SRMTEC

## Semi- hermetic High- efficient Variable- frequency

# Refrigeration Screw Compressor

**SRM Sweden**

The inventor and leader of screw compressor

100-year legacy of technical quality&energy efficiency

100 YEARS OF ENERGY EFFICIENCY

## Focus on screw technology for one hundred years

More than 3 million screw compressors all over the world are technologically licensed by SRM


SRMTec Europe

SRM Germany GmbH

Address: Hasenäcker 12, 88142 Wasserburg, Germany

Tel: +49 8382 9768229 Fax: +49 8382 9768229

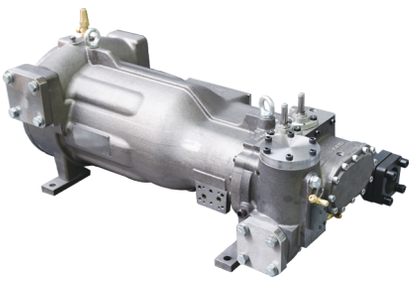
Http: //www.srmtecgroup.com E- mail: info@srmtecgroup.com


SRMTEC

## SRMTEC SRS Semi- hermetic High- efficient Screw Compressor

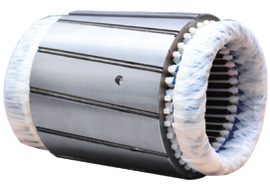
The product range consists of 20 models (SRS- 08 to SRS- 20) with displacements ranging from 85 to 850 $m^3/h$ which operate with Ammonia (R717).

The compressor is widely used in food processing and - storage, marine applications, industrial process chillers, air- conditioning and other fields.



### Compressor body

- High- strength design with working pressure of up to 28 bar;
- Optimized suction gas flow through the motor to ensure motor cooling with significantly reduced pressure drop for low energy consumption;
- Integrated reliable lubrication system for simple installation;
- Compact design with integrated stop valve, discharge temperature sensor, oil filter, oil differential pressure switch, oil shut- off valve.

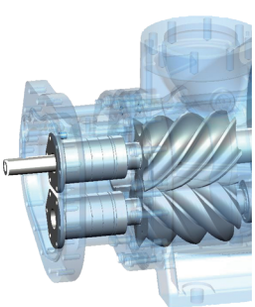


### Motor

- Specially adopted materials are used to make it applicable to ammonia;
- Permanent Magnet synchronous variable frequency motors with a high power factor increase efficiency and flexibility;
- Controlled by an inverter the compressor can follow the load profile exactly and smoothly, thus saving energy especially during part load conditions.

### Motor protection

- INT69 SNY module protects from excess temperature , reverse rotation and phase failure ;
- 6 PTC thermistors in series prevent motor burn out;
- Feedback of status and real- time monitoring are enabled during operation.



### Bearing

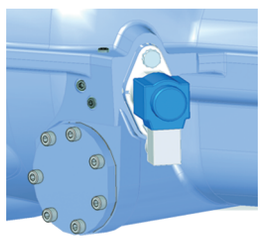
- Multiple bearings are combined for perfect axial and radial compliance for high load at lowest wear and noise levels;
- Precision and wear resistant rolling bearing elements and a special profile result in a design life of 80,000 h.

### Suction filter

With pores of 100μm the suction filter removes contamination from the refrigerant and protects the system.

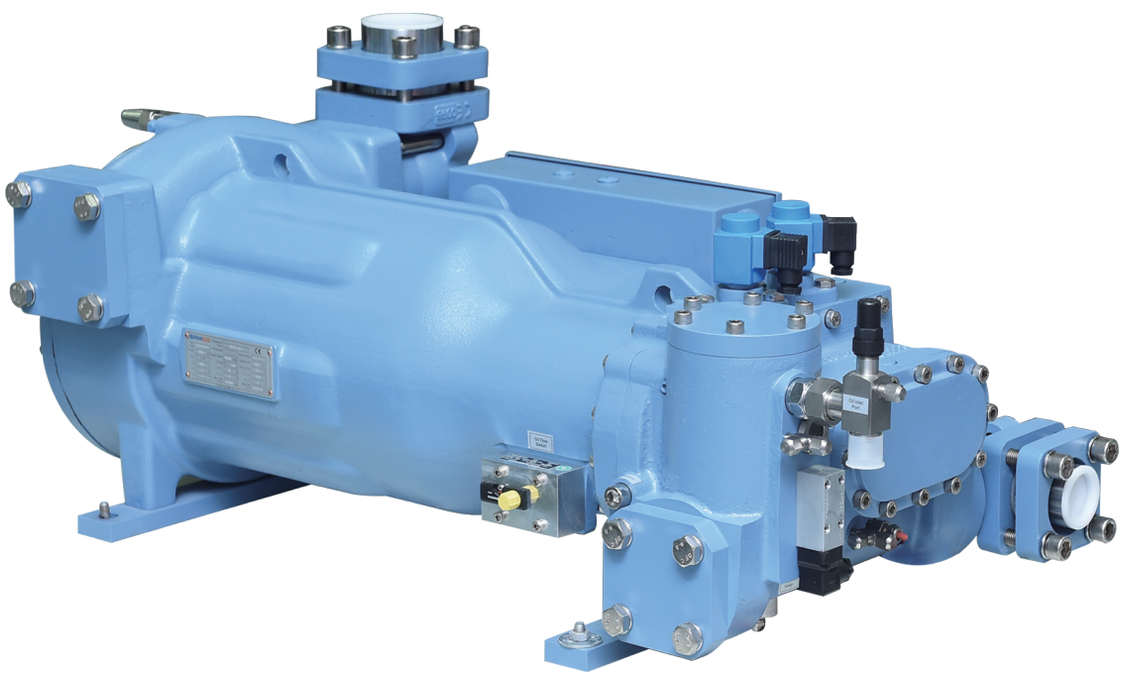
## Rotor

- SRM "i" type patented profile with 5 + 7 gear ratio, results in high efficiency and smooth operation;
- The rotors are machined from high quality steel of high strength and wear resistance;
- Micrometer precision ensures tight sealing and smooth operation resulting in low noise and long service life;
- The maximum speed of up to 5,000 rpm is significantly increasing capacity and flexibility.



## VI (Interior volume ratio)

- Vi- control guarantees best adaptation to the operating parameters for highest COP. It is available on SRS- 14 to SRS- 16 models.
- Manual Regulation is used to adapt infrequently to new conditions like for summer/winter mode or changing temperature levels in cold- rooms for different goods (rental warehouses).
- Automatic Regulation is perfectly suitable for frequently changing conditions like huge differences between day and night or climate chambers with multiple temperature simulations.



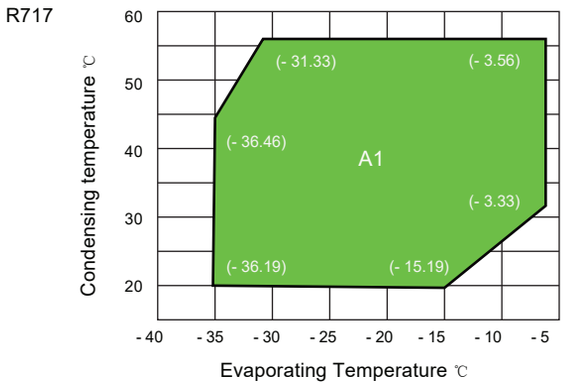
## The suction and discharge shut- off valves are

- 360 degree rotatable;
- side-changeable;
- compact and of low pressure drop => flexible and easy to integrate into systems.

## Capacity regulator

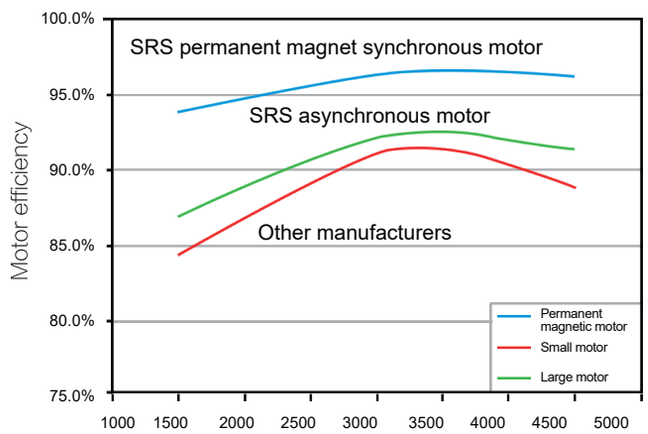
- Stepped or step- less capacity regulation follows the load profile;
- The slide valve is installed between housing and rotor presenting a compact design with superior sealing performance.

## Working Conditions

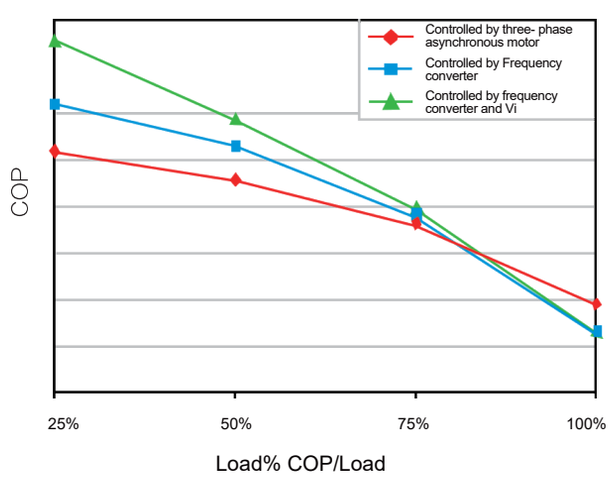



## Energy- saving Analysis

Comparison on efficiency of permanent magnet synchronous motor and asynchronous motor:




Comparison on COP in different control ways:




## SRS compressor performance data list

| $NH_3$ | Cooling capacity [kW] | | | | |
|---|---|---|---|---|---|
| | SRS 08S | | | | |
| | Pe(bar) | 1.90 | 2.36 | 2.91 | 3.55 |
| Pc(bar) | Tc \ Te | - 20 | - 15 | - 10 | - 5 |
| 8.57 | 20 | 42.3 | 52.3 | 64.0 | 77.6 |
| 10.03 | 25 | 40.7 | 50.8 | 63.0 | 76.5 |
| 11.67 | 30 | 39.2 | 49.2 | 60.8 | 74.5 |
| 13.51 | 35 | 37.2 | 47.6 | 58.8 | 72.2 |

| $NH_3$ | Cooling capacity [kW] | | | | |
|---|---|---|---|---|---|
| | SRS 08M | | | | |
| | Pe(bar) | 1.90 | 2.36 | 2.91 | 3.55 |
| Pc(bar) | Tc \ Te | - 20 | - 15 | - 10 | - 5 |
| 8.57 | 20 | 51.7 | 63.9 | 78.1 | 94.7 |
| 10.03 | 25 | 49.8 | 62.0 | 76.9 | 93.3 |
| 11.67 | 30 | 47.9 | 60.1 | 74.2 | 91.0 |
| 13.51 | 35 | 45.4 | 58.1 | 71.8 | 88.1 |

## SRS compressor performance data list

| $NH_3$ | Cooling capacity [kW] | | | | |
|---|---|---|---|---|---|
| | SRS 08L | | | | |
| | Pe(bar) | 1.90 | 2.36 | 2.91 | 3.55 |
| Pc(bar) | Tc \ Te | - 20 | - 15 | - 10 | - 5 |
| 8.57 | 20 | 59.0 | 73.0 | 89.2 | 108.2 |
| 10.03 | 25 | 56.9 | 70.8 | 87.9 | 106.7 |
| 11.67 | 30 | 54.8 | 68.6 | 84.8 | 104.0 |
| 13.51 | 35 | 51.9 | 66.4 | 82.0 | 100.7 |

| $NH_3$ | Cooling capacity [kW] | | | | |
|---|---|---|---|---|---|
| | SRS 10S | | | | |
| | Pe(bar) | 1.90 | 2.36 | 2.91 | 3.55 |
| Pc(bar) | Tc \ Te | - 20 | - 15 | - 10 | - 5 |
| 8.57 | 20 | 69.9 | 86.4 | 105.6 | 128.1 |
| 10.03 | 25 | 67.3 | 83.8 | 104.0 | 126.2 |
| 11.67 | 30 | 64.8 | 81.2 | 100.4 | 123.1 |
| 13.51 | 35 | 61.4 | 78.6 | 97.1 | 119.1 |

| $NH_3$ | Cooling capacity [kW] | | | | |
|---|---|---|---|---|---|
| | SRS 10L | | | | |
| | Pe(bar) | 1.90 | 2.36 | 2.91 | 3.55 |
| Pc(bar) | Tc \ Te | - 20 | - 15 | - 10 | - 5 |
| 8.57 | 20 | 82.6 | 102.2 | 124.9 | 151.5 |
| 10.03 | 25 | 79.6 | 99.2 | 123.1 | 149.4 |
| 11.67 | 30 | 76.7 | 96.1 | 118.8 | 145.6 |
| 13.51 | 35 | 72.7 | 93.0 | 114.8 | 141.0 |

| $NH_3$ | Cooling capacity [kW] | | | | |
|---|---|---|---|---|---|
| | SRS 12S | | | | |
| | Pe(bar) | 1.90 | 2.36 | 2.91 | 3.55 |
| Pc(bar) | Tc \ Te | - 20 | - 15 | - 10 | - 5 |
| 8.57 | 20 | 103.3 | 127.8 | 156.2 | 189.4 |
| 10.03 | 25 | 99.5 | 124.0 | 153.8 | 186.7 |
| 11.67 | 30 | 95.8 | 120.1 | 148.5 | 182.0 |
| 13.51 | 35 | 90.9 | 116.2 | 143.6 | 176.2 |

| $NH_3$ | Cooling capacity [kW] | | | | |
|---|---|---|---|---|---|
| | SRS 12M | | | | |
| | Pe(bar) | 1.90 | 2.36 | 2.91 | 3.55 |
| Pc(bar) | Tc \ Te | - 20 | - 15 | - 10 | - 5 |
| 8.57 | 20 | 114.6 | 141.8 | 173.3 | 210.2 |
| 10.03 | 25 | 110.4 | 137.6 | 170.7 | 207.1 |
| 11.67 | 30 | 106.3 | 133.3 | 164.7 | 201.9 |
| 13.51 | 35 | 100.8 | 128.9 | 159.3 | 195.5 |

| $NH_3$ | Cooling capacity [kW] | | | | |
|---|---|---|---|---|---|
| | SRS 12L | | | | |
| | Pe(bar) | 1.90 | 2.36 | 2.91 | 3.55 |
| Pc(bar) | Tc \ Te | - 20 | - 15 | - 10 | - 5 |
| 8.57 | 20 | 125.4 | 155.2 | 189.6 | 230.0 |
| 10.03 | 25 | 120.8 | 150.6 | 186.8 | 226.7 |
| 11.67 | 30 | 116.3 | 145.9 | 180.3 | 221.0 |
| 13.51 | 35 | 110.3 | 141.1 | 174.3 | 213.9 |

| $NH_3$ | Cooling capacity [kW] | | | | |
|---|---|---|---|---|---|
| | SRS 14S | | | | |
| | Pe(bar) | 1.90 | 2.36 | 2.91 | 3.55 |
| Pc(bar) | Tc \ Te | - 20 | - 15 | - 10 | - 5 |
| 8.57 | 20 | 152.0 | 188.0 | 229.8 | 278.7 |
| 10.03 | 25 | 146.4 | 182.4 | 226.3 | 274.7 |
| 11.67 | 30 | 141.0 | 176.8 | 218.4 | 267.8 |
| 13.51 | 35 | 133.7 | 171.0 | 211.2 | 259.2 |

| $NH_3$ | Cooling capacity [kW] | | | | |
|---|---|---|---|---|---|
| | SRS 14M | | | | |
| | Pe(bar) | 1.90 | 2.36 | 2.91 | 3.55 |
| Pc(bar) | Tc \ Te | - 20 | - 15 | - 10 | - 5 |
| 8.57 | 20 | 168.2 | 208.1 | 254.3 | 308.5 |
| 10.03 | 25 | 162.1 | 201.9 | 250.5 | 304.0 |
| 11.67 | 30 | 156.0 | 195.6 | 241.8 | 296.4 |
| 13.51 | 35 | 148.0 | 189.2 | 233.8 | 286.9 |

| $NH_3$ | Cooling capacity [kW] | | | | |
|---|---|---|---|---|---|
| | SRS 14L | | | | |
| | Pe(bar) | 1.90 | 2.36 | 2.91 | 3.55 |
| Pc(bar) | Tc \ Te | - 20 | - 15 | - 10 | - 5 |
| 8.57 | 20 | 182.5 | 225.7 | 275.9 | 334.7 |
| 10.03 | 25 | 175.8 | 219.0 | 271.7 | 329.8 |
| 11.67 | 30 | 169.3 | 212.2 | 262.3 | 321.5 |
| 13.51 | 35 | 160.5 | 205.3 | 253.6 | 311.3 |

| $NH_3$ | Cooling capacity [kW] | | | | |
|---|---|---|---|---|---|
| | SRS 16S | | | | |
| | Pe(bar) | 1.90 | 2.36 | 2.91 | 3.55 |
| Pc(bar) | Tc \ Te | - 20 | - 15 | - 10 | - 5 |
| 8.57 | 20 | 206.6 | 255.5 | 312.3 | 378.9 |
| 10.03 | 25 | 199.0 | 248.0 | 307.6 | 373.4 |
| 11.67 | 30 | 191.6 | 240.3 | 300.3 | 370.2 |
| 13.51 | 35 | 181.7 | 232.4 | 287.1 | 356.8 |

| $NH_3$ | Cooling capacity [kW] | | | | |
|---|---|---|---|---|---|
| | SRS 16M | | | | |
| | Pe(bar) | 1.90 | 2.36 | 2.91 | 3.55 |
| Pc(bar) | Tc \ Te | - 20 | - 15 | - 10 | - 5 |
| 8.57 | 20 | 222.1 | 274.7 | 335.8 | 407.3 |
| 10.03 | 25 | 213.9 | 266.6 | 330.7 | 401.4 |
| 11.67 | 30 | 206.0 | 258.3 | 322.9 | 397.9 |
| 13.51 | 35 | 195.4 | 249.8 | 308.6 | 383.6 |

| $NH_3$ | Cooling capacity [kW] | | | | |
|---|---|---|---|---|---|
| | SRS 16L | | | | |
| | Pe(bar) | 1.90 | 2.36 | 2.91 | 3.55 |
| Pc(bar) | Tc \ Te | - 20 | - 15 | - 10 | - 5 |
| 8.57 | 20 | 246.0 | 304.2 | 371.8 | 451.0 |
| 10.03 | 25 | 236.9 | 295.2 | 366.2 | 444.5 |
| 11.67 | 30 | 228.1 | 286.0 | 357.5 | 440.7 |
| 13.51 | 35 | 216.4 | 276.7 | 341.8 | 424.8 |