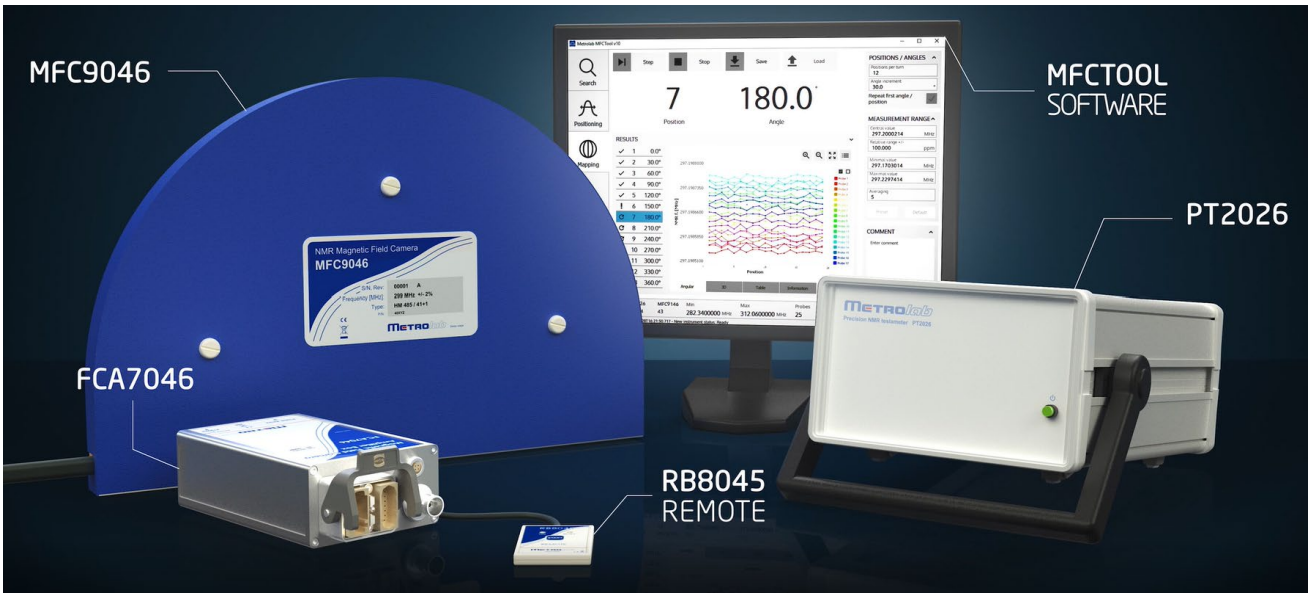
1- KEY SPECIFICATIONS

1-1 DIMENSIONS

PT2026 Main Unit	210 X 125 X 324 mm
FCA7046 Amplifier Box	210 X 61 X 112 mm
MFC9046 Probe-Array	Depends on the customer's request, see below
MFC9146 Probe-Array	Depends on the customer's request, see below



1-2 MEASUREMENT

Measurement principle: pulsed wave Nuclear Magnetic Resonance

Frequency range	1 MHz – 1.1 GHz
Resolution	± 0.1 Hz (stable field, low gradient, no averaging) < 0.01 ppm (10 ppb) in uniform 3 T field
Accuracy	± 5 ppm, independent of temperature
Max gradient	> 1000 ppm/cm
Measurement rate	Up to 33 Hz
Trigger modes	Immediate, Timed, Bus, External

1-3 PT2026 MAIN UNIT RATINGS

PT2026 MFC ready	Basic PT2026 made MFC ready by firmware upgrade
Power	55 VA, 100 – 240 VAC, 50-60 Hz
Overvoltage	Accepts temporary overvoltage occurring on the mains supply—transient overvoltage up to overvoltage category ll levels
Fuse	3.15 A (T), 5x20 mm, 250 V
Environment	Indoor use; no air inlet (IP 50)
Operating temperature	10 – 40 °C
Storage / transport temperature	-25 – 80 °C
Altitude	≤ 2000 m
Relative humidity	Maximum 80 % for temperatures up to 31 °C, decreasing linearly to 50 % relative humidity at 40 °C
Pollution	Pollution degree 2: only non-conductive pollution occurs, except that occasionally a temporary conductivity caused by condensation is to be expected
Magnetic environment	< 0.2 T
Electromagnetic environment	Equipment intended to be used in an industrial electromagnetic environment, class A

1-4 FCA7046 AMPLIFIER BOX RATINGS

Environment	Indoor use; IP 50
Operating temperature	10 – 40 °C
Storage / transport temperature	-25 – 80 °C
Altitude	≤ 2000 m
Relative humidity	Maximum 80 % for temperatures up to 31 °C, decreasing linearly to 50 % relative humidity at 40 °C
Pollution	Pollution degree 2: only non-conductive pollution occurs, except that occasionally a temporary conductivity caused by condensation is to be expected
Magnetic environment	< 1 T
Electromagnetic environment	Equipment intended to be used in an industrial electromagnetic environment, class A
Fixing lugs available upon request	

1-5 MFCTOOL SOFTWARE

Supported platforms	Microsoft Windows 7 or higher
API	Access to all system features; LabVIEW® 2015 SP1
Licenses	Metrolab (including source code for API) National Instruments (LabVIEW® and NI-VISA run-times) Qt 5.12 under GPL and 3-Clause BSD

2- PROBE-ARRAY SPECIFICATIONS

2-1 MFC9046 PROBE-ARRAY RATINGS

Frequency	1 MHz- 1.1 GHz Depends on the magnetic field requested, probe tuning dedicated to one frequency
Magnetic Field Range	Nominal probe-array value ±3% (typical)
Probes on the periphery of the half-moon	Example: 1.5 T probe-array: range => 1.455 T to 1.545 T Sample Ø 2.9 mm, height 3.0 mm, Hydrogen, Synthetic rubber
Sample geometry and material	3.0 T probe-array: range => 2.91 T to 3.09 T Sample Ø 2.9 mm, height 3.0 mm, Hydrogen, Synthetic rubber
Probe-array normalization	The discrepancy between probes placed in the exact same field ≤ ±0.2 ppm Probe-array normalization recommended every 12 months
Magnetic Field Range	Dynamic range of x3 below the nominal probe-array value
Central wide-range probe	Example: 1.5 T probe-array: wide-range probe => 0.5 T to 1.5 T Sample Ø 4.3 mm, height 4.0 mm, Hydrogen, Synthetic rubber
Sample geometry and material	3.0 T probe-array: wide-range probe => 1.0 T to 3.0 T

	Sample Ø 2.9 mm, height 3.0 mm, Hydrogen, Synthetic rubber
Dimensions	DSV from 150 mm up to 600 mm, See below for details
Geometry	Standard sizes and geometries available, customizable on request
Measurement points	Theoretically, up to 255 probes
Position accuracy	Better than ±0.3 mm
Cable Length	4 meters
Environment	Indoor use
Operating temperature	10 – 40 °C
Storage / transport temperature	-25 – 80 °C
Altitude	≤ 2000 m
Relative humidity	Maximum 80 % for temperatures up to 31 °C, decreasing linearly to 50 % relative humidity at 40 °C
Pollution	Pollution degree 2: only non-conductive pollution occurs, except that occasionally a temporary conductivity caused by condensation is to be expected
Electromagnetic environment	Equipment intended to be used in an industrial electromagnetic environment, class A

2-2 MFC9046 PROBE-ARRAY DIMENSIONS

Standard probe-array design

MFC9046 type	DSV (mm)	Number of peripheral probes	Central wide range probe	Dimensions
HM24-300	300	24	✗	237.4 x 29.4 x 324.4 mm
HM24-1-300	300	24	✓	237.4 x 29.4 x 324.4 mm
HM24-400	400	24	✗	287.4 x 29.4 x 424.4 mm
HM24-1-400	400	24	✓	287.4 x 29.4 x 424.4 mm
HM32-400	400	32	✗	287.4 x 29.4 x 424.4 mm
HM32-1-400	400	32	✓	287.4 x 29.4 x 424.4 mm
HM24-450	450	24	✗	312.4 x 29.4 x 474.4 mm
HM24-1-450	450	24	✓	312.4 x 29.4 x 474.4 mm
HM32-450	450	32	✗	312.4 x 29.4 x 474.4 mm
HM32-1-450	450	32	✓	312.4 x 29.4 x 474.4 mm
HM24-500	500	24	✗	337.4 x 29.4 x 524.4 mm
HM24-1-500	500	24	✓	337.4 x 29.4 x 524.4 mm
HM32-500	500	32	✗	337.4 x 29.4 x 524.4 mm
HM32-1-500	500	32	✓	337.4 x 29.4 x 524.4 mm

Other geometries are available on request.

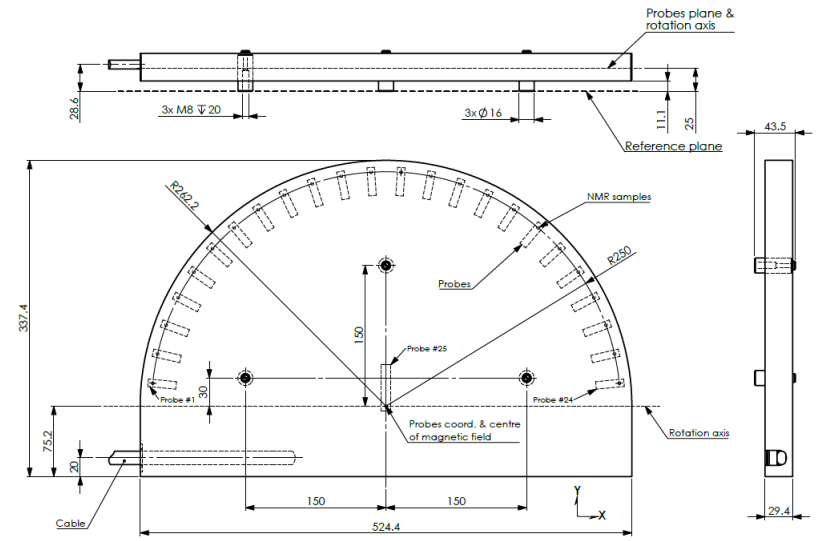
Examples:

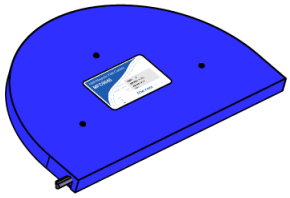
Probe-Array - MFC9046, model (HM24-1-500)

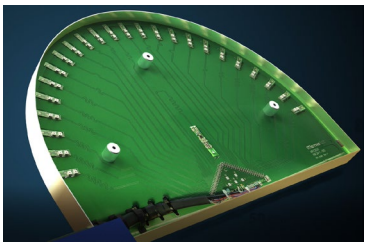
337.4 x 29.4 x 524.4 mm

DSV = 500 mm

24 probes + 1 central wide-range probe





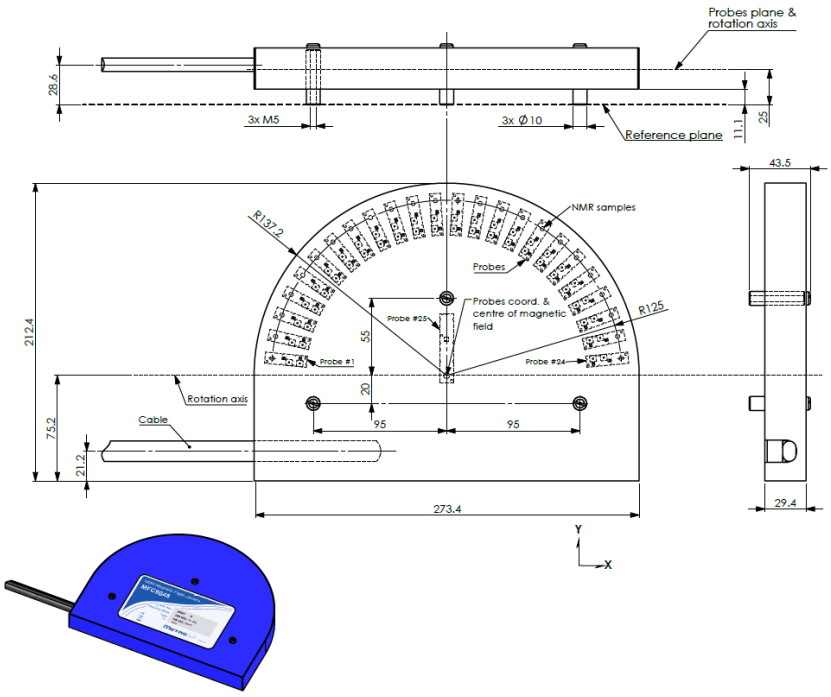


Custom Probe-Array - MFC9046, model HM24-1-250

212.4 x 29.4 x 273.4 mm

DSV = 250 mm

24 probes + 1 central wide-range probe



2-3 PROBE ARRAY MFC9146 RATINGS

Frequency	1 MHz- 1.1 GHz Depends on the magnetic field requested, probe tuning dedicated to one frequency
Magnetic Field Range	Nominal probe-array value ±3% (typical) Example: 1.5 T probe-array: range => 1.455 T to 1.545 T 3.0 T probe-array: range => 2.91 T to 3.09 T
Probe-array normalization	The discrepancy between probes placed in the exact same field ≤ ±0.2 ppm Probe-array normalization recommended every 12 months
Magnetic Field Range Central wide-range probe	Not available
Dimensions	Target cylindrical volume from 10 mm (diameter) X 28 mm (length)
Geometry	Custom geometries No standard sizes
Measurement points	Theoretically, up to 255 probes
Position accuracy	Better than ±0.3 mm
Cable Length	4 meters
Environment	Indoor use
Operating temperature	10 – 40 °C
Storage / transport temperature	-25 – 80 °C
Altitude	≤ 2000 m
Relative humidity	Maximum 80 % for temperatures up to 31 °C, decreasing linearly to 50 % relative humidity at 40 °C
Pollution	Pollution degree 2: only non-conductive pollution occurs, except that occasionally a temporary conductivity caused by condensation is to be expected
Electromagnetic environment	Equipment intended to be used in an industrial electromagnetic environment, class A

Example:

MFC9146 manufactured for HTS-110 400 MHz NMR spectrometer magnet:

https://www.metrolab.com/bringing-a-cryogen-free-400-mhz-hts-nmr-spectrometer-into-a-chemistry-lab-a-discussion-with-maria-silva-elipe/