

<div><div><div>बीएचईल</div><div>BHEL</div></div><div>HYDERABAD</div></div>	PRODUCT STANDARD		TC 5 4322
			Rev. No: 12
	INDUSTRIAL TURBINES & COMPRESSORS		Page 1 of 6

BLADDER TYPE OIL ACCUMULATOR

1.0 PURPOSE:

The accumulators are used in Turbine / compressor oil system circuits. Wherever system pressure falls due to various system disturbances like pump changeover or turbine servo control transients, these accumulators restore the required pressure. The pressure shall be maintained above the equipment manufacturer's minimum specified supply pressure for all operating conditions (including transients). (R11)

2.0 CONSTRUCTION:

The accumulator is a sealed kit bladder type vessel to suit Nitrogen pre-charging. The design shall be as per ASME Sec. VIII Division I. The accumulator comprises a Shell, Bladder, a gas valve and fluid port with puppet valve. The outlet connection should be 2"-150 lb, ANSI rated flange

3.0 TECHNICAL REQUIREMENTS:

3.1

Shell material

:

As per variant table. - Rev 02

3.2

Bladder material

:

Nitrile

3.3

Liquid to be handled

:

Lube Oil Grade ISO 46/32

3.4

Shell design pressure

:

12 Kg/Cm² (G) - Rev 02

3.5

Temperature

:

-10 to 100°C

3.6

Pre-charging pressure

:

90% Minimum operating pressure

3.7

Outlet port connection

:

2"-150lb RF as per ANSI B16.5

3.8

Accessories

:

Simple stand as per SL.No. 11 for mounting accumulators with necessary fittings.

3.9

Test pressure

:

1.5 times of design pressure.

4.0 PROCEDURE FOR ORDERING: - NA

4.1

The vendors shall provide the selection procedure with the following input parameters during quotation.

— P2, Maximum working pressure in Kg/Cm²(Abs)

— P1, Minimum working pressure in Kg/Cm²(Abs)

— Oil to be discharged in specific time in liters 4 Seconds

The values of P1 & P2 will be sent along with offer.

4.2

Vendor has to confirm the selected numbers of accumulators are suitable after considering the values of P1 & P2

4.3

BHEL will provide no of accumulators required during enquiry

5.0 SCOPE OF SUPPLY FOR ACCUMULATOR: (R11)

5.1.a

Bladder type accumulator along with stand for each variant by providing 2"-150lb outlet connection and it will be inspected by BHEL or its inspection agency.


Proper plugs to be provided for threaded holes on Accumulator discharge line.

One Set of Foundation Bolts along with nuts suitable for mounting the accumulator station

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	<p>5.1.b In case of more than one accumulator all accumulators shall be mounted in a single stand & Accumulators in Each Row should not exceed 4 nos. (Refer foundation Plan in Annexure-II to TC54322, if applicable & the same shall be complied by vendor)</p> <p>5.1.c The Vent/drain & Pressure gauge connections of each accumulator shall be ended with valves. Plug connection shall be provided with valves. Unless otherwise specified valves shall be ball valve type. (R11)</p> <p>5.2</p> <p>SCOPE OF SUPPLY FOR ACCUMULATORS with HOOK UP (As per material code) (R11) Scope of supply form 5.1.a to 5.1.c & One Permanent Pressure Gauge along with isolation valve to be mounted on each Accumulator to view the nitrogen pressure on Accumulator Bladder as per Annexure –I to TC54322 as per material code requirement mentioned in variant table.</p> <p>6.0 <u>DOCUMENTATION:</u> (R11)</p> <p>6.1 <u>DOCUMENTS ALONG WITH QUOTATION</u> - G.A. Drawing.</p> <p>6.2 <u>DOCUMENTS AFTER PLACEMENT OF ORDER</u> - G.A. Drawing. - Cross sectional drawing with spare parts indication - Contents of Charging kit with identification</p> <p>6.3 <u>DOCUMENTS AFTER AWARD OF CONTRACT:</u> - O&M manuals - 2 copies along with consignment and also soft copy in mail - Test & Guarantee Certificates - 2 copies along with consignment and also soft copy in mail</p> <p>7.0 <u>QUALITY REQUIREMENTS:</u></p> <p>7.1 Material test certificates</p> <p>7.2 Hydrostatic Test, witness</p> <p>7.3 Design calculations as per ASME Sec VIII Div. I</p> <p>7.4 Leak test of charging kit (R11)</p> <p>7.5 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. The Inspection agency shall be BHEL nominated/ customer representative. In case of imported item, the same shall be inspected by M/s Lloyds and the inspection charges shall be included in the offer.</p> <p>8.0 <u>TEST AND GUARANTEE CERTIFICATES:</u></p> <p>8.1 <u>TEST CERTIFICATE:</u></p> <p>2 copies of Inspection and test certificates shall be supplied for each item of the consignment quoting BHEL STD Number, Purchase Order No and manufacturer's identification serial numbers</p> <p>8.2 <u>GUARANTEE CERTIFICATE:</u> A guarantee certificate for 18 months of trouble free performance from the date of shipment or 12 months from the date of commissioning whichever is earlier shall be supplied. If any malperformance or defects occur during the guarantee period, the vendor shall make all necessary alteration, repairs, or replacement free of charge</p>	
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9.0 SPECIAL NOTES: (R11)

- 9.1 Final documents as per clause 6.2 & 6.3 shall also be furnished in soft copy mail.
9.2 O&M manuals shall be furnished in soft copy mail.
9.3 Vendor to submit the stamped & signed copy of Annexure-I & II along with the offer.

10.0 PAINTING:**As per below or as per project specific painting requirement mentioned in Annexure -1**

Unit should be painted with Epoxy, anti rust, anti corrosive type paint. Final shade shall be 692 as per IS: 5.

Approval shall be obtained for mechanical cleaning and painting procedure from BHEL prior to starting manufacturing.

Painting shall not be carried out for shells in case of S.S (300 Series) construction and only stand to be painted.

VARIANTS TABLE

VAR. NO.	Shell Material	DESCRIPTION	MAT.CODE
01	C.S	Set of Oil Accumulators 1x35 Liters in a single stand	TC9754322015
02	C.S	Set of Oil Accumulators 2x35 Liters in a single stand	TC9754322023
03	C.S	Set of Oil Accumulators 3x35 Liters in a single stand	TC9754322031
04	C.S	Set of Oil Accumulators 4x35 Liters in a single stand	TC9754322040
05	C.S	Set of Oil Accumulators 1x55 Liters in a single stand	TC9754322058
06	C.S	Set of Oil Accumulators 2x55 Liters in a single stand	TC9754322066
07	C.S	Set of Oil Accumulators 3x55 Liters in a single stand	TC9754322074
08	C.S	Set of Oil Accumulators 4x55 Liters in a single stand	TC9754322082
09		Charging Kit for Accumulator	TC9754322090
10		Spare Bladder for 35 Lts capacity Accumulator	TC9754322104
11		Spare Bladder for 55 Lts capacity Accumulator	TC9754322112
12	C.S	Set of Oil Accumulators 5x55 Liters in a single stand	TC9754322120
13	C.S	Set of Oil Accumulators 6x55 Liters in a single stand	TC9754322139
14	S.S 316	Set of Oil Accumulators 1x35 Liters in a single stand	TC9754322147
15	S.S 316	Set of Oil Accumulators 2x35 Liters in a single stand	TC9754322155
16	S.S 316	Set of Oil Accumulators 3x35 Liters in a single stand	TC9754322163
17	S.S 316	Set of Oil Accumulators 4x35 Liters in a single stand	TC9754322171
18	S.S 316	Set of Oil Accumulators 1x55 Liters in a single stand	TC9754322180
19	S.S 316	Set of Oil Accumulators 2x55 Liters in a single stand	TC9754322198
20	S.S 316	Set of Oil Accumulators 3x55 Liters in a single stand	TC9754322201
21	S.S 316	Set of Oil Accumulators 4x55 Liters in a single stand	TC9754322210
22	S.S 316	Set of Oil Accumulators 5x55 Liters in a single stand	TC9754322228
23	S.S 316	Set of Oil Accumulators 6x55 Liters in a single stand	TC9754322236
24		Set of "O" rings & gaskets for oil Accumulator 55 Lts	TC9754322244
25			
26		Spare connector for Oil Accumulators 35/55 Liters	TC9754322260
27	S.S 316	Set of Oil Accumulators 7x55 Liters in a single stand	TC9754322279
28	S.S 316	Set of Oil Accumulators 8x55 Liters in a single stand	TC9754322287
29	S.S 316	Set of Oil Accumulators 9x55 Liters in a single stand	TC9754322295
30		Charging Kit for Accumulator	TC9754322309
31		Spare Bladder 55 Lts ACC & Gasket Set	TC9754322317
32		Spare Bladder 35 Lts ACC & Gasket Set	TC9754322325
33	S.S 316	Set of Oil Accumulators 3x35 Liters in a single stand with Hookup	TC9754322333

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VARIANTS TABLE

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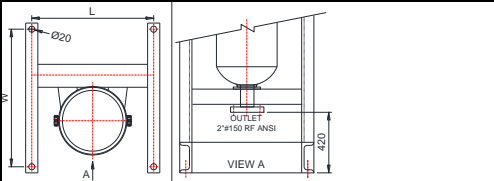
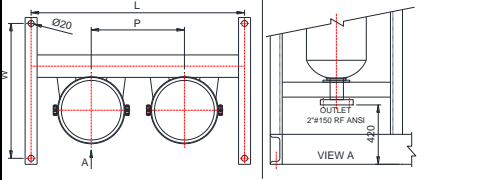
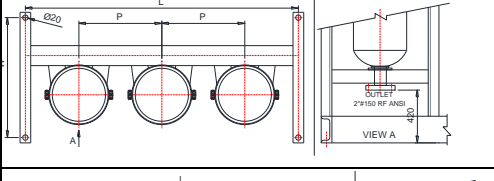
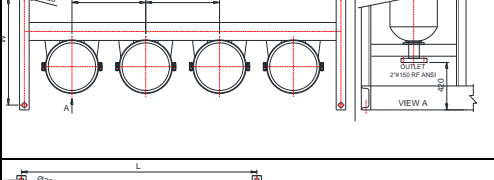
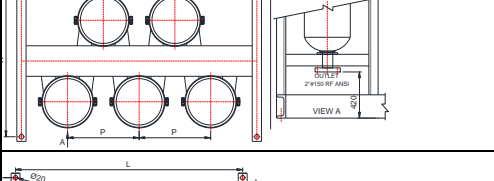
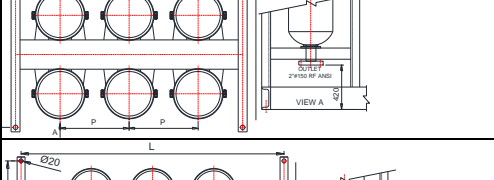
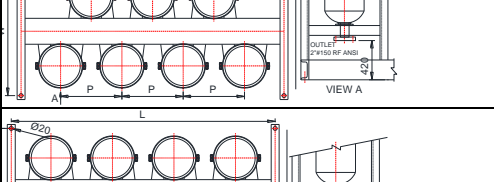
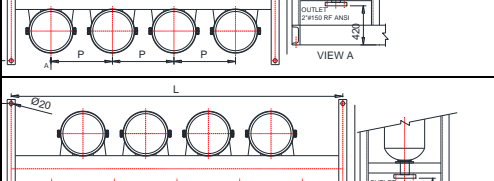
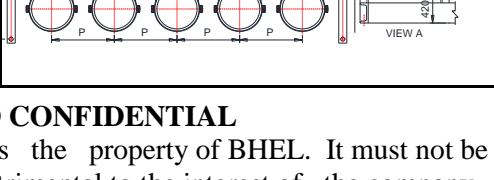
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11.0 Vendor to follow the following arrangement along with foundation fixing and outlet nozzle Dimensions.

Model	Material code	W	L	P	Schematic for foundation
1x35	TC9754322015 / TC9754322147	450	400	NA	
1x55	TC9754322058 / TC9754322180				
2x35	TC9754322023 / TC9754322155	450	710	310	
2x55	TC9754322066 / TC9754322198				
3x35	TC9754322031 / TC9754322163	450	1020	310	
3x55	TC9754322074 / TC9754322201				
4x35	TC9754322040 / TC9754322171	450	1330	310	
4x55	TC9754322082 / TC9754322210				
5x55	TC9754322120 / TC9754322228	650	1020	310	
6x55	TC9754322139 / TC9754322236	650	1020	310	
7x55	TC9754322278	650	1330	310	
8x55	TC9754322287	650	1330	310	
9x55	TC9754322295/ TC9754322511	650	1640	310	
10x55	TC9754322520				

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<div>RECORD OF REVISIONS</div>				
Rev.No	Date	Revision Details	Revised	Approved
00	28.08.04	First issue.	----	----
01	19.02.07	Variants 10 & 11 added	M.V.S.Raju	K.K.Rao
02	19.04.08	Generally revised & Variants added	M.V.S.Raju	K.K.Rao
03	21.05.10	Variants up to 29 added	M.V.S.Raju	R A Krishnan
04	28.05.12	Generally revised	M.V.S.Raju	VV Subramanyam
05	25.07.13	Clause 5.3 Added	M.S.Kumar	M.V.S.Raju
06	01.04.14	Variants 30,31 & 32 Added	M.S.Kumar	M.V.S.Raju
07	04.08.15	Clause 5.2 & 5.3 modified and clause 9.3 added	M.S.Kumar	M.V.S.Raju
08	23.09.15	Clause 5.4 added	M.S.Kumar	M.V.S.Raju
09	19.11.15	Variant 33 Added	M S Kumar	M V S Raju
10	09.05.16	Clause 5.1 Modified Variant up to 39 added	M S KUMAR	M V S RAJU
11	13.03.20	Complete Specification generally revised and changes marked as R11. Variant up to 52 added	Kotta Bharath	SUNIL B JIWTODE
12	15.03.22	Variant up to 58 added	Kotta Bharath	SUNIL B JIWTODE
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