	PURCHASE SPECIFICATION	Rev. 0
	Circumferential Barrier Seal	Dt. 16.9.2008
	Item Code No ED-05	Specification No. COECED-05

1. General:

This specification covers the technical requirements for Circumferential Barrier seal to prevent leakage of working fluid from the **EXISTING** high speed compressor test rig towards bearings.

2. Technical specifications:

MAXIMUM CONTINUOUS SPEED: **15000 RPM**

PROCESS GAS: AIR

BUFFER GAS: AIR

BUFFER GAS PRESSURE: 2 ATA MAX

BUFFER GAS TEMP. : 45 deg C MAX

DIRECTION OF ROTATION: BI-DIRECTIONAL

THE SEAL SHOULD BE IN TWO HALVES (HORIZONTAL SPLIT)

The high speed compressor test rig consists of a single stage of a prototype centrifugal compressor driven by a 350 kW motor through a 5:1 step-up gear box with a VFD controller. Compressor speed can be varied from 1000 to 15000 rpm. The max impeller diameter is 500 mm and it is mounted on a over hang shaft supported by two nos. of tilting pad journal bearings of journal dia 70mm (outer side) and 90 mm (inner side) respectively . A double acting tilting pad thrust bearing is mounted in between the two journal bearings. A labyrinth seal is fitted in-between the impeller and the inner journal bearing. The schematic of the test set up is shown in Fig-1. The overhung shaft is driven by a gearbox through a flexible coupling fitted at the end of the shaft.

A barrier seal is proposed to be procured for insertion in to the Place at Position-A as shown in fig-1: Lab seal position in between the impeller and the 90 mm dia JB replacing a portion of labyrinth seal. The details of the barrier seal assembly as fitted in the compressor is shown in fig-2. The matching components in the shaft for the seal assembly viz. mechanical sleeve, key and lock nut are shown in fig-3. These components are a part of the scope of supply by the vendor.

Buffer gas connections can be suggested by the vendor through the bearing housing. The provision of the buffer gas viz. filtered compressed air at 2 ata. will be provided by BHEL. The type of

Filtration and the minimum size of particle allowed shall be specified by the vendor. The circumferential barrier seal should be a dry running gas seal. The buffer gas will be supplied at approximately 0.2 ata above compressor stage discharge pressure. There should be light contact between one edge of the carbon ring bore and the rotating shaft sleeve, while springs should be used to load the seal rings in the axial direction. The seal should be provided with Tungsten Carbide coated shaft sleeve. The seal shall be designed for bi-directional operation.


Buffer gas filtration:

Compressed air at the required filtration level will be provided by BHEL for the buffer gas. Appropriate routing inside the casing will also be taken care by BHEL. Oil free compressed air will be supplied through the filtration unit without drying. Type of filtration and maximum practical size to be mentioned by the seal supplier.

Seal cavity:

As per Fig-1 and 2 .

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Expected leakage:

The maximum leakage expected through the seal to be specified by the vendor along with the quotation.

Horsepower loss:

Power loss per seal assembly to be specified

Spares:


One set of seal interface carbon ring and 'O' rings to be quoted separately

Note :

1. The vendor shall enclose a list of customers in India where such type of seals have been supplied and in operation
2. The vendors are advised to visit the Turbomachinery Laboratory and study the arrangement before submission of quotation.
3. The quotation shall be subdivided in two parts-A. Technical bid and B. price bid. All the technical catalogue showing features of the proposed seal along with the drawings are to be enclosed to technical bid, unpriced bid also to be enclosed along with the technical bid. Commercial terms such as delivery, warranty and validity of offer shall also be indicated in the technical bid.

For any Technical Clarification, please contact :
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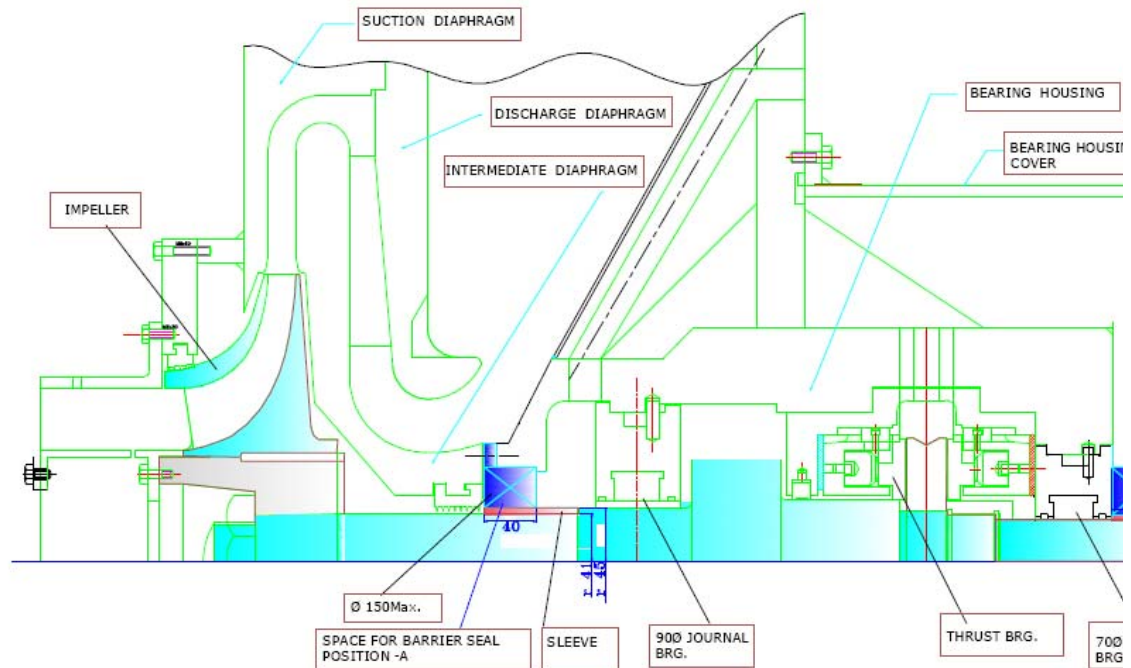


FIG.1. BARRIER SEAL ARRANGEMENT IN HIGH SPEED COMPRESSOR TEST RIG

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