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**RefComp**

## Reciprocating Compressor

SPM Series Semi-hermetic Marine Reciprocating Compressor



Commercial  
Reciprocating  
Advanced  
Technology

Originated from Italy,  
advanced screw &  
reciprocating compressor  
technologies.

Global Service Hotline  
**400-109-6660**



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## Structural Diagram of SPM Series Semi-hermetic Marine Reciprocating Compressor

The SPM series compressor is developed for marine application. The oil storage and supply mechanisms of the compressor have been specially designed to ensure the reliability of the compressor's lubrication and oil supply system when the vessel is inclined and swaying during navigation. The SPM series includes 14 models with 4-cylinder and 6-cylinder configurations, with a discharge range of 64.7~154.4 m³/h and a power range of 15~50HP, widely used in marine air conditioning, marine dehumidification, and marine ice-making applications.

### Safety valve

- The machine uses an integrated safety valve design, connecting the high-pressure and low-pressure sides, dynamically regulating internal pressure and precisely maintaining it within preset safety limits.
- Equipped with high sensitivity and a sealed structure design for operation, allowing for timely full opening, stable discharge, and immediate reseating. The overall system has excellent adaptability to working conditions and long-term operational stability.



### Cooling capacity control

- Cooling capacity can be adjusted according to operating load conditions, with solenoid valves controlling stepless or step energy adjustment.
- Cooling capacity control includes 50% for 4 cylinder machines and 66%-33% for 6 cylinder machines, to a large extent meeting the system cooling needs.



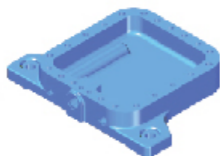
### Bearings

- The combination of slide bearings and thrust washers avoids axial and radial wear with high full load, high precision, extreme wear resistance and low noise.
- High resistance slide component and good lubrication extend the lifespan to 50,000-80,000 hours.



### Oil sump

- The deepen oil sump design guarantee the reliable oil supply of the compressor when swaying.



### Crankshaft, connecting rods piston

- The crankshaft designed by Refcomp is equipped with balance block features smooth operation, low noise and vibration and good lubrication.
- High efficiency, high strength, low vibration, low airflow pulsation, and low noise, utilizing new technologies to achieve a higher level compared to similar models.
- Optimized design enhances the compressing efficiency, widely used in the low and medium temperature cooling conditions.
- The connecting rod piston is connected through a connecting rod, with wear-resistant bushings inside the small head of the connecting rod, which can extend the service life.



### Compressor body

- The design pressure is 25 bar, specially developed for marine usage. The special structural design adapt to various marine situations.
- Low-pressure drop intake path design results in low intake minimizes intake resistance while ensuring adequate cooling of the motor.
- The central straight-through air channel design reduces losses along the way. Minimal throttling losses in the exhaust process, leading to lower energy consumption.
- The highly integrated components including filter, stop valve and temperature sensor together with compact structure effectively boost the reliability of the operation.



### Motor protection

- Equipped with INT69B2 protection module. The module enables dynamic monitoring ensuring safety operation of the compressor.



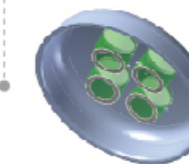
### Shut-off valve

- The suction and discharge shut-off valve can be rotated, offering convenient installment and compact and flexible design.



### Suction filter

- Internal delicate suction filter effectively filters impurities from the refrigeration gas and protects the motor.
- Located at the utmost end of the motor with compact structure and easy replacement.



### Motor

- Uses partial winding or Y-Δ starting method, with low starting current and low operating energy consumption.
- Equipped with variable frequency motors, and vector control can be achieved.
- Designed with special materials, compatible with various refrigerants including R407C, R134a, R134A and R507.
- Special structural design and spatial layout enables effective cooling and suction superheat levitating suction components.



### Model Description

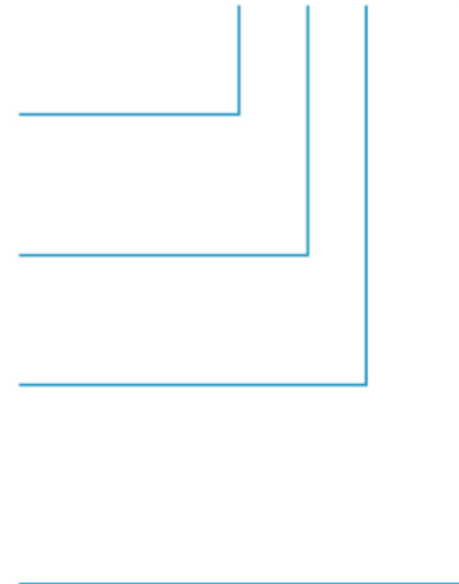
Compressor	SPM	6	H	5000
	SPM	4	L	180E

Compressor Series	
SPM	Semi-hermetic Marine Reciprocating Compressor

Cylinder	
	4, 6

Type of Motor	
H	High temperature compressor motor
L	Low temperature compressor motor

Motor nominal power HP X 100 <sup>(1)</sup>	
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The model ending with letter "E" indicates compressor using POE oil.

### Technical Parameters

Model	SPM4H				SPM6H			
	2200	2500	3000	3500	3700	4000	5000	
	220E	250E	300E	350E	370E	400E	500E	
Nominal power	HP/kW	22/16.4	25/18.7	30/22.4	35/26.1	37/27.6	40/29.9	50/37.3
Displacement 50/60Hz	m³/hr	64.7/77.6	75/90	86.1/103.3	102.9/123.5	112.5/135	129.1/154.9	154.4/185.3
Compressor cylinder number		4	4	4	4	6	6	6
Weight	kg	206	219	222	251	254	259	263
Oil charge	dm³	6	6	6	6	6.5	6.5	6.5
Crankshaft heater electrical parameters		230V-220W-50/60Hz						
Discharge port	mm/inch	28 1 1/8"	28 1 1/8"	28 1 1/8"	35 1 3/8"	35 1 3/8"	35 1 3/8"	42 1 5/8"
Suction port	mm/inch	42 1 5/8"	54 2 1/8"	54 2 1/8"	54 2 1/8"	54 2 1/8"	54 2 1/8"	54 2 1/8"
Capacity regulation		Full load, 50%				Full load, 66%, 33%		
Standard motor electrical parameters		400V/3/50Hz-460V/3/60Hz PW <sup>(1)</sup>						
Starting current Y/D	A	102/170	123/201	150/243	178/290	178/290	201/330	233/394
Maximum operating current	A	37	43	52	56	60	75	93

Model	SPM4L				SPM6L			
	1500	1800	2200	2500	2700	3000	4000	
	150E	180E	220E	250E	270E	300E	400E	
Nominal power	HP/kW	15/11.2	18/13.3	22/16.4	25/18.7	27/20.2	30/22.4	40/29.9
Displacement 50/60Hz	m³/hr	64.7/77.6	75/90	86.1/103.3	102.9/123.5	112.5/135	129.1/154.9	154.4/185.3
Compressor cylinder number		4	4	4	4	6	6	6
Weight	kg	195	199	208	233	243	249	260
Oil charge	dm³	6	6	6	6	6.5	6.5	6.5
Crankshaft heater electrical parameters		230V-220W-50/60Hz						
Discharge port	mm/inch	28 1 1/8"	28 1 1/8"	28 1 1/8"	35 1 3/8"	35 1 3/8"	35 1 3/8"	42 1 5/8"
Suction port	mm/inch	42 1 5/8"	42 1 5/8"	54 2 1/8"	54 2 1/8"	54 2 1/8"	54 2 1/8"	54 2 1/8"
Capacity regulation		Full load, 50%				Full load, 66%, 33%		
Standard motor electrical parameters		400V/3/50Hz-460V/3/60Hz PW <sup>(1)</sup>						
Starting current Y/D	A	88/146	102/170	102/170	123/201	123/201	150/243	201/330
Maximum operating current	A	29	33	39	43	48	54	75

(1) voltage fluctuation range ±10%

## Product Features

### Optimized Mechanism of Oil Storage and Oil Supply

Developed specifically for marine applications, the SPM series semi-hermetic piston compressors feature a specially designed oil storage and supply mechanism to ensure smooth oil pump suction and high reliability during the vessel's tilt and sway.

### Refrigerant University

Compatible with HFC refrigerant including R407C, R134a, R404A and R507A.

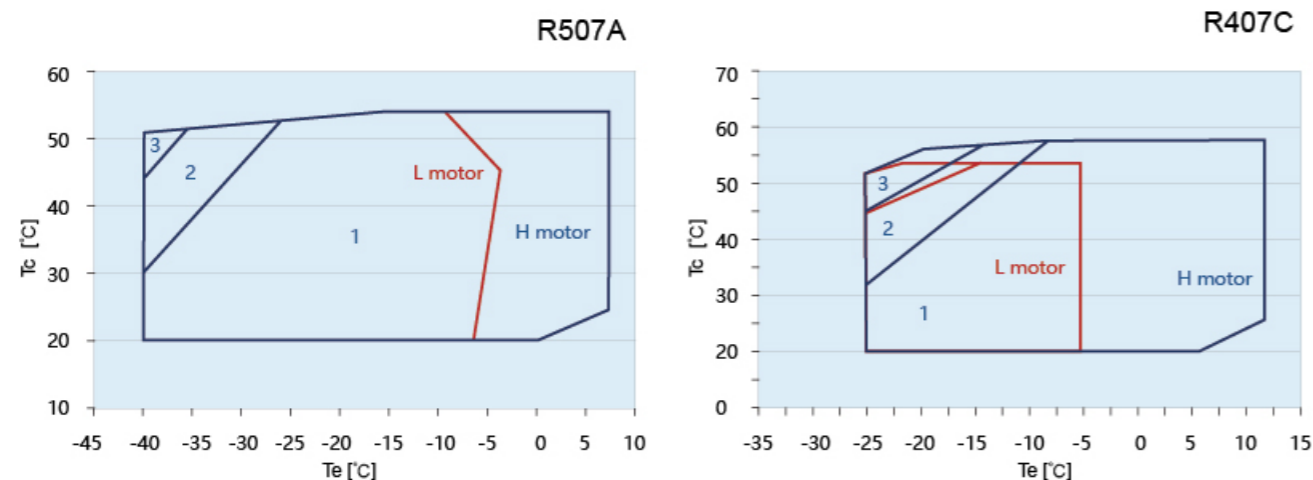
### Wide Temperature Range

For R134a refrigerant, the working condensing temperature can reach up to 80°C. for R404A, R507A, and other refrigerants, the working evaporation temperature can reach down to -40°C. The wide temperature range ensures stable operation of the compressor.

### Compact Structure, Easy Installation, and Maintenance

Low vibration and low noise

## Application Range



- Full load operation application range
- 1=standard application range([25°C]suction temperature)
  - 2=additional cooling application range
  - 3=required additional cooling +maximum 10K suction superheat application range
  - 4=application range requiring d

## Performance Parameters(SPM\*H, refrigerant R407C)

SPM4H220E								
Tc	30		40		50		58	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-25	15.9	7.2	12.5	8.2	10.3	9.0	-	-
-20	21.0	8.1	17.0	9.4	13.9	10.4	-	-
-15	27.6	9.0	22.9	10.4	18.8	11.8	-	-
-10	35.7	9.7	30.2	11.4	25.1	13.0	-	-
-5	45.3	10.3	39.0	12.2	32.9	14.2	28.0	15.9
0	56.4	10.9	49.3	13.0	42.1	15.3	36.1	17.2
5	69.1	11.3	61.1	13.6	52.7	16.2	45.6	18.5
10	83.3	11.6	74.4	14.1	64.7	17.0	56.5	19.7

SPM4H250E								
Tc	30		40		50		58	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-25	18.5	8.4	14.6	9.5	12.0	10.4	-	-
-20	24.3	9.4	19.7	10.9	16.1	12.1	-	-
-15	32.0	10.4	26.5	12.1	21.8	13.7	-	-
-10	41.4	11.3	35.0	13.2	29.1	15.1	-	-
-5	52.5	12.0	45.3	14.2	38.1	16.5	32.5	18.4
0	65.4	12.6	57.2	15.0	48.8	17.7	41.9	20.0
5	80.1	13.1	70.9	15.8	61.1	18.8	52.9	21.4
10	96.6	13.5	86.3	16.4	75.1	19.8	65.5	22.8

SPM4H300E								
Tc	30		40		50		58	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-25	21.2	9.6	16.7	10.9	13.8	11.9	-	-
-20	27.9	10.8	22.6	12.5	18.4	13.9	-	-
-15	36.7	11.9	30.4	13.9	25.0	15.7	-	-
-10	47.4	12.9	40.2	15.1	33.4	17.4	-	-
-5	60.2	13.8	51.9	16.2	43.7	18.9	37.3	21.1
0	75.0	14.5	65.6	17.2	55.9	20.3	48.0	22.9
5	91.9	15.0	81.3	18.1	70.1	21.5	60.6	24.6
10	110.7	15.4	98.9	18.8	86.1	22.7	75.1	26.1

SPM4H350E								
Tc	30		40		50		58	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-25	25.3	11.4	20.0	13.1	16.5	14.3	-	-
-20	33.4	12.9	27.0	14.9	22.0	16.6	-	-
-15	43.8	14.3	36.3	16.6	29.9	18.7	-	-
-10	56.7	15.5	48.0	18.1	39.9	20.7	-	-
-5	72.0	16.5	62.1	19.4	52.3	22.6	44.5	25.2
0	89.7	17.3	78.4	20.6	66.9	24.3	57.4	27.4
5	109.8	17.9	97.2	21.6	83.8	25.8	72.5	29.4
10	132.4	18.4	118.3	22.5	102.9	27.1	89.8	31.3

SPM6H370E								
Tc	30		40		50		58	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-25	27.7	12.5	21.8	14.3	18.0	15.6	-	-
-20	36.5	14.2	29.5	16.3	24.1	18.2	-	-
-15	48.0	15.6	39.8	18.1	32.7	20.5	-	-
-10	62.0	16.9	52.6	19.8	43.7	22.7	-	-
-5	78.8	18.0	67.9	21.3	57.2	24.7	48.7	27.6
0	98.1	18.9	85.8	22.5	73.2	26.5	62.8	30.0
5	120.2	19.6	106.3	23.7	91.7	28.2	79.3	32.2
10	144.9	20.2	129.4	24.6	112.6	29.7	98.3	34.2

SPM6H400E								
Tc	30		40		50		58	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-25	31.9	14.4	26.1	16.4	20.7	17.9	-	-
-20	42.1	16.3	33.9	18.7	27.7	20.9	-	-
-15	55.1	18.0	45.7	20.8	37.5	23.6	-	-
-10	71.3	19.4	60.4	22.7	50.2	26.1	-	-
-5	90.5	20.7	78.1	24.4	65.8	28.4	56.0	31.7
0	112.8	21.7	98.7	25.9	84.1	30.5	72.2	34.4
5	138.1	22.6	122.2	27.2	105.4	32.4	94.2	37.0
10	166.5	23.2	148.8	28.2	129.4	34.1	112.9	39.3

SPM6H500E								
Tc	30		40		50		58	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-25	38.1	17.2	30.0	19.6	24.7	21.4	-	-
-20	50.2	19.5	40.6	22.4	33.1	24.9	-	-
-15	65.9	21.5	54.6	24.9	44.9	28.2	-	-
-10	85.2	23.2	72.2	27.2	60.0	31.2	-	-
-5	108.2	24.7	93.3	29.2	78.6	33.9	67.0	37.9
0	134.8	26.0	117.9	31.0	100.5	36.5	86.3	41.2
5	165.1	27.0	146.1	32.5	125.9	38.7	109.0	44.2
10	199.0	27.7	177.8	33.8	154.7	40.7	135.0	47.0

Key:  
 Pf=cooling capacity (kW)  
 Pa=input power (kW)  
 Te=evaporating temperature(°C)  
 Tc=condensing temperature(°C)  
 50Hz=frequency  
 liquid sub cooling 5K  
 suction superheat 10K  
 The shaded area indicates the need for additional cooling (refer to application limits).  
 Refer to the full load operation limits at 50Hz.  
 For performance data under different working conditions, please refer to the LEONARDO selection software.

### Performance Parameters (SPM\*L, refrigerant R407C)

SPM4L150E									
Tc	30			40			54		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	15.9	7.2	12.5	8.2	10.3	9.0	-	-	
-20	21.0	8.1	17.0	9.4	13.9	10.4	12.9	10.8	
-15	27.6	9.0	22.9	10.4	18.8	11.8	17.3	12.3	
-10	35.7	9.7	30.2	11.4	25.1	13.0	23.2	13.7	
-5	45.3	10.3	39.0	12.2	32.9	14.2	30.4	15.0	

SPM4L180E									
Tc	30			40			54		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	18.5	8.4	14.6	9.5	12.0	10.4	-	-	
-20	24.3	9.4	19.7	10.9	16.1	12.1	14.9	12.5	
-15	32.0	10.4	26.5	12.1	21.8	13.7	20.1	14.3	
-10	41.4	11.3	35.0	13.2	29.1	15.1	26.9	15.9	
-5	52.5	12.0	45.3	14.2	38.1	16.5	35.3	17.4	

SPM4L220E									
Tc	30			40			54		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	21.2	9.6	16.7	10.9	13.8	11.9	-	-	
-20	27.9	10.8	22.6	12.5	18.4	13.9	17.1	14.4	
-15	36.7	11.9	30.4	13.9	25.0	15.7	23.0	16.4	
-10	47.4	12.9	40.2	15.1	33.4	17.4	30.8	18.2	
-5	60.2	13.8	51.9	16.2	43.7	18.9	40.5	20.0	

SPM4L250E									
Tc	30			40			54		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	25.5	11.5	20.1	13.2	16.6	14.4	-	-	
-20	33.6	13.0	27.2	15.0	22.2	16.7	20.6	17.3	
-15	44.1	14.4	36.6	16.7	30.0	18.9	27.7	19.7	
-10	57.1	15.5	48.3	18.2	40.2	20.9	37.1	21.9	
-5	72.4	16.6	62.5	19.5	52.6	22.7	48.7	24.0	

SPM6L270E									
Tc	30			40			54		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	27.7	12.5	21.8	14.3	18.0	15.6	-	-	
-20	36.5	14.2	29.5	16.3	24.1	18.2	22.4	18.8	
-15	48.0	15.6	39.8	18.1	32.7	20.5	30.1	21.4	
-10	62.0	16.9	52.6	19.8	43.7	22.7	40.3	23.9	
-5	78.8	18.0	67.9	21.3	57.2	24.7	53.0	26.1	

SPM6L300E									
Tc	30			40			54		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	31.9	14.4	25.1	16.4	20.7	17.9	-	-	
-20	42.0	16.3	33.9	18.7	27.7	20.9	25.7	21.6	
-15	55.1	18.0	45.7	20.8	37.5	23.6	34.6	24.6	
-10	71.3	19.4	60.4	22.7	50.2	26.1	46.4	27.4	
-5	90.5	20.7	78.1	24.4	65.8	28.4	60.9	30.0	

SPM6L400E									
Tc	30			40			54		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	38.2	17.3	30.1	19.7	24.8	21.5	-	-	
-20	50.4	19.5	40.7	22.5	33.2	25.0	30.9	25.9	
-15	66.2	21.6	54.9	25.0	45.1	28.3	41.6	29.5	
-10	85.6	23.3	72.5	27.3	60.3	31.3	55.6	32.9	
-5	108.6	24.8	93.7	29.3	78.9	34.1	73.0	36.0	

Key:  
 Pf=cooling capacity(kW)  
 Pa=input power(kW)  
 Te=evaporating temperature(°C)  
 Tc=condensing temperature(°C)  
 50Hz=frequency  
 liquid sub cooling 5K  
 suction superheat 10K

The shaded area indicates the need for additional cooling (refer to application limits).

Refer to the full load operation limits at 50Hz.

For performance data under different working conditions, please refer to the LEONARDO selection software.

### Performance Parameters (SPM\*H, refrigerant R134a)

SPM4H220E									
Tc	40			50			70		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-20	11.7	5.6	10.0	5.7	8.4	5.8	6.9	5.7	
-15	15.7	6.3	13.4	6.6	11.3	6.8	9.3	6.9	
-10	20.7	7.1	17.8	7.6	15.1	7.9	12.5	8.0	
-5	26.6	7.9	23.1	8.5	19.7	9.0	16.5	9.3	
0	33.7	8.7	29.4	9.5	25.3	10.1	21.4	10.6	
5	41.7	9.5	36.6	10.5	31.7	11.3	27.1	12.0	
10	50.8	10.3	44.9	11.5	39.1	12.6	33.6	13.4	
15	61.0	11.1	54.1	12.6	47.4	13.9	40.9	14.9	

SPM4H250E									
Tc	40			50			70		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-20	13.6	6.5	11.6	6.6	9.7	6.7	8.0	6.7	
-15	18.2	7.3	15.6	7.7	13.1	7.9	10.8	8.0	
-10	24.0	8.3	20.6	8.8	17.5	9.1	14.5	9.3	
-5	30.9	9.2	26.8	9.9	22.9	10.4	19.2	10.8	
0	39.0	10.1	34.1	11.0	29.3	11.7	24.8	12.3	
5	48.4	11.0	42.5	12.2	36.8	13.1	31.4	13.9	
10	59.0	11.9	52.0	13.4	45.4	14.6	38.9	15.6	
15	70.8	12.8	62.7	14.6	55.0	16.1	47.5	17.3	

SPM4H300E									
Tc	40			50			70		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-20	15.6	7.4	13.3	7.6	11.1	7.7	9.2	7.6	
-15	20.9	8.4	17.8	8.8	15.0	9.0	12.4	9.1	
-10	27.5	9.5	23.7	10.0	20.0	10.5	16.6	10.7	
-5	35.4	10.5	30.7	11.3	26.3	11.9	22.0	12.4	
0	44.8	11.6	39.1	12.6	33.6	13.5	28.4	14.1	
5	55.5	12.6	48.7	14.0	42.2	15.1	36.0	15.9	
10	67.6	13.7	59.7	15.3	52.0	16.7	44.7	17.8	
15	81.1	14.7	71.9	16.7	63.1	18.4	54.5	19.8	

SPM4H350E									
Tc	40			50			70		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-20	18.7	8.8	15.9	9.1	13.3	9.2	10.9	9.1	
-15	25.0	10.1	21.3	10.5	18.0	10.8	14.8	10.9	
-10	32.8	11.3	28.3	12.0	24.0	12.5	19.9	12.8	
-5	42.4	12.6	36.7	13.5	31.4	14.3	26.3	14.8	
0	53.5	13.8	46.7	15.1	40.2	16.1	34.0	16.9	
5	66.3	15.1	58.2	16.7	50.5	18.0	43.0	19.0	
10	80.8	16.3	71.3	18.3	62.2	20.0	53.4	21.3	
15	97.0	17.6	86.0	20.0	75.4	22.0	65.1	23.7	

SPM6H370E									
Tc	40			50			70		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-20	20.4	9.7	17.4	9.9	14.6	10.0	12.0	10.0	
-15	27.3	11.0	23.3	11.5	19.6	11.8	16.2	11.9	
-10	35.9	12.4	30.9	13.1	26.2	13.7	21.8	14.0	
-5	46.4	13.7	40.2	14.8	34.3	15.6	28.8	16.2	
0	58.6	15.1	51.1	16.5	44.0	17.6	37.2	18.4	
5	72.6	16.5	63.7	18.3	55.2	19.7	47.1	20.8	
10	88.5	17.9	78.1	20.1	68.1	21.9	58.4	23.3	
15	106.2	19.3	94.1	21.9	82.5	24.1	71.3	26.0	

SPM6H400E									
Tc	40			50			70		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-20	23.5	11.1	20.0	11.4	16.8	11.5	13.8	11.5	
-15	31.4	12.7	26.8	13.2	22.6	13.6	18.6	13.7	
-10	41.3	14.2	35.6	15.1	30.1	15.7	25.0	16.1	
-5	53.3	15.8	46.2	17.0	39.5	17.9	33.1	18.6	
0	67.3	17.4	58.8	19.0	50.6	20.3	42.8	21.2	
5	83.4	19.0	73.3	21.0	63.5	22.7	54.1	24.0	
10	101.7	20.6	89.7	23.1	78.2	25.1	67.2	26.8	
15	122.0	22.1	108.2	25.2	94.8	27.7	81.9	29.8	

Key:  
 Pf=cooling capacity(kW)  
 Pa=input power(kW)  
 Te=evaporating temperature(°C)  
 Tc=condensing temperature(°C)  
 50Hz=frequency  
 liquid sub cooling 5K  
 suction superheat 10K

The shaded area indicates the need for additional cooling (refer to application limits).

Refer to the full load operation limits at 50Hz.

For performance data under different working conditions, please refer to the LEONARDO selection software.

### Performance Parameters(SPM\*L, refrigerant R134a)

SPM4L150E									
Tc	30			40			50		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	10.2	4.7	8.8	4.8	7.5	4.8	6.3	4.8	
-20	13.6	5.3	11.7	5.6	10.0	5.7	8.4	5.8	
-15	18.1	6.0	15.7	6.3	13.4	6.6	11.3	6.8	
-10	23.7	6.6	20.7	7.1	17.8	7.6	15.1	7.9	
-5	30.4	7.1	26.6	7.9	23.1	8.5	19.7	9.0	
0	38.1	7.7	33.7	8.7	29.4	9.5	25.3	10.1	
5	47.0	8.3	41.7	9.5	36.6	10.5	31.7	11.3	
10	57.0	8.8	50.8	10.3	44.9	11.5	39.1	12.6	

SPM4L180E									
Tc	30			40			50		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	11.8	5.4	10.2	5.6	8.7	5.6	7.3	5.6	
-20	15.8	6.2	13.6	6.5	11.6	6.6	9.7	6.7	
-15	21.0	6.9	18.2	7.3	15.6	7.7	13.1	7.9	
-10	27.5	7.6	24.0	8.3	20.6	8.8	17.5	9.1	
-5	35.2	8.3	30.9	9.2	26.8	9.9	22.9	10.4	
0	44.2	9.0	39.0	10.1	34.1	11.0	29.3	11.7	
5	54.5	9.6	48.4	11.0	42.5	12.2	36.8	13.1	
10	66.1	10.2	59.0	11.9	52.0	13.4	45.4	14.6	

SPM4L220E									
Tc	30			40			50		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	13.6	6.2	11.7	6.4	10.0	6.4	8.4	6.4	
-20	18.1	7.1	15.6	7.4	13.3	7.6	11.1	7.7	
-15	24.1	7.9	20.9	8.4	17.8	8.8	15.0	9.0	
-10	31.5	8.7	27.5	9.5	23.7	10.0	20.0	10.5	
-5	40.4	9.5	35.4	10.5	30.7	11.3	26.3	11.9	
0	50.7	10.3	44.8	11.6	39.1	12.6	33.6	13.5	
5	62.6	11.0	55.5	12.6	48.7	14.0	42.2	15.1	
10	75.9	11.7	67.6	13.7	59.7	15.3	52.0	16.7	

SPM4L250E									
Tc	30			40			50		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	16.3	7.5	14.1	7.7	12.0	7.7	10.1	7.7	
-20	21.8	8.5	18.8	8.9	16.0	9.1	13.4	9.2	
-15	29.0	9.5	25.1	10.1	21.5	10.6	18.1	10.9	
-10	37.9	10.5	33.1	11.4	28.5	12.1	24.1	12.6	
-5	48.6	11.4	42.6	12.6	37.0	13.6	31.6	14.4	
0	61.0	12.4	53.9	13.9	47.0	15.2	40.5	16.2	
5	75.3	13.2	66.8	15.2	58.6	16.8	50.8	18.1	
10	91.3	14.1	81.3	16.4	71.8	18.4	62.6	20.1	

SPM6L270E									
Tc	30			40			50		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	17.8	8.2	15.3	8.3	13.0	8.4	11.0	8.3	
-20	23.7	9.3	20.4	9.7	17.4	9.9	14.6	10.0	
-15	31.5	10.4	27.3	11.0	23.3	11.5	19.6	11.8	
-10	41.2	11.4	35.9	12.4	30.9	13.1	26.2	13.7	
-5	52.9	12.4	46.4	13.7	40.2	14.8	34.3	15.6	
0	66.4	13.4	58.6	15.1	51.1	16.5	44.0	17.6	
5	81.8	14.4	72.6	16.5	63.7	18.3	55.2	19.7	
10	99.2	15.4	88.5	17.9	78.1	20.1	68.1	21.9	

SPM6L300E									
Tc	30			40			50		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	20.4	9.4	17.6	9.6	15.0	9.7	12.7	9.6	
-20	27.3	10.7	23.5	11.1	20.0	11.4	16.8	11.5	
-15	36.3	11.9	31.4	12.7	26.8	13.2	22.6	13.6	
-10	47.4	13.1	41.3	14.2	35.6	15.1	30.1	15.7	
-5	60.8	14.3	53.3	15.8	46.2	17.0	39.5	17.9	
0	76.3	15.4	67.3	17.4	58.8	19.0	50.6	20.3	
5	94.1	16.6	83.4	19.0	73.3	21.0	63.5	22.7	
10	114.1	17.6	101.7	20.6	89.7	23.1	78.2	25.1	

SPM6L400E									
Tc	30			40			50		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	24.5	11.3	21.1	11.5	18.0	11.6	15.2	11.5	
-20	32.7	12.8	28.2	13.4	24.0	13.7	20.1	13.8	
-15	43.5	14.3	37.7	15.2	32.2	15.9	27.1	16.3	
-10	56.9	15.7	49.6	17.1	42.7	18.1	36.2	18.9	
-5	72.9	17.2	63.9	19.0	55.4	20.4	47.4	21.5	
0	91.6	18.5	80.8	20.9	70.5	22.8	60.7	24.3	
5	112.9	19.9	100.1	22.8	87.9	25.2	76.2	27.2	
10	136.9	21.2	122.0	24.7	107.7	27.7	93.9	30.2	

Key:

Pf=cooling capacity(kW)

Pa=input power(kW)


Te=evaporating temperature(°C)

Tc=condensing temperature(°C)

50Hz=frequency

liquid sub cooling 5K

suction superheat 10K

 The shaded area indicates the need for additional cooling (refer to application limits).

Refer to the full load operation limits at 50Hz.

For performance data under different working conditions, please refer to the LEONARDO selection software.

### Performance Parameters(SPM\*H, refrigerant R404A-R507A)

SPM4H220E									
Tc	30			40			50		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	20.7	9.3	16.9	10.0	13.1	10.7	-	-	
-20	26.3	10.4	21.8	11.3	17.2	12.2	-	-	
-15	33.4	11.4	28.1	12.5	22.5	13.7	19.6	14.3	
-10	41.9	12.3	35.7	13.7	29.0	15.1	25.4	15.8	
-5	51.8	13.0	44.6	14.7	36.6	16.4	32.4	17.2	
0	63.2	13.6	54.8	15.6	45.4	17.6	40.4	18.6	
5	76.1	14.2	66.3	16.5	55.4	18.8	49.6	19.9	

SPM4H250E									
Tc	30			40			50		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	24.0	10.8	19.6	11.6	15.2	12.4	-	-	
-20	30.5	12.1	25.3	13.1	20.0	14.2	-	-	
-15	38.7	13.2	32.6	14.5	26.1	15.9	22.7	16.6	
-10	48.6	14.2	41.4	15.8	33.6	17.5	29.5	18.3	
-5	60.1	15.1	51.7	17.0	42.5	19.0	37.5	20.0	
0	73.3	15.8	63.5	18.1	52.7	20.4	46.9	21.6	
5	88.2	16.4	76.9	19.1	64.3	21.8	57.5	23.1	

SPM4H300E									
Tc	30			40			50		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	27.6	12.4	22.4	13.3	17.4	14.2	-	-	
-20	35.0	13.9	29.0	15.0	22.9	16.3	-	-	
-15	44.4	15.2	37.4	16.7	29.9	18.2	26.1	19.0	
-10	55.7	16.3	47.5	18.2	38.5	20.1	33.8	21.0	
-5	68.9	17.3	59.3	19.5	48.7	21.8	43.1	22.9	
0	84.1	18.1	72.9	20.8	60.4	23.7	53.8	24.7	
5	101.2	18.8	88.2	21.9	73.7	24.9	65.9	26.5	

SPM4H350E									
Tc	30			40			50		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	33.0	14.8	26.8	15.8	20.8	17.0	-	-	
-20	41.9	16.6	34.7	18.0	27.4	19.4	-	-	
-15	53.1	18.1	44.7	19.9	35.8	21.8	31.2	22.7	
-10	66.6	19.5	56.7	21.7	46.1	24.0	40.4	25.1	
-5	82.4	20.7	70.9	23.4	58.2	26.0	51.5	27.4	
0	100.5	21.7	87.1	24.8	72.2	28.0	64.3	29.6	
5	120.9	22.5	105.4	26.2	88.1	29.8	78.8	31.6	

SPM6H370E									
Tc	30			40			50		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	36.1	16.2	29.3	17.3	22.8	18.6	-	-	
-20	45.8	18.1	38.0	19.7	30.0	21.3	-	-	
-15	58.1	19.8	48.9	21.8	39.2	23.8	34.1	24.9	
-10	72.9	21.3	62.1	23.8	50.4	26.2	44.3	27.5	
-5	90.2	22.6	77.6	25.6	63.7	28.5	56.3	30.0	
0	110.0	23.7	95.3	27.2	79.0	30.6	70.6	32.4	
5	132.4	24.6	115.3	28.6	96.4	32.6	86.2	34.6	

SPM6H400E									
Tc	30			40			50		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	41.5	18.7	33.7	19.9	26.2	21.3	-	-	
-20	52.7	20.9	43.6	22.6	34.4	24.4	-	-	
-15	66.8	22.8	56.2	25.1	45.0	27.4	39.2	28.6	
-10	83.8	24.5	71.4	27.3	58.0	30.2	50.9	31.6	
-5	103.7	26.0	89.1	29.4	73.2	32.8	64.7	34.5	
0	126.5	27.3	109.6	31.2	90.9	35.2	80.8	37.2	
5	152.1	28.3	132.6	32.9	110.8	37.5	99.1	39.8	

SPM6H500E									
Tc	30			40			50		
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	
-25	49.5	22.3	40.3	23.8	31.3	25.5	-	-	
-20	62.9	24.9	52.2	27.0	41.2	29.2	-	-	
-15	79.8	27.3	67.1	29.9	53.8	32.7	46.9	34.1	
-10	100.1	29.3	85.3	32.6	69.3	36.0	60.8	37.8	
-5	123.9	31.1	106.5	35.1	87.5	39.2	77.4	41.2	
0	151.1	32.6	130.9	37.3	108.6	42.1	96.6	44.5	
5	181.8	33.8	158.4	39.3	132.4	44.8	118.5	47.6	

Key:

Pf=cooling capacity(kW)

Pa=input power(kW)

Te=evaporating temperature(°C)

Tc=condensing temperature(°C)

50Hz=frequency

liquid sub cooling

## Performance Parameters(SPM\*L, refrigerant R404-R507A)

SPM4L150E								
Tc	30		40		50		52	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-40	9.6	6.2	7.4	6.2	5.0	6.1	-	-
-35	12.8	7.4	10.0	7.6	7.0	7.8	-	-
-30	16.9	8.6	13.5	9.0	9.9	9.4	9.2	9.5
-25	22.0	9.7	17.9	10.4	13.6	11.0	12.8	11.2
-20	27.9	10.8	23.2	11.7	18.3	12.6	17.3	12.8
-15	34.8	11.8	29.4	13.0	23.9	14.2	22.7	14.4
-10	42.6	12.8	36.5	14.2	32.3	15.7	29.0	16.0
-6	49.5	13.6	42.9	15.2	36.1	16.9	-	-

SPM4L180E								
Tc	30		40		50		52	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-40	11.1	7.2	8.6	7.2	5.8	7.1	-	-
-35	14.8	8.6	11.6	8.8	8.1	9.0	-	-
-30	19.6	9.9	15.6	10.4	11.5	10.9	10.6	11.0
-25	25.5	11.2	20.7	12.0	15.8	12.8	14.8	13.0
-20	32.4	12.5	26.9	13.5	21.2	14.7	20.1	14.9
-15	40.4	13.7	34.1	15.0	27.7	16.5	26.4	16.7
-10	49.4	14.8	42.4	16.5	35.1	18.2	33.7	18.6
-6	57.4	15.7	49.7	17.6	41.9	19.6	-	-

SPM4L220E								
Tc	30		40		50		52	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-40	12.8	8.3	9.8	8.2	6.7	8.1	-	-
-35	17.0	9.9	13.3	10.1	9.3	10.4	-	-
-30	22.5	11.4	17.9	12.0	13.1	12.5	12.2	12.7
-25	29.2	12.9	23.8	13.8	18.1	14.7	17.0	14.9
-20	37.1	14.3	30.8	15.5	24.3	16.8	23.0	17.1
-15	46.3	15.7	39.1	17.2	31.7	18.9	30.2	19.2
-10	56.7	17.0	48.6	18.9	40.3	20.9	38.6	21.3
-6	65.9	18.0	57.0	20.2	48.0	22.5	-	-

SPM4L250E								
Tc	30		40		50		52	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-40	15.4	10.0	11.8	9.9	8.1	9.8	-	-
-35	20.5	11.9	15.9	12.2	11.2	12.5	-	-
-30	27.1	13.7	21.5	14.4	15.8	15.1	14.6	15.2
-25	35.1	15.5	28.6	16.6	21.8	17.7	20.5	17.9
-20	44.7	17.2	37.1	18.7	29.3	20.2	27.7	20.5
-15	55.7	18.9	47.0	20.7	38.2	22.7	36.4	23.1
-10	68.2	20.5	58.4	22.8	48.5	25.1	46.5	25.6
-6	79.2	21.7	68.6	24.3	57.8	27.1	-	-

SPM6L270E								
Tc	30		40		50		52	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-40	16.7	10.9	12.8	10.8	8.8	10.6	-	-
-35	22.3	12.9	17.3	13.3	12.2	13.5	-	-
-30	29.4	14.9	23.4	15.7	17.2	16.4	15.9	16.6
-25	38.2	16.9	31.1	18.0	23.7	19.2	22.3	19.5
-20	48.6	18.7	40.3	20.3	31.8	22.0	30.1	22.3
-15	60.6	20.5	51.1	22.6	41.5	24.7	39.5	25.1
-10	74.1	22.3	63.5	24.7	52.7	27.3	50.5	27.9
-6	86.2	23.6	74.6	26.4	62.8	29.4	-	-

SPM6L300E								
Tc	30		40		50		52	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-40	19.2	12.5	14.8	12.4	10.1	12.2	-	-
-35	25.6	14.9	19.9	15.2	14.0	15.6	-	-
-30	33.8	17.2	26.9	18.0	19.8	18.9	18.3	19.0
-25	43.9	19.4	35.7	20.7	27.3	22.1	25.6	22.4
-20	55.8	21.5	46.3	23.4	36.6	25.3	34.6	25.7
-15	69.6	23.6	58.8	25.9	47.7	28.4	45.5	28.9
-10	85.2	25.6	73.0	28.4	60.6	31.4	58.1	32.0
-6	99.0	27.1	85.8	30.4	72.2	33.8	-	-

SPM6L400E								
Tc	30		40		50		52	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-40	23.1	15.0	17.7	14.9	12.1	14.7	-	-
-35	30.7	17.8	23.9	18.3	16.8	18.7	-	-
-30	40.6	20.6	32.3	21.6	23.7	22.6	22.0	22.8
-25	52.7	23.2	42.9	24.9	32.8	26.5	30.7	26.9
-20	67.0	25.8	55.6	28.0	43.9	30.3	41.6	30.8
-15	83.5	28.3	70.5	31.1	57.2	34.1	54.6	34.7
-10	102.3	30.7	87.7	34.1	72.7	37.7	69.7	38.4
-6	118.8	32.5	102.9	36.5	86.6	40.6	-	-

Key:

Pf=cooling capacity(kW)

Pa=input power(kW)

Te=evaporating temperature(°C)

Tc=condensing temperature(°C)

50Hz=frequency

liquid sub cooling 5K

suction superheat 10K

The shaded area indicates the need for additional cooling (refer to application limits).

Refer to the full load operation limits at 50Hz.

For performance data under different working conditions, please refer to the LEONARDO selection software.

## Product Supply

Standard accessories:

- Partial-winding start motor(400V/3/50 Hz or 460V/3/60 Hz)
- Crankcase heater
- Discharge shut-off valve
- Suction shut-off valve
- Spring vibration damper
- Direct on-line (DOL)
- Safety valve
- Oil sight glass
- Oil charging
- PTC protective thermistor
- INT69B2 protection module (230V/1/50 or 60 Hz)
- IP54 rated electrical box
- Nitrogen purging

Optional Accessories:

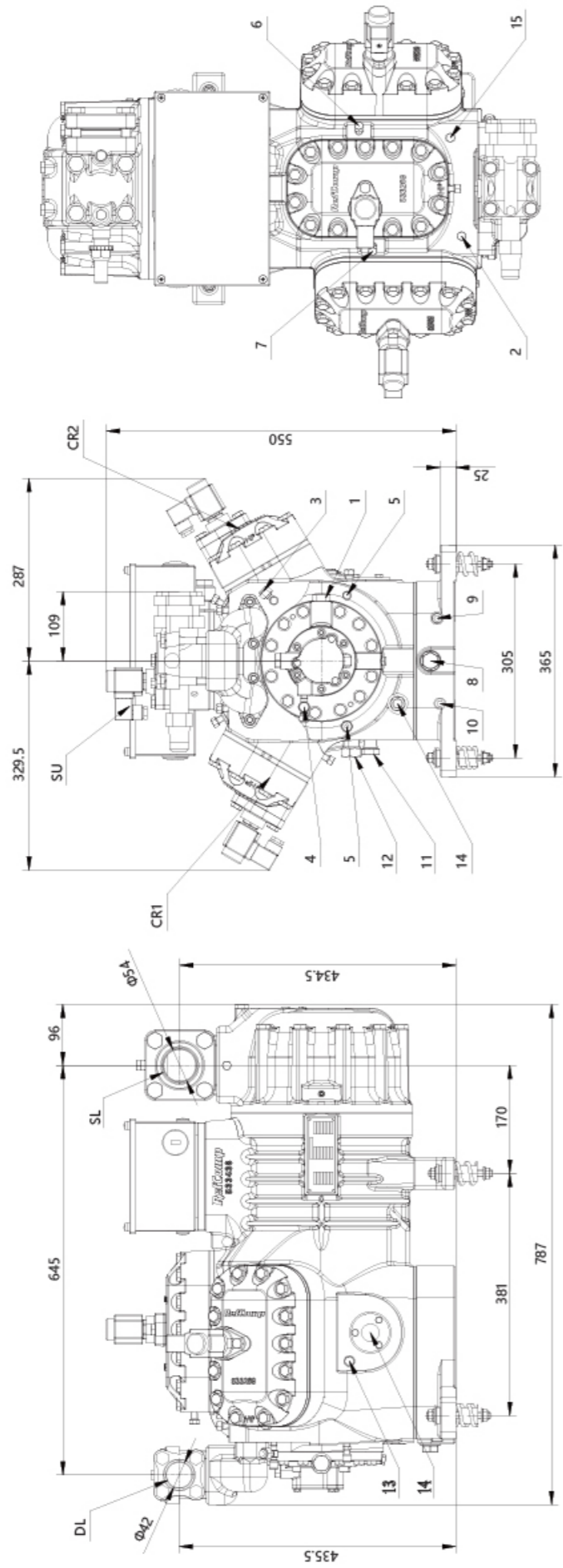
- star-delta start motors (400V/3/50Hz or 460V/3/60Hz).
- special voltage motor.
- oil pressure differential switch.
- CR energy control assembly.
- SU unload start assembly.
- spray assembly.
- fan assembly.
- temperature probe assembly.
- oil charging valve.
- compressor parallel port.
- special packaging.

Type of Compressor	Energy Control Level	Energy Control Point	Energy Control Level	Energy Control Point
4-cylinder	1	50%	-	-
6-cylinder	1	66%	2	66%-33%

The standard electrical system for compressor accessories (electronic protection module, crankcase heater, CR, SU electromagnetic valve coil) is 230V AC 50/60Hz. For special electrical system accessories, please consult RefComp.



SPM6L4000-SPM6L400E  
SPM6H5000-SPM6H500E



Key:

1	electrical oil pressure differential switch connection
2	discharge temperature sensor valve
3	high pressure connection 1/4"SAE-FLARE
4	oil high pressure connection
5	oil high pressure connection 1/4"SAE-FLARE
6	low pressure connection1/8"NPT
7	low pressure connection 1/8"NPT(liquid injection)
8	oil filter
9	oil drain plug
10	crankcase heater

11	Connection for oil equalization (parallel operation)
12	Connection for gas equalization (parallel operation)
13	oil charging connection 1/4"NPT
14	oil sight glass
15	high pressure connection 1/4"NPT
DL	discharge shut-off valve
SL	suction shut-off valve
CR1	capacity regulation assembly level 1
CR2	capacity regulation assembly level 2
SU	start unloading assembly