

	Supply of Tuneable YIG Band Pass Filter and Tuneable YIG source along with Driver	Tender No. I-I/ET/GTE/26006/26-27
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Title	Tender No. I-I/ET/GTE/26006/26-27 for Supply of Tuneable YIG Band Pass Filter and Tuneable YIG source along with Driver
Subtitle	PART-I: Scope of Supply, Scope of Work, Technical Specifications and Essential Eligibility Criteria



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1 Introduction

Institute for Plasma Research (IPR) is a premiere research institute pursuing research on plasma science and technology in India. ITER-India is the Indian domestic agency (IN-DA), a centre of IPR, is responsible for Indian in-kind commitments to ITER international project (<https://www.iter.org>). As a part of IN-DA deliverables, ITER-India needs to design, develop and deliver a Radiometer to ITER as Electron Cyclotron Emission (ECE) diagnostic system instrument. The ECE diagnostic is dedicated for measuring plasma electron temperature profile with good spatial and temporal resolution. For tuning IF frequency of the Radiometer, we need a tuneable YIG band pass filter along accessories.

The purpose of this tender is to supply YIG tuneable band pass filter and YIG tuneable source with required drivers for prototype radiometer work. These components will be used at ITER-India, IPR, India. Detailed technical specifications and requirements are provided in this document to enable the manufacturers/ suppliers, to submit their bids with complete details, complying ITER-India requirements.

2 Scope of Supply

The scope of supply by the supplier includes the following:

Sr. no	Deliverables	Qty
1	YIG tuneable filter with driver electronics, interface cables, and all accessories required for operation	1
2	YIG tuneable source with driver electronics, interface cables, and all accessories required for operation	1
3	Operation/Instruction manuals and data sheet	1 set (hard and soft copy)
4	Calibration chart for YIG tuneable filter	1 set (hard and soft copy)

3 General Requirements

1. The YIG tuneable band-pass filter and YIG tuneable source shall be supplied including compatible driver electronics, interface cables, and all accessories necessary for operation and control.
2. The system shall support stable and repeatable frequency tuning over the specified operating range.

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3. All necessary accessories required for operation shall be included in the supply.
4. Operation manuals and technical documentation shall be provided in English.

4 Technical Specifications

The required technical specifications are given in below table:

Table 1 YIG tunable band- pass filter with driver electronics Quantity = 1

Sr. No.	Parameters	Value	Unit
1	Frequency range	3.75 to 20	GHz
2	3-dB Bandwidth	Nominally 100 to 300	MHz
3	Frequency Accuracy	± 35 or better	MHz (excluding hysteresis)
4	Insertion Loss	≤ 7	dB
5	Passband Ripple	≤ 2	dB
6	Passband VSWR	$\leq 2.0 : 1$	-
7	Off Resonance Isolation	≥ 60	dB
8	Off Resonance Spurious	≥ 40	dB
9	Limiting Level or saturation level	$\geq +5$	dBm
10	Power handling capability or No permanent damage level	$\geq +20$	dBm
11	Linearity	± 18 or better	MHz
12	Hysteresis	≤ 25	MHz
13	Tuning speed	≤ 600	$\mu\text{Sec} / \text{GHz}$ over any 2 GHz span of its operating frequency range.
14	Connector	SMA, 50 Ω	-
15	Operation and control	Compatible driver electronics, interface cables, and all accessories necessary for remote operation and control.	

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Table 2 . A compatible YIG tunable Oscillator with driver electronics for testing YIG tunable filter. Quantity = 1

Sr. No.	Parameters	Value	Unit
1	Frequency range	2 to 20	GHz
2	Power Output	$\geq +9$	dBm
3	Power Output Variation	$\leq \pm 3$	dB
4	Power in Harmonics (2nd / 3rd)	$\leq -12/-15$	dBc
5	Spurious Output	≤ -70	dBc
6	Phase Noise @ 100 kHz offset	≤ -110	dBc/Hz
7	Frequency Tuning Accuracy (after calibration)	± 20 or better	MHz
8	Connector	SMA, 50 Ω	-
9	Operation and control	Compatible driver electronics, interface cables, and all accessories necessary for remote operation and control.	

5 Other requirements

- All Standard accessories required for the operation of the Filter and the source shall be specified in the bid.
- Any precaution and warning taken during operation should be mentioned in the operation manuals.
- Operating Environment: Ambient Temperature +18 to +30 °C; relative humidity $\leq 85\%$
- Available utility power supply at site: 240 V AC, 50 Hz. Equipment shall be compatible with this supply.

6 Acceptance test criterion (FAT&SAT)

6.1 Factory Acceptance Test (FAT)

Datasheet of the specifications listed in Table 1 and Table 2 along with calibration chart have to be sent to ITER-India by the supplier before pre-dispatch. Dispatch clearance will be given when the submitted documents are found as per technical compliance.

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6.2 Site Acceptance Test (SAT)

At ITER-India lab, the following tests will be carried out using available measurement setup at ITER-India Lab for final acceptance:

1. Insertion loss of the filter
2. Output power of the oscillator
3. Tests for tuning speed subject to the availability of resources at ITER-India lab.

The measurements shall be used to verify the functionality of the supplied items.

Support from the supplier or their representative may be provided, if required. After successful testing at ITER-India, final acceptance will be given.

7 Eligibility Criteria

Essential Eligibility Criteria	Documentary evidence
Supplier must be an Original Equipment Manufacturer (OEM) / Authorized Dealer or Distributor of OEM of YIG Filter/Source	Bidder shall provide documentary evidence i.e. Product Catalogue along with Self Declaration in case of OEM of YIG Filter/Source or valid authorization certificate from OEM in case of Dealer or distributor of OEM of YIG Filter/Source.

Annexure -A: Technical Compliance Sheet

Clause No.	Description				Bidder Compliance (Yes/No)
2	Scope of Supply				
3	General Requirements				
4	Technical Specifications				
	Table:1 YIG tunable band- pass filter with driver electronics				
	Sr. No.	Parameters	Value	Unit	
	1	Frequency range	3.75 to 20	GHz	
	2	3-dB Bandwidth	Nominally 100 to 300	MHz	
	3	Frequency Accuracy	± 35 or better	MHz (excluding hysteresis)	
	4	Insertion Loss	≤ 7	dB	
	5	Passband Ripple	≤ 2	dB	
	6	Passband VSWR	$\leq 2.0 : 1$	-	
	7	Off Resonance Isolation	≥ 60	dB	
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	9	Limiting Level or saturation level	$\geq +5$	dBm	
	10	Power handling capability or No permanent damage level	$\geq +20$	dBm	
	11	Linearity	± 18 or better	MHz	
	12	Hysteresis	≤ 25	MHz	
	13	Tuning speed	≤ 600	$\mu\text{Sec} / \text{GHz}$ over any 2 GHz span of its operating frequency range.	
	14	Connector	SMA, 50 Ω	-	
	15	Operation and control	Compatible driver electronics, interface cables, and all accessories necessary for remote operation and control.		

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Table:2 A compatible YIG tunable Oscillator with driver electronics for testing YIG tunable filter.				
Sr. No.	Parameters	Value	Unit	
1	Frequency range	2 to 20	GHz	
2	Power Output	$\geq +9$	dBm	
3	Power Output Variation	$\leq \pm 3$	dB	
4	Power in Harmonics (2nd / 3rd)	$\leq -12/-15$	dBc	
5	Spurious Output	≤ -70	dBc	
6	Phase Noise @ 100 kHz offset	≤ -110	dBc/Hz	
7	Frequency Tuning Accuracy (after calibration)	± 20 or better	MHz	
8	Connector	SMA, 50 Ω	-	
9	Operation and control	Compatible driver electronics, interface cables, and all accessories necessary for remote operation and control.		
5	Other requirements			
6	Acceptance test criterion (FAT&SAT)			
7	Document evidence to compliance to Essential Eligibility Criteria provided			

Bidder Signature		
Name of the signatory & Title	Name	Title
Bidder's Official seal		
Place & Date	Place	DD-MM-YYYY