

MARITZA EAST I Power Station

Maintenance Manual

Maintenance Manual Number:

KKS Code:

01 HAD01 AA251

Equipment Description:

Valves KSB – Type ZTS-D + PRV
DN 65/50

Supplier

Name:

KSB – Pumpy+Armatury, s.r.o.

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Supplier Document Number:

Revision Date:

28.04.2009



**Gate valve
die-forged**

pressure seal bonnet

with butt-weld ends

**p ca. 600 bar
DN 50/50-500/450**

Application

- In industrial plants, power stations, process engineering and marine engineering.
- For water, steam, gas, oil and other non-aggressive media.
- Other applications on request.

Operating data

- Maximum allowable pressure 600 bar
- Maximum allowable temperature 650 °C
- Pressure-temperature ratings see next side

Materials

- Body:

P 250 GH ¹⁾	1.0460	up to 450 °C
15 NiCuMoNb 5	1.6368	up to 450 °C
16 Mo 3	1.5415	up to 530 °C
13 CrMo 4-5	1.7335	up to 550 °C
10 CrMo 910	1.7380	up to 570 °C
X 20 CrMo V 11-1	1.4922	up to 600 °C
X 10 CrMoVNb 9-1	1.4903	up to 650 °C
X 11 CrMoWVNb 9-1-1	1.4905	up to 650 °C
- Other materials on request

Design

- Body die-forged
- Pressure-seal bonnet
- Non-rotating stem
- Wedges
- Yoke suitable for mounting electric and pneumatic actuators (DIN ISO 5210/5211)
- Seats made of wear-resistant and corrosion-proof stellite 6

¹⁾ previously: C 22.8

Standard variants

- Parallel discs
- Hard-faced back seat
- Drain connection
- Lantern ring in the gland
- Gland packing press-out device
- Cup-disc-spring-supported threaded bush
- Mechanical position indicator
- Position switch
- Spur gear or bevel gear
- Electric or pneumatic actuator
- Drive bushing for remote actuator
- Threaded bush free from non-ferrous metals
- Flange design
- Locking device
- Bypass
- Relief hole upstream of seat ring
- Acceptance tests to technical codes such as TRD/TRB/AD2000 or customer specification

Remarks

- Swing check valves, type ZRS with pressure seal bonnet, see type series booklet 7278.1
- Operating instructions 0570.81
- Pressure relief valve: 7300.1

On all enquiries / orders please specify

- | | |
|-------------------------|-------------------------------|
| 1 Type | 7 Material |
| 2 PN | 8 Medium |
| 3 DN | 9 Flow rate |
| 4 Working pressure | 10 Pipe connection |
| 5 Differential pressure | 11 Optional extras |
| 6 Operating temperature | 12 Type series booklet number |

When ordering spares, indicate original factory number and year of manufacture.

The valves meet the safety requirements of the Pressure Equipment Directive 97/23/EC (PED) of annex I for fluids of the groups 1 and 2.



The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, group II, category 2 (zones 1+21) and category 3 (zones 2+22) according to ATEX 94/9/EC.



Pressure-Temperature ratings

Material	Comp. group	Max. test pressure bar *)	Working pressures in bar at temperatures in °C 1)																										
			20	100	150	200	250	300	350	400	425	450	475	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640	650
P 250 GH 1.0460	C D E F	290 440 580 710	212 323 426 521	202 308 407 496	181 277 366 446	161 246 325 397	141 215 284 347	126 192 254 310	105 161 213 260	85 130 172 210	76 115 152 186	66 100 132 160																	
15NiCuMoNb5 1.6368	C D	585 900	429 660	407 618	394 598	380 578	367 558	365 539	341 518	327 498	314 476	242 374																	
16Mo3 1.5415	C D E F	365 555 735 895	268 408 539 657	237 361 478 583	214 326 432 527	192 292 386 471	177 269 356 434	151 231 304 372	147 223 294 359	141 215 284 347	140 211 275 341	136 207 269 335	134 205 269 329	94 143 189 231	66 100 132 162	52 79 104 128	42 63 83 102												
13CrMo4-5 1.7335	C D E F	365 555 735 895	268 408 539 657	243 369 488 596	228 346 457 558	213 323 427 521	202 308 407 496	187 269 355 459	177 254 335 434	167 246 325 409	162 238 315 378	155 211 277 341	138 178 236 288	118 145 191 233	95 119 158 193	79 93 124 151	61 75 100 121	49 75 100 121											
10CrMo910 1.7380	C D E F	365 555 735 895	268 408 539 657	248 377 498 608	232 354 467 570	217 331 437 533	213 323 427 521	202 308 407 496	187 269 355 459	177 254 335 434	173 262 345 422	167 246 325 409	162 238 315 378	136 207 275 335	119 181 239 292	104 158 210 255	91 138 183 223	79 119 158 193	69 104 138 168	58 89 117 144	51 78 103 126								
X20CrMoV11-1 1.4922	C D E F												237 361 478 583	213 324 429 523	188 286 378 462	169 257 339 414	148 226 299 365	129 196 260 317	113 172 227 278	96 126 167 203	83 107 143 173	71 90 119 146	59 90 117 146						
X10CrMoVNb 9-1 1.4903	C D E F															245 324 470 514	225 296 429 472	204 270 391 428	185 244 353 387	166 214 283 347	148 195 263 311	131 174 251 275	116 154 221 244	102 135 197 215	89 117 170 186	78 87 126 162	67 77 148 139	59 67 112 122	50 67 96 105
X11CrMoWVNb 9-1-1 1.4905	C D E F																			205 263 355 420	187 239 322 380	170 218 294 347	152 195 263 311	136 174 234 276	125 160 215 254	115 147 198 234	102 130 175 207	91 116 156 184	78 100 132 158

1) The valves can be used down to -60 °C

*) Max. test pressure = working pressure x 1,5 / 1,1

Operating pressures to EN 1092/1 are also permissible

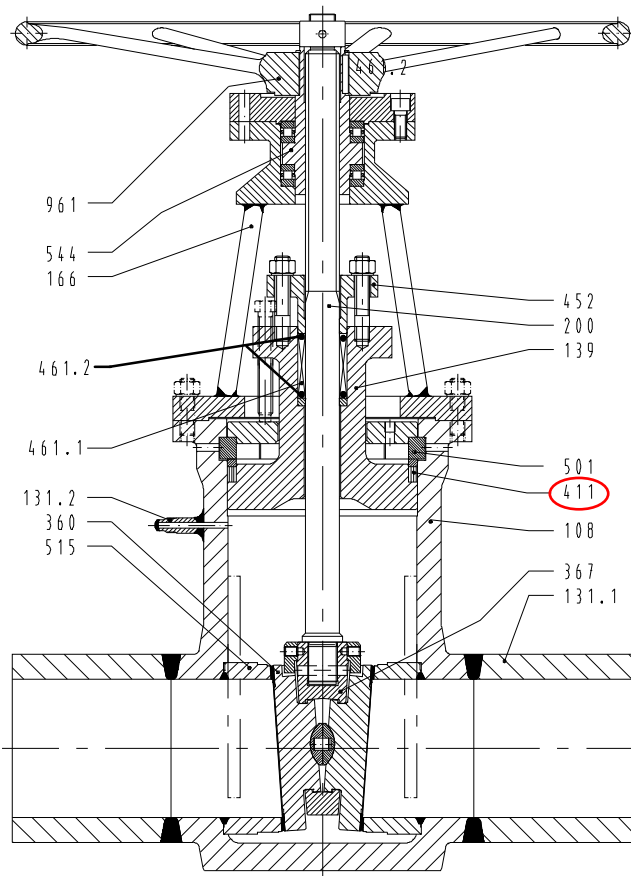
Materials

Part no.	Name of parts	Materials for working temperatures up to °C						
		450		530	550	570	600	650
101	Body lower part	P 250 GH 1.0460		16Mo3 1.5415	13CrMo4-5 1.7335	10CrMo910 1.7380		
102	Body upper part							
108	Body							
131.1	Connection branch							
139	Bonnet	10CrMo910 1.7380	15NiCuMoNb5 1.6368	10CrMo910 1.7380			X20CrMoV11-1 1.4922	X10CrMoVNb 9-1 1.4903 X11CrMoWVNb 9-1-1 1.4905
501 *)	Split ring							
360 *)	Wedges Hard-faced stellite 6							
368 *)	Slide discs Hard-faced stellite 6							
515	Seat ring Hard-faced stellite 6	13CrMo4-5 1.7335		13CrMo44 1.7335		10CrMo910 1.7380		
131.2	Connection branch	13CrMo4-5 1.7335				10CrMo910 1.7380 X10CrMoVNb 9-1 1.4903 X11CrMoWVNb 9-1-1 1.4905		
166	Yoke	13CrMo4-5 - 1.7335 C22 N - 1.0402					10CrMo910 - 1.7380 C22 N - 1.0402	
200 *)	Stem	X39CrMo17-1 1.4122					X22CrMoV121 1.4923 X5NiCrTi2615 1.4980	
367 *)	Wedge holder	13CrMo4-5 1.7335	15NiCuMoNb5 1.6368	10CrMo910 1.7380			X10CrMoVNb 9-1 1.4903	
411.1 *)	Gasket	Pure graphite						
452	Gland	13CrMo4-5 - 1.7335				10CrMo9-10 - 1.7380		
461 *)	Packing	Pure graphite						
544 *)	Threaded bushing	Multi-alloy bronze / Multi-alloy bronze - C 22.8 (on ball bearings)						
961	Handwheel	GG - 0.6025 / steel welded						

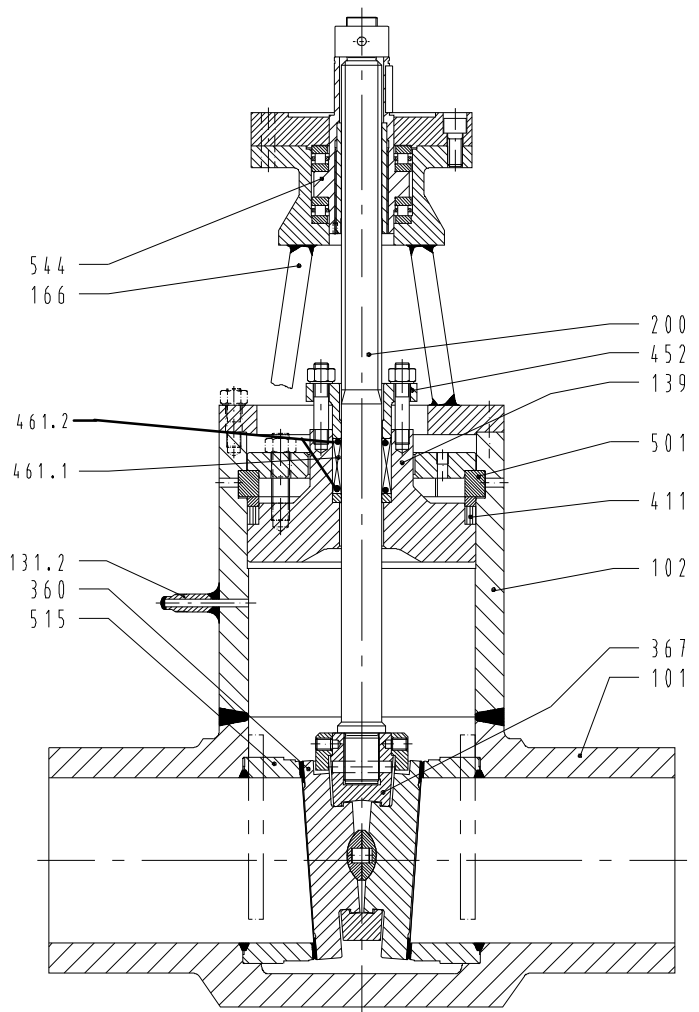
*) Recommended spare parts

DN 50/50 - 200/175

DN 200/200 - 500/450

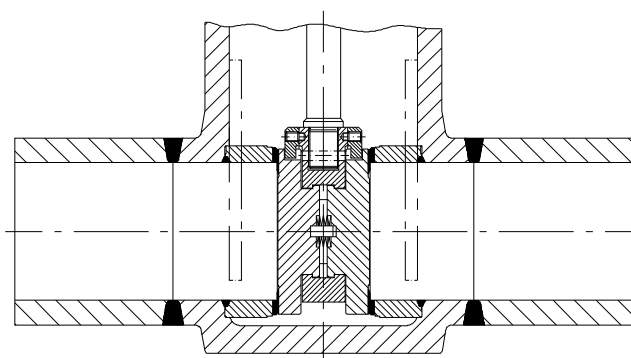


with connection branches

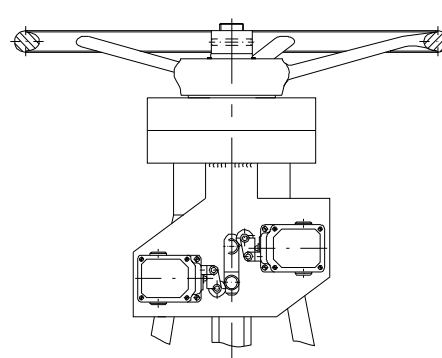


without connection branches

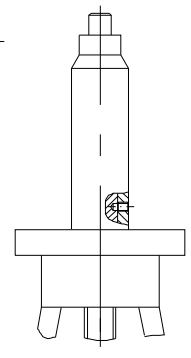
Variants



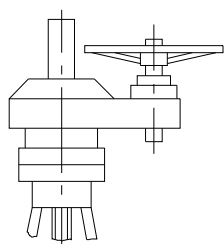
Slide discs



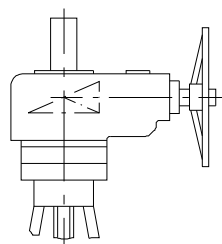
Position indicator
with position switch



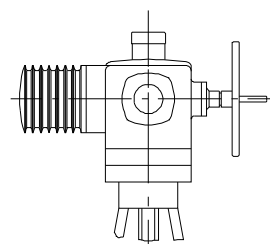
Drive bushing



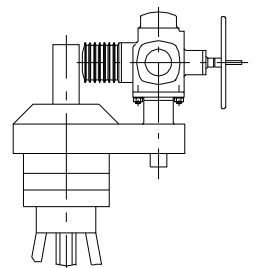
Spur gear with handwheel



Bevel gear with handwheel



Electr. actuator



Electr. actuator with spur gear