

# Matrix Magnets

## ROOM TEMPERATURE SHIMS TYPE 3, 18 CHANNEL, OD 89mm, ID 73mm TECHNICAL SPECIFICATIONS

### To Suit Oxford Instruments and Varian Legacy Magnets 200/89, 300/89, 400/89/AS

A range of room temperature (RT) shims for high resolution NMR spectroscopy.

These RT shims are specially configured for legacy magnets manufactured by Oxford Instruments, Varian and Agilent Technologies.

#### Technical Description

With an outside diameter of 89mm and inside diameter 73mm, these RT shims have 18 independent channels with strengths suitable for shimming magnets and probes used for high resolution, solid state NMR spectroscopy, including MAS experiments.

The shims are designed to improve the magnet homogeneity by correcting residual gradients in magnetic field left over from the magnet after supercon shimming as well as those introduced by probe imperfections. The strengths and purities of the RT shims are optimized over a cylindrical sample region, 20 mm high by 30 mm diameter. The shims are 'pure' shims of the type pioneered by Oxford Instruments, with each channel designed to make corrections to a single term in the Legendre expansion describing the field variation inside the cylindrical volume. Pure RT shims are equally well suited to automated and manual shimming processes and can deliver superlatively narrow experimental linewidths, even on difficult-to-shim samples.

Other details include:

- Black colour
- Air-cooled via 4 mm O/D tube
- Two fixing screws to attach assembly to cryostat
- All 5 probe fixing holes on legacy 300/89 shims preserved without modification
- Lead is demountable from stock
- Plug-in lead with 64-way connector
- All aluminium stock
- Interchangeable without extensive re-shimming
- Repeatable on strength, polarity and position between shim sets
- Maximum shim heating load set at 8 W

The 64-way lead is made from RF Shielded cable in 28 AWG wire and is colour black.

Ref. 89mm Type3 188973 Version 003 Issue B Mar 1995 Apr 2003.

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## Parts List

Item No	Description	No. off
1	300/89 RT shim	1
2	64-way RT shim cable	1
3	Nylon tube 4 mm OD	1
4	M5 brass studding (10 cm length)	2
5	M5 brass studding	2
6	1 mm RT shim spacer	2
7	2 mm RT shim spacer	2
8	4 mm RT shim spacer	2
9	8 mm RT shim spacer	2
10	Tube adaptor	1
11	Room temperature shim manual	1

## Channel Specifications

All strengths quoted in deuterium Hz (DHz)

Axial shim strengths quoted on radius R0 = 10 mm at maximum operating current

Transverse shim strengths quoted on 20 mm long by 30 mm diameter cylinder at maximum operating current

Nominal lead resistance is 2.8 ohms for 6.5 metres.

## Axial shims

Shim	Maximum Strength (DHz)	Resistance (ohms)	Tolerance (DHz)	Maximum Operating Current (A)
Z0	2920	258	± 10	0.05
Z1	316	12.9	± 1	0.20
Z2	126	47.5	± 3	0.20
Z3	21	20.3	± 2	0.20
Z4	7.4	43.0	± 3	0.20
Z5	0.86	47.5	± 3	0.20

## Transverse shims

Shim	Maximum Strength (DHz)	Resistance (ohms)	Tolerance (DHz)	Maximum Operating Current (A)
X	578	1.5	± 0.4	1.5
ZX	157	1.6	± 0.4	1.5
C2	139	0.7	± 0.4	1.5
Z2X	110	2.6	± 0.4	1.5
ZC2	261	3.4	± 0.4	1.5
C3	196	3.5	± 0.4	1.5

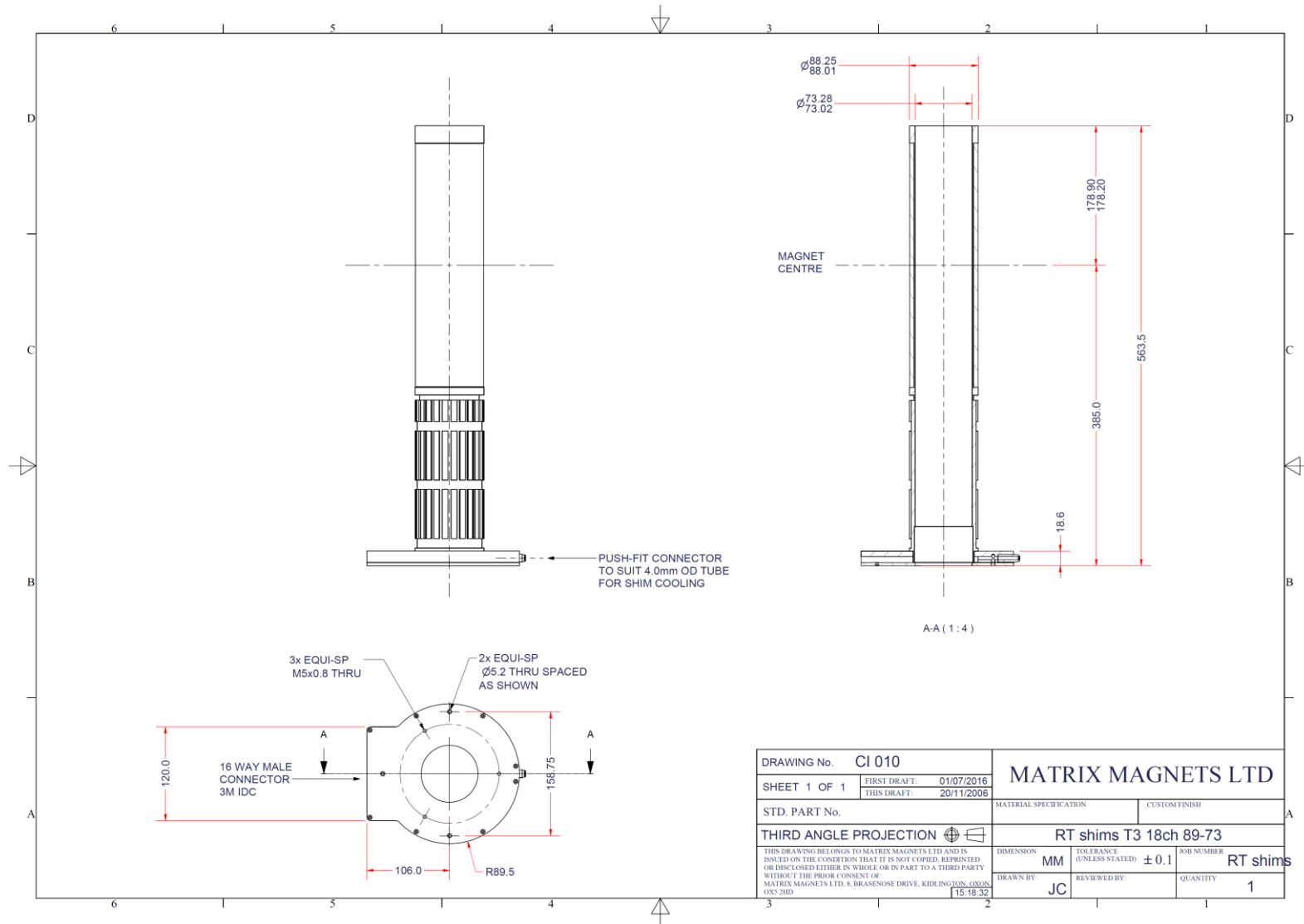
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## Pin Connections for 18 Channels 64-Way Strip Connector

64 WAY CONNECTOR	SHIM TYPE	SENSE	64 WAY CONNECTOR	SHIM TYPE	SENSE
B1 = 1	Z0	+ VE	B17 = 33	ZC2	+ VE
A1 = 2	Z0	- VE	A17 = 34	ZC2	- VE
B2 = 3	Z1	+ VE	B18 = 35	ZS2	+ VE
A2 = 4	Z1	- VE	A18 = 36	ZS2	- VE
B3 = 5	Z2	+ VE	B19 = 37	C3	+ VE
A3 = 6	Z2	- VE	A19 = 38	C3	- VE
B4 = 7	Z3	+ VE	B20 = 39	S3	+ VE
A4 = 8	Z3	- VE	A20 = 40	S3	- VE
B5 = 9	Z4	+ VE	B21 = 41		
A5 = 10	Z4	- VE	A21 = 42		
B6 = 11	Z5	+ VE	B22 = 43		
A6 = 12	Z5	- VE	A22 = 44		
B7 = 13	NOT CONNECTED	+ VE	B23 = 45		
A7 = 14	NOT CONNECTED	- VE	A23 = 46		
B8 = 15	NOT CONNECTED	+ VE	B24 = 47		
A8 = 16	NOT CONNECTED	- VE	A24 = 48		
B9 = 17	X	+ VE	B25 = 49		
A9 = 18	X	- VE	A25 = 50		
B10 = 19	Y	+ VE	B26 = 51		
A10 = 20	Y	- VE	A26 = 52		
B11 = 21	ZX	+ VE	B27 = 53		
A11 = 22	ZX	- VE	A27 = 54		
B12 = 23	ZY	+ VE	B28 = 55		
A12 = 24	ZY	- VE	A28 = 56		
B13 = 25	C2	+ VE	B29 = 57		
A13 = 26	C2	- VE	A29 = 58		
B14 = 27	S2	+ VE	B30 = 59		
A14 = 28	S2	- VE	A30 = 60		
B15 = 29	Z2X	+ VE	B31 = 61		
A15 = 30	Z2X	- VE	A31 = 62		
B16 = 31	Z2Y	+ VE	B32 = 63		
A16 = 32	Z2Y	- VE	A32 = 64		

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## CUSTOMER INTERFACE DRAWING



DRAWING No. CI 010		MATRIX MAGNETS LTD	
SHEET 1 OF 1	FIRST DRAFT: 01/07/2016 THIS DRAFT: 20/11/2006		
STD. PART No.		MATERIAL SPECIFICATION	CUSTOM FINISH
THIRD ANGLE PROJECTION		RT shims T3 18ch 89-73	
THIS DRAWING BELONGS TO MATRIX MAGNETS LTD AND IS ISSUED ON THE CONDITION THAT IT IS NOT COPIED, REPRINTED OR DISCLOSED EITHER IN WHOLE OR IN PART TO A THIRD PARTY WITHOUT THE PRIOR CONSENT OF MATRIX MAGNETS LTD, 8, BRASENOSSE DRIVE, KIDLINGTON, OXON, OX5 2HD		DIMENSION	TOLERANCE (UNLESS STATED) $\pm 0.1$
		MM	JOB NUMBER RT shims
		DRAWN BY: JC	REVIEWED BY:
			QUANTITY 1
		15/18/32	