



Q300T T Triple Target, Large Chamber, Turbo-Pumped Sputter Coater

Quick Overview

The Q300T T is a large chamber, turbomolecular-pumped coating system ideally suited for sputtering a single large diameter specimen up to 8"/200mm (eg a wafer) or multiple smaller specimens over a similar diameter.

The Q300T T is fitted with three individual sputtering heads to ensure even deposition on a range of specimen types. The system is designed to sputter both oxidising metals, eg chromium (Cr) and aluminium (Al), and non-oxidising (noble) metals, eg gold (Au), gold/palladium (Au/Pd) and platinum (Pt). The Q300T T is fitted with three individual sputtering heads to ensure even sputtering deposition over a large diameter. Chromium (Cr) targets are fitted as standard.

NB: For sputtering non-oxidising metals *only*, see the Q300R T Triple Target, Large Chamber, Rotary-Pumped Sputter Coater.

For sequential sputtering of two different oxidising or non-oxidising metals, see the Q300T D Dual Target, Large Chamber, Turbo-Pumped Sputter Coater.



Key features

- * **Large area sputter coating** - up to 8"/200mm diameter
- * **Triple sputtering head** - ensures even coating deposition of large specimens
- * **Single target selection** - for economic coating of small specimens
- * **Fine grain sputtering** - for advanced high resolution FE-SEM applications
- * **Coat logging** - details of the last 100 coatings available on screen
- * **High-vacuum turbo pumping** - allows sputtering of a wide range of oxidising and non-oxidising (noble) metals - suitable for SEM, high resolution FE-SEM and also for many thin film applications. NB: To avoid a short target

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life, it is not advisable to use targets of less than 0.3mm for coatings of 50nm or thicker in conjunction with high sputter currents. Please consider using a bonded or thicker target

- * **Precise thickness control using the film thickness monitor option**
- * **Fully automatic touch screen control** - rapid data input, simple operation
- * **Multiple, customer-defined coating schedules can be stored** - ideal for multi-user laboratories
- * **Automatic vacuum control** - can be pre-programmed to suit the process and material; no needle valve to adjust
- * **Easy-to-change, drop-in style specimen stages (rotation stage as standard)**
- * **Vacuum shut-down option** - leaves the process chamber under vacuum when not in use - improved vacuum performance
- * **Pump hold** - allows the system to be held in continuous pumping mode, awaiting user input before continuing the process
- * **Thick film coating** - up to 60 minutes sputtering time without breaking vacuum
- * **Ergonomic one-piece moulded case** - easy maintenance and service access
- * **Ethernet with local FTP server connection** - simple programmer updates
- * **Power factor correction** - complies with the current legislation (CE Certification) - efficient use of power means reduced running costs
- * **Three-year warranty**

Product Description

Ideal for sputter coating large specimens, thin film applications and SEM/FE-SEM

The Q300T T is suited for sputtering a range of oxidising and non-oxidising (noble) metals for scanning electron microscopy (SEM) and thin film applications. The range of target materials available is extensive - see Ordering Information.

High-vacuum turbomolecular pumping

The Q300T T is fitted with an internally mounted 70L/s turbomolecular pump, backed by a 50L/m two-stage rotary pump (order separately). A Pirani vacuum measurement gauge (range: 1,000mbar to 5×10^{-4} mbar) is included, but a full range gauge (1,000mbar to 5×10^{-9} mbar) is available as an option. Typical ultimate vacuum of around 5×10^{-5} mbar can be expected in a clean system after pre-pumping with dry nitrogen gas.

Triple sputtering head

The Q300T T is fitted with three individual sputtering heads to ensure even deposition of individual large specimens or multiple specimens. For economical coating of small specimens, 'single target' mode can be selected.

NB: It is not possible to sequentially sputter three different sputtering metals from each sputtering head - for sequential coating see the Q300T D Dual Target, Large Chamber, Turbo-Pumped Sputter Coater.

Moulded case with colour touch screen

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The Q300T T is presented in a custom moulded, one-piece case - allowing easy servicing access. The colour touch screen allows multiple users to input and store coating 'recipes'. The case houses all the working components and includes an automatic bleed control that ensures optimum vacuum conditions during sputtering.

The vacuum chamber has an internal diameter of 283mm/12" and comes with an integral implosion guard. The vacuum shutdown option can enhance vacuum performance by allowing the chamber vacuum to be maintained when the system is not in use.

A variable speed rotary specimen stage is fitted as standard and accommodates 200mm/8" and 150mm/6" wafers, with other stages available as options - see Options and Accessories.

Rapid data entry

At the operational heart of the Q300T T is a simple colour touch screen, which allows even the most inexperienced or occasional operator to rapidly enter and store their own process data. To further aid ease of use, a number of typical sputter coating profiles are already stored. For added convenience summaries of the last 100 coatings carried out can be viewed.

Maintenance

The intuitive touch screen interface features maintenance prompts that highlight:

- * Time of last clean
- * Coating time since last cleaned
- * System 'on time'
- * Time of last service.

Additional Information

Options and Accessories (including details the standard specimen stage)

Specimen stages:

The Q300T T has specimen stages to meet most requirements. All are easy-change, drop-in style (no screws) and are height adjustable (except rotary planetary stage). Rotation speed is variable between preset limits:

- * **Flat rotation stage for wafers** - for 200mm/8" and 150mm/6" wafers (fitted as standard)
- * **Rotation stage** - 50mm Ø. This stage only rotates - no tilt or height adjustment
- * **Rotate-tilt stage** - 50mm Ø with height adjustment (target to stage height variable between 30-80mm). The tilt angle can be pre-set (horizontal to 30°)
- * **Rotation stage for glass microscope slides.**

Other options:

- * **Extended height chamber for taller specimens**
- * **Film thickness monitor (FTM)**. The optional FTM attachment (11520) consists of a controller and quartz crystal oscillator built into the Q300T T and a vacuum feed-through, chamber-mounted crystal holder and quartz crystal. As sputtered material is deposited onto the crystal, its frequency of oscillation is modified. This 'modification'

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is used to measure and control the thickness of material deposited. NB: Cannot be used when the coater is operated in 'single target' mode.

Specifications

Instrument case	585mm W x 470mm D x 410mm H (total height with coating head open: 650mm)
Weight	36.4kg
Packed dimensions	725mm W x 660mm D x 680mm H (44.8kg)
Work chamber	Borosilicate glass 283mm ID x 127mm H
Safety shield	Integral polyethylene terephthalate (PET) cylinder
Display	145mm W x 320mm D x 240mm H colour graphic thin film transistor (TFT) display
User interface	Intuitive full graphical interface with touch screen buttons, includes features such as a log of the last 100 coatings carried out and reminders for when maintenance is due
Sputter target	Disc style 57mm Ø with thickness depending upon the targets fitted. Three 57mm Ø x 0.3mm thick chromium (Cr) targets (TK8845) are fitted as standard

Vacuum

High vacuum pumping	Internally-mounted, 70L/s air-cooled turbomolecular pump
Rotary pump	50L/m two-stage rotary pump with oil mist filter. (Order separately, see EK3175)
Vacuum measurement	Pirani gauge Typical ultimate vacuum 5×10^{-5} mbar in a clean system after pre-pumping with dry nitrogen gas
Specimen stage	Flat rotation stage for 200mm/8" and 150mm/6" wafers fitted as standard. Rotation speed is variable between preset limits. For alternative stages see Options and Accessories

Services and other information

Gases	Argon sputtering process gas, 99.999% Nitrogen venting gas (optional)
Electrical supply	90-250V 50/60Hz 1,400VA including RV3 rotary pump power. 110/240V voltage selectable
Conformity	Power factor correction. Complies with the current legislation (CE Certification) and ensures efficient use of power, resulting in reduced running costs

Ordering information

Q300T T	Triple Target, Large Chamber, Turbo-Pumped Sputter Coater, fitted with three sputtering heads to ensure even metal deposition. Includes three 57mm Ø x 0.3mm chromium (Cr) sputter targets (TK8845). A 10826 flat rotation stage for 200mm/8" and 150mm/6" wafers is fitted as standard
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Rotary pump requirements (needs to be ordered separately)

EK3175	Edwards RV3 50L/s two-stage rotary pump, with vacuum hose, coupling kit and oil mist filter
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Options and accessories

- 10357 Rotating 50mm Ø specimen stage with adjustable tilt. The platform has six specimen stub positions for 15mm, 10mm, 6.5mm or 1/8" pin stubs. Stage rotation speed variable between preset limits. No rotation when in 'single target' mode. NB: Target to stage height is variable between 0-42mm for the standard stage. When used with the extended height cylinder (optional accessory 10596) the target to stage height would be an additional 87mm
- 10067 50mm Ø variable height specimen stage with six stub positions for 15mm, 10mm, 6.5mm disc stubs
- 10360 50mm Ø rotary tilting stage. A rotary planetary style stage with variable tilt angle from horizontal to 30°. The platform has six positions for either 15mm, 10mm, 6.5mm disc stubs or 1/8" pin stubs. Rotation speed is variable between preset limits. NB: Depending on specimen height, this stage may require the optional extended height cylinder
- 10358 90mm Ø specimen stage for glass microscope slides (up to two x 75mm x 25mm slides or a single 75mm x 50mm slide). The stage can alternatively accommodate up to six 1/8" SEM pin stubs. The stage rotation speed is variable between preset limits. Includes a gear box to allow optional FTM to be used
- 11520 Film thickness monitor (FTM) attachment. Including oscillator, feed-through, quartz crystal holder and one C5460 quartz crystal
- C5460 Spare quartz crystal 10596 Extended height vacuum chamber (214mm H - the standard chamber is 127mm H). For increased source to specimen distance and for coating large specimens
- 10731 Vacuum spigot allows a more convenient connection of the vacuum hose to the rear of the Q300T T when bench depth is limited
- 11223 A lockable emergency stop (e-stop) switch which can be mounted on top of the system in a position easily accessible for the operator. It is provided with a key to release the knob after activation. NB: The addition of the e-stop does not inhibit or replace the normal on/off switch function. The e-stop can be retrofitted to existing systems
- 10577 Coating shields. Can be fitted to protect large surfaces from coating deposition - easily removable for ease of cleaning
- 10428 Full range, active vacuum gauge capable of measurement over the range of 1,000mbar to 5×10^{-9} mbar. Typical ultimate vacuum of system is 5×10^{-5} mbar. NB: Must be factory fitted
- 11289 Spares kit, including: spare standard glass cylinder, three 57mm Ø x 0.3mm chromium (Cr) targets (TK8845), vacuum tubing with coupling insert, argon gas tubing, three sputter head magnets, rotary pump oil mist filter and fuses
- Sputter targets** NB: The Q300T T is fitted as standard with three 57mm Ø x 0.3mm chromium (Cr) targets (TK8845). Other optional targets are available (three required):
- TK9000 Aluminium (Al) 57mm Ø x 0.76mm
- TK8875 Aluminium (Al) 57mm Ø x 1.0mm

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TK8869	Carbon (C) 54mm Ø x 1.5mm
TK8862	Chromium (Cr) 54mm Ø x 1.5mm
TK8845	Chromium (Cr) 54mm Ø x 0.3mm
TK8900	Cobalt (Co) 57mm Ø x 0.1mm
SC502-314H	Copper (Cu) 57mm Ø x 0.1mm
SC502-314A	Gold (Au) 57mm Ø x 0.1mm
SC502-314A/0.2mm	Gold (Au) 57mm Ø x 0.2mm
TK8889	Gold (Au) 57mm Ø x 0.3mm
SC502-314B	Gold/palladium (Au/Pd) (80:20) 57mm Ø x 0.1mm
SC502-314B/0.2mm	Gold/palladium (Au/Pd) (80:20) 57mm Ø x 0.2mm
TK8891	Gold/palladium (Au/Pd) (60:40) 57mm Ø x 0.3mm
TK8907	Indium tin oxide (ITO) 57mm Ø x 3mm
TK8899	Iridium (Ir) 57mm Ø x 0.3mm
TK8897	Iron (Fe) 57mm Ø x 0.1mm
TK8905	Magnesium (Mg) 57mm Ø x 0.3mm
TK8903	Molybdenum (Mo) 57mm Ø x 0.1mm
SC502-314D	Nickel (Ni) 57mm Ø x 0.1mm
SC502-314G	Palladium (Pd) 57mm Ø x 0.1mm
SC502-314C	Platinum (Pt) 57mm Ø x 0.1mm
SC502-314C/0.2mm	Platinum (Pt) 57mm Ø x 0.2mm
TK8893	Platinum (Pt) 57mm Ø x 0.3mm
TK8887	Platinum/palladium (Pt/Pd) (80:20) 57mm Ø x 0.3mm
SC502-314E	Silver (Ag) 57mm Ø x 0.1mm
TK8906	Tantalum (Ta) 57mm Ø x 0.1mm
TK8902	Tin (Sn) 57mm Ø x 0.1mm
TK8879	Titanium (Ti) 57mm Ø x 1.5mm
TK8895	Titanium (Ti) 57mm Ø x 0.5mm
TK8846	Tungsten (W) 57mm Ø x 0.5mm
TK8867	Tungsten (W) 57mm Ø x 0.2mm

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