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DATE: 25 November, 2019
TO: Air Conditioning Original Equipment Manufacturers, Wholesalers and End Users
FROM: Copeland™ Marketing – Air Conditioning
SUBJECT: Introducing a new generation of 6-40T Commercial Copeland Scroll™ Compressors optimized for R410A, R32 and R454B

Introduction

Emerson is pleased to introduce a new generation of 6-40T Commercial scroll compressors, with the first models launching in February 2020. This new lineup will be optimized for each of the following refrigerants: R410A (ZPKZ), R32 (YPK1 and YPKA), and R454B (YAK1).

These products have been carefully designed for industry-leading efficiency and reliability, and are suitable for a wide array of commercial applications including rooftops, splits, chillers, and reversible systems. The specifications for R32, R410A and R454B for any model are consistent, meaning equal capacity and better efficiency than existing R410A systems.

The entire platform is positioned to help OEMs achieve compliance with:

1. Department Of Energy (DOE) EL3 regulations effective January 1, 2023, that raise minimum efficiency levels for IEER rated, commercial rooftops and split systems (**Figure 1**). For more information on upcoming regulations, visit the DOE website [here](#).
2. Expected state-by-state regulation that requires acceptable refrigerants to have a Global Warming Potential (GWP) of 750 or lower for new HVAC systems, starting in 2023.

This bulletin is primarily focused on ZPKZ (R410A) and YPK1 (R32) 12-15T that will be launched between February and May 2020.

Other models in the 6-40T range, optimized for each refrigerant, will be available for sale between 2020 to 2022. Separate marketing bulletins will be released for these products, other than ZPKZ and YPK1 12-15T, closer to their launch dates.

To get the most out of this bulletin, please see sections:

- **Features and Scope of Full Platform** for design strategy and availability on the full next generation 6-40T product line.
- **ZPKZ and YPK1 12-15T Efficiency, ZPKZ and YPK1 12-15T Motor Voltage Availability and ZPKZ and YPK1 12-15T BOM Availability** for details on 12-15T models that will be released between February and May 2020.
- **ZPKZ and YPK1 Multiples Availability** for Emerson assembled multiples – both tandems and trios - in this family, with a focus on ZPKZ and YPK1 12-15T models.
- **Appendix**, which provides nomenclature guidelines for this platform.

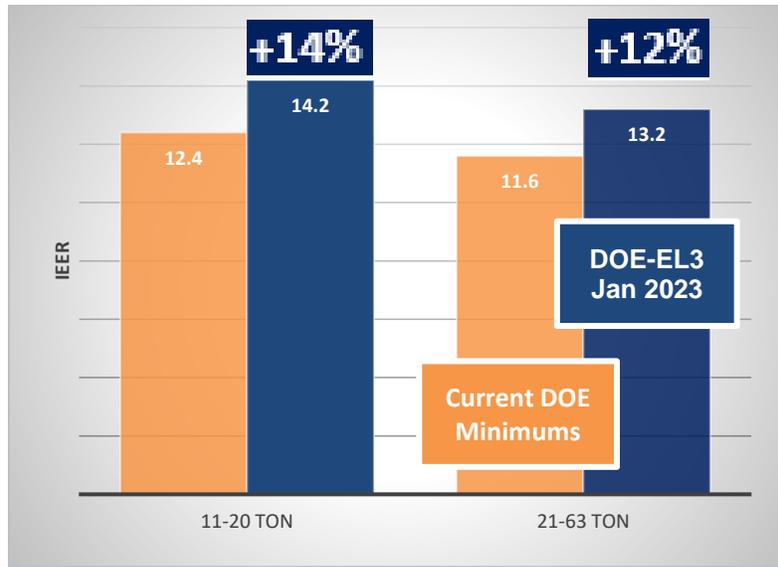


Figure 1: Department Of Energy Efficiency Levels Effective January 1, 2023 For Commercial Rooftops And Split Systems

Features And Scope Of Full Platform



Figure 2: ZPKZ / YPK1 / YPKA / YAK1 6-40T

Emerson's next generation 6-40T products will be optimized for R410A (ZPKZ), R32 (YPK1 and YPKA) and R454B (YAK1), and launched between February 2020 and late 2022.

For the convenience of our OEMs, Emerson has adopted a dual design strategy for R32:

1. YPK1 with the same nominal full load capacity as R410A, for those customers that prefer to minimize redesign for R32 systems
2. YPKA with 5 – 7% extra capacity than R410A, for those customers who prefer to optimize their R32 systems and reduce applied cost

The unique aspects of this next generation platform include, but are not limited to:

1. Discharge valving in the scrolls that reduces over-compression at light loads, saving energy and operating cost. This enables optimal performance over a range of cooling loads, enabling superior seasonal efficiency - Integrated Energy Efficiency Ratio (IEER) for rooftop units, and Integrated Part Load Value (IPLV) for chillers. See **Figure 3** for the location and design of this valving, and this [video](#) for its operation.
2. Highly efficient induction motors.
3. An active oil feed to the scrolls that enables hydrodynamic lubrication and mitigates the higher heat of compression associated with R32 and R454B.
4. Overcurrent and thermal protection internal to the compressor on all models and voltages up to 15T (no external electronic module required).
5. Expanded speed (35 – 75Hz) capability on 12 – 40T when paired with a variable speed drive, for both singles and multiples.
6. Dual design strategy for R32 on certain models for system design flexibility.
7. 20% smaller footprint for the new 20-25T, versus legacy ZP236KC and ZP296KC models.
8. Harmonized external features on 12 – 40T for ease of tandemization and smaller multiples footprint. See **Figure 4** for details.

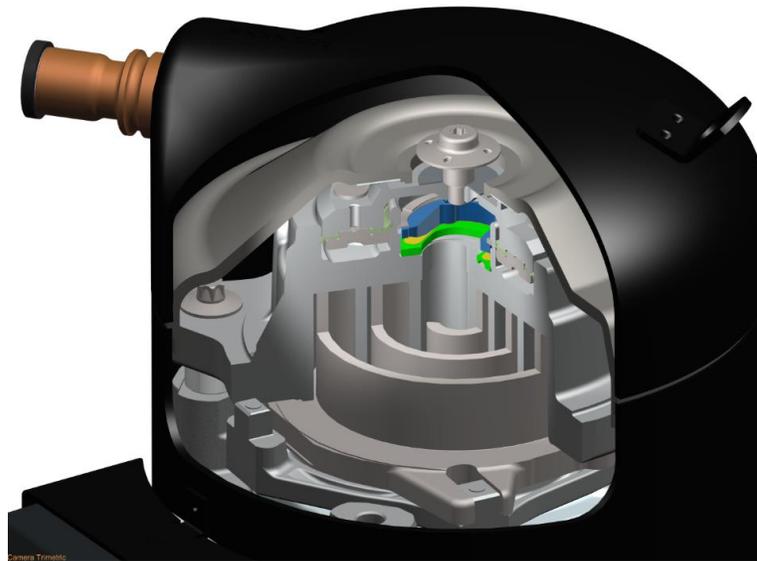


Figure 3: Scroll Discharge Valving For Superior Seasonal Efficiency

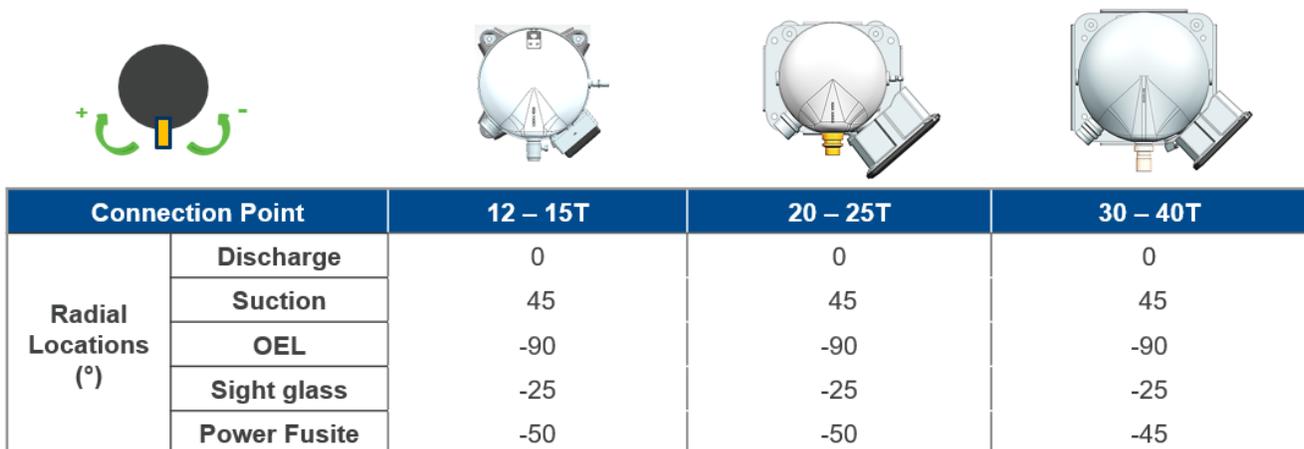


Figure 4: KZ / YP / YA Platform – External Fitting Orientation

These features greatly enable customers to save time, labor, applied costs, and complexity associated with:

- a. Eliminating system components and plumbing - that would have otherwise been required – for higher efficiency, compressor protection, and vapor or liquid injection to manage R32 and R454B discharge temperatures
- b. Smaller single and multiple compressor footprints

For the full range of offerings in this family and launch timing, please refer to **Figure 5**. “Future” is used to indicate models that will launch before the end of 2022; however, definitive timing is being assessed. Separate marketing bulletins will be released for all models, other than ZPKZ and YPK1 12-15T, closer to launch.

Legend	Primary scope of this bulletin			
Platform	ZPKZ	YPK1	YPKA	YAK1
Refrigerant	R410A	R32	R32	R454B
6-8 T	Future	Future	Future	Future
9-10 T	Future	Future	Future	Future
12-15 T	Feb – April 2020	May 2020	Future	Future
20-25 T	Future	Not Planned	Future	Future
30-40 T	Not Planned	Not Planned	Future	Not Planned

Figure 5: Launch Schedule

Please see the [Appendix](#) for nomenclature guidelines for these products.

The 12-40T models will be built on Emerson’s brand new, state of the art assembly line at the plant in Lebanon, Missouri (see Figure 6). This highly automated new line improves manufacturing processes, increases operations flexibility, enhances product quality, and prepares for future regulatory requirements. Lebanon’s geographic location also enables Emerson to streamline its supply chain to serve customers better.

Key benefits of this new line and location:

- 1) Better line flexibility and responsiveness
- 2) Improved quality
- 3) Improved logistics and lead times



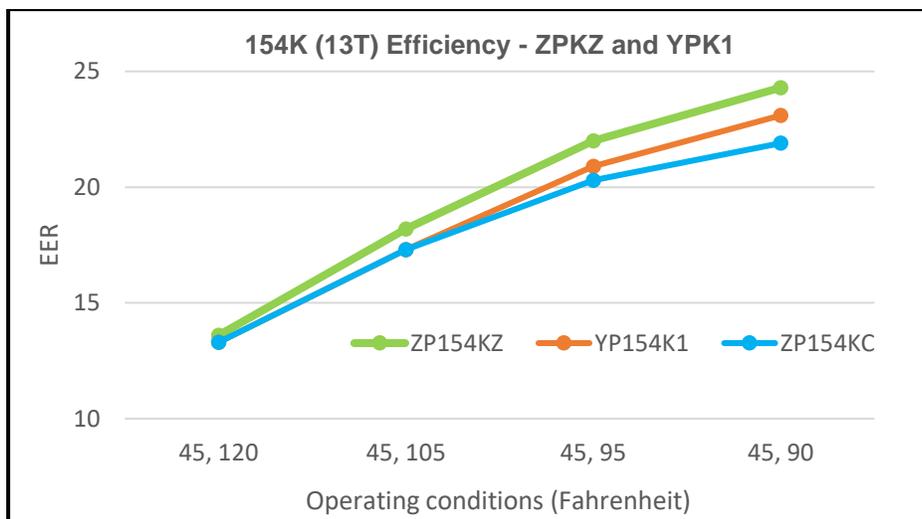
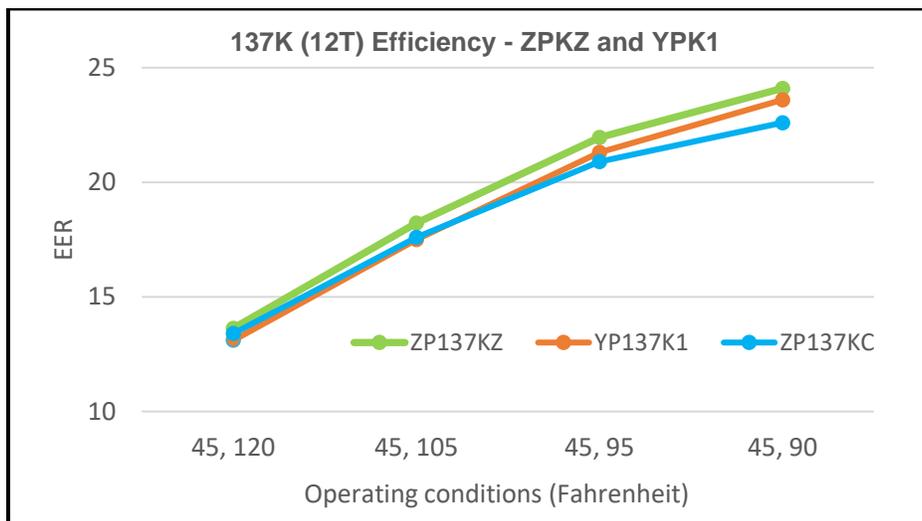
Figure 6: Emerson Plant in Lebanon, Missouri

ZPKZ and YPK1 12-15T Efficiency

As described in **Features and Scope of Full Platform**, superior efficiency is one of the hallmarks of the ZPKZ and YPK1 line of products. These models are as much as 8% more efficient than legacy ZPKC models at the Integrated Energy Efficiency Ratio (IEER) weighted efficiency that is used to rate rooftops and split systems.

Please see **Figure 7** for efficiency comparisons and application bulletin *AE4-1448* for operating envelopes, or call your application or sales representative for further details on the application of ZPKZ and YPK1 12-15T Copeland Scroll™ compressors.

Additional product performance and electrical information can also be accessed online at www.climate.emerson.com. Log in or register for Online Product Information.



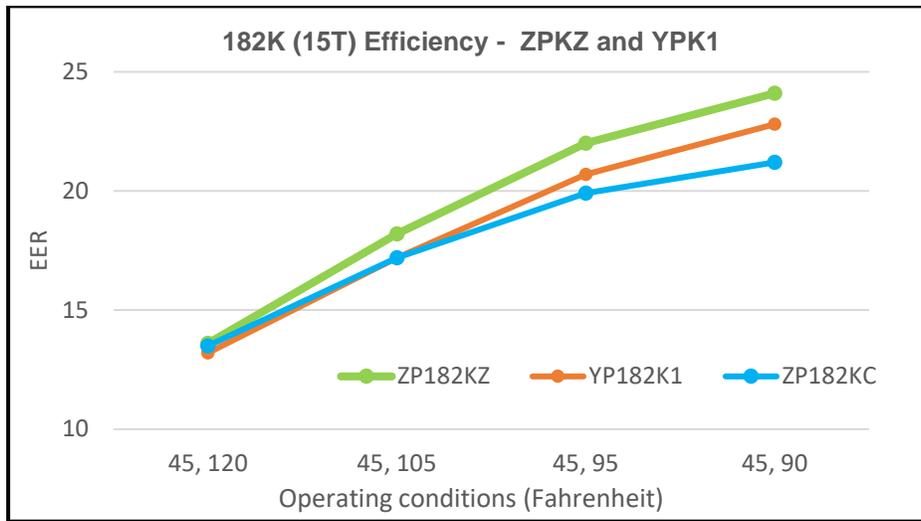


Figure 7: 12-15T Efficiency Comparisons – ZPKZ (improved R410A) and YPK1 (R32) versus ZPKC (legacy R410A)

ZPKZ and YPK1 12-15T Motor Voltage Availability

For availability of specific motor voltage codes in the 12-15T family, please see **Figure 8**. For YPK1 12-15T models, only the TFD motor code will be available. For interest in other voltages, please contact your application or sales representative.

Model	ZP137KZ (12T)	ZP154KZ (13T)	ZP182KZ (15T)
TF5 3Φ-200/230V-60Hz 3Φ-200/220V-50Hz	February 2020	April 2020	March 2020
TFD 3Φ-460V-60Hz 3Φ-380/420-50Hz	February 2020	April 2020	March 2020
TFE 3Φ-575V-60Hz	February 2020	April 2020	March 2020
TF7 3Φ-380/400V - 60Hz	February 2020	April 2020	March 2020

Model	YP137K1 (12T)	YP154K1 (13T)	YP182K1 (15T)
TFD 3Φ-460V-60Hz 3Φ-380/420-50Hz	May 2020	May 2020	May 2020

Figure 8: ZPKZ and YPK1 12-15T Availability (Ship Dates)

ZPKZ and YPK1 12-15T Features Available

These models have the following features available on single compressors. Please contact your Sales or Application Engineering representative for details.

- 1) Molded plug, fence, cover – IP66 rating (available on 460V only)
- 2) Terminal block, fence, cover - IP21 rating
- 3) Terminal block, terminal box - IP54 rating
- 4) Braze suction and discharge fittings
- 5) Rotalock suction and discharge fittings
- 6) Oil sight glass
- 7) Oil equalization fitting, with or without a gas equalization fitting

Refer to **ZPKZ and YPK1 Multiples Features Available** for features on Emerson assembled tandems and trios.

ZPKZ and YPK1 Multiples Availability

Emerson's multiples offering – using customized manifolds that are proven to aid in oil balance and maintain system uptime – help our customers achieve lower applied costs, superior efficiency, and regulatory compliance. Multiples are a cost-effective, relatively easy way to increase modulation stages, and reduce the number of circuits required for the nominal tonnage in any system. Additionally, ZPKZ tandems have been qualified to run an expanded speed (35 – 75Hz) operating envelope, meaning infinite steps of modulation with a variable speed drive.

This bulletin focuses primarily on combinations consisting of ZPKZ and YPK1 12-15T, with availability as shown in **Figures 9 and 10**. Note Emerson now assembles both tandems and trios.

Tandems (✓ Indicates Available)

Product Configuration	Model Names	Steps Of Modulation	Design Availability	Product Launch
ZPKZ 12-15T combinations				
15T + 15T	ZPT364KZE-TFD	2		April 2020
13T + 13T	ZPT308KZE-TFD	2		
12T + 12T	ZPT274KZE-TFD	2		
13T + 15T	ZPU336KZE-TFD	3	✓	
12T + 15T	ZPU319KZE-TFD	3		
12T + 13T	ZPU291KZE-TFD	3		
YPK1 12-15T combinations				
15T + 15T	YPT364K1T-TF	2		Upon request
13T + 13T	YPT308K1T -TF	2		
12T + 12T	YPT274K1T -TF	2		
13T + 15T	YPU336K1T -TF	3	Upon request	
12T + 15T	YPU319K1T -TF	3		
12T + 13T	YPU291K1T -TF	3		

Product Configuration	Model Names	Steps Of Modulation	Design Availability	Product Launch
ZPKZ 12-15T + 20-25T combinations 15T + 25T 13T + 25T 12T + 25T 15T + 20T 13T + 20T 12T + 20T	ZPU474KZE-TZ	3	✓	Upon request
	ZPU446KZE-TZ	3		
	ZPU429KZE-TZ	3		
	ZPU414KZE-TZ	3		
	ZPU386KZE-TZ	3		
	ZPU339KZE-TZ	3		
YPK1 12-15T + 20-25T combinations 15T + 25T 13T + 25T 12T + 25T 15T + 20T 13T + 20T 12T + 20T	YPU474K1T-TZ	3	Upon request	Upon request
	YPU446K1T-TZ	3		
	YPU429K1T-TZ	3		
	YPU414K1T-TZ	3		
	YPU386K1T-TZ	3		
	YPU339K1T-TZ	3		
ZPV Variable speed 15T + ZPKZ 20-25T Combinations 15T + 20T 15T + 25T	ZPVU306KZE-TZ	Infinite	✓	Upon request
	ZPVU358KZE-TZ			
YPK1 Variable speed 15T + YPK1 20-25T Combinations 15T + 20T 15T + 25T	YPVU306K1T-TZ	Infinite	Upon request	Upon request
	YPVU358K1T-TZ			

Figure 9: ZPKZ And YPK1 12-15T Assembled Tandem Availability

Trios (✓ Indicates Available)

Product Configuration	Model Names	Steps Of Modulation	Design Availability	Product Launch	
ZPKZ 12-15T combinations					
15T + 15T + 15T	ZPY546KZE-TF	3		April 2020	
13T + 13T + 13T	ZPY462KZE-TF	3			
12T + 12T + 12T	ZPY411KZE-TF	3			
15T + 15T + 13T	ZPM518KZE-TF	4	✓		
15T + 15T + 12T	ZPM501KZE-TF	4			
13T + 13T + 12T	ZPM445KZE-TF	4			
13T + 13T + 15T	ZPM490KZE-TF	4			
12T + 12T + 13T	ZPM428KZE-TF	4			
12T + 12T + 15T	ZPY456KZE-TF	4			
YPK1 12-15T combinations					
15T + 15T + 15T	YPY546K1T-TF	3	Upon request		Upon request
13T + 13T + 13T	YPY462K1T-TF	3			
12T + 12T + 12T	YPY411K1T-TF	3			
15T + 15T + 13T	YPM518K1T-TF	4			
15T + 15T + 12T	YPM501K1T-TF	4			
13T + 13T + 12T	YPM445K1T-TF	4			
13T + 13T + 15T	YPM490K1T-TF	4			
12T + 12T + 13T	YPM428K1T-TF	4			
12T + 12T + 15T	YPY456K1T-TF	4			

Figure 10: ZPKZ And YPK1 Assembled Trio Availability

ZPKZ and YPK1 Multiples Features Available

The following features will be available on the ZPKZ and YPK1 multiples. For specific BOMs, please contact your sales or application engineering representative.

- 1) All electrical enclosures listed in **ZPKZ and YPK1 12-15T Features Available**
- 2) Brazed suction and discharge fittings on the compressor
- 3) Rotalock suction and discharge fittings on the compressor – for ease of field service
- 4) Vertical suction – see **Figure 11**
- 5) Brazed Oil Equalization Line (OEL)
- 6) Two Phase Tube Line (TPTL)
- 7) Gas Equalization Line (GEL)
- 8) Oil sight glass*
- 9) Bi-directional discharge

** Oil sight glass is rotalock and located on the compressors in a multiple that does not utilize a TPTL. Oil sight glass is located on the TPTL in multiples that use a TPTL.*



Figure 11: ZPKZ and YPK1 12-15T Tandem



Figure 12: ZPKZ and YPK1 12-15T + 20-25T Tandem

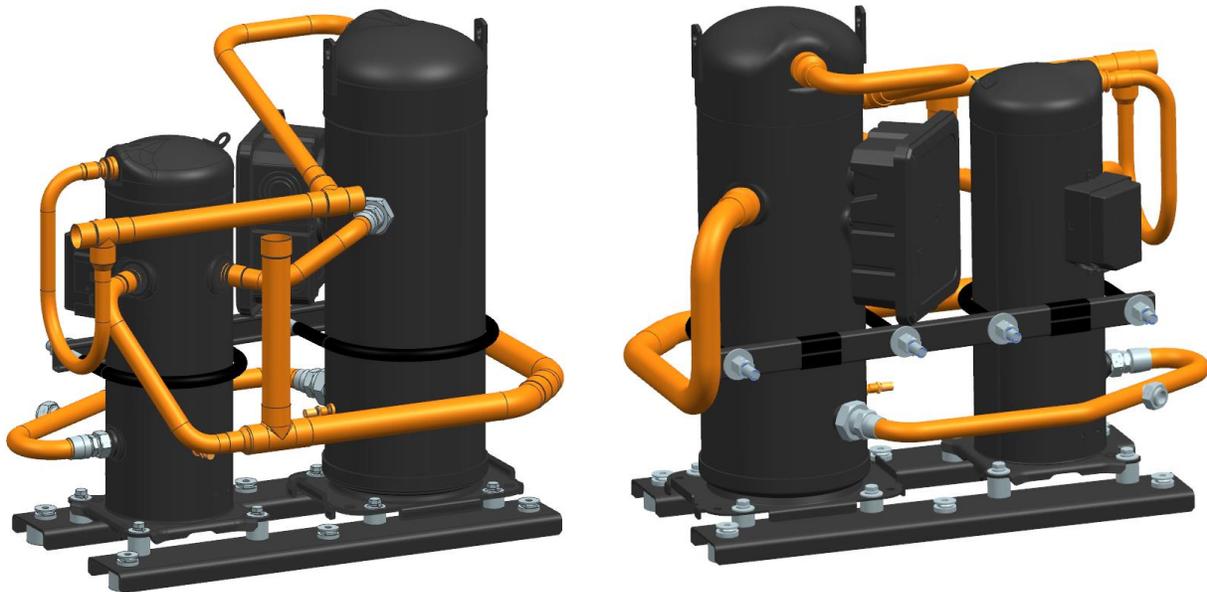


Figure 13:
ZPV Variable Speed 10-15T + ZPKZ 20-25T Tandem
YPV Variable Speed 10-15T + YPK1 20-25T Tandem

Appendix - Product Nomenclature Guidelines

For model nomenclature guidelines for this platform, please see **Figures 14 and 15**.

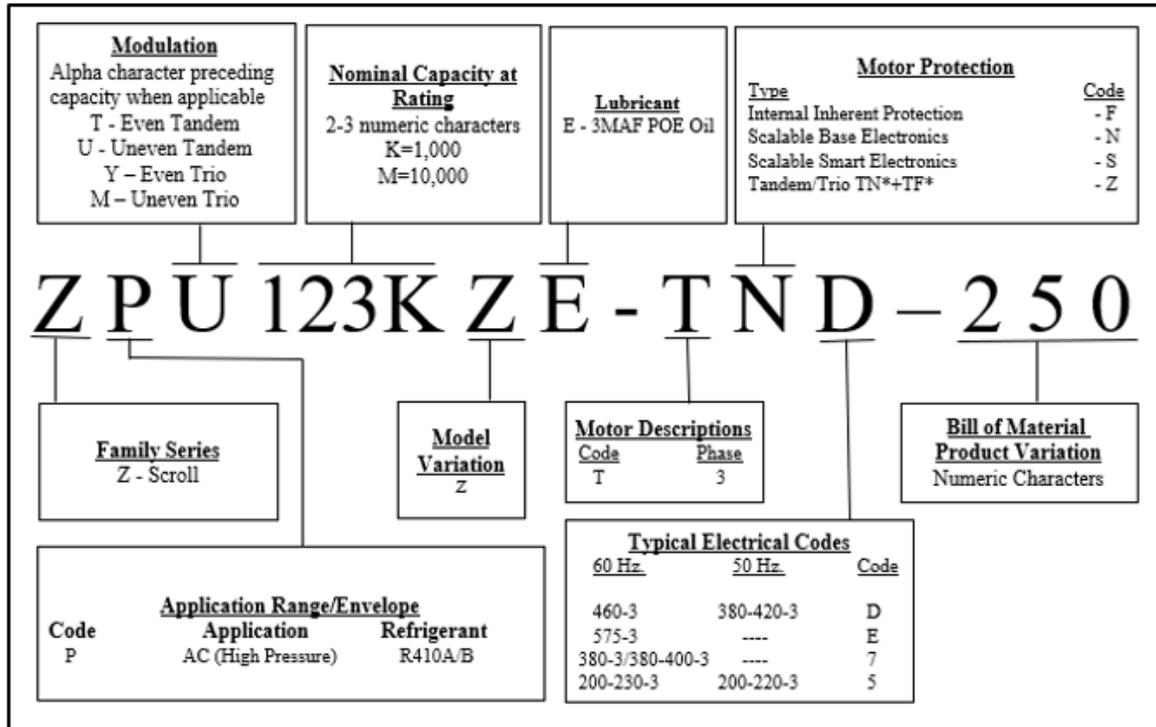


Figure 14: R410A Nomenclature Guide for Next-gen 6-40HP

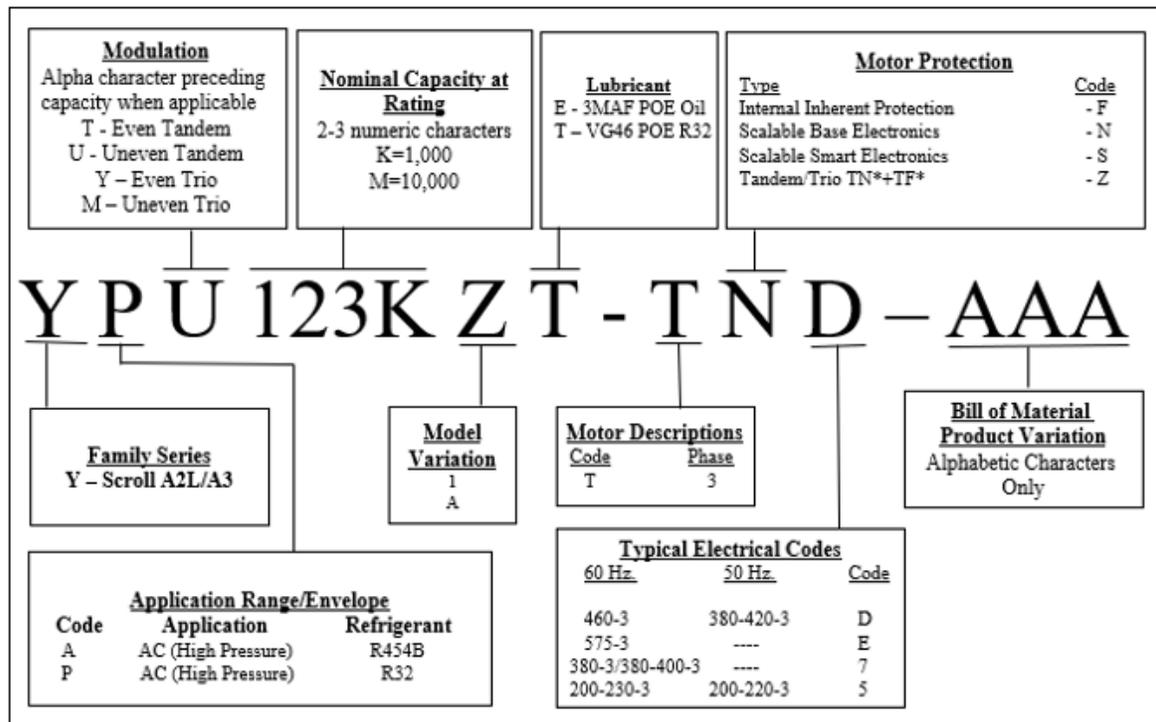


Figure 15: R32 and R454B Nomenclature Guide for Next-gen 6-40HP