# **BEIJER REF**

**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





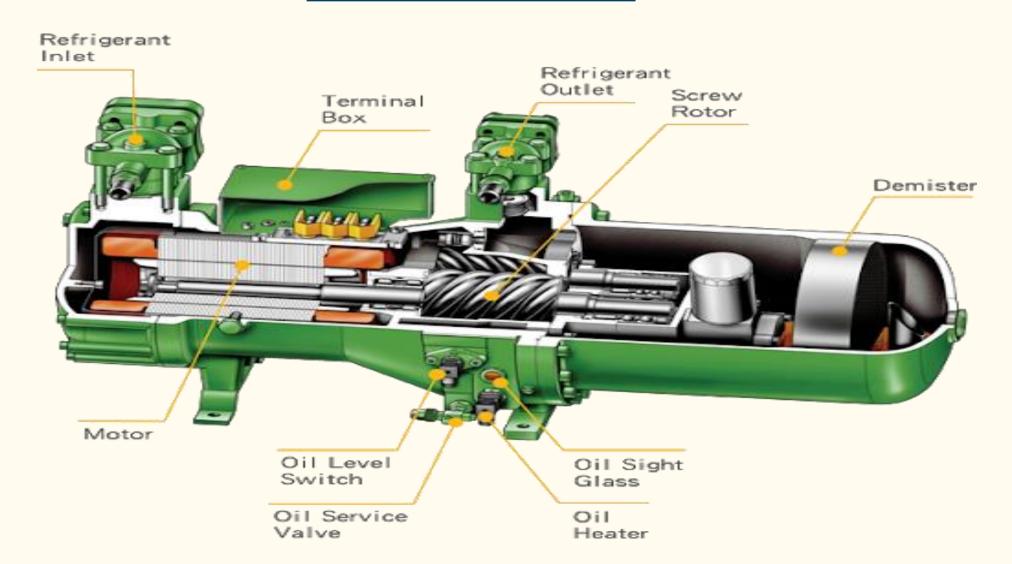
# **SCREW COMPRESSOR**







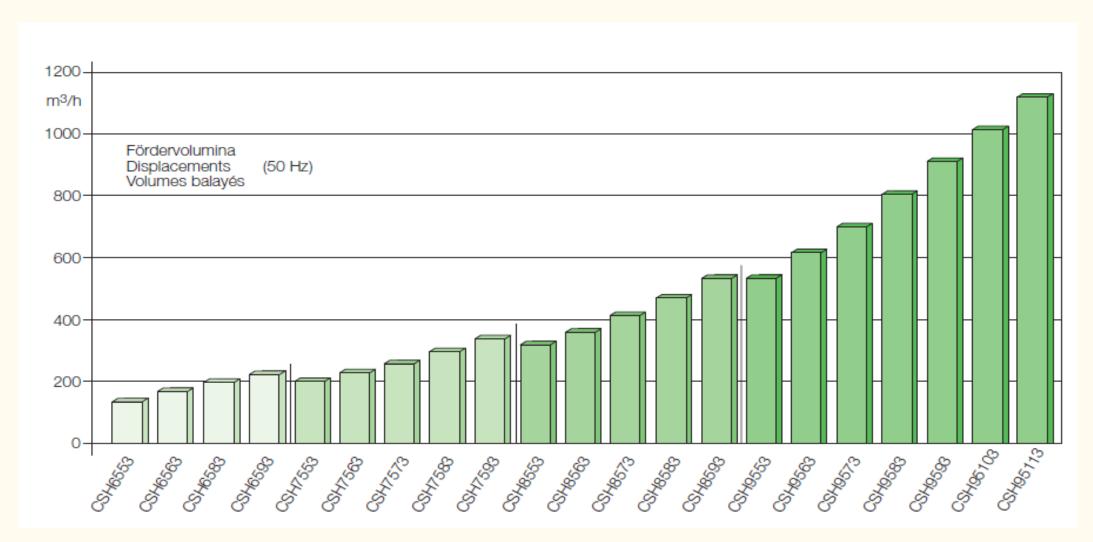
#### **SCREW COMPRESSOR**







# **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 73 - 90 Y - 40P

Code for displacement (5 .. 11)

CSH 7573 - 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

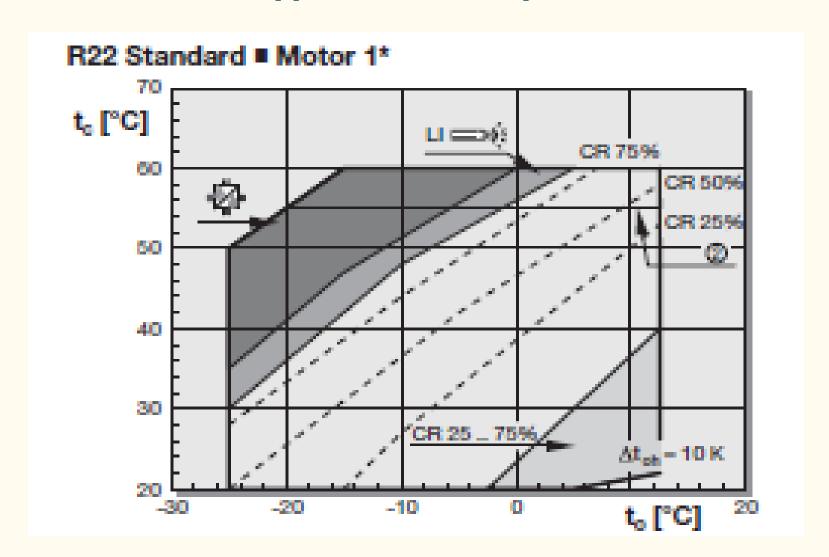
Motor code

CSH 7573 -90 Y - 40P





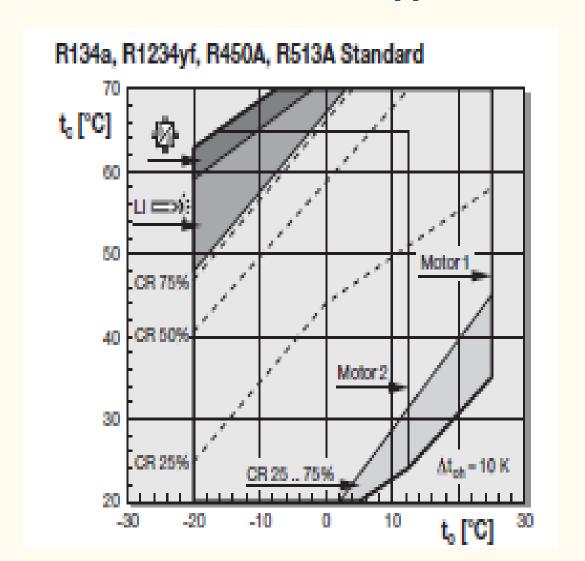
# **CSH Application Envelope – R22**

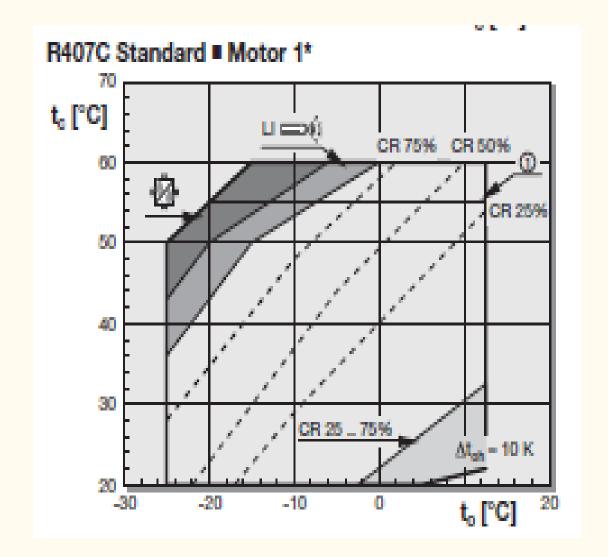






#### CSH Application Envelope - R134a / R407c









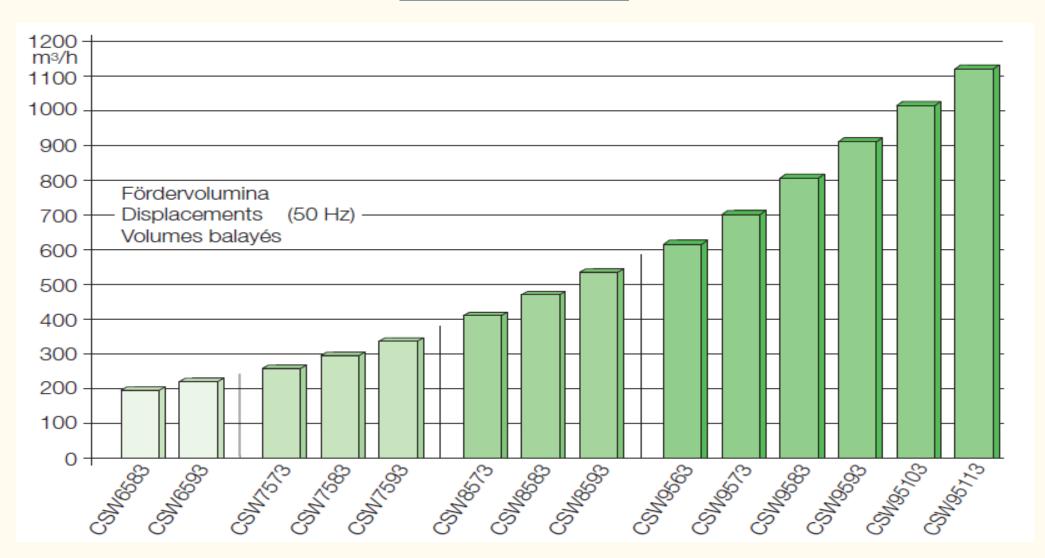
# **CONTROL MODULE**

	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*
nen Sr bæse	PTC-Messkreis PTC control circuit Bouche de mesure PTC	~	~	~	~
Grundfunktionen Basic functions Functions de bæe	Drehrichtungsüberwachung Rotation direction monitoring Contrôle de sense de rotation	~	V	~	~
Grun Basic Func	Phasenausfallüberwachung Phase failure monitoring Contrôle de défaillance de phase	~	~	~	~
	Für FU-Betrieb geeignet Suitable for FI operation Convient au fonctionnement avec CF	_	_	~	~
S S S	Ölniveauüberwachung Oil level monitoring Contrôle de niveau d'huile	_	_	-	~
Erveiterte Funktionen Extended functions Fonctions avancées	Schalthäufigkeitsüberwachung Cycling rate monitoring Contrôle de fréquence d'enclenchements	_	_	_	~
rweiterte xtended onctions	Datenaufzeichnung Data log Enregistrement des données	_	_	_	~
<u> </u>	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

CSW 7573 - 60 Y - 40P

Semi-hermetic compact screw compressor

CSW 7573 - 60 Y - 40P

Version for low condensing temperatures

CSW 7573 - 60 Y - 40P

Housing size

CSW 7573 - 60 Y - 40P

Code for displacement (6 .. 11)

CSW 7573 - 60 Y - 40P

Compressor execution

(3 = optimized for SEER)

CSW 7573 - 60 Y - 40P

Code for motor size

CSW 7573 - 60 Y - 40P

Oil charge (polyol-ester)

CSW 7573 - 60 Y - 40P

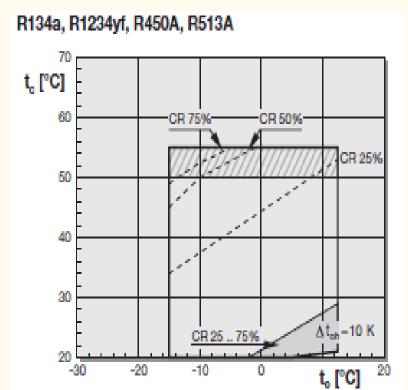
Motor code

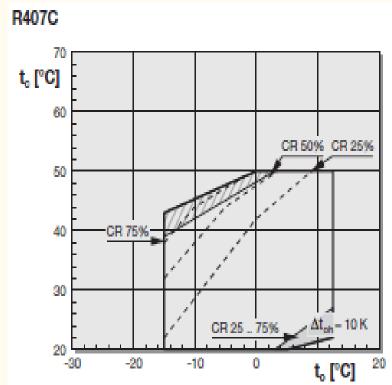
CSW 7573 -60 Y - 40P

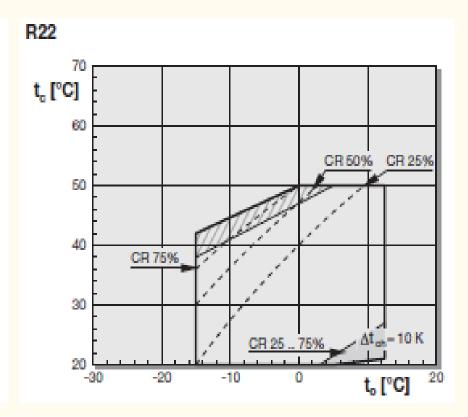




# **CSW Application Envelope**











# **Scope of Supply – CSH**

Г	Compact Screw Compressors CS Series					CS	вн				c	SH.	6	csw								
			CSH65_Y	CSH65. (Y)	CSH75_Y	CSH75(Y)	CSH85_Y	CSH85. (Y)	CSH95_Y	CSH95. (Y)	CSH76_Y	CSH86_Y	CSH96_Y	CSW65_Y	CSW65_(Y)	CSW75_Y	CSW75_(Y)	CSW86_Y	CSW85_(Y)	CSW95_Y	CSW95_(Y)	CSW108_Y
1	Motor with PTC sensors	- part winding type - motor code 40P	5	s	5	s	s	s			s	5		5	s	s	s	s	5			
2	MODE WITH PTC SHIBOTS	- star-delta type Y/Δ - motor code 40D							s	s			s							s	5	s
3	Integrated frequency inverter and motor with PTC sensors	- complete operation monitoring integrated - motor code 40A																				
4	Integrated frequency inverter and permanent magnet motor with PTC sensors	- complete operation monitoring integrated - motor code 40M																				
5	Integrated oil separator	-	5	s	5	s	5	5	s	5	s	5	s	s	5	5	s	s	5	5	5	s
6	Connection suction line	braze and weld bushing	5	s	5	s	s	5	s	5	s	5	s	s	s	s	s	s	5	s	5	s
7	Connection discharge line	braze and weld bushing	5	s	5	s	s	s	5	5	s	5	s	5	s	s	s	s	5	s	5	s
8	Connection for economiser	sealing screw or flange	5	s	5	s	s	s	s	5	s	5	s	s	s	s	s	s	5	s	5	s
9		Integrated	5	5	5	5	5	5	5	5	S	5	S	5	5	5	5	s	5	5	5	s
10	Oll management system	- Integrated - with accessible filter																				
11		BSE170 (ester oil)	5		5		S		S													
12	Oll charge	BSE170L (ester oil)	L						Ш		S	5	S	5		5		s		S		s
13		B320SH	$oxed{oxed}$	5		5		5	Щ	5					5		5		5		5	
14	Sight glass	2x	5	s	5	s	5	s	s	5	s	5	s	5	5	5	s	s	5	s	5	s
15	Motor protection device SE-E1	motor and oil temperature monitoring - details see technical information ST-120	5	s	5	s	s	s	s	5	s	5	s	5	5	5	s	s	5	s	5	
16	Compressor module CM-SW-01	with extended protection concept and silder control     mounted and wired																				s





# **Scope of Supply – CSH**

Γ				CSH CSH.6 CSW																		
	Compact Screw Compressors CS Series		CSH65Y	CSH65(Y)	CSH75Y	CSH75(Y)	CSH85Y	CSH85(Y)	CSH95Y	(X):'96HSO	CSH76Y	A.º98HSO	CSH96Y	CSW65Y	(Y)69MSD	CSW75Y	CSW75(Y)	A.'98MSD	(J.)**	CSW95Y	CSW95(Y)	CSW105Y
17	Oil heater	200 W	S	S	S	S					S			S	S	S	S					
18		300 W					s	s	S	S		S	S					S	S	S	s	S
19	Oil level monitoring OLC-D1-S · opto-electronic	minimum																				s
20		slider system	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	
21	Capacity regulator	· speed control with frequency inverter · V; control with slider (2 steps)																				
22		double slider system infinite capacity control and V <sub>i</sub> control																				s
23	Terminal box	enclosure class IP54	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
24	Pressure relief valve(s)	•	s	s	s	s	s	s	S	S	s	s	s	S	s	s	s	s	s	s	s	s
25	Check valve integrated	-	s	s	s	s	s	s	s	s	s	s	s	S	s	s	s	s	s	s	s	s
26	Oil service valve	•	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
27		PTC 120	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	
28	Oil temperature sensor	NTC																				









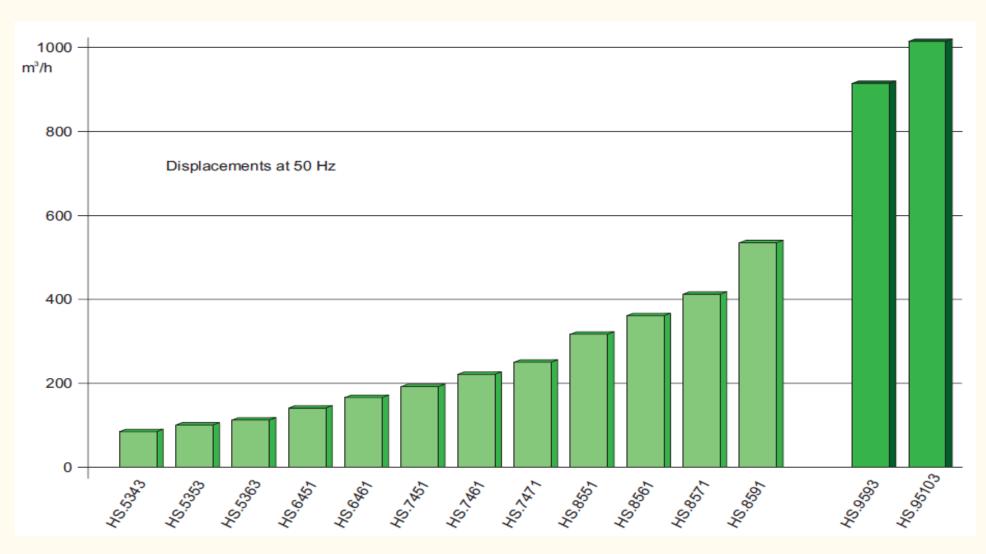








# **Range of HS**







# **Nomenclature - HS**

**HS**K 95103 - 320 - 40D

Semi-hermetic screw compressor

HS**K** 95103 - 320 - 40D

Application range

K = Air conditioning and medium temperature application

N = Low temperature application

HSK **95**103 - 320 - 40D

Housing size

HSK 95**10**3 - 320 - 40D

Displacement

HSK 9510**3** - 320 - 40D

Compressor execution

HSK 95103 - **320** - 40D

Motor size and design

HSK 95103 - 320 - 40D

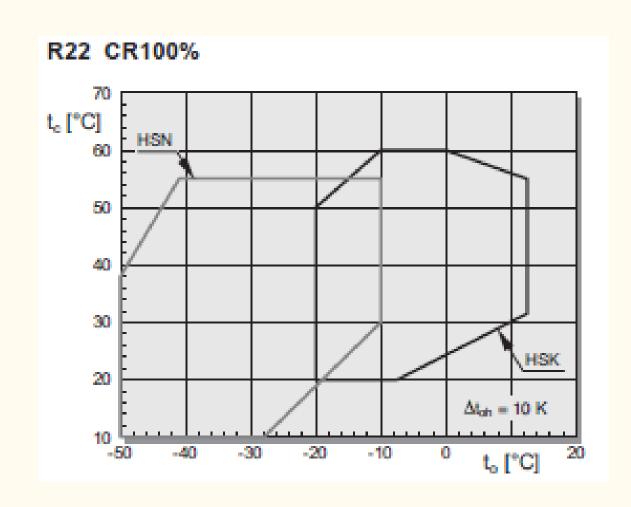
Motor code

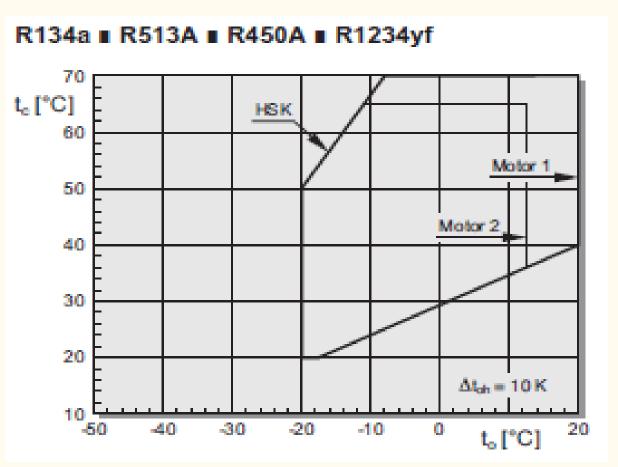
HS K 95 103 - 320 - 40D





# **HS Application Envelope - R22 / R134a**

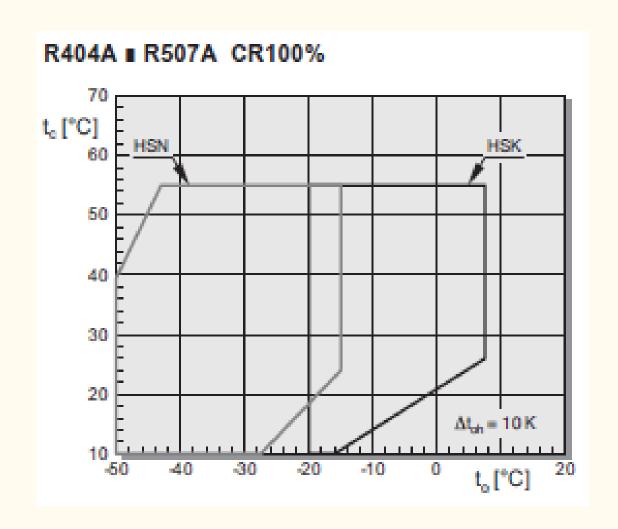


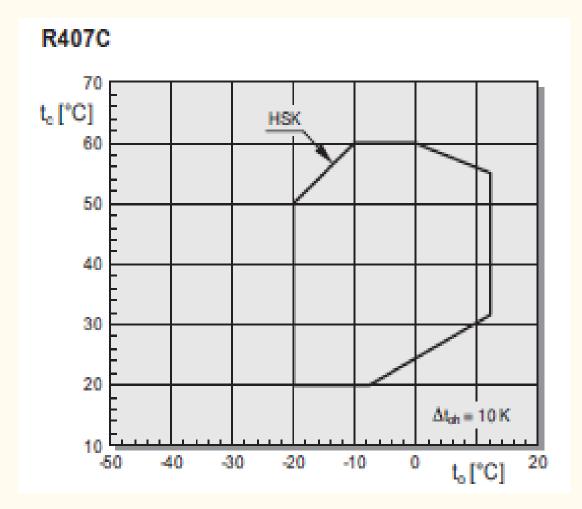






# **HS Application Envelope - R404a / R407c**









# **Scope of Supply – HS**

ı				HS		
	Semi-hermetic Screw Compress HS Series	ors	H863 H884 H874	нав6	Н886	Specification
1		· part winding type	s	s		400 V (+/-10%) / 3 / 50 Hz
2	Motor with PTC sensors	- mater code 40P  - star-delta type Y/\(\Delta\) - motor code 40D			s	460 V (+/-10%) / 3 / 60 Hz 400 V (+/-10%) / 3 / 50 Hz / Δ 460 V (+/-10%) / 3 / 60 Hz / Δ
3		braze and weld bushing		s	s	-
4	Connection suction line	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	Companion for an injection	braze and weld bushing			S	-
9		external system	s			solenoid valve, filter, flow switch, SE-B2, electrolytic capacitor, sight glass
10	Oil management system	external system			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		regulator pistons 2 steps	s			colls for solenoid valves 230 V-1-50 Hz
15	Capacity regulator	silder system		s		
16		double slider system Infinite capacity control and Vi control			s	colls for solenoid valves 230 V-1-50/50 Hz
17	Terminal box	enclosure class IPS4	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	Discrimingo que semponature semson	Pt 1000		S	S	-



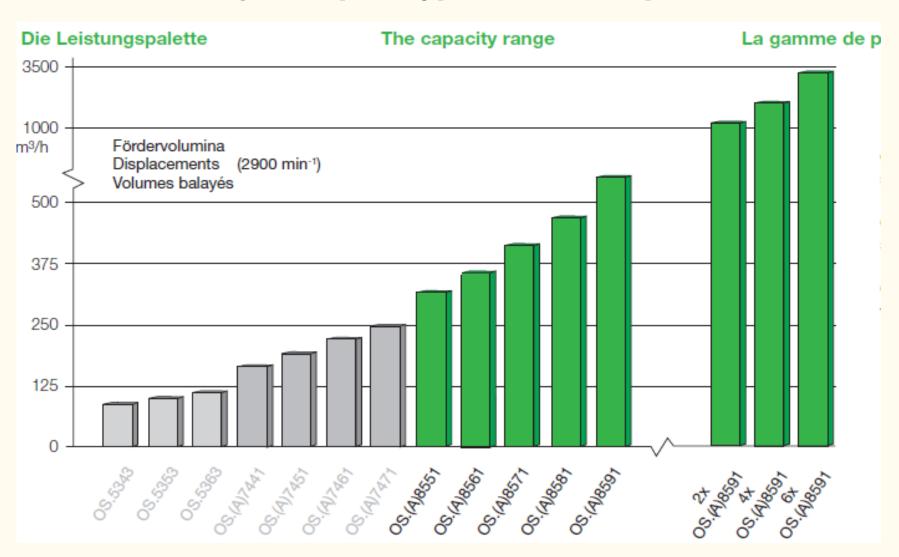








# **Range of Open Type Screw Compressor**







# Nomenclature - Open Screw Compressor

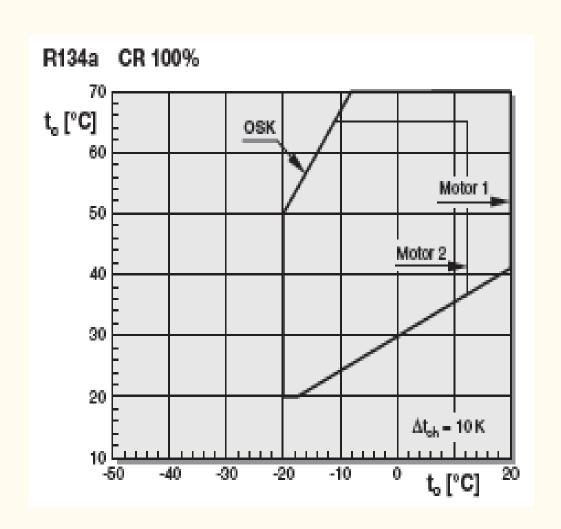
Explanation of model designation								
Example								
OSKA95103-K								
Open screw compressor								
OS <b>K</b> A 9 5 1 0 3 - K								
Identification letter for optimised part load range K = Universal temperature range N = Low temperature range								
OSK A 9 5 1 0 3 - K								
NH <sub>3</sub> design								
OSKA 9 5 1 0 3 - K								
Housing size								
OSKA95 <b>10</b> 3-K								
Displacement								
OSKA95103-K								
Compressor execution								
OSKA95103-K								
Design for direct coupling								

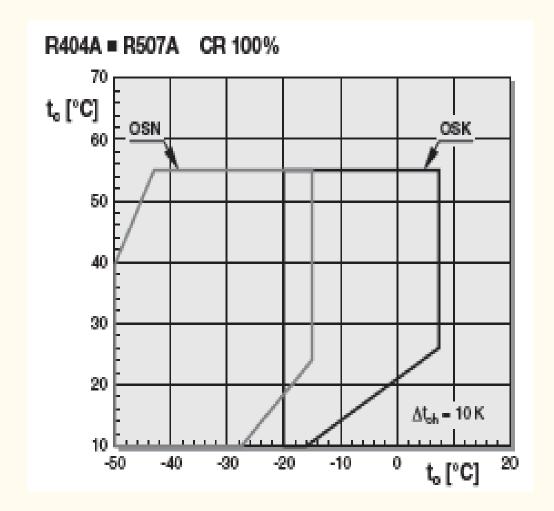
• OS K A 95 103 -K





# Open Screw Application Envelope - R134a/R404a/ R507a

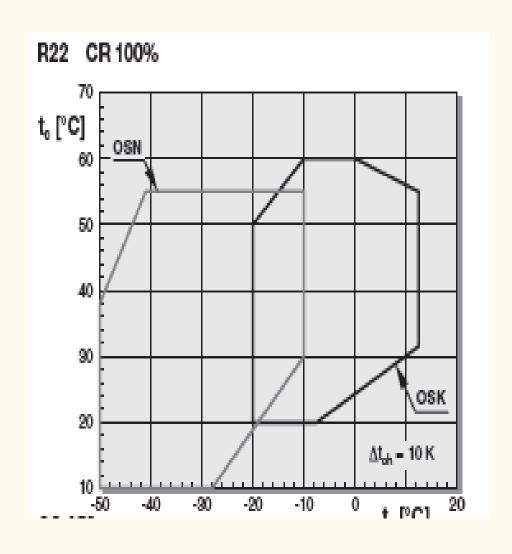


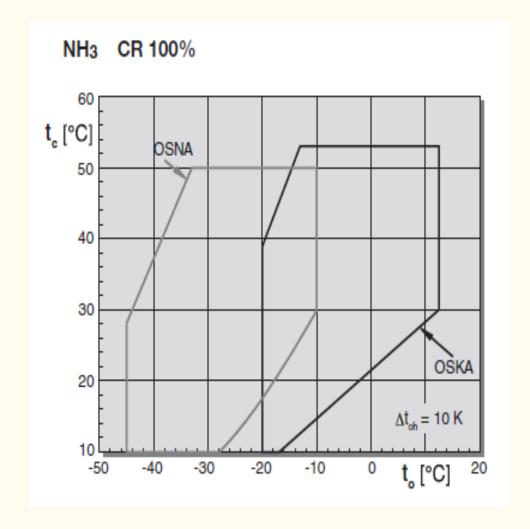






# Open Screw Application Envelope - R22 / NH3









# **Scope of Supply – OS**

ı	I.			os			OSA f	or NH <sub>8</sub>		
	Open Drive Screw Compres OS Series	ssors	O\$53	O\$74	O\$85	OSA53	OSA74	O\$A85	O\$A95	Specification
1	Connection suction line	braze and weld bushing			5			5	5	-
2	Competent operation and	shut-off valve	5	5		5	S			-
3	Connection discharge line	braze and weld bushing	5	5	5	S	5	5	5	-
4	Connection for economiser	sealing screw or flange	5	5	S	5	5	5	5	-
5		Rotalock connection	5	5	5	5	5			-
6	Connection for oil injection	shut-off valve						S		-
7		braze and weld bushing							S	-
8			5	S						solenoid valve, filter, flow switch, SE-B2, electrolytic capacitor, sight glass
9		external system				S	S			solenoid valve, filter, flow switch, SE-B2, electrolytic capacitor
10	Oll management system								S	with OLC-D1
11		Internal system			s					Integrated oil management, accessible filter, SE-B2 (2x), electrolytic capacitor, sight glass
12		mental oyalem						s		Integrated oil management, accessible filter, SE-B2 (2x), electrolytic capacitor
13		regulator platons · 2 steps (OS.7441 - 1 step)		s			s			coli(s) for scienoid valve(s) 230 V-1-50 Hz
14	Capacity regulator	slider system			s			s		colls for scienoid valves
15		double silder system Infinite capacity control and V <sub>i</sub> control							s	230 V-1-50/60 Hz
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 inferface
17	Pressure relief valve(s)	-	5	S	S	S	S	S	S	-
18	Check valve	-	5	5	5	5	5	5	5	-
19	Discharge use temperature sensor	PTC 100	5	5	5	S	5	5		-
20	Discharge gas temperature sensor	Pt 1000							S	-



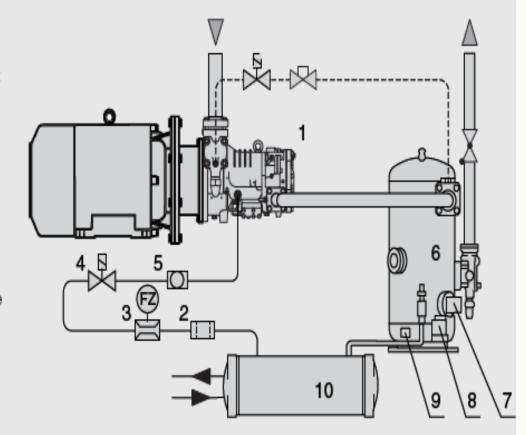


#### **Oil Circuit**

- Verdichter
- 2 Ölfilter
- 3 Öldurchfluss-Wächter
- 4 Öl-Magnetventil
- 5 Schauglas
- 6 Ölabscheider
- 7 Ölniveauwächter
- 8 Ölthemostat
- 9 Ölheizung
- 10 Ölkühler (bei Bedarf)
- 11 Rückschlagventil
- 12 Magnetventil (Stillstand-Bypass) bei Bedarf

- 1 Compressor
- 2 Oil filter
- 3 Oil flow switch
- 4 Oil solenoid valve
- 5 Sight glass
- 6 Oil separator
- 7 Oil level switch
- 8 Oil thermostat
- 9 Oil heater
- Oil cooler (when required)
- 11 Check valve
- 12 Solenoid valve (standstill by-pass) If required

- 1 Compresseur
- 2 Filtre à huile
- 3 Contrôleur de débit d'huile
- 4 Vanne magnétique
- 5 Voyant
- 6 Separateur d'huile
- 7 Contrôleur de niveau d'huile
- 8 Thermostat d'huile
- 9 Chauffage d'huile
- Refroidisseur d'huile (si nécessaire)
- 11 Clapet de retenue
- 12 Vanne mágnétique (bipasse en arrêt) 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





# Thank you