



Department of Aerospace Engineering
Indian Institute of Technology Madras
Chennai – 600 036, India

Prof.K.BHASKAR
Head of the Department

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REF.NO. ASE/2012 /SRCH/ MFC

Dated: 06-07-2012

DUE DATE: 20/07/2012

Dear Sir,

1. Quotations are invited in duplicate for the various items **shown below**/overleaf/enclosed list.
2. The quotations are to be **in two parts** as
Technical Offer and as Commercial offer:
The two parts of the offer are to be clearly marked on the envelopes. The two parts of the offer in separate envelopes must be enclosed in the one bigger envelope duly sealed and super scribed with reference number and due date and must be addressed to the undersigned so as to reach him on or before the due date stipulated above.
3. The quotations duly sealed and super scribed on the envelope with reference no. and due date, should be addressed to the undersigned so as to reach him or before the **due date** stipulated above.
4. Quotations should be valid for 60 days from the due date and period of delivery be indicated.
5. Local firms to quote for free delivery to this Institute. If quoted for Ex-Godown delivery charges be indicated separately.
6. Relevant literature pertaining to the items quoted with full specifications.
7. Sales Tax/General Taxes/ED if applicable and such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. If this is not indicated no such claim will be admitted at any stage. The taxes leviable should take into consideration that we are entitled to have concessional Sales Tax applicable to Non-Government Educational Institutions run with no profit motive for which a concession is given. Sales Tax Certificate will be issued at the time of final settlement of the bill.
8. Goods should be supplied carriage paid and insured.
9. Goods shall not be supplied without an official supply order.
10. Every effort will be made to make payment within 30 days from the date of bill/acceptance of goods whichever is later.
11. The Guarantee period of the item may be indicated clearly.
12. In case of LC. Payment 90% of the payment will be made after completion of the supply. The balance 10% of the payment will be made after satisfactory installation of the equipment.
13. IIT Madras is exempt from payment of Excise Duty and is eligible for concessional rate of custom duty. Necessary certificate will be issued on demand. IIT Madras will make necessary arrangements for the clearance of imported goods at the Airport/Seaport. Hence the price should not include the above charges.
14. **Acceptance and Rejection:-** I.I.T. Madras has the right to accept the whole or any part of the Tender or portion of the quantity offered or reject it in full without assigning any reason.

Yours faithfully,

Head of the Department
Aerospace Engineering
Department.IITMadras
Chennai 600036.

Items required: Mass flow controllers as per specifications attached.

Department of Aerospace Engineering

Indian Institute of Technology Madras

Chennai – 600 036, India

Items required:

1. Mass flow controller: 50 SLPM
Display: Color display with backlit
Medium: Methane gas (and air, nitrogen, helium)
Medium Temperature: 5 to 40 °C
Medium humidity: 0 to 100%
Range: 0 to 50 SLPM of methane
Inlet pressure: up to 10 bar gauge
Pressure drop across MFC: less than 0.65 bar
Inlet and outlet hose connections: 1/4 NPT Female
Accuracy: ± 0.3 SLPM @ 50 SLPM set point
Repeatability: ± 0.1 SLPM
Control Range: 0.05 to 50 SLPM
Set point resolution: 0.01 or 0.1 SLPM
Response time: Less than 100 ms
Warm-up time: Less than 1 sec
Control parameter: selectable between mass flow, volume flow, pressure
Gas selection: MFC with multiple gas selection, gas properties should be preprogrammed and should not require additional correction factors.
Operating principle: Differential pressure type, temperature based MFC are not preferred.
Quantity: 1 no.
2. Mass flow controller: 100 SLPM
Display: Color display with backlit
Medium: Methane gas (and air, nitrogen, helium, LPG)
Medium Temperature: 10 to 50 °C
Medium humidity: 0 to 100%
Range: 0 to 100 SLPM of methane
Inlet pressure: up to 10 bar gauge
Pressure drop across MFC: less than 0.85 bar
Inlet and outlet hose connections: 1/4 NPT Female
Accuracy: ± 1 SLPM @ 100 SLPM set point
Repeatability: ± 0.2 SLPM
Control Range: 0.1 to 100 SLPM
Set point resolution: 0.01 or 0.1 SLPM
Response time: Less than 100 ms
Warm-up time: Less than 1 sec
Control parameter: selectable between mass flow, volume flow, pressure
Gas selection: MFC with multiple gas selection, gas properties should be preprogrammed and should not require additional correction factors.
Operating principle: Differential pressure type, temperature based MFC are not preferred.
Quantity: 2 nos.

3. Mass flow controller: 1000 SLPM
Display: Color display with backlit
Medium: Air gas (and methane, nitrogen, helium)
Medium Temperature: 5 to 40 °C
Medium humidity: 0 to 100%
Range: 0 to 1000 SLPM of air
Inlet pressure: up to 10 bar gauge
Pressure drop across MFC: less than 1 bar
Inlet and outlet hose connections: 3/4 NPT Female
Accuracy: ± 10 SLPM @ 1000 SLPM set point
Repeatability: ± 2 SLPM
Control Range: 10 to 1000 SLPM
Set point resolution: 1 SLPM
Response time: Less than 100 ms
Warm-up time: Less than 1 sec
Control parameter: selectable between mass flow, volume flow, pressure
Gas selection: MFC with multiple gas selection, gas properties should be preprogrammed and should not require additional correction factors.
Operating principle: Differential pressure type, temperature based MFC are not preferred.
Quantity: 1 no.

4. Mass flow controller: 4000 SLPM
Display: Color display with backlit
Medium: Air gas (and methane, nitrogen, helium)
Medium Temperature: 10 to 50 °C
Medium humidity: 0 to 100%
Range: 0 to 4000 SLPM of air
Inlet pressure: up to 10 bar gauge
Pressure drop across MFC: less than 1 bar
Inlet and outlet hose connections: 3/4 NPT Female
Accuracy: ± 40 SLPM @ 4000 SLPM set point
Repeatability: ± 8 SLPM
Control Range: 10 to 4000 SLPM
Set point resolution: 1 SLPM
Response time: Less than 100 ms
Warm-up time: Less than 1 sec
Control parameter: selectable between mass flow, volume flow, pressure
Gas selection: MFC with multiple gas selection, gas properties should be preprogrammed and should not require additional correction factors.
Operating principle: Differential pressure type, temperature based MFC are not preferred.
Quantity: 1 no.

5. Junction box, required cables, power supply units and software to connect all above MFC to the RS-232 computer port. Operation requires remote control, hence instantaneous flow rate values should be displayed on computer with at least 100 ms refresh time.

Note: Above items should be delivered within 3 weeks, products should have at least a year warranty cover.