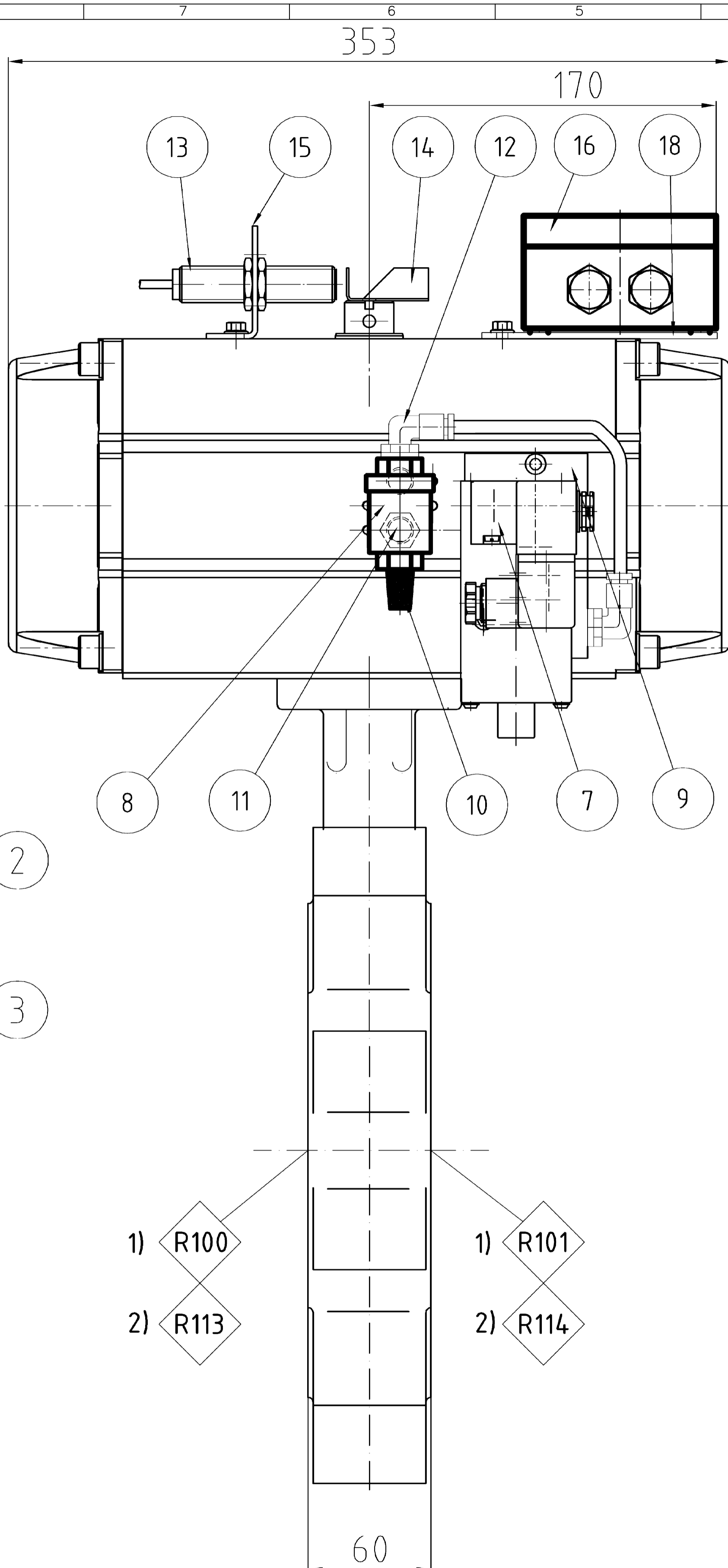
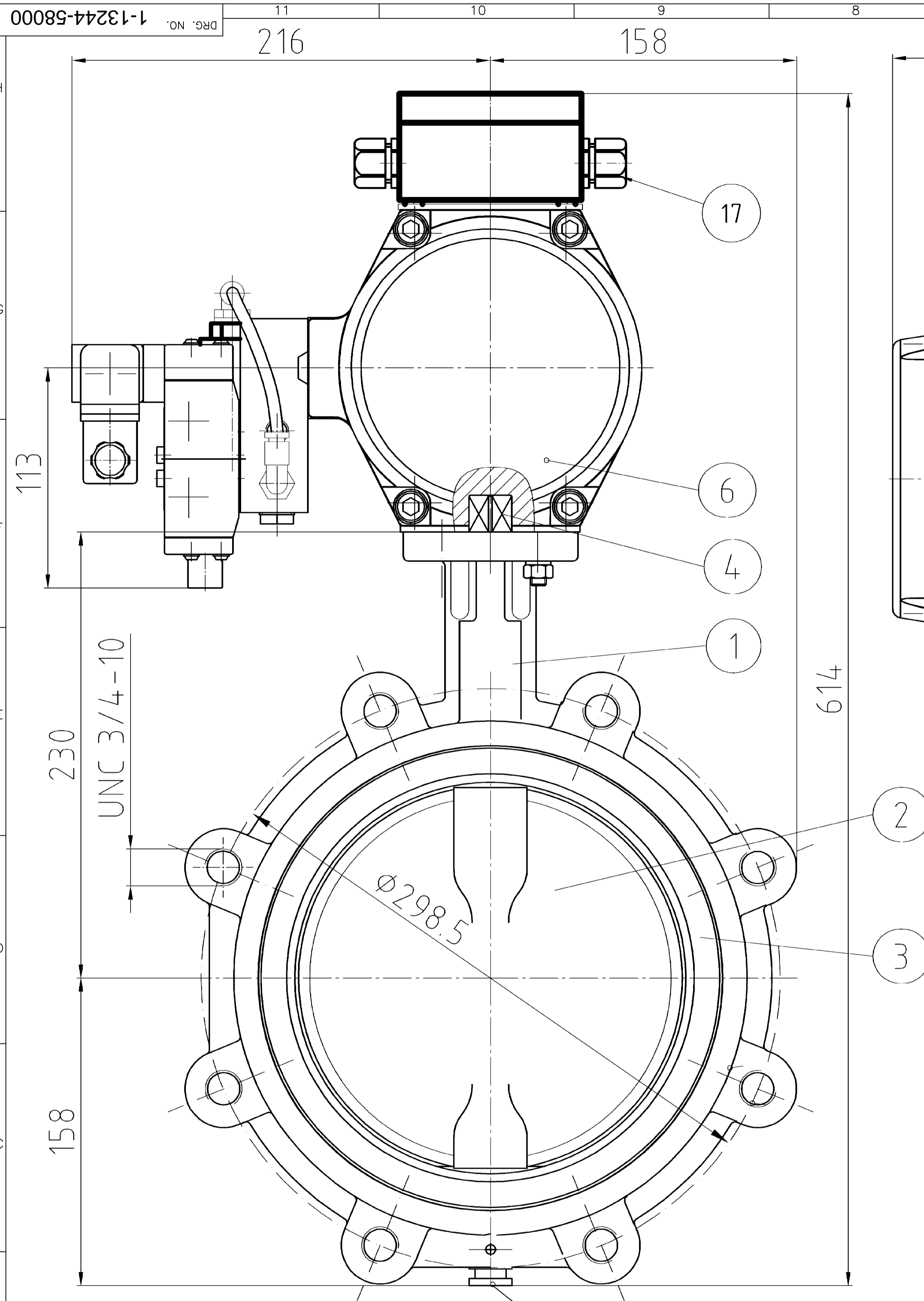


FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. 1-13244-58000

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.



**TECHNICAL REQUIREMENT :**

TECNICAL DETAILS OF VACUUM BREAKER VALVE ALONG WITH PNEUMATIC ACTUATOR ( VACUUM BREAKER, Klappe; NPS 8", ANSI 150 FLANGE , REFERRED AT SL.1 OF TABLE-1 IN ZONE B12) SHALL BE AS FOLLOWS:- **01**

**A. TECHNICAL DATA :-**

THE TECHNICAL DATA MENTIONED BELOW MUST BE USED IN CONJUNCTION WITH THE 4-13244-56105. THE CONTENT OF THIS SPECIFICATION GIVES THE PROJECT SPECIFIC REQUIREMENTS AND MAY ADDRESS ADDITIONAL DESIGN FEATURES. IN CASE THAT REQUIREMENTS SPECIFIED IN THIS DOCUMENT CANNOT BE FULFILLED, OR ANY DOCUMENTS OF THE CONTRACT STAND IN CONTRADICTION, THE VENDOR HAS TO CONTACT BHEL FOR CLARIFICATION OF FURTHER ACTIVITIES.

1. VALVE TYPE DESIGNATION: CENTERLINE BUTTERFLY VALVE SERIES RS
2. VALVE PARAMETERS:  
NOMINAL SIZE / FLANGE SIZE / PRESSURE RATING: 8" / ANSI B16.5 RF / CLASS 150
3. DESIGN DATA:  
(i) OPERATION MEDIUM: a. AT VALVE INLET: AIR  
b. AT VALVE OUTLET: WET STEAM  
(ii) OPERATION PRESSURE AT VALVE INLET: 1 bar (a)  
(iii) OPERATION PRESSURE AT VALVE OUTLET: ≤ 0.3 bar (a)  
(iv) TEMPERATURE AT INLET: -10°C TO 55°C  
(v) TEMPERATURE AT OUTLET: 130°C (MAX.)
4. SEISMIC REQUIREMENT FOR SAFE SHUT DOWN: a. HORIZONTAL: 0.3 g  
b. VERTICAL: 0.2 g
5. REQUIRED OPERATION TIME FOR THE VACUUM BREAKER VALVE: a. t ≤ 2.4 sec (OPEN DIRECTION)  
b. t ≤ 2.0 sec (CLOSE DIRECTION)
6. CONTROL AIR PRESSURE: a. MINIMUM 5 bar  
b. MAXIMUM 10 bar
7. CONTROL AIR CONNECTION: ACCORDING TO DRG. NO. 3-13244-58001
8. PIPE CONNECTION LIST: DRG. NO. 3-13244-58001.
9. LANGUAGE OF DOCUMENTATION / OPERATION DESIGN ETC.: ENGLISH
10. FLANGED CASING; GAS AND LIQUID TIGHT ACCORDING TO DIN 3230, LEAKAGE RATE 1 OR LEAKAGE CLASS V ACCORDING TO ANSI FC1.  
VALVE SEAT/DISC SHALL BE METALLIC.
11. INHERENT CHARACTERISTICS OF VALVE FOR OPEN & CLOSE SHALL BE ACCORDING TO IEC 534.

**B. C&I REQUIREMENT :-**

1. PNEUMATIC ACTUATOR, FUNCTION: FOR OPEN / CLOSE OPERATION OF THE VALVE  
CONTROL AIR TO OPEN, SPRING TO CLOSE
2. VALVE POSITION POWERLESS: NORMALLY CLOSED
3. LIMIT SWITCHES FOR VALVE POS. OPEN AND CLOSE: STANDARD TYPE, ACCORDING TO DRG. NO. 4-13244-56002
4. ELECTRICAL CONNECTION DIAGRAM: DRG. NO. 3-13244-56003.
5. ELECTRICAL SPECIFICATION: DRG. NO. 4-13244-56002.
6. TAGGING: (i) VACUUM BREAKER -(1)  
(A). VACUUM BREAKER VALVE. (TAG NO. MAG10AA051)  
(B). LIMIT SWITCH (OPEN). (TAG NO. MAG10CG051B)  
(C). LIMIT SWITCH (CLOSE). (TAG NO. MAG10CG051C)  
(D). SOLENOID VALVE. (TAG NO. MAG10AA051A)  
(ii) VACUUM BREAKER -(2) ; (IF APPLICABLE IN ONE TG-SET )  
(A). VACUUM BREAKER VALVE. (TAG NO. MAG20AA051)  
(B). LIMIT SWITCH (OPEN). (TAG NO. MAG20CG051B)  
(C). LIMIT SWITCH (CLOSE). (TAG NO. MAG20CG051C)  
(D). SOLENOID VALVE. (TAG NO. MAG20AA051A)

**C. QUALITY REQUIREMENT :-**

QUALITY REQUIREMENT SHALL GENERALLY BE IN ACCORDING WITH INTERNATIONAL PRACTICES FOR SIMILAR EQUIPMENTS EXCEPT OTHERWISE SPECIFIED IN THE SPECIFICATIONS AND MUTUALLY AGREED QUALITY PLAN ON BHEL FORMAT. BHEL FORMAT FOR THE QUALITY PLAN SHALL BE PROVIDED TO SUPPLIER.

**D. SCOPE OF SUPPLY :-**

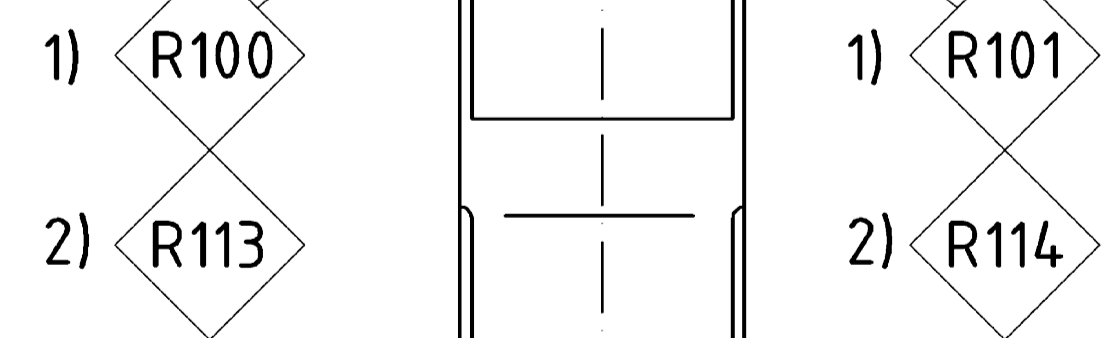
1. COMPLETE ASSEMBLY OF VACUUM BREAKER VALVE ALONG WITH PNEUMATIC ACTUATOR - 1 SET.
2. MOUNTING FRAME FOR SOLENOID VALVE , AIR VOLUME TANK , AIR SET & OTHER ACCESSORIES IS TO - 1 SET
3. COMMISSIONING SPARES - 1SET
4. SPECIAL TOOLS & TACKLES - 1SET
5. O & M MANUALS IN ENGLISH - 21 SET HARD COPIES & 3 CDS. (3 SETS OF HARD COPIES SHALL BE SUPPLIED ALONG WITH THE VALVE AT SITE WHILE 3 CDS & 18 SETS OF HARDCOPIES SHALL BE SUPPLIED AT PURCHASER'S OFFICE AT BHEL HARIDWAR .

**E. FOLLOWING INFORMATION SHALL BE FURNISHED BY THE VENDOR ALONG WITH THE OFFER:-**

1. GENERAL ARRANGEMENT DRAWING OF VALVE / ACTUATOR ALONG WITH SOLENOID VALVE AIR VOLUME TANK AND AIR SET ILLUSTRATING LEADING DIMENSIONS DISMANTLING DIMENSIONS, WEIGHT & CONNECTION DETAILS.
2. DETAIL CATALOGUE MENTIONING TYPE OF SOLENOID VALVE, AIR VOLUME TANK, AIR SET, LIMIT SWITCH & ASSOCIATED EQUIPMENTS.
3. BILL OF MATERIAL OF VALVE ACTUATOR AND ASSOCIATED EQUIPMENTS.
4. HOOK-UP DIAGRAM ALONG WITH FUNCTIONAL WRITE-UP.
5. PRICED LIST OF RECOMMENDED SPARES OF VALVE, ACTUATOR AND ASSOCIATED EQUIPMENT FOR FUTURE ORDERING.
6. RECOMMENDED QUALITY OF AIR AND QUANTITY OF AIR.
7. REQUIRED AIR PRESSURE TO ACTUATOR.
8. ALL ITEMS OF THE ASSEMBLY SHALL BE MARKED AND MADE PART OF THE OPERATION AND MAINTENANCE DOCUMENTATION.

**F. TABLE-1; CROSS REFERRED DOCUMENTS:-**

SL.NO.	BHEL DRG.NO.	EQUIVALENT SIEMENS DRG.NO.	DISCRIPTION
1.	1-13244-58000	DSPPG-0137585,12565-986790/001, PSK048K104	VACUUM BREAKER VALVE WITH PNEUMATIC ACTUATOR.
2.	3-13244-58001	DSPPG-0131335,12565-980350/888	END CONNECTION OF VACUUM BREAKER VALVE.
3.	4-13244-56002	DSPPG-0124555, A0000-002650/221	SOLENOID VALVE & LIMIT SWITCH FOR VACUUM BREAKER VALVE
4.	3-13244-56003	DSPPG-0019936, 00000-002670/251	CONNECTION DIAGRAM FOR VACUUM BREAKER VALVE
5.	4-13244-56105	TLV 2001	TECHNICAL PURCHASE SPECIFICATION FOR VALVES



MAT. CODE: -W90313244154

C.B.O.M. No. —	STATUS OF DRG	TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT	STEAM TURBINE
AGREED DEPT	NAME	SIGN	DATE
CIE	SASWATI	-SD-	30.11.12
GRADE OF UNTOL. DIM		BHEL BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR	
M/CG.- AA0230208 m		DRN	H.GARG -SD- 24.11.12
WELDING-CLASS 'B' OF AA0621104		CHD	N.NIRALA -SD- 30.11.12
GAS CUTTING-TABLE 3 OF AA0621101		APPD	RCA -SD- 01.12.12
REV	DATE	ALTERED	H.SINGH -SD- 19.03.15
REV	DATE	CHECKED	N.NIRALA -SD-
DEPT	STE	SCALE	WEIGHT (KG)
CODE 4011		N.T.S.	
CHANGES HAS BEEN INCORPORATED AS PER C/A-STE-15-F0113.		TITLE : VACUUM BREAKER VALVE WITH PNEUM. ACT.	CARD CODE
		DRAWING NO. 1-13244-58000	NO. OF SHEETS 1

SIGN AND DATE INVENTORY NO



FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

REV	DATE	ALTERED	REV	DATE	ALTERED	H.SINGH -SD-	GMS No/GRSP No.	STATUS		
		CHECKED	01	04.12.12	CHECKED	N.NIRALA -SD-	—	OF DRG		
			FOLLOWING CHANGE HAVE BEEN INCORPORATED AS PER C/A NO.: STE-12-F0494.				AGREED DEPT.	NAME	SIGN	DATE
							CIE	BSR	- SD-	02.02.11

GRADE OF UNTOL.DIM.M/CGC/M/F.AA0230208 | WELDING A/B/C/D AA0621104 | GAS CUTTING-T3 AA0621101

**Allgemeine Anforderungen / GENERAL REQUIREMENTS:**

Spannung: 24 V GS  
 VOLTAGE: 24 V DC  
 Spannungstoleranz: min. +10 / -15%  
 VOLTAGE TOLERANCE: min. +10 / -15%  
 Schutzart: min. IP65 / NEMA 4  
 ENCLOSURE RATING: min. IP65 / NEMA 4  
 Elektr. Anschluss: mit Klemmkasten  
 ELECTRICAL CONNECTION: VIA TERMINAL BOX  
 Temperaturbereich: +5°C bis +70°C (+41°F bis +158°F)  
 TEMPERATURE RANGE: +5°C to +70°C (+41°F to +158°F)

**Magnetventil / SOLENOID VALVE:**

Relative Einschaltdauer: 100%  
 ENERGIZED TIME: CONSTANT RATED  
 Spulen-Isolationsklasse: F  
 COIL ISOLATION CLASS: F  
 Nennstrom ≤ 1 A  
 NOMINAL CURRENT ≤ 1 A

**Stellungsgeber / POSITION TRANSMITTER:**

Typ: induktiv  
 TYPE: INDUCTIVE  
 Schaltelementfunktion: PNP Schließer  
 SWITCHING ELEMENT FUNCTION: PNP NORMAL OPEN  
 Anschluss: 3-polig  
 CONNECTION: 3-POLE  
 Schirmung: nicht erforderlich, aber verdrahtet wenn vorhanden  
 SHIELD: NOT REQUIRED, BUT WIRED IF AVAILABLE

**Klemmkasten / TERMINAL BOX:**

Klemmkasten: siehe Allgemeine Anforderungen  
 TERMINAL BOX: SEE GENERAL REQUIREMENTS

Alles Equipment ist gemäß Anschlussplan auf dem Klemmkasten zu verkabeln  
 ALL EQUIPMENT TO BE WIRED ON THE TERMINAL BOX ACC. TO WIRING DIAGRAM

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A0000-002650/221,  
 DSPCG-0124555 REV.A  
 REF.DRG.NO.

01

SIGN & DATE



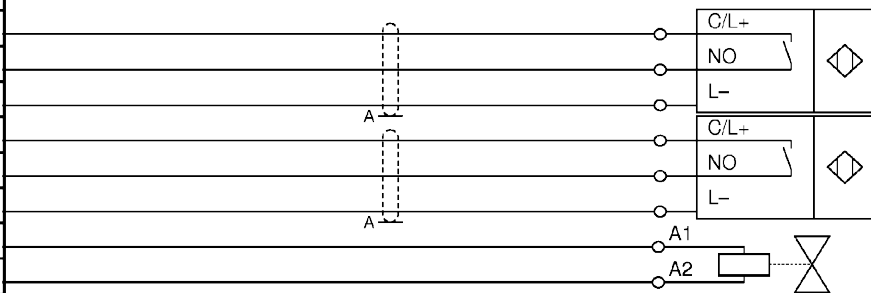
**BHARAT HEAVY ELECTRICALS LTD**  
**HARDWAR**

	NAME	SIGN	DATE	NO. OF VAR
DRN	H.GARG	- SD-	29.01.11	
CHD	N.NIRALA	- SD-	31.01.11	
APD	RCA	- SD-	03.02.11	

INVENTORY No.	DEPT.		SCALE	WEIGHT(Kg)	REF.TO ASSY.DRG.	ITEM No.	No OF ITEMS
	CODE		N.T.S	—	<b>1-13244-56000</b>	—	—
	TITLE SOLENOID VALVE & LIMIT SWITCHES FOR VACUUM BREAKER VALVE					DRAWING No. <b>4-13244-56002</b>	
					SHEET No. 1	No.OF SHEETS	1

3-13244-56003  
DRAWING No.

MAG10GF051: -X01	
1	MAG10CG051C
2	"
3	"
4	MAG10CG051B
5	"
6	"
7	MAG10AA051A
8	"
9	
10	



Zuordnung der Adernfarben (DIN IEC 757)  
Assignment of core conductor colours (DIN IEC 757)

- BK : Schwarz / BLACK
- BN : Braun / BROWN
- BU : Blau / BLUE
- GN : Gruen / GREEN
- GY : Grau / GREY
- OG : Orange / ORANGE
- PK : Rosa / PINK
- PU : Purpur / PURPLE
- RD : Rot / RED
- WH : Weiss / WHITE
- YE : Gelb / YELLOW

Der Klemmkasten und der Klemmenkastendeckel sind mit "MAG10GF051" zu kennzeichnen  
The Junction Box and the Junction Box Cover has to be labelled with "MAG10GF051"

Abschirmung auf gebrueckte Schirmklemmen 9-10 aufgelegt.  
Shields connected to bridged Shield terminal 9-10 .

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01

DSPPG-0019936 REV.C,  
00000-002670/251  
Ref. Drawing No.

Sign & Date

Inventory No.

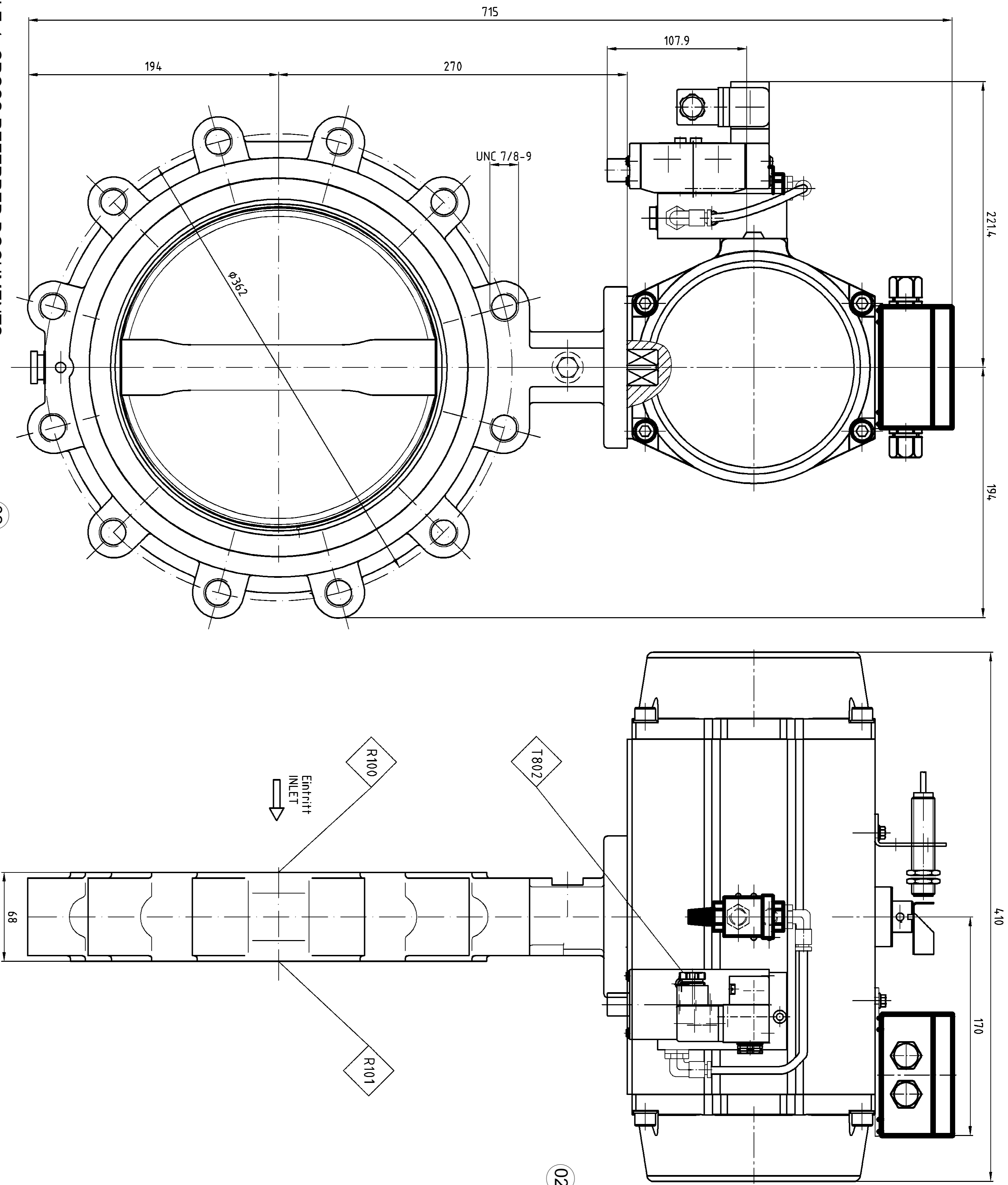
GRADE OF UNTOL. DIM  
M/CG.- AA0230208 m  
WELDING-CLASS 'B' OF AA0621104  
GAS CUTTING-TABLE 3 OF AA0621101

C B O M				STATUS OF DRG
AGREED	NAME	SIGN	DATE	
CIE	BSR	- SD-	02.02.11	

REV	DATE	ALTERED	H.SINGH -SD-
01	04.12.12	CHECKED	N.NIRALA -SD-

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		<b>STEAM TURBINE</b>				
BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR		DRN	H.GARG	- SD-	29.01.11	NO. OF VAR
		CHD	N.NIRALA	- SD-	31.01.11	
		APPD	RCA	- SD-	03.02.11	
DEPT STE	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM No.	NO. OF ITEMS	
CODE 4011	N.T.S.	—	<b>1-13244-56000</b>	—	75 77	
TITLE : <b>CONNECTION DIAGRAM FOR VACUUM BREAKER VLV</b>		CARD CODE	DRAWING NO. <b>3-13244-56003</b>			
FOLLOWING CHANGE HAVE BEEN INCORPORATED AS PER C/A NO.:STE-12-F0495.		SHEET No. 1		No. OF SHEETS 1		



**TECHNICAL REQUIREMENT :**

TECHNICAL DETAILS OF VACUUM BREAKER VALVE ALONG WITH PNEUMATIC ACTUATOR / VACUUM BREAKER, KLAFFE: NPS 10", ANSI 150 FLANGE, REFERRED AT SL.1 OF TABLE-1 IN ZONE B12) SHALL BE AS FOLLOWS:-

**A. TECHNICAL DATA :-**

THE TECHNICAL DATA MENTIONED BELOW MUST BE USED IN CONJUNCTION WITH THE 4-13244-56105. THE CONTENT OF THIS SPECIFICATION GIVES THE PROJECT SPECIFIC REQUIREMENTS AND MAY ADDRESS ADDITIONAL DESIGN FEATURES, IN CASE THAT REQUIREMENTS SPECIFIED IN THIS DOCUMENT CANNOT BE FULL FILLED. OR ANY DOCUMENTS OF THE CONTRACT STAND IN CONTRADICTION. THE VENDOR HAS TO CONTACT BHEL FOR CLARIFICATION OF FURTHER ACTIVITIES.

1. VALVE TYPE DESIGNATION: CENTERLINE BUTTERFLY VALVE SERIES RS
2. VALVE PARAMETERS:  
NOMINAL SIZE / FLANGE SIZE / PRESSURE RATING: 10" / ANSI B16.5 RF / CLASS 150
3. DESIGN DATA:  
(i) OPERATION MEDIUM: a. AT VALVE INLET, AIR  
b. AT VALVE OUTLET, WET STEAM
- (ii) OPERATION PRESSURE AT VALVE INLET: 1 bar (a)
- (iii) OPERATION PRESSURE AT VALVE OUTLET: 5.0.3 bar (a)
- (iv) MAX. TEMPERATURE OF THE OPERATION MEDIUM: 50°C
- (v) MAXIMUM AMBIENT TEMPERATURE: 50°C
4. SEISMIC REQUIREMENT FOR SAFE SHUT DOWN:  
a. HORIZONTAL: 0.3 g  
b. VERTICAL: 0.2 g
5. REQUIRED OPERATION TIME FOR THE VACUUM BREAKER VALVE: a. 1.5 2.4 sec (OPEN DIRECTION)  
b. 1.5 2.0 sec (CLOSE DIRECTION)
6. CONTROL AIR PRESSURE: a. MINIMUM 5 bar  
b. MAXIMUM 10 bar
7. CONTROL AIR CONNECTION: ACCORDING TO DRG. NO. 3-13244-56101
8. PIPE CONNECTION LIST: DRG. NO. 3-13244-56101.
9. LANGUAGE OF DOCUMENTATION / OPERATION DESIGN ETC.: ENGLISH
10. FLANGED CASING: GAS AND LIQUID TIGHT ACCORDING TO DIN 3230. LEAKAGE RATE 1 OR LEAKAGE CLASS V ACCORDING TO ANSI FCI.
11. INHERENT CHARACTERISTICS OF VALVE FOR OPEN & CLOSE SHALL BE ACCORDING TO IEC 534.

**B. C&I REQUIREMENT :-**

- FOR OPEN / CLOSE OPERATION OF THE VALVE CONTROL AIR TO OPEN / SPRING TO CLOSE
1. PNEUMATIC ACTUATOR, FUNCTION: NORMALLY CLOSED
  2. VALVE POSITION POWERLESS: NORMALLY CLOSED
  3. LIMIT SWITCHES FOR VALVE POS. OPEN AND CLOSE: STANDARD TYPE ACCORDING TO DRG. NO. 4-13244-56102
  4. ELECTRICAL CONNECTION DIAGRAM: DRG. NO. 3-13244-56103.
  5. ELECTRICAL SPECIFICATION: DRG. NO. 4-13244-56102.
  6. TAGGING:  
a. VACUUM BREAKER VALVE: MAG10 AA051  
b. SOLENOID VALVE: MAG10 AA051A  
c. LIMIT SWITCH 1 (OPEN): MAG10 CG051B  
d. LIMIT SWITCH 2 (CLOSED): MAG10 CG051C

**C. QUALITY REQUIREMENT :-**

QUALITY REQUIREMENT SHALL GENERALLY BE IN ACCORDING WITH INTERNATIONAL PRACTICES FOR SIMILAR EQUIPMENTS EXCEPT OTHERWISE SPECIFIED IN THE SPECIFICATIONS AND MUTUALLY AGREED QUALITY PLAN ON BHEL FORMAT. BHEL FORMAT FOR THE QUALITY PLAN SHALL BE PROVIDED TO SUPPLIER.

**D. SCOPE OF SUPPLY :-**

1. COMPLETE ASSEMBLY OF VACUUM BREAKER VALVE ALONG WITH PNEUMATIC ACTUATOR - 1 SET.
2. MOUNTING FRAME FOR SOLENOID VALVE, AIR VOLUME TANK, AIR SET & OTHER ACCESSORIES IS TO - 1 SET
3. COMMISSIONING SPARES - 1SET
4. SPECIAL TOOLS & TACKLES - 1SET
5. O & M MANUALS IN ENGLISH - 21 SET HARD COPIES & 3 CDS. (3 SETS OF HARD COPIES SHALL BE SUPPLIED ALONG WITH THE VALVE AT SITE WHILE 3 CDS & 18 SETS OF HARD COPIES SHALL BE SUPPLIED AT PURCHASERS OFFICE AT BHEL HANUMANK.

**E. FOLLOWING INFORMATION SHALL BE FURNISHED BY THE VENDOR ALONG**

1. GENERAL ARRANGEMENT DRAWING OF VALVE / ACTUATOR ALONG WITH SOLENOID VALVE AIR VOLUME TANK AND AIR SET ILLUSTRATING LEADING DIMENSIONS DISMANTLING DIMENSIONS, WEIGHT & CONNECTION DETAILS.
2. DETAIL CATALOGUE MENTIONING TYPE OF SOLENOID VALVE, AIR VOLUME TANK, AIR SET, LIMIT SWITCH & ASSOCIATED EQUIPMENTS.
3. BILL OF MATERIAL OF VALVE ACTUATOR AND ASSOCIATED EQUIPMENTS.
4. HOOK-UP DIAGRAM ALONG WITH FUNCTIONAL WRITE-UP.
5. PRICED LIST OF RECOMMENDED SPARES OF VALVE, ACTUATOR AND ASSOCIATED EQUIPMENT FOR FUTURE ORDERING.
6. RECOMMENDED QUALITY OF AIR AND QUANTITY OF AIR.
7. REQUIRED AIR PRESSURE TO ACTUATOR.
8. ALL ITEMS OF THE ASSEMBLY SHALL BE MARKED AND MADE PART OF THE OPERATION AND MAINTENANCE DOCUMENTATION.

F. TABLE-1: CROSS REFERRED DOCUMENTS:-

SL.NO.	BHEL DRG.NO.	EQUIVALENT SIEMENS DRG.NO.	DISCRPTION
1.	1-13244-56100	DSPPG-0132818, 12679-980350, DSPPG-0165780, PSK052R728,	VACUUM BREAKER VALVE WITH PNEUMATIC ACTUATOR.
2.	3-13244-56101	DSPPG-0132812, 12679-980350/888	END CONNECTION OF VACUUM BREAKER VALVE.
3.	4-13244-56102	DSPPG-0124555, A0000-002650/221	SOLENOID VALVE & LIMIT SWITCH FOR VACUUM BREAKER VALVE
4.	3-13244-56103	DSPPG-0019936, 00000-002670/251	CONNECTION DIAGRAM FOR VACUUM BREAKER VALVE
5.	3-13244-56104	DSPPG-0172779, 12991-989134(Rev.C)	COMPONENT DIAGRAM VACUUM BREAKER VALVE
6.	4-13244-56105	TLV 2001	TECHNICAL PURCHASE SPECIFICATION FOR VALVES

REV	DATE	ALTERED CHECKED	GRADE OF UNTOL. DIM	WELDING CLASS	GAS CUTTING	REV	DATE	ALTERED CHECKED	CHANGES HAS BEEN INCORPORATED AS PER C/A-	ZONE	CHANGES HAS BEEN INCORPORATED AS PER C/A-	DEPT	TITLE	CARD CODE	DRAWING NO.	NO. OF SHEETS	NO. OF SHEETS	
02	16.03.15	CHECKED	AA0230208 m	SD	TABLE 3 OF AA021101	01	06.09.12	CHECKED	CHANGES HAS BEEN INCORPORATED AS PER C/A-	A1Z	ST-12-70356.	RAMPUR, HARDWAR	VACUUM BREAKER VALVE WITH PNEUM. ACT.	7	1-13244-56100	22	23	24
01	16.03.15	CHECKED	AA0230208 m	SD	TABLE 3 OF AA021101	01	06.09.12	CHECKED	CHANGES HAS BEEN INCORPORATED AS PER C/A-	A1Z	ST-12-70356.	RAMPUR, HARDWAR	VACUUM BREAKER VALVE WITH PNEUM. ACT.	7	1-13244-56100	22	23	24



FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

REV	DATE	ALTERED	REV	DATE	ALTERED	GMS No/GRSP No.	STATUS OF DRG
		CHECKED			CHECKED		
				AGREED DEPT.	NAME	SIGN	DATE
				CIE	BSR	- SD-	23.12.11

GRADE OF UNTOL.DIM.M/CGC/M/F.AA0230208 | WELDING A/B/C/D AA0621104 | GAS CUTTING-T3 AA0621101

**Allgemeine Anforderungen / GENERAL REQUIREMENTS:**

Spannung: 24 V GS  
 VOLTAGE: 24 V DC  
 Spannungstoleranz: min. +10 / -15%  
 VOLTAGE TOLERANCE: min. +10 / -15%  
 Schutzart: min. IP65 / NEMA 4  
 ENCLOSURE RATING: min. IP65 / NEMA 4  
 Elektr. Anschluss: mit Klemmkasten  
 ELECTRICAL CONNECTION: VIA TERMINAL BOX  
 Temperaturbereich: +5°C bis +70°C (+41°F bis +158°F)  
 TEMPERATURE RANGE: +5°C to +70°C (+41°F to +158°F)

**Magnetventil / SOLENOID VALVE:**

Relative Einschaltdauer: 100%  
 ENERGIZED TIME: CONSTANT RATED  
 Spulen-Isolationsklasse: F  
 COIL ISOLATION CLASS: F  
 Nennstrom ≤ 1 A  
 NOMINAL CURRENT ≤ 1 A

**Stellungsgeber / POSITION TRANSMITTER:**

Typ: induktiv  
 TYPE: INDUCTIVE  
 Schaltelementfunktion: PNP Schließer (normal geöffnet)  
 SWITCHING ELEMENT FUNCTION: PNP CLOSE (NORMAL OPEN)  
 Anschluss: 3-polig  
 CONNECTION: 3-POLE  
 Schirmung: verdrahtet wenn vorhanden  
 SHIELD: WIRED IF AVAILABLE

**Klemmkasten / TERMINAL BOX:**

Klemmkasten: siehe Allgemeine Anforderungen  
 TERMINAL BOX: SEE GENERAL REQUIREMENTS

Alles Equipment ist gemäß Anschlussplan auf dem Klemmkasten zu verkabeln  
 ALL EQUIPMENT TO BE WIRED ON THE TERMINAL BOX ACC. TO WIRING DIAGRAM

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DSPPG-0124555 rev B  
 A0000-002650/221,  
 REF.DRG.No.

SIGN & DATE



**BHARAT HEAVY ELECTRICALS LTD**  
**HARDWAR**

	NAME	SIGN	DATE	NO. OF VAR
DRN	H.GARG	- SD-	22.12.11	
CHD	N.NIRALA	- SD-	23.12.11	
APD	RCA	- SD-	29.12.11	

INVENTORY No.	DEPT.		SCALE	WEIGHT(Kg)	REF.TO ASSY.DRG.	ITEM No.	No OF ITEMS
	CODE		N.T.S	—	<b>1-13244-56100</b>	—	—
	TITLE SOLENOID VALVE & LIMIT SWITCHES FOR VACUUM BREAKER VALVE					DRAWING No.	
					<b>4-13244-56102</b>		
					SHEET No. 1	No.OF SHEETS	1

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30195-44231-3

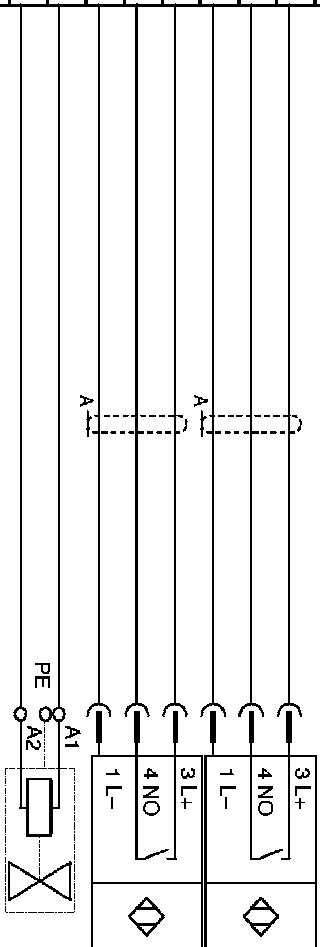
DRAWING No.

FIRST ANGLE PROJECTION

( ALL DIMENSIONS ARE IN mm )

FORM DG 38(B)

MAG10GF051: -X01	
1	MAG10CG051C
2	"
3	"
4	MAG10CG051B
5	"
6	"
7	MAG10AA051A
8	"
9	"
10	"
PE	"



Zuordnung der Aderfarben (DIN IEC 757)  
Assignment of core conductor colours (DIN IEC 757)

BK :	Schwarz	/	BLACK
BN :	Braun	/	BROWN
BU :	Blau	/	BLUE
GN :	Grün	/	GREEN
GY :	Grau	/	GREY
OG :	Orange	/	ORANGE
PK :	Rosa	/	PINK
PU :	Purpur	/	PURPLE
RD :	Rot	/	RED
WH :	Weiss	/	WHITE
YE :	Gelb	/	YELLOW

Der Klemmkasten und der Klemmenkastendeckel sind mit "MAG10GF051" zu kennzeichnen  
The Junction Box and the Junction Box Cover has to be labelled with "MAG10GF051"

Abschirmung (A) auf gedruckte Schirmklemmen 9-10 aufgelegt.

Shields (A) connected to bridged Shield terminal 9-10 .

Erde (PE) auf Erdklemmen aufgelegt  
Ground (PE) connected to ground terminals

DSPPG-0019936 revD,  
No> 00000-002670/251

Inventory No. Sign & Date Ref.Drawing

REV	DATE	ALTERED	REV	DATE	ALTERED	REV	DATE	ALTERED	REV	DATE	ALTERED
		CHECKED			CHECKED			CHECKED			CHECKED

C B O M		STATUS OF DRG	
AGREED	NAME	SIGN	DATE
CIE	BSR	-SD-	23.12.11

GRADE OF UNTOL. DIM		M/CG.- AA0230208 m	
WELDING-CLASS 'B' OF AA0621104		GAS CUTTING-TABLE 3 OF AA0621101	
DEPT	STE	SCALE	WEIGHT (KG)
CODE 4011		N.T.S.	
TITLE : CONNECTION DIAGRAM FOR VACUUM BREAKER VLV		CARD CODE	
		7	



BHARAT HEAVY ELECTRICALS LTD.  
RANIPUR, HARDWAR

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

STEAM TURBINE

DRN	NAME	SIGN	DATE	NO. OF VAR
CHD	H.GARG	-SD-	22.12.11	
APPD	N.NIRALA	-SD-	23.12.11	
	RCA	-SD-	29.12.11	

REF. TO ASSY. DRG.	1-13244-56100	ITEM No.	75	NO. OF ITEMS	74
DRAWING NO.	3-13244-56103	SHEET No.	1	No. OF SHEETS	1

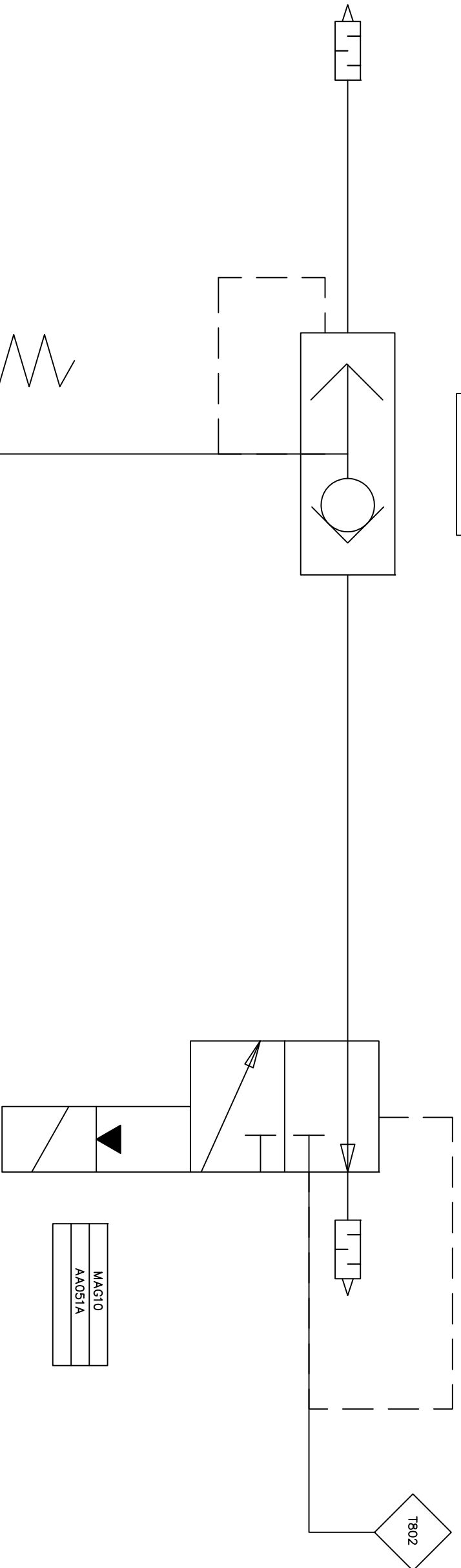
SIZE A3

DRAWING NO.  
**3-12344-56104**

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

FORM: DG-38(B)



- NOTES:-**
1. VALVES IN SWITCH POSITION DEPRESSURIZED AND DEENERGIZED STATE
  2. CROSSING LINES ARE NO CONNECTIONS
  3. NC: NORMALLY CLOSED

DSPPG-0172779  
 12991-989134 Rev.C  
 REF. DRG NO.

INVENTORY NO. SIGN & DATE

GRADE OF UNTOL. DIM:--  
 M/CG - V/C/M/F AA 0230208  
 WELDING-A/B/C/D-AA621104  
 GAS CUTTING-'T3'AA0621101

REV.	DATE	ALTERED	CHECKED	REV.	DATE	ALTERED	CHECKED

AGREED DEPT.	NAME	SIGN	DATE	STATUS OF DRG.
CIE	BSR	-sd-	08.06.12	

TYPE OF PRODUCT OR NAME OF CUSTOMER/ PROJECT  
**STEAM TURBINE**

**BHARAT HEAVY ELECTRICALS LTD.**  
**HARDWAR**

DRN	H.SINGH	SIGN	DATE	NO.OF VAR.
CHD	N.NIRALA	-SD-	08/06/12	
APD	V.S.	-SD-	09/06/12	73, 74

TITLE  
**COMPONENT DIAGRAM**  
**VACUUM BREAKER VALVE**

DRAWING NO. **3-13244-56104**  
 SHEET NO. 1 NO. OF SHEETS 1  
 SIZE A3

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

REV	DATE	ALTERED CHECKED	REV	DATE	ALTERED CHECKED	GMS No/GRSP No. -----		STATUS OF DRG	
						AGREED DEPT.	NAME	SIGN	DATE

GRADE OF UNTOL.DIM./CGE/M/F.AA0230208 WELDING A/B/C/D-AA0621104 GAS CUTTING-13 AA0621101

## TECHNICAL PURCHASING SPECIFICATION: VALVES

TABLE OF CONTENT	PAGE
1. SCOPE OF APPLICATION .....	2
2. TYPE-TESTED VALVES .....	2
3. REFERENCED DOCUMENTS .....	2
4. TECHNICAL DATA AND DESIGN.....	2
5. INSPECTION CERTIFICATE / DECLARATION OF COMPLIANCE IN DDEPENDENCE ON FLUID, PRESSURE AND TEMPERATURE.....	2
5.1 VALVES FOR STEAM:.....	2
5.2 VALVES FOR GAS (INFLAMMABLE):.....	2
5.3 VALVES FOR OIL AND FIRE-RESISTANT FLUIDS: .....	2
5.4 VALVES FOR PRIMARY WATER:.....	2
5.5 VALVES FOR VACUUM AND CONDENSATE: .....	2
6. QA-REQUIREMENTS REGARDING THE VALVE MANUFACTURER AND HIS SUPPLIERS.....	3
7. MANUFACTURING AND INSPECTION PLAN (MIP) .....	3
8. CONDITION FOR MANUFACTURING.....	3
9. HERSTELLUNG UND PRÜFUNG .....	3
9.1 STEEL CASTINGS .....	3
9.2 ROLLED OR FORGED MATERIAL.....	3
9.3 CONNECTING ELEMENTS .....	4
9.4 WELDING.....	4
9.5 MANUFACTURING INSPECTIONS .....	4
10. MARKING .....	5
11. SURFACE CONDITION AND SURFACE PROTECTION .....	5
12. DOCUMENTATION.....	5
13. FINAL INSPECTION.....	6
14. DELIVERY AND PACKING .....	6
15. SUPPLEMENTARY REQUIREMENTS .....	7
16. DEVIATIONS .....	7

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 REF.DRG.No.

SIGN & DATE



BHARAT HEAVY ELECTRICALS LTD  
HARDWAR

	NAME	SIGN	DATE	NO. OF VAR
DRN	H.SINGH	SD/-	08.03.15	
CHD	H.G./N.N.	SD/-	17.03.15	
APD	N.GARG	SD/-	18.03.15	-

INVENTORY No.	DEPT. STE		SCALE	WEIGHT(KG)	REF.TO ASSY.DRG.	ITEM No.	No OF ITEMS
	CODE 4011		N.T.S	----	1-13244-56100	06	
	TITLE					DRAWING No.	
TECHNICAL PURCHASE SPEC. FOR VALVES					4-13244-56105		
					SHEET No.01	No.OF SHEETS	07

REV	DATE	ALTERED CHECKED	REV	DATE	ALTERED CHECKED	GMS No/ <del>GRSP No.</del> -----	STATUS OF DRG
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# TECHNICAL PURCHASING SPECIFICATION: VALVES

## 1. SCOPE OF APPLICATION

THIS TECHNICAL PURCHASING SPECIFICATION COVERS VALVES FOR CONTROL AND/OR SAFETY PURPOSES FOR THE USE IN SYSTEMS OF TURBINE AND GENERATOR UNITS.

THE REQUIREMENTS OF THIS DRG. ARE VALID AS FAR AS NO OTHER REQUIREMENTS ARE GIVEN IN OTHER BHEL DRAWING.

## 2. TYPE-TESTED VALVES

VALVES WITH A VALID TYPE-TESTING CERTIFICATE ACCORDING TO PED97/23/EC AND TO THE CORRESPONDING VDTUV-DATA SHEETS, OF TRD 110 ATTACHMENT 1 AS WELL AS ACCORDINGLY TO THE REGISTRATION OF DIN-DVGW FULFILL THE REQUIREMENTS OF THIS TLV. BYPASS VALVES ARE ALSO LIABLE TO PED 97/23/EC. FOR THESE VALVES THE REQUIREMENTS FOR MANUFACTURING AND TESTING AGREED UPON WITH THE TUV'S RESPECTIVELY WITH THE DVGW-FEDERATION SHALL BE FULFILLED (DECLARATION OF COMMITMENT).

## 3. REFERENCED DOCUMENTS

- AD2000-W 0
- AD2000-W 7
- AD2000-HP 0
- AD2000-HP 5/3
- TRD 100
- EN 287-1
- DIN EN ISO 15607
- DIN EN ISO 15609-1
- DIN EN ISO 15614-1
- EN 1418
- EN 10028
- EN 10204
- EN 10213
- EN 10222
- EN 10273
- DIN 1690-10
- EN 1559-1
- EN 1559-2
- EN 12266-1/-2
- DIN 17175,
- SIEMENS-TLV 960501
- PED 97/23/EC

IN CASE OF DIFFERENCES OR CONTRADICTIONS OF THE REFERENCED DOCUMENTS THE HIGHER REQUIREMENTS SHALL BE APPLIED.

## 4. TECHNICAL DATA AND DESIGN

THE CRITERIA, E.G. FLUID, PRESSURE, TEMPERATURE, MATERIAL OF THE CASING, ETC., AS WELL AS OTHER TECHNICAL DATA ARE GIVEN IN THE BHEL DRAWING.

## 5. INSPECTION CERTIFICATE / DECLARATION OF COMPLIANCE IN DEPENDENCE ON FLUID, PRESSURE AND TEMPERATURE

FOR ALL VALVES AN INSPECTION CERTIFICATION 3.1 MUST BE PROVIDED. DEVIATING HEREOF AN INSPECTION CERTIFICATION 2.1 IS SUFFICIENT FOR SMALL VALVES AS DESCRIBED IN THE FOLLOWING SECTIONS.

### 5.1 VALVES FOR STEAM:

FOR VALVES WITH DN ≤ 50 MM AND MAXIMUM ALLOWABLE WORKING PRESSURE ≤ 10 BAR AND MAXIMUM ALLOWABLE WORKING TEMPERATURE ≤ 150°C A CERTIFICATE OF COMPLIANCE 2.1 ACCORDING TO EN 10204 IS SUFFICIENT.

### 5.2 VALVES FOR GAS (INFLAMMABLE):

ESPECIALLY DIN EN 12266 IS TO APPLY.

### 5.3 VALVES FOR OIL AND FIRE-RESISTANT FLUIDS:

FOR VALVES WITH DN ≤ 50 MM AND MAXIMUM ALLOWABLE WORKING PRESSURE ≤ 10 BAR A CERTIFICATE OF COMPLIANCE 2.1 ACCORDING TO EN 10204 IS SUFFICIENT.

### 5.4 VALVES FOR PRIMARY WATER:

FOR VALVES WITH DN ≤ 50 MM A CERTIFICATE OF COMPLIANCE 2.1 ACCORDING TO EN 10204 IS SUFFICIENT.

### 5.5 VALVES FOR VACUUM AND CONDENSATE:

FOR ALL VALVES FOR VACUUM- AND/OR CONDENSATE SYSTEMS A CERTIFICATE OF COMPLIANCE 2.1 ACCORDING TO EN 10204 IS SUFFICIENT.

TITLE  
**TECHNICAL PURCHASE  
SPEC. FOR VALVES**

DRAWING No.  
**4-13244-56105**  
SHEET No. 02 No. OF SHEETS 07

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REF.DRG.No.

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INVENTORY No.

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# TECHNICAL PURCHASING SPECIFICATION: VALVES

## 6. QA-REQUIREMENTS REGARDING THE VALVE MANUFACTURER AND HIS SUPPLIERS

THE VALVE MANUFACTURER AS WELL AS HIS SUPPLIERS FOR THE MAIN COMPONENTS LIKE E.G. PRESSURE GUIDING COMPONENTS, INSTRUMENTATION AND CONTROL, SHALL HAVE AN INTRODUCED AND WELL-WORKING QUALITY MANAGEMENT SYSTEM, E.G. ACCORDING TO EN ISO 9000 SERIES OR EQUIVALENT STANDARD. MANUFACTURERS OF PRESSURE GUIDING COMPONENTS SHALL HAVE IN ADDITION A CERTIFICATE ACCORDING TO AD2000-W 0 RESPECTIVELY TRD 100.

AS FAR AS WELDING WILL BE PERFORMED ON THE VALVES, THE WELD SHOP SHALL BE CERTIFIED ACCORDING TO AD2000-HP 0.

## 7. MANUFACTURING AND INSPECTION PLAN (MIP)

FOR EACH VALVE TYPE WITH DN ≥100 MM, DELIVERED FOR THE FIRST TIME TO THE PURCHASER, THE VALVE MANUFACTURER SHALL PREPARE A MANUFACTURING AND INSPECTION PLAN CONTAINING SUFFICIENT INFORMATION ON THE SEQUENCE AND EXTENT OF THE VALVE INSPECTIONS AS WELL AS THE MAIN RAW MATERIAL AND SHALL DELIVER THIS TO THE PURCHASER FOR REVIEW AT THE LATEST 4 WEEKS AFTER ORDER RECEIPT, BUT AT LEAST 2 WEEKS BEFORE STARTING MANUFACTURING.

## 8. CONDITION FOR MANUFACTURING

MANUFACTURING OF THE IN POINT SEVEN MENTIONED VALVE SHALL NOT BE STARTED BEFORE THE REVIEW FOR THE DESIGN AS WELL AS FOR THE MIP HAS BEEN GIVEN BY THE PURCHASER. TO PROHIBIT ANY DELAY THE VALVE MANUFACTURER SHALL CALL FOR MISSING REVIEWS AND REMIND THE PURCHASER ON TIME.

BY REVIEWING THE MIP THE PURCHASER DOES NOT TAKE ON ANY RESPONSIBILITY FOR PROCESSES OR MANUFACTURING DETAILS OF THE VALVE MANUFACTURER OR HIS SUPPLIERS, OR FOR THE VALVE ITSELF.

## 9. MANUFACTURING AND TESTING

## 9.1 STEEL CASTINGS

STEEL CASTINGS, E.G. VALVE CASINGS, COVERS, ETC., SHALL BE MANUFACTURED AND INSPECTED ACCORDING TO EN 10213 AND EN 1559 PART 1 AND PART 2 AND DIN 1690 PART 10, AND FOLLOWING MINIMUM REQUIREMENTS:

- ANALYSIS (CHEMICAL COMPOSITION) PER HEAT
- MECHANICAL PROPERTIES PER HEAT AND HEAT TREATMENT BATCH, FOR CASTINGS WITH AN INDIVIDUAL WEIGHT > 1000 KG TESTING PER CASTING
- AMOUNT OF NON-DESTRUCTIVE TESTING ACCORDING TO DIN 1690 PART 10:
  - WELD ENDS OF VALVES WITHOUT CONNECTION PIECES: QUALITY CLASS A WITH QUALITY GRADES S1+V1
  - TRANSITION AREAS: QUALITY CLASS B WITH QUALITY GRADES S2+V2
  - WELD ENDS OF VALVES WITH CONNECTION PIECES: QUALITY CLASS B WITH QUALITY GRADES S2+V2
  - REMAINING AREAS OF THE CASTING: QUALITY CLASS D WITH QUALITY GRADES S3+V4; ADDITIONALLY FOR CASTINGS ≥ 500 KG OR DN ≥400 MM EACH CASTING 100% VOLUME INSPECTION SHALL BE PERFORMED.

## 9.2 ROLLED OR FORGED MATERIAL

ROLLED OR FORGED MATERIAL, E.G. CONNECTION PIECE, SHALL BE MANUFACTURED AND INSPECTED ACCORDING TO THE CORRESPONDING MATERIAL STANDARD, E.G. EN 10028, EN 10088, EN 10222, EN 10273, DIN EN 10216-2 AND DIN 17440, ETC. AND FOLLOWING SUPPLEMENTS:

- ANALYSIS (CHEMICAL COMPOSITION) PER HEAT
- MECHANICAL PROPERTIES PER HEAT AND HEAT TREATMENT BATCH

TITLE  
**TECHNICAL PURCHASE  
SPEC. FOR VALVES**

DRAWING No.  
**4-13244-56105**  
SHEET No. 03 No. OF SHEETS 07

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# TECHNICAL PURCHASING SPECIFICATION: VALVES

## 9.3 CONNECTING ELEMENTS

CONNECTING ELEMENTS SHALL BE MANUFACTURED AND TESTED ACCORDING TO AD2000-W 7. AS FAR AS THERE IS A REQUIREMENT FOR A TEST CERTIFICATE FOR GRADE PROPERTIES, THIS SHALL BE AN INSPECTION CERTIFICATE 3.1 ACCORDING TO EN 10204.

## 9.4 WELDING

AS FAR AS WELDING WILL BE PERFORMED ON THE VALVES (ALSO IN CASE OF FABRICATION WELDING ON CASTINGS):

- WELDING SHALL BE PERFORMED ONLY BY WELDERS TESTED IN LINE WITH EN 287 OR MECHANIZED WELDS BY WELDING OPERATORS TESTED IN LINE WITH EN 1418
- CORRESPONDING WELDING PROCEDURE SPECIFICATIONS AND PROCEDURE APPROVAL RECORDS ACCORDING TO
  - DIN EN ISO 15607
  - DIN EN ISO 15609-1
  - DIN EN ISO 15614-1
 SHALL BE AVAILABLE.

- FABRICATION WELDS ON CASTINGS SHALL BE INSPECTED ACCORDING TO DIN 1690.
- FABRICATION WELDS HAVING A LENGTH  $\geq$  150 MM OR A DEPTH  $\geq$  40% OF THE WALL THICKNESS OR A DEPTH  $\geq$  25 MM SHALL BE RECORDED.
- DESIGN WELDS SHALL BE INSPECTED ACCORDING TO AD2000-HP 5/3. IN CASE OF SERIAL PRODUCTION MANUFACTURER-SPECIFIC INSPECTION CONCEPTS MAY BE APPLIED WITH WRITTEN AGREEMENT OF THE PURCHASER.

- IF CAST STEEL PARTS ARE SUBJECTED TO HEAT TREATMENT IN THE COURSE OF VALVE MANUFACTURE, ALL PARTS HEATED SHALL SUBSEQUENTLY BE SUBJECTED TO A 100% SURFACE CRACK EXAMINATION.

## 9.5 MANUFACTURING INSPECTIONS

MANUFACTURING INSPECTIONS SHALL BE

PERFORMED ACCORDING TO PED 97/23/EC / EN 12266. THE PED 97/23/EC AS AN SUPERIOR LEGISLATION SHALL BE OBSERVED AND APPLIED. THESE ARE ESPECIALLY:

- A) PRESSURE TEST
  - TEST P10 ACCORDING TO EN 12266 PART 1
- B) LEAK TEST
  - ISOLATING VALVES
    - TEST P11 + P12, LEAKAGE CLASS B ACCORDING TO EN 12266 TEIL 1
  - ALL VALVES IN GENERATOR AND VACUUM SYSTEMS:
    - TEST P11 + P12, LEAKAGE CLASS A ACCORDING TO EN 12266 TEIL 1
  - CHECK VALVES IN EXTRACTION AND COLD REHEAT LINES
    - TEST P11 + P12, LEAKAGE CLASS B ACCORDING TO EN 12266 PART 1
  - CONTROL VALVES
    - TEST P11 + P12, LEAKAGE CLASS C ACCORDING TO EN 12266 TEIL 1
  - COMBINED STOP AND CONTROL VALVES
    - TEST P11 + P12, LEAKAGE CLASS B ACCORDING TO EN 12266 TEIL 1
- C) FUNCTIONAL TEST
  - TEST F20 ACCORDING TO EN12266 PART 2
- D) VERIFICATION OF DIMENSIONS
  - MAIN DIMENSIONS
  - CONNECTING DIMENSIONS

ALL TOLERANCE RANGES WHICH ARE IMPORTANT FOR THE FUNCTION SHALL BE RECORDED. AS

- STEM DIAMETER
- DIAMETERS OF GUIDES AND FITS

TITLE  
**TECHNICAL PURCHASE  
SPEC. FOR VALVES**

DRAWING No.  
**4-13244-56105**  
SHEET No. 04 No. OF SHEETS 07

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# TECHNICAL PURCHASING SPECIFICATION: VALVES

## 10. MARKING

VALVES SHALL BE MARKED AS FOLLOWS:

- THE NAME AND ADDRESS OR OTHER MEANS OF IDENTIFICATION OF THE MANUFACTURER AND, WHERE APPROPRIATE, OF HIS AUTHORIZED REPRESENTATIVE ESTABLISHED WITHIN THE COMMUNITY
- NOMINAL DIAMETER
- NOMINAL PRESSURE CLASS
- CASING MATERIAL
- FLOW DIRECTION ARROW
- IDENTIFICATION-NO. (ALSO COMMISSION-NO.)
- THE YEAR OF MANUFACTURE
- IDENTIFICATION OF THE PRESSURE EQUIPMENT ACCORDING TO ITS NATURE, SUCH AS TYPE, SERIES OR BATCH IDENTIFICATION AND SERIAL NUMBER
- ESSENTIAL MAXIMUM/MINIMUM ALLOWABLE LIMITS
- CE MARKING

VALVES WITH A TOTAL WEIGHT > 1000 KG SHALL BE MARKED ADDITIONALLY WITH A PERMANENT INFORMATION OF THE WEIGHT ON THE VALVE OR ON AN SAFE NAME PLATE.

THE PROVISIONAL KKS-LABELS WHICH ARE FABRICATED AND PROPERLY SIZED ARE TO BE MADE OF PLASTIC OR SIMILAR UNBREAKABLE MATERIAL AND ATTACHED TO THE COMPONENT BY WIRE. THE LETTERING ON THE LABELS SHOULD INCLUDE THE KKS CLASSIFICATION IN BACK, PERMANENT INK.

MARKING OF THE MATERIALS FOR ALL PRESSURE LOADED CASING COMPONENTS SHALL SURVIVE DURING ALL MANUFACTURING PROCESSES ACCORDING TO AD2000-HP 0.

## 11. SURFACE CONDITION AND SURFACE PROTECTION

SURFACES OF STAINLESS STEEL VALVES SHALL

BE METALLIC BRIGHT AND CLEAN AND FREE OF GREASE, OIL, CHLORIDES, CLEANING AGENTS, SCALE OR OTHER IMPURITIES. ANNEALING COLOURS TIL STRAW-YELLOW ARE ACCEPTABLE.

IF THERE ARE NO OTHER REQUIREMENTS GIVEN IN THE ORDER, VALVE MANUFACTURER SPECIFIC COATINGS MAY BE USED FOR NON-STAINLESS STEEL VALVES. HOWEVER THESE COATINGS SHALL BE APPROVED BY THE PURCHASER ON TIME BEFORE USE. OTHERWISE FOR SURFACE PREPARATION AND COATING OF NON-STAINLESS STEEL VALVES SIEMENS-TECHNICAL PURCHASING SPECIFICATION TLV 960501 SHALL BE APPLIED.

## 12. DOCUMENTATION

ALL THE DOCUMENTATION FOR THE DELIVERED VALVE SHALL REMAIN WITH THE VALVE MANUFACTURER AND SHALL BE STORED FOR AT LEAST 10 YEARS. THIS DOCUMENTATION SHALL BE LABELLED SUCH AS TO ENSURE TRACEABILITY AND ALLOCATION TO THE CORRESPONDING VALVE AND SHALL BE MARKED AS BELONGING TO BHEL. THE VALVE MANUFACTURER SHALL CHECK THE DOCUMENTATION WITH RESPECT TO COMPLETENESS AND CORRECTNESS BEFORE SHIPPING THE VALVE. THE VALVE MANUFACTURER SHALL CERTIFY THIS AT THE TIME OF THE DELIVERY. IT IS THE OBLIGATION OF THE VALVE MANUFACTURER TO HAND OVER A COPY OF THE TOTAL DOCUMENTATION TO THE PURCHASER ON REQUEST AND FREE-OF-CHARGE.

BHEL EXPECTS A DOCUMENTATION OF THE MODULE/PARTS INCLUDING ALL INSTRUCTIONS WHICH ARE NECESSARY FOR SERVICE, INSTALLATION AND MAINTENANCE. THE DOCUMENTS HAVE TO BE IN COMPLIANCE WITH THE REQUIREMENTS OF THE DOCUMENT 1-11400-56012. AMENDMENTS WILL BE REQUESTED SEPARATELY.

IN ACCORDANCE TO THE MACHINERY DIRECTIVE (98/37/EC) AND PRESSURE EQUIPMENT DIRECTIVE (97/23/EC) THE FOLLOWING RECORDS AND LOGS SHALL BE PROVIDED TO THE PURCHASER IN ANY CASE:

- MANUFACTURES DECLARATION
- DECLARATION OF CONFORMITY
- MATERIAL CERTIFICATES
- PRESSURE TEST

TITLE  
**TECHNICAL PURCHASE  
SPEC. FOR VALVES**

DRAWING No.  
**4-13244-56105**  
SHEET No. 05 No. OF SHEETS 07

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# TECHNICAL PURCHASING SPECIFICATION: VALVES

– NON-DESTRUCTIVE TESTS

THE DOCUMENTATION—ALSO THAT OF THE SUBSUPPLIERS —SHALL BE WRITTEN IN GERMAN AND ENGLISH LANGUAGE AND SHALL CONTAIN AT LEAST:

- TEST CERTIFICATES OF THE PREMATERIAL (AT LEAST INSPECTION CERTIFICATE 3.1B ACCORDING TO EN10204)
- RECORDS OF ALL INSPECTIONS PERFORMED BY THE VALVE MANUFACTURER OR HIS SUBSUPPLIERS DURING MANUFACTURING:
- NON-DESTRUCTIVE INSPECTIONS OF E.G. WELD AREAS OR WELDS
- VERIFICATION OF DIMENSIONS
- PRESSURE AND LEAK TESTS
- FUNCTIONAL TESTS
- HEAT TREATMENTS PERFORMED

- THE EUROPEAN UNION GUIDELINES AND STANDARDS WHICH ARE VALID AND CAN BE USED FOR THE AREA OF APPLICATION (E.G. PED 97/23/EG, LOW-VOLTAGE GUIDELINE 73/23/EWG, ETC..) ARE TO BE DESIGNATED IN THE DECLARATION OF CONFORMITY ACCORDING TO THE REMARKS AND APPLIED QUALITY MODULES, AND SHALL INCLUDE ALL RELEVANT DATA (SEE E.G. APPENDIX VII OF GUIDELINE 97/23/EG). RISK DISCLOSURE AND DANGER ANALYSES IN ACCORDANCE WITH EN 1050 ARE TO BE HANDED OVER TO SIEMENS IF NECESSARY.

- IF MATERIALS WITHOUT EUROPEAN MATERIAL APPROVAL ARE DRAWN ON FOR THE ORDER (ORDER PAPERS/DESIGNS) (E.G. ANSI/ASME MATERIALS) APPROPRIATE SUBSTITUTE CERTIFICATES FROM A DESIGNATED AUTHORITY SHALL BE PROCURED AND DOCUMENTED ACCORDINGLY. IF THE ORDER PERTAINS TO A COMPONENT OF A TOTAL DESIGN GROUP, THEN ALL CERTIFICATES AND CERTIFICATION OF THE COMPONENT OF THE HIGHEST CATEGORY OF THE TOTAL DESIGN GROUP SHALL BE MADE AVAILABLE.

## 13. FINAL INSPECTION

THE PURCHASER RESERVES THE RIGHT TO PERFORM FINAL INSPECTIONS ON HIS ORDERED PARTS IN THE SHOP OF THE VALVE MANUFACTURER, AS WELL AS IN THE SHOP OF HIS SUBSUPPLIERS

## 14. DELIVERY AND PACKING

DETAILS REGARDING DELIVERY ARE GIVEN IN THE ORDER, HOWEVER AT LEAST FOLLOWING DETAILS SHALL BE GIVEN TOGETHER WITH THE DELIVERED PARTS:

ACTUALISATION OF STANDARDS AND INSTRUCTIONS.

- PURCHASER
- ORDER-NO. / PROJECT
- MANUFACTURER COMMISSION-NO./ ORKS-NO.
- SPECIFICATION
- NUMBER OF PIECES
- TYPE / ITEM
- NOMINAL DIAMETER [DN]
- MAXIMUM ALLOWABLE PRESSURE [PS]
- MAXIMUM ALLOWABLE TEMPERATURE [TS]
- FLUID
- MANUFACTURER DRAWING-NO.
- IDENTIFICATION-NO. OF THE VALVE
- PIECE WEIGHT

TOGETHER WITH THE DELIVERY OF THE VALVE THE VALVE MANUFACTURER SHALL HAND OVER A CERTIFICATE 2.1 ACCORDING TO EN 10204 IN ENGLISH, WHICH CONFIRMS, THAT THE DELIVERED VALVE FULFILLS THE REQUIREMENTS GIVEN IN THE BHEL DRAWING AND IN THIS DRAWING. FURTHERMORE THE VALVE MANUFACTURER SHALL CONFIRM, THAT ONLY MATERIALS AS LISTED IN THE DESIGN BILL OF MATERIAL HAVE BEEN USED AND THAT THE DOCUMENTATION IS AVAILABLE IN HIS SHOP IN LINE WITH ITEM 12 ABOVE AND THAT HE HAS CHECKED THE DOCUMENTATION CAREFULLY.

TITLE  
**TECHNICAL PURCHASE  
SPEC. FOR VALVES**

DRAWING No.  
**4-13244-56105**  
SHEET No. 06 No. OF SHEETS 07

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SPE\_TLV2001\_E\_DE  
REF.DRG.No.

SIGN & DATE

INVENTORY No.

REV	DATE	ALTERED CHECKED	REV	DATE	ALTERED CHECKED	GMS No/ <del>GRSP No.</del> -----	STATUS OF DRG
-----	------	--------------------	-----	------	--------------------	--------------------------------------	------------------

# TECHNICAL PURCHASING SPECIFICATION: VALVES

PACKING OF THE VALVE SHALL BE AS FOLLOWS:

- THE VALVE SHALL BE PACKED AND LOCKED THAT WAY, THAT IN GENERAL CASE ANY DAMAGE WILL BE PROHIBITED.
- ALL OPENINGS SHALL BE PLUGGED.
- DETAIL PARTS RESPECTIVELY COMPONENTS SHALL BE PACKED INDIVIDUALLY, HOWEVER ASSIGNMENT SHALL BE ENSURED.
- AS FAR AS NECESSARY ACCESSORY DEVICES FOR TRANSPORTATION PURPOSES SHALL BE ATTACHED TO THE VALVE AND/OR TO THE PACKING, E.G. LIFTING EYES AND LIFTING SIGNS.
- BEARING AREAS SHALL BE MARKED, IF NECESSARY.

IN CASE OF ANY DEVIATION FROM THE SPECIFIED PROPERTIES, ALSO IF THE PROOF BY TESTING IS NOT REQUIRED, THE PURCHASER HAS THE RIGHT TO REJECT THE MATERIAL.

## 15. SUPPLEMENTARY REQUIREMENTS

FOR EACH VALVE, DELIVERED FOR THE FIRST TIME TO THE PURCHASER, THE VALVE MANUFACTURER SHALL SEND FOLLOWING DOCUMENTS WRITTEN IN ENGLISH LANGUAGE TRIPLE TO THE PURCHASER'S DEPARTMENT FOR STANDARDS. DOCUMENTS LISTED UNDER A) AND C) SHALL BE DELIVERED ALREADY TOGETHER WITH THE ORDER  
ACKNOWLEDGEMENT:

- A) CUTAWAY DRAWING SHOWING THE FUNCTION OF THE VALVE AND THE DESIGN BILL OF MATERIAL
- B) OPERATING AND MAINTENANCE INSTRUCTION
- C) SPARE PART LIST

## 16. DEVIATIONS

ANY DEVIATION FROM THIS PURCHASING SPECIFICATION HAS TO BE REPORTED TO THE PURCHASER IMMEDIATELY USING A DEVIATION REPORT ACCORDING TO ATTACHMENT 1.

ANY DEVIATION IS ACCEPTED ONLY IF THIS HAS BEEN APPROVED OR TOLERATED BY THE PURCHASER IN WRITING.

TITLE  
**TECHNICAL PURCHASE  
SPEC. FOR VALVES**

DRAWING No.  
**4-13244-56105**  
SHEET No. 07 No. OF SHEETS 07

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SPE\_TLV2001\_E\_DE  
 REF.DRG.No.

SIGN & DATE

INVENTORY No.

MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN				TO BE FILLED BY BHEL		TO BE FILLED BY SHEL			
VENDOR'S NAME		VACUUM BREAKER VALVE		QP NO.	QA BL QP 113	DATED		21.10.2014			
BHEL	DRG. NO.	AS PER PO		AS PER PO		AS PER PO					
	SPEC.	AS PER PO		AS PER PO		AS PER PO					
	REV.	01		01		01					
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTITY OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY	REMARKS	
1	2	3	4	5	6	7	8	9	M B N	10	11

1.0 RAW MATERIALS & BOUGHT OUT ITEMS											
1.1	BODY, BONNET PLUG, SEAT & PRESSURE CONTAINING FASTENERS	MECHANICAL PROPERTIES	MA	MECHANICAL PROPERTIES	ONE PER HEAT	APPROVED DATA SHEET / ASTM STD	APPROVED DATA SHEET / ASTM STD	TEST CERTIFICA TE	V	P	V
1.2	ACCESSORIES LIKE SOLENOID VALVE, SWITCH ETC	VISUAL	MA	VISUAL / MODEL VERIFICATIO N	100%	APPROVED DATASHEET / DRAWING	APPROVED DATA SHEET / ASTM STD	MANUFAC TURER CERTIFICA TE	V	P	V
2. IN PROCESS INSPECTION											
2.1	BODY, BONNET PLUG, SEAT RINGS AFTER MACHINING	DIMENSIONAL CHECK	MA	MEASUREME NT	100%	DRG.	DRG.	-	V	P	V
2.2	HARD FACE D TRIM PARTS	LIQUID PENETRANT TESTING	MAJOR	SURFACE DEFECTS	100%	APPROVED DATASHEET / DRAWING	APPROVED DATASHEET / DRAWING	TEST CERTIFICA TE	V	P	V
									HARDNESS	MAJOR	HARDNESS
2.3	PNEUMATIC ACTUATOR	LEAKAGE TEST WITH SOAP BUBBLE	MAJOR	LEAKAGE	100%	VENDOR STANDARD	NO LEAKAGE	TEST CERTIFICA TE	V	P	V
3.0	FINAL INSPECTION & TESTING										

MANUFACTURER/SUBCONTRACTOR	LEGEND	FOR CUSTOMER USE	APPROVED BY
	<p>RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION</p> <p>M MANUFACTURER / SUBCONTRACTOR B BHEL / NOM INSPECTION AGENCY N CUSTOMER</p> <p>INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION</p> <p>ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER</p>		<p>Sanjeev Kumar Bhatnagar</p> <p>21/10/2014</p>

APPROVED BY: **Sanjeev**  
 संजीव कुमार भारद्वाज  
 21/10/2014  
 अश्विन/Engineer  
 गुणता अश्विन/Quality Assurance  
 बी.एच.ई.ए. हरिद्वार/BHEL Haridwar

MANUFACTURER'S NAME AND ADDRESS: BHEL  
 STANDARD QUALITY PLAN: VACUUM BREAKER VALVE  
 TO BE FILLED BY BHEL: QA BI QP 113  
 TO BE FILLED BY BHEL: 21.10.2014

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTITY OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS
									M	B	N	
1	2	3	4	5	6	7	8	9	10	11		

31	PERFORMANCE TEST ON ASSEMBLED VALVE	HYDRO TEST	MAJOR	HYDRO TEST	100%	ANSI B 16.34 APPROVED DATASHEET / DRAWING	APPROVED DATASHEET / DRAWING	TEST CERTIFICATE	V	P	W	
32	SEAT LEAK TEST	MAJOR	LEAK TEST	100%	APPROVED DATASHEET / DRAWING	APPROVED DATASHEET / DRAWING	TEST CERTIFICATE	V	P	W		
33	PERFORMANCE TEST OF VALVE	MAJOR	CALIBRATION (HYSTERISIS TRAVEL), OPEN & CLOSE TIME	100%	APPROVED DATASHEET / DRAWING	APPROVED DATASHEET / DRAWING	TEST CERTIFICATE	V	P	W		QA TYPE TEST REPORT FOR REVIEW
34	PACKING TIGHTNESS	MAJOR	GLAND LEAK TEST	100%	VENDOR STANDARD	VENDOR STANDARD	-	V	P	W		
40	PRESERVATION & PACKING											
41	FINAL INSPECTION	OVERALL DIMENSIONS	MAJOR	VISUAL & DIMENSIONAL	100%	APP. GA DRG.	APP. GA DRG.	TEST CERTIFICATE	V	P	W	
42	PAINTING	CLEANLINESS, STAMPING ETC.	MAJOR	VISUAL	100%	AS PER SPEC & APPROVED DRG.	AS PER SPEC & APPROVED DRG.	V	P	W		
43	PACKING	PAINT FINISH, COLOUR, SHADE	MAJOR	VISUAL & DFT MEASUREMENT	100%	AS PER APPROVED DRG. / DATASHEET	AS PER APPROVED DRG. / DATASHEET	V	P	W		
43	PACKING	PACKING LIST, SAFETY	MAJOR	VERIFICATION	100%	BHEL SPEC	BHEL SPEC	PACKING LIST	V	P	W	

LEGEND:  
 I RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.  
 M MANUFACTURER / SUBCONTRACTOR B BHEL / NOM INSPECTION AGENCY  
 N CUSTOMER  
 P PERFORM W WITNESS AND V VERIFICATION  
 ALL W INDICATED IN COLUMN N SHALL BE CIP OF CUSTOMER

FOR CUSTOMER USE

APPROVED BY: *Sanjeev*  
 21/10/2014  
 संजीव कुमार भारद्वाज  
 Sanjeev Kumar Bhardwaj  
 संधिपदा/Engineering