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**Beijer Ref India – Bitzer Screw Compressor Training ( 2022)**



## **Scheme of Presentation**

- Screw Compressor
- Refrigerant
- Types of Screw compressor
- Nomenclature
- Scope of supply
- Application Envelope
- How to select a compressor



## **Types of Bitzer Screw Compressors**

1. Compact Screw Compressor – CSH / CSW
2. Semi Hermetic Screw Compressor – HSK / HSW
3. Open Type Screw Compressor – OSK / OSN



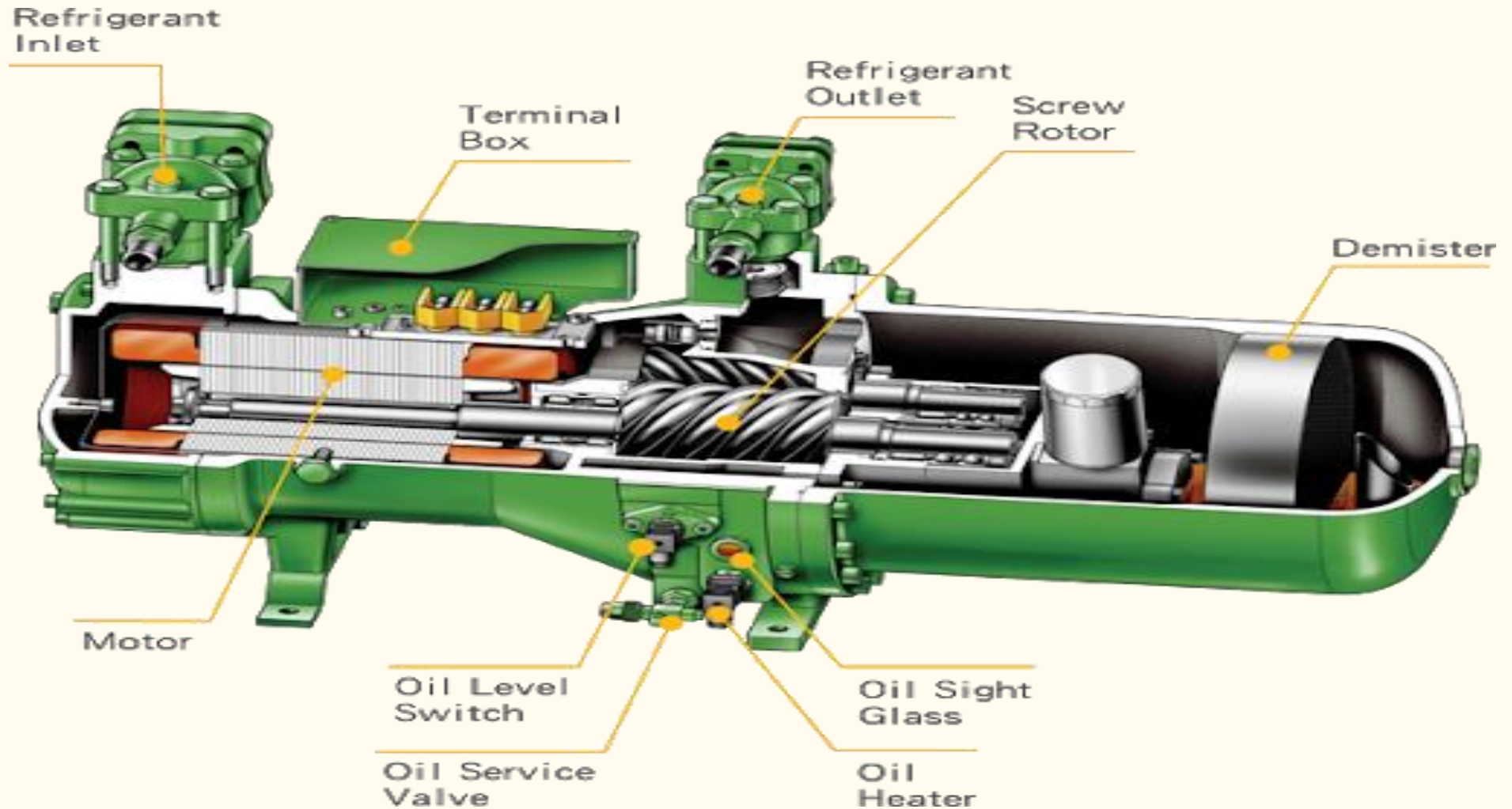
## **Compatible Refrigerants**

- R22
- R134a
- R407C
- R404a
  
- R407a
- R407F
- R448a
- R449a
- R450a
- R507a
- R513a
- R1234yf
- R1234ze
- NH3

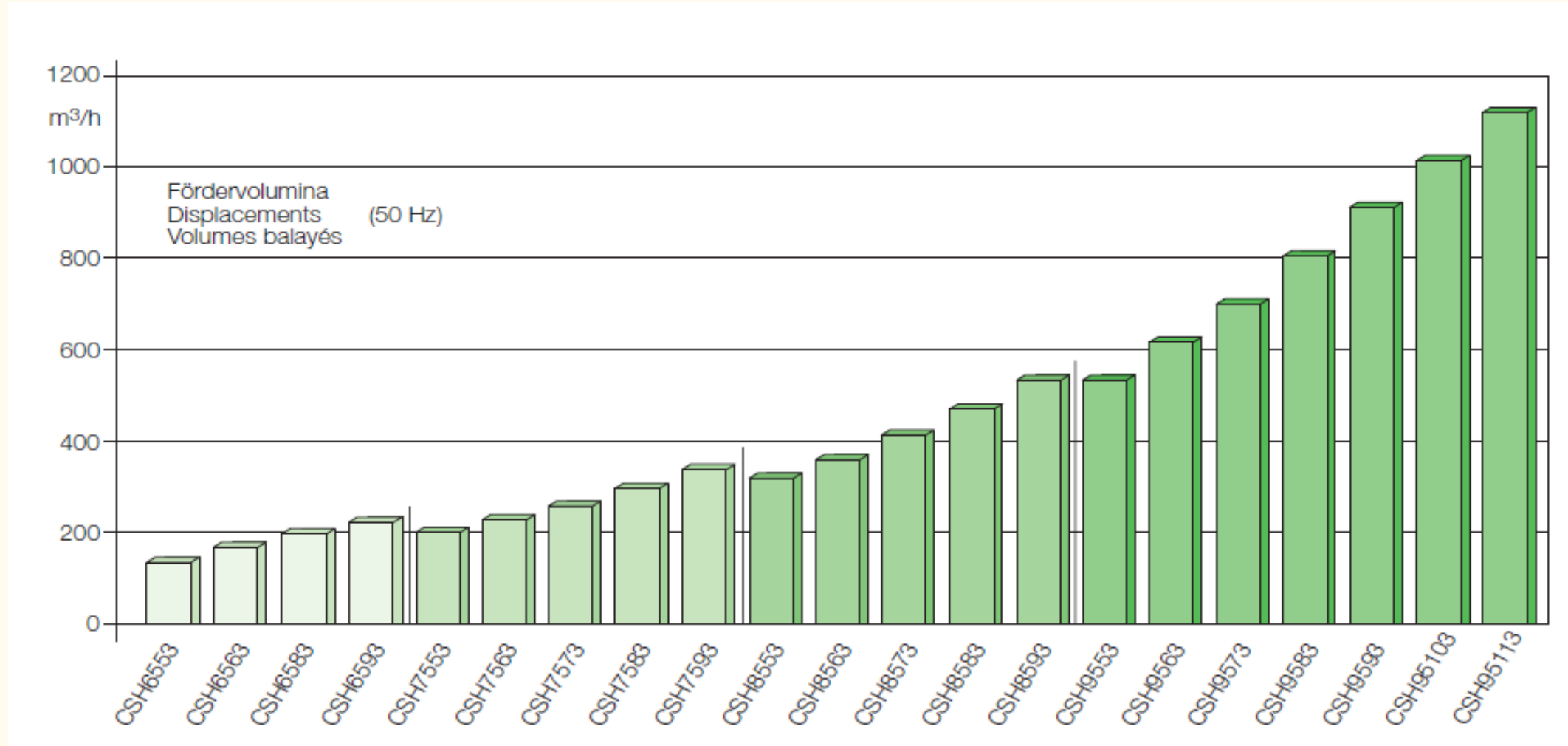
**SCREW COMPRESSOR**



**SCREW COMPRESSOR**



**Range of CSH**



## Nomenclature - CSH

### Type designation

**CSH** 7573 - 90 Y - 40P

Semi-hermetic compact screw  
compressor

CSH **75**73 - 90 Y - 40P

Housing size

CSH 75**7**3 - 90 Y - 40P

Code for displacement (5 .. 11)

CSH 757**3** - 90 Y - 40P

Compressor execution

CSH 7573 - **90** Y - 40P

Code for motor size

CSH 7573 - 90 **Y** - 40P

Oil charge (polyol-ester)

CSH 7573 - 90 Y - **40P**

Motor code

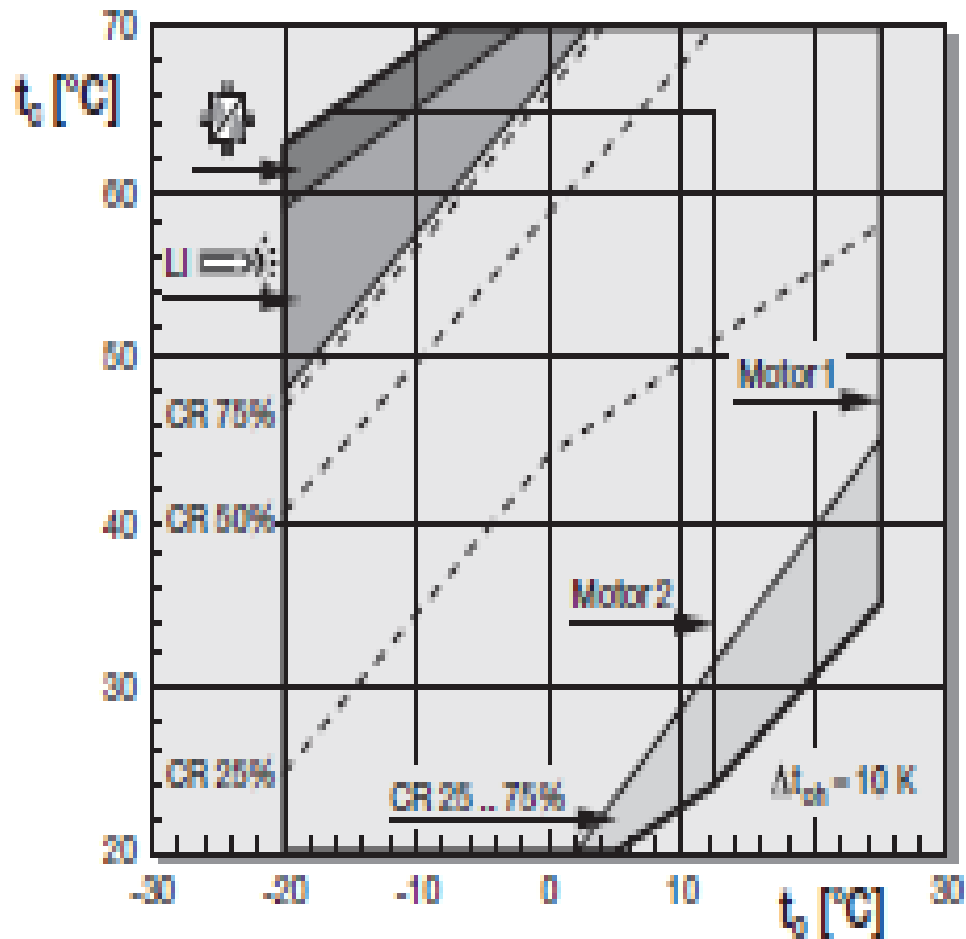
- CSH 7573 -90 Y – 40P



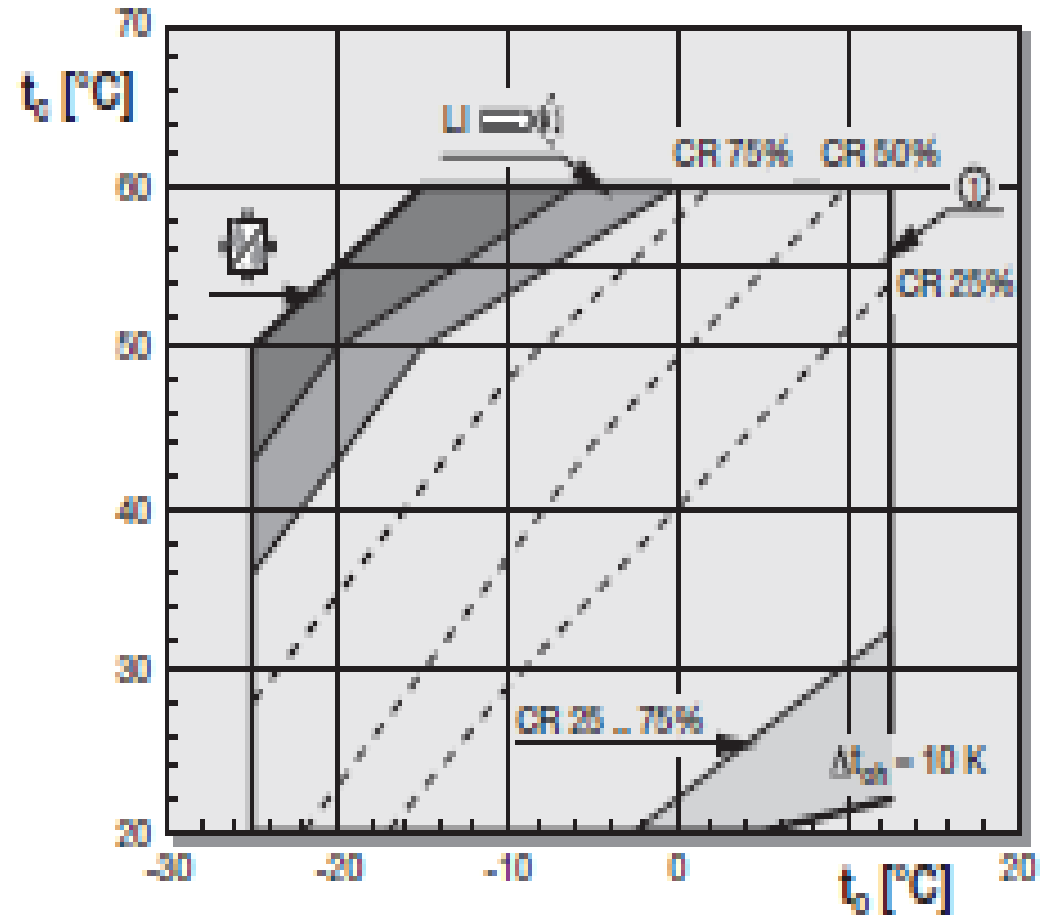


**CSH Application Envelope – R134a / R407c**

R134a, R1234yf, R450A, R513A Standard



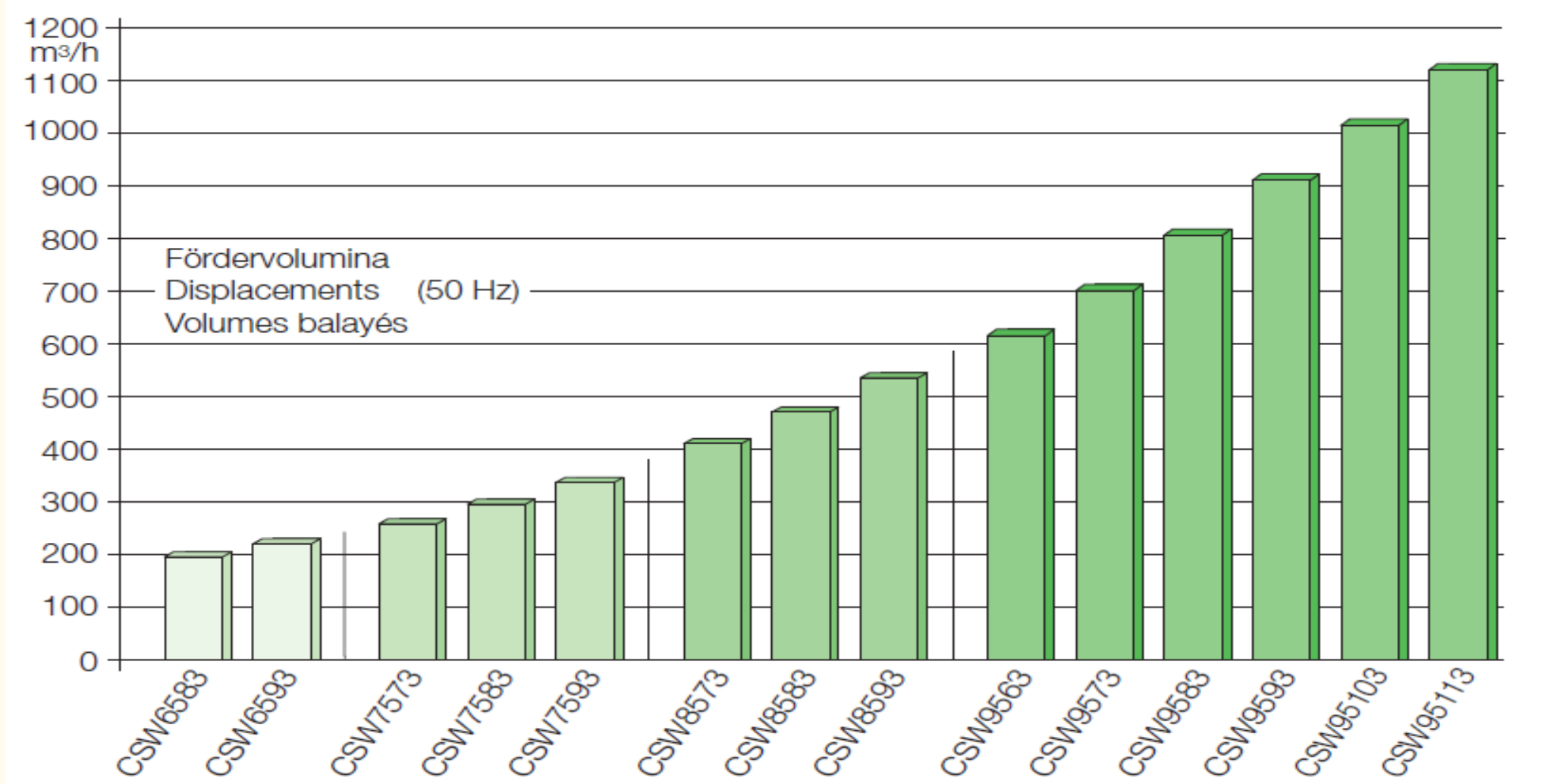
R407C Standard ■ Motor 1\*



## CONTROL MODULE

	Schutzgerät Protection device Dispositif de protection	SE - E1	SE - E3	SE - E2	SE - i1
	Spannungsbereich Motor Voltage range motor Plage de tension moteur	200 - 600 V	600 - 690 V	80 - 575 V	60 - 690 V
	Frequenzbereich Motor Frequency range motor Gamme de fréquences moteur	50 / 60 Hz	50 / 60 Hz	FI / ESS*	FI / ESS*
Grundfunktionen Basic functions Fonctions de base	PTC-Messkreis PTC control circuit Bouche de mesure PTC	✓	✓	✓	✓
	Drehrichtungsüberwachung Rotation direction monitoring Contrôle de sens de rotation	✓	✓	✓	✓
	Phasenausfallüberwachung Phase failure monitoring Contrôle de défaillance de phase	✓	✓	✓	✓
Erweiterte Funktionen Extended functions Fonctions avancées	Für FU-Betrieb geeignet Suitable for FI operation Convient au fonctionnement avec CF	—	—	✓	✓
	Ölniveauüberwachung Oil level monitoring Contrôle de niveau d'huile	—	—	—	✓
	Schalthäufigkeitsüberwachung Cycling rate monitoring Contrôle de fréquence d'enclenchements	—	—	—	✓
	Datenaufzeichnung Data log Enregistrement des données	—	—	—	✓
	Einsatzgrenzüberwachung Application limits monitoring Contrôle des limites d'application	—	—	—	✓
	Datenkommunikation (BEST/Modbus) Data communication (BEST/Modbus) Communication data (BEST/Modbus)	—	—	—	✓
	CE und UL/CSA Abnahme CE and UL/CSA approval Approbation de CE et UL/CSA	✓	—	✓	✓

**RANGE OF CSW**





## Nomenclature - CSW

### Type designation

**C S** W 7 5 7 3 - 6 0 Y - 40P

Semi-hermetic compact screw compressor

**C S** **W** 7 5 7 3 - 6 0 Y - 40P

Version for low condensing temperatures

**C S** W **7 5** 7 3 - 6 0 Y - 40P

Housing size

**C S** W 7 5 **7** 3 - 6 0 Y - 40P

Code for displacement (6 .. 11)

**C S** W 7 5 7 **3** - 6 0 Y - 40P

Compressor execution  
(3 = optimized for SEER)

**C S** W 7 5 7 3 - **6 0** Y - 40P

Code for motor size

**C S** W 7 5 7 3 - 6 0 **Y** - 40P

Oil charge (polyol-ester)

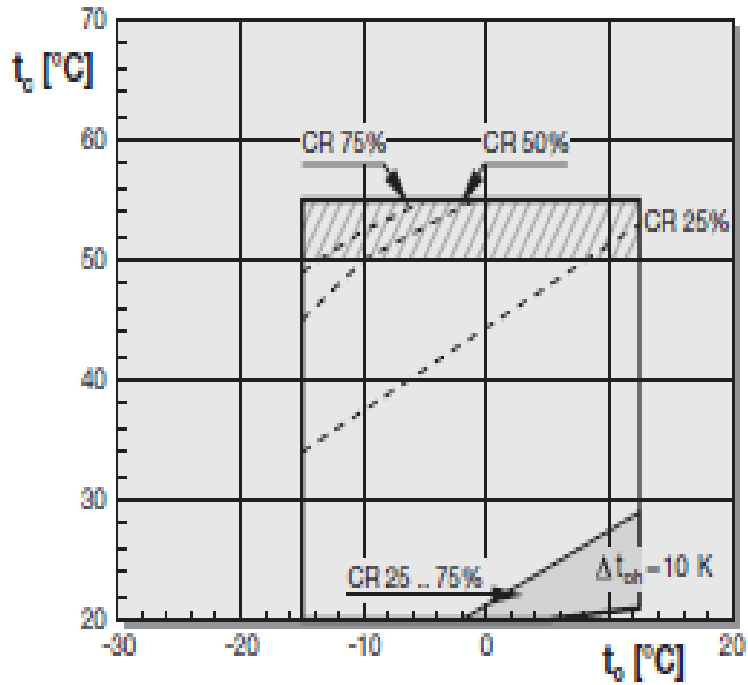
**C S** W 7 5 7 3 - 6 0 Y - **40P**

Motor code

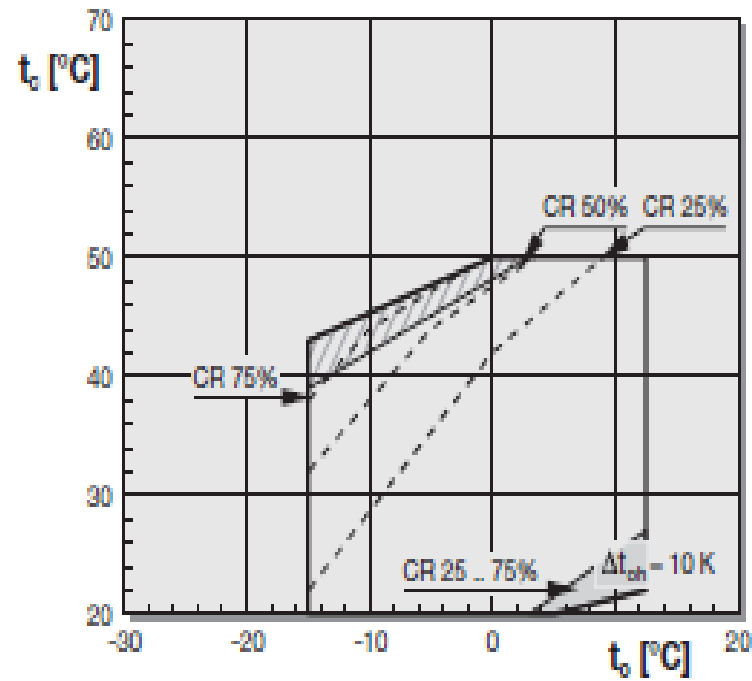
- CSW 7573 -60 Y – 40P

**CSW Application Envelope**

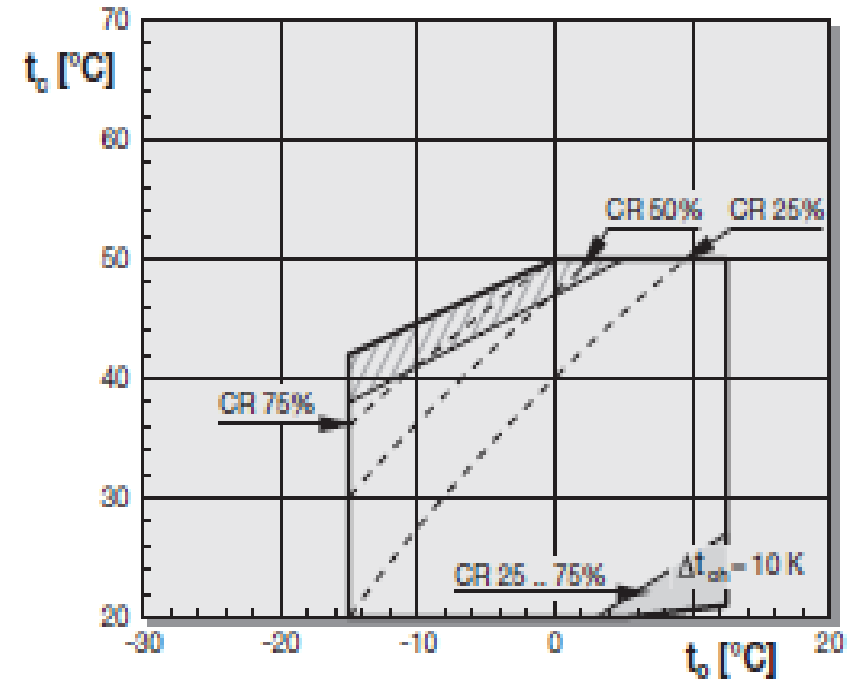
R134a, R1234yf, R450A, R513A



R407C



R22

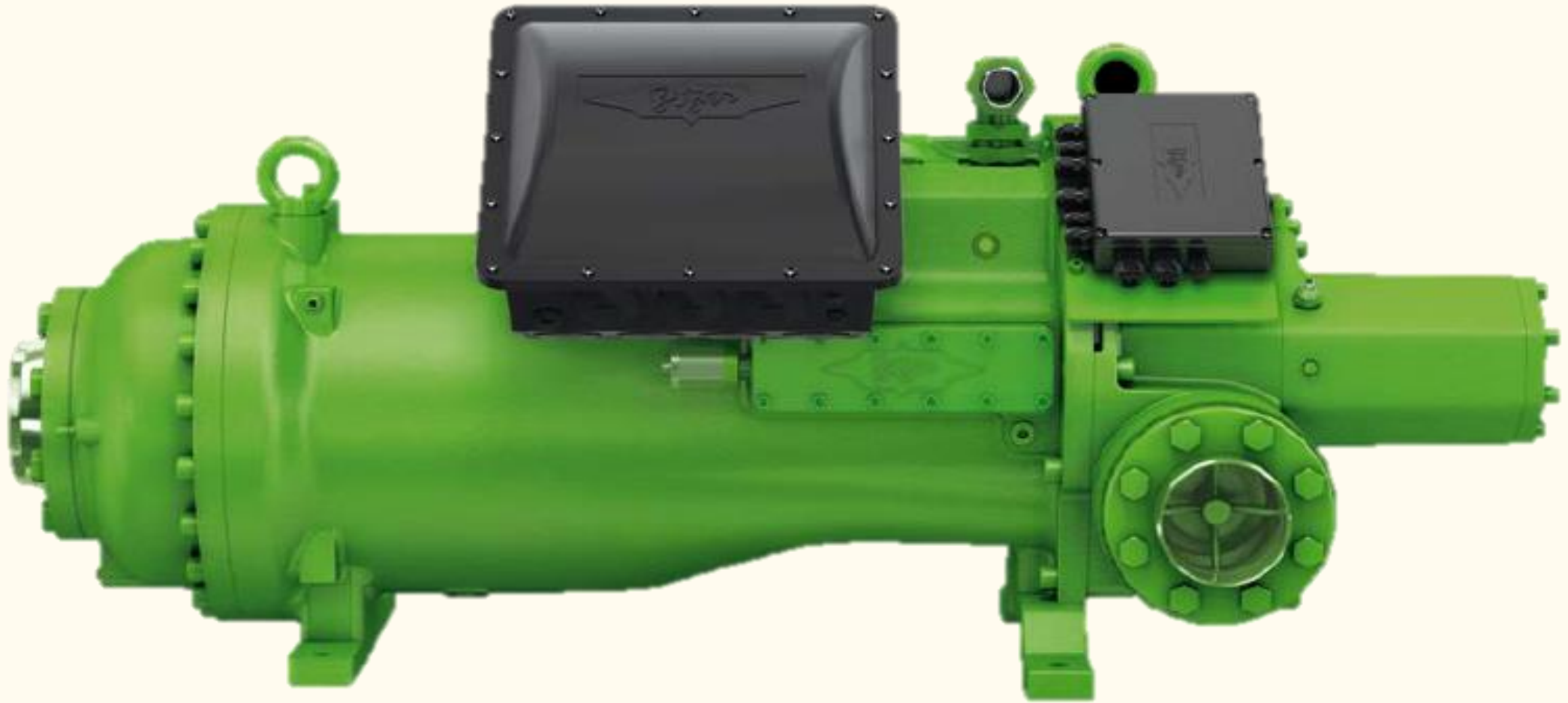








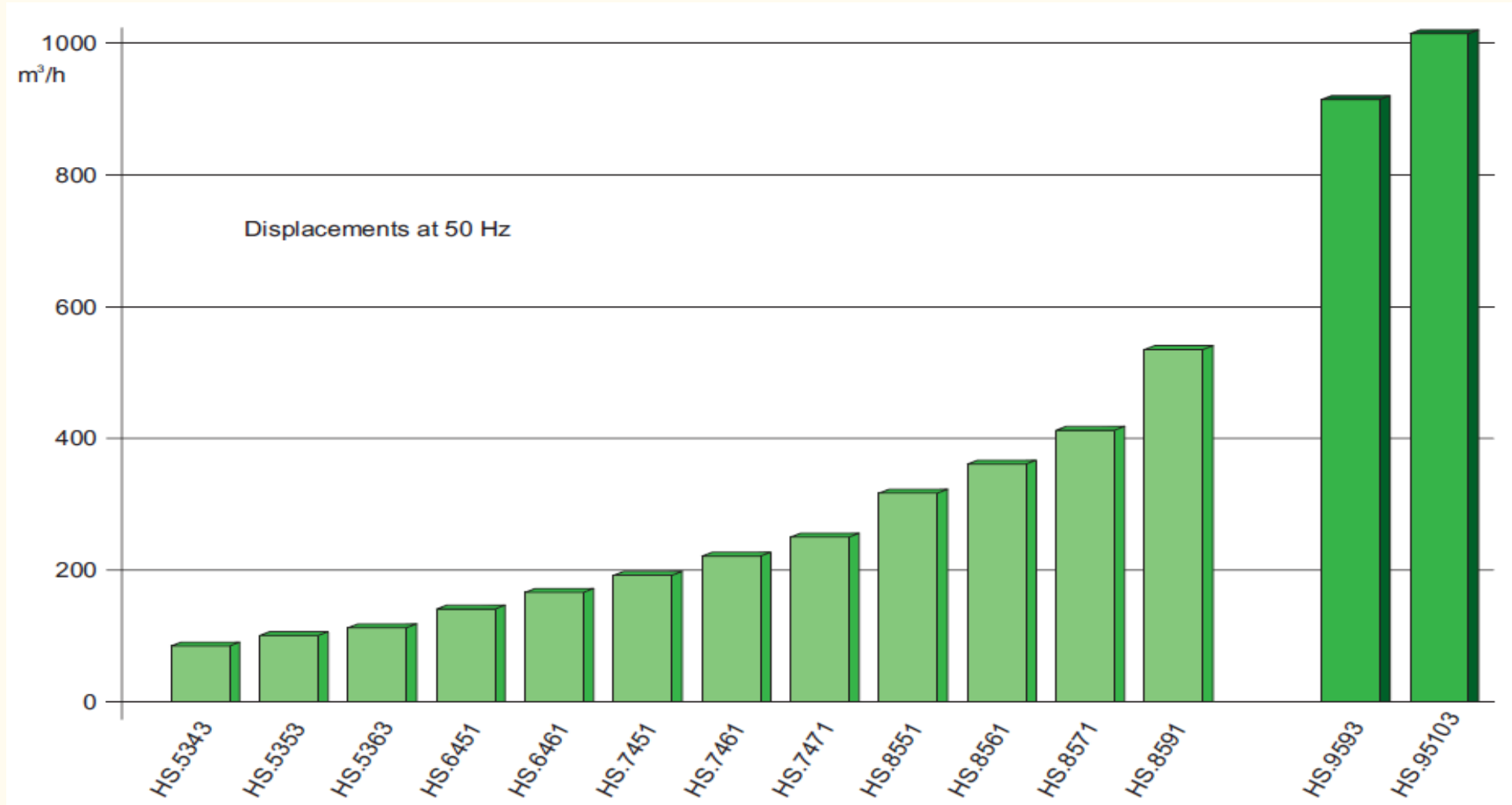
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**Range of HS**





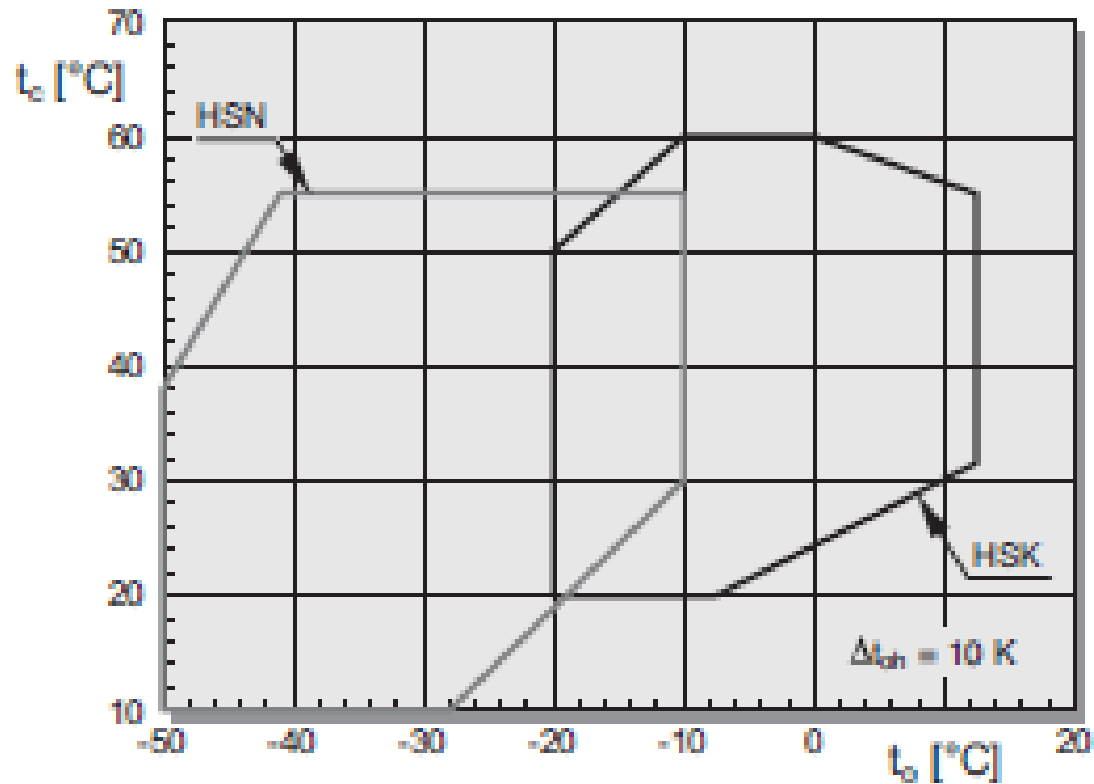
## Nomenclature - HS

	<b>HS</b> K 95103 - 320 - 40D
Semi-hermetic screw compressor	
	<b>HSK</b> 95103 - 320 - 40D
Application range	
K = Air conditioning and medium temperature application	
N = Low temperature application	
	<b>HSK 95</b> 103 - 320 - 40D
Housing size	
	<b>HSK 9510</b> 3 - 320 - 40D
Displacement	
	<b>HSK 95103</b> - 320 - 40D
Compressor execution	
	<b>HSK 95103 - 320</b> - 40D
Motor size and design	
	<b>HSK 95103 - 320 - 40D</b>
Motor code	

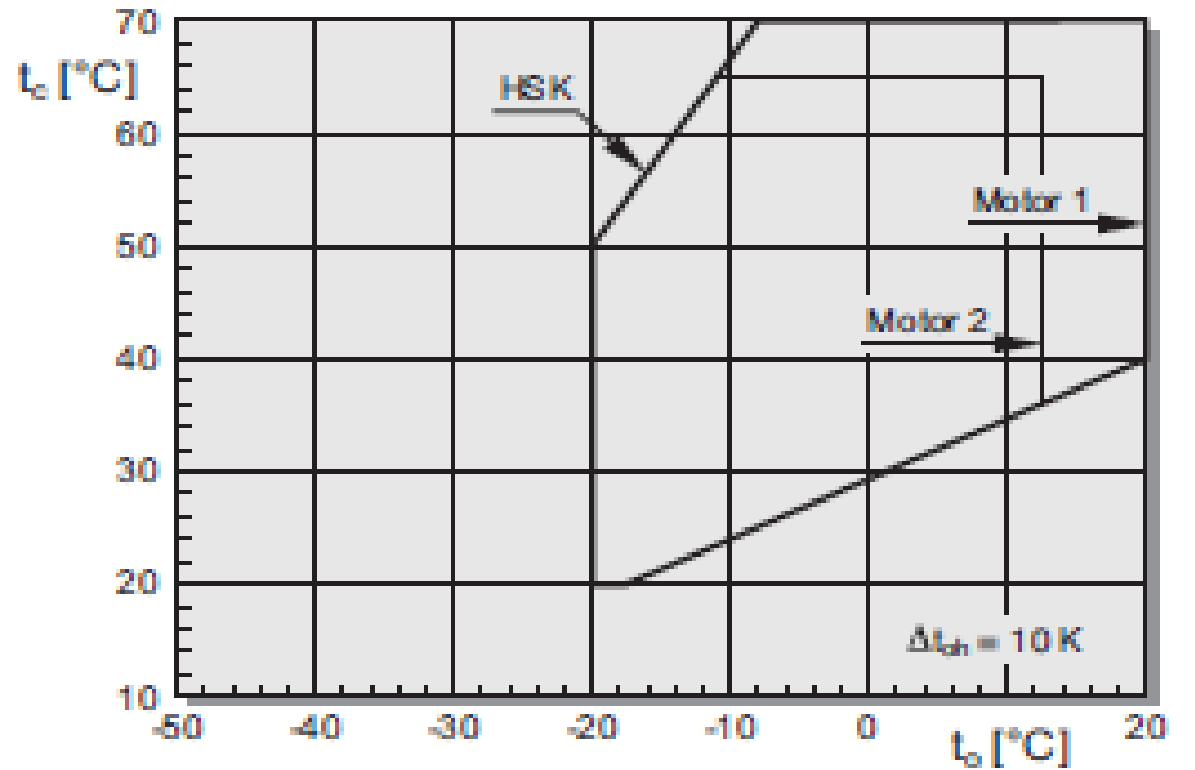
- HS K 95 103 – 320 – 40D

**HS Application Envelope – R22 / R134a**

**R22 CR100%**

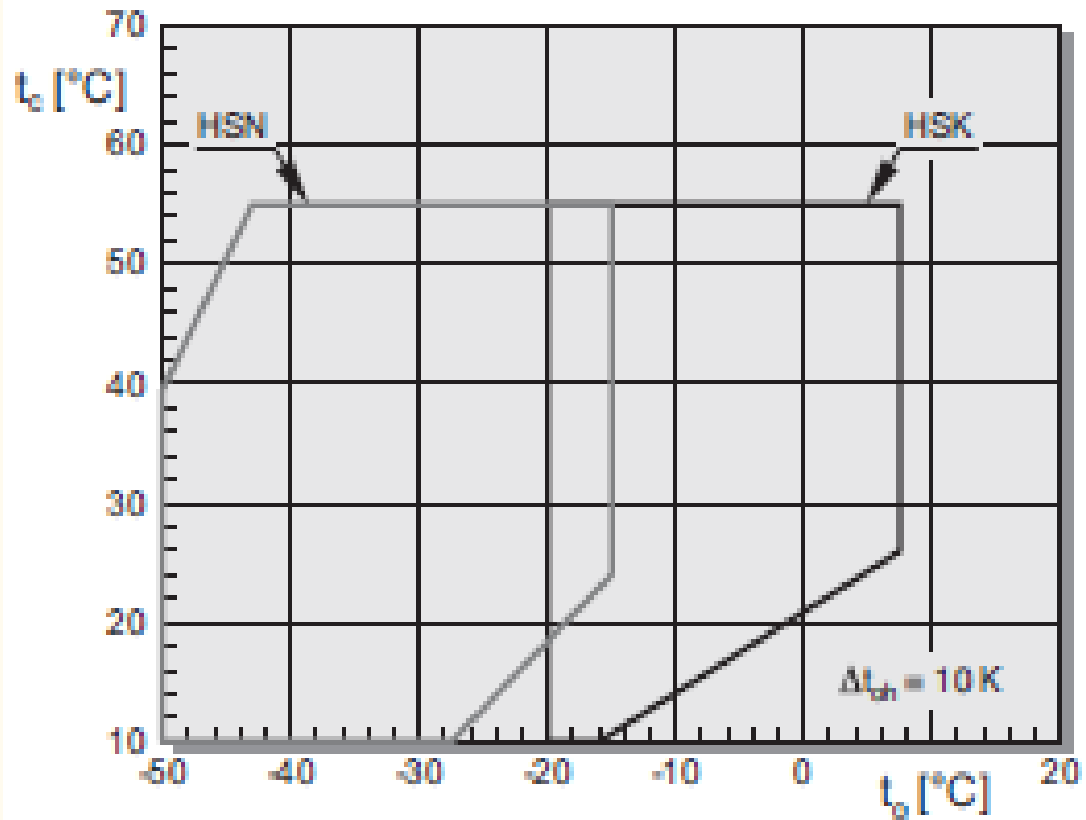


**R134a ■ R513A ■ R450A ■ R1234yf**

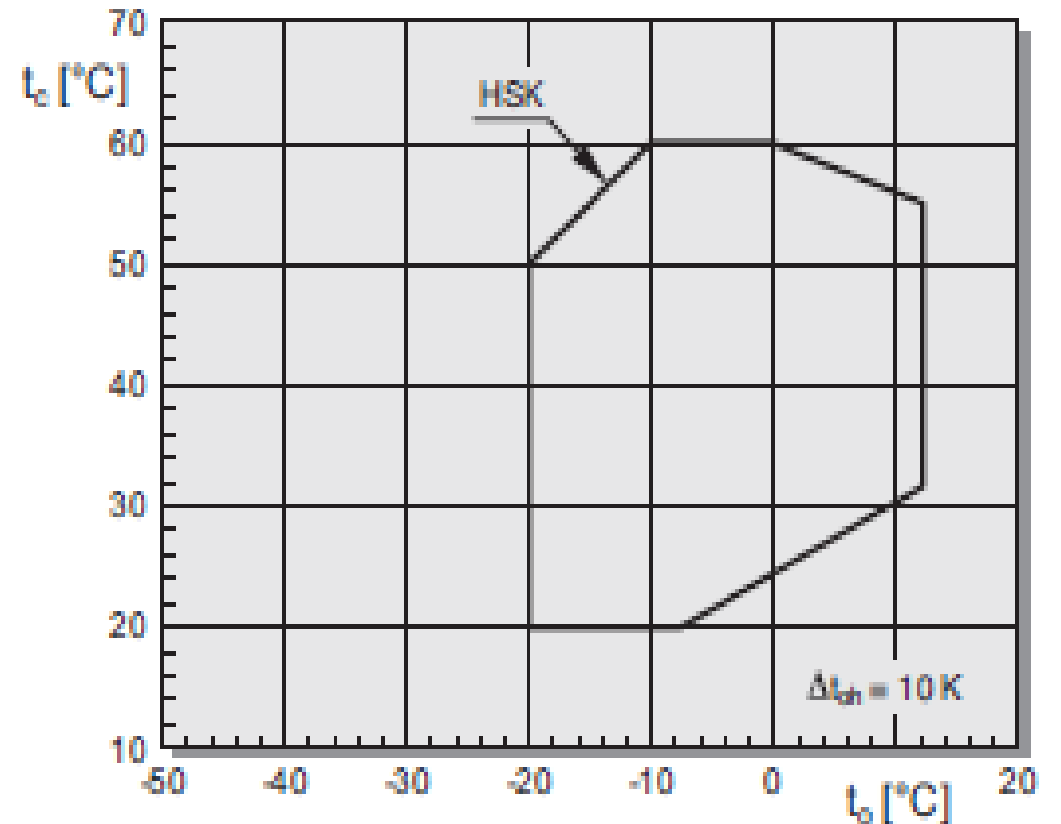


**HS Application Envelope – R404a / R407c**

**R404A ■ R507A CR100%**



**R407C**



## Scope of Supply – HS

Semi-hermetic Screw Compressors HS Series			HS			Specification
			H863 H864 H874	H886	H886	
1	Motor with PTC sensors	· part winding type · motor code 40P	S	S		400 V (+/-10%) / 3 / 50 Hz 460 V (+/-10%) / 3 / 60 Hz
2		· star-delta type Y/Δ · motor code 40D			S	400 V (+/-10%) / 3 / 50 Hz / Δ 460 V (+/-10%) / 3 / 60 Hz / Δ
3	Connection suction line	braze and weld bushing		S	S	-
4		shut-off valve	S			-
5	Connection discharge line	braze and weld bushing	S	S	S	-
6	Connection for economiser	sealing screw or flange	S	S	S	-
7	Connection for oil injection	Rotalock connection	S	S		-
8		braze and weld bushing			S	-
9	Oil management system	external system	S			solenoid valve, filter, flow switch, SE-B2, electrolytic capacitor, sight glass
10					S	with opto-electronic oil monitoring OLC-D1 and oil pressure transmitter
11		internal system		S		integrated oil management, accessible filter, SE-B2 (2x), electrolytic capacitor, sight glass
12	Motor protection device SE-E1	motor and discharge gas temperature monitoring · details see technical information ST-120	S	S		230/115 V-1-50/60 Hz
13	Compressor module CM-SW-01	· with extended protection concept and slider control · mounted and wired			S	115 .. 230 V-1-50/60 Hz · with Modbus Interface
14	Capacity regulator	regulator pistons 2 steps	S			coils for solenoid valves 230 V-1-50 Hz
15		slider system		S		coils for solenoid valves 230 V-1-50/60 Hz
16		double slider system · infinite capacity control and V <sub>i</sub> control			S	
17	Terminal box	enclosure class IP54	S	S	S	-
18	Pressure relief valve(s)	-	S	S	S	-
19	Check valve	-	S	S	S	-
20	Discharge gas temperature sensor	PTC 100	S	S		-
21		Pt 1000		S	S	-

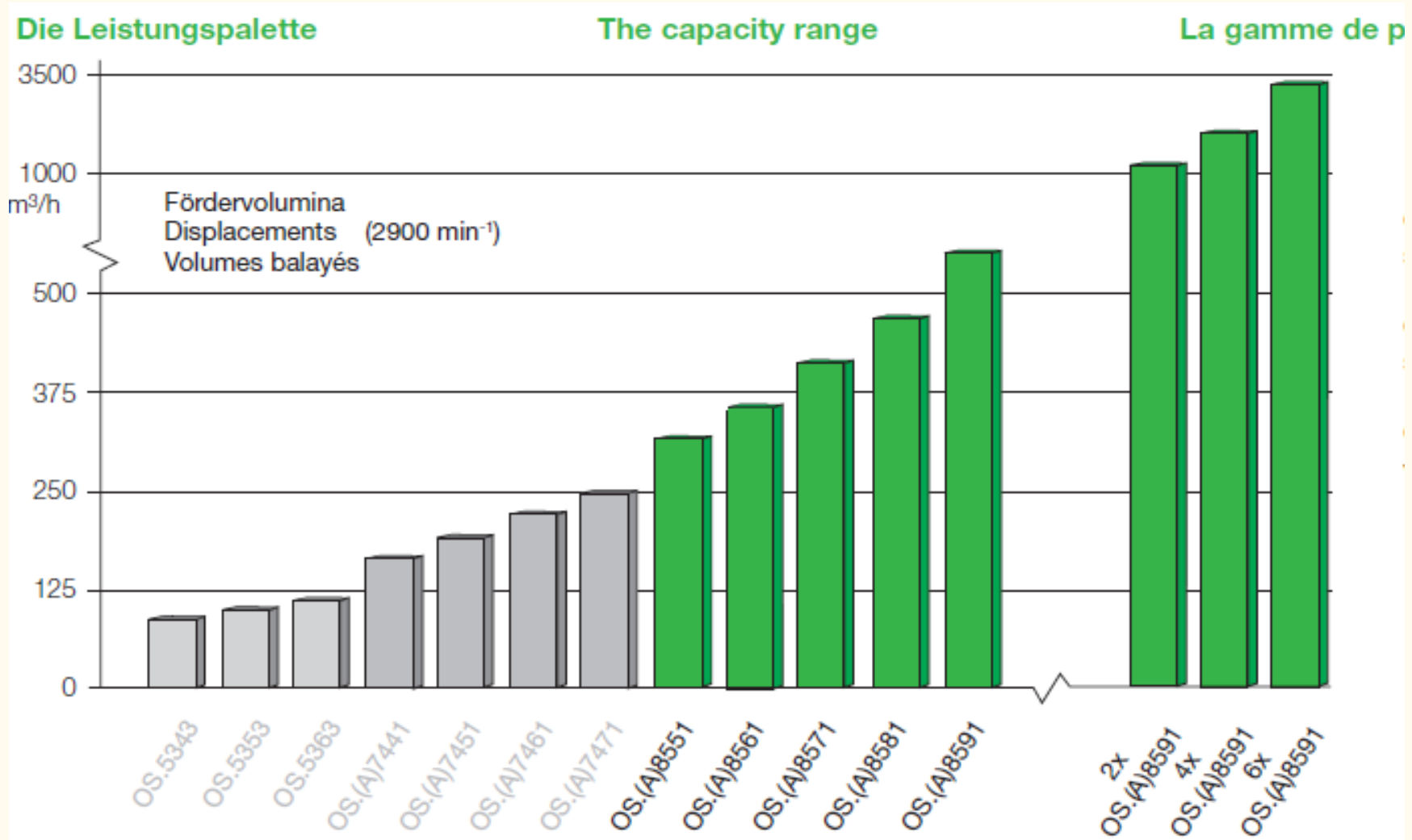
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**Range of Open Type Screw Compressor**



## Nomenclature – Open Screw Compressor

### Explanation of model designation

Example

**OS** K A 9 5 1 0 3 - K

Open screw compressor

O **S** K A 9 5 1 0 3 - K

Identification letter for optimised part load range

K = Universal temperature range

N = Low temperature range

O S K **A** 9 5 1 0 3 - K

NH<sub>3</sub> design

O S K A **9 5** 1 0 3 - K

Housing size

O S K A 9 5 **1 0** 3 - K

Displacement

O S K A 9 5 1 0 **3** - K

Compressor execution

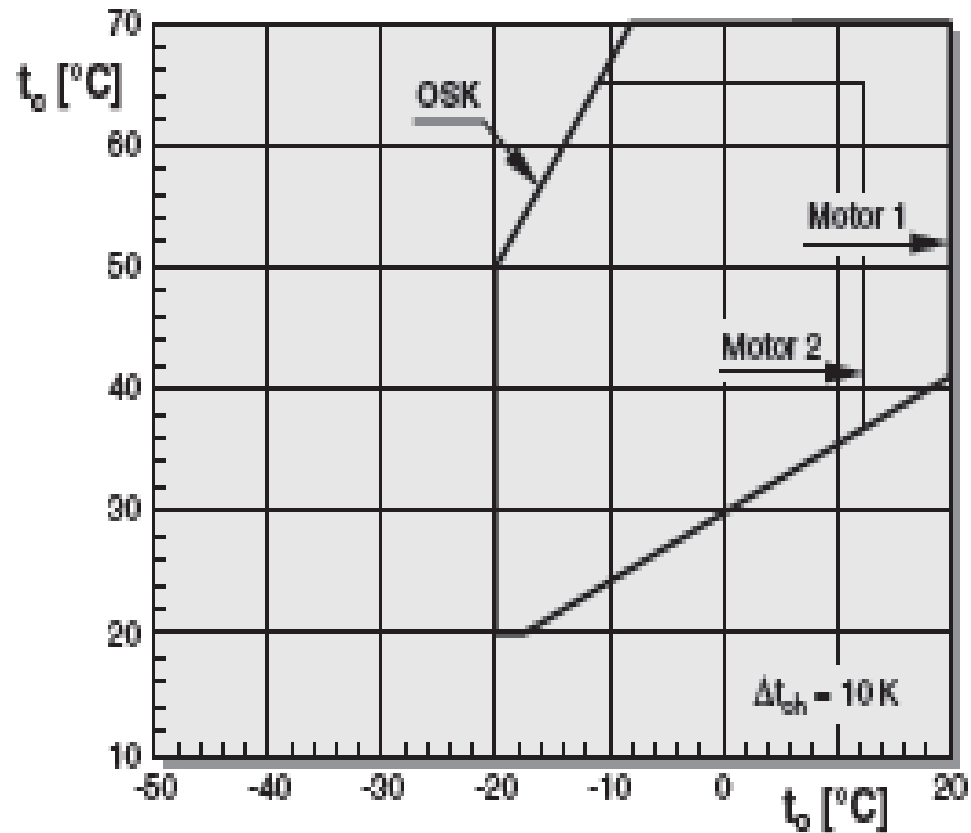
O S K A 9 5 1 0 3 - **K**

Design for direct coupling

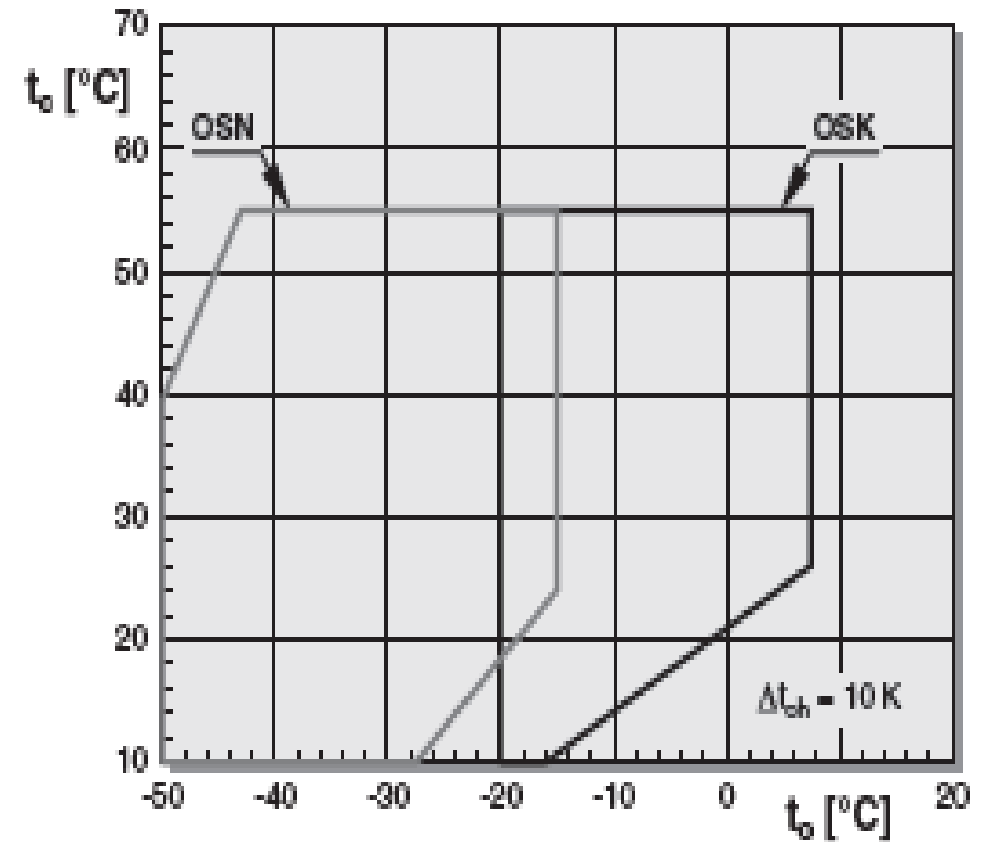
- OS K A 95 103 -K

**Open Screw Application Envelope – R134a/R404a/ R507a**

R134a CR 100%

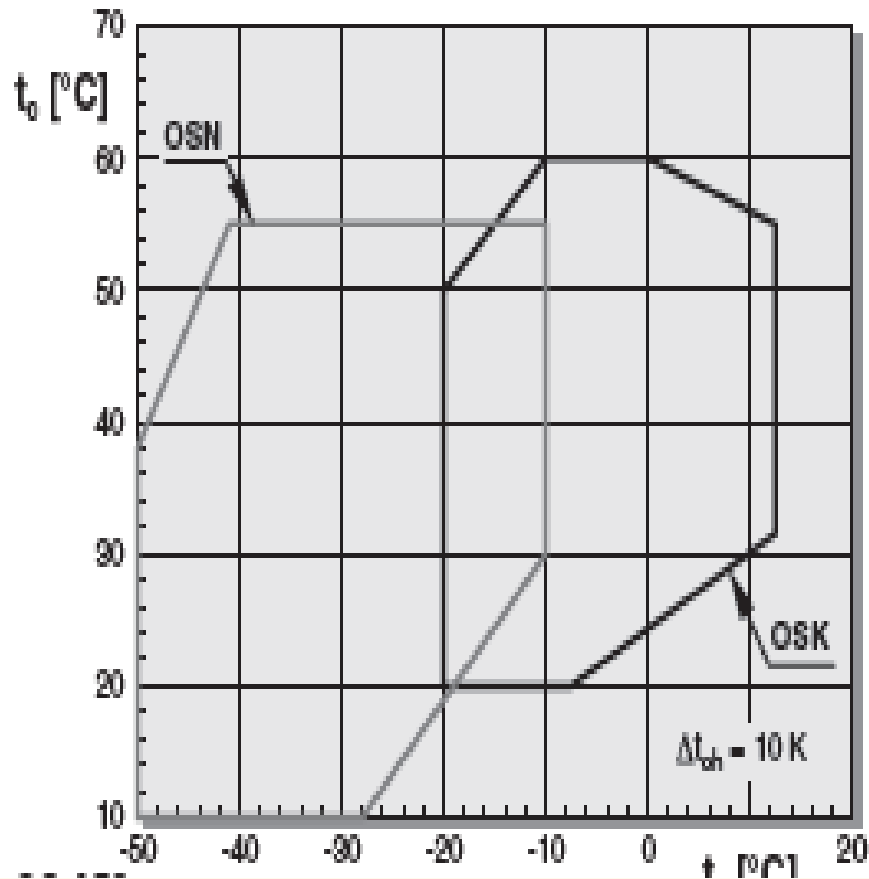


R404A ■ R507A CR 100%

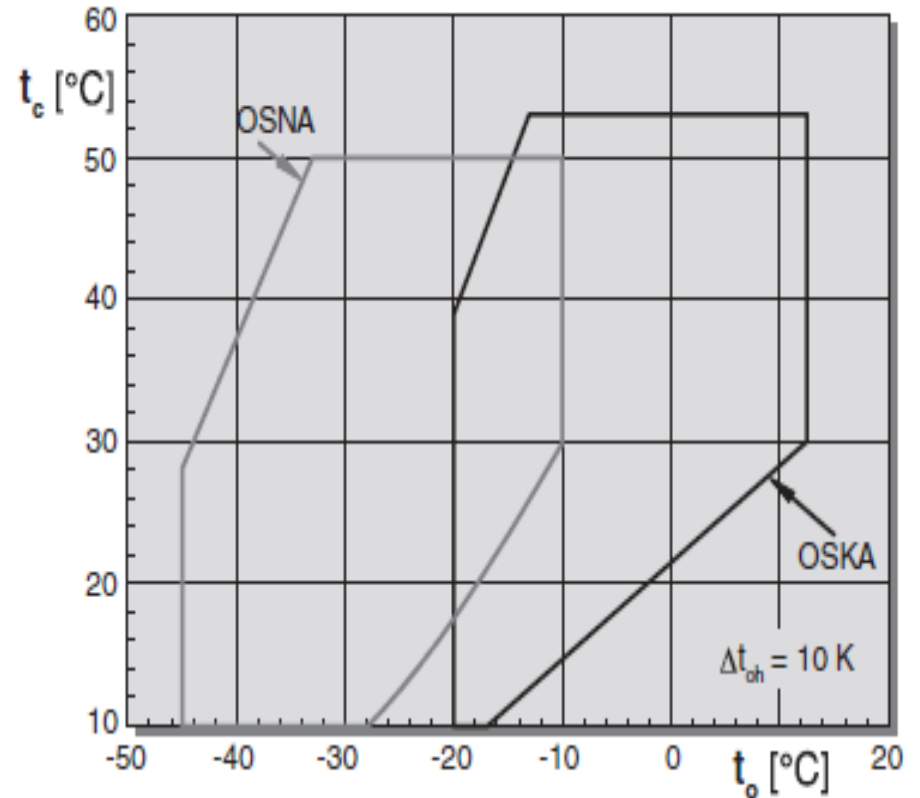


**Open Screw Application Envelope – R22 / NH3**

R22 CR 100%



NH3 CR 100%

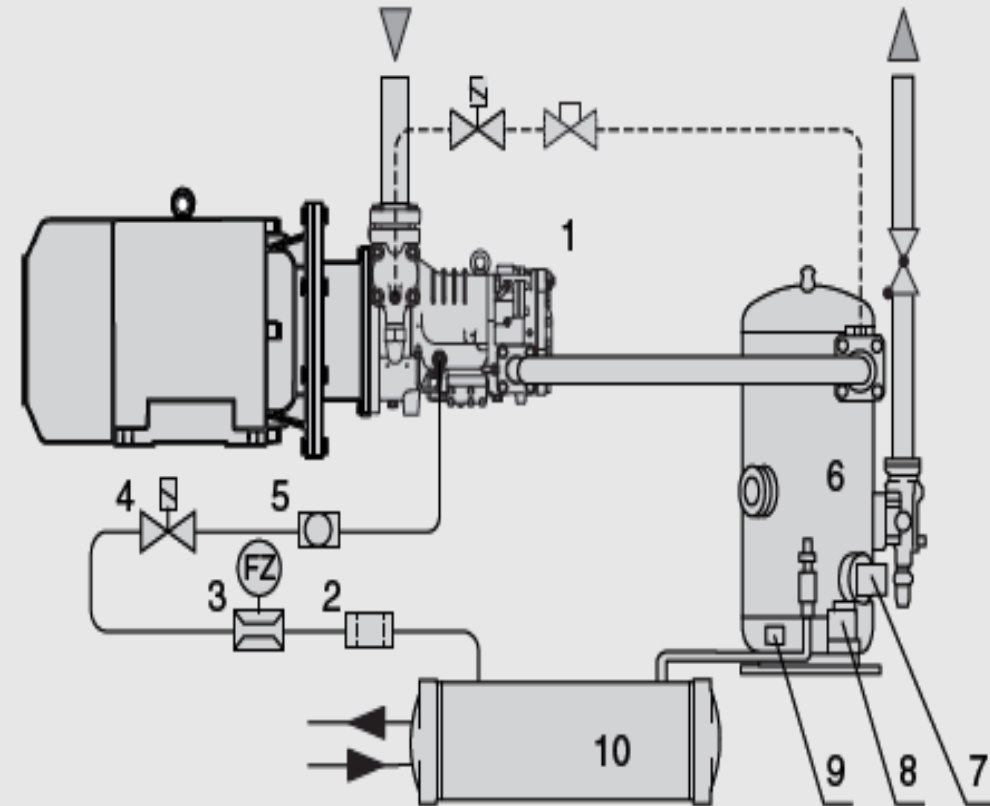


## Scope of Supply – OS

Open Drive Screw Compressors OS Series		OS			OSA for NH <sub>3</sub>				Specification
		OS53	OS74	OS85	OSA53	OSA74	OSA85	OSA95	
1	Connection suction line	braze and weld bushing		S			S	S	-
2		shut-off valve	S	S		S	S		-
3	Connection discharge line	braze and weld bushing	S	S	S	S	S	S	-
4	Connection for economiser	sealing screw or flange	S	S	S	S	S	S	-
5	Connection for oil injection	Rotolock connection	S	S	S	S			-
6		shut-off valve					S		-
7		braze and weld bushing						S	-
8	Oil management system	external system	S	S					solenoid valve, filter, flow switch, SE-B2, electrolytic capacitor, sight glass
9					S	S			solenoid valve, filter, flow switch, SE-B2, electrolytic capacitor
10		Internal system			S			S	with OLC-D1
11									Integrated oil management, accessible filter, SE-B2 (2x), electrolytic capacitor, sight glass
12						S		Integrated oil management, accessible filter, SE-B2 (2x), electrolytic capacitor	
13	Capacity regulator	regulator pistons - 2 steps (OS.7441 - 1 step)		S		S			coil(s) for solenoid valve(s) 230 V-1-50 Hz
14		slider system			S		S		coils for solenoid valves 230 V-1-50/60 Hz
15		double slider system - infinite capacity control and V <sub>1</sub> control						S	
16	Compressor module CM-SW-01	- with extended protection concept and slider control - mounted and wired						S	115 .. 230 V-1-50/60 Hz - with Modbus interface
17	Pressure relief valve(s)	-	S	S	S	S	S	S	-
18	Check valve	-	S	S	S	S	S	S	-
19	Discharge gas temperature sensor	PTC 100	S	S	S	S	S		-
20		Pt 1000						S	-

## Oil Circuit

- |  |  |  |
|--|--|--|
| 1 Verdichter   | 1 Compressor   | 1 Compresseur  |
| 2 Ölfilter   | 2 Oil filter   | 2 Filtre à huile   |
| 3 Öldurchfluss-<br>Wächter                           | 3 Oil flow switch  | 3 Contrôleur de débit<br>d'huile                           |
| 4 Öl-Magnetventil                                    | 4 Oil solenoid valve                                     | 4 Vanne magnétique   |
| 5 Schauglas  | 5 Sight glass  | 5 Voyant   |
| 6 Ölabscheider                                       | 6 Oil separator  | 6 Séparateur d'huile                                       |
| 7 Ölniveauwächter                                    | 7 Oil level switch                                       | 7 Contrôleur de<br>niveau d'huile                          |
| 8 Ölthermostat                                       | 8 Oil thermostat   | 8 Thermostat d'huile                                       |
| 9 Ölheizung  | 9 Oil heater   | 9 Chauffage d'huile  |
| 10 Ölkühler<br>(bei Bedarf)                          | 10 Oil cooler<br>(when required)                         | 10 Refroidisseur d'huile<br>(si nécessaire)                |
| 11 Rückschlagventil                                  | 11 Check valve   | 11 Clapet de retenue                                       |
| 12 Magnetventil<br>(Stillstand-Bypass)<br>bei Bedarf | 12 Solenoid valve<br>(standstill by-pass)<br>if required | 12 Vanne magnétique<br>(bipasse en arrêt)<br>si nécessaire |



Ölkreislauf / Zubehör

Oil circuit / accessories

Circuit d'huile / accessoires



## **How to Select a Compressor**

The following inputs are required for selection.

- Refrigerant
- Cooling Capacity
- Evaporating Temperature
- Condensing Temperature

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**Thank you**  

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