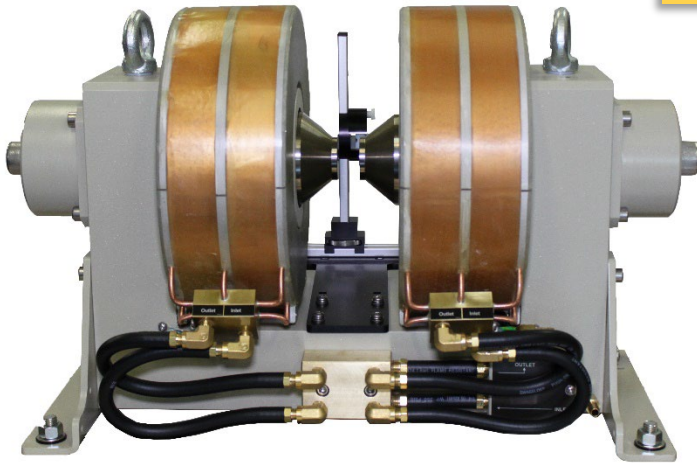


# 5405 Electromagnet



## OVERVIEW

The **5405** dipole electromagnet is a fit, form and function upgrade for the 5403 electromagnet system. This upgrade provides approximately 40% more field for a given pole gap. The 5405 is shipped with a standard set of poles that optimize maximum field, but several pole options are available. GMW can also design custom poles that achieve a specific performance. Poles are interchangeable and are available with an axial access bore.

## Features

- Intermediate Weight at 155kg
- Peak Continuous Fields up to 3T for 15mm Pole Face Diameter at 8mm Gap
- Any Mounting Orientation
- Fast Cycle Times
- Configurable Coils for User Defined Power Supplies

## Applications

- EPR
- FMR
- MOKE

## Options

- Optional Overbar – For Slight Increased Field and Greatly Increased Uniformity. Overbar Has  $\text{\O}40\text{mm}$  Bore for  $1\frac{1}{2}$ " Cryostat or Optical Access.
- Waterflow Switch for Protection.
- Waterflow Meter for Yellow Alert Status.
- Separate Temperature Sensor Circuit for Yellow Alert Status.

**GMW** Associates

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## Model 5405 General Specifications

### Mechanical

Dimensions	600mm W x 322mm D x 355mm H
Weight (excluding hoses and water)	155kg
Standard Pole Face Diameter	3mm, 10mm, 38mm and 76mm
Pole Gap	0 to 86mm
Coil Spacing	86mm

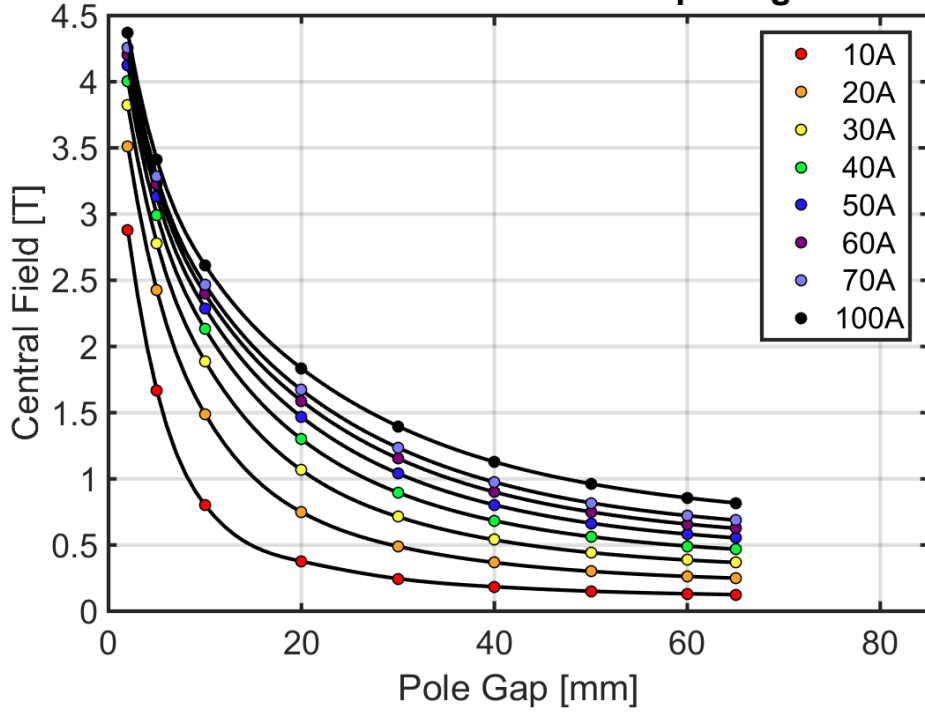
### Coils

Resistance (20°C)	0.84Ω
Max Resistance	1.01Ω
Self Inductance	278mH
Max continuous Power (water)	70A, 70V, 5kW
Max Peak Power (water)	120A, 120V, 14kW
Cooling (water)	8liters/min, 1.0bar (1US GPM, <60psid)
Maximum Pressure	6.7bar (100psid)
Water Fittings	3/8-1/4 NPT

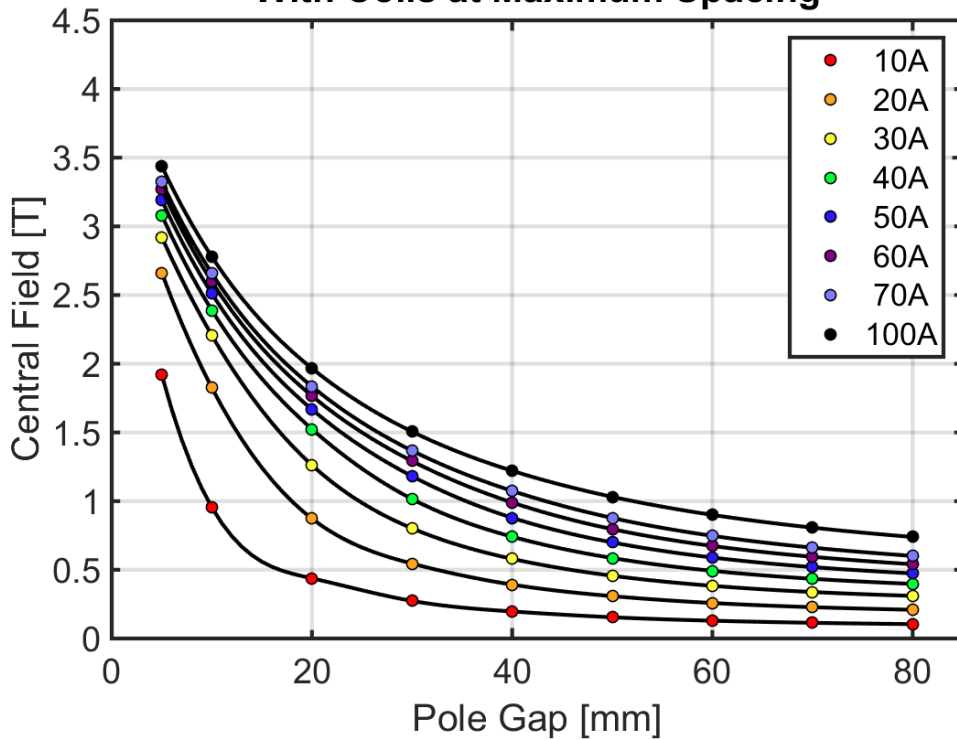
### Safety

Overtemperature Interlock	Airpax 67L-070 thermostat, mounted onto each cooling plate, wired in series. Contacts open above 70°C
Water Flow	GEM flow switch FS927/70823. 0.75GPM

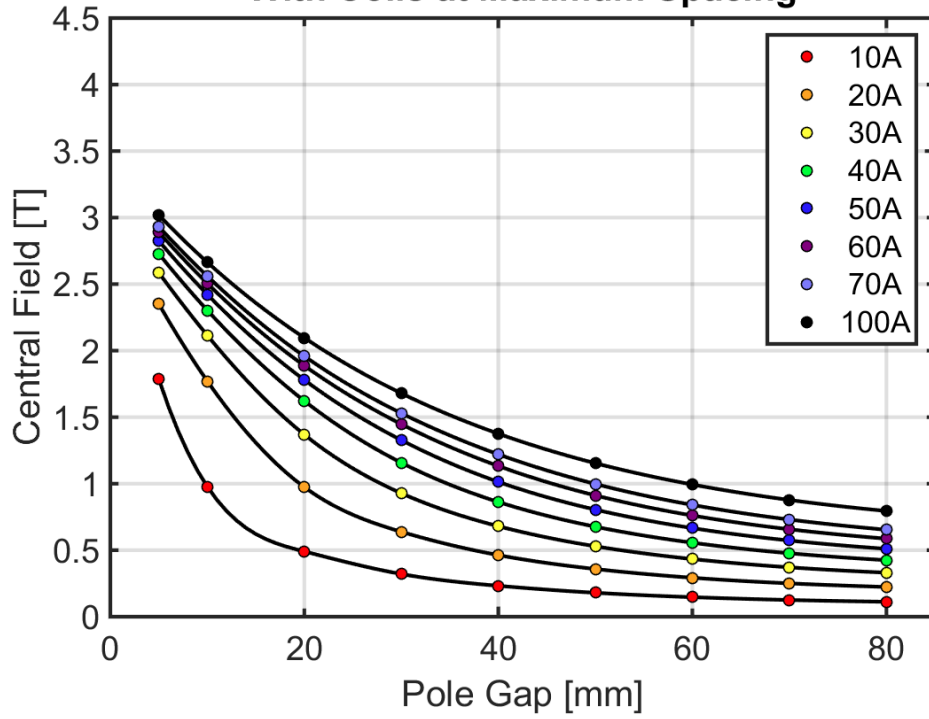
**Modelled Data for 3mm Pole  
With Coils at Maximum Spacing**



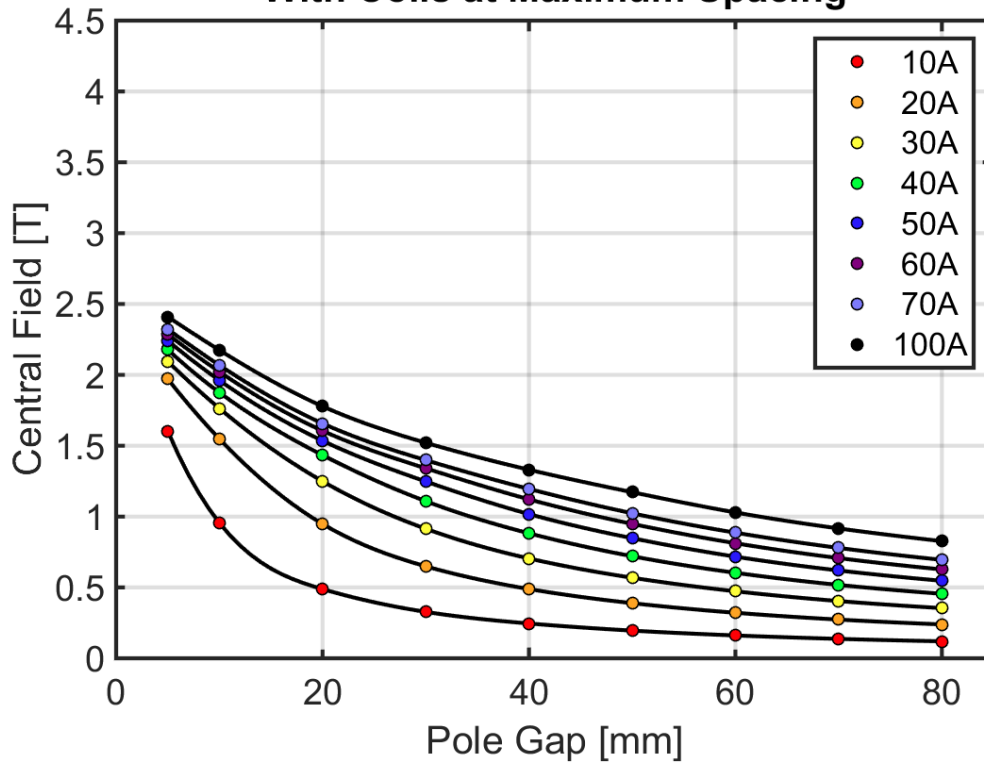
**Modelled Data for 10mm Pole  
With Coils at Maximum Spacing**

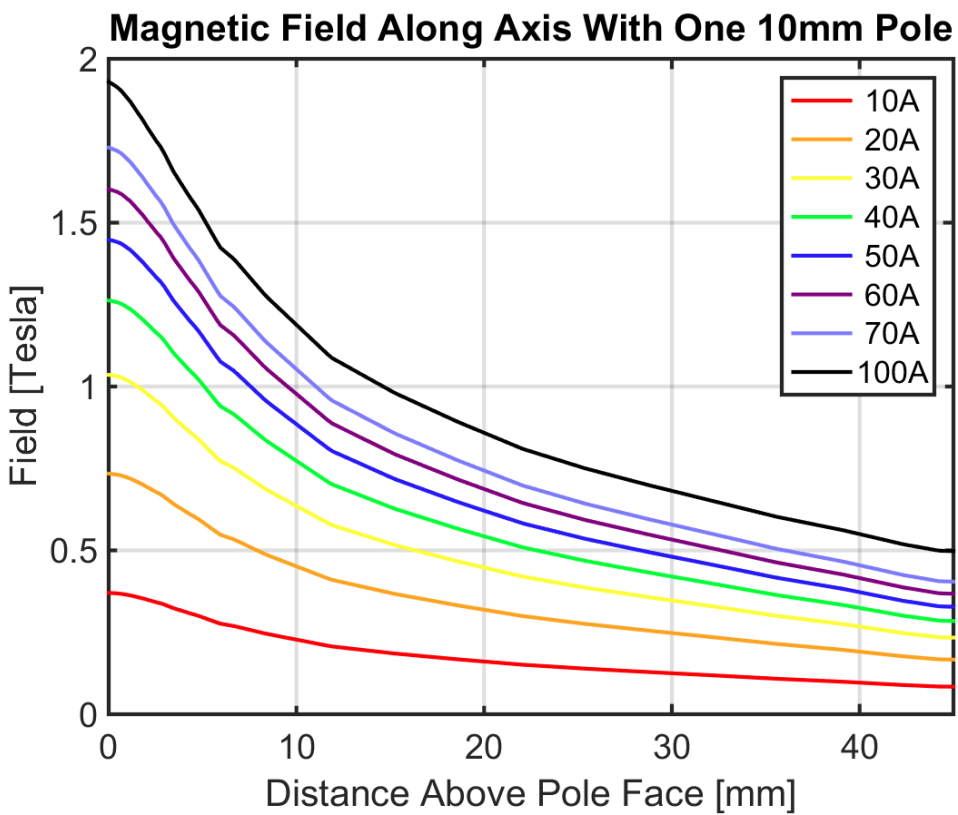
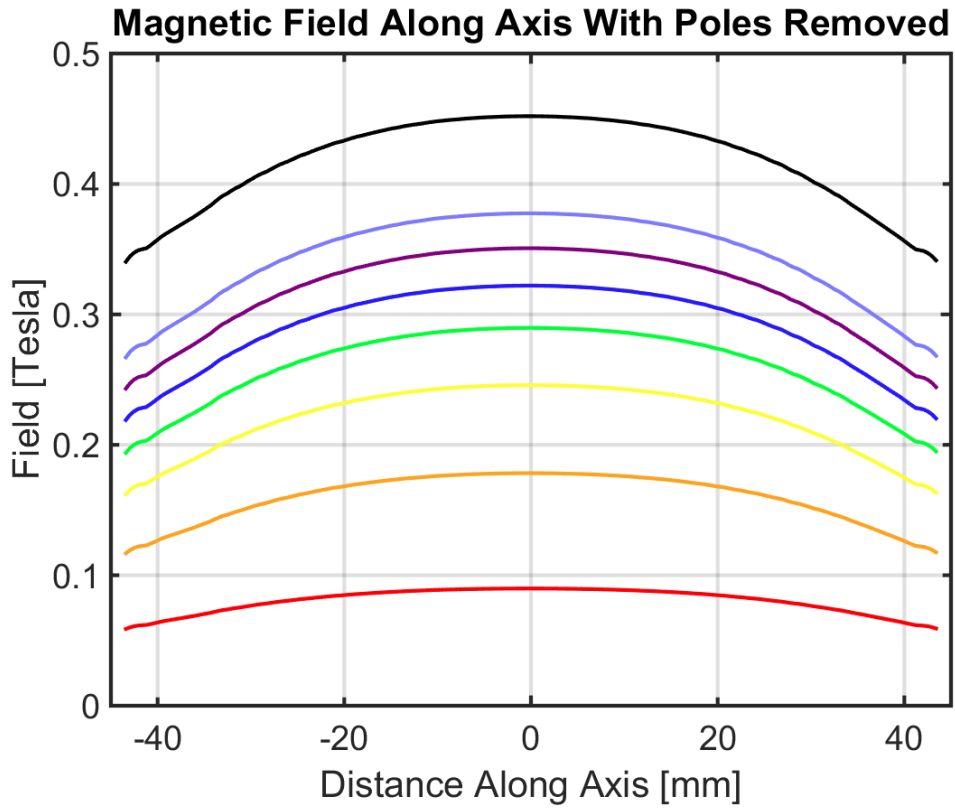


**Modelled Data for 38mm Pole  
With Coils at Maximum Spacing**

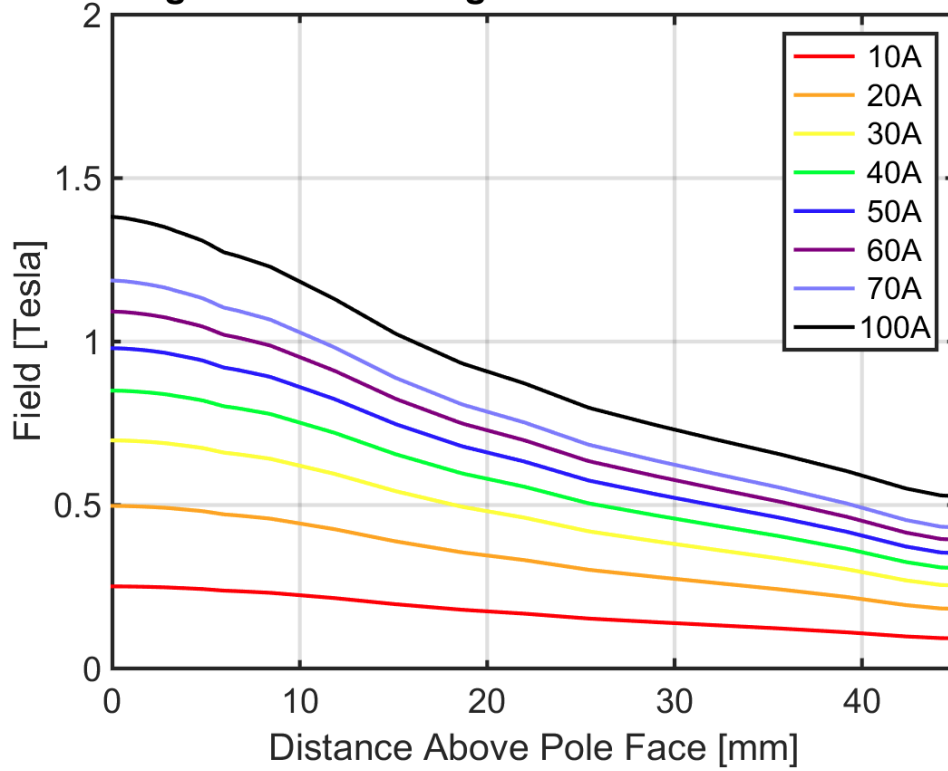


**Modelled Data for 76mm Pole  
With Coils at Maximum Spacing**

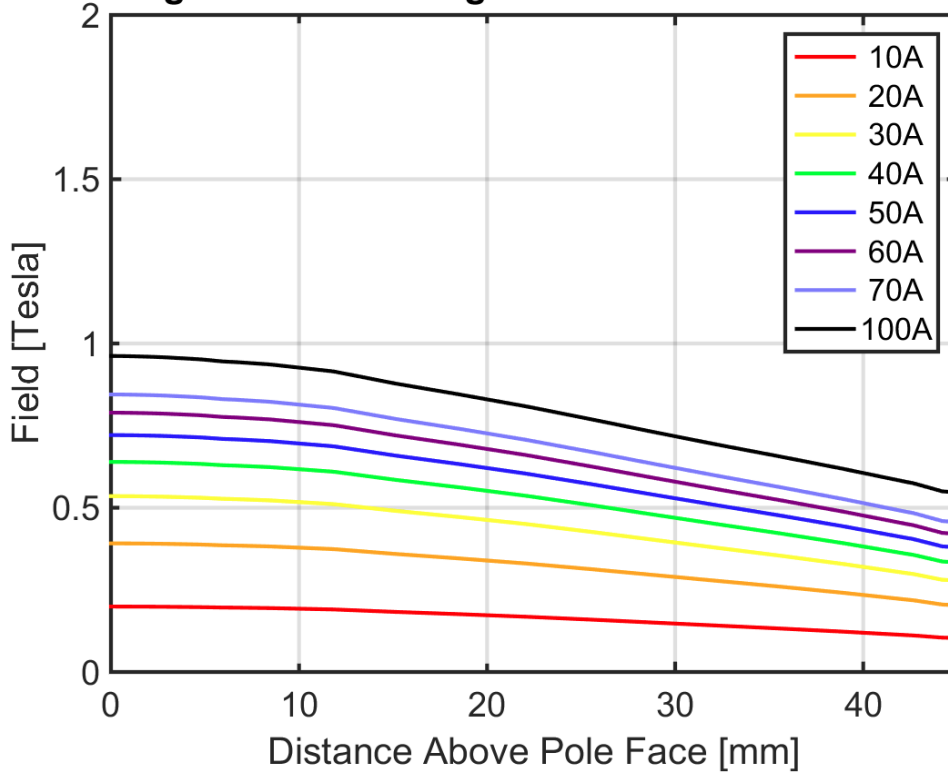




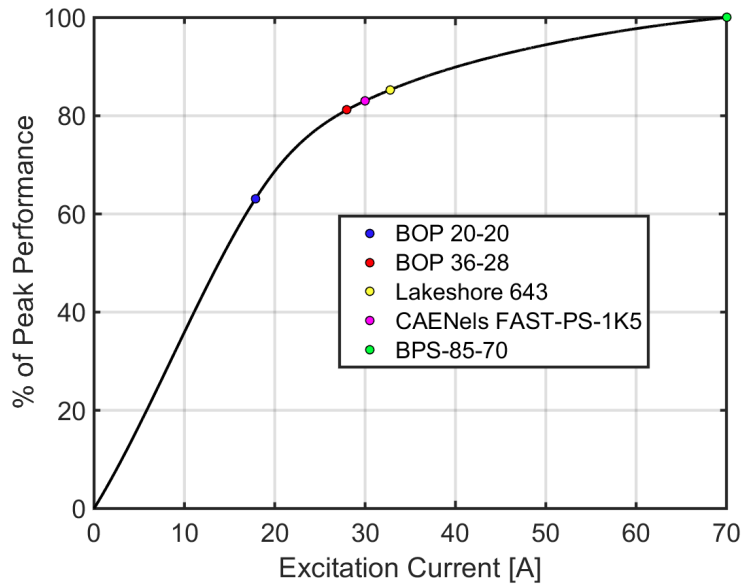
**Magnetic Field Along Axis With One 38mm Pole**



**Magnetic Field Along Axis With One 76mm Pole**



## Percentage of Peak Performance Achieved for Various Power Supplies



### Overbar Option



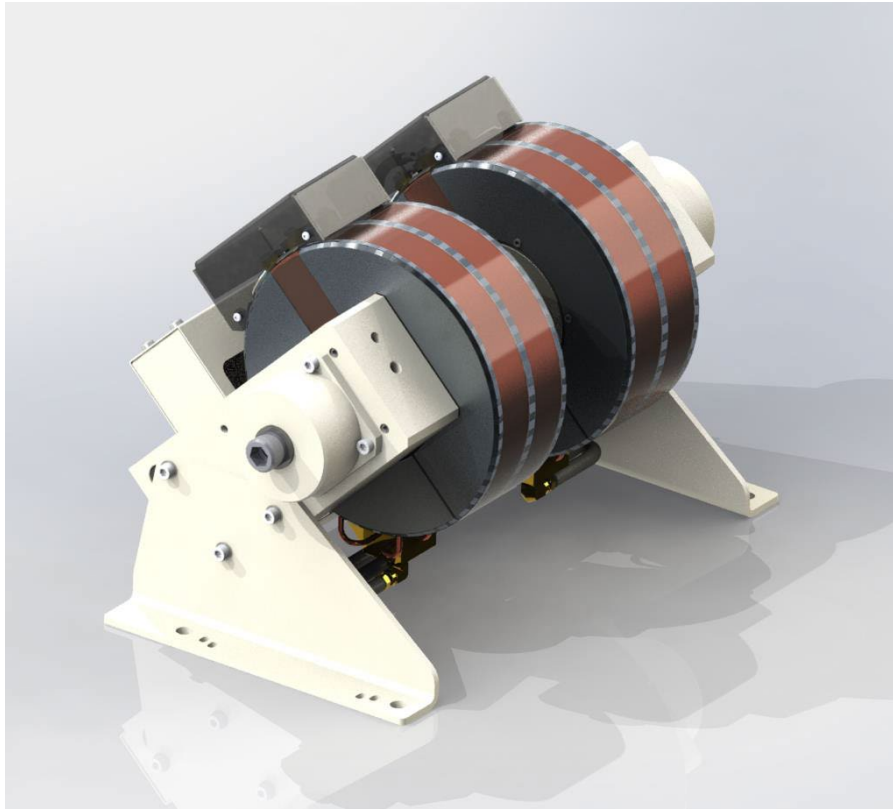
The 5405 includes the option of an overbar configuration. In this configuration, the magnet provides slightly increased field and greatly increased field uniformity in the working region. Note the  $\text{\O}40\text{mm}$  bore in the overbar. This facilitates the integration of the magnet with a  $1\frac{1}{2}$ " cryostat.

## Vertical Mounting Bracket

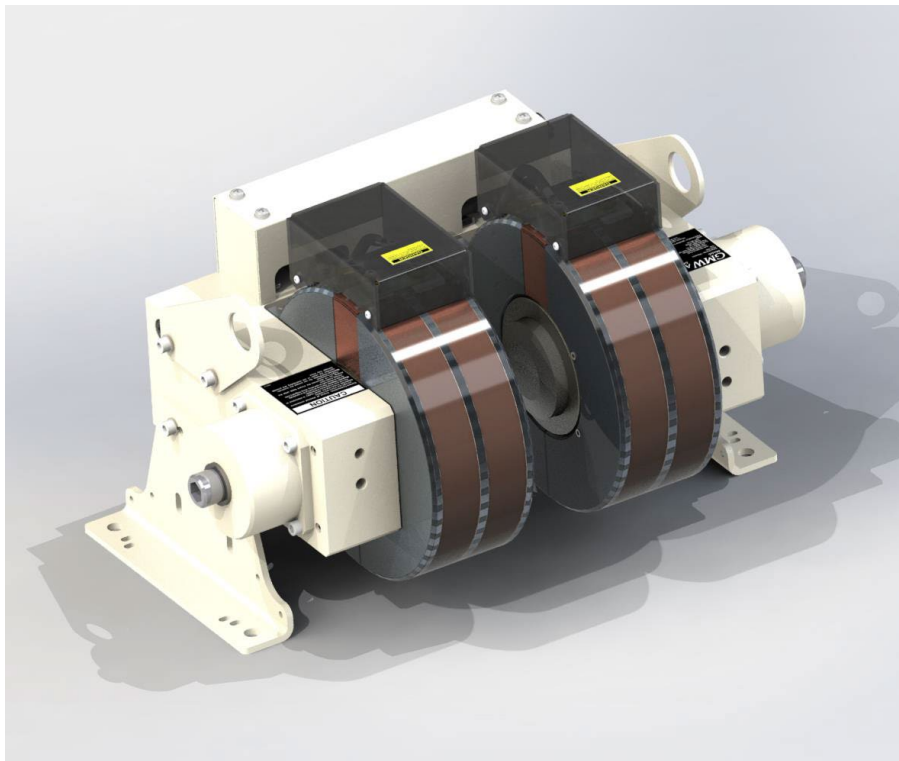




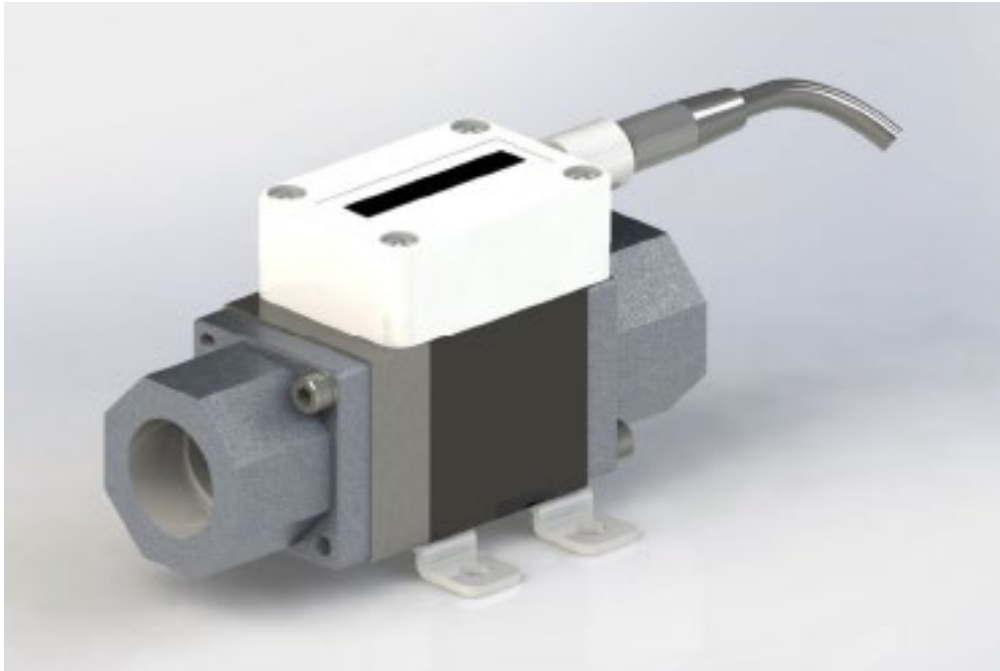
**45° Mounting Bracket**



**90° Mounting Bracket**

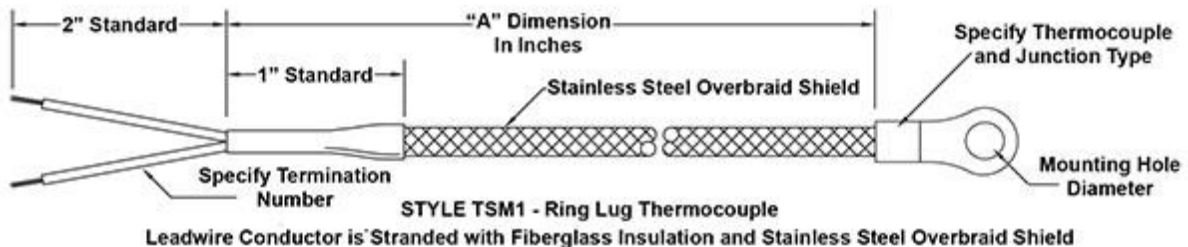


### Flow Meter Option PF3W520-N03-1T-RA-X143\_PF3W



It is often important to be able to identify variations from normal operating procedure. One method for achieving this is to include a flow meter in the return water line. This can present a yellow alert that indicates the system is still operating within acceptable parameters, but the system requires attention. This is critical for continuous duty applications.

### Thermocouple Option TSM1-KG-0363B



For process control a mounting point is provided on each of the four coils that make up the conducting circuit. Thermocouples may be mounted on some or all of these coils to make sure that the magnet system is continually monitored for out-of-normal operation.