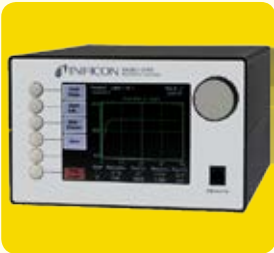


## Thin Film Instrumentation



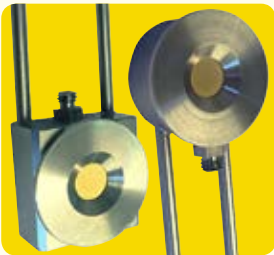
### Deposition Thickness / Rate Monitors

Deposition thickness / rate monitors will monitor and report the rate of deposition and / or the layer thickness within your coating system. Monitors are available as stand alone cased units or as single board units for incorporation into your bespoke control system. Monitors are designed to use industry standard gold plated 6MHz oscillating quartz crystal sensors.



### Deposition Rate Controllers

Deposition rate controllers will monitor and report the rate of deposition and or the layer thickness within your coating system. In addition they will provide output signals as feedback into your coating system to allow accurate control of the coating system in order to maintain the highest accuracy of film thickness and deposition rate.



### Sensor Heads & Accessories

In addition to our range of monitors and controllers we also supply a comprehensive range of crystal sensor heads, quartz crystals, oscillators, vacuum feedthroughs and cables.

## Multi-Channel Thin Film Deposition Thickness / Rate Monitor



The TF-SQM160 uses proven INFICON quartz crystal sensor technology to measure rate and thickness in thin film deposition processes. Two sensor inputs are standard and four additional sensor inputs are optional. Two recorder outputs provide analogue rate and thickness signals.

Sensor inputs can be assigned to different materials, averaged for accurate deposition control in large systems, or configured for a dual sensor. The rate sampling mode allows a shuttered sensor to extend sensor life in high rate processes. Rate displays of 0.1Å/s or 0.01Å/s are user selectable. In addition, Frequency or Mass displays can be selected. Four relay outputs allow the TF-SQM160 to control source or sensor shutters, signal time and thickness set points, and signal crystal failure. Digital inputs allow external signals to start/stop and zero readings.

The SQM160 comes with an RS-232 port and Windows® software that allows instrument setup from your computer. The software can be used to set and store all parameters, operate the instrument, and save process data in an Excel® file format. USB or Ethernet options add to the communications flexibility.

**EASY TO USE**

To start rate and thickness measurements, press zero to null the last thickness reading, then Shutter to open the source or sensor shutter. The large, bright LEDs simultaneously show thickness and rate readings that are visible from across the room. When the desired thickness is reached, or time has elapsed, the shutter closes and the appropriate front panel annunciators light. Press the Xtal Life button at any time to view the remaining crystal life.

Two menu control instrument setup for the 99 stored films. To access the menus, press Program. Turn the setting knob to select/edit parameters. The main display shows menu prompts, and values are shown in the auxiliary (Time) display.

**HIGH ACCURACY, LOW COST**

Standard frequency resolution is 0.12Hz at four readings per second. The high accuracy option increases resolution to 0.03Hz at 10 readings per second. Temperature stability is 2ppm over the entire operating range. This combination of high accuracy and high stability are unmatched in an instrument at this price!

**Specifications:****QCM Sensor Inputs**

Standard : 2 / Optional : 6

**Frequency Range** 1-6.5MHz

**Frequency Resolution**

Standard : ±0.12Hz @ 4 readings /sec

Optional : ±0.03Hz @ 10 readings /sec

**Frequency Stability**

± 2 ppm total, over 0-50°C

**Selectable Measurement Period**

0.10 to 2 sec (in .05 sec increments)

**Measurement Filter** 1 to 20 readings

**Stored Films** 99

**Analogue Outputs**

Two 0 to 5VDC, rate & thickness

**Digital Inputs/Outputs**

Two inputs, four relay outputs

**Digital Interface**

Standard : RS232

Optional : USB or Ethernet

**Power**

100-120 /200-240 VAC, 50.60Hz, 20W

**Housing / Mounting**

1/2-rack, 89mm high, 89x213x197mm

**Weight** 2.7kg

**Windows Software**

Provides remote set-up and operation, data-logging functions.

All dimensions are nominal in millimetres unless otherwise specified

## Multi-Channel Thin Film Deposition Thickness / Rate Monitor



Description	Part Code	Price £	Price €
2 channel thickness rate / monitor RS232 only	TF-SQM160-S-2-R	£1415	€1628
High Resolution, 2 channel thickness rate / monitor RS232 only	TF-SQM160-H-2-R	£1600	€1840
6 channel upgrade for TF-SQM-160	Change 2 to 6	£756	€870
Additional USB interface for TF-SQM-160	Change R to U	£171	€197
Additional ethernet interface for TF-SQM160	Change R to E	£300	€345
19" rack adapter for 1 SQM-160 or CL-100 instrument	TF-SQM160/CI-100-19RM1	£227	€261
19" rack adapter for 2 SQM-160 OR CI-100 instruments	TF-SQM160/CI-100-19RM2	£187	€216

All dimensions are nominal in millimetres unless otherwise specified

## USB Thin Film Deposition Thickness / Rate Monitor



The TF-STM-2 combines the simplicity of USB connectivity with the accuracy of a precision measurement engine, all in a compact, inexpensive package. The size and simplicity of TF-STM-2 helps make setup and operation easy and efficient.

The TF-STM-2 is the most accurate USB powered thin film monitor in the industry. Ten measurements are taken per second while achieving a resolution of 0.037 Å per measurement

The TF-STM-2 comes with everything you need to connect a QCM sensor/feedthrough to a Windows® computer. Up to eight STM-2s monitoring up to eight sensors can be connected to a computer simultaneously. To setup The TF-STM-2, simply connect the included BNC cable from the feedthrough to the TF-STM-2, then connect the TF-STM-2 to a computer using the included USB cable. No external oscillator or power supply is required.

The TF-STM-2 features an internal oscillator that allows for a simple and cost effective installation when the TF-STM-2 is located within 1 m (40 in.) of the quartz crystal. A standard oscillator kit can also be used for applications where the TF-STM-2 must be located farther away from the feedthrough.

**Features:**

- Low cost QCM monitor.
- USB connection.
- Internal oscillator.
- High accuracy at 10 measurements per second.
- Compatible with an external oscillator.

**Specifications:****Compatible sensors**

single, non-shuttered

**Sensor input** One, female BNC

**Measurement frequency**

6.0to 5.0 at 6MHz

**Frequency resolution** ±0.03Hz at 6MHz

**Measurement interval** 0.1s

**Ref frequency stability** ±2 ppm

**Resolution** ±0.037Å

**Thickness display resolution** 1Å

**Interface**

USB, v1.1 or later(400mA, 5VDC)

**Size** 114 x 76 x 25mm

**Weight** 57g

**PC requirements**

Windows 2000, Windows XP, Windows Vista, Windows 7 or Windows 8 with one available USB 1.1 (or later) port for each TF-STM2

All dimensions are nominal in millimetres unless otherwise specified

Email : sales@lewvac.co.uk - Tel : +44 (0)1444 2333728 - Fax : +44 (0)1444 233392 - Website : www.lewvac.co.uk

## USB Thin Film Deposition Thickness / Rate Monitor



Description	Part Code	Price £	Price €
USB thin film thickness / rate deposition monitor on board oscillator	TF-STM-2	£516	€594

All dimensions are nominal in millimetres unless otherwise specified

Email : sales@lewvac.co.uk - Tel : +44 (0)1444 233372 - Fax : +44 (0)1444 233392 - Website : www.lewvac.co.uk

## Two Channel Thin Film Deposition Thickness / Rate Monitor



The TF-STM-2XM is a two channel rate/thickness monitor that combines high accuracy with flexible programming and easy operation at an affordable price.

TF-STM-2XM is equipped with five operation modes to accommodate processes from simple to complex. For example, use simple mode to monitor just one single sensor for the simplest process, or use alloy mode for codeposition monitoring. Independent mode allows TF-STM-2XM to function as two completely separate monitors.

Two sensor inputs allow for the use of two single quartz crystal sensors or one dual quartz crystal sensor. Ten measurements are taken per second while achieving a resolution of 0.037 Å per measurement.

The TF-STM-2XM has eight programmable digital inputs, eight programmable digital outputs, and four analogue outputs allowing for a level of integration usually reserved for more expensive instruments.

Programmable features include shutter delay, time/power monitoring, and rate sampling. Use all of these features to achieve the most accurate readings and the longest crystal life.

Operate and monitor TF-STM-2XM through the simple front panel interface or program the TF-STM-2XM through the included LabVIEW® software. This simple software can be an on-line or off-line editor for films and system parameters and is easy to use.

TF-STM-2XM features a high contrast LCD display and intuitive menu system. On-screen hints can be found throughout the menus for simple, guided programming and operation. The easy-to-read LCD can display in accumulated mass or thickness

**Features:**

- Two measurement channels.
- Four analogue outputs for rate, rate deviation or thickness.
- Eight programmable digital inputs.
- Eight programmable digital outputs.
- High accuracy at 10 readings per second.
- Display mass or thickness.
- Codeposition monitoring capabilities.

**Specifications:**

Sensor inputs	Two
Compatible sensors	Single/shuttered single or dual
Measurement frequency	6.0 to 5.0 MHz
Frequency resolution	±0.03Hz at 6MHz
Ref frequency stability	±2 ppm
Resolution	±0.037Å
Measurement interval	0.1s
Display mode	Thickness / Mass
Digital inputs	Eight
Digital outputs	Eight
Analogue inputs	Four
Analogue output rating	0 to ±10V, 10mA
Relay rating	Up to 48VDC/VAC, 2A
Mains power supply	100-240VAC, 50/60Hz, 2.5VA

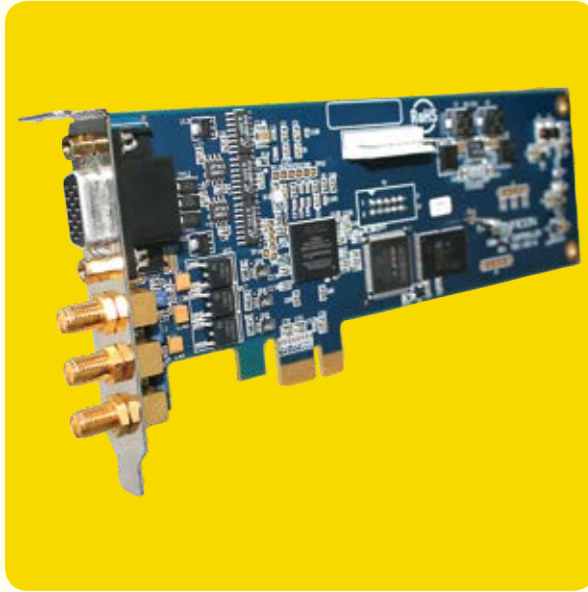
All dimensions are nominal in millimetres unless otherwise specified

**Two Channel Thin Film Deposition Thickness / Rate Monitor**

Description	Part Code	Price £	Price €
2 Channel deposition thickness / rate monitor with RS232	TF-STM-2XM	£1548	€1781
19" Rack adapter for 1 STM unit	TF-STM19RA1	£55	€64
19" Rack adapter for 2 STM units	TF-STM19RA2	£55	€64

All dimensions are nominal in millimetres unless otherwise specified

## Low Cost Deposition Control On A PCI Express Card



The TF-IQM-233 PCI Express card turns your PC into a thin film deposition controller. This INFICON designed and manufactured product is the ideal choice for system OEMs, or anyone wishing to incorporate a thin film deposition controller into an existing PC or PLC controlled system. Installation is simple—all you need is an unoccupied PCI Express slot. TF-IQM-233 is available to fit in standard or small form factor PC towers.

**UNPARALLELED FEATURES**

The TF-IQM-233 features three QCM sensor inputs and three source outputs on each card. Up to two TF-IQM-233 cards can be installed in a single PC (using optional TF-IQS-233 software), giving you a maximum of six sensor inputs and six source outputs. Only INFICON offers this level of flexibility in a fully integrated PC controlled QCM controller. TF-IQM-233 is compatible with all of our single and dual sensor heads.

**CHOOSE THE SOFTWARE SOLUTION RIGHT FOR YOU**

TF-IQM-233 includes basic Windows® software for setup and control of simple sequential or co-deposition processes with one TF-IQM-233 card. The optional TF-IQS-233 advanced Windows software allows for more complex process setup, including multi-layer codeposition, graphing, and PLC integration with event selectable relay/input functions. TF-IQS-233 software also allows for use of up to two TF-IQM-233 cards. As an alternative for customers wanting to write their own software, the TF-IQM-233 includes a LabVIEW™ sample program to provide basic functionality and demonstrate programming techniques.

**Features:**

- PCI Express.
- Three sensor inputs, three control outputs.
- Install multiple cards in a PC.
- Codeposition of multiple sources.
- Easy PLC integration to add I/O capabilities.
- Easy to use.
- Value price.

**Specifications:****Sensor inputs**

Connectors SMA (inc. 1xSMA/BNC adapter)	
Frequency Range	4 to 6 MHz
Frequency Resolution	0.05Hz
Resolution	0.0613Å/s/M
Sample Period	0.1 to 2 Sec.

**Outputs**

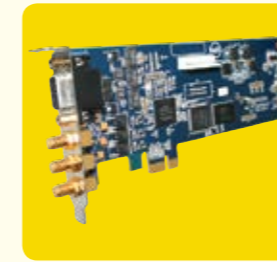
Connectors	15-pin high density D-sub
Signal	0 to ±10 VDC
Resolution	15 bit plus sign
Impedance	50Ω
PC interface	PCIe x1 PCI Express slot
	Standard or Small Form Factor

**PC Requirements:**

- 1.5 GHz or better CPU.
- 2GB RAM.
- 200MB of free HD space.
- Minimum screen resolution of 1152x648.
- Windows XP SP3, Windows 7 32/64bit, Windows 8 32/64bit.
- One PCI Express slot (any size) is required for each TF-IQM-233 card.
- 800 x 600 minimum resolution.

All dimensions are nominal in millimetres unless otherwise specified

## Low Cost Deposition Control On A PCI Express Card



Description	Part Code	Price £	Price €
Thin film deposition controller card	TF-IQM-233	£1320	POA
Thin film deposition controller card (SFF)	TF-IQM-233-SFF	£1320	POA
Codeposition software for TF-IQM-233	TF-IQS233	£878	POA

All dimensions are nominal in millimetres unless otherwise specified

## Thin Film Deposition Rate Controller



With advanced electronics, an improved display and a very affordable price, the TF-SQC-310 series gives you features not found on competitors' thin film controllers. You can choose the ideal model for your application: sequential deposition with the TF-SQC-310 or co-deposition with TF-SQC310C

For sequential deposition, the TF-SQC-310 features two sensor inputs, two source outputs and eight digital inputs/outputs, with an optional expansion card that doubles these numbers. For co-deposition, the TF-SQC-310C controller monitors up to four quartz crystal sensors with four PID control outputs, 16 digital inputs and 16 relay outputs to the same specs as the TF-SQC310.

**Features:**

- Bright, 1/4 VGA active matrix colour LCD display
- Standard RS232 and USB (RS232 & ethernet option).
- Easy set up and operation with a "Quick Setup" menu, 6 context sensitive push buttons and convenient parameter setting knob
- Windows® program for developing, testing, and downloading processes and for logging instrument data to your PC for process analysis and quality control.
- Accurate process control, especially for low deposition rates, with  $\pm 0.03\text{Hz}$  resolution at 10 readings/second.
- Storage capacity for up to 100 processes, 1000 layers, 50 films.
- Monitoring of source material with a single sensor or with multiple sensors to provide accurate source distribution monitoring.

**Specifications:****Measurement**

QCM inputs	2, 4 optional - (4)
Frequency range	4 to 6MHz
Frequency resolution	$\pm 0.03\text{Hz}$ at 0.1s period
Thickness resolution	0.0368Å
Measurement rate	1 to 10Hz
Rate display	0.01Å/sec.

**Control**

Storage	100 proc. 1000 layers, 50 films
Control outputs	2, 4 optional - (4)
Output signal	$\pm 0$ to 10VDC, 15 bits
Digital inputs/Relays	8, 16 optional - (16)
Digital inputs	5Vdc non-isolated
Relays	SPST from 1A, 30V, 2A max.
Interfaces	Standard RS232 and USB (RS232 & Ethernet optional)
Remote Power Control	Optional

**Display**

Type	1/4 VGA 320 x 320 active matrix colour LCD
Graphs	rate, deviation, power or full screen numeric

**General**

Power	100-240 VAC, 50/60Hz, 25W
Compliance	CE, RoHS
Windows® software	Included
Housing	5.25 Inch, half rack

All dimensions are nominal in millimetres unless otherwise specified

## Thin Film Deposition Rate Controller



Description	Part Code	Price £	Price €
Deposition rate controller 2 QCM channels (2 sensor inputs, 2 source outputs, 8 relays / 8 inputs)	TF-SQC310-2-R-1	£2502	€?
Deposition rate controller 4 QCM channels (4 sensor inputs, 4 source outputs, 16 relays / 16 inputs)	TF-SQC310-4-R-1	POA	POA
Deposition rate controller for co-deposition 4 QCM channels (4 sensor inputs, 4 source outputs, 16 relays / 16 inputs)	TF-SQC310C-4-R-1	POA	POA

All dimensions are nominal in millimetres unless otherwise specified

Sensors, Feedthroughs and Crystals



Using industry standard 6MHz crystals LewVac provides quality sensors and feedthroughs that support the vacuum coating industries. All products are made with vacuum safe materials: stainless steel, Teflon® and alumina ceramics. We offer a full standard line of products and will create customised sensor packages for more exotic configurations. Our sensors are designed for easy crystal changes while remaining rugged enough for demanding depositions. Compact shutter designs give the ability to have a crystal saving shutter without taking up valuable vacuum space. The long life shutter actuator is a vacuum tight compact assembly with thousands of shutter cycles, for carefree operation. Robust design of all products ensures that they will perform well in all applications.

**Specifications:**

**Crystal Sensors**

Industry standard 6MHz AT cut, plano/convex

**Maximum Temperature**

Non bakeable 175°C (200°C intermittently)

Bakeable 275°C

**Materials**

304 stainless steel, alumina ceramic, Teflon®

**Crystal**

Quartz with gold electrodes

**Water Temperature**

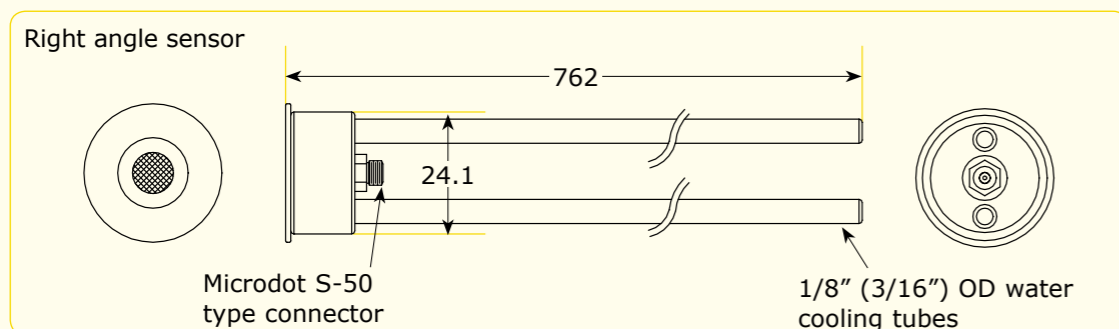
50°C

**Connection**

Microdot® miniature

**Features:**

- High quality construction.
- Single and dual crystal designs.
- Non bakeable and bakeable versions available.
- Shuttered sensors available.
- Easy crystal changes.
- Industry standard 6MHz crystals.
- Custom built sensors available to meet individual requirements.

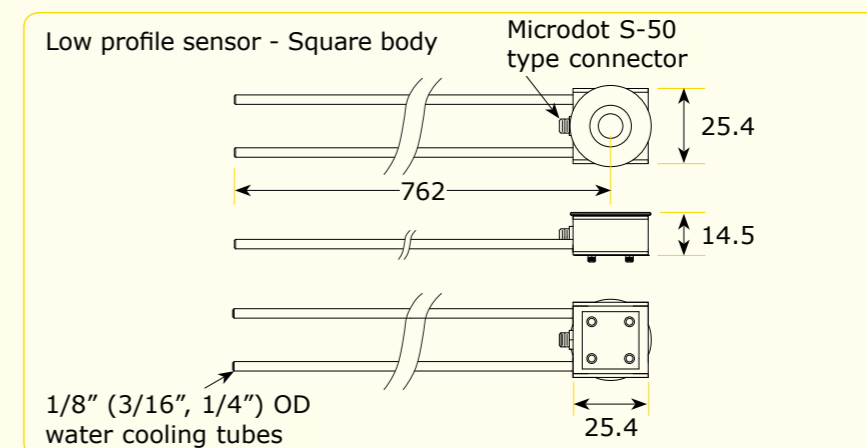
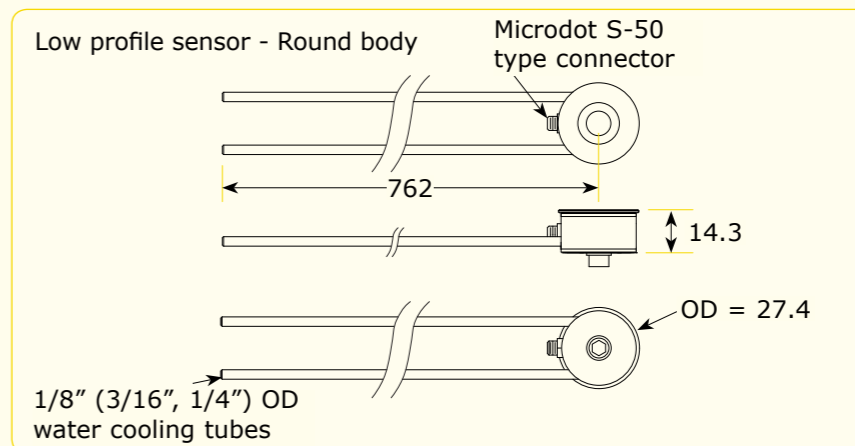


All dimensions are nominal in millimetres unless otherwise specified

**Non Bakeable Sensors**



Description	Part Code	Price £	Price €
Round body low profile sensor head with 1/8" water lines	TF-LPSH-R	£404	€465
Square body low profile sensor head with 1/8" water lines	TF-LPSH-S	£404	€465
Square body low profile sensor head with 3/16" water lines	TF-LPSH-S-3/16	£404	€465
Square body low profile sensor head with 1/4" water lines	TF-LPSH-S-1/4	£420	€483
Square body low profile sensor head with 1/8" water lines with shutter	TF-LPSH-S-SHUT	£1942	€2234
Square body low profile sensor head with 3/16" water lines with shutter	TF-LPSH-S-SHUT-3/16	£1942	€2234
Dual square body low profile sensor head with 1/8" water lines with shutter	TF-2LPSH-S-SHUT	£2072	€2383
Dual square body low profile sensor head with 3/16" water lines with shutter	TF-2LPSH-S-SHUT-3/16	£2072	€2383
Right angle sensor head 1/8" water lines	TF-RASH	£404	€465
Right angle sensor head 3/16" water lines	TF-RASH-3/16	£404	€465
Right angle sensor head 1/8" water lines with shutter	TF-RASH-SHUT	£2075	€2387
Dual right angle sensor head 1/8" water lines with shutter	TF-2RASH-SHUT	£2139	€2460
Dual right angle sensor head 3/16" water lines with shutter	TF-2RASH-SHUT-3/16	£2139	€2460



All dimensions are nominal in millimetres unless otherwise specified

## Sensors, Feedthroughs and Crystals

LewVac offer sensor head packages that contain all of the parts required (except the vacuum feedthrough) to connect the sensor head to the monitor or controller electronics. The water cooling tubes can be bent into the desired shape and can also be cut to the desired length to achieve desired sensor orientation.

## Low Profile Sensor Head Package



## Features:

- Low profile sensor head.
- Remote oscillator.
- 760mm long in-vacuum cable.
- 150mm long BNC cable.
- 3m long BNC cable.
- Pack of 10 crystals.
- Tube unions - for connecting water lines to feedthrough tubes.
- Feedthrough must be purchased separately.

Description	Part Code	Price £	Price €
Low profile sensor package*	TF-LPSP	£750	€863
Low profile sensor head with shutter package	TF-LPSH-SHUTP	POA	POA

## Right Angle Sensor Head Package



## Features:

- Right angle sensor head.
- Remote oscillator.
- 760mm long in-vacuum cable.
- 150mm long BNC cable.
- 3m long BNC cable.
- Pack of 10 crystals.
- Tube unions - for connecting water lines to feedthrough tubes.
- Feedthrough must be purchased separately.

Description	Part Code	Price £	Price €
Right angle sensor package*	TF-RASP-3/16	£750	€863

\* - PLEASE NOTE - Sensor packages do not include a vacuum feedthrough. The appropriate feedthrough must be ordered separately.

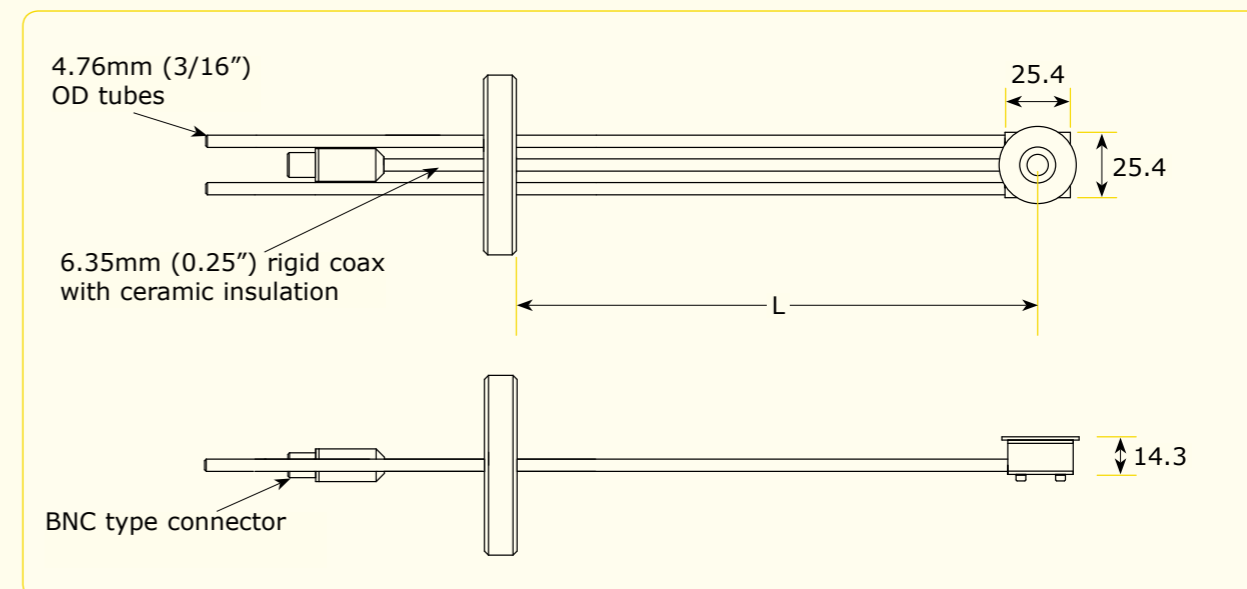
All dimensions are nominal in millimetres unless otherwise specified

## Bakeable Sensors



## Features:

- Bakeable to 275°C.
- UHV compatible.
- Customer specific length 76 - 508mm, please specify when placing order.
- Mounted on DN40CF rotatable flange.
- Optional shutter available.
- Offset and bent configurations available to special order.



Description	Part Code	Price £	Price €
Bakeable sensor head L=TBA (76 - 508mm)	TF-BSH-###	£1098	€1263
Right angle bakeable sensor head L=TBA (101.6 - 508mm)	TF-RABSH-###	£1098	€1263
Bakeable sensor head with shutter L=TBA (76 - 508mm)	TF-BSH-###-SHUT	POA	POA
Dual bakeable sensor head with shutter L=TBA (101.6 - 508mm)	TF-DBSH-###-SHUT	POA	POA

PLEASE NOTE - Customer to advise required length, L, in mm (Min. 76mm - Max. 508mm) at time of ordering.

All dimensions are nominal in millimetres unless otherwise specified



## Sensors Feedthroughs and Crystals

## Oscillator Package



## Features:

- Remote oscillator.
- 150mm long BNC cable.
- 3m long BNC cable.

Description	Part Code	Price £	Price €
Oscillator package	TF-OSC	£183	€211
Oscillator only	TF-OSC-100	£168	€194

## Accessories &amp; Crystals



Description	Part Code	Price £	Price €
In-vacuum cable microdot - microdot L=250mm	TF-IVC250	£63	€73
In-vacuum cable microdot - microdot L=762mm	TF-IVC762	£63	€73
Gold coated sensing crystals 10/pk	TF-CRY	£47	€55
BNC cable L=0.15m	TF-BNC0.15M	£26	€30
BNC cable L=3m	TF-BNC3M	£31	€36
BNC cable L=10m	TF-BNC10M	£40	€46
Tube union for sensor tube to feedthrough tube	TF-SL-FITTING	£16	€19
3/16" to 3/16" Tube union for in vac sensor - FT	TF-SL-FITTING-3/16	£13	€15

All dimensions are nominal in millimetres unless otherwise specified

## Feedthroughs



## Specifications:

Voltage	500VDC
Current	1A
Impedance	Non-constant
Temperature Range	
Ceramic	0 to 400°C
Glass	0 to 150°C

These specially designed feedthroughs provide electrical and water cooling lines to your sensor head. These feedthroughs are available in various configurations to suit the particular sensor head of your choice.

Description	Part Code	Price £	Price €
DN40CF sensor head feedthrough 1x BNC/Microdot 2x Liquid	TF-SH-1X-2L-C40	£294	€339
DN40CF sensor head feedthrough 1x BNC/Microdot 2x Liquid Cajon	TF-SH-1X-2LC-C40	£404	€465
DN40CF sensor head feedthrough 2x BNC/Microdot 2x Liquid	TF-SH-2X-2L-C40	£432	€497
DN40CF sensor head feedthrough 1x BNC/Microdot 3x Liquid	TF-SH-1X-3L-C40	£465	€535
DN40CF sensor head feedthrough 2x BNC/Microdot 3x Liquid	TF-SH-2X-3L-C40	£521	€600
DN40CF sensor head feedthrough 2x BNC/Microdot 3x Liquid Cajon	TF-SH-2X-3LC-C40	£577	€664
DN40CF sensor head feedthrough 1x BNC/Microdot	TF-SH-1X-C40	£314	€362
DN40CF sensor head feedthrough 2x BNC/Microdot	TF-SH-2X-C40	£398	€458
DN40CF sensor head feedthrough 4x BNC/Microdot	TF-SH-4X-C40	£594	€684
DN40KF sensor head feedthrough 1x BNC/Microdot 2x Liquid	TF-SH-1X-2L-K40	£342	€394
DN40KF sensor head feedthrough 4x BNC/Microdot	TF-SH-4X-K40	£672	€773
DN40KF sensor head feedthrough 1x BNC/Microdot 2x Liquid Cajon	TF-SH-1X-2LC-K40	£381	€439
1" Bolt sensor head feedthrough 1x BNC/Microdot 2x Liquid	TF-SH-1X-2L-B	£436	€502
1" Bolt sensor head feedthrough 1x BNC/Microdot 2x Liquid Ultra-Torr	TF-SH-1X-2LUT-B	£420	€483
1" Bolt sensor head feedthrough 1x BNC/Microdot 3x Liquid	TF-SH-1X-3L-B	£404	€465
1" Bolt sensor head feedthrough 2x BNC/Microdot 3x Liquid	TF-SH-2X-3L-B	£633	€728
1" Bolt sensor head feedthrough 1x BNC/Microdot	TF-SH-1X-B	£266	€306
1" Bolt sensor head feedthrough 2x BNC/Microdot	TF-SH-2X-B	£443	€510

Many more variations of these feedthroughs are available, please call sales office for details. CF & KF flanged feedthroughs have ceramic seals within electrical feedthrough, bolt feedthroughs employ glass sealing technology.

All dimensions are nominal in millimetres unless otherwise specified

