Data Sheet

Agilent
Trusted Answers

# Agilent TwisTorr 704 FS


## The new generation Turbo Pump with Agilent Floating Suspension

The Agilent TwisTorr 704 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 704 FS eliminate oil and maintenance, and permit operation of the pump in any orientation. Available with onboard or rack controllers.

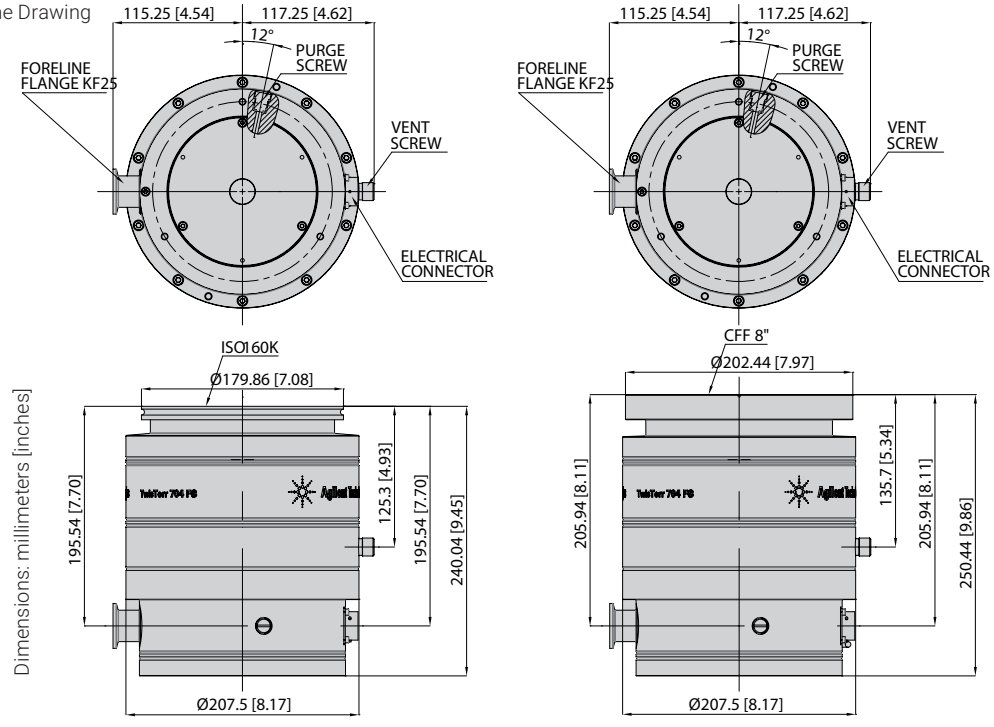
## Technical Specifications

| Technical Specifications | | |
|---|---|---|
| **Pumping speed** | ISO 160 / CF 8” | |
| $N_2$<br>He<br>$H_2$<br>Ar | 660 L/s<br>640 L/s<br>480 L/s<br>625 L/s | |
| **Max Gas Throughput (*)** | Air Cooling (25°C ambient temperature) | Water Cooling (15°C water temp. / 25°C ambient temp.) |
| **$N_2$** | 4.3 mbar L/s<br>255 SCCM | 6.2 mbar L/s<br>367 SCCM |
| **He** | 7.9 mbar L/s<br>467 SCCM | 10.4 mbar L/s<br>615 SCCM |
| **Ar** | 1.5 mbar L/s<br>89 SCCM | 3.3 mbar L/s<br>195 SCCM |
| *(*) Backing pump 11.6 $m^3$/hr* | | |
| **Compression ratio and foreline tolerance (**)** | | |
| $N_2$<br>He<br>$H_2$<br>Ar | > 1 x $10^{11}$<br>2 x $10^8$<br>3 x $10^6$<br>> 1 x $10^{11}$ | 10 mbar<br>10 mbar<br>>4 mbar<br>8.5 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<br>(< 1 x $10^{-10}$ Torr) | |
| **Inlet flange** | ISO 160K, ISO 160F, CFF 8” | |
| **Foreline flange** | NW25 (NW40 as option) | |
| **Rotational speed** | Auto setting from 40'800 RPM to 49'500 RPM | |
| **Start-up time** | < 5 minutes | |

| Technical Specifications | | |
|---|---|---|
| **Recommended forepump** | Agilent DS302 Rotary Vane Pump<br>Agilent IDP-10 Dry Scroll Pump<br>Agilent IDP-15 Dry Scroll Pump | |
| **Operating position** | Any | |
| **Oper. ambient temp.** | +5 °C to +35 °C | |
| **Rel. humidity of air** | 0 - 90 % (not condensing) | |
| **Bakeout temp.** | ISO pump: 80 °C at inlet flange<br>CFF pump: 120 °C at inlet 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<br>Water flow min. 100L/h | |
| **Noise Pressure Level (at 1m at full speed)** | 43dB(A) | |
| **Storage temp.** | -40°C to +70°C | |
| **Max altitude** | 3000 m | |
| **Weight kg (lbs)** | ISO160K<br>ISO160F<br>CFF 8” | 20.6 kg (45.3)<br>22.6 kg (49.7)<br>22 kg (48.4) |

| Conformity to norms | |
|---|---|
| **EMC (Control Units)** | 61326-1 |
| **Safety (CE/CSA)** | 61010-1 |
| **Machinery Directive** | DIR 2006/42/CE |
| **Low Voltage Directive** | DIR 2014/35/EU |
| **EMC Directive (Control Units)** | DIR 2014/30/EU |
| **ROHS** | DIR 2011/65/EU |

Outline Drawing





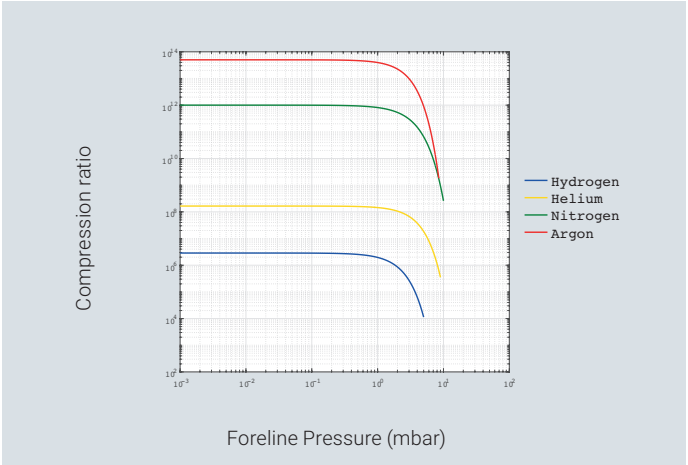

*3D Drawings available for download*

## Ordering Information

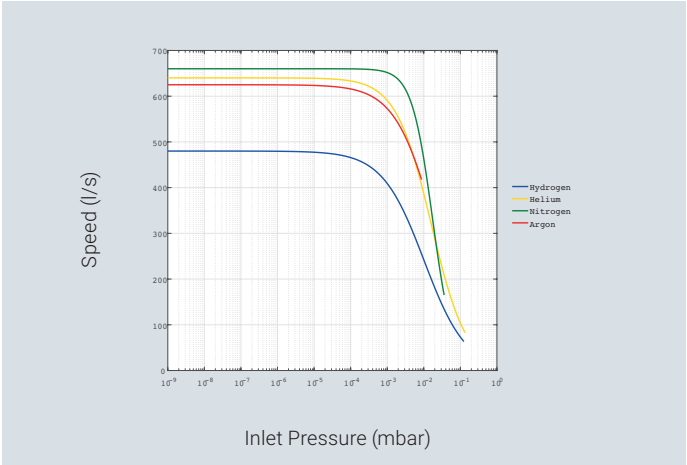
| Pumps | Configuration Options |
|---|---|
| TwisTorr 704 FS ISO160K KF25 air cooling | X3511-64000 |
| TwisTorr 704 FS ISO160F KF25 air cooling | X3511-64001 |
| TwisTorr 704 FS CFF8" KF25 air cooling | X3511-64002 |
| TwisTorr 704 FS CFF8" Long-Neck KF25 air cooling | X3511-64003 |
| TwisTorr 704 FS ISO160K KF25 water cooling | X3511-64015 |
| TwisTorr 704 FS ISO160F KF25 water cooling | X3511-64016 |
| TwisTorr 704 FS CFF8" KF25 water cooling | X3511-64017 |
| TwisTorr 704 FS CFF8" Long-Neck KF25 water cooling | X3511-64018 |
| **Controllers** | **Part Numbers** |
| TwisTorr Medium-TMP rack controller | X3501-64016 |
| TwisTorr Medium-TMP onboard controller | X3512-64016 |
| **Cables** | **Part Numbers** |
| Mains cable NEMA plug 3 m long | 9699958 |
| Mains cable EU plug 3 m long | 9699957 |
| Mains cable UK plug 2.5 m long | X3501-68005 |
| Serial Cable and A-plus | 9699883 |
| Medium-TMP Extension Cable | 9699948M001 (5 m)<br>9699948M003 (10 m)<br>9699948M004 (15 m)<br>9699948M002 (20 m)<br>9699948M005 (30 m)<br>9699948M006 (50 m)<br>9699948M009 (75 m)<br>9699948M010 (100 m) |
| **Inlet Screen** | **Part Numbers** |
| Inlet Screen ISO160/CFF8 | 9699304 |
| **Cooling** | **Part Numbers** |
| Medium-TMP Air Cooling Kit for rack controller | X3501-68001 |
| Medium-TMP Air Cooling Kit for onboard controller | 9699297 |
| Plastic water cooling kit | 9699347 |
| Metal Water cooling Kit | 9699337 |

| | |
|---|---|
| Air Cooling Kit Extension Cable | X3501-68101 (5 m)<br>X3501-68051 (10 m)<br>X3501-68061 (15 m)<br>X3501-68021 (20 m)<br>X3501-68011 (30 m)<br>X3501-68071 (50 m)<br>X3501-68081 (75 m)<br>X3501-68091 (100 m) |
| **Venting** | **Part Numbers** |
| Vent valve driven by rack controller | X3501-68002 |
| Vent valve driven by onboard controller | 9699834 |
| Vent flange, NW 10 KF / M8 | 9699108 |
| Spare Vent Screw | X3511-68000 |
| Vent valve Rack Extension Cable | X3501-68004 (5 m)<br>X3501-68054 (10 m)<br>X3501-68064 (15 m)<br>X3501-68074 (20 m)<br>X3501-68084 (30 m)<br>X3501-68034 (50 m)<br>X3501-68094 (75 m)<br>X3501-68104 (100 m) |
| **Purge** | **Part Numbers** |
| Purge 10SCCM M12-NW16KF | 9699239 |
| Purge 10SCCM M12-1/4Swagelok | 9699240 |
| Purge 20SCCM M12-NW16KF | 9699241 |
| Purge 20SCCM M12-1/4Swagelok | 9699242 |
| Spare Purge Screw | X3502-68004 |
| **Mounting** | **Part Numbers** |
| Medium-TMP onboard ctlr. side-mounting bracket | X3511-68003 |
| Medium-TMP KF25 foreline flange | X3511-68001 |
| Medium-TMP KF40 foreline flange | X3511-68002 |
| **Active Gauges** | **Part Numbers** |
| FRG 700 Full Range Gauge<br>PVG 500 Pirani Vacuum Gauge<br>PCG 750 Pirani Capacitance Gauge<br>CDG-500 Capacitance Diaphragm Gauge | Ask Agilent for details |

Compression Ratio




Pumping Speed



www.agilent.com/chem/vacuum

**United States**
Agilent Technologies
121 Hartwell Avenue, Lexington MA 02421, USA
Tel: +1 781 861 7200
Toll free: +1 800 882 7426
vpl-customercare@agilent.com

**Europe and other countries**
Agilent Technologies Italia SpA
via F.lli Varian 54, 10040 Leini, (Torino), Italy
Tel: +39 011 9979 111
Toll free: 00 800 234 234 00
vpt-customercare@agilent.com


Published in the USA, May 2018
5991-9476EN

Agilent
Trusted Answers