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INSTRUMENTATION SCIENTIFIQUE

EA186H

625 Kg 453 x 685 x 732 mm

Gap (mm)	Nominal (T)	Max. (T)
5	4.01	4.14
10	3.34	3.48
20	2.68	2.82
50	1.55	1.78
80	1.01	1.22

INTRODUCTION

The CAYLAR EA186H is an electromagnet with a variety of air gap and pole cap configurations ideal for material studies. Several options are available and custom modifications are possible.

Mechanical	
Weight	625 Kg
Pole Gap	5 to 80 mm
Coil Spacing	>100 mm
Dimensions	453 x 685 x 732 mm

Coils in series	
Nominal current[1]	140 A (7.3 kW - Max 7.7kW)
Max continuous operating current	160 A (9.5 kW - Max 10.3 kW)
Water Cooling	10 L/min
Max coils surface temp.	45 °C
Overtemperature Interlock	70 °C (Inside coils)
Resistance @ 20 -70 °C	0.37 Ω – 0.45 Ω max
Inductance	Approx ~ 290 mH ±15 %

[1] Nominal Current: The nominal current is defined by a good ratio Power / Magnetic Field before too high saturation.

POWER SUPPLY

We recommend the **MPU-55V140A-4Q-10PPM**, ±140A ±55V 7.7kW true 10ppm bipolar 4-quadrant magnet power supply.

OPTIONS

- Special pole caps (cylindrical, conical, drilled poles etc.)
- Chassis, 45° or 90° base, table.
- Rotating base (manual / motorized)
- Custom coils adapted to a power supply
- Custom dimensions, coil space, taped holes...
- AC modulation coils
- Hall or NMR Regulation

APPLICATIONS

- Magneto-optical studies, MOKE
- Magnetic hysteresis studies
- Hall effect studies
- Susceptibility measurements
- Biological studies
- Vibrating Sample Magnetometer (VSM)
- Spin magnetic resonance, NMR
- EPR, ESR spectroscopy
- Ferromagnetic resonance spectroscopy (FMR)

SAS CAYLAR - 14 avenue du Québec - 91140 Villebon-sur-Yvette - FRANCE
VAT : FR55 441 581 618
contact@caylar.net - www.caylar.net - phone : +33 1 69 29 91 62

DatasheetV8
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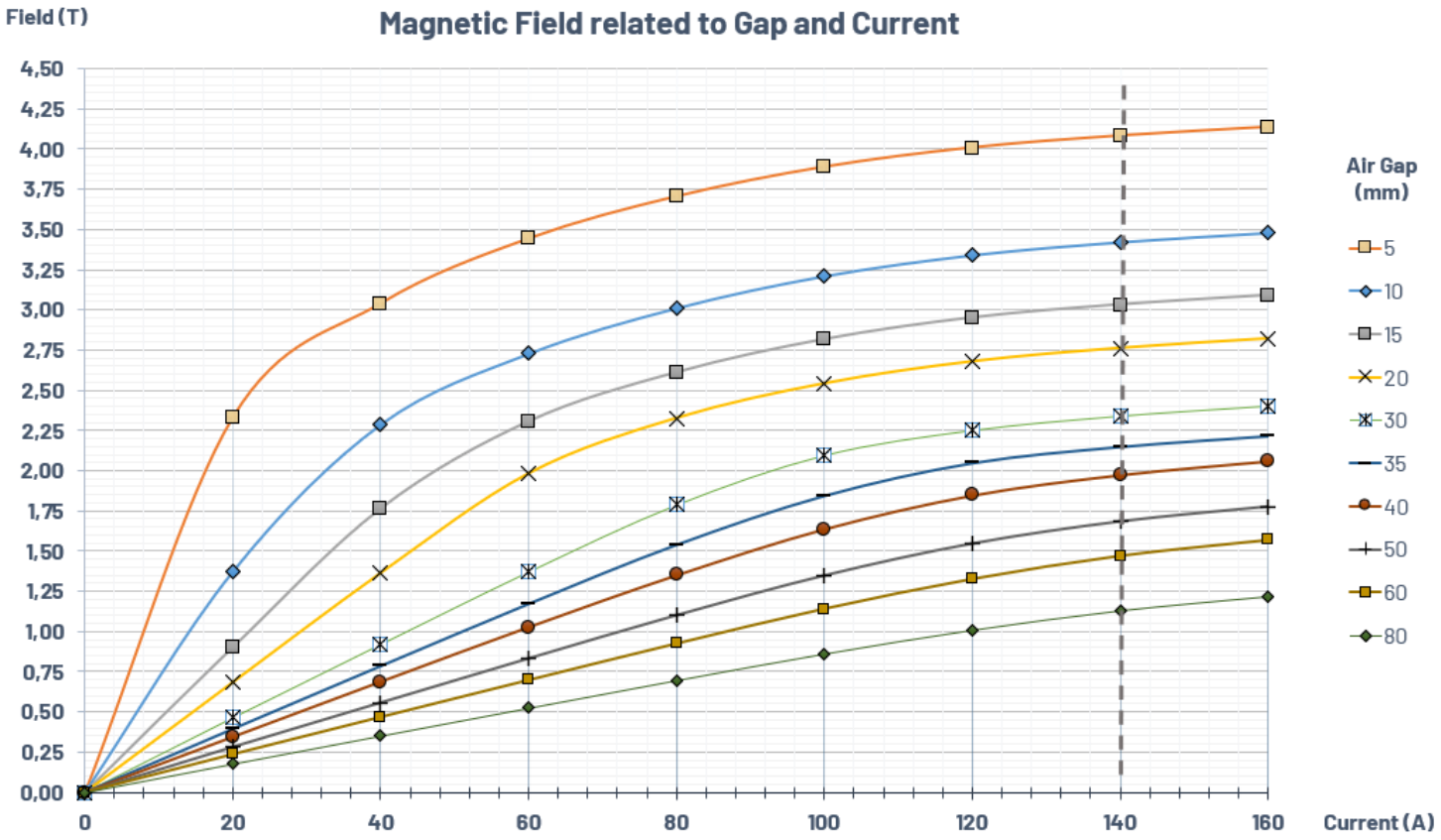

Full data are available on our website

Magnetic fields and uniformities									
Air Gap	Pole Face	B@ 60 A	Uniformity[1]	B @ 120 A	Uniformity[1]	**B @ 140 A**	**Uniformity[1]**	B @ 160 A	Uniformity[1]
5 mm	7 mm	3.89 T	/	4.01 T	/	**4.08 T**	**/**	4.14 T	/
10 mm	12 mm	3.21 T	/	3.34 T	/	**3.42 T**	**/**	3.48 T	/
15 mm	24 mm	2.82 T	1.94 %	2.95 T	1.84 %	**3.03 T**	**1.78 %**	3.09 T	1.74 %
20 mm	34 mm	2.54 T	0.86 %	2.68 T	0.82 %	**2.76 T**	**0.79 %**	2.82 T	0.77 %
30 mm	55 mm	2.10 T	0.46 %	2.25 T	0.44 %	**2.34 T**	**0.42 %**	2.40 T	0.40 %
35 mm	70 mm	1.85 T	0.17 %	2.05 T	0.22 %	**2.15 T**	**0.23 %**	2.22 T	0.23 %
40 mm	80 mm	1.64 T	0.12 %	1.85 T	0.13 %	**1.98 T**	**0.15 %**	2.06 T	0.18 %
50 mm	90 mm	1.35 T	0.11 %	1.55 T	0.12 %	**1.68 T**	**0.12 %**	1.78 T	0.13 %
60 mm	95 mm	1.14 T	0.13 %	1.33 T	0.14 %	**1.47 T**	**0.14 %**	1.57 T	0.14 %
80 mm	100 mm	0.86 T	0.05 %	1.01 T	0.05 %	**1.13 T**	**0.05 %**	1.22 T	0.06 %

[1] Uniformity volume: In a cylinder 1 cm high and 1cm in diameter (coaxial with poles)
<5 % of error on magnetic field value and uniformity

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MAGNETIC FIELD DATA

[1] Normal power: It is the normal power in optimal cooling
[2] Power @ max temp.: Maximum power at the limit (overtemperature interlock switch)
[3] Uniformity volume: In a cylinder 1cm high and 1cm in diameter (coaxial with poles)
[4] Uniformity surface in 1cm in diameter (coaxial with poles)

5 mm Gap / 7 mm Pole face diameter

Current	Magnetic Field	Normal Power[1]	Power @max temp. [2]	Uniformity volume[3]	Uniformity surface[4]
0 A	0.00 T	0.0 W	0.0 W	nc	nc
20 A	2.33 T	155.4 W	161.4 W	nc	nc
40 A	3.04 T	621.7 W	645.6 W	nc	nc
60 A	3.44 T	1398.9 W	1452.7 W	nc	nc
80 A	3.70 T	2486.9 W	2582.5 W	nc	nc
100 A	3.89 T	3885.8 W	4035.2 W	nc	nc
120 A	4.01 T	5595.5 W	5810.7 W	nc	nc
140 A	4.08 T	7616.1 W	7909.0 W	nc	nc
160 A	4.14 T	9945.2 W	10330.1 W	nc	nc

10 mm Gap / 12 mm Pole face diameter

Current	Magnetic Field	Normal Power[1]	Power @max temp. [2]	Uniformity volume[3]	Uniformity surface[4]
0 A	0.00 T	0.0 W	0.0 W	nc	0.00 %
20 A	1.37 T	155.4 W	161.4 W	nc	4.97 %
40 A	2.29 T	621.7 W	645.6 W	nc	4.49 %
60 A	2.73 T	1398.9 W	1452.7 W	nc	3.78 %
80 A	3.01 T	2486.9 W	2582.5 W	nc	3.38 %
100 A	3.21 T	3885.8 W	4035.2 W	nc	3.13 %
120 A	3.34 T	5595.5 W	5810.7 W	nc	2.98 %
140 A	3.42 T	7616.1 W	7909.0 W	nc	2.90 %
160 A	3.48 T	9945.2 W	10330.1 W	nc	2.84 %

15 mm Gap / 24 mm Pole face diameter

Current	Magnetic Field	Normal Power[1]	Power @max temp. [2]	Uniformity volume[3]	Uniformity surface[4]
0 A	0.00 T	0.0 W	0.0 W	0.00 %	0.00 %
20 A	0.90 T	155.4 W	161.4 W	2.49 %	0.69 %
40 A	1.76 T	621.7 W	645.6 W	2.51 %	0.79 %
60 A	2.31 T	1398.9 W	1452.7 W	2.27 %	0.94 %
80 A	2.61 T	2486.9 W	2582.5 W	2.09 %	0.85 %
100 A	2.82 T	3885.8 W	4035.2 W	1.94 %	0.77 %
120 A	2.95 T	5595.5 W	5810.7 W	1.84 %	0.73 %
140 A	3.03 T	7616.1 W	7909.0 W	1.78 %	0.70 %
160 A	3.09 T	9945.2 W	10330.1 W	1.74 %	0.69 %

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20 mm Gap / 34 mm Pole face diameter					
Current	Magnetic Field	Normal Power[1]	Power @max temp. [2]	Uniformity volume[3]	Uniformity surface[4]
0 A	0.00 T	0.0 W	0.0 W	0.00 %	0.00 %
20 A	0.68 T	155.4 W	161.4 W	0.87 %	0.35 %
40 A	1.36 T	621.7 W	645.6 W	0.85 %	0.33 %
60 A	1.98 T	1398.9 W	1452.7 W	0.88 %	0.33 %
80 A	2.33 T	2486.9 W	2582.5 W	0.90 %	0.36 %
100 A	2.54 T	3885.8 W	4035.2 W	0.86 %	0.34 %
120 A	2.68 T	5595.5 W	5810.7 W	0.82 %	0.32 %
140 A	2.76 T	7616.1 W	7909.0 W	0.79 %	0.31 %
160 A	2.82 T	9945.2 W	10330.1 W	0.77 %	0.30 %

30 mm Gap / 55 mm Pole face diameter					
Current	Magnetic Field	Normal Power[1]	Power @max temp. [2]	Uniformity volume[3]	Uniformity surface[4]
0 A	0.00 T	0.0 W	0.0 W	0,00 %	0,00 %
20 A	0.47 T	155.4 W	161.4 W	0,20 %	0,06 %
40 A	0.92 T	597,8 W	645,6 W	0,23 %	0,08 %
60 A	1.37 T	1398.9 W	1452.7 W	0,25 %	0,09 %
80 A	1.79 T	2486.9 W	2582.5 W	0,31 %	0,11 %
100 A	2.10 T	3885.8 W	4035.2 W	0,46 %	0,17 %
120 A	2.25 T	5595.5 W	5810.7 W	0,44 %	0,16 %
140 A	2.34 T	7616.1 W	7909.0 W	0,42 %	0,15 %
160 A	2.40 T	9945.2 W	10330.1 W	0,40 %	0,14 %

35 mm Gap / 70 mm Pole face diameter					
Current	Magnetic Field	Normal Power[1]	Power @max temp. [2]	Uniformity volume[3]	Uniformity surface[4]
0 A	0.00 T	0.0 W	0.0 W	0,00 %	0,00 %
20 A	0.39 T	155.4 W	161.4 W	0,07 %	0,03 %
40 A	0.79 T	621.7 W	645.6 W	0,13 %	0,04 %
60 A	1.17 T	1398.9 W	1452.7 W	0,15 %	0,05 %
80 A	1.54 T	2486.9 W	2582.5 W	0,15 %	0,05 %
100 A	1.85 T	3885.8 W	4035.2 W	0,17 %	0,06 %
120 A	2.05 T	5595.5 W	5810.7 W	0,22 %	0,08 %
140 A	2.15 T	7616.1 W	7909.0 W	0,23 %	0,08 %
160 A	2.22 T	9945.2 W	10330.1 W	0,23 %	0,08 %

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40 mm Gap / 80 mm Pole face diameter					
Current	Magnetic Field	Normal Power[1]	Power @max temp. [2]	Uniformity volume[3]	Uniformity surface[4]
0 A	0.00 T	0.0 W	0.0 W	0,00 %	0,00 %
20 A	0.35 T	155.4 W	161.4 W	0,09 %	0,03 %
40 A	0.69 T	621.7 W	645.6 W	0,11 %	0,04 %
60 A	1.03 T	1398.9 W	1452.7 W	0,12 %	0,04 %
80 A	1.35 T	2486.9 W	2582.5 W	0,12 %	0,04 %
100 A	1.64 T	3885.8 W	4035.2 W	0,12 %	0,04 %
120 A	1.85 T	5595.5 W	5810.7 W	0,13 %	0,05 %
140 A	1.98 T	7616.1 W	7909.0 W	0,15 %	0,05 %
160 A	2.06 T	9945.2 W	10330.1 W	0,18 %	0,06 %

50 mm Gap / 90 mm Pole face diameter					
Current	Magnetic Field	Normal Power[1]	Power @max temp. [2]	Uniformity volume[3]	Uniformity surface[4]
0 A	0.00 T	0.0 W	0.0 W	0,00 %	0,00 %
20 A	0.28 T	155.4 W	161.4 W	0,03 %	0,01 %
40 A	0.56 T	621.7 W	645.6 W	0,10 %	0,03 %
60 A	0.83 T	1398.9 W	1452.7 W	0,11 %	0,04 %
80 A	1.10 T	2486.9 W	2582.5 W	0,11 %	0,04 %
100 A	1.35 T	3885.8 W	4035.2 W	0,11 %	0,04 %
120 A	1.55 T	5595.5 W	5810.7 W	0,12 %	0,04 %
140 A	1.68 T	7616.1 W	7909.0 W	0,12 %	0,04 %
160 A	1.78 T	9945.2 W	10330.1 W	0,13 %	0,04 %

60 mm Gap / 95 mm Pole face diameter					
Current	Magnetic Field	Normal Power[1]	Power @max temp. [2]	Uniformity volume[3]	Uniformity surface[4]
0 A	0.00 T	0.0 W	0.0 W	0,00 %	0,00 %
20 A	0.24 T	155.4 W	161.4 W	0,11 %	0,04 %
40 A	0.47 T	621.7 W	645.6 W	0,12 %	0,04 %
60 A	0.70 T	1398.9 W	1452.7 W	0,13 %	0,04 %
80 A	0.93 T	2486.9 W	2582.5 W	0,13 %	0,05 %
100 A	1.14 T	3885.8 W	4035.2 W	0,13 %	0,05 %
120 A	1.33 T	5595.5 W	5810.7 W	0,14 %	0,05 %
140 A	1.47 T	7616.1 W	7909.0 W	0,14 %	0,05 %
160 A	1.57 T	9945.2 W	10330.1 W	0,14 %	0,05 %

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80 mm Gap / 105 mm Pole face diameter					
Current	Magnetic Field	Normal Power*	Power @max temp. *	Uniformity volume*	Uniformity surface*
0 A	0.00 T	0.0 W	0.0 W	0.00 %	0.00 %
20 A	0.18 T	155.4 W	161.4 W	0.01 %	0.00 %
40 A	0.35 T	621.7 W	645.6 W	0.03 %	0.01 %
60 A	0.52 T	1398.9 W	1452.7 W	0.04 %	0.01 %
80 A	0.70 T	2486.9 W	2582.5 W	0.04 %	0.02 %
100 A	0.86 T	3885.8 W	4035.2 W	0.05 %	0.02 %
120 A	1.01 T	5595.5 W	5810.7 W	0.05 %	0.02 %
140 A	1.13 T	7616.1 W	7909.0 W	0.05 %	0.02 %
160 A	1.22 T	9945.2 W	10330.1 W	0.06 %	0.02 %