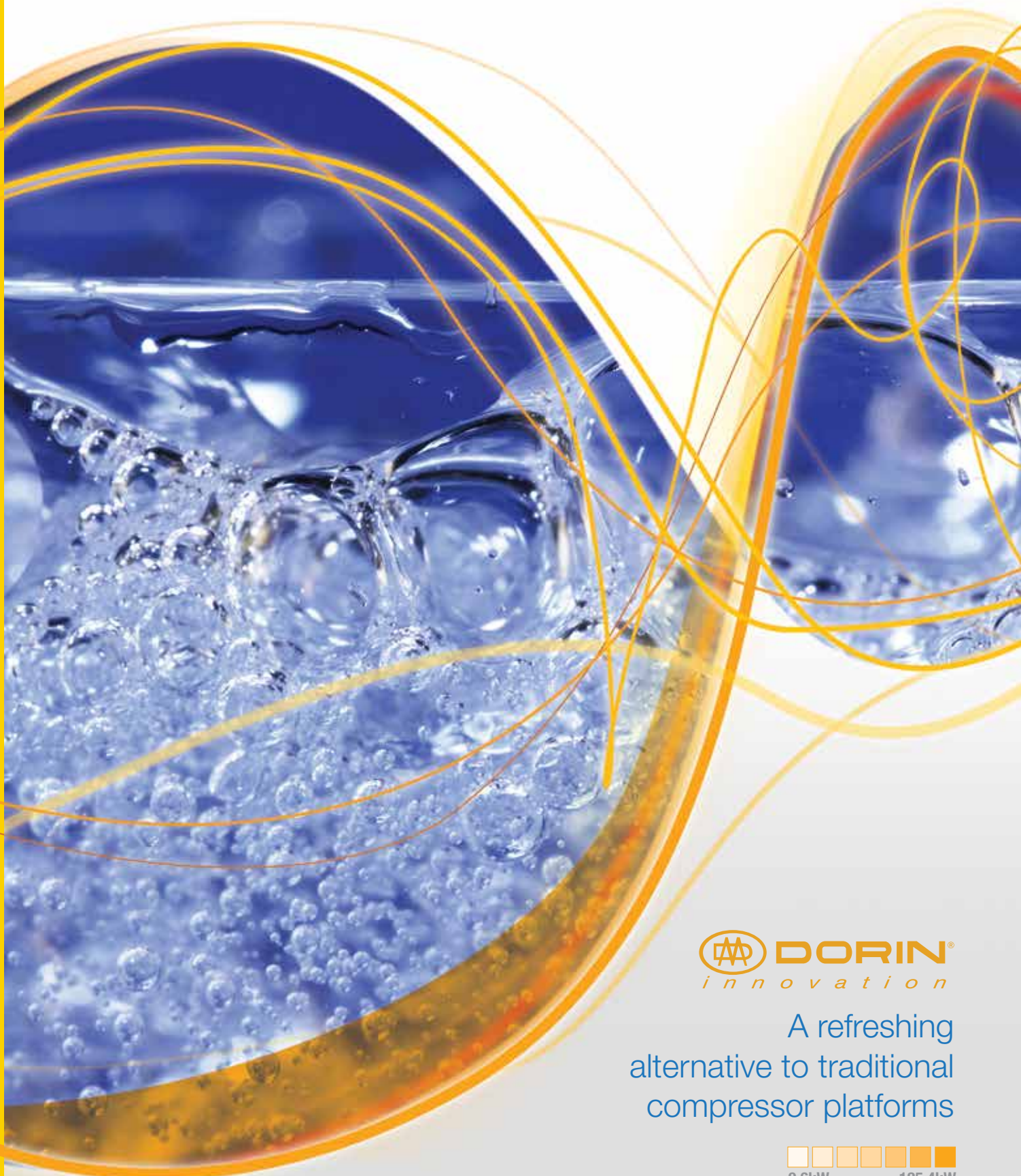


Dorin CO₂ Compressor Range



 **DORIN**[®]
innovation

A refreshing
alternative to traditional
compressor platforms


9.6kW 125.4kW

Dorin CO₂ Compressor Range



DORIN presents the widest CO₂ compressor range available in the market, able to satisfy almost every application. The range consists of the following models:

SCC

Compressors able to operate in subcritical conditions. Suitable for:

- cascade systems
- brine systems

SCS

Single stage compressors suitable for sub-critical and trans-critical operation (however in a smaller envelope than TCS Range). Suitable for:

- water cooled refrigeration systems
- hot gas defrost system

TCS

Single stage compressors able to operate in trans-critical conditions. Suitable for:

- commercial refrigeration for medium low evaporating temperature (NT)
- refrigerated transport
- sanitary hot water heat pump and ambient heating systems
- chiller
- HVAC systems (including reverse cycle systems)

TCD

Double stage compressors able to operate in trans-critical conditions. Suitable for:

- commercial refrigeration with very low evaporating temperature (LT)
- refrigerated transport

T-TCS

Single stage compressors of the range TCS assembled in tandem arrangement, able to operate in trans-critical applications. Discharge lines with check valves and common base frame are included.

T-SCS

Single stage compressors of the range SCS assembled in tandem arrangement, able to operate in trans-critical (in a smaller application envelope) and sub-critical applications. Discharge lines with check valves and common base frame are included.

Dorin CO₂ Compressor Range

SCS 373 / SCS 385

Subcritical Single Stage Compressor



SCS 373 SUBCRITICAL SINGLE STAGE						
Evaporating Temp. (°C)	Condensing Temperature (°C)				Capacity (kW)	Input Power (kW)
	-5	5	15	25		
SCS 373 Operation in Subcritical Conditions						
Cooling Capacity (kW)	-35	22.1	19.1	15.8	12.3	
	-30	27.0	23.4	19.6	15.4	
	-25	32.3	28.5	24.3	19.1	
	-20		34.5	29.0	23.6	
	-15		40.6	35.2	28.3	
	-10		47.7	41.4	33.6	
	-5			48.1	39.7	
	0			56.1	45.5	
	5				53.0	
	10				61.1	
Input Power (kW)	-35	7.8	8.9	10.2	11.1	
	-30	8.0	9.1	10.7	11.6	
	-25	7.8	9.3	11.1	12.2	
	-20		9.1	11.1	12.7	
	-15		8.5	10.7	12.9	
	-10		7.4	10.2	12.7	
	-5			9.3	12.3	
	0			8.0	11.6	
	5				10.3	
	10				8.7	

SCS 385 SUBCRITICAL SINGLE STAGE						
Evaporating Temp. (°C)	Condensing Temperature (°C)				Capacity (kW)	Input Power (kW)
	-5	5	15	25		
SCS 385 Operation in Subcritical Conditions						
Cooling Capacity (kW)	-35	26.0	22.4	18.5	14.5	
	-30	31.7	27.5	23.0	18.1	
	-25	37.9	33.4	28.5	22.4	
	-20		40.4	34.1	27.7	
	-15		47.7	41.3	33.2	
	-10		56.0	48.5	39.4	
	-5			56.4	46.6	
	0			65.8	53.4	
	5				62.2	
	10				71.7	
Input Power (kW)	-35	9.2	10.4	11.9	13.0	
	-30	9.4	10.6	12.6	13.6	
	-25	9.2	10.9	13.0	14.3	
	-20		10.6	13.0	14.9	
	-15		10.0	12.6	15.1	
	-10		8.7	11.9	14.9	
	-5			10.9	14.5	
	0			9.4	13.6	
	5				12.1	
	10				10.2	

t_evap (°C)	p_suc (bar)	tgc_out (°C)	p_dis (bar)	Capacity (kW)	Input Power (kW)
SCS 373 Operation in Transcritical Conditions					
-15	22.88	15	75	33.2	13.8
		25	75	28.3	13.8
-10	26.45	15	75	40.1	14.2
		25	75	34.1	14.2
-5	30.42	15	75	47.5	14.2
		25	75	40.6	14.2
0	34.81	25	75	55.3	13.6
		35	75	47.0	13.6
5	39.65	15	75	64.2	12.9
		25	75	54.6	12.9

t_evap (°C)	p_suc (bar)	tgc_out (°C)	p_dis (bar)	Capacity (kW)	Input Power (kW)
SCS 385 Operation in Transcritical Conditions					
-15	22.88	15	75	39.0	16.2
		25	75	33.2	16.2
-10	26.45	15	75	47.0	16.6
		25	75	40.0	16.6
-5	30.42	15	75	55.8	16.6
		25	75	47.7	16.6
0	34.81	25	75	64.9	16.0
		35	75	55.1	16.0
5	39.65	15	75	75.4	15.1
		25	75	64.1	15.1

Preliminary data subject to variation without notice.

Data is valid with 10K of suction gas useful superheat

t_ev evaporating temperature (°C)

p_suc suction pressure (bar_a)

tgc_out gas cooler outlet temperature (°C)

p_dis discharge pressure (bar_a)

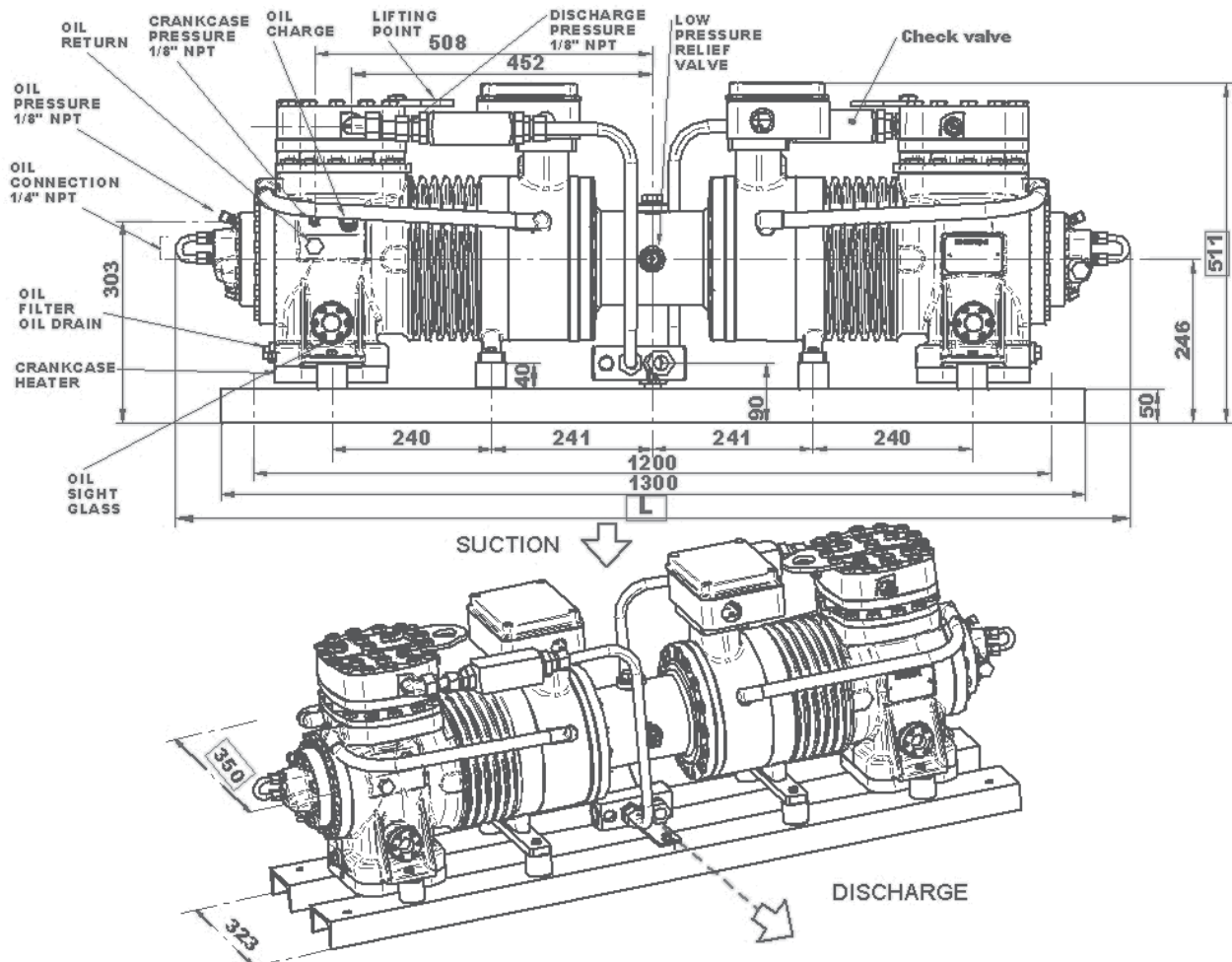
beta pressure ratio

Q refrigerating capacity (kW)

Dorin CO₂ Compressor Range SCS Range Transcritical Single Stage Compressor



Dimensions



Technical Data

SCS RANGE TRANSCRITICAL SINGLE STAGE							
Model	Compressors	RPM	Swept Volume (m ³ /h)	Suction NPT	Discharge NPT	Weight (kg)	Length L (mm)
T-SCS380-D	2 x SCS340-D	2900	14.0	1"	3/4"	290	1404
T-SCS3102-D	2 x SCS351-D	2900	17.6	1"	3/4"	295	1404
T-SCS3124-D	2 x SCS362-D	2900	21.4	1"	3/4"	305	1404
T-SCS3146-D	2 x SCS373-D	2900	25.4	1"	3/4"	310	1404
T-SCS3170-D	2 x SCS385-D	2900	29.8	1 1/2"	1"	315	1434
T-SCS3K16-D	2 x SCS3K8-D	2900	37.6	1 1/2"	1"	325	1434

Performances

For evaluation of cooling capacities and input power, refer to the values specified in the previous pages for each single compressor.

Dorin CO₂ Compressor Range

TCS Range

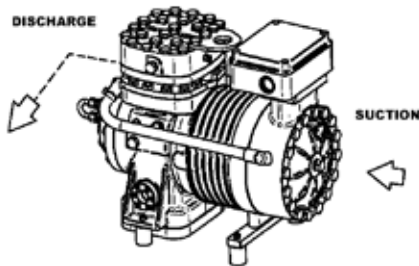
Transcritical Single Stage Compressor



Design Issues

Considering the operating conditions of a transcritical CO₂ compressor, it has been decided to develop a completely new compressor platform, without trying to modify a standard HFCs compressor. The design has been developed using the most modern solid modelling tools such as FEM analysis.

Nowadays HFCs reciprocating compressors work almost exclusively at 1450 rpm. For these CO₂ compressors it has been possible to develop models with two poles electric motor (rotating at 2900 rpm) thanks to the small amount of compressed refrigerant compared to the crankcase and bigger wall thicknesses. This led to the design of silent and low-vibrating compressor models equipped with two poles electric motor; in this way it has been possible to double the swept volume with the same compressor platform, leading to very favourable performance/price ratio.



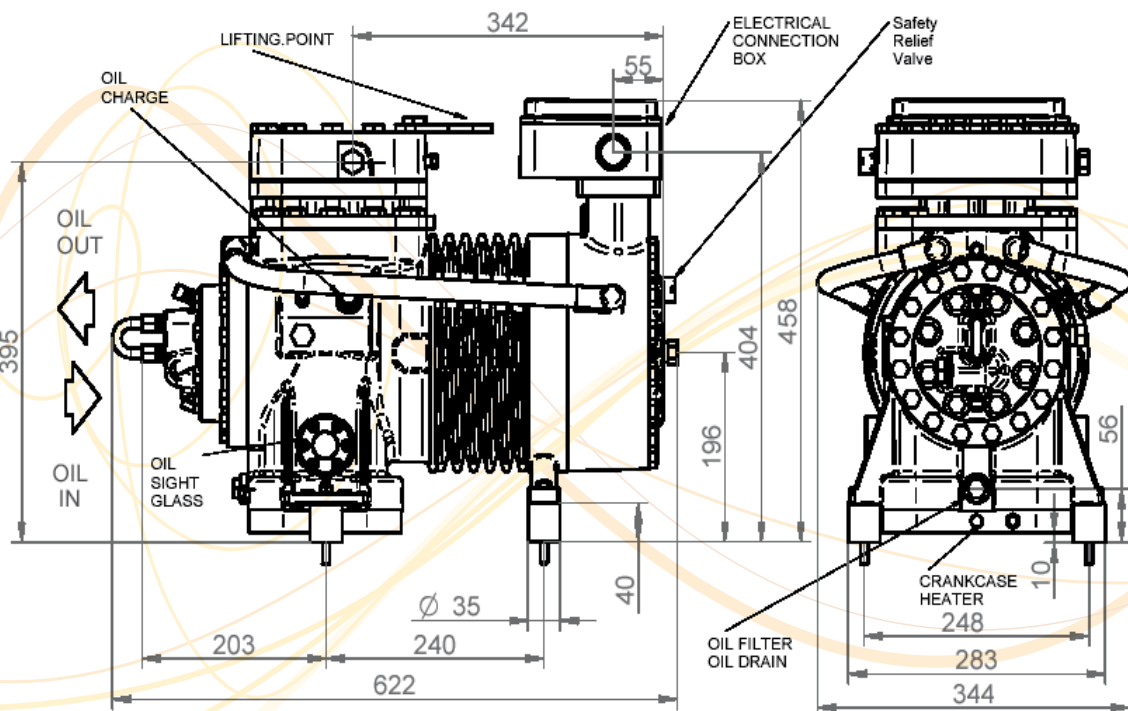
Features

DORIN CO₂ compressors are standardly equipped with:

- electric motors with thermistor protection
- oil pump
- oil pump cover adjusted for oil cooler installation (The use of the oil cooler is strictly recommended. It will have to withdraw about 20% of the electric motor power absorption. Oil temperature shall not exceed 65°C. It's also important that oil temperature shall not decrease under 30°C as this is a symptom of liquid refrigerant inside the lubricant.)
- low and high pressure relief valve with relieving set point of respectively 100 bar (Pss) and 163 bar (PS)
- CPM3 protection module
- crankcase heater
- special lubricant for CO₂ transcritical application
- electric box with IP55 class of protection

DORIN CO₂ compressors are PED certified.

Compressor Dimensions





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