



Bharat Heavy Electricals Limited
Ranipet – 632 406
Purchase Department

HYDRAULIC ACTUATING DEVICE (HAD)
(Expression of Interest)

BHEL is looking for Vendors having experience in Hydraulic Servo Controls with precision machining facilities for Manufacturing, Assembling and Testing of (HAD) Hydraulic Actuating Device as per BHEL specification & drawings which can be downloaded from web site. Any clarifications and additional details can be obtained from Mr. D. Kumar, Manager/Purchase, BHEL – Ranipet. Phone No. 04172-254172, Cell No. 9442141827

Addl. General Manager / Materials Management.

Hydraulic Adjustment Device (HAD) for blade pitch control of axial fans

1. Variable pitch axial fans are widely used as draft fans in thermal power plants. The blades of these fans bolted to the respective blade shaft (fitted to the fan impeller hub) can be moved in real time (when the impeller is in rotation) by the HAD connected to the blade shaft through a set of linkages – for varying the fan performance. Refer photographs / schematic attached – Annexure -1.
2. The HAD comprises of a control head into which pressurized oil (mineral oil – ISO VG 68) from an external oil pumping unit can be admitted through precision machined moving spool. The spool movement is effected by an external pneumatic / electrical control actuator – receiving signal from boiler controls (4-20 mA).
3. The control head has also ports for return oil & leakage oil flow. The oil from the control head is fed to a hydraulic cylinder. Depending on the side to which pressurized oil is admitted, the cylinder moves to the right or left – leading to opening or closing the blade position (increasing / decreasing the fan performance). Refer typical arrangement of HAD attached – Annexure 2. The flange connection shown with the HAD will be fastened to the impeller and the cylinder assembly spins with the impeller. The control head is stationary.
4. The normal working pressure of the oil is 35 bar. The internal components of the control head are precision machined and assembled with seals of reputed make to ensure reliable operation for a mission critical application (required to work 24x7). The cylinder is machined from spheroidal graphite iron casting.
5. The complete assembly shall be subjected to leak-tightness test at 1.5 times operating pressure and run test at the rated speed (100% check) in the test rig – and parameters like leakage flow / temperature etc are to be monitored.
6. BHEL is looking for suitable vendors who can take up the complete manufacture / assembly / testing / supply of HAD. The vendor shall have expertise and experience in handling hydraulic servo-controls and shall have precision machining facilities. The required test arrangement shall be rigged up at the vendor's works with variable speed drive arrangement – for testing different size HADs at different speeds.
7. Interested vendors can submit an "Expression of Interest (Eoi)" along with their profile – covering experience in hydraulics, infrastructure, existing product profile, business volumes etc and approach BHEL for detailed interaction. Complete set of drawings and documents of the different sizes and one typical assembly of HAD can be shown to them for better understanding.

8. After such detailed interaction, BHEL will send formal enquiry against which the interested vendors can submit their offers. After techno-commercial evaluation and finalizing the vendor, BHEL will provide
 - (a) Complete set of assembly and manufacturing drawings and bill of material for the ordered size of HAD
 - (b) Test procedure
9. The successful vendor shall be required to enter into a “Memorandum of Understanding” and “Non Disclosure Agreement” with BHEL for manufacture and supply of HADs using BHEL input information. Quality plan with inspection stages by BHEL / end user will be finalized with the successful vendor.
10. The approximate annual requirement of HADs of different sizes is:

Style	Designation Cylinder dia (mm) / stroke (mm)	Quantity / annum (Nos)	Fan operating speed / HAD test speed (rpm)
01	200 / 50	25	1500
02	336 / 50	50	1500
03	336 / 100	25	1000 / 750
04	415 / 100	10	750 / 600

11. For details contact:

Manager / Purchase
 (Attention Mr. D. Kumar / Mr. M.S. Ravi Kumar)
 Boiler Auxiliaries Plant
 Bharat Heavy Electricals Limited
 Ranipet – 632 406
 Tamil Nadu, India

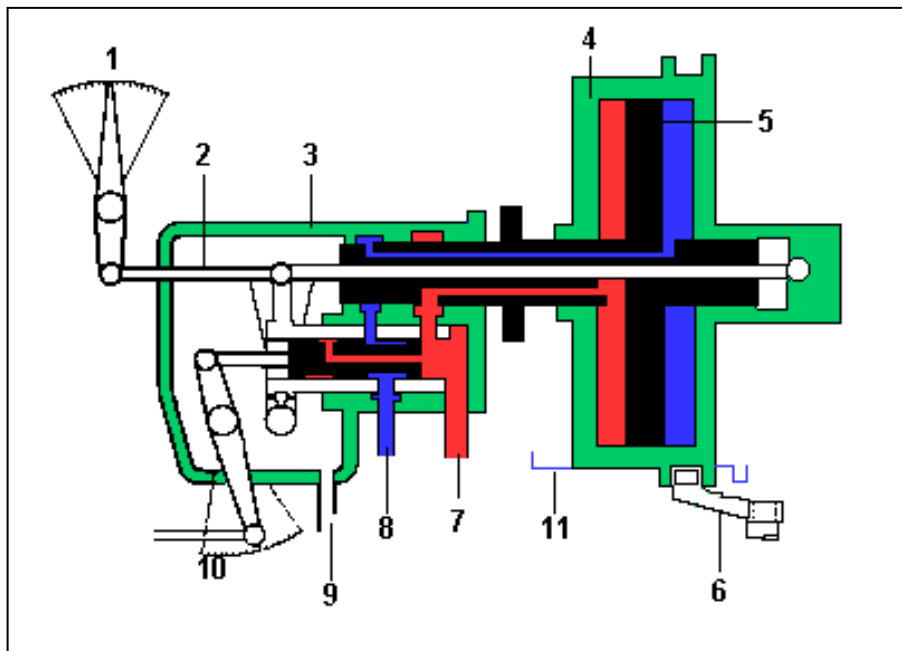
Email: dkumar@bhelrpt.co.in msravi@bhelrpt.co.in
 Phone: 04172 – 254172 04172 - 254533
 Fax: 04172 – 241131



Fan rotor mounted with blades & HAD



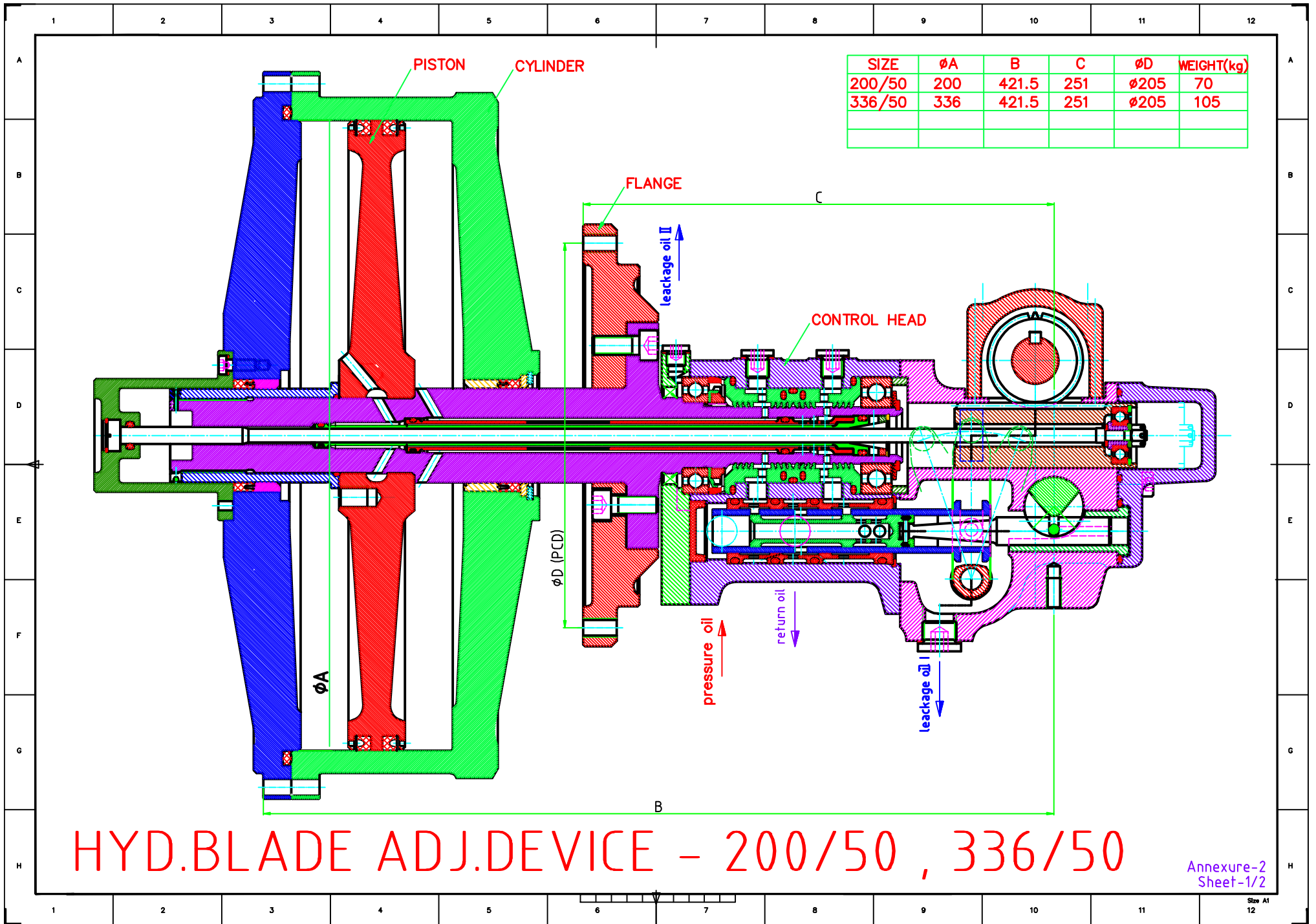
Closer views of HAD



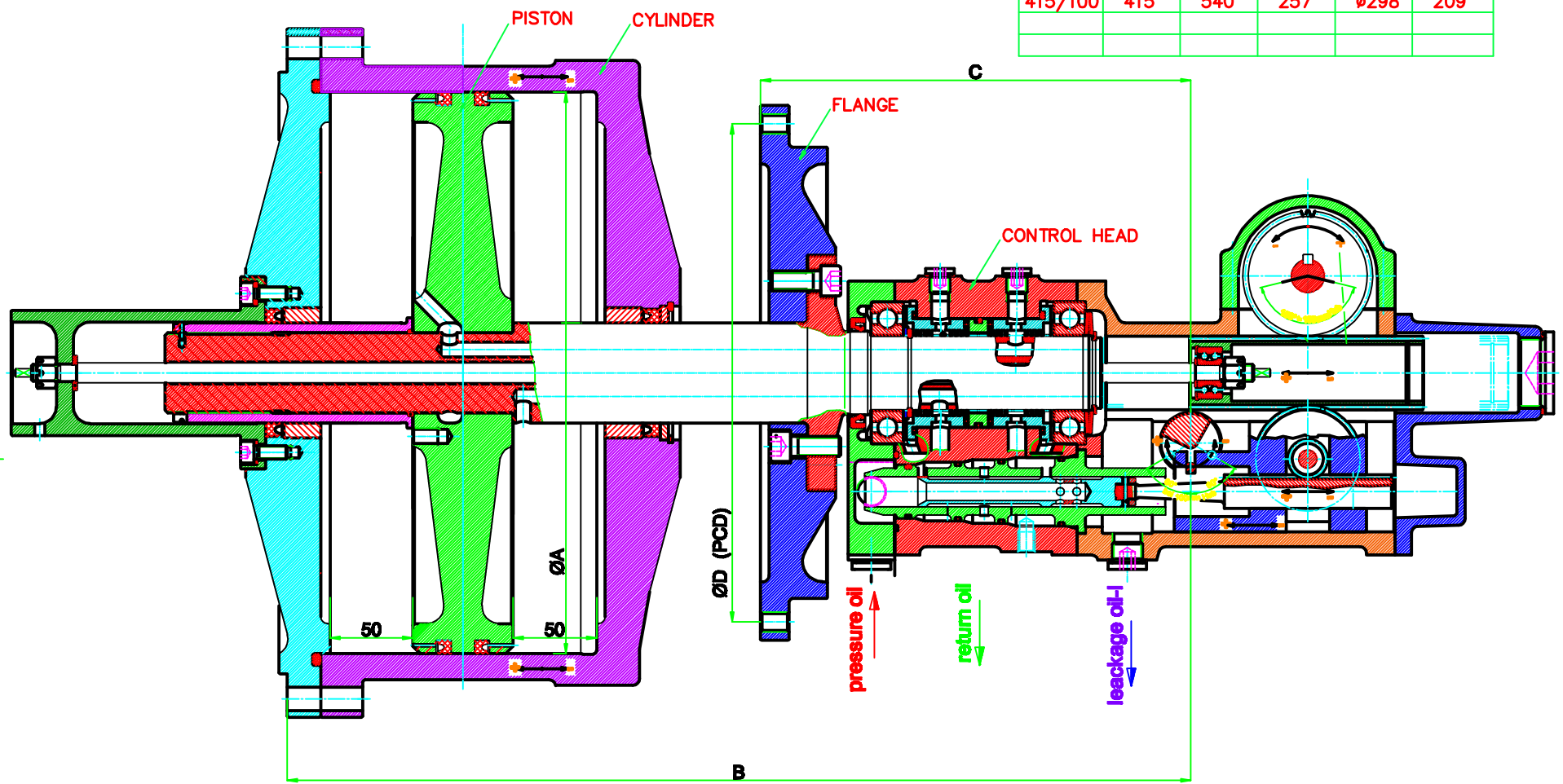
Schematic of HAD

Legend

- | | | |
|-----------------------|--------------------|----------------------|
| 1. Blade position | 5. Piston | 9. Leakage Oil |
| 2. Feedback rod | 6. Adjusting Lever | 10. Local Indication |
| 3. Control head | 7. Pressure Oil | 11. Actuation Range |
| 4. Adjusting cylinder | 8. Return Oil | |



SIZE	ØA	B	C	ØD	WEIGHT(kg)
336/100	336	540	257	Ø298	165
415/100	415	540	257	Ø298	209



HYD.BLADE ADJ.DEVICE - 336/100, 415/100