

MODUL DESIGNATION	Sizing of Control Valve , Steam	06,V 7.81	DOCUMENT NUMBER
MODUL DATABASE	P:\WBABSY\DATEN\BABSY3.598		
CONTAINER	70011158_1-[00200]		PAGE 1
40 41 00 00 00 00 00 plant/project	Maritza East I		USER-[0001-112][S]
customer	Alstom Power		<b>v.d. Lieck</b>
offer no./commission	40007823		LAST ACTION
plant identification			<b>16.01.2007 14:17:28</b>

# CONTROL VALVE SIZING

INQUIRY NUMBER	
PART DESIGNATION	<b>ND - Bypass Control Valve</b>

VALVE TYPE	<b>STEAM PRESSURE REDUCING VALVE</b>
VALVE DESCRIPTION	<b>Typ 155 L</b>

DN-INLET	PN-INLET	DN-OUTLET	PN-OUTLET
<b>550</b>	<b>---</b>	<b>800</b>	<b>---</b>

<b>DESIGN</b>	INLET	OUTLET	
DESIGN PRESSURE	<b>50,00</b>	<b>30,00</b>	<b>barg {O}</b>
DESIGN TEMPERATURE	<b>550</b>	<b>550</b>	<b>°C</b>
CALCULATION TEMPERATURE	<b>555</b>	<b>555</b>	<b>°C</b>

SERVICE DATA	CASE A	CASE B	CASE C	CASE D	CASE E	CASE F	
	<b>LF 1</b>	<b>LF 2</b>					
INLET FLOW	<b>268,000</b>	<b>94,400</b>					<b>kg/s</b>
INLET PRESSURE	<b>36,25</b>	<b>13,50</b>					<b>bar abs</b>
OUTLET PRESSURE	<b>19,70</b>	<b>7,00</b>					<b>bar abs</b>
INLET TEMPERATURE	<b>539</b>	<b>517</b>					<b>°C</b>
OUTLET TEMPERATURE	<b>532</b>	<b>514</b>					<b>°C</b>
SPRAYWATER PRESSURE							<b>bar abs</b>
SPRAYWATER TEMP.							<b>°C</b>
REQUIRED KV VALUE	<b>3407,9</b>	<b>3201,3</b>					<b>m³/h</b>
SPRAYWATER FLOW							<b>kg/s</b>
P out / P in	<b>0,54</b>	<b>0,52</b>					<b>-</b>
OUTL. TEMP. NOT COOLED							<b>°C</b>

RANGE OF CONTROL	<b>1 : 1,2</b>	CALCULATED
KV(min) VALUE	<b>3201,3</b>	<b>m³/h</b>
KV(max) VALUE	<b>3407,9</b>	<b>m³/h</b>
KVS VALUE	<b>3748,6</b>	<b>m³/h</b>
ALPHA VALUE	<b>0,750</b>	<b>-</b>
PLUG TYPE	<b>PERFORATED DISC</b>	
CHARACTERISTIC	<b>LINEAR</b>	
STEM-ø	<b>80,00</b>	<b>mm</b>
SEAT-ø	<b>420,00</b>	<b>mm</b>

<b>RANGE OF CONTROL : 1:25,0 AVAILABLE</b>
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SEAT-ø CALCULATED	<b>453,59</b>	<b>mm</b>	*)refer stages data
INNER-ø PERFORATED DISC	<b>393,59</b>	<b>mm</b>	*)refer stages data
STROKE	<b>150,00</b>	<b>mm</b>	*)refer stages data
VALVE STROKE , MINIMUM	<b>249,47</b>	<b>mm</b>	
NUMBER OF STAGES	<b>2</b>		

FLOW DIRECTION	<b>FLOW TENDS TO CLOSE</b>	BODY TYPE	<b>ANGLE TYPE</b>
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Date	<b>09.10.2007</b>			
Name	<b>v.d. Lieck</b>			
<b>Sempell</b>				
Re.Ind.	Revision Notice	Date	Name	

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NOISE LEVEL	CASE A	CASE B	CASE C	CASE D	CASE E	CASE F	
OUTLET	92,0	84,0					dB(A)

MAXIMUM NOISE PRESSURE LEVEL (NOISE GUARANTEE)	92,0	dB(A)
CALCULATION MODUL FROM Müller BBM		

INLET VELOCITY TO SELECTED ø	520,00	mm
A 127,7 m/s	> 80,0 <= 150,0	; RELEASE FROM TECHN. DEPT. REQUIRED
B 119,2 m/s	> 80,0 <= 150,0	; RELEASE FROM TECHN. DEPT. REQUIRED
C		
D		
E		
F		

OUTLET VELOCITY TO SELECTED ø	753,00	mm
A 112,3 m/s	> 80,0	; RELEASED , BUT NO MORE COMPONENTS !!! x=0,00
B 109,7 m/s	> 80,0	; RELEASED , BUT NO MORE COMPONENTS !!! x=0,00
C		
D		
E		
F		


ACTUATOR MAKE	Sempell Hydraulic	DELTA-P	50,00	bar
ACTUATOR TYPE	AHFS.C..... Spring to close			
REV. STROKE	-	THREAD	-	
OPERATING TIME	CONTROL CASE	SAFETY CASE	FAST OPENING	FAST CLOSING
	10-15	-	5	0,6
THRUST REQUIRED	OPEN	CLOSE	SPRING	
	-	-	-	kN
TORQUE REQUIRED	OPEN	CLOSE	MAXIMUM	
	-	-	-	Nm
ACCESSORIES				

INSPECTION PROCEDURE	PED 97/23 EC

MATERIALS	NUMBER	DIN CODE	REMARKS
INLET	1.7706	GS-17CrMoV511	
OUTLET	1.7706	GS-17CrMoV511	
BODY	1.7706	GS-17CrMoV511	
SEAT			
PLUG			

ENDS	TYPE	DIMENSIONS
INLET	BW ends DN 550	DN 620 x 50
OUTLET	BW ends DN 800	DN 813 x 30

REMARKS	

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STAGE DATA		CASE A	CASE B	CASE C	CASE D	CASE E	CASE F	
01	PRESSURE	36,25	13,50					bar abs
	TEMPERATURE	539	517					°C
	AREA	98581	91016					mm²
02	PRESSURE	26,72	9,72					bar abs
	TEMPERATURE	535	515					°C
	AREA	133788	126424					mm²
03	PRESSURE	19,70	7,00					bar abs
	TEMPERATURE	532	514					°C
	AREA							mm²
04	PRESSURE							bar abs
	TEMPERATURE							°C
	AREA							mm²
05	PRESSURE							bar abs
	TEMPERATURE							°C
	AREA							mm²
06	PRESSURE							bar abs
	TEMPERATURE							°C
	AREA							mm²
07	PRESSURE							bar abs
	TEMPERATURE							°C
	AREA							mm²
08	PRESSURE							bar abs
	TEMPERATURE							°C
	AREA							mm²
09	PRESSURE							bar abs
	TEMPERATURE							°C
	AREA							mm²
10	PRESSURE							bar abs
	TEMPERATURE							°C
	AREA							mm²
11	PRESSURE							bar abs
	TEMPERATURE							°C
	AREA							mm²
12	PRESSURE							bar abs
	TEMPERATURE							°C
	AREA							mm²
13	PRESSURE							bar abs
	TEMPERATURE							°C
	AREA							mm²
14	PRESSURE							bar abs
	TEMPERATURE							°C
	AREA							mm²
15	PRESSURE							bar abs
	TEMPERATURE							°C
	AREA							mm²

A design	108439	mm²	A max	98581	mm²	A min	91016	mm²
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***\*)SEAT-ø, PERFORATED DISC INNER-ø + STROKE ARE CALCULATED FROM A design = 108439 mm²***

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## NOISE GUARANTEE

CALCULATION MODUL FROM Müller BBM - V2.05

NUMBER OF PRESSURE STAGES	2	-
PIPE OUTSIDE DIAMETER, OUTLET	813,00	mm
PIPE WALLTHICKNESS , OUTLET	30,00	mm
INSULATION THICKNESS , OUTLET	150,00	mm
LOCATION OF INSTALLATION	OUTDOOR	
TYPE OF INSULATION	NOISE INSULATION WITH ELASTIC SPACER FIBROUS MATERIAL; 1 MM STEEL- OR ALUM. SHELL WITH MINIMUM 3 MM ANTI NOISE PASTE LAYER, ELASTIC SPACER NOISE SPECIFICATION ACC. TO Zi. 51700 76.5A	

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MAXIMUM NOISE PRESSURE LEVEL (NOISE GUARANTEE)	92,0	dB(A)
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OKTAV NOISE PRESSURE LEVEL IN 1 M DISTANCE FROM VALVE STATION									
	125	250	500	1000	2000	4000	8000	Σ	Hz
WITHOUT INSULATION	66,0	77,0	87,0	99,0	106,0	108,0	101,0	111,0	dB(A)
WITH INSULATION	66,0	66,0	67,0	77,0	87,0	89,0	83,0	92,0	dB(A)

OKTAV NOISE EFFICIENCY LEVEL, PIPE LINE DOWNSTREAM THE VALVE									
	125	250	500	1000	2000	4000	8000	Σ	Hz
WITHOUT INSULATION	89,0	101,0	112,0	125,0	134,0	135,0	127,0	138,0	dB(A)
WITH INSULATION	89,0	90,0	91,0	95,0	104,0	105,0	97,0	108,0	dB(A)

OKTAV NOISE EFFICIENCY LEVEL, REFLECTION FROM PIPE OUTLET TO OUTDOOR									
	125	250	500	1000	2000	4000	8000	Σ	Hz
	99,0	113,0	124,0	133,0	140,0	145,0	143,0	148,0	dB(A)

OKTAV NOISE EFFICIENCY LEVEL, IN THE PIPE LINE DOWNSTREAM THE VALVE									
	125	250	500	1000	2000	4000	8000	Σ	Hz
	110,0	117,0	124,0	133,0	140,0	145,0	143,0	148,0	dB(A)

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