AMI 9-3 T

INTEGRATED CRYOGEN-FREE

SUPERCONDUCTING MAGNET SYSTEM

MAGNET SPECIFICATIONS AND PERFORMANCE SHEET

#15556

May 03, 2022

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1 Magnet Specifications and System Layout

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MAGNET SPECIFICATIONS

AMI Magnet Serial Number: 15556
Type: MAxes™ CC-MX-039-076-001-LD
For: BlueFors Cryogenics Oy Ltd
Test Date: 14 March 2022

Simultaneous Magnet Operation

Rated Y/Z Vector @ 4.2K[1] ..... **30 kG**

Note

This magnet system produces a magnetic field vector by appropriate combinations of fields from the multi-axis system.

Independent Solenoid (Z-Axis)

Rated Central Field @ 4.2K ..... **90 kG**
Maximum Test Field @ 4.2K[2] ..... **91 kG**
Rated Operating Current ..... **83.72 Amps**
Ramp Rate ..... **0.0541 Amps/second**
Field to Current Ratio ..... **1.075 kG/Amp**
Homogeneity over 1 cm DSV ..... **+/-0.1%**
Inductance ..... **18.4 Henry**
Clear Bore ..... **76 mm [3.00 inches]**
Recommended Persistent Switch Heater Current ..... **18 mA**
Persistent Switch Heater Nominal Resistance[3] ..... **78 Ohms**
Total Magnet and Switch Resistance[3] ..... **36 Ohms**

1. Magnets not warranted for simultaneous operation of resultant field magnitudes above rated vector
2. Magnet not warranted for independent operation of Z-Axis magnet above 90 KG., and Y-Axis magnet above 30 KG.
3. All resistance measurements made at room temperature

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Figure 1 Magnet specification sheet for 9-3 T, 2D Magnet (1)

Independent Split Coil (Y-Axis)

Rated Central Field @ 4.2K	**30 kG**
Maximum Test Field @ 4.2K[2]	**31 kG**
Rated Operating Current	**82.83 Amps**
Ramp Rate	**0.0322 Amps/Second**
Field to Current Ratio	**0.3632 kG/Amp**
Homogeneity over 1 cm DSV	**+/-0.5%**
Inductance	**31.1 Henrys**
Magnet Resistance[3]	**2172 Ohms**

Overall Magnet Dimensions

Magnet Width	**249 mm [9.8″]**
Magnet Outside Diameter	**352 mm [13.86″]**
Magnet Height (flange to flange)	**344 mm [13.55″]**
Weight	**71.7 kg [158 lbs]**

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Figure 2: Magnet specification sheet for 9-3 T, 2D Magnet (2)

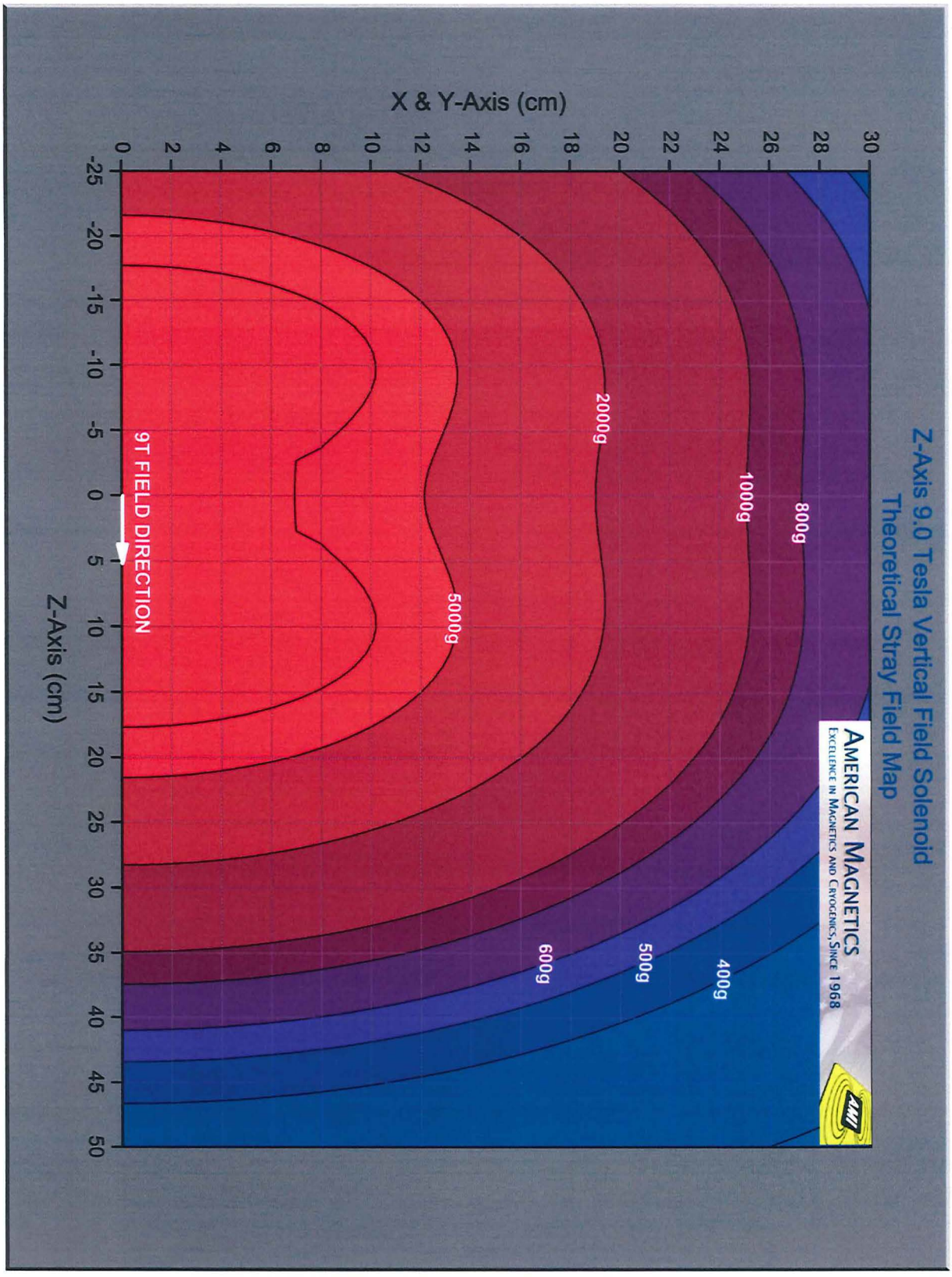


Figure 3: Theoretical stray field map for Z-axis

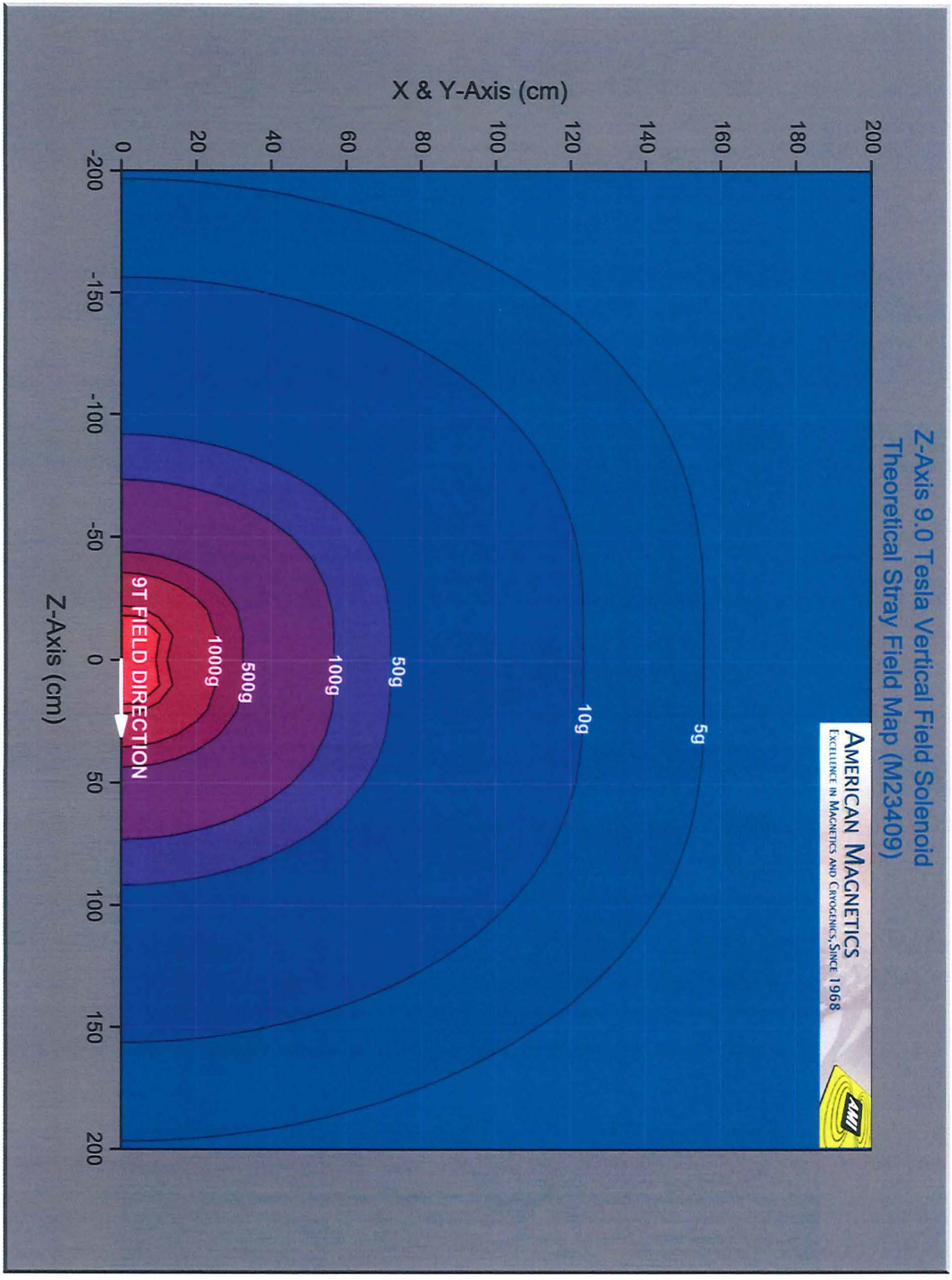


Figure 4 Theoretical stray field map for Z-axis (5g)

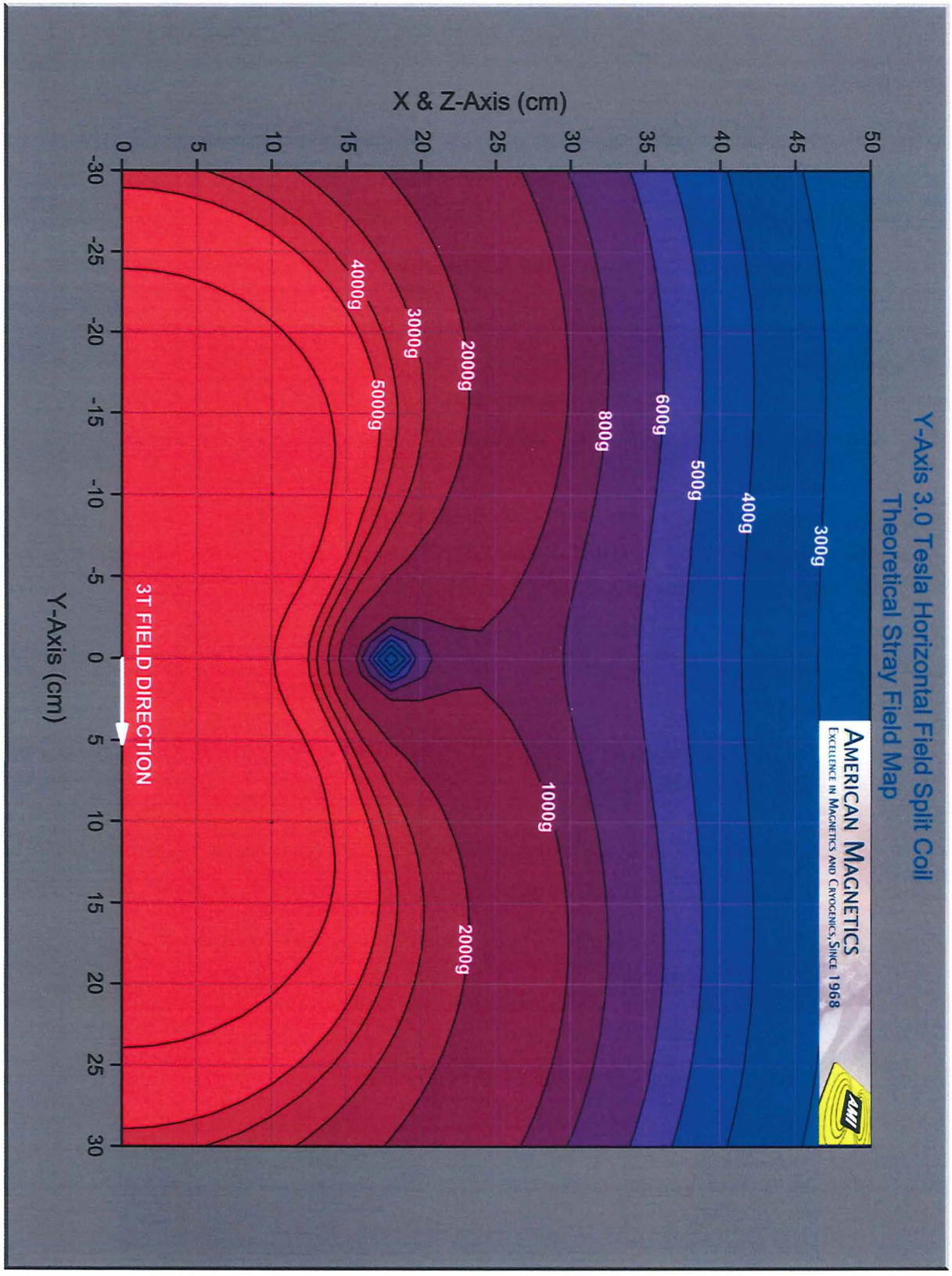


Figure 5: Theoretical stray field map for Y-axis

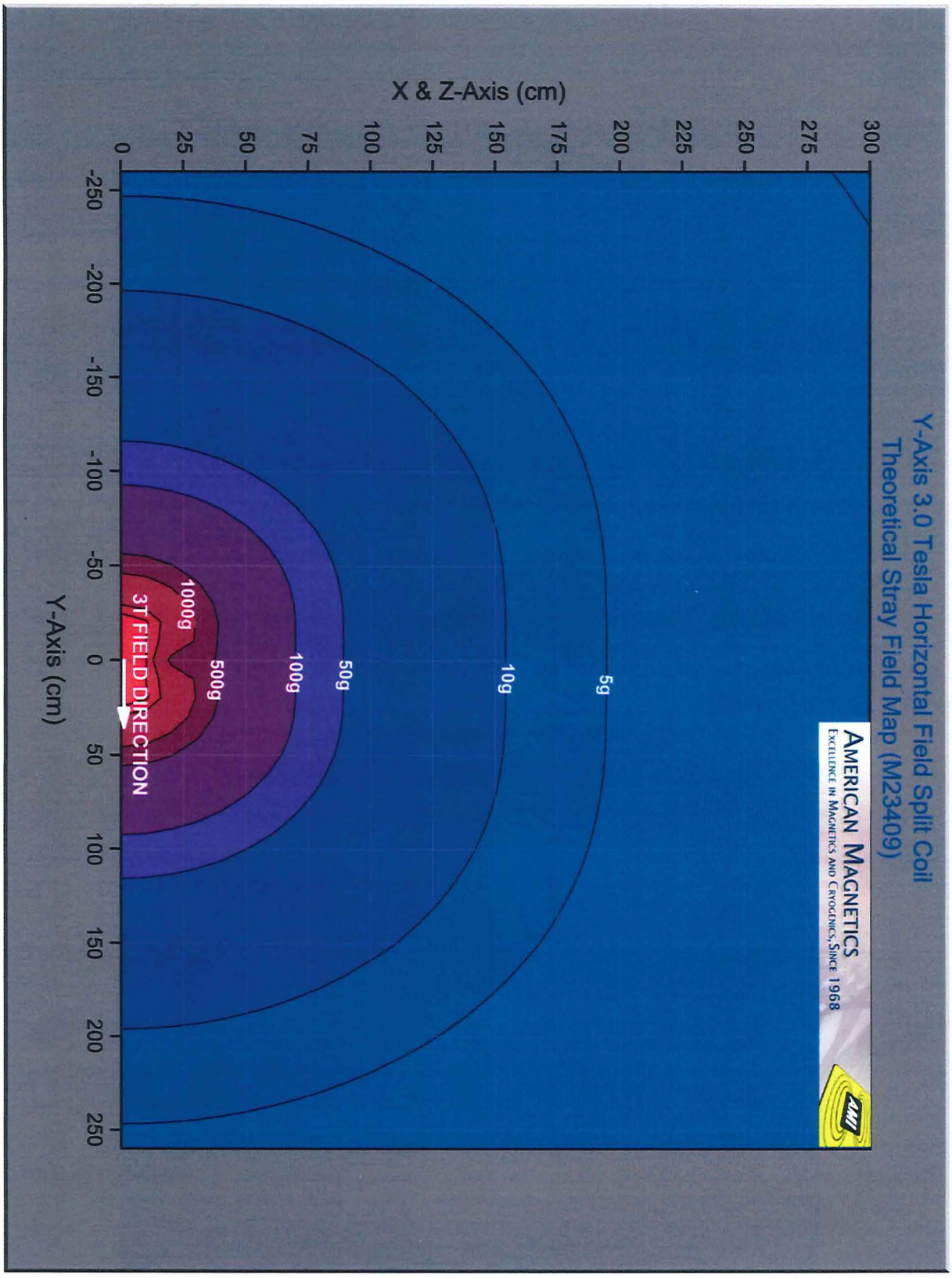


Figure 6 Theoretical stray field map for Y-axis (5g)

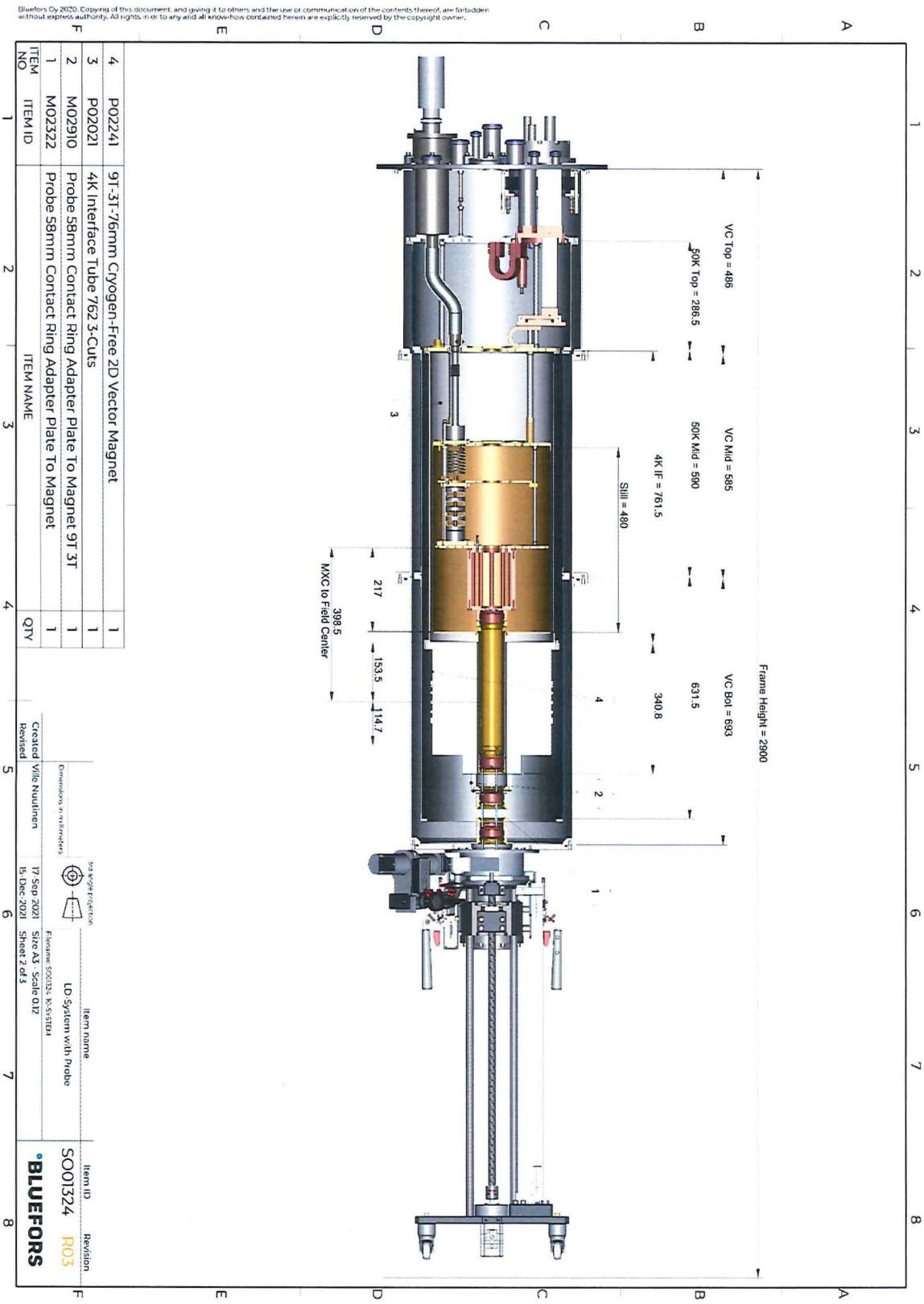


Figure 7 Cryostat layout picture with magnet

2 Performance Test

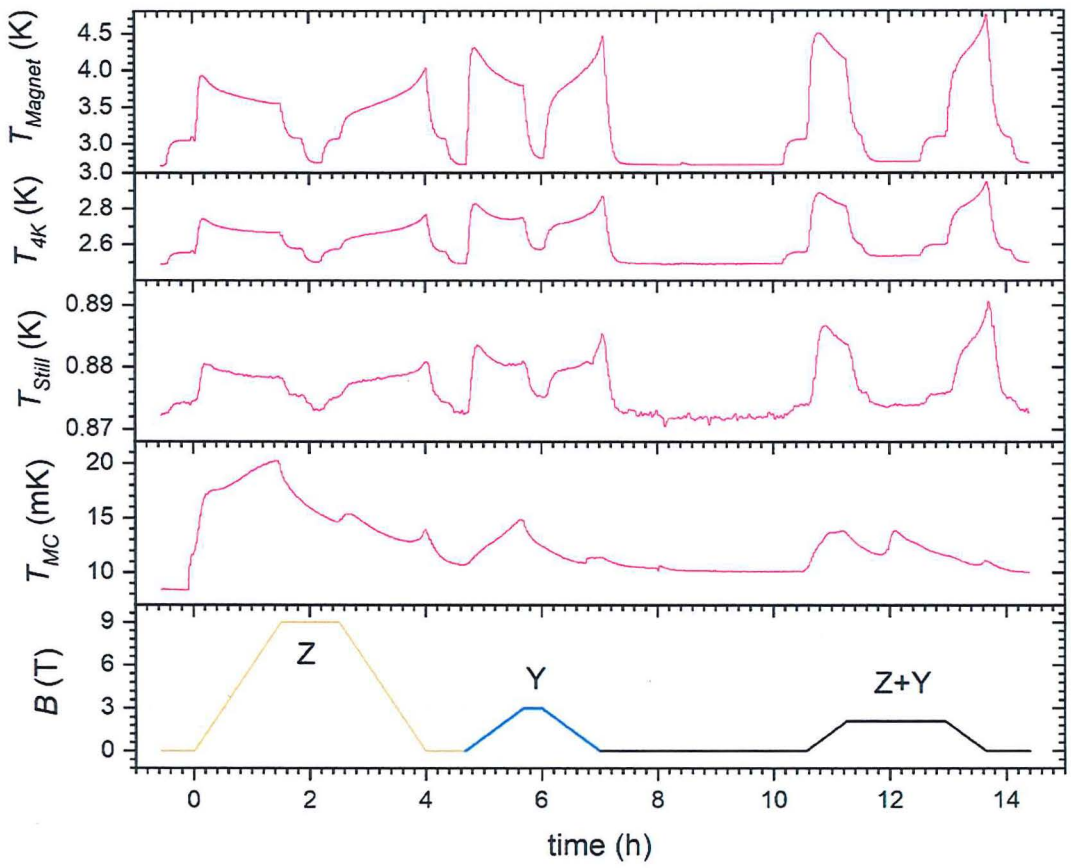


Figure 8 Magnet temperature graph of Z, Y and vector ramp

Ramp rates used:

Sweep rates used:	Individual coils:	Z-axis (9 T):	0,1 T/min
		Y-axis (3 T):	0,05 T/min
	2D-vector:	Y+Z (2.1 T):	0,05 T/min

Date measured: April 29-May 2, 2022

Operator: M. Khan

3 Thermometers and Heaters

3.1.1 Thermometers

Location	Type	S.N.	Cal. Range [Kelvin]	Default channel BFTC[1]	BFTC Excitation
Magnet-main-coil**	Cernox CX-1010	X159196	310 – 0.1	3	200 µV

**NOTE: THERMOMETER MUST SHOW < 4.2 K WHEN OPERATING THE MAGNET

[1] BFTC – Bluefors Temperature Controller

4 Resistor Sensor Calibration

Temperature Sensor X159196 Calibration Report

Sensor Information:

Model	Cernox
Serial Number	X159196
Data format	4 (Log Ohms/Kelvin)
Setpoint limit	325.0 (Kelvin)
Temperature coefficient	1 (Negative)
No. of breakpoints	180

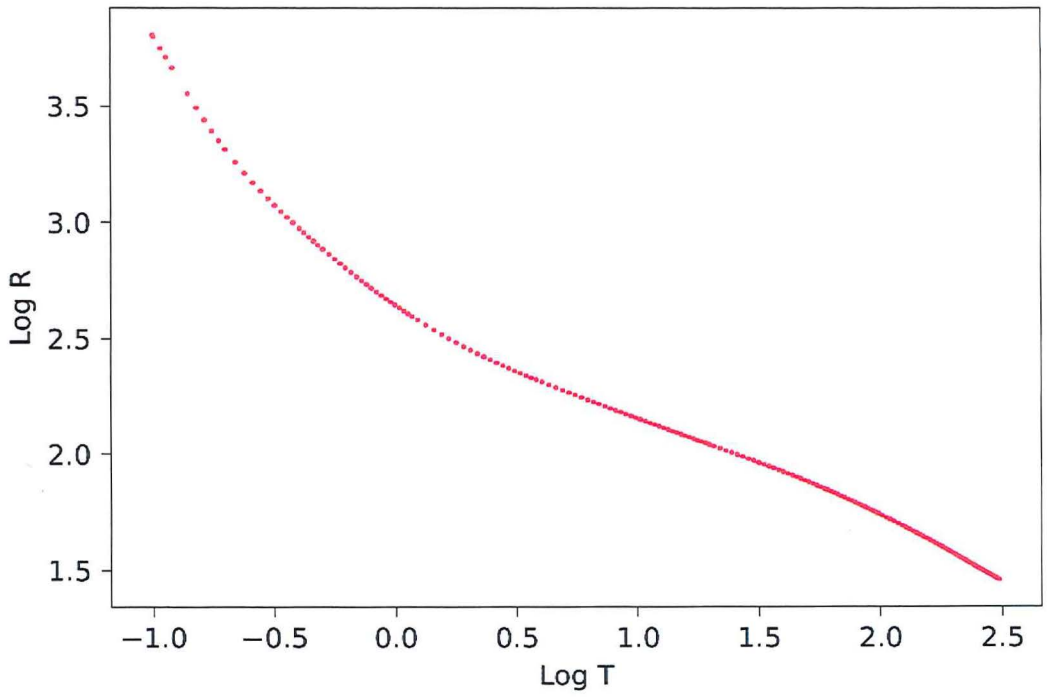
Calibration Instruments

Measurement device:

Model	Bluefors Temperature Controller
Serial number	88
-	

Reference sensors:

Range	Type	Serial Number
308K-200mK	Cernox	X54138
200mK-100mK	Noise thermometer	156



Calibration Date: 22/03/2022

Signature: