



Western

Centre for Functional
and Metabolic Mapping

3T/7T MRI FACILITY

SOP Number:	320.03
Title	3T MRI Black/Brown Out Procedure

Revision Chronology		
Version Number	Date	Changes
320.01	01 March 2010	New Version
320.02	22 January 2013	Updated procedures
320.03	28 May 2019	Complete Revision

Facility Manager Signature: _____

Date: _____

ROBARTS RESEARCH INSTITUTE
CENTRE FOR FUNCTIONAL AND METABOLIC MAPPING:
3T MRI FACILITY

Standard Operating Procedure #320.03

MRI Black/Brown Out Procedure

1. Introduction

- 1.1 Research involving Magnetic Resonance Imaging (MRI) at high magnetic field strengths presents unique hazards to both research subjects and individuals working within and around the MRI system. Consequently, the potential for serious personal injury is present due to the sheer magnitude and strength of the static magnetic field along with the immense flexibility of the research system and associated peripheral hardware.
- 1.2 Dangerous and potentially lethal levels of electricity are used by both the 3T and 7T MRI systems. Therefore it is important that all individuals working around the MRI systems be aware of the dangers and understand the safety issues concerning electricity. Current-carrying cables, connections, and junction points in the vicinity of the main magnetic field are particularly susceptible to damage due to the extreme Lorentz forces created through the normal operation of the system. Periodically, the effects of prolonged mechanical fatigue may result in breakage, thereby causing electrical arcing, sparking, and high heat levels before the system can shut down. In these instances there is a high potential for personal injury as well as the possibility of a fire being ignited.
- 1.3 Equipment in the 3T MRI Facility is sensitive to the order used in powering the system up and down. If the proper procedures are not followed, the equipment may be damaged or malfunction. Only authorized Level 2 MRI Personnel are permitted to perform these procedures.
- 1.4 Extensive training is required before performing any procedure on the 3T MRI system, see SOP#130: "MRI Personnel Training".

2. Black/Brown Out Procedure

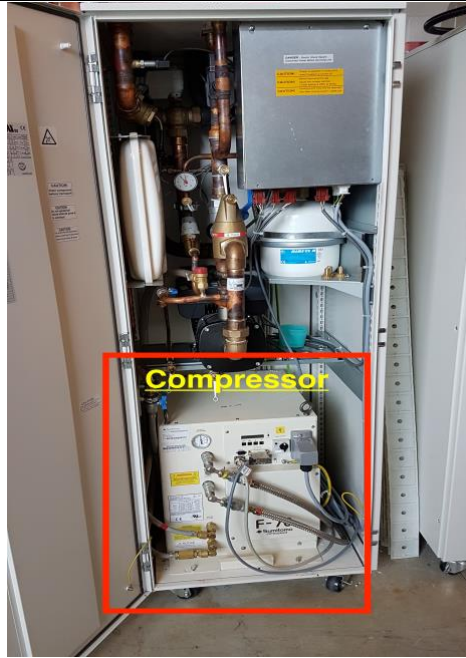
- 2.1 If you are unsure of any of the steps in the following procedure, DO NOT continue. Contact Associate Director or Senior MRI Technologist immediately.
- 2.2 In the event that there is a black out or a momentary power interruption there is the possibility that the 480V electrical supply may be lost. The loss of power will cause the 3T MRI to shutdown including the magnet cold head and compressor.
- 2.3 Before proceeding any further, ensure the system is fully shut down. Follow the procedure Section 3 of SOP#300: "3T MRI System Start-Up and Shutdown" to complete a full system shutdown.
- 2.4 The 480V power supply must be reset via the following procedure.

- 2.4.1 On the wall by the Chiller, press the **GREEN button** labeled “480V Reset”.



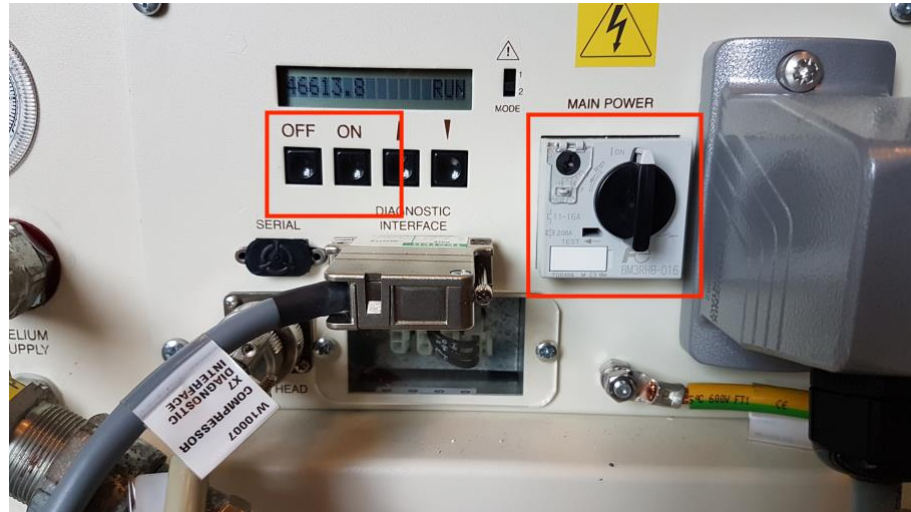
- 2.4.2 At this point, the cold head compressor may attempt to restart itself. Note: the compressor may start and then stop while the water pump starts up. The compressor will not engage until water flow is established. Give the system ~5 minutes. If the compressor does not turn on automatically, proceed to the next step.

2.4.3 Locate the compressor cabinet (SEP) as seen in the pictures below:



2.4.4 Restart the Magnet Cold Head: press the ON button at the front of the F-70 compressor box at the bottom of the Siemens chiller cabinet (see picture below), immediately right of the filter plate in the equipment room. Wait until you hear the rhythmic sound of the Cold Head before proceeding to next step.

- 2.4.5 If the compressor does not turn on after pressing the ‘ON’ button, try turning the main power counter clockwise (OFF)_and then clockwise (ON). This will cycle power to the compressor.



- 2.4.6 Confirm that the cold head is running by opening the magnet room door and listening. If the cold head is running, proceed with booting the system.
- 2.4.7 Power up the system by pressing the “**SYSTEM ON**” button on the Siemens control panel. See SOP#300: “3T MRI System Start-up and Shutdown”.



**If attempts to restart the compressor and cold heads are unsuccessful, Siemens will need to be informed immediately. Please contact Siemens UPTIME and explain the situation. The CFMM Associate Director or Senior MRI Technologist also need to be notified as soon as possible.