# SABROE® TCMO/TSMC two-stage reciprocating compressor units

## Two-stage versions of CMO and SMC reciprocating compressors, with swept volumes of 150–1000 m³/h

SABROE® TCMO/TSMC two-stage reciprocating compressors are an economical operating alternative to single-stage compressors in smaller low-temperature refrigeration installations.

TCMO/TSMC compressor units are also ideal for medium-size industrial refrigeration installations that involve a big temperature range, such as freezer installations. Furthermore, these units are easy to customise with intermediate cooling systems.

Using a two-stage set-up built together as a single unit helps avoid equipment duplication – and thus reduce costs and save space.

TSMC 108 two-stage reciprocating compresor unit shown with closed flash inter-stage cooling system and UniSAB systems controller

### Range

Eight different models are available to provide swept volumes of between 150 and 1000 m³/h.

| Advantages | Benefits |
|---|---|
| Splitting the temperature lift into two separate stages reduces overall energy consumption | Two-stage installations are relatively cost-effective, which helps reduce energy costs |
| Relatively small footprint | Can be installed in relatively small locations, or where space is limited |
| High coefficient of performance (COP), with excellent performance under part-load conditions | Low power consumption, which greatly reduces operating costs |
| Variable-speed drive (optional) provides stepless capacity control over the entire operating range | Power consumption and operating costs kept to a minimum |

### Options

- UniSAB systems controller
- Gauges, thermometers and temperature/pressure control switches
- Oil level regulator (for use in parallel systems)
- ATEX-compliant configuration
- Special vibration dampening.

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## Intermediate cooling system options

In plants with multiple two-stage compressors, TCMO/TSMC units can be connected to a shared intermediate cooler, in a separate installation.

Alternatively, a range of built-on intermediate cooling systems are available, as optional equipment.

- Injection inter-stage gas cooling without liquid subcooling
- Injection inter-stage gas cooling with liquid subcooling in a shell-and-tube heat exchanger
- Closed flash inter-stage cooling in a shell-and-coil intermediate cooler, with liquid subcooling in the coil.

| Model | Number of cylinders low/high-pressure side | Swept volume at 1500 rpm | Swept volume at 1800 rpm | Nominal capacities in kW R717 * -40/+35°C | | Unit dimensions in mm | | | Weight excluding motor | Sound pressure level at 1500 rpm | Sound pressure level at 1800 rpm |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | m³/h | m³/h | 1500 rpm | 1800 rpm | L | W | H | kg | dB(A) | dB(A) |
| TCMO 28 | 6 / 2 | 146 | 175 | 20 | 24 | 1400-1750 | 700 | 1000 | 500 | 68 | 70 |
| TCMO 38 | 6 / 2 | 170 | 205 | 23 | 28 | 1400-1750 | 700 | 1000 | 500 | 69 | 71 |
| TSMC 108 S | 6 / 2 | 339 | 407 | 50 | 60 | 2311-2915 | 1052 | 1247 | 1746 | 80 | 82 |
| TSMC 108 L | 6 / 2 | 424 | 509 | 66 | 79 | 2311-2915 | 1052 | 1247 | 1781 | 81 | 83 |
| TSMC 108 E | 6 / 2 | 509 | N/A | 81 | N/A | 2311-2915 | 1052 | 1247 | 1796 | 81 | 83 |
| TSMC 116 S | 12 / 4 | 679 | 814 | 100 | 121 | 3329-3737 | 1327 | 1445 | 2791 | 81 | 83 |
| TSMC 116 L | 12 / 4 | 848 | 1018 | 133 | 159 | 3329-3737 | 1327 | 1445 | 2841 | 82 | 84 |
| TSMC 116 E | 12 / 4 | 1018 | N/A | 163 | N/A | 3329-3737 | 1327 | 1445 | 2891 | 83 | 84 |

* Other refrigerants are available on request.

Nominal capacities are based on:
1500 rpm at 50 Hz.
1800 rpm at 60 Hz or VSD.

**For R717**
2K liquid subcooling, 0.5 K non-usable suction superheat and liquid subcooling in intermediate cooler to 10K above intermediate temperature.

For TCMO
Design pressure, HP side: 28 bar
Design pressure, LP side: 18 bar
Differential pressure: 25 bar.

For TSMC
Design pressure, HP side: 28 bar
Design pressure, LP side: 18 bar
Differential pressure: 25 bar.

Sound pressure levels measured in free field, over reflecting plane and one metre distance from the compressor block.

| Min./max. speed | R717 |
|---|---|
| TCMO 20 | 700-1800 rpm |
| TCMO 30 | 700-1800 rpm |
| TSMC S | 500-1800 rpm |
| TSMC L | 500-1800 rpm |
| TSMC E | 500-1500 rpm |

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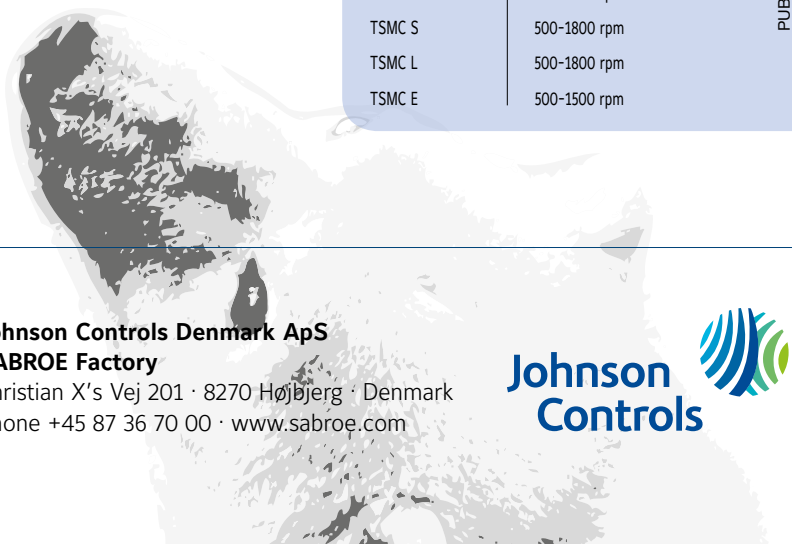



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