



# Gooch & Housego



## 'Industry Standard' Acousto-Optic Q-Switch

A water-cooled Acousto-optic Q-Switch for use in high power Nd:YAG lasers systems.

Combining top grade fused silica with high quality optical finishing and in-house anti-reflection coatings, this Q-Switch exhibits very low insertion loss and high damage threshold. It's design characteristics and repeatable manufacturing process enable RF powers of up to 100W

Standard options include a choice of RF frequency (24 to 68MHz), active apertures (1.0 – 8.0mm), acoustic modes (compressional for linear polarisation, shear for unpolarised) and water connectors. Customised housings are available for OEM's.

Our scientists and engineers are available to assist in selecting the most appropriate model of Q-Switch and also RF driver for your application.

### Key Features:

- Industry standard for Nd:YAG lasers
- Worldwide reputation
- High damage threshold
- Low insertion loss
- Up to 100W RF power handling
- Custom configurations available

### Applications:

- Material processing:
  - Laser marking
  - Laser engraving
  - Laser cutting
  - Laser drilling
- Medical (surgery)
- Lithography

## General Specifications

Interaction material:	Fused Silica
Wavelength:	1064nm
AR coating reflectivity:	< 0.2% per surface
Damage threshold:	> 1GWcm <sup>-2</sup>
Transmission (single pass):	> 99.6%
Static insertion loss:	≤ 6% at 50W laser power
VSWR:	< 1.2:1 (<1.4:1 at 50W RF power)
RF power rating (maximum):	50W cw for Compressional acoustic mode 100W cw for Shear acoustic mode
Water flow rate:	> 190cc / minute
Water-cooling channel material:	Aluminium (de-ionised water is strongly recommended)
Recommended water temperature:	+22°C to +32°C
Thermal switch cut-off:	+55°C +/- 5°C

As part of our policy of continuous product improvement we reserve the right to change specifications at any time



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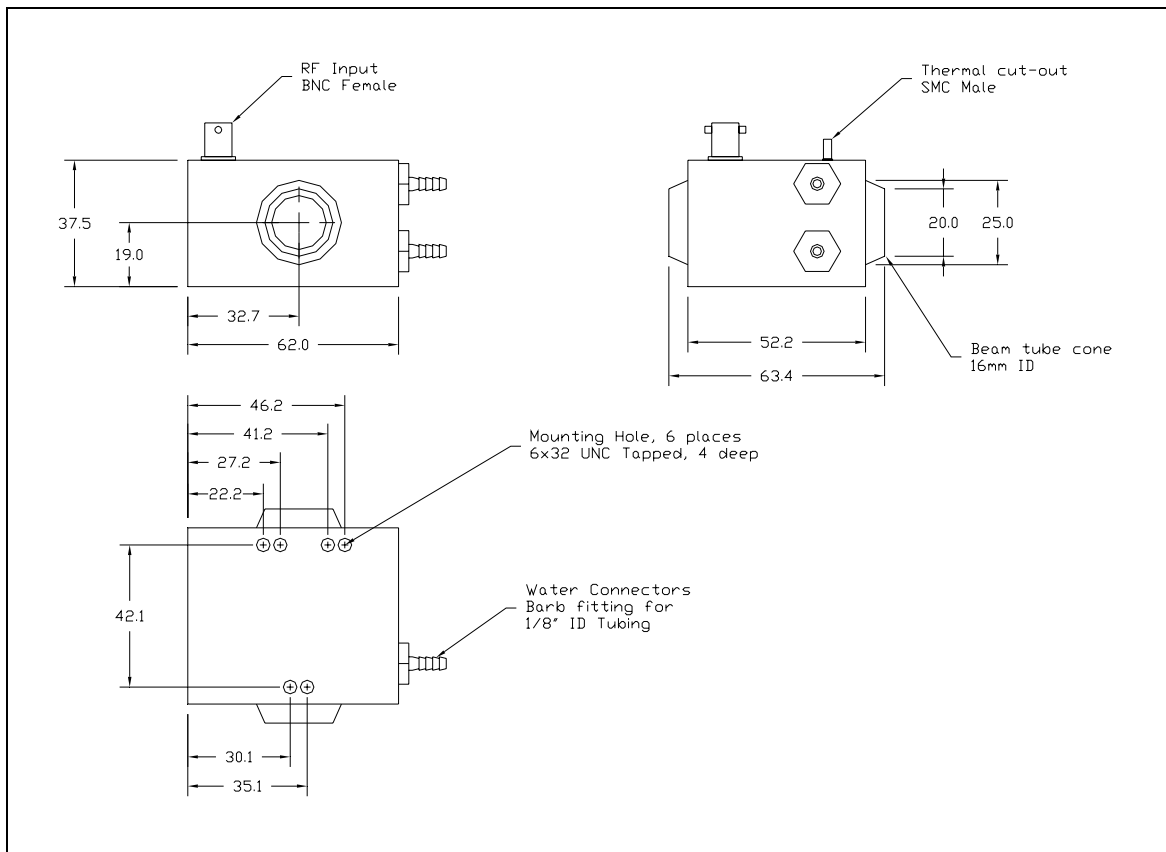
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## Ordering Codes

**Example: I-QS027-4S4G-B5-AT1** (Q-Switch, 27.12MHz, 4mm active aperture, shear mode, fused silica, 1064nm, Barbed water-connectors, BNC, standard housing with M3 mounting holes) Note: As indicated, the -AT1 designation indicates M3 mounting holes, for imperial 6-32UNC mounting holes, no prefix is required.

**I - Q S X X X - X X X X 4 G - X 5 - A T 1**

Code	Frequency	Code	Active aperture	Code	Acoustic mode	Code	Water connector
024	24.00MHz	1.6	1.6mm	C	Compressional	B	Barbed, push on
027	27.12MHz	2	2.0mm	S	Shear	S	Screw on (1/8" OD tube)
041	40.68MHz	3	3.0mm				
068	68.00MHz	4	4.0mm				
		5	5.0mm				
		6.5	6.5mm				
		8	8.0mm				





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## 'Industry Standard' Acousto-Optic Q-Switch

A 'Stallion' version of our industry standard water-cooled Acousto-optic Q-Switch, for use in high power lamp or diode pumped Nd:YAG lasers.

The patent pending 'Stallion' manufacturing technique provides superior corrosion resistance whilst maintaining optimum performance and RF power handling capabilities up to 100W.

Combining top grade fused silica with high quality optical finishing and in-house anti-reflection coatings, this Q-Switch exhibits very low insertion loss and high damage threshold.

In addition to the standard product shown, custom configurations are available for specialised applications. These include alternative housing options, wavelengths and RF frequencies.

### Key Features:

- Industry standard for Nd:YAG lasers
- Superior corrosion resistance
- Stainless steel cooling channels
- High damage threshold
- Push fit water-connectors
- Up to 100W RF power handling
- Custom configurations available

### Applications:

- Material processing:
  - Laser marking
  - Laser engraving
  - Laser cutting
  - Laser drilling
- Medical (surgery)
- Lithography

## General Specifications

Interaction material:	Fused Silica
Wavelength:	1064nm
AR coating reflectivity:	< 0.2% per surface
Damage threshold:	> 1GWcm <sup>-2</sup>
Transmission (single pass):	> 99.6%
Static insertion loss:	≤ 6% at 50W laser power
VSWR:	< 1.2:1 (<1.4:1 at 50W RF power)
RF power rating (maximum):	50W cw for Compressional acoustic mode 100W cw for Shear acoustic mode
Water flow rate:	> 190cc / minute
Water-cooling channel material:	Stainless steel 316
Recommended water temperature:	+22°C to +32°C
Thermal switch cut-off:	+55°C +/- 5°C

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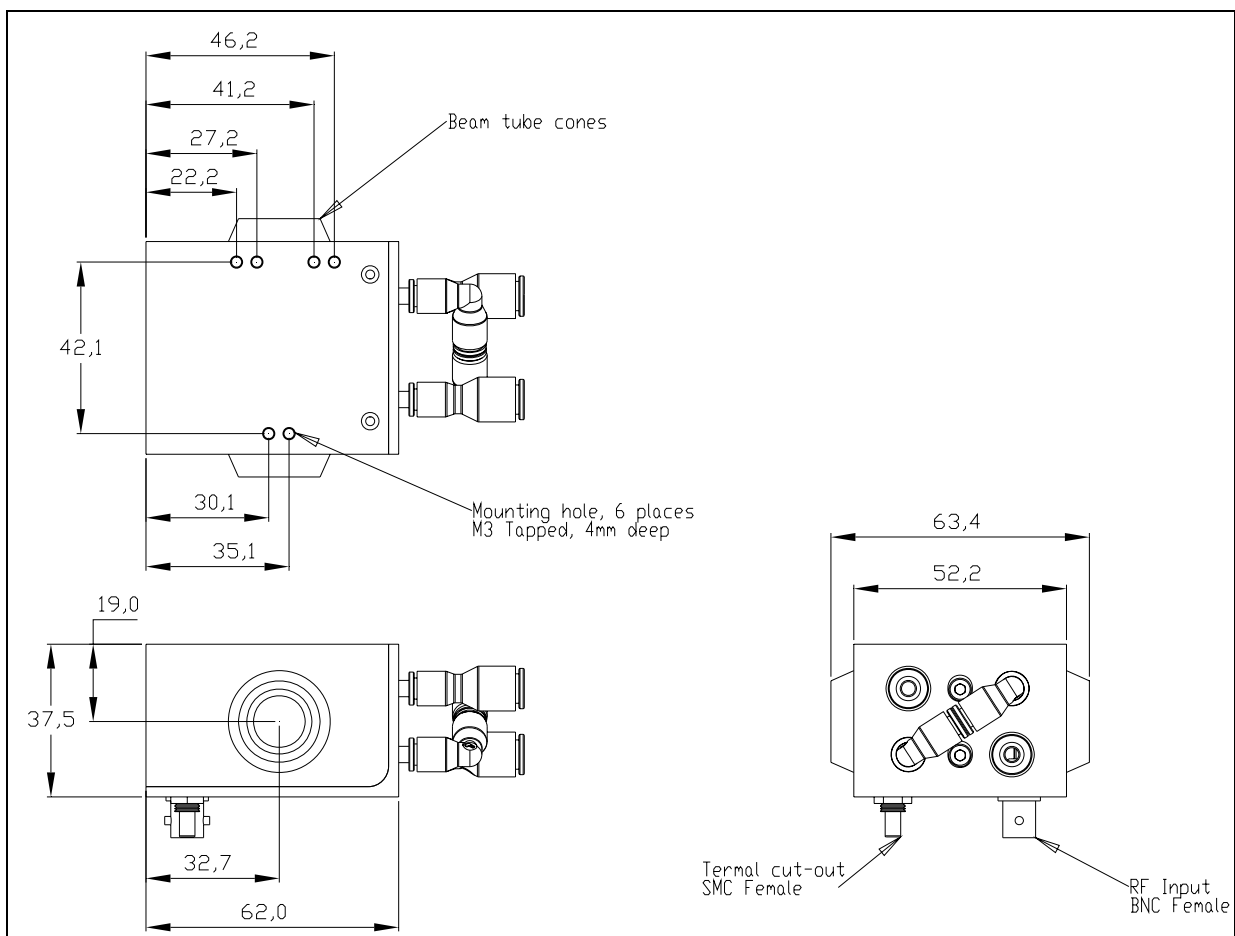
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## Ordering Codes

**Example: I-QS027-4S4G-N5-ST1** (Q-Switch, 27.12MHz, 4mm active aperture, shear mode, fused silica, 1064nm, 4mm OD straight push fit water-connectors, BNC, Stallion housing with M3 mounting holes)

**I - Q S X X X - X X X X 4 G - X 5 - S T 1**

Code	Frequency	Code	Active aperture	Code	Acoustic mode	Code	Water connector
024	24.00MHz	1.6	1.6mm	C	Compressional	N	4mmOD straight push fit
027	27.12MHz	2	2.0mm	S	Shear	P	6mmOD straight push fit
041	40.68MHz	3	3.0mm			Q	4mmOD right angle push fit
068	68.00MHz	4	4.0mm			U	6mmOD right angle push fit
		5	5.0mm				
		6.5	6.5mm				
		8	8.0mm				





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## VHE

### 'Very High Efficiency' Acousto-Optic Q-Switch

The VHE acousto-optic Q-Switch is ideal for use in high gain, high power, linearly polarised Nd:YAG & NdYVO<sub>4</sub> lasers. Using a unique patent-pending acousto-optic design, it provides up to 96% single pass loss modulation, compared to ~85% for conventional designs.

This astonishing performance is achieved inside the 'industry standard' package, allowing simple integration into existing cavity configurations.

Utilising our 'Stallion' manufacturing technique providing superior corrosion resistance whilst maintaining optimum performance and RF power handling capabilities up to 100W.

#### Key Features:

- Industry standard for Nd:YAG lasers
- Superior corrosion resistance
- Stainless steel cooling channels
- High damage threshold
- Push fit water-connectors
- Up to 100W RF power handling
- Custom configurations available

#### Applications:

- Material processing:
  - Laser marking
  - Laser engraving
  - Laser cutting
  - Laser drilling

### General Specifications

Interaction material:	Crystal Quartz
Wavelength:	1064nm
AR coating reflectivity:	< 0.2% per surface
Damage threshold:	> 1GWcm <sup>-2</sup>
Transmission (single pass):	> 99.6%
RF Frequency:	68MHz
VSWR:	< 1.2:1 (50Ω input impedance)
RF power rating:	100W cw (max)
Loss Modulation:	> 95% (single pass)
Water flow rate:	> 190cc / minute
Water-cooling channel material:	Stainless steel 316
Recommended water temperature:	+22°C to +32°C
Thermal switch cut-off:	+65°C +/- 5°C

As part of our policy of continuous product improvement we reserve the right to change specifications at any time.



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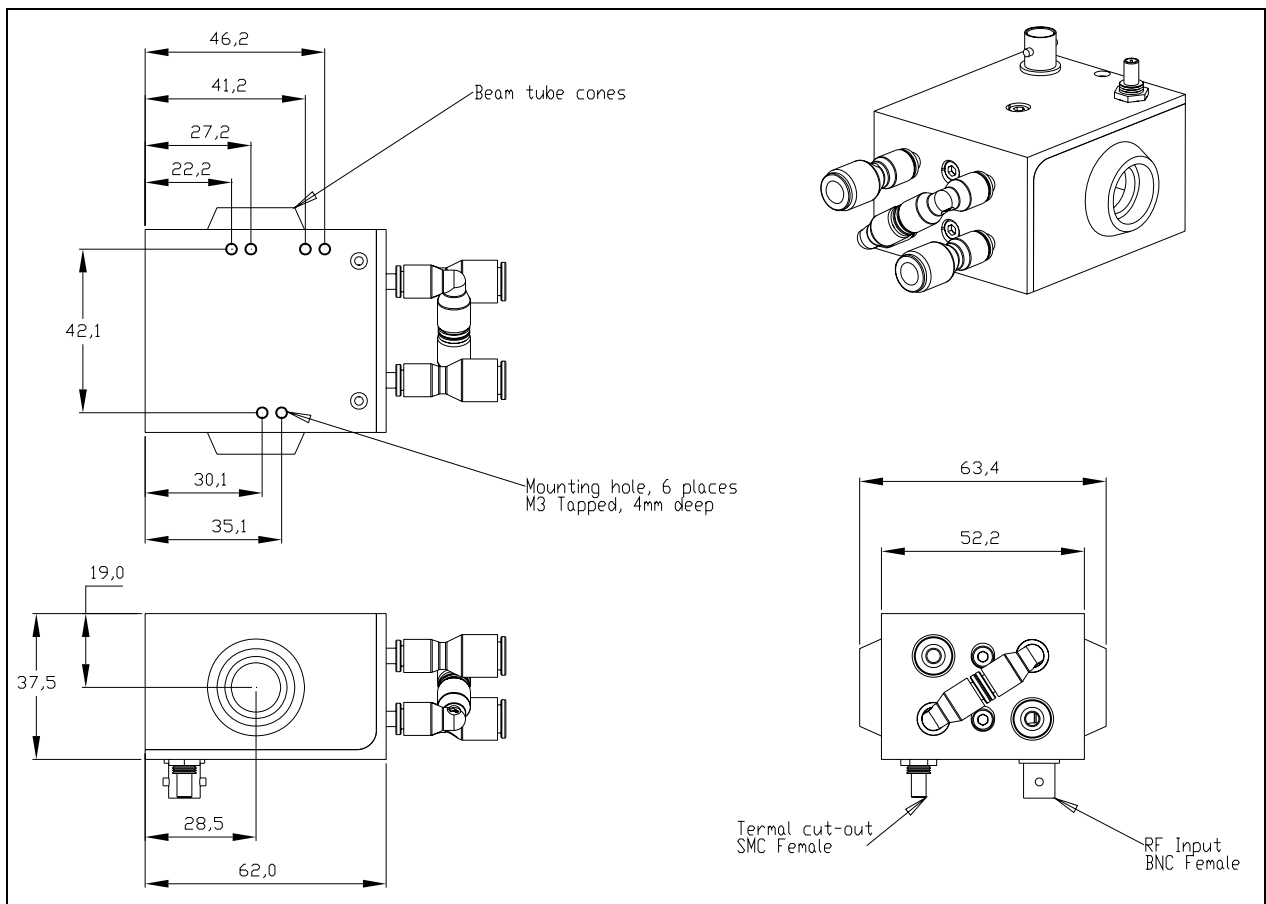
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## Ordering Codes

**Example: I-QS068-X-X-X-V10G-X5-ST3** (Q-Switch, 68MHz, 2.5mm active aperture, VHE, Crystal Quartz, 1064nm, 4mm OD straight push fit water-connectors, BNC, Stallion housing with M3 mounting holes)

**I - Q S 0 6 8 - X X X V 1 0 G - X 5 - S T 3**

Code	Active aperture	Code	Water connector
1.6	1.6mm	N	4mmOD straight push fit
2	2.0mm	P	6mmOD straight push fit
2.5	2.5mm	Q	4mmOD right angle push fit
3	3.0mm	U	6mmOD right angle push fit
4	4.0mm		





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## 'Super Q-Switch' Acousto-Optic Q-Switch

A new compressional mode, water-cooled, AO Q-Switch designed to work with high power unpolarised Nd:YAG lasers, giving faster switching & improved pulse to pulse stability.

Enhance your systems performance with greater punch and increased power.

This Q-Switch uses a dual channel driver to operate two orthogonal compressional mode transducers bonded to a single monolithic optical cell and mounted in one convenient housing. Gooch and Housego's proprietary bonding techniques and power handling technology allows this device to operate up to 50W RF power per channel giving an efficient, compact, single device for the next generation of high power, high gain, solid state lasers.

Our scientists and engineers are available to assist in selecting the most appropriate model of Q-Switch and also RF driver for your application.

### Key Features:

- Industry standard for Nd:YAG lasers
- Worldwide reputation
- High damage threshold
- Low insertion loss
- Up to 100W RF power handling
- Custom configurations available

### Applications:

- Material processing:
- Laser marking
  - Laser engraving
  - Laser cutting
  - Laser drilling
- Medical (surgery)  
Lithography

## General Specifications

Interaction material:	Fused Silica
Wavelength:	1064nm
AR coating reflectivity:	< 0.2% per surface
Damage threshold:	> 1GWcm <sup>-2</sup>
Transmission (single pass):	> 99.6%
VSWR:	< 1.2:1 (<1.4:1 at 50W RF power)
Acoustic mode:	Compressional (orthogonal)
Rise-time / fall-time:	109ns/mm
RF power rating:	2 x 50W cw (max)
Water flow rate:	> 190cc / minute
Water-cooling channel material:	Aluminium (de-ionised water is strongly recommended)
Recommended water temperature:	+22°C to +32°C
Thermal switch cut-off:	+55°C +/- 5°C

As part of our policy of continuous product improvement we reserve the right to change specifications at any time.



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## Ordering Codes

**Example: I-QS027-4D4G-B5** (Q-Switch, 27.12MHz, 4mm active aperture, Dual (orthogonal transducer), fused silica, 1064nm, Barbed water-connectors, BNC)

**I - Q S X X X - X X X D 4 G - X 5**

Code	Frequency	Code	Active aperture	Code	Water connector
024	24.00MHz	1.6	1.6mm	B	Barbed, push on
027	27.12MHz	2	2.0mm	S	Screw on (1/8" OD tube)
		3	3.0mm		
		4	4.0mm		
		5	5.0mm		
		6.5	6.5mm		

