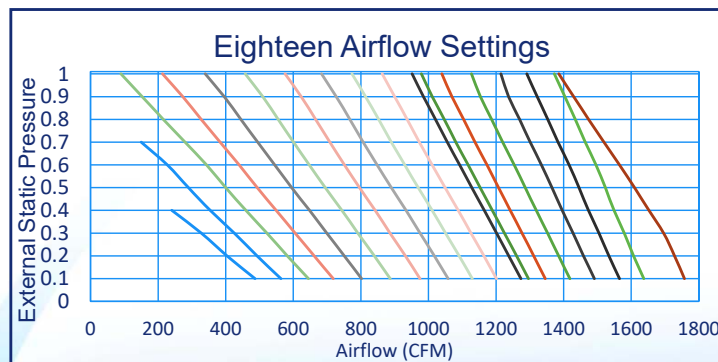


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37

## Multi Speed Constant Torque (MCT) Motor

- Optimized airflows for 2023 test procedure
- Increases max airflows by up to 28%
- 70% reduction for replacement blower motors

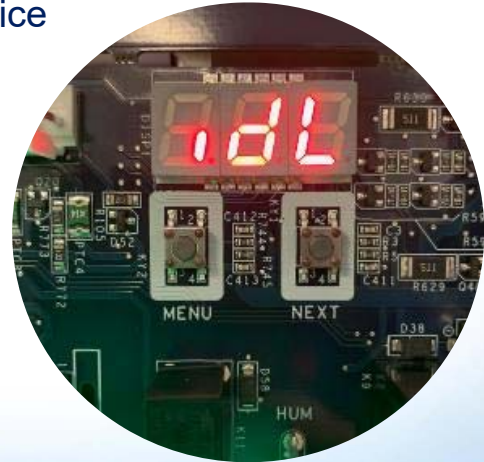


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38

## New Motor → New Control Board

- 3 digit display with 2 push buttons
  - Configure the furnace during installation
  - Communicate fault codes during service



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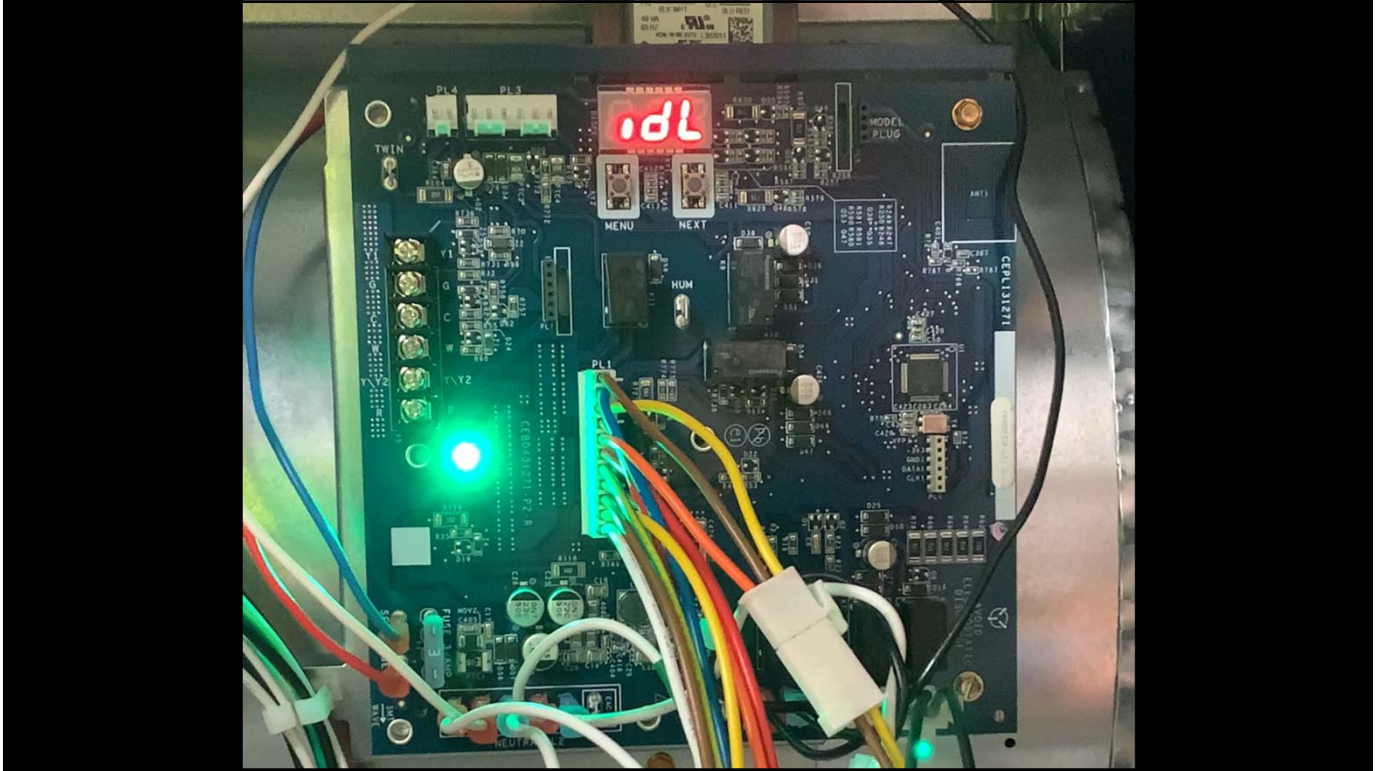
39

## New Motor → New Control Board

Main Menu		
Display	7-Segment Visual	Function
FLt	FLt	Fault History Retrieval Menu
Ht	Ht	Heating Blower Speed Index
CL	CL	Cooling Blower Speed Index
CFn	CFn	Continuous Fan Blower Speed Index
Hod	Hod	Heating Blower Off Delay
Cod	Cod	Cooling Blower Off Delay
dir	dir	Direction; Unit Orientation Menu
CFn	CFn	Continuous Fan Blower Speed Index
tnn	tnn	Twinning Furnace Select
inF	inF	Startup Information (Software Version)
Ct	Ct	Component Test
rSt	rSt	Reset to Default Settings
idL	idL	Idle

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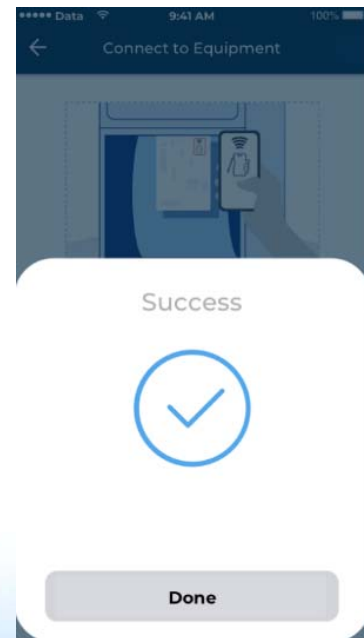
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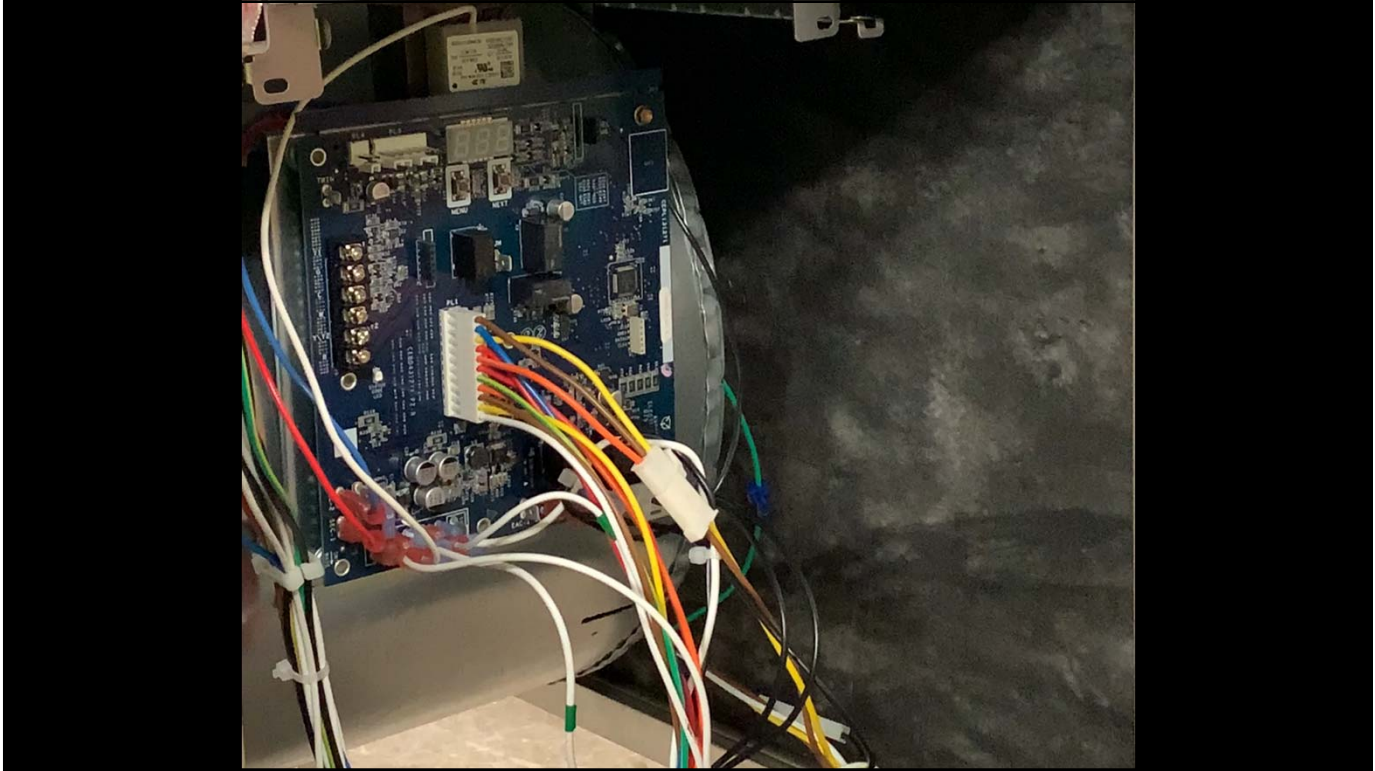
## New Motor → New Control Board

- Utilize app featuring patent-pending Near Field Communication (NFC)



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42



43

## New Motor → New Control Board

**CONTRACTOR WAREHOUSE**

134 Blair  
144 Blair  
155 Grandin

**COMMUNITIES**

134 Blair  
144 Blair  
155 Grandin

Community	Model Number
Blair	595C2E080M17-14
Grandin	595C2E080M17-16
Maxwell	595C6AD40M14-10

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44

## 2023 Gas Furnace Nomenclature

Motor	Description
E	Fixed Speed Constant Torque (FCT) ECM
M	Multi 18 Speed Constant Torque (MCT) ECM
V	VS Constant Torque (VCT) ECM
C	Comm. VS Constant Airflow (VCA) ECM

	Motor Designator	
	Current	2023
Comfort Series	E	M
Performance Series	V	V
Infinity Series	C	C

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## Comfort Series Furnaces (single stage)

Current	New	Stages	Motor	Max AFUE
59SC5B	59SC6A	1	MCT	96.5
59SC2D	59SC2E	1	MCT	92.1

Current	New	Stages	Motor	Max AFUE
58SB1A	58SB1B	1	MCT	80

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46

## Performance Series Furnaces (two stage)

Current	New	Stages	Motor	Max AFUE
59TP6B	59TP6C	2	VCT	96.5

Current	New	Stages	Motor	Max AFUE
58TP1A	58TP1B	2	VCT	80

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## Future Furnace Lineup

### Performance SERIES

- Control board upgrade



### Comfort SERIES

- Motor upgrade to MCT 18-Speed
- Control board upgrade



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48



## BAAQMD Regulation 9, Rule 4

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- 9-4-301 A person shall not sell, install or offer for sale within the District:
  - 301.1 Any stationary natural gas-fired residential fan type central furnace manufactured after January 1, 1984, that emits more than 40 nanograms of nitrogen oxides expressed as NO<sub>2</sub> per joule of useful heat delivered to the heated space.

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51

## BAAQMD Regulation 9, Rule 4

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- 9-4-301 A person shall not sell, install or offer for sale within the District:
  - 301.2 Any stationary natural gas-fired residential natural fan type central furnace manufactured after July 1, 2023, that emits more than 14 nanograms of nitrogen oxides expressed as NO<sub>2</sub> per joule of useful heat delivered to the heated space.

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52

## BAAQMD Regulation 9, Rule 4

- 9-4-301 A person shall not sell, install or offer for sale within the District:
  - 301.3 Any stationary natural gas-fired furnace manufactured after January 1, 2029, that emits more than 0 nanograms of nitrogen oxides expressed as NO<sub>2</sub> per joule of useful heat delivered to the heated space. This includes non-central installations such as wall furnaces as well as units installed in non-residential applications. This section does not apply to furnaces used for mobile homes.

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53

## Ultra Low NOx Compliant Furnaces

	Non-Condensing	Condensing
<b>Tier</b>	Comfort Series	Comfort Series
<b>Model Number</b>	58SU0A → 58SU0B	59SU5A → 59SU5B
<b>AFUE</b>	80%	95%
<b>Heating Stages</b>	1	1
<b>Motor</b>	FCT → MCT (18-Speed)	FCT → MCT (5-Speed)
<b>Models Sizes</b>	40k, 3 tons 60k, 4 tons 80k, 5 tons 100k, 5 tons	40k, 3 tons 60k, 4 tons 80k, 5 tons 100k, 5 tons

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54

## Refrigerant Regulations

55

### What's on the Horizon

Transition date	Equipment	Requirement	Where <sup>(1)?</sup>
January 1, 2023	TRU	GWP ≤ 2,200	California National <sup>(2)</sup>
January 1, 2024	Chillers	SNAP Rule 21 Refrigerants ban GWP ≤ 750	12 States - CA, CO, DE, MA, MD, ME, NJ, NY, VA, VT, WA, RI National <sup>(2)</sup>
January 1, 2025	Res and Light CML Stationary A/C	GWP ≤ 750	California, Washington National <sup>(2)</sup>
January 1, 2026	VRF	GWP ≤ 750	California, Washington National <sup>(2)</sup>

<sup>(1)</sup> Situation as of December 2021. Several States at an early stage of the rulemaking process are not listed.  
<sup>(2)</sup> Regulation in progress - NOT approved yet

56

## What are the Options?

### R-410A

Short term solution.  
Phasing out in 2025

GWP

**2088**

### R-32

Short term solution.  
Will begin phase-out in 2029

GWP

**675**

Better efficiency and capacity than R-410a

### R-454B

Leader in regulatory.  
Puron® Advance will be compliant until at least 2034

GWP

**466**




Better efficiency and slightly lower capacity than R-410a

Lower discharge temperatures for improved reliability

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57

## Refrigerant Classifications

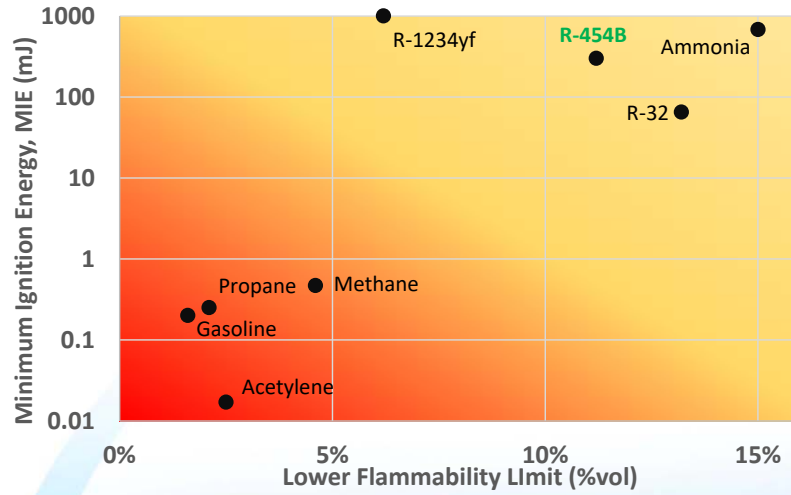
	ASHRAE Class	Example Refrigerants	
Higher Flammability	<b>A3</b>	Propane, Isobutane	Ignites very easily Potentially Explosive 
Lower Flammability	<b>A2</b>		Ignites Easily Relatively High Energy Release 
	<b>A2L</b>	R-454B, R-32, R-454A, R-455A	"Mildly Flammable" Difficult to Ignite Relatively Low Energy Release Low Flame Speed  Low Grade Coal
No Flame Propagation	<b>A1</b>	R-410A, R-404A, R-134a, R-452A Equinox Blends	No Flame Propagation

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58

## A2L = Low Risk, But a New Issue

- A2L Refrigerants are difficult to ignite

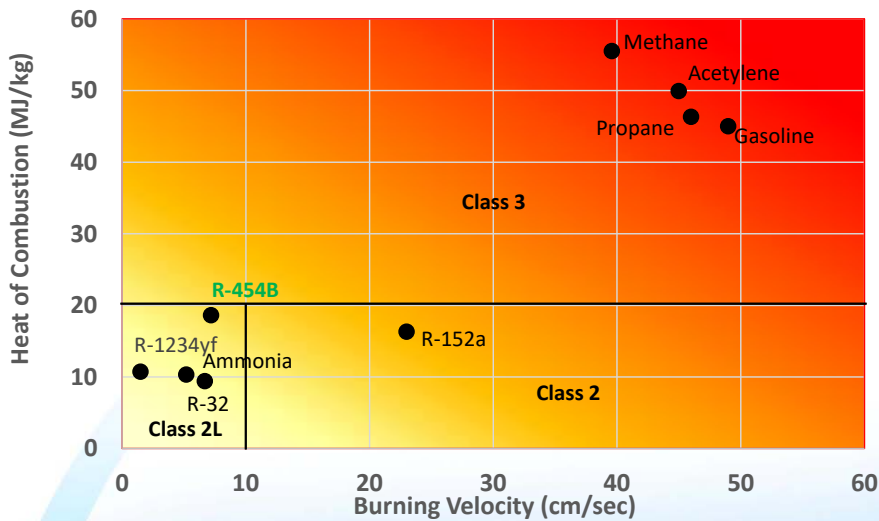


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59

## A2L = Low Risk, But a New Issue

- If ignited, A2L energy release is low



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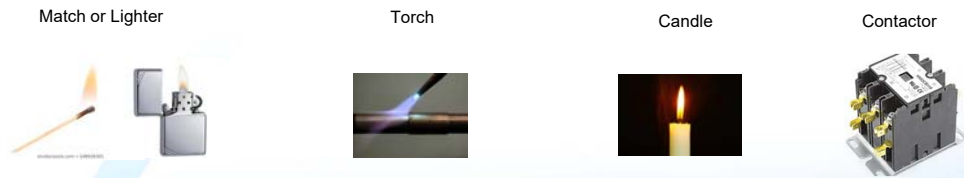
60

## A2L = Low Risk, But a New Issue

### Most Household Objects are NOT A2L ignition sources:



### Potential A2L Ignition Sources:



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## Required Unit Changes

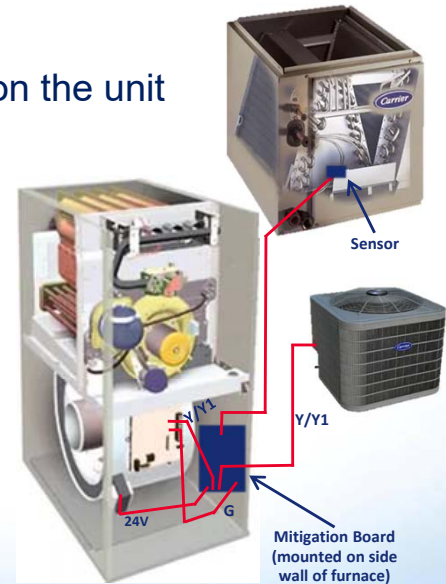
- **Outdoor Unit**
  - New compressor designed for R-454B
  - New A2L contactor
  - Wire sleeves on compressor plug and crank case heater
  - New labels throughout
- **Indoor Units**
  - Mitigation board / updated wiring diagram
  - 1 Refrigerant sensor(s)
  - TXV designed for R-454B
  - New labels throughout

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## Installation Changes

- **Outdoor Unit**
  - Ensure disconnect box is not mounted on the unit
- **Evaporator Coil / Fan Coil Units**
  - Use certified lineset connections (brazed or mechanical)
  - Sensor is factory installed
  - Connect to mitigation board
- **Furnace**
  - Mount mitigation board to furnace
  - Connect to mitigation board



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## R-454B Field Trial

- 26 units starting in October 2020
- More than 300,000 cycles
- **Preliminary Results**
  - No refrigerant leaks
  - Sensors are accurate
  - No false trips
  - Compressor wear is normal

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## Additional Resources

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65

## Additional Resources

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- [www.SiglerNorCal.com/engineer](http://www.SiglerNorCal.com/engineer)
  - Product data
  - System selections
- Steve Small, [ssmall@siglers.com](mailto:ssmall@siglers.com), 916.995.1247
- Jon Malkovich, [jmalkovich@siglers.com](mailto:jmalkovich@siglers.com), 415.786.9277
- Eric Doyle, [edoyle@siglers.com](mailto:edoyle@siglers.com), 623.670.1365

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66

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Thank you!