GUARANTEE

Equipment manufactured by the Magstim Company Limited is fully guaranteed covering materials and workmanship for a period of one year from the date of shipment. The Magstim Company Limited reserves the right to perform guaranteed services in its factory, at an authorised repair station, or at the customer's installation.

The Magstim Company's obligations under this guarantee are limited to repairs or at the company's option, replacement of any defective parts of our equipment, except batteries, without charge if said defects occur during normal service.

Claims for damages during shipment must be filed promptly with the transportation company. All correspondence concerning the equipment must specify both model name and/ or number and serial number, as it appears on the invoice for said equipment.

Improper use, mishandling, tampering with, or operation of the equipment without following specific operating instructions will void this guarantee and release the Magstim Company from any further guarantee obligations.

The Magstim Company will only accept responsibility for the effects on safety, reliability and performance of the equipment if:

i modifications or repairs are carried out by persons authorised by The Magstim Company.

ii the electrical installation of the relevant room complies with local regulations, and

iii the equipment is used in accordance with the instructions for use.
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**SECTION 1: MAGSTIM COILS & ACCESSORIES**

**1.1 INTRODUCTION**

This document is written for users of the following Magstim Stimulating Coils and Accessories:

<table>
<thead>
<tr>
<th>Standard Coil Range:</th>
<th></th>
<th>Special Taped Coil Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP 90mm Coil</td>
<td>9784-00</td>
<td>50mm Small coil</td>
</tr>
<tr>
<td>70mm Medium Coil</td>
<td>9762-00</td>
<td>70mm Double Coil</td>
</tr>
<tr>
<td>110mm Double Cone Coil</td>
<td>9902-00</td>
<td>70mm Double Coil,  Placebo System</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eng. Spc. (SP)</td>
</tr>
<tr>
<td>25mm Small Double Coil</td>
<td>1165-00</td>
<td>70mm Double Flat Coil</td>
</tr>
<tr>
<td>70mm Double Branding Iron Coil</td>
<td>3271-00</td>
<td></td>
</tr>
</tbody>
</table>
Interconnecting Cables

In-line Inductor  3467-00  
Coil Extension Cable  1420-01  
Coil Adapter  3110-00  
Y Cable  1871-00

The discharge current through the stimulating coil generates a high intensity magnetic pulse. When the coil is applied to a conductive medium, such as the human body, eddy currents are produced by electromagnetic induction, which causes stimulation to the tissue.

The stimulating coils and accessories are designed to be used in conjunction with the original range of Magstim Stimulators for the magnetic stimulation of neuromuscular tissue, with the exception of the Coil Adapter, which has been designed to enable the original range of Stimulating Coils to be used on the Magstim 2nd Generation Magnetic Stimulator range. The stimulating coils are for use by, or under the supervision of, a medical practitioner only. See coil compatibility chart for details of coil suitability.

1.2 INDICATIONS FOR USE – General Distribution

The Magstim Stimulating Coils and Accessories are designed for use with the original Magstim range of Magnetic Stimulators for the stimulation of neuromuscular tissue. The Magstim systems are for use by, or under the supervision of, a medical practitioner only.

INDICATIONS FOR USE – USA Only

The Magstim Stimulating Coils and Accessories are designed for use with the original Magstim range of Magnetic Stimulators and are intended for the stimulation of peripheral nerves for diagnostic purposes.

Note - Magnetic Stimulators have not been cleared by the FDA for cortical stimulation. Investigational human uses require that the user complies with the FDA regulations regarding Investigational Devices.

1.3 CAUTION

Federal law restricts these devices to sale by or on the order of a practitioner licensed by the law of the State in which he/she practices to use or order the use of the device.

1.4 CONTRAINDICATIONS

The Magstim Stimulating Coils and Accessories should not be used on, or in the vicinity of, patients or users with cardiac demand pacemakers, implanted defibrillators and/or implanted neurostimulators.
1.5 COIL POSITIONING

Correct coil positioning is essential to allow accurate measurements of the important parameters such as conduction latency, threshold of stimulation, response size and waveform morphology.

Mono-phasic Stimulation

In the Magstim Models 200, 250 and BISTIM, the discharge current in the stimulating coil and the resulting magnetic pulse is mono-phasic, giving unidirectional current from the Magstim unit through the coil, allowing for mono-hemispheric stimulation. Therefore, the direction of the current relative to the stimulated tissue is dependent on the orientation of the coil. To enable the user to determine the stimulation they are delivering to the patient, the coil heads are labelled as follows:

Circular Coils

<table>
<thead>
<tr>
<th>Coil Type</th>
<th>Code</th>
<th>50mm Small Coil</th>
<th>9999-00</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP 90mm Coil</td>
<td>9784-00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70mm Medium Coil</td>
<td>9762-00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These all have their faces labelled A and B respectively. With Side A visible and Side B facing the area to be stimulated, the coil current flows in an anticlockwise direction and the induced tissue current flows in the clockwise direction. If the coil head is reversed, so are the current directions. To record the best responses from the muscles in the right side of the body, always place the coil such that SIDE A is visible to the operator and SIDE B is touching the subject. For the left side of the body, this should be reversed. The turquoise arrows fitted to the faces of the stimulating coils represent the direction of the coil discharge current.

Double Coils

<table>
<thead>
<tr>
<th>Coil Type</th>
<th>Code</th>
<th>25mm Small Taped Double Coil</th>
<th>1165-00</th>
</tr>
</thead>
<tbody>
<tr>
<td>70mm Standard Double Coil</td>
<td>9925-00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>110mm Double Cone Coil</td>
<td>9902-00</td>
<td>70mm Taped Double Flat Coil</td>
<td>3281-00</td>
</tr>
<tr>
<td>70mm Taped Double Branding Iron Coil</td>
<td>3271-00</td>
<td>70mm Double Coil Eng. Spc. (SP)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Placebo System</td>
<td></td>
</tr>
</tbody>
</table>

All double coils have their coil heads labelled with turquoise arrows, which, as in the single coils, represent the direction of the coil discharge current. The virtual cathode for these coils is approximate to the valley or trough formed by the conjunction of the two coils, directly opposite the handle towards the leading edge of the coil.

In addition to the discharge current directional arrows, the 70mm Double coil – 9925-00 also has, moulded into the plastic top cover, a minus symbol near the front and three arrows pointing towards it from the handle. These marks are intended to show the virtual cathode and the evoked current flow respectively. The evoked (induced) current is in the opposite direction to the coil discharge current, indicated by the turquoise arrows fitted to the coil.
Bi-phasic Stimulation

The Magstim 220 and the RAPID are bi-phasic, resulting in current flow through the coil in both directions. Therefore, when using these machines, the selection of the appropriate coil face is normally less critical. However, if the induced stimulus is important to the recorded result, the most suitable coil orientation should be established before proceeding to record from the subject. The turquoise arrows represent the direction of the coil discharge current during the initial, rising phase of the discharge waveform.

Stimulating the motor cortex using the stimulating coils produces responses which can be recorded from the majority of muscles in the body, allowing for the functional assessment of motor pathways.
1.6 COIL SELECTION

<table>
<thead>
<tr>
<th>Circular Coils for Cortical and Peripheral Stimulation</th>
<th>Double Coils for Focal Stimulation</th>
</tr>
</thead>
</table>
| **Small 50mm Coil**  
P/N 9999-00  
Applications include:  
- Facial nerve  
- Superficial peripheral nerves  
The 50mm coils are focal and effective for nerves 5-15mm deep. | **Double Small 25mm Coil**  
P/N 1165-00  
Applications include:  
- Facial nerve  
- Median nerve  
- Ulnar nerve  
- Somatosensory evoked potentials  
- F-Wave and reflexes  
The double small coil has been designed for enhanced positional accuracy in peripheral stimulation. |
| **Medium 70mm Coil**  
P/N 9762-00  
Applications include:  
- Peripheral nerves  
- Motor cortex  
The 70mm Coil is designed for Paediatric and Infant use. | **Double 70mm Coil**  
P/N 9925-00  
Applications include:  
- Excitation of spinal roots  
- Motor cortex  
- Peripheral nerves  
The Double 70mm Coil is capable of accurate stimulation of cortical areas and spinal nerve roots. |
| **High Power 90mm Coil**  
P/N 9784-00  
Applications include:  
- Motor cortex  
- Cervical nerve roots  
- Lumbosacral nerve roots  
- Phrenic nerve roots  
The High Power 90mm Coil can be used for central motor conduction studies. The design of the coil allows 140 stimuli at the maximum power level. | **Double Cone Coil**  
P/N 9902-00  
Applications include:  
- Central motor disorders  
- Spinal Injuries  
- O.R. monitoring  
- Urology  
The Double Cone Coil elicits responses from relaxed muscles of the lower pelvic floor and lower limbs. |

The HP90mm coil is primarily designed to easily stimulate the motor cortex to obtain responses from muscles in the arms and hands. When the centre of the coil is positioned over the vertex the mean diameter of the windings sit over the motor strip of both hemispheres. In the case of all circular coils, stimulation takes place under the winding and not the coil centre. When recording from muscles in the lower limbs, move the stimulating coil forward from the vertex and contralateral to the target muscle by approximately 2 inches each way, such that the mean diameter of the coil winding lies over the central fissure.

Other coils may be more localised in their area of stimulation. The Double Cone coil, for instance, predominantly stimulates over the central fissure and enables good responses to be
obtained from the lower pelvic floor and lower limbs at lower power levels than from a circular coil. Smaller coils are more focal in their area of stimulation but generally have less depth of penetration than larger coils and therefore need higher discharge currents. For reproducible results from cortical stimulation, the most effective site of stimulation should established and marked upon a lightweight, close fitting cap. For peripheral sites, the stimulation site can be marked with a suitable pen.

**In-line Inductor**

The In-line Inductor has been developed to enable the use of small, low-inductance coils, primarily the small double 25mm Coil, with the Magstim Rapid. Connecting the In-line Inductor in series with the coil brings the overall inductance seen by the Rapid at the coil socket to greater than 15μH. Without the In-line Inductor connected, the Rapid is at risk of suffering permanent damage to its internal circuitry, and should therefore not be attempted. The In-line Inductor may be used with any Magstim Model stimulator (with the exception of the Quadropulse and the Magstim 200 range of products), if required, but it should be noted that, as with its use on the Rapid, it will reduce the stimulating effect achieved. Due to the different circuitry in the M200, the low-inductance coils may be connected directly to the coil socket, without any risk of damage to the unit.
Double 70mm Placebo Coil System

The System is designed to be used in conjunction with the Magstim Double 70mm Stimulating Coil 9925-00 and either the Magstim 200 or the Magstim Rapid Magnetic Stimulator. The Placebo Coil System is not suitable for use with the BiStim system, as this operates solely with high power stimulating coils.

Designed to replicate the appearance and operation of the Standard Double 70mm Coil 9925-00, the Placebo Coil provides slight sensory stimulation and discharge noise without stimulating cortical tissue. This facility to imitate treatment enables the determination of the placebo effect of the treatment. This coil is widely used in research fields, typically in the areas of psychiatry and psychology.

Y Cable

The "Y-Cable", is intended for use only with two Magstim 200 units. The "Y Cable" enables the output of the two Magstim 200 stimulators to be channelled into a single stimulating coil, the two pulses not being closer together than 1ms. The accuracy of the inter-pulse delay is dependent on the means by which the delay is achieved by the operator.

It should be noted that the stimulus strength of each Magstim 200 pulse is attenuated by approximately 9% when using the "Y Cable", which is equivalent to that experienced when using a BiStim system. This attenuation is necessary for to provide operational protection for the two Magstim 200's.

For information regarding selection of suitable trigger input and output settings, see the Magstim 200 Operating Manual – Section 6 – Synchronisation.

To function correctly the "Y-Cable" requires a high power coil such as the High Power 90mm (9784-00), Medium 70mm (9762-00), Double 70mm (9925-00) or the 110mm Double Cone Coil (9902-00).

The "Y-Cable" should not be used with the 50mm Small Coil (9999-00) or the 25mm Small Double Coil (1165-00).

IMPORTANT

The "Y-Cable" is designed for use with Magstim 200 units only. It must not be used with any other model of Magstim stimulator, i.e. the Magstim Rapid, 220 and 250
Custom Coils

If specific coil geometries are required, that are not covered by the ranges shown in this operating manual, please contact The Magstim Company Ltd. for further information.

Magstim have the ability to design and manufacture prototype coils to customer’s design and specification both in configuration and geometry. Custom coils are predominantly polyurethane coated, as opposed to the cast plastic cases utilised on the standard coil range. This reduced enclosure thickness allows the stimulating coil to come into closer proximity to the targeted site of stimulation – resulting in an increase in the stimulating efficiency.

**Magstim Cooled Coil** – Where prolonged protocols are used with the Magstim Rapid it may be necessary to use two similar stimulating coils, one being in operation while the other cools. For Rapid protocols utilising the Double 70mm Coil, Magstim has developed a forced air-cooled version of the coil. Please contact The Magstim Company Ltd. for further details.
## SECTION 2: WARNINGS AND PRECAUTIONS

| USA Only | CAUTION: Magnetic Stimulators have not been cleared by the FDA for cortical stimulation. Investigational human uses require that the user complies with the FDA regulations regarding Investigational Devices. Please visit www.fda.gov/cdrh or www.magstim-us.com for more information.  

CAUTION: In the USA, Federal Law restricts this device to sale by or on the order of a practitioner licensed by the law of the State in which he/she practices to use or order the use of the device. |

Attention: Consult accompanying documentation before using the Stimulating Coils and Accessories.  

CAUTION: The Stimulating Coils and Accessories must not be used on, or in the vicinity of, patients or subjects with cardiac demand pacemakers, implanted defibrillators, or other electronic implants.  

The Stimulating Coils generate high intensity magnetic pulses. The induced eddy current is of sufficient magnitude to stimulate nerves and muscle.  

The strong magnetic pulses generated by stimulating coils induce eddy currents in any conductive medium such as the human body, nearby metallic objects or electronic devices.  

NB Particular care must be taken to ensure that leads connected directly to the patient, or other equipment, are not in a position where the Stimulating Coil and Accessories can couple resulting in currents being induced in them.  

Do not discharge the Stimulating Coils in the vicinity of metallic objects or these may be projected, moved and/or damaged.  

The Stimulating Coils and Accessories must not be used in an explosive atmosphere or in the presence of flammable anaesthetics.  

When the magnetic pulse is delivered, a discharge click is produced by the Stimulator and its stimulating coil. This discharge click may startle.  

Where possible avoid the use of the stimulating coil near the ears. The use of ear plugs is recommended.  

High voltages are present within the Stimulating Coils and Accessories during operation. Do not remove covers. Refer servicing to qualified personnel.
The Stimulating Coils and Accessories must not be used if there are any signs of external damage or if any parts are damp or wet.

Cortical magnetic stimulation runs the risk of inducing seizures.

Do not discharge the Stimulating Coil in the vicinity of objects sensitive to magnetic fields. Examples are credit cards, floppy disks and computer screens.

Protection circuits disable the equipment if the temperature of the Stimulating Coil exceeds 40°C.

Coils and Accessories must not be immersed in water, put in an ice bucket, or refrigerated. Not even if placed within a plastic bag. The Coils and Accessories do not have any specialised protection against the ingress of liquids, therefore conditions where ingress of liquid, or the forming of condensation within the coil, can occur must be avoided as the electrical insulation will be compromised. Cooling must only be performed by using a flow of cool air from a fan or air conditioning unit.

Due to thermal lag, the surface temperature of the Stimulating Coil will continue to rise following the coil over-temp activating and forcing the main unit into a standby condition. Therefore, the Coil must be removed from the patient as soon as the replace coil symbol is illuminated.

There are currently few medical papers available regarding the effects of magnetic stimulation on the unborn child/ foetus or the expectant mother. As a result of this, we are unable to verify the safety of the Coil's use on, or by, pregnant women. We recommend that anyone wishing to use the Coil on a pregnant woman, or use it whilst pregnant, should contact the Magstim Company Ltd. for more information as new medical papers become available.

On no account must the Stimulating Coils and Accessories be used in environmental conditions outside those specified in this operating manual.
SECTION 3: OPERATING INSTRUCTIONS

3.1 General  (for more detailed operating instructions see main Magstim Operating Manual)

IMPORTANT

• To avoid interference problems the Stimulating Coils and Accessories should not be used in the vicinity of any equipment that does not comply with EMC Standard EN 60601-1-2, including mobile phones.

• At the start of each session the Operator must check the plastic casing of the Stimulating Coils and Accessories for any signs of external damage. If any cracks are visible in the housing, or the cable insulation is damaged in any way, the item must not be used and should be returned to the Magstim Company, or one of its authorised service centre, for servicing and repairs.

3.2 Standard and Taped Coil Operation (instructions relate to use with a Magstim 200/Rapid)

1. Connect the Coil to the main Magstim unit. Switch on, select the desired stimulating power by using the OUTPUT POWER knob, and press the RUN switch on the front panel of the Magstim to arm the unit. The Magstim will charge and the READY display will be illuminated.

2. Position the Stimulating Coil on the desired area to be stimulated. Press and hold down one or both of the safety switches at the base of the Stimulating Coil. Triggering the Magstim results in a magnetic pulse being delivered by the Stimulating Coil, stimulating the nerves beneath it.

3. When necessary, reposition the Stimulating Coil and/ or modify the stimulating power level to suit the requirements for the next stimulus. Meanwhile, the Magstim would have recharged and can be triggered once again in the normal manner.

4. When the tests have been completed, press the STOP switch on the front panel of the Magstim and replace the Stimulating Coil on the Coil Hanger. The Magstim will then revert to STANDBY mode and cannot be triggered until it is armed once more.
3.3 Coil Adapter Operation (instructions relate to use with a Magstim 200²/Rapid²)

1. Connect the Original, or Custom, Magstim Stimulating Coil to the socket section of the Coil Adapter, ensuring that the connector is fully mated and the metal locking ring fully engaged.

2. Connect the plug section of the Coil Adapter to the main Magstim unit as follows:
   Ensure that the locating spot on the Coil Adapter plug is correctly lined up with the COIL OUTPUT SOCKET, located on the front panel of the Magstim Model 200²/Rapid². Insert the plug of the Coil Adapter into the
output socket. When the plug is fully engaged in the socket, lock it in place by turning the black locking ring clockwise until it clicks into place. Go through the set-up procedure detailed in the main Magstim unit Operating Manual, select the desired stimulating power by using the OUTPUT POWER knob, and press the RUN switch on the Control Unit of the Magstim to arm the unit. The Magstim will charge and the READY indicator will be illuminated.

3. Position the Stimulating Coil on the desired area to be stimulated. Depress the footswitch, hold the Stimulating Coil and press and hold down one, or both, of the Trigger Enable switches on the Stimulating Coil. Press and hold the TRIGGER key on the Control Unit of the Magstim. There should be a clicking noise emanating from both the stimulating coil and the Magstim, each time the Magstim is discharged, indicating that a magnetic pulse is being delivered by the Stimulating Coil, stimulating the nerves beneath it.

4. When necessary, reposition the Stimulating Coil and/or modify the stimulating power level to suit the requirements for the next stimulus. Meanwhile, the Magstim will have recharged and can be triggered once again in the normal manner.

5. When the stimulations have been completed, press the STOP switch on the Control Unit of the Magstim.

Note

1. A magnetic pulse will only be produced if one or both of the safety switches at the base of the stimulating coil are pressed. **On no account must the trigger and enable buttons on the stimulating coil be permanently activated, by taping down, or any other method of fixing. They are designed as a safety interlock, to disable them could result in a serious injury as a result of an inadvertent discharge of the coil.**

2. If the instrument has not been triggered for over 1 minute after the READY symbol is illuminated the unit will automatically select the default mode and discharge internally.

3. Ensure the Coil Adapter, and Stimulating Coil are functioning properly before proceeding.

**Error Codes**

The Magstim Model 200²/Rapid² will display the appropriate error code on its display. The faults, and associated error codes, relating to the operation of the Coil Adapter are listed below. The error codes for faults relating directly to the operation of the stimulating coil are listed in section 6 of the Magstim Model 200² Operating Manual and in section 8 of the Magstim Rapid² Operating Manual.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C25</td>
<td>EMC Detected (Coil adapter only).</td>
</tr>
<tr>
<td>C26</td>
<td>Invalid Coil Power Identification (Coil adapter only).</td>
</tr>
</tbody>
</table>
3.4 Placebo Coil Operation (instructions relate to use with a Magstim 200/ Rapid)

1. Connect the plug of the Placebo Stimulating Coil to the socket on the Placebo Coil Interconnecting Box. Then connect the plug of the Placebo Coil Interconnecting Box to the coil socket on the front panel of the main Magstim unit. Switch on, select the desired power level by using the OUTPUT POWER knob, and press the RUN switch on the front panel of the Magstim to arm the unit. The Magstim will charge and the READY display will be illuminated.

2. Position the Stimulating Coil on the desired area. Press and hold down one or both of the safety switches at the base of the Stimulating Coil. Triggering the Magstim results in a discharge click being produced by the Stimulating Coil.

3. When necessary, reposition the Stimulating Coil and/or modify the stimulating power level to suit the requirements. Meanwhile, the Magstim would have recharged and can be triggered once again in the normal manner.

4. When the tests have been completed, press the STOP switch on the front panel of the Magstim and replace the Stimulating Coil on the Coil Hanger. The Magstim will then revert to STANDBY mode and cannot be triggered until it is armed once more.

NB

If, when the coil is connected up as described above, a discharge click is not produced when the Magstim is triggered, it is possible that the Placebo Coil may have been connected to the Interconnecting Box for the standard Double 70mm Coil by mistake. Due to the different pinning of the coil active line for the Placebo Coils compared to that for the standard coils, the Placebo Coil will only work when connected through its own connecting box. This has been done to prevent the Placebo Coils, which have a very low inductance, from being plugged directly into the main Magstim unit, causing damage to the unit.

DOUBLE 70MM COIL  9925-00

1. Connect the plug of the Double 70mm Coil to the socket on the Double 70mm Coil Interconnecting Box. Then connect the plug of the Double 70mm Coil Interconnecting Box to the coil socket on the front panel of the main Magstim unit. Switch on, select the desired power level by using the OUTPUT POWER knob, and press the RUN switch on the front panel of the Magstim to arm the unit. The Magstim will charge and the READY display will be illuminated.

2. Follow the operating instructions, points 2 – 4, described in the Coil Family Operating Manual supplied with the Double 70mm Coil.

NB

If, when the coil is connected up as described above, a discharge click is not produced when the Magstim is triggered, it is possible that the Double 70mm Coil may have been connected to the Interconnecting Box for the Placebo Coil by mistake.
3.5 In-line Inductor/ Extension Cable Operation- The Extension Cable features identical plug and socket connectors and cable as for the In-line Inductor, with the cased inductor being replaced with a 2m length of cable.

1. Connect the plug end of the Interconnecting Cable to the Coil Socket on the front of the Magstim. Ensure that the plug is fully pushed home, then lock the plug in position by turning the locking ring clockwise until it clicks.

2. Connect the plug of the Stimulating Coil to the socket connector on the Interconnecting Cable. Ensure that the plug is fully pushed home, then lock the plug in position by turning the locking ring clockwise until it clicks.

3. Press the safety switch on the coil, the Magstim stimulator may then be triggered using the selected triggering method.

3.6 Y Cable – For use with Magstim 200 Stimulators only.

1. Connect the Y Cable so that the 1st cable goes to the output of the 1st Magstim 200 unit, and the 2nd cable goes to the 2nd Magstim 200 unit. Connect the coil to the socket on the 3rd Cable. Cables 1 and 2 are fitted with plug connectors, therefore they can not be erroneously connected to the coil.

2. Set the required interpulse spacing on the external triggering device.

3. Press the safety switch on the coil, the Magstims may then be triggered using the selected triggering method.

4. Do not depress the footswitch again until each Magstim has armed. Be aware that the Magstim 200 units may not arm at the same rate.

**NOTE**

It is important that there is a minimum interpulse spacing of 1ms, or the Magstim 200 units will be damaged. Therefore measures should be taken when setting up triggering equipment that an interpulse spacing of less than 1ms is impossible to achieve.
Suitable equipment capable of providing the correct trigger pulses may be a computer with appropriate software, a signal generator, which can provide 2 pulses, suitably spaced, or a custom designed trigger arrangement. Please note that the Company will not guarantee its products if the trigger arrangement used does not comply with the specifications of the Magstim 200 units, in particular in relation to the minimum interpulse spacing.
SECTION 4: MAINTENANCE

4.1 USER MAINTENANCE

At the start of each session the Operator must check the Stimulating Coils and Accessories for any signs of external damage. If any cracks are visible in the head enclosure, housing, plug or socket, or the cable insulation is compromised; the item must not be used and should be returned for servicing and repairs.

4.2 TECHNICAL MAINTENANCE

The plug and socket pins should be checked carefully, at the start of each day’s operation, for any signs of pitting, or burning, as under conditions of exceptionally hard use at high energy levels, it is possible for the localised heating to manifest itself in the form of micro-welds. Continued used in this condition will eventually result in the coil pins/sockets becoming totally eroded and open circuit.

Note: The pin burning is communicable - any item with good pins that is used on a stimulator with burned socket pins will have its pins damaged immediately. The reverse is also true, a socket with good pins that has an item with burnt pins connected to it will have its pins damaged immediately. If damage is noticed on any connecting plug or socket the complete system must not be used until all pins and sockets are carefully examined for any damage. If any contacts show damage, even if slight, they will need to be changed. If this is not done thoroughly there is the risk that the cycle of contact damage will continue.

As contact repair is a specialised procedure, it is recommended that contact replacement is undertaken by the Magstim Company, or one of its authorised service centres. If additional advice or information is required, please contact The Magstim Company.
4.3 CLEANING AND DISINFECTING

The Stimulating Coils, and Accessories, may be cleaned using an isopropyl alcohol moistened cloth. Ensure that the Stimulating Coils, and Accessories, have dried thoroughly before use.

Note: The Coils and Accessories cannot be sterilised. Do not allow them to become contaminated with bodily fluids.

4.4 SERVICING

The Stimulating Coils and Accessories must be returned immediately to the Magstim Company Ltd., if there are any signs of external damage. All Coil and Accessory Servicing must be carried out by the Magstim Company Service Department only. It is also advisable that the item is returned for servicing after two years of use. For servicing information contact the Magstim Company Limited at:

The Magstim Company Limited
Spring Gardens
Whitland
Carmarthenshire
SA34 0HR
Wales
United Kingdom
Tel: +44 (0) 1994 240798
Fax: +44 (0) 1994 240061
email: service@magstim.com
Website: www.magstim.com

4.5 DEVICE LIFETIME

The lifetime of the Magstim Stimulating Coils and Accessories is defined as being 2 years from the date of shipment, with the exception of the Coil Adapter, whose lifetime is defined as being 5 years from the date of shipment. The Magstim Company Ltd. will support the products for the duration of their lifetime.

4.6 DISPOSAL

When a Magstim Stimulating Coil, or Accessory, reaches the end of its serviceable life, the Magstim Company Limited should be contacted, at the above address, to arrange for its disposal in compliance with the appropriate environmental regulations.
SECTION 5: SPECIFICATIONS

5.1 GENERAL SPECIFICATIONS

When used with a Magstim Magnetic Stimulator, the whole system is classified as Class 1. The Stimulating Coils and Accessories are classified as type BF applied parts when used with the Magstim Magnetic Stimulators. This means that their external surfaces are electrically isolated from the other parts of the equipment as required by safety standards of BSEN60601-1.

They comply with the requirements of the Safety Standard EN60601-1 (90), including amendment 1 (91) and amendment 2 (95), and EMC Standard EN 60601-1-2.

Protection against ingress of liquids - The Magstim Stimulating Coils and Accessories are classified as IPX0 (Not Protected), as there is no specialised protection provided against the ingress of liquids.

Protection against flammable anaesthetic mixtures – Not Protected. Therefore, the Stimulating Coils and Accessories are not suitable for use in the presence of a flammable anaesthetic mixture with air, oxygen or nitrous oxide.

EMC Susceptibility
To avoid interference problems the Magstim Magnetic Stimulators, and their accessories, should not be used in the vicinity of any equipment that does not comply with EMC Standard EN 60601-1-2, including mobile phones.

5.2 TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Coil</th>
<th>Average Inductance</th>
<th>Max. magnetic field strength</th>
<th>Max. No. of Stimulations at 50% Power</th>
<th>Max. No. of Stimulations at 80% Power</th>
<th>Max. No. of Stimulations at 100% Power</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP 90mm 9784-00</td>
<td>23.30μH</td>
<td>2.0T</td>
<td>&gt; 505</td>
<td>258</td>
<td>143</td>
<td>1.4kg</td>
</tr>
<tr>
<td>70mm 9762-00</td>
<td>16.25μH</td>
<td>2.6T</td>
<td>256</td>
<td>98</td>
<td>63</td>
<td>1.28kg</td>
</tr>
<tr>
<td>50mm 9999-00</td>
<td>13.50μH</td>
<td>3.6T</td>
<td>281</td>
<td>104</td>
<td>65</td>
<td>1.14kg</td>
</tr>
<tr>
<td>Db 70mm 9925-00</td>
<td>16.35μH</td>
<td>2.2T</td>
<td>338</td>
<td>108</td>
<td>56</td>
<td>1.6kg</td>
</tr>
<tr>
<td>DC 110mm 9902-00</td>
<td>17.85μH</td>
<td>1.4T</td>
<td>-</td>
<td>-</td>
<td>584</td>
<td>2kg</td>
</tr>
<tr>
<td>Db 25mm 1165-00</td>
<td>10.11μH</td>
<td>4.0T</td>
<td>146</td>
<td>55</td>
<td>40</td>
<td>1.15kg</td>
</tr>
<tr>
<td>Db 70mm Flat 3281-00</td>
<td>19.29μH</td>
<td>2.0T</td>
<td>633</td>
<td>170</td>
<td>121</td>
<td>1.61kg</td>
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</tbody>
</table>
### Coil Specifications

<table>
<thead>
<tr>
<th>Coil</th>
<th>Average Inductance</th>
<th>Max. Magnetic Field Strength</th>
<th>Max. No. of Stimulations at 50% Power</th>
<th>Max. No. of Stimulations at 80% Power</th>
<th>Max. No. of Stimulations at 100% Power</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Db 70mm BI 3271-00</td>
<td>19.40μH</td>
<td>2.0T</td>
<td>1023</td>
<td>176</td>
<td>123</td>
<td>1.58kg</td>
</tr>
<tr>
<td>Dbl 70mm Placebo Coil</td>
<td>Max. 2.8μH</td>
<td>0.2T</td>
<td>&gt;984</td>
<td>&gt;984</td>
<td>984</td>
<td>1.15kg</td>
</tr>
<tr>
<td>Placebo Coil &amp; Box</td>
<td>18μH</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3.72kg</td>
</tr>
<tr>
<td>Coil Adapter</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.74kg</td>
</tr>
</tbody>
</table>

### Y Cable

- **Stimulus Repetition Rate:** One stimulus pair every 4 seconds
- **Stimulus pair interval:** 1ms to 60s
- **Maximum No. of Stimuli per hour:** 584
- **Maximum discharge voltage:** 2.6kV (High Power Magstim)
- **Maximum magnetic field:** 1.65T (High Power 90mm Coil), 1.75T (Double 70mm Coil)
- **Stimulus attenuation:** 9% in relation to a Magstim 200 at 100%
- **Pulse Characteristics:**
  - 125ms rise time (High Power 90mm Coil)
  - 110ms rise time (Double 70mm Coil)
  - 1ms total pulse duration

All Coils and Accessories are fitted with a 2m cable as standard with the exception of the Coil Adapter and Y Cable, whose overall lengths are approximately 1m.

The "maximum number of stimulations" columns relate to the number of stimulations that can be achieved with a Magstim 200, at an ambient temperature of 20 - 25°C, before the coil exceeds its permitted operating temperature.

### 5.3 Ambient Temperature

Permissible Environment Conditions for Transport:

<table>
<thead>
<tr>
<th>Ambient Temperature Range:</th>
<th>-25°C to 60°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Humidity Range:</td>
<td>10% to 80% Non Condensing</td>
</tr>
<tr>
<td>Atmospheric Pressure Range:</td>
<td>50kPa to 106kPa</td>
</tr>
</tbody>
</table>

Storage and Operating Conditions:

<table>
<thead>
<tr>
<th>Operating Temperature:</th>
<th>5°C to 40°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Temperature:</td>
<td>-25°C to 60°C</td>
</tr>
<tr>
<td>Atmospheric Pressure Range:</td>
<td>50kPa to 106kPa</td>
</tr>
</tbody>
</table>
### 5.4 COIL COMPATIBILITY CHART

<table>
<thead>
<tr>
<th>Coil</th>
<th>Magstim 200</th>
<th>Magstim 220</th>
<th>Magstim 250</th>
<th>Magstim Bistim</th>
<th>Magstim Rapid</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP 90mm 9784-00</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>70mm 9762-00</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>50mm 9999-00</td>
<td>✓</td>
<td>-</td>
<td>✓</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Db. 70mm 9925-00</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>DC 110mm 9902-00</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Db 25mm 1165-00</td>
<td>✓</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Db 70mm Flat 3281-00</td>
<td>✓</td>
<td>✓</td>
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</tr>
<tr>
<td>Db 70mm BI 3271-00</td>
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<tr>
<td>Db 70mm Placebo Coil</td>
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<td>-</td>
<td>-</td>
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<tr>
<td>Y Cable</td>
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<td>-</td>
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<tr>
<td>Extension Cable</td>
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<tr>
<td>In-line Inductor</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

The Coil Adapter has been designed to enable the original range of Stimulating Coils to be used on the Magstim 2nd Generation Magnetic Stimulator range. If using one of the above coils with a 2nd Generation Magnetic Stimulator, the same compatibility constraints apply, i.e. if the coil is only suitable for use with a Magstim 200 unit, then it will only be suitable for use with its 2nd Generation equivalent, the Magstim 2002.