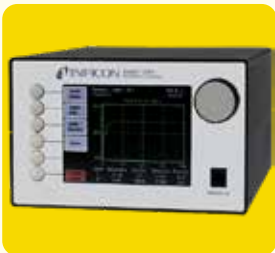


## Thin Film Instrumentation



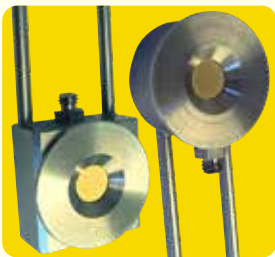
### Deposition Thickness / Rate Monitors

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 menus 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	£1678	€1930
High Resolution, 2 channel thickness rate / monitor RS232 only	TF-SQM160-H-2-R	£1892	€2176
6 channel upgrade for TF-SQM-160	Change 2 to 6	£891	€1025
Additional USB interface for TF-SQM-160	Change R to U	£209	€241
Additional ethernet interface for TF-SQM160	Change R to E	£352	€405
19" rack adapter for 1 SQM-160 or CL-100 instrument	TF-SQM160/CI-100-19RM1	£368	€424
19" rack adapter for 2 SQM-160 OR CI-100 instruments	TF-SQM160/CI-100-19RM2	£307	€354

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 requiremants

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

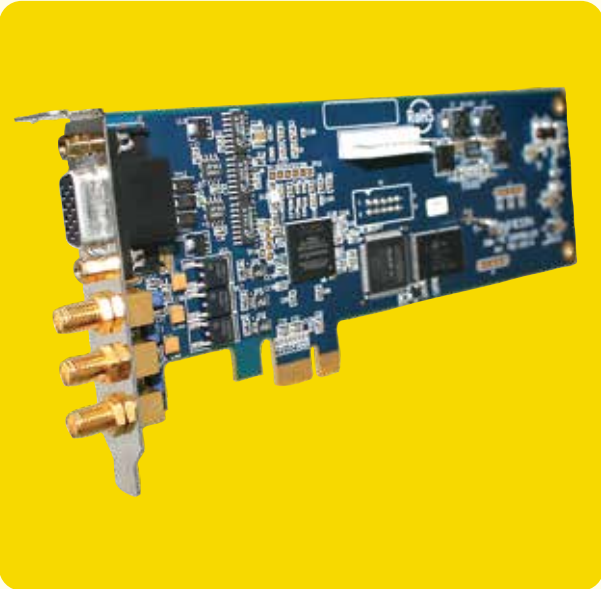
USB Thin Film Deposition Thickness / Rate Monitor



Description	Part Code	Price £	Price €
USB thin film thickness / rate deposition monitor on board oscillator	TF-STM-2	£624	€718

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	£1507	€1734
Thin film deposition controller card (SFF)	TF-IQM-233-SFF	£1507	€1734
Codeposition software for TF-IQM-233	TF-IQS233	£1139	€1310

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 ±0.03Hz 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 ±0.03Hz 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 ±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

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	£2822	€3246
Deposition rate controller 4 QCM channels (4 sensor inputs, 4 source outputs, 16 relays / 16 inputs)	TF-SQC310-4-R-1	£3812	€4384
Deposition rate controller for co-deposition 4 QCM channels (4 sensor inputs, 4 source outputs, 16 relays / 16 inputs)	TF-SQC310C-4-R-1	£5093	€5857

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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 intermittantly)  
Bakeable 275°C

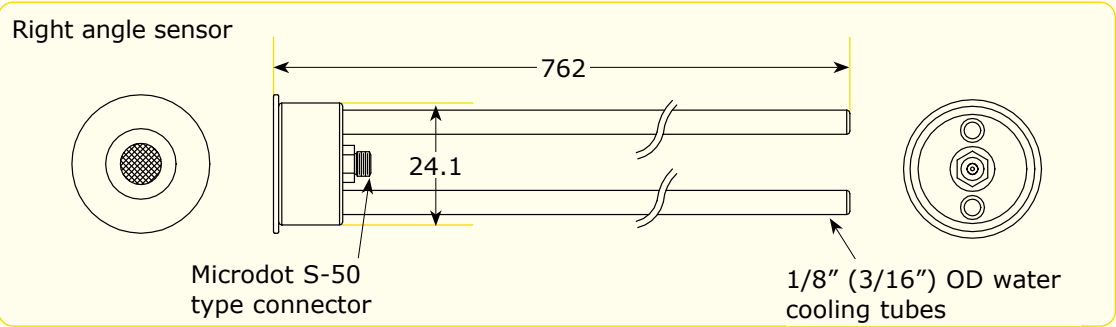
**Materials**  
304 stainless steel, alumina ceramic, Teflon®  
**Crystal**  
Quartz with gold electrodes

**Water Temperature**  
50°C

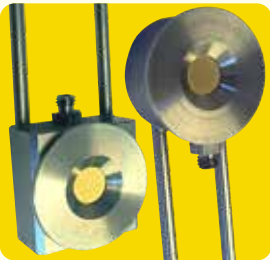
**Connection**  
Microdot® miniature

Features:

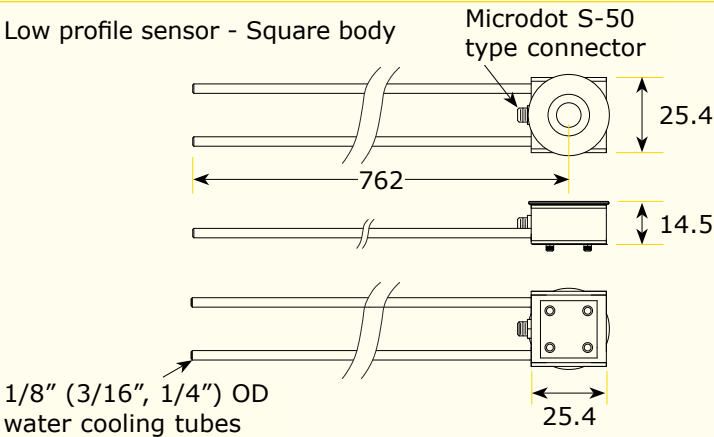
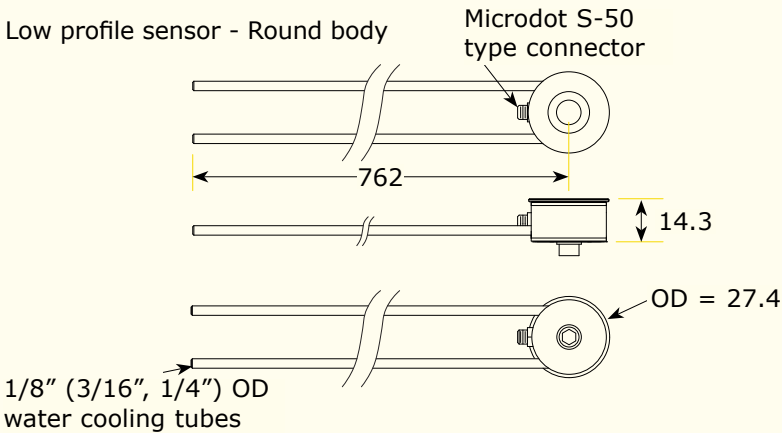
- High quality construction.
- Single and dual crystal designs.
- Non bakeable and bakeable versions available.
- Shuttered sensors available.
- Easy crystal changes.
- Industry standard 6MHz crystals.
- Custom built sensors available to meet individual requirements.



Non Bakeable Sensors



Description	Part Code	Price £	Price €
Round body low profile sensor head with 1/8" water lines	TF-LPSH-R	£455	€524
Square body low profile sensor head with 1/8" water lines	TF-LPSH-S	£455	€524
Square body low profile sensor head with 3/16" water lines	TF-LPSH-S-3/16	£455	€524
Square body low profile sensor head with 1/4" water lines	TF-LPSH-S-1/4	£479	€551
Square body low profile sensor head with 1/8" water lines with shutter	TF-LPSH-S-SHUT	£2211	€2543
Square body low profile sensor head with 3/16" water lines with shutter	TF-LPSH-S-SHUT-3/16	£2211	€2543
Dual square body low profile sensor head with 1/8" water lines with shutter	TF-2LPSH-S-SHUT	£2356	€2710
Dual square body low profile sensor head with 3/16" water lines with shutter	TF-2LPSH-S-SHUT-3/16	£2356	€2710
Right angle sensor head 1/8" water lines	TF-RASH	£455	€524
Right angle sensor head 3/16" water lines	TF-RASH-3/16	£455	€524
Right angle sensor head 1/8" water lines with shutter	TF-RASH-SHUT	POA	POA
Dual right angle sensor head 1/8" water lines with shutter	TF-2RASH-SHUT	£2356	€2710
Dual right angle sensor head 3/16" water lines with shutter	TF-2RASH-SHUT-3/16	£2356	€2710



All dimensions are nominal in millimetres unless otherwise specified

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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 1/8" water lines (includes Oscillator, cables, crystals & Swagelok® unions)*	TF-LPSP	£879	€1011
Low profile sensor package 1/8" water lines with shutter (includes Oscillator, cables, crystals & Swagelok® unions)*	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 1/8" water lines (includes Oscillator, cables, crystals & Swagelok® unions)*	TF-RASP	£879	€1011

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

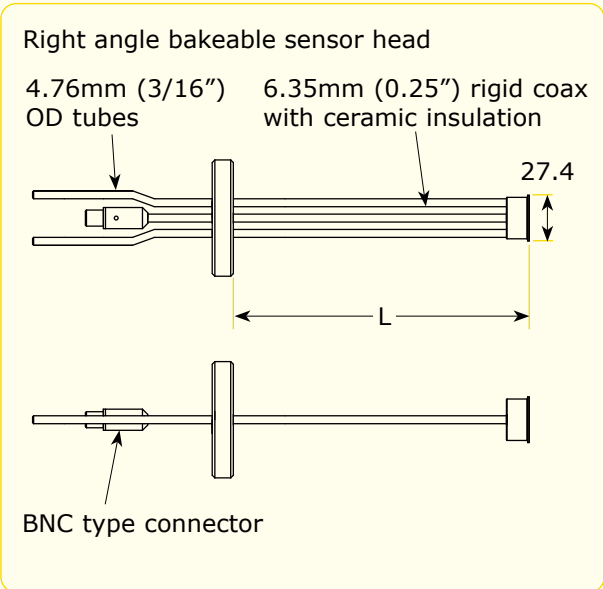
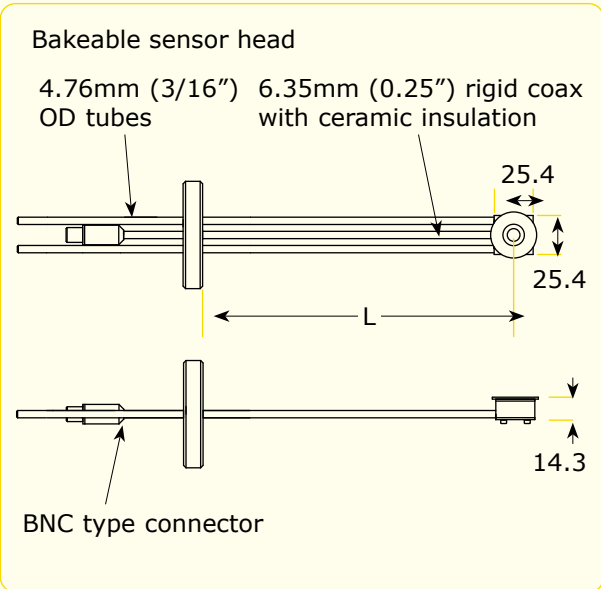
All dimensions are nominal in millimetres unless otherwise specified

Bakeable Sensors



- Features:**
- Bakeable to 300°C. (chsk with us for shuttered version)
  - UHV compatible.
  - Customer specific length 51 - 762mm, 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 (51 - 762mm)	TF-BSH-###	£1231	€1416
Right angle bakeable sensor head L=TBA (51 - 762mm)	TF-RABSH-###	£1231	€1416
Bakeable sensor head with shutter L=TBA (51 - 762mm)	TF-BSH-###-SHUT	£3025	€3479
Dual bakeable sensor head with shutter L=TBA (51 - 762mm)	TF-DBSH-###-SHUT	POA	POA



PLEASE NOTE - Customer to advise required length, L, in mm (Min. 51mm - Max. 762mm) at time of ordering. If you require a longer length or angled sensor, please contact our sales office.

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	£291	€335
Oscillator only	TF-OSC-100	£206	€237

Accessories & Crystals

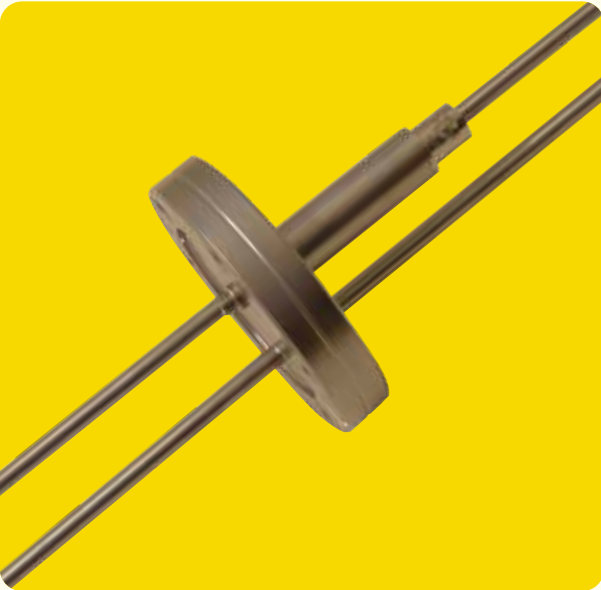


Description	Part Code	Price £	Price €
In-vacuum cable microdot - microdot L=250mm	TF-IVC250	£117	€135
In-vacuum cable microdot - microdot L=762mm	TF-IVC762	£94	€109
Gold coated sensing crystals 10/pk	TF-CRY	£40	€46
Gold coated sensing crystals thermal shock 10/pk*	TF-CRY-THERM	£40	€46
BNC cable L=0.15m	TF-BNC0.15M	£43	€50
BNC cable L=3m	TF-BNC3M	£47	€55
BNC cable L=10m	TF-BNC10M	£40	€46
Tube union for sensor tube to feedthrough tube	TF-SL-FITTING	£21	€25
3/16" to 3/16" Tube union for in vac sensor - F/T	TF-SL-FITTING-3/16	£13	€15

\* - use for applications such as shuttered sensors where thermal shock may occur when opening the shutter.

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	£361	€416
DN40CF sensor head feedthrough 1x BNC/Microdot 2x Liquid Cajon / Ultratorr	TF-SH-1X-2LC-C40	£455	€524
DN40CF sensor head feedthrough 2x BNC/Microdot 2x Liquid	TF-SH-2X-2L-C40	£485	€558
DN40CF sensor head feedthrough 1x BNC/Microdot 3x Liquid	TF-SH-1X-3L-C40	£531	€611
DN40CF sensor head feedthrough 2x BNC/Microdot 3x Liquid	TF-SH-2X-3L-C40	£584	€672
DN40CF sensor head feedthrough 2x BNC/Microdot 3x Liquid Cajon / Ultratorr	TF-SH-2X-3LC-C40	£648	€746
DN40CF sensor head feedthrough 1x BNC/Microdot	TF-SH-1X-C40	£359	€413
DN40CF sensor head feedthrough 2x BNC/Microdot	TF-SH-2X-C40	£450	€518
DN40CF sensor head feedthrough 4x BNC/Microdot	TF-SH-4X-C40	£671	€772
DN40KF sensor head feedthrough 1x BNC/Microdot 2x Liquid	TF-SH-1X-2L-K40	£372	€428
DN40KF sensor head feedthrough 4x BNC/Microdot	TF-SH-4X-K40	£700	€805
DN40KF sensor head feedthrough 1x BNC/Microdot 2x Liquid Cajon / Ultratorr	TF-SH-1X-2LC-K40	£444	€511
1" Bolt sensor head feedthrough 1x BNC/Microdot 2x Liquid	TF-SH-1X-2L-B	£325	€374
1" Bolt sensor head feedthrough 1x BNC/Microdot 2x Liquid Ultra-Torr / Ultratorr	TF-SH-1X-2LUT-B	£479	€551
1" Bolt sensor head feedthrough 1x BNC/Microdot 3x Liquid	TF-SH-1X-3L-B	£455	€524
1" Bolt sensor head feedthrough 2x BNC/Microdot 3x Liquid	TF-SH-2X-3L-B	£683	€786
1" Bolt sensor head feedthrough 1x BNC/Microdot	TF-SH-1X-B	POA	€0
1" Bolt sensor head feedthrough 2x BNC/Microdot	TF-SH-2X-B	£502	€578

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



