

Agilent TwisTorr 304 FS*



The new generation Turbo Pump with Agilent Floating Suspension

The Agilent TwisTorr 304 FS turbomolecular high-vacuum pump combines TwisTorr drag stage technology and Agilent Floating Suspension to provide high performance, reliability, and economy.

TwisTorr drag stages create high compression ratios for light gases such as hydrogen and helium to deliver high throughput and high tolerance of foreline pressure, thereby permitting the use of smaller and more economical backing pumps. This technology results in a compact rotor design that is energy-efficient and maintains a low operating temperature.

The Agilent Floating Suspension system reduces noise and vibration, and ensures optimal bearing operating conditions to extend operating life, minimize system downtime, and assure stability over time.

The unique bearing and dry lubrication in the TwisTorr 304 FS eliminate oil and maintenance, and permit operation of the pump in any orientation. Available with onboard or rack controllers.

(*) **NOTE:** The product is discontinued and replaced by [TwisTorr 305 FS](#)

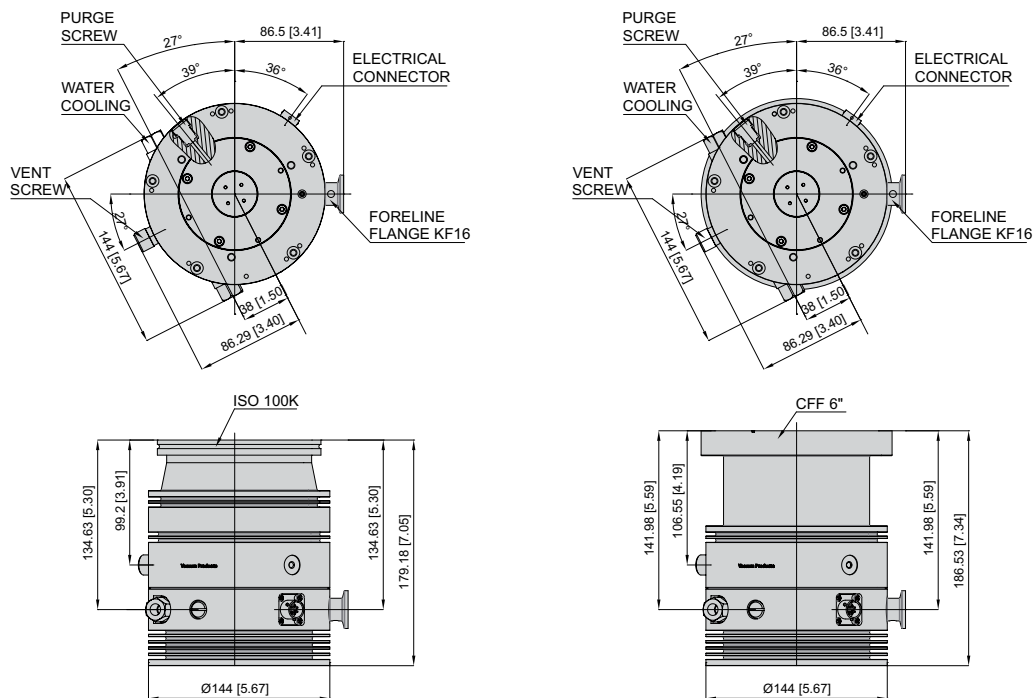
Technical Specification

| Technical Specifications | | |
|---|---|---|
| Pumping speed | ISO 100 / CF 6" | ISO 160 / CF 8" |
| N ₂ | 250 L/s | 250 L/s |
| He | 255 L/s | 255 L/s |
| H ₂ | 220 L/s | 220 L/s |
| Ar | 250 L/s | 250 L/s |
| Max Gas Throughput (*) | Air Cooling (25°C ambient temperature) | Water Cooling (15°C water temp. / 25°C ambient temp.) |
| N ₂ | 170 SCCM | 170 SCCM |
| Ar | 110 SCCM | 110 SCCM |
| (*) Backing pump 11.6 m ³ /h | | |
| Compression ratio and foreline tolerance (**) | | |
| N ₂ | > 1 x 10 ¹¹ | >10 mbar |
| He | > 1 x 10 ⁹ | >10 mbar |
| H ₂ | 1.5 x 10 ⁶ | >4 mbar |
| Ar | > 1 x 10 ¹¹ | >10 mbar |
| (**) Foreline Tolerance defined as the pressure at which the turbopump still produce a compression of 100 and estimated in water cooling mode | | |
| Base pressure with recomm. forepump | < 1 x 10 ⁻¹⁰ mbar (< 1 x 10 ⁻¹⁰ Torr) | |
| Inlet flange | ISO 100, CFF 6", ISO 160, CFF 8" | |
| Foreline flange | KF16 NW (KF25 - optional) | |
| Rotational speed | 60000 rpm (1010 Hz driving frequency) | |
| Start-up time | < 3 minutes | |

| Technical Specifications | | |
|---|---|--|
| Recommended forepump | Agilent DS102 Rotary Vane Pump Agilent IDP-7 Dry Scroll Pump | |
| Operating position | Any | |
| Oper. ambient temperature | +5 °C to +35 °C | |
| Rel. humidity of air | 0 to 90 % (not condensing) | |
| Bakeout temp. | 80 °C at inlet flange max (ISO flange) 120 °C at inlet flange max (CFF flange) | |
| Lubricant | Permanent lubrication | |
| Cooling requirements | | |
| Air cooling | Air temperature from +5°C to 35°C | |
| Water cooling | Water temperature from +15°C to +25°C Water flow min. 50 L/h | |
| Noise Pressure Level (at 1m at full speed) | < 50 dB(A) | |
| Storage temp. | -40°C to +70°C | |
| Max altitude | 3000 m | |
| Weight kg (lbs) | ISO 100 CFF 6" ISO 160 CFF 8" | 5.5 kg (12.3) 7.5 kg (16.5) 5.7 kg (12.6) 9.7 kg (20.9) |

| Conformity to norms | |
|---|---|
| EMC (Control Units) Safety (CE/CSA) ROHS | 61326-1 DIR 2006/42/CE DIR 2011/65/EU |

Outline Drawings



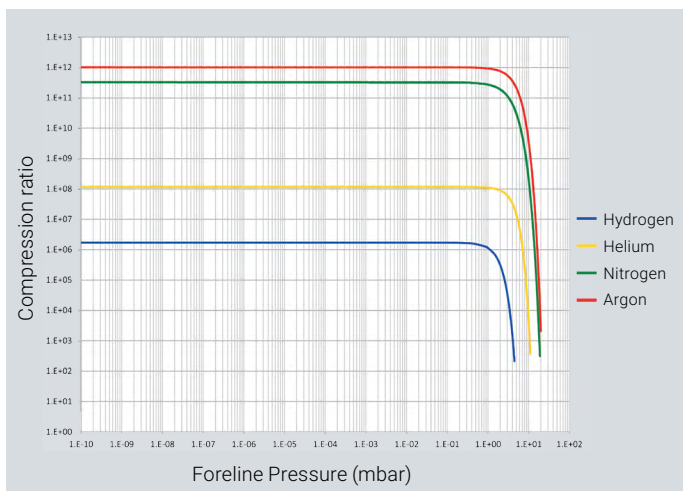
Dimensions: millimeters [inches]

Ordering Information

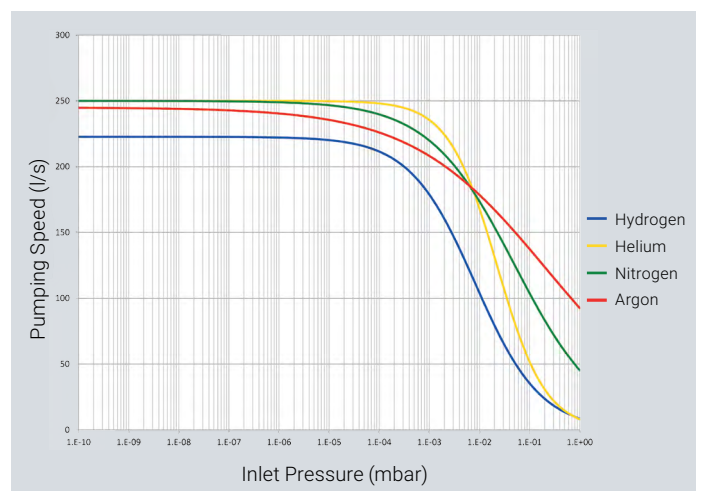
| Pumps | Configuration Options |
|---|---|
| TwisTorr 304 FS ISO 100 water cooling | X3500-64000 |
| TwisTorr 304 FS CFF 6" water cooling | X3500-64001 |
| TwisTorr 304 FS ISO 160 water cooling | X3500-64002 |
| TwisTorr 304 FS CFF 8" water cooling | X3500-64003 |
| TwisTorr 304 FS ISO100 air cooling | X3500-64004 |
| TwisTorr 304 FS CFF 6" air cooling | X3500-64005 |
| TwisTorr 304 FS ISO 160 air cooling | X3500-64006 |
| TwisTorr 304 FS CFF 8" air cooling | X3500-64007 |
| TwisTorr 304 FS ISO 100 SF water cooling | X3500-64010 |
| Controllers | Part Numbers |
| TwisTorr 304 FS AG rack controller with RS232/485 | X3506-64002 |
| TwisTorr 304 FS AG rack controller with Profibus | X3506-64003 |
| TwisTorr 304 FS onboard controller 24 Vdc | X3507-64002 |
| TwisTorr 304 FS onboard controller 100-240 Vac | X3507-64003 |
| Cables | Part Numbers |
| Mains cable NEMA plug, 3 m long | 9699958 |
| Mains cable European plug, 3 m long | 9699957 |
| Serial cable and A-plus Software | 9699883 |
| Extension cables | 9699948M007 (5 m) 9699948M006 (10 m) 9699948M005 (15 m) 9699948M004 (20 m) |
| Inlet Screen | Part Numbers |
| Inlet Screen ISO 100 | X3500-68000 |
| Inlet Screen CFF 6" | 9699302 |
| Inlet Screen ISO 160 | X3500-68001 |
| Inlet Screen CFF 8" | 9699304 |
| Cooling | Part Numbers |
| Water cooling kit | 9699337 |
| Plastic water cooling kit | 9699347 |
| Air cooling kit for onboard controller | X3500-68010 |

| Fan extension cable for onboard controller | 9699949 |
|---|-------------------------|
| Air cooling kit for rack AG controller | X3500-68011 |
| Fan extension cable for rack AG controller | 9699940 |
| Vibration isolator | Part Numbers |
| Vibration isolator ISO 100 | 9699344 |
| Vibration isolator CF 6" | 9699334 |
| Vibration isolator ISO 160 | 9699345 |
| Vibration isolator CF 8" | 9699335 |
| Vibration isolator ISO 100 IDX | 9699396 |
| Vent flange, NW 10 KF / M8 | 9699108 |
| Venting | Part Numbers |
| Delay vent valve 1.2 mm orifice | X3505-68000 |
| Delay vent valve 0.5 mm orifice | X3505-68001 |
| Vent valve N.O. for rack AG controller (0.5 mm) | 9699844 |
| Vent valve for onboard controller (1.2 mm) | 9699834 |
| Vent valve for onboard controller (0.5 mm) | 9699834M006 |
| Purge | Part Numbers |
| Purge valve 10 SCCM NW16KF - M12 | 9699239 |
| Purge valve 10 SCCM ¼ Swagelok - M12 | 9699240 |
| Purge valve 20 SCCM NW16KF - M12 | 9699241 |
| Purge valve 20 SCCM ¼ Swagelok - M12 | 9699242 |
| Purge valve 10 SCCM ¼ Swagelok - ¼ Swagelok | 9699232 |
| Purge valve 20 SCCM ¼ Swagelok - ¼ Swagelok | 9699236 |
| Mounting | Part Numbers |
| Bracket for onboard controller side mounting | X3500-68012 |
| Foreline flange KF25 | X3500-68002 |
| Active Gauges | Part Numbers |
| FRG 700 Full Range Gauge | Ask Agilent for details |
| PVG 500 Pirani Vacuum Gauge | Ask Agilent for details |
| PCG 750 Pirani Capacitance Gauge | Ask Agilent for details |
| CDG-500 Capacitance Diaphragm Gauge | Ask Agilent for details |

Compression Ratio



Pumping Speed



www.agilent.com/chem/twistorrfsfamily

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