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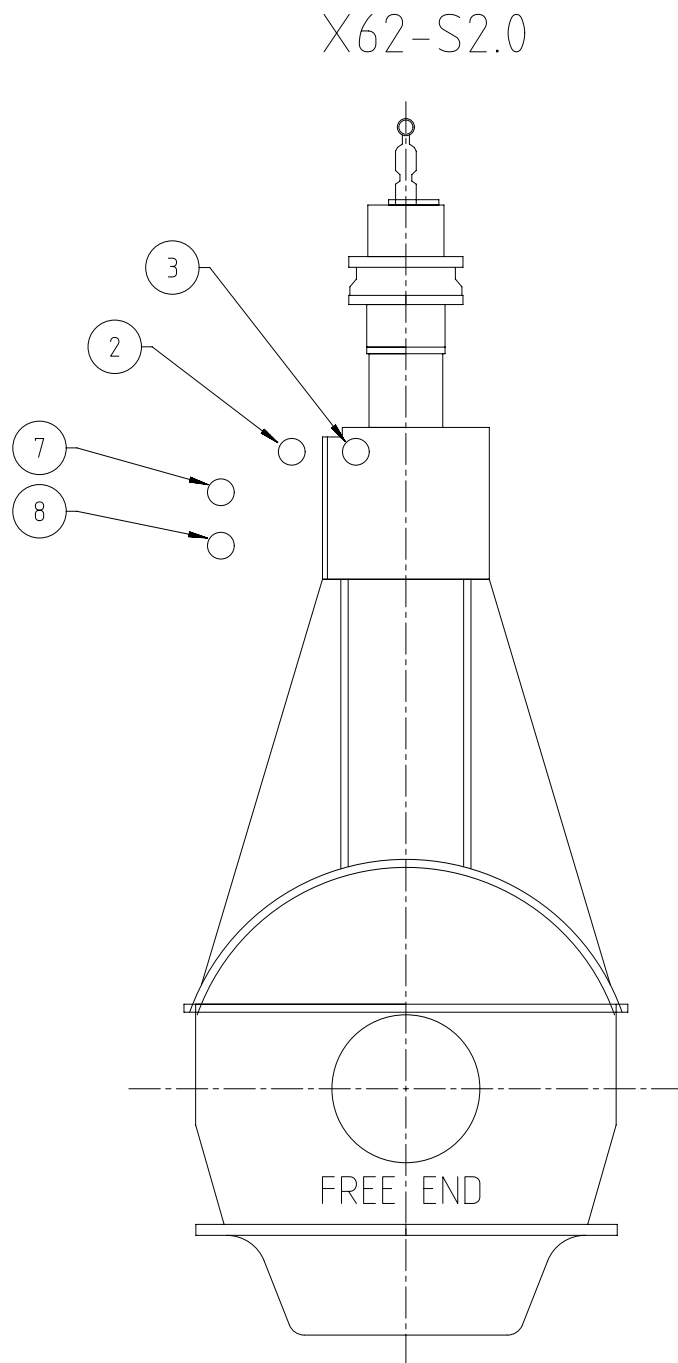
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SPECIFICATION which must be met:

- | | |
|---|--|
| 2 | <p>INLET - Cylinder cooling water (HT water)</p> <ul style="list-style-type: none"> - Cooling water pressure: 2.0 - 4.0 bar - Cooling water volume flow: according to GTD specification - Cooling water (freshwater) has to be treated according to WinGD specification. - An expansion tank must be installed. - The static pressure at engine inlet must be adjusted by the installation of the expansion tank. - Pre-heating: The engine must be warmed-up by heated HT water to min. 60 °C before engine start. - HT cooling water amount on engine side: Given in table1 on page 2 |
| 3 | <p>OUTLET - Cylinder cooling water (HT water)</p> <p>Cooling water temperature:</p> <ul style="list-style-type: none"> - Controller set-point: 90 °C - Steady state condition: 90 ± 2 °C - Transient condition: 90 ± 4 °C |
| 7 | <p>INLET - Scavenge air cooler (SAC) cooling water (LT water)</p> <ul style="list-style-type: none"> - Cooling water pressure: 2.0 - 4.0 bar - Cooling water temperature: 10 - 36 °C - Cooling water volume flow: according to GTD specification - Cooling water (freshwater) has to be treated according to WinGD specification. - LT cooling water amount on engine side: Given in table1 on page 2 |
| 8 | <p>OUTLET - Scavenge air cooler (SAC) cooling water (LT water)</p> <ul style="list-style-type: none"> - Cooling water volume flow: according to GTD specification, adjusted by an orifice in the outlet pipe on shipside. |

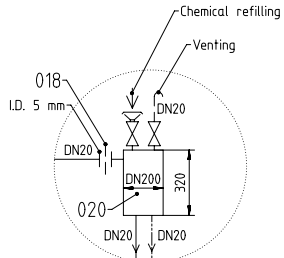
1	016	107.245.419.500	EXPANSION TANK			107.245.419		0,001
1	015	107.413.097.500	EXPANSION TANK			107.413.097		0,001
QTY	SEQ NO	Material ID	Material Name Dimension, Occ			Standard or Drawing	Basic Material Material Standard	Weight GR./NET
Free space for lic.							Q-Code XXXXX	Main Drw.
							Standard ISO; JIS	
Modif.								
	Number	Drawn date		Number	Drawn date		Number	Drawn date
 Winterthur Gas & Diesel			Product 5-8X62-S2.0			CENTRAL COOLING WATER SYSTEM HT_static-pressure: EXP tank Zentralkuehlwassersystem		
Units	mm kg	NX		Basic Material				Net Weight 0,003
Made	06.10.2020 Sudant Deogade			Scale	-	Size A3	Page 1/2	Material ID PAAD362616
Chkd	26.02.2021 jpi101 Pickup			Design Group 9721		Drawing ID DAAD133940	Rev. -	
Appd	26.02.2021 mhu019 Hug							

SYSTEM PROPOSAL

Pos.	ENGINE COMPONENTS *3)
EC01	Scavenge air cooler (SAC)
EC02	Manual vent valve, for each cylinder *15)
EC03	Air separator
EC04	Automatic venting unit

Pos.	ENGINE CONNECTIONS *2)
②	INLET - Cylinder cooling water (HT water)
③	OUTLET - Cylinder cooling water (HT water)
⑦	INLET - Scavenge air cooler (SAC) cooling water (LT water) *7)
⑧	OUTLET - Scavenge air cooler (SAC) cooling water (LT water) *7)

Pos.	SYSTEM COMPONENTS *1)
001	Low sea chest
002	High sea chest
003	Seawater strainer
004	Air vent (air vent pipe or equal venting system acc. to shipyard's design)
005	Seawater circulating pump
006	Central cooler (LT cooling water)
007	Automatic temperature control valve for LT circuit *13)
008	Temperature sensor of regulating system *13)
009	Cooling water pump for LT circuit
010	Lubricating oil cooler
011	Automatic temperature control valve for HT circuit *14)
012	Temperature sensor of regulating system *14)
013	Cylinder cooling water pump for HT circuit
014	Pre-heating circulating pump (optional, cap. 10% from cylinder cooling pump *8)
015	HT water expansion tank (link to detail drawing on page 1)
016	LT water expansion tank (link to detail drawing on page 1)
017	Pre-heater for main engine (HT circuit)
018	Throttling disc *5)
019	Freshwater generator
020	Chemical treatment refill unit *4)
021	HT cooling water cooler
022	Transition piece (adapter) *9)
023	MDO/MGO cooler



DETAIL "A"

Number of cylinders		5	6	7	8
Main engine X62-S2.0 (R1 rated)	power (kW)	13425	16110	18795	21480
	speed (rpm)	108			
Pressure drop across the engine	(bar)	1.3			
Cooling water expansion tank (HT)	Cap. (m³)	Depending on ancillary plants min. 10% of HT cooling water			
Cooling water expansion tank (LT)	Cap. (m³)	Depending on ancillary plants min. 10% of LT cooling water			

PROPOSAL for pipe dimensioning *11)					
Nominal pipe diameter	A	DN	Yard determination, suitable for main engine and ancillary plants		
	B	DN			
	C	DN			
	D	DN	200	200	250
	E	DN	125	125	150
	G	DN	125	150	150
	H	DN	65	65	65
	J	DN	65	65	65

Table 1: Water content on engine side

Cylinder	HT circuit Cyl. C.W. Volume (l)	LT circuit SAC Volume (l)
5	600 l	475 l a)
6	700 l	475 l a) / 1100 l b)
7	825 l	475 l a) / 1200 l b)
8	950 l	500 l a) / 1300 l b)

a) Values for executions with 1 scavenge air cooler.
b) Values for executions with 2 scavenge air coolers.

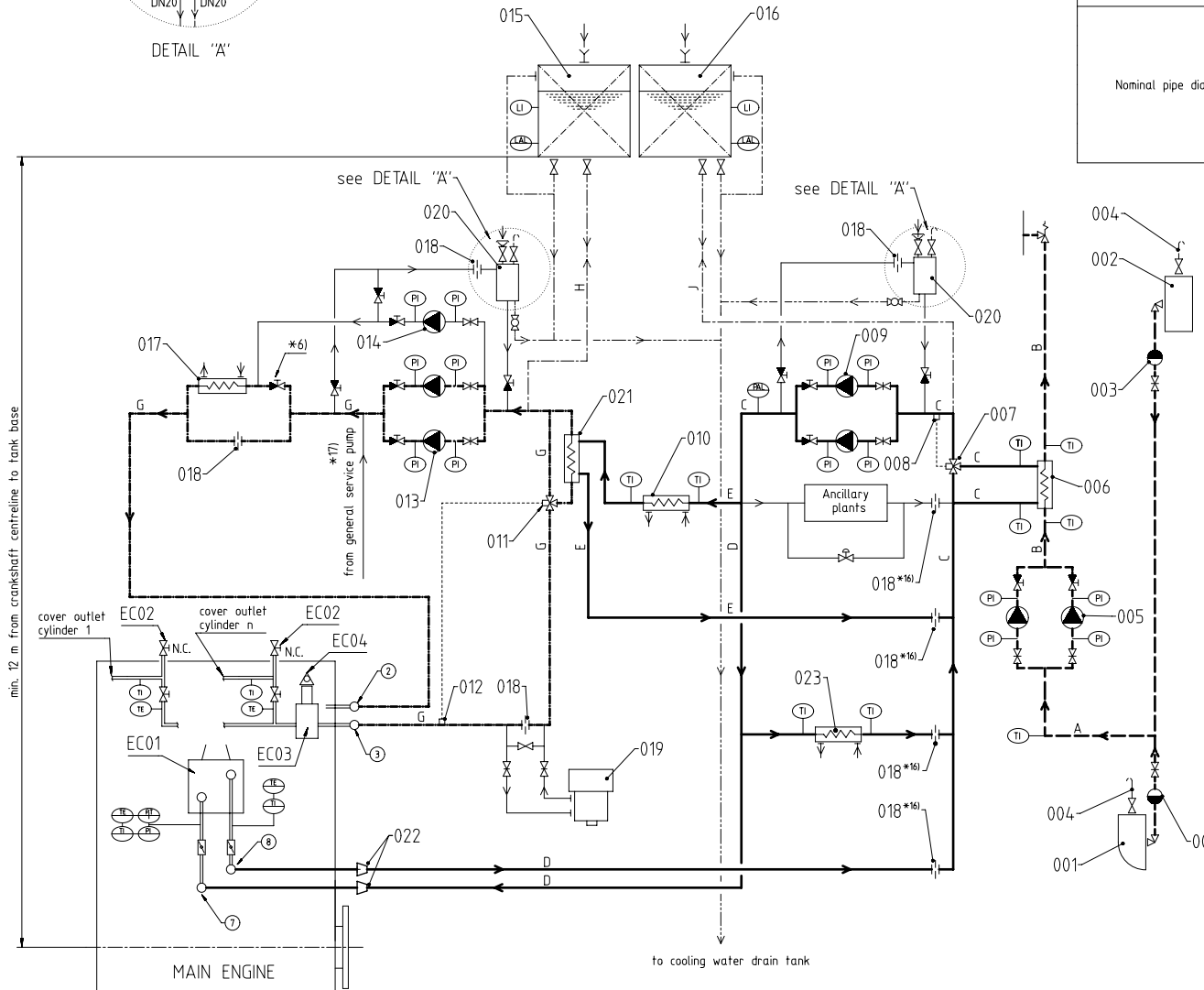
Remarks:

- Air vent and drain pipes not shown on drawing. Shall be installed where required.
- Air vent and drain pipes must be fully functional at all inclination angles of the ship at which the engine must be operational.

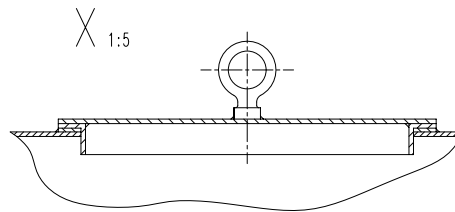
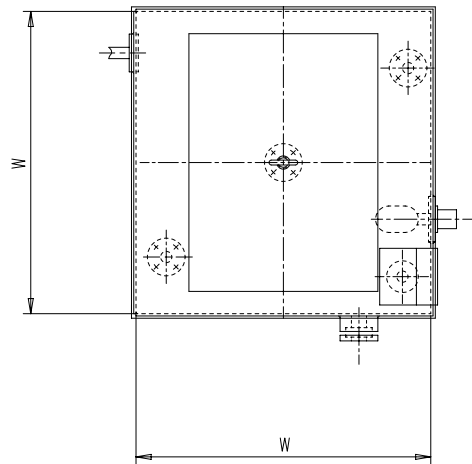
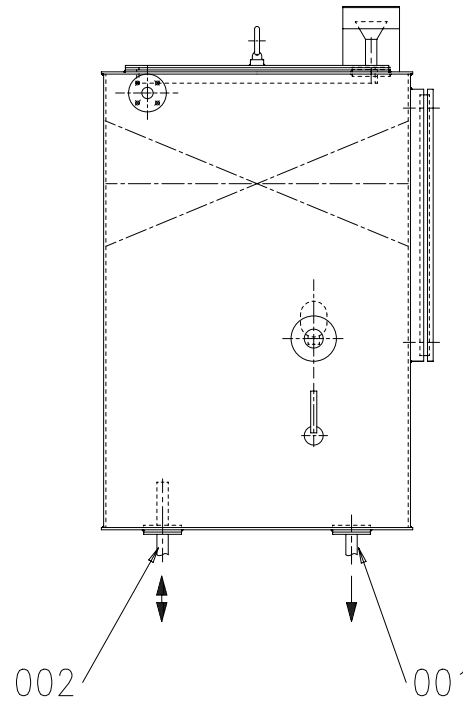
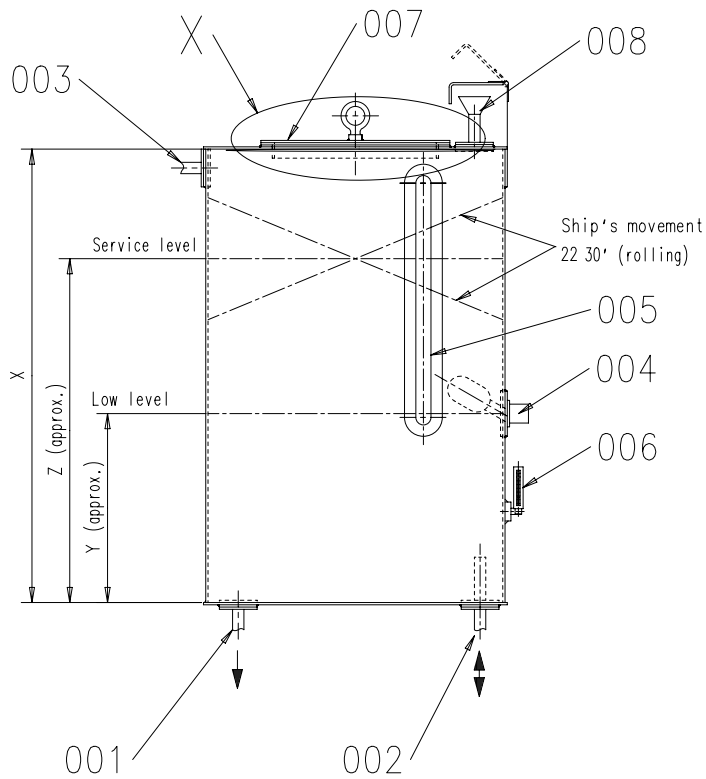
- *1) To be installed by the shipyard.
- *2) Refer to the "Pipe Connection Plan" for the execution and location of the engine pipe connection.
- *3) To be delivered by the engine manufacturer, i.e. already equipped on engine side.
- *4) To be installed for cooling water after-treatment during regular engine operation. Convenient dimensions are provided in view "A". Other designs are possible.
- *5) When using a valve, lock in proper position to avoid mishandling.
- *6) Only when pos. 014 is installed.
- *7) The inlet and outlet pipes to SAC must be designed to allow engine thermal expansion, or be fitted with expansion pieces.
- *8) For guidance only, final layout according to actual engine pre-heating requirements.
- *9) Installed as required (check with "Pipe Connection Plan")
- *10) All given diameters are valid for the mentioned rating and serve just as an example. To make the layout for the project specific rating please refer to D9730 "Fluid velocities and flow rates, recommended values for pipework of diesel plants" for selecting the appropriate pipe diameter. Rating specific flow rates are provided by GTD.
- *11) A minimum temperature at engine inlet must be maintained. The minimum temperature set-point is 10°C.
A lower LT water temperature assists the main engine to reach lower BSFC. If the ancillary plants require a temperature lower or higher than the LT water set-point, a separate LT water supply system with the different temperature set-point has to be installed (please refer to system proposal in MIM).
- *14) A constant temperature at engine outlet must be maintained. Required controller set-point for main engine operation is 90 °C.
- *15) Only to be used for manual venting of isolated cylinders after maintenance. To be kept closed during engine operation.
- *16) Optional, only to be installed if needed for hydraulic balancing.
- *17) Optional connection to the general service pump. To be considered if requested by class rules for emergency engine cooling.

- Seawater pipes ---
- LT freshwater pipes —
- HT freshwater pipes —
- Balance pipes ---
- Ancillary equipment pipes —
- Drain/overflow pipes ----
- Air vent pipes --
- Control/feed back -----
- Pipes on Engine ==
- Pipe connections ○

min. 12 m from crankshaft centreline to tank base



G-Code		XXXXXX		Main Drw.	
Standard		ISO; JIS			
Mod.	Free space for file				
Number	Drawn date	Number	Drawn date	Number	Drawn date
01	26.02.2021	02	26.02.2021	03	26.02.2021
Product		5-BX62-S2.0		CENTRAL COOLING WATER SYSTEM	
HT static-pressure: EXP tank		Zentralkuehlwassersystem			
Units	mm kg	NX	Basic Material	Scale	1:1
Size	Page	Material	Net Weight	0,003	
PAAD362616	2/2	PAAD362616			
SURFACE PROTECTION SEE GROUP 0344		Made		06.10.2020 Sudant Deogade	
TOLERANCING PRINCIPLE ISO8015		Chd		26.02.2021 jgr101 Pickup	
GENERAL TOLERANCES ACCORDING TO ISO2768-mS		Appd		26.02.2021 mhu019 Hug	



drawing view shows dimensioning scale for 0.75 m³ capacity

Pos.	Description
001	Drain from HT circuit
002	Balance pipe from HT circuit
003	Overflow/air vent
004	Low level alarm
005	Level indicator *1)
006	Thermometer
007	Inspection cover *2)
008	Filling pipe/inlet chemical treatment *2)

Remarks:

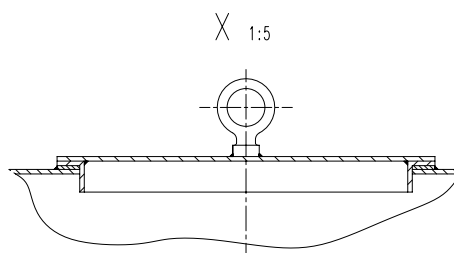
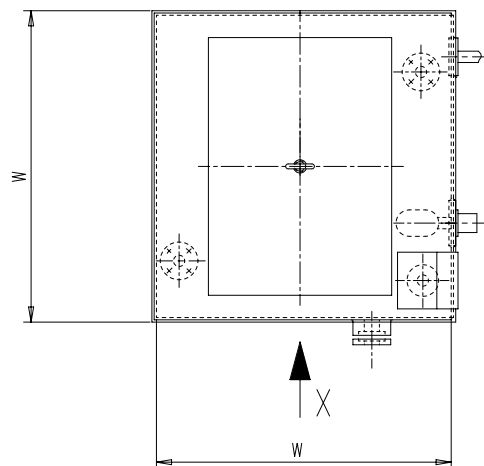
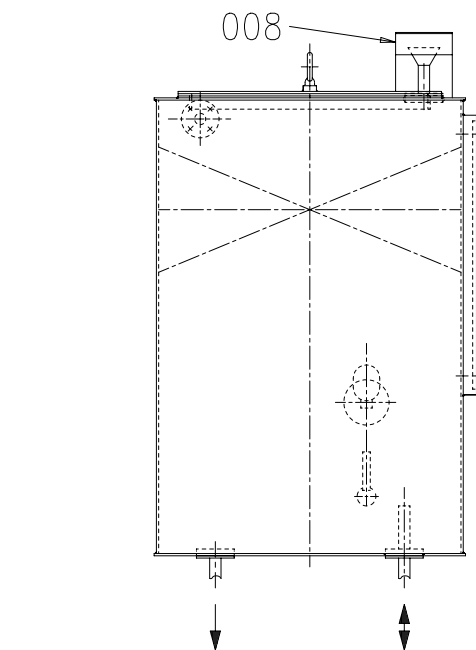
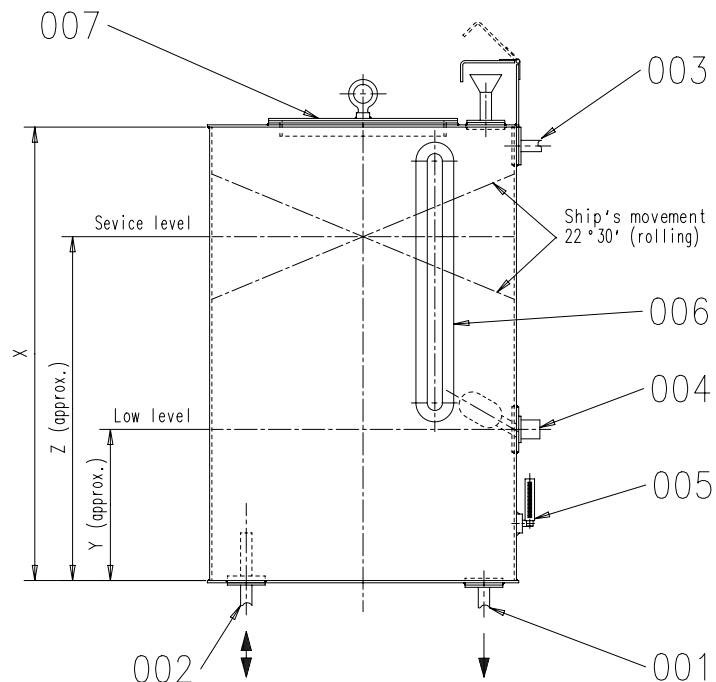
- *1) Level indicator can be omitted if an alternative is fitted.
- *2) Other designs like hinged covers, etc. are also possible

- Tank dimensions are defined by the Tank capacity, as seen in Table 1. For capacity and pipe diameter, refer to drawing 'Central cooling water system'.

Table 1: Tank dimensions

HT Tank capacity	W	X	Y	Z
(m ³)	(mm)	(mm)	(mm)	(mm)
0.5	800	800	330	640
0.75	800	1200	500	960
1.0	800	1600	670	1280
1.25	1000	1250	530	1000
1.5	1000	1500	630	1200
1.75	1000	1750	730	1400
2.0	1000	2000	830	1600

Free space for lic.		Q-Code XXXXXX Standard ISO; JIS		Main Drw.	
Modif.	EAAD091567	15.11.2019			
Number		Drawn date	Number	Drawn date	Number
Product W-25		EXPANSION TANK CENTRAL COOLING WATER HT CIRCUIT Ausgleichstank Zentralkuehlwassersystem HT circuit			
Units mm kg NX		Basic Material		Net Weight 0,001	
SURFACE PROTECTION SEE GROUP 0344		Made 16.04.2009 M.PRSTEC	Scale 1:10	Size A2	Page 1/1
TOLERANCING PRINCIPLE ISO8015		Chkd	Design Group	Material ID 107.413.097.500	Rev. A
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd 30.04.2009 MPR002 Prstec	7921	Drawing ID 107.413.097	



Drawn for 0.75 m³ capacity

Pos.	Description
001	Drain
002	Balance pipe from LT circuit
003	Overflow/air vent
004	Low level alarm
005	Thermometer
006	Level indicator *1)
007	Inspection cover *2)
008	Filling pipe/inlet chemical treatment *2)

Remarks:

- *1) Level indicator can be omitted if an alternative is fitted.
- *2) Other designs like hinged covers, etc. are also possible

- For required tank capacity and pipe diameters refer to drawing 'Central cooling water system'

Table 1: Tank dimensions

LT tank capacity	W	X	Y	Z
(m ³)	(mm)	(mm)	(mm)	(mm)
0.5	800	800	330	640
0.75	800	1200	500	960
1.0	800	1600	670	1280
1.25	1000	1250	530	1000
1.5	1000	1500	630	1200
1.75	1000	1750	730	1400
2.0	1000	2000	830	1600

Modif.	Free space for lic.						Q-Code XXXXXX Standard ISO; JIS	Main Drw.			
	A	EAAD014356	16.06.1997	B	7-37.090	16.08.2007	C	EAAD083145	25.01.2012	D	EAAD091029
Number		Drawn date		Number		Drawn date		Number		Drawn date	
								Product W-25		EXPANSION TANK CENTRAL COOLING WATER LT CIRCUIT Ausgleichstank Zentralkuehlwassersystem LT	
Units		mm kg		NX		Basic Material		Net Weight		0,001	
SURFACE PROTECTION SEE GROUP 0344				Made		11.06.1997 T.LANDERT		Scale		1:10	
TOLERANCING PRINCIPLE ISO8015				Chkd				Size		A2	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK				Appd		11.06.1997 WCH001 Service User		Design Group		9721	
Drawing ID								107.245.419		Rev.	
Material ID								107.245.419.500		D	

SPECIFICATION which must be met:

- 8
- OUTLET - Scavenge air cooler (SAC) cooling water (LT water)
- Cooling water volume flow: according to GTD specification, adjusted by an orifice in the outlet pipe on shipside.

- 1
- INLET - Cylinder cooling water (HT water)
- Cooling water pressure: 2.0 - 4.0 bar

- Cooling water volume flow: according to GTD specification

- Cooling water (freshwater) has to be treated according to WinGD specification.

- A buffer unit must be installed.

- The static pressure at engine inlet must be adjusted by buffer unit pressure setting.

- Pre-heating: The engine must be warmed-up by heated HT water to min. 60 °C before engine start.

- HT cooling water amount on engine side: Given in table 1 on page 2

- 3
- OUTLET - Cylinder cooling water (HT water)
- Cooling water temperature

- Controller set-point: 90 °C

- Steady state condition: 90 ± 2 °C

- Transient condition: 90 ± 4 °C

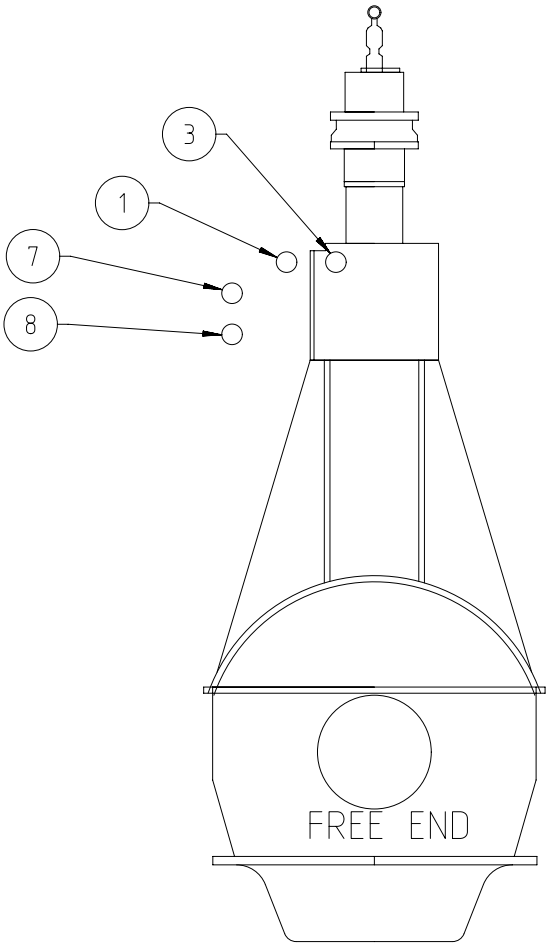
- 7
- INLET - Scavenge air cooler (SAC) cooling water (LT water)
- Cooling water pressure: 2.0 - 4.0 bar

- Cooling water temperature: 10 - 36 °C

- Cooling water volume flow: according to GTD specification

- Cooling water (freshwater) has to be treated according to WinGD specification.


- LT cooling water amount on engine side: Given in table 1 on page 2.



1	016	107.245.419.500	EXPANSION TANK	107.245.419		0,001
1	015	107.245.626.500	BUFFER	107.245.626		0,001

QTY	SEQ NO	Material ID	Material Name	Dimension, Occ	Standard or Drawing	Basic Material Material Standard	Weight GR./NET
Free space for lic.						Q-Code XXXXXX	Main Drw.
						Standard ISO; JIS	

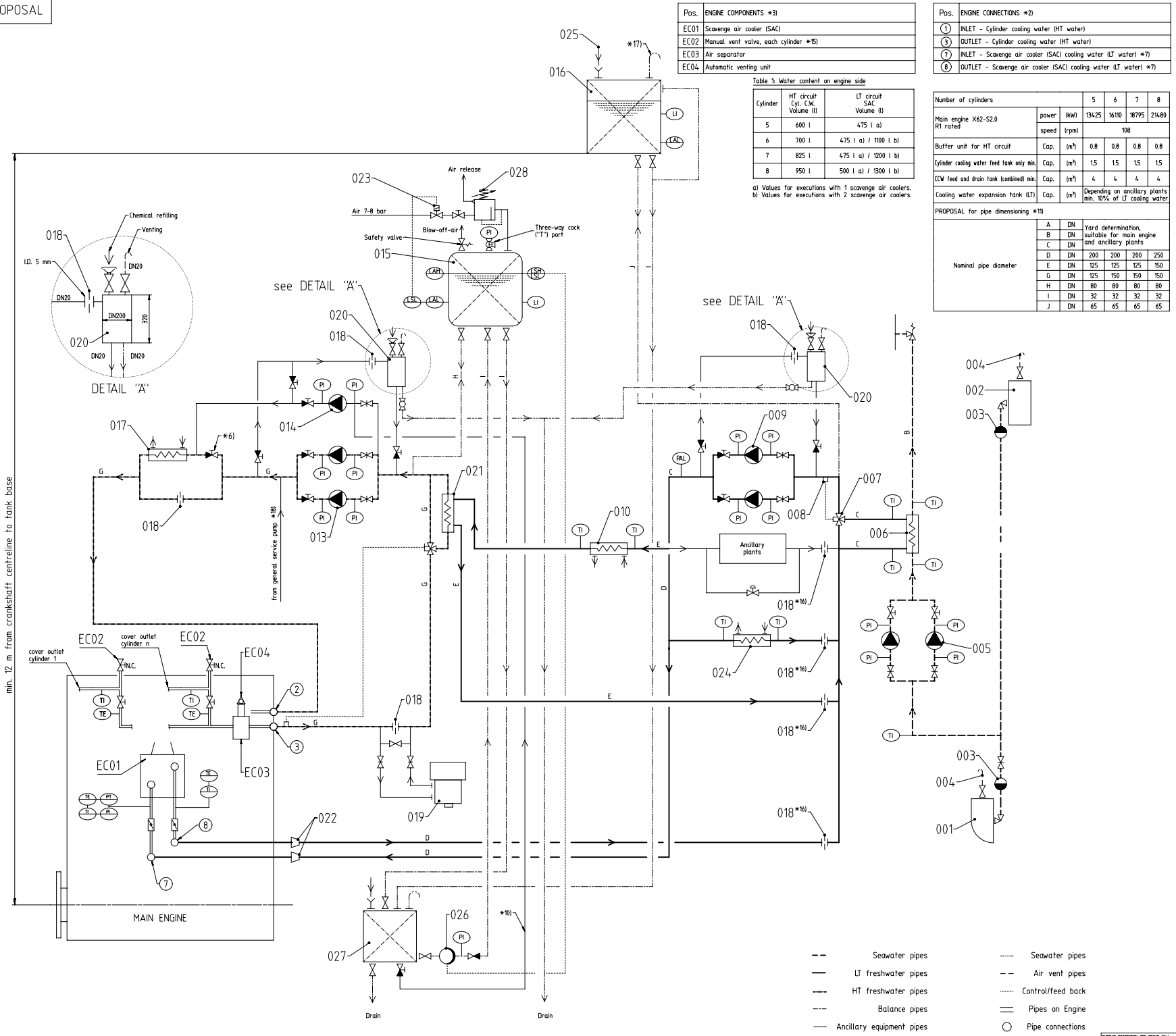
Modif.									
	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date	

		Product 5-8X62-S2.0	CENTRAL COOLING WATER SYSTEM HT_static-pressure: Buffer-unit Zentralkuehlwassersystem					
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Units	mm kg	NX		Basic Material				Net Weight 0,001	
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SURFACE PROTECTION SEE GROUP 0344	Made	06.01.2021	Sudant Deogade	Scale	-	Size	A3	Page	1/2	Material ID	PAAD362619
TOLERANCING PRINCIPLE ISO8015	Chkd	26.02.2021	jpi101 Pickup	Design Group	9721	Drawing ID	DAAD133941			Rev.	-
GENERAL TOLERANCES ACCORDING TO ISO2768-mK	Appd	26.02.2021	mhu019 Hug								

SYSTEM PROPOSAL



Pos.	ENGINE COMPONENTS *3)
EC01	Scavenge air cooler (SAC)
EC02	Manual vent valve, each cylinder *15)
EC03	Air separator
EC04	Automatic venting unit

Cylinder	HT circuit Cyl. C.W. Volume (l)	LT circuit SAC Volume (l)
5	600 l	475 l a)
6	700 l	475 l a) / 1100 l b)
7	825 l	475 l a) / 1200 l b)
8	950 l	500 l a) / 1300 l b)

a) Values for executions with 1 scavenge air coolers.
b) Values for executions with 2 scavenge air coolers.

Pos.	ENGINE CONNECTIONS *2)
①	INLET - Cylinder cooling water (HT water)
②	OUTLET - Cylinder cooling water (HT water)
③	INLET - Scavenge air cooler (SAC) cooling water (LT water) *7)
④	OUTLET - Scavenge air cooler (SAC) cooling water (LT water) *7)

Number of cylinders			5	6	7	8
Main engine X62-S2.0 R1 rated	power	(kW)	13425	16110	18795	21480
	speed	(rpm)	108			

Buffer unit for HT circuit	Cap.	(m ³)	0.8	0.8	0.8	0.8
Cylinder cooling water feed tank only min.	Cap.	(m ³)	1.5	1.5	1.5	1.5

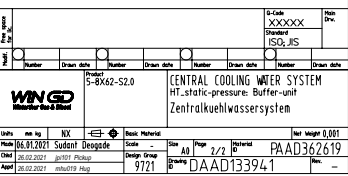
(CW feed and drain tank (combined) min.	Cap.	(m ³)	4	4	4	4
Cooling water expansion tank (LT)	Cap.	(m ³)	Depending on ancillary plants min. 10% of IT cooling water			

PROPOSAL for pipe dimensioning *11)

Nominal pipe diameter	A	DN	Yard determination, suitable for main engine and ancillary plants			
	B	DN				
	C	DN				
	D	DN	200	200	200	250
	E	DN	125	125	125	150
	G	DN	125	150	150	150
	H	DN	80	80	80	80
	I	DN	32	32	32	32
	J	DN	65	65	65	65

Pos.	SYSTEM COMPONENTS *1)
001	Low sea chest
002	High sea chest
003	Seawater strainer
004	Air vent (air vent pipe or equal venting system acc. to shipyard's design)

- Remains
- (1) Air vent and drain pipes not shown on drawing.
 - Shall be installed where required.
- (2) Air vent and drain pipes must be fully functional at all inclination angles of the ship which the engine must be operational.
- (3) To be installed by the shipyard.
- (4) Refer to the "Pipe Connection Plan" for the execution and location of the engine pipe connections.
- (5) To be delivered by the engine manufacturer, i.e. already equipped on engine side.
- (6) For the piping for cooling water after treatment during regular engine operation. Convenient dimensions are provided in view R. (Other designs are possible).
- (7) When fitting a valve, lock in proper position to avoid mishandling.
- (8) Only when gas 0/4 is installed.
- (9) The inlet and outlet pipes to SAH must be designed to allow engine operation in the future.
- (10) For gaseous, final layout according to actual engine pre-heating requirements.
- (11) Installation required (check with "Pipe Connection Plan")
- (12) Optional fitting line to enable fast system re-filling (e.g. after a complete system drainage) by means of the pre-heating pumps.
- (13) All systems must be kept ready for operation in case of emergency. As just an example, to make the layout for the project specific filling please refer to D07370 "Fluid velocities and flow rates, recommended values for specification of pump plants" for selecting the appropriate pipe diameter. Rating specific "fluid rates" are provided by GTD.
- (14) If the selected control air valve does not have the integrated air release function, a separate air release valve can be installed as alternative on the top of the buffer unit.
- (15) A minimum temperature at engine inlet must be maintained. The temperature of the cooling water must be maintained.
- (16) At a lower water temperature assists the main engine to reach lower BSFC. If the ancillary plants require a temperature lower or greater than the set-point, a separate U/V water supply system with the different temperature set-point has to be installed.
- (17) Please refer to system proposal in H90.
- (18) The engine temperature must be maintained.
- (19) Recommended controller set-point for main engine operation is 90 °C.
- (20) Only to be used for manual venting of isolated cylinders after the cylinders have been kept under pressure.
- (21) Optional, only to be installed if needed for hydraulic balancing.
- (22) If gas driven auxiliaries are connected to the U circuit, the gas driven tank must be kept under gas tight and has to be connected to a safe area outside of engine room.
- (23) Optional connection to the general service pump.
- (24) To be considered if requested by class rules for emergency engine cooling.





(F)



- 01 Compressed air supply from control air valve,
DN15 with blank flange
- 02 Pressure indicator, DN25 with blank flange
- 03 Safety and relief valve adjustment 5,5 bar
DN32 with blank flange
- 04 Level alarm high, with blank flange
- 05 Level alarm low, with blank flange
- 06 Compensation, DN80 with blank flange
- 07 Drain, DN32 with blank flange
- 08 Feed, DN32 with blank flange
- 09 Flanges for level indicator
- ① 11 Valve for level indicator, self-closing type
- 12 Level indicator
- 13 Level switch high, with blank flange **
- 14 Level switch low, with blank flange **

(F) ** Tank volume between LSH and LSL shall be no less than 150 litres.

123456789101112131415161718192021222324252627282930313233343536373839404142434445464748495051525354555657585960616263646566676869707172737475767778798081828384858687888990919293949596979899100		1 2 3 4 5 6 7 8 9 10 11 12		13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100		101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200		201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300		301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400		401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500		501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600		601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700		701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 	
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MIDS_WinGD-X62-S2.0_COOLING-WATER-SYSTEM

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2021-03-01	DRAWING SET	First web upload

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