DUPLEX FILTER WITH CHANGE OVER DEVICE FOR LUBE OIL SERVICE

1.0.0 **SCOPE:**

This standard specifies the requirement of Duplex filter with change over valve used in L.O system as per BHEL Standard.. The construction of duplex filter shall be as per ASME Section VIII Div 1.

2.0.0 **ARRANGEMENT:**

The Duplex filter shall consist of two filter bowls mounted in parallel with a change over valve. Each bowl is 100% capacity. The change over valve is used for switching over from one filter bowl to other filter bowl during operation, so that one filter open to operating oil flow other one closed for changing filter elements. There shall not be any reduction of flow area during switching over operation. Arrow mark shall be provided to indicate the filter in operation. Oil shall flow from the outside inward toward the center of the filter element.

2.1.0 **DESIGN PHILOSOPHY/CRITERIA-GENERAL:**

Selection of rotating equipment shall be based upon the following consideration

2.1.1 Suitability for the specified duty conditions.
2.1.2 Standard models under vendor's regular range of manufacture
2.1.3 Proven track record in similar service.
2.1.4 Optimum operating and maintenance costs
2.1.5 Maximum interchangeability of parts
2.1.6 Ease of operation and maintenance.

2.2.0 **THE ORDER OF PRECEDENCE IS TO BE FOLLOWED.**

2.2.1 Customer / Consultant's data sheets
2.2.2 Engineering design basis
2.2.3 Applicable codes, standards
2.2.4 For design aspects not specifically covered by data sheets, specifications, codes and standards or regulations, the design shall be based on good engineering practices.

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3.0 TECHNICAL REQUIREMENTS:

3.1	Flow	:	As per enquiry
3.2	Design pressure	:	As per enquiry
3.3	Design Temperature	:	100 °C
3.4	Operating Temperature	:	60 °C
3.5	Pressure drop for complete unit	:	**0.35** Kg/cm^2 clean at design condition of at 40°C (46CST) (DP across complete unit including filter elements, filter body & 3-way transflow valve shall not exceed 0.35 bar during starting). **1.5** Kg/cm^2 Dirty condition (Element to be changed). Collapsible min. pr. 10 Kg/cm^2 (g).
3.6	Design	:	As per API 614, 5th Edition Clause 4.6 & ASME Sec VIII Div. I. The design shall be at 40 °C (46CST)
3.7	Fluid handled	:	Turbine Oil type ISO VG46
3.8	Kinematic Viscosity	:	18 CST at 65°C (operating) 46 CST at 40 °C (Design)
3.9	Specific Gravity	:	0.88
3.10	Filtration	:	β 10 = 200, 10 Microns (absolute) or as specified in variant table.
3.11	Cleanliness Level Requirement	:	ISO 4406 grade 17/14 or NAS 8.
3.12	Filtration Area Requirement in CM^2	:	Vendor has to specify
3.13	Inlet / outlet connections	:	Raised face Flanged ends (With 150/300 class rated flanges as per ANSI)
3.14	Vent connections	:	Required with valve NPT ¾" screwed.

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3.15	Drain connections	:	Required with valve NPT ¾" screwed. (Clean- and dirty-side valved drain connections. The dirty side connections shall be located lower in the housing than the filter elements or cartridge support bases to allow complete drainage of the dirty side.)
3.16	Leakage	:	Not allowed during operation when one half is closed.
3.17	Pressure equalization line with valve	:	Required.
3.18	Differential Pressure indicator	:	Required.
3.19	Magnet	:	Required to collect the solid contamination.
3.20	Inlet / outlet connections	:	Raised face Flanged ends (With 150/300 class rated flanges as per ANSI), Inlet and Outlet shall be 2"-150 class.
3.22	Terminal points	:	All terminal points shall be flanged ANSI B 16.5, RF smooth finish.
3.23	Material	:	Carbon steel for Filter housing and valve body. Casted body filters are not acceptable. Trans flow valve internals shall be stainless steel(SS)
3.24	Hydro static test pressure	:	1.5 times of design pressure or as specified in ASME Section VIII Div 1
3.25	Filter element material	:	Disposable Type, Resin impregnated fiber. (Free water resistance organic paper) Vendor to provide standard (similar) size filter element for all the models offered. The no of filter elements may vary from one capacity to another
3.26	Performance curves required	:	Vendors shall provide the following 1. Flow Vs Pr. drop curves for housings & 2. Elements.

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3. Actual area of filtering media
4. Dirt retention capacity.
5. Number of elements per housing.

4.0 **SCOPE OF SUPPLY**

1 Duplex filter with 3-way transflow type change over valve in C.S construction. The valve internals shall be in S.S construction. **R01**
2 One set of S.S 40 microns filter element for flushing.
3 1 set of 5 microns filter element other than elements fitted in the filter. The material shall be Fiber glass pleating material with S.S support
4 One set of gaskets & "O" rings duplex filter. The material shall be r asbestos type.
5 One set of foundation bolts & nuts.

Note: One set means number of elements for both filter housings

5.0 **QUALITY REQUIREMENTS** :

1 Material test certificates
2 Hydrostatic Test
3 Design calculations as per ASME Sec VIII Div. I
4 Performance Test & type test certificates of similar model shall be submitted.
5 Quality plan followed during manufacturing shall be provided to BHEL for review and approval.

Inspection and testing as per Standard. Quality plan to be submitted along with offer and the same to be approved by BHEL.

M/s Lloyds is the approved Inspection agency, if the item is procuring from imported organization. The Inspection charges shall be included in main equipment price.

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