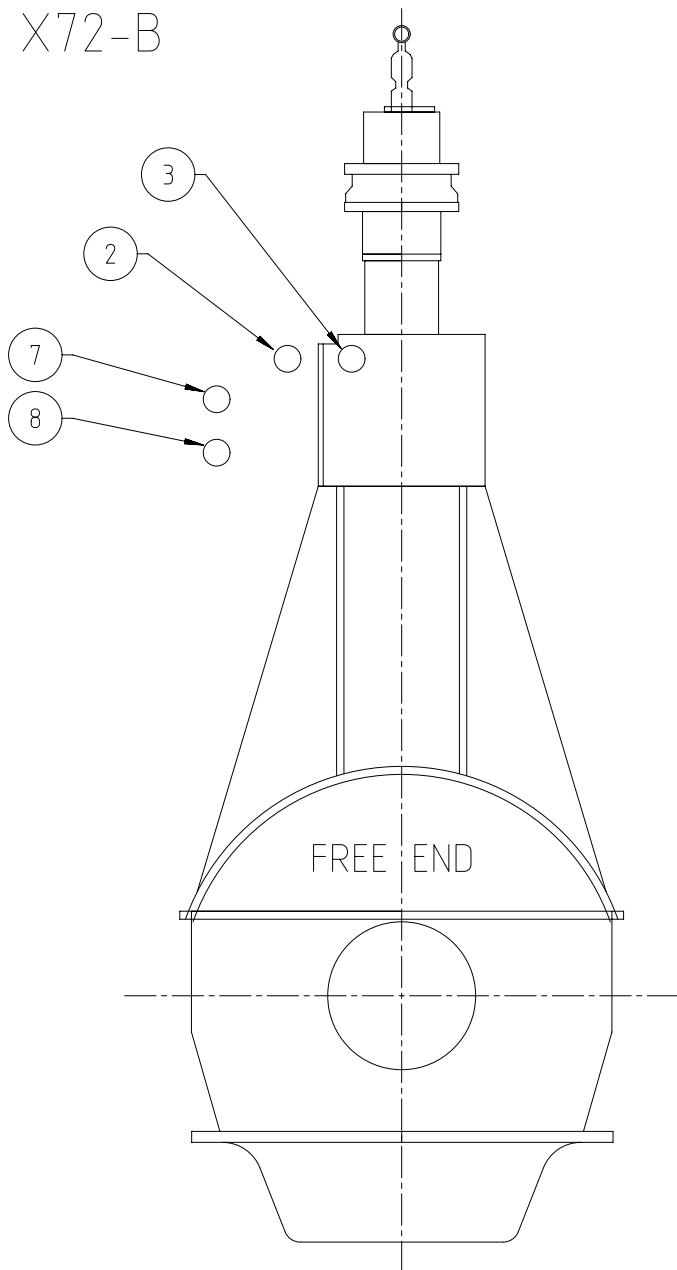


X72-B



SPECIFICATION which must be met:

2 C	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. - Pre-heating: The engine must be warmed-up by means of heated HT water to min. 60°C before engine start. - HT cooling water amount on engine side: Given in table1 on page 2
3 C	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 - A venting devise (air separator) must be installed as close as possible after the outlet connection to remove accumulated air from the system.
7 C	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 table1 on page 2
8 C	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.

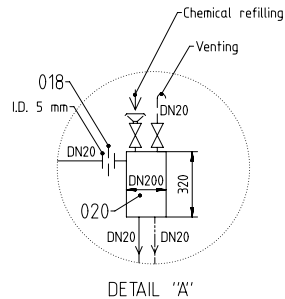
1	023	PAAD297120	AIR SEPARATOR			DAAD101945			0,001		
1	016	107.245.419.500	EXPANSION TANK			107.245.419			0,001		
1	015	107.413.097.500	EXPANSION TANK			107.413.097			0,001		
QTY	SEQ NO	Material ID	Material Name			Standard or Drawing	Basic Material Material Standard	Weight GR./NET			
Free space for lic.								Q-Code	Main Drw.		
								XXXXXX			
								Standard ISO; JIS			
Modif.	A	EAAD090483	08.04.2019	B	EAAD090593	29.08.2019	C	EAAD092431	20.02.2020		
	Number		Drawn date	Number		Drawn date	Number		Drawn date	Number	Drawn date
 Winterthur Gas & Diesel			Product 5-8X72-B			CENTRAL COOLING WATER SYSTEM HT_static-pressure: EXP tank					
Units	mm kg		NX				Basic Material			Net Weight 0,003	
Made	08.05.2019 Arindam					Scale	-	Size	A3	Page	1/2
Chkd	19.07.2018 wwa008 Wang					Design Group		Material ID		PAAD294727	
Appd	27.07.2018 mhu019 Hug					9721		Drawing ID		DAAD100420	
									Rev.		C

SYSTEM PROPOSAL

Pos.	ENGINE COMPONENTS *3)
EC01	Scavenge air cooler (SAC)
EC02	Manual vent valve, for each cylinder *15)

Pos.	ENGINE CONNECTIONS *2) C
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	Air separator (link to details drawing on page 1)
024	Automatic venting unit



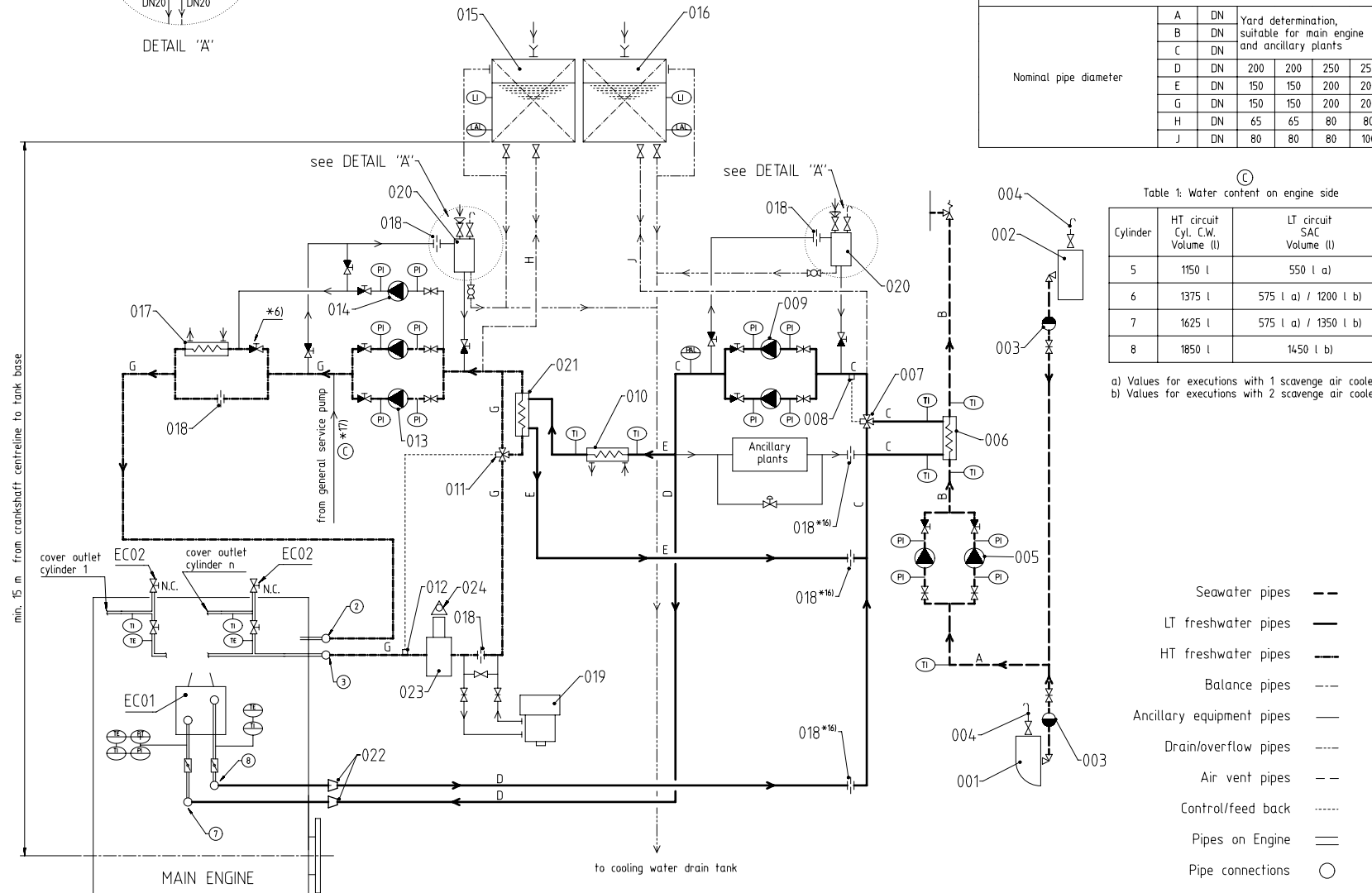
Number of cylinders		5	6	7	8
Main engine X72-B (R1 rated)	power (kW)	19600	23520	27440	31360
	speed (rpm)	89			
Pressure drop across the engine	(bar)	1.3			
Cooling water expansion tank (HT)	Cap. (m³)	Depending on ancillary plants min. 10% of HT cooling water			
Cooling water expansion tank (LT)	Cap. (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	150	150	200
	G	DN	150	150	200
	H	DN	65	65	80
	J	DN	80	80	100

Table 1: Water content on engine side

Cylinder	HT circuit Cyl. C.W. Volume (l)	LT circuit SAC Volume (l)
5	1150 l	550 l a)
6	1375 l	575 l a) / 1200 l b)
7	1625 l	575 l a) / 1350 l b)
8	1850 l	1450 l b)

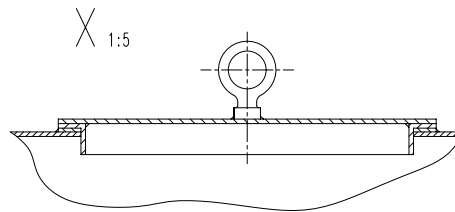
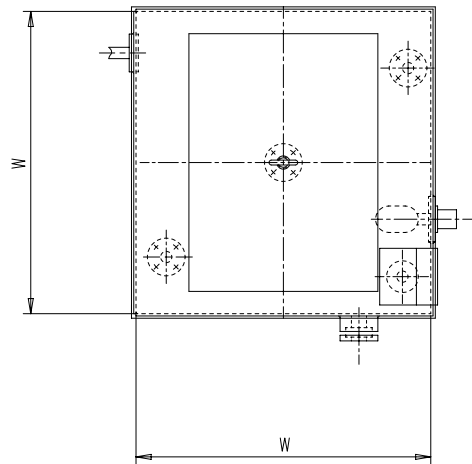
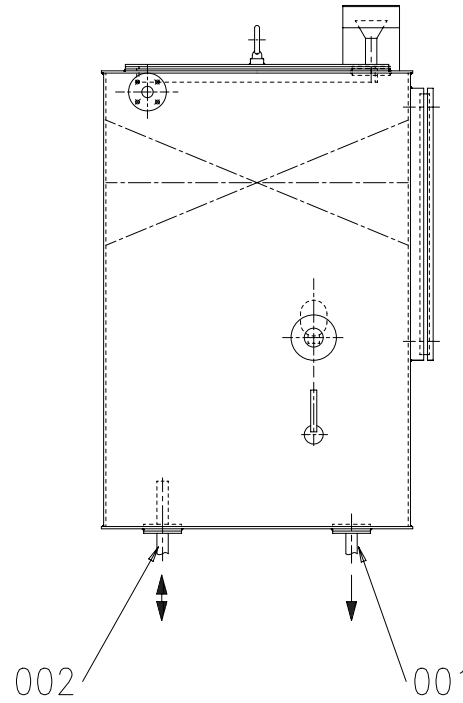
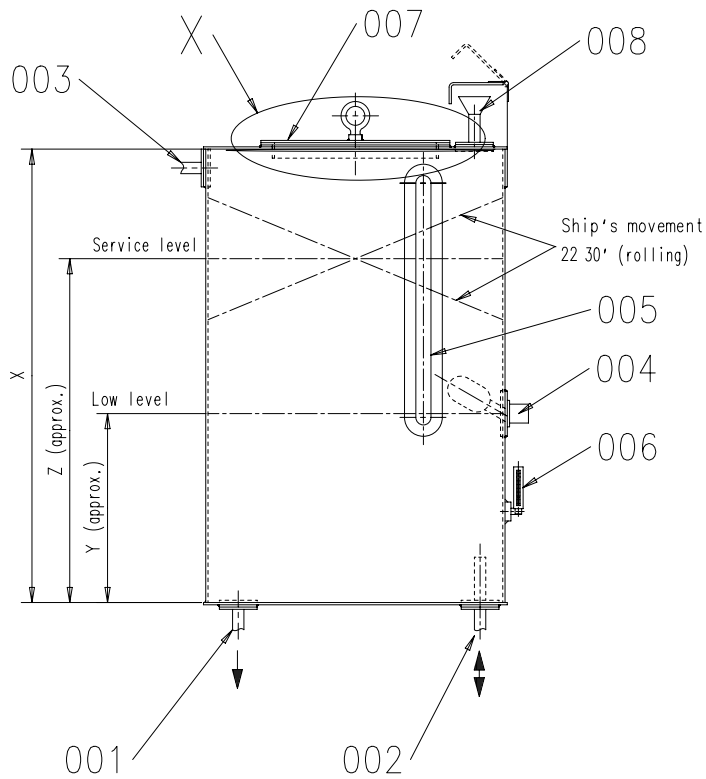
a) Values for executions with 1 scavenge air cooler.
b) Values for executions with 2 scavenge air coolers.



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 ○

- Remarks: C
- 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 delivered by external supplier and 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 DG9730 "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.
*13) A constant temperature at engine inlet must be maintained. Temperature set-point can be selected between 10 - 36 °C. WinGD recommends a set-point of 25 °C. A lower LT water temperature assists the main engine to reach lower BSFC. If the ancillary plants require a temperature lower or greater than the LT water set-point, a separate water supply system with different temperature set-point has to be installed (please refer to the 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 close during engine operation.
*16) Optional, only to be installed if needed for hydraulic balancing.
*17) Optional connection. To be installed if requested by class rules for emergency engine cooling.

Model	Free space for all	Q-Code	XXXXXX	Main Drw.
Number	Drawn date	Number	Drawn date	Number
1	08.05.2019	2	08.05.2019	3
4	08.05.2019	5	08.05.2019	6
7	08.05.2019	8	08.05.2019	9
10	08.05.2019	11	08.05.2019	12
13	08.05.2019	14	08.05.2019	15
16	08.05.2019	17	08.05.2019	18
19	08.05.2019	20	08.05.2019	21
22	08.05.2019	23	08.05.2019	24
25	08.05.2019	26	08.05.2019	27
28	08.05.2019	29	08.05.2019	30
31	08.05.2019	32	08.05.2019	33
34	08.05.2019	35	08.05.2019	36
37	08.05.2019	38	08.05.2019	39
40	08.05.2019	41	08.05.2019	42
43	08.05.2019	44	08.05.2019	45
46	08.05.2019	47	08.05.2019	48
49	08.05.2019	50	08.05.2019	51
52	08.05.2019	53	08.05.2019	54
55	08.05.2019	56	08.05.2019	57
58	08.05.2019	59	08.05.2019	60
61	08.05.2019	62	08.05.2019	63
64	08.05.2019	65	08.05.2019	66
67	08.05.2019	68	08.05.2019	69
70	08.05.2019	71	08.05.2019	72
73	08.05.2019	74	08.05.2019	75
76	08.05.2019	77	08.05.2019	78
79	08.05.2019	80	08.05.2019	81
82	08.05.2019	83	08.05.2019	84
85	08.05.2019	86	08.05.2019	87
88	08.05.2019	89	08.05.2019	90
91	08.05.2019	92	08.05.2019	93
94	08.05.2019	95	08.05.2019	96
97	08.05.2019	98	08.05.2019	99
100	08.05.2019	101	08.05.2019	102
103	08.05.2019	104	08.05.2019	105
106	08.05.2019	107	08.05.2019	108
109	08.05.2019	110	08.05.2019	111
112	08.05.2019	113	08.05.2019	114
115	08.05.2019	116	08.05.2019	117
118	08.05.2019	119	08.05.2019	120
121	08.05.2019	122	08.05.2019	123
124	08.05.2019	125	08.05.2019	126
127	08.05.2019	128	08.05.2019	129
130	08.05.2019	131	08.05.2019	132
133	08.05.2019	134	08.05.2019	135
136	08.05.2019	137	08.05.2019	138
139	08.05.2019	140	08.05.2019	141
142	08.05.2019	143	08.05.2019	144
145	08.05.2019	146	08.05.2019	147
148	08.05.2019	149	08.05.2019	150
151	08.05.2019	152	08.05.2019	153
154	08.05.2019	155	08.05.2019	156
157	08.05.2019	158	08.05.2019	159
160	08.05.2019	161	08.05.2019	162
163	08.05.2019	164	08.05.2019	165
166	08.05.2019	167	08.05.2019	168
169	08.05.2019	170	08.05.2019	171
172	08.05.2019	173	08.05.2019	174
175	08.05.2019	176	08.05.2019	177
178	08.05.2019	179	08.05.2019	180
181	08.05.2019	182	08.05.2019	183
184	08.05.2019	185	08.05.2019	186
187	08.05.2019	188	08.05.2019	189
190	08.05.2019	191	08.05.2019	192
193	08.05.2019	194	08.05.2019	195
196	08.05.2019	197	08.05.2019	198
199	08.05.2019	200	08.05.2019	201
202	08.05.2019	203	08.05.2019	204
205	08.05.2019	206	08.05.2019	207
208	08.05.2019	209	08.05.2019	210
211	08.05.2019	212	08.05.2019	213
214	08.05.2019	215	08.05.2019	216
217	08.05.2019	218	08.05.2019	219
220	08.05.2019	221	08.05.2019	222
223	08.05.2019	224	08.05.2019	225
226	08.05.2019	227	08.05.2019	228
229	08.05.2019	230	08.05.2019	231
232	08.05.2019	233	08.05.2019	234
235	08.05.2019	236	08.05.2019	237
238	08.05.2019	239	08.05.2019	240
241	08.05.2019	242	08.05.2019	243
244	08.05.2019	245	08.05.2019	246
247	08.05.2019	248	08.05.2019	249
250	08.05.2019	251	08.05.2019	252
253	08.05.2019	254	08.05.2019	255
256	08.05.2019	257	08.05.2019	258
259	08.05.2019	260	08.05.2019	261
262	08.05.2019	263	08.05.2019	264
265	08.05.2019	266	08.05.2019	267
268	08.05.2019	269	08.05.2019	270
271	08.05.2019	272	08.05.2019	273
274	08.05.2019	275	08.05.2019	276
277	08.05.2019	278	08.05.2019	279
280	08.05.2019	281	08.05.2019	282
283	08.05.2019	284	08.05.2019	285
286	08.05.2019	287	08.05.2019	288
289	08.05.2019	290	08.05.2019	291
292	08.05.2019	293	08.05.2019	294
295	08.05.2019	296	08.05.2019	297
298	08.05.2019	299	08.05.2019	300
301	08.05.2019	302	08.05.2019	303
304	08.05.2019	305	08.05.2019	306
307	08.05.2019	308	08.05.2019	309
310	08.05.2019	311	08.05.2019	312
313	08.05.2019	314	08.05.2019	315
316	08.05.2019	317	08.05.2019	318
319	08.05.2019	320	08.05.2019	321
322	08.05.2019	323	08.05.2019	324
325	08.05.2019	326	08.05.2019	327
328	08.05.2019	329	08.05.2019	330
331	08.05.2019	332	08.05.2019	333
334	08.05.2019	335	08.05.2019	336
337	08.05.2019	338	08.05.2019	339
340	08.05.2019	341	08.05.2019	342
343	08.05.2019	344	08.05.2019	345
346	08.05.2019	347	08.05.2019	348
349	08.05.2019	350	08.05.2019	351
352	08.05.2019	353	08.05.2019	354
355	08.05.2019	356	08.05.2019	357
358	08.05.2019	359	08.05.2019	360
361	08.05.2019	362	08.05.2019	363
364	08.05.2019	365	08.05.2019	366
367	08.05.2019	368	08.05.2019	369
370	08.05.2019	371	08.05.2019	372
373	08.05.2019	374	08.05.2019	375
376	08.05.2019	377	08.05.2019	378
379	08.05.2019	380	08.05.2019	381
382	08.05.2019	383	08.05.2019	384
385	08.05.2019	386	08.05.2019	387
388	08.05.2019	389	08.05.2019	390
391	08.05.2019	392	08.05.2019	393
394	08.05.2019	395	08.05.2019	396
397	08.05.2019	398	08.05.2019	399
400	08.05.2019	401	08.05.2019	402
403	08.05.2019	404	08.05.2019	405
406	08.05.2019	407	08.05.2019	408
409	08.05.2019	410	08.05.2019	411
412	08.05.2019	413	08.05.2019	414
415	08.05.201			



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

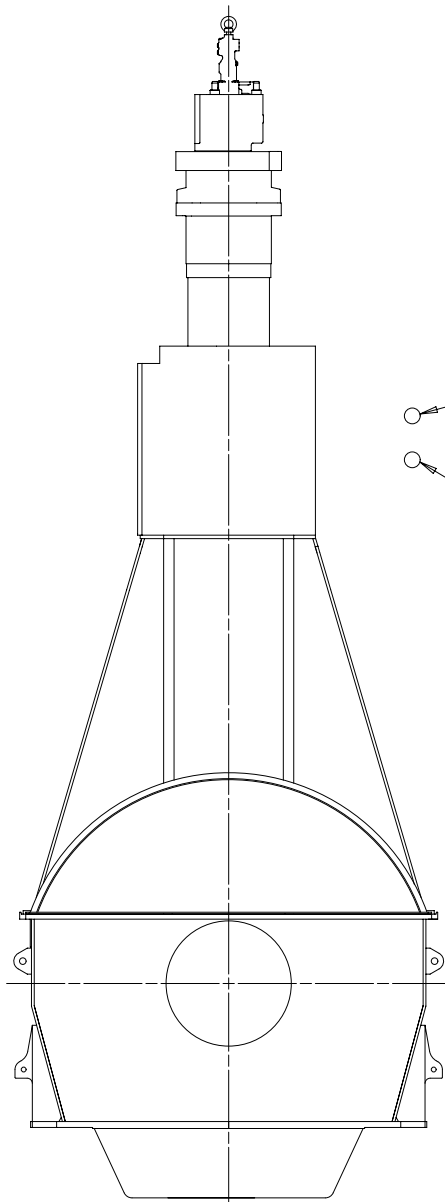
Modif.	A	EAAD091567	15.11.2019	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date	Q-Code	Main Drw.
												XXXXX	
												Standard	
												ISO; JIS	

WIN GD Winterthur Gas & Diesel		Product		EXPANSION TANK CENTRAL COOLING WATER HT CIRCUIT Ausgleichstank Zentralkuehlwassersystem HT circuit	
		W-25			
Units	mm kg	NX	Basic Material		Net Weight 0,001
Made	16.04.2009	M.PRSTEC	Scale	1:10	Size A2 Page 1/1
Chkd			Design Group	7921	Material ID 107.413.097.500
Appd	30.04.2009	MPR002 Prstec	Drawing ID	107.413.097	Rev. A

SURFACE PROTECTION SEE GROUP 0344		GENERAL TOLERANCES ACCORDING TO ISO2768-mK	
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X72-B
DRIVING END

FUEL SIDE



EXHAUST SIDE

SPECIFICATION which must be met:

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's 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 means of heated HT water to min. 60°C before engine start. - HT cooling water amount on engine side: Given in table1 on page 2
3	OUTLET - Cylinder cooling water (HT water) - Cooling water temperature set point: 90 °C - Controller set-point: 90 °C (controller type: PI) - Steady state condition: 90 ± 2 °C - Transient condition: 90 ± 4 °C - A venting device (air separator) must be installed as close as possible after the outlet connection to remove accumulated air from the system
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's specification. - LT cooling water amount on engine side: Given in table1 on page 2
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	029	PAAD297120	AIR SEPARATOR		DAAD101945		0,001	
1	021	107.245.419.500	EXPANSION TANK		107.245.419		0,001	
1	020	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	Main Drw.
							XXXXXX	
							Standard ISO; JIS	
Modif.	☐		☐		☐		☐	
	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date
WIN GD Winterthur Gas & Diesel			Product 5-8X72-B		CENTRAL COOLING WATER SYSTEM Zentralkuehlwassersystem			
Units		mm kg	☐ ☒		Basic Material			Net Weight 0,001
Made	05.10.2020	Sudant	Deogade		Scale	-	Size A2	Page 1/2
Chkd	05.10.2020	mhu019 Hug	Design Group		Material ID		PAAD366324	
Appd	05.10.2020	dst009 Strödecke		9721	Drawing ID		DAAD135807	
mK							Rev.	-

SYSTEM PROPOSAL

Pos.	ENGINE CONNECTIONS *2)
①	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.	ENGINE COMPONENTS *3)
EC01	Scavenge air cooler (SAC)
EC02	Manual vent valve, for each cylinder *16)

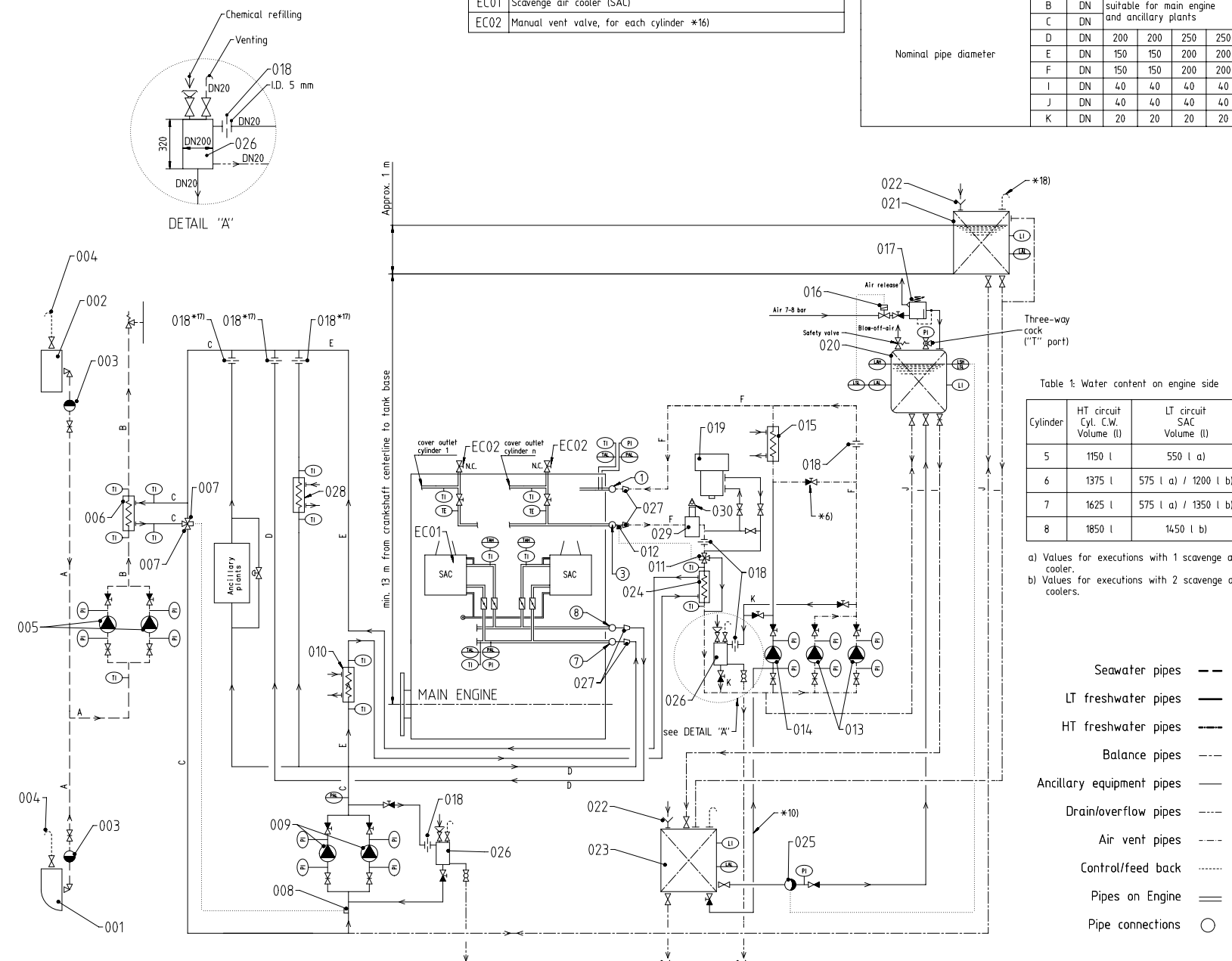
Number of cylinders		5	6	7	8
Main engine X72-B (R1 rated)	power (kW)	19600	23520	27440	31360
	speed (rpm)	89			
Buffer unit for HT circuit	Cap. (m³)	0.8	0.8	0.8	0.8
Cylinder cooling water feed tank only min.	Cap. (m³)	1.5	1.5	1.5	1.5
CCW feed and drain tank (combined) min.	Cap. (m³)	4	4	4	4
Cooling water expansion tank (LT)	Cap. (m³)	Depending on ancillary plants			

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	250
	E	DN	150	150	200	200
	F	DN	150	150	200	200
	I	DN	40	40	40	40
	J	DN	40	40	40	40
	K	DN	20	20	20	20

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	LT water temperature sensor *13)
009	Cooling water pump for LT circuit
010	Lubricating oil cooler
011	Automatic temperature control valve for HT circuit *14)
012	HT water temperature sensor *14)
013	Cylinder cooling water pump for HT circuit
014	Pre-heating circulating pump (optional), cap. 10% from cylinder cooling pump *8)
015	Pre-heater for main engine (HT circuit)
016	Solenoid valve (air inlet to be interlocked with min. water level)
017	Control air valve with air release function *15) (to be adjusted to ensure CW pressure at ME inlet 4 - 5 bar(g))
018	Throttling disc *5)
019	Freshwater generator
020	Buffer unit for HT circuit (link to detail drawing on page 1)
021	LT water expansion tank (link to detail drawing on page 1) *18)
022	Filling pipe / inlet chemical treatment
023	Cylinder cooling water feed & drain tank (or feed tank only)
024	Cylinder cooling water cooler
025	Supply pump, automatic level control (0.5 m³/h at 4 bar)
026	Chemical treatment refill unit *4)
027	Transition piece (adapter) *9)
028	MDO/MGO cooler
029	Air separator (link to detail drawing on page 1)
030	Automatic venting unit

Remarks:

- 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 delivered by external supplier and 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) Optional filling line to enable fast system re-filling (e.g. after a complete system drainage) by means of the pre-heating pumps.
- *11) 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 DG9730 "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.
- *13) A constant temperature at engine inlet must be maintained. Temperature set-point can be selected between 10 - 36 °C. WinGD recommends a set-point of 25 °C. A lower LT water temperature assists the main engine to reach lower BSFC. If the ancillary plants require a temperature lower or greater than the LT water set-point, a separate water supply system with different temperature set-point has to be installed (please refer to the 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) If the selected control air valve does not have the integrated air release functionality a separate air release valve can be installed as alternative on the top of the buffer unit.
- *16) Only to be used for manual venting of isolated cylinders after maintenance.
- *17) Optional, only to be installed if needed for hydraulic balancing.
- *18) If gas driven auxiliaries are connected to the LT circuit, the LT expansion tank must be gas tight and has to be vented to a safe area outside of engine room.



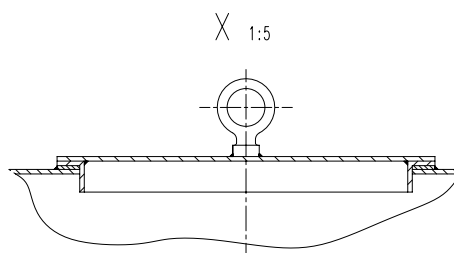
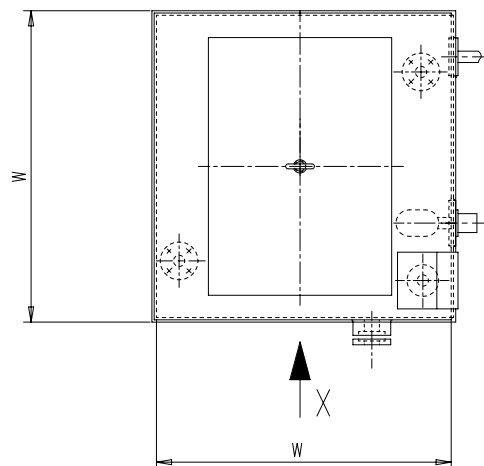
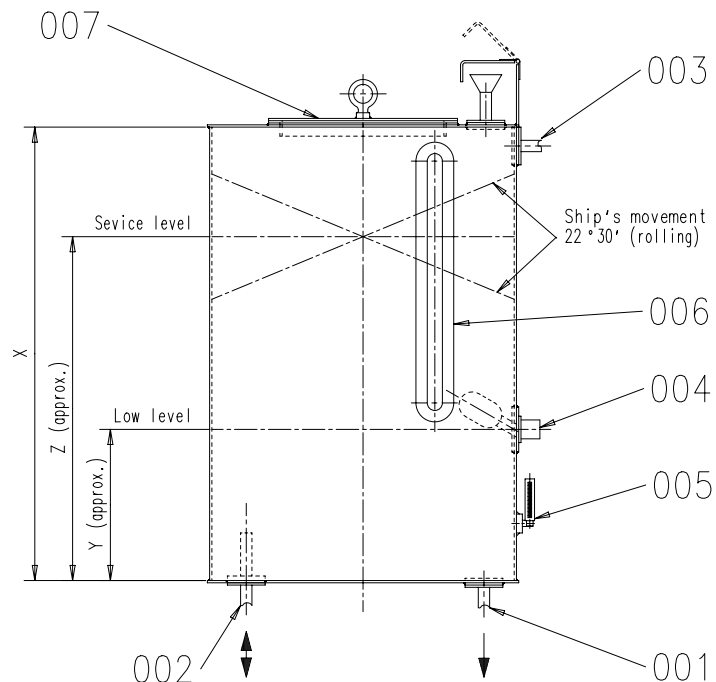
 $\textcircled{F}$

(F)



Ⓟ

12345678910 111213141516171819202122232425262728293031		3-Date XXXXXX 4-Inv. XXXXXX	
5-Standard C-7461.644		6-Standard ISO	
7-14.05.2008		8-14.05.2012	
9-17.02.2014		10-17.02.2014	
11-Number	12-Draw date	13-Number	14-Draw date
15-Number	16-Draw date	17-Number	18-Draw date
		19-BUFFER 20-TO CYL.,COOLING WATER SYS 21-Puffer	
22-Unit	23-mm kg	24-IDE	25-Net Weight 0,001
26-22.09.00	27-5.575 L/Min	28-1	29-107.245.626
30-9721	31-107.245.626	32-1	33-F



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:

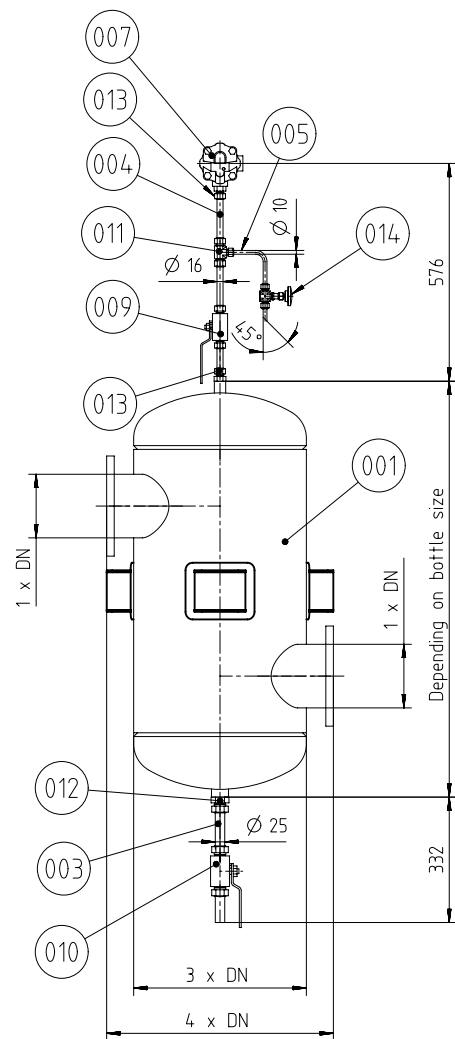
- *1) Level indicator can be omitted if an alternative is fitted.
- *2) Other designs like hinged covers, etc. are also possible

- 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						Material ID		107.245.419.500	
		Rev.						Drawing ID		107.245.419	



PIPE LENGTHS TO BE DECIDED BY SHIPYARD

1	014	107.324.704.001	NEEDLE VALVE DN7	107.324.704	Steel	0,438
2	013	107.324.101.017	SCREW-IN UNION DN12xG1/2	107.324.101	Steel	0,125
1	012	107.324.101.021	SCREW-IN UNION DN20xG1	107.324.101	Steel	0,329
1	011	107.324.131.007	TEE UNION DN12 x DN7	107.324.131	Steel	0,25
1	010	107.324.703.005	BALL VALVE DN20	107.324.703	Steel	1,24
1	009	107.324.703.003	BALL VALVE DN12	107.324.703	Steel	
1	007	PAAD185947	AUTOMATIC VENTING UNIT Rp1/2	DAAD065150		2,5
1m	005	005.405.131.043	PIPE DN7 / 10 x 1.5		W-FU-235-N-T	0,31
1m	004	005.405.131.087	PIPE DN12 / 16 x 2		W-FU-235-N-T	0,69
0,25m	003	005.405.131.131	PIPE DN20 / 25 x 2		W-FU-235-N-T	1,13
1	001	PAAD297112	AIR SEPARATOR	DAAD101890		139

QTY	SEQ NO	Material ID	Material Name	Dimension, Occ	Standard or Drawing	Basic Material Material Standard	Weight GR./NET
						Q-Code XXXXXX Standard ISO; JIS	Main Drw.
Modif.	A	EAAD090871	26.09.2019	B	EAAD096344	10.03.2021	
	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number

WIN GD Winterthur Gas & Diesel		Product W-25	AIR SEPARATOR			
Units	mm kg	NX	Basic Material	Net Weight 0.001		
Made	06.06.2018	Kashyap Patel	Scale	1:10	Size	A2
Chkd	17.07.2018	wwwa008 Wang	Design Group	1/1	Material ID	PAAD297120
Appd	17.07.2018	mhu019 Hug	79721	Drawing ID	DAAD101945	Rev. B

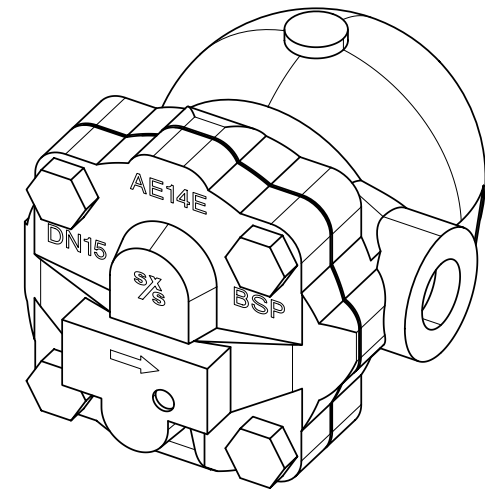
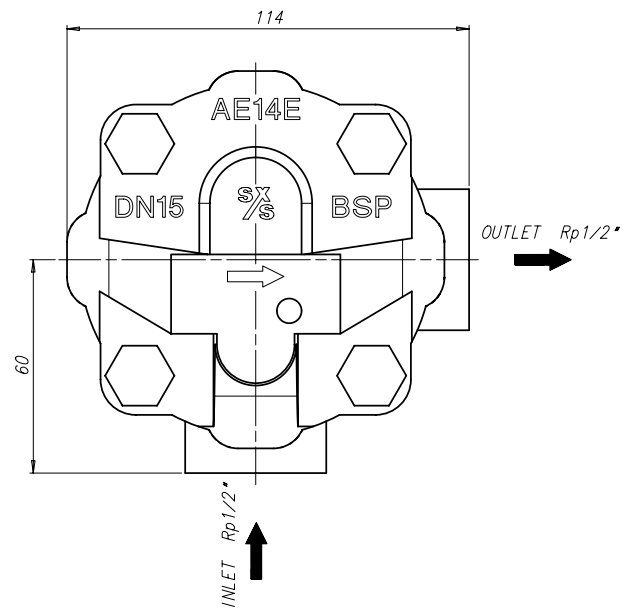
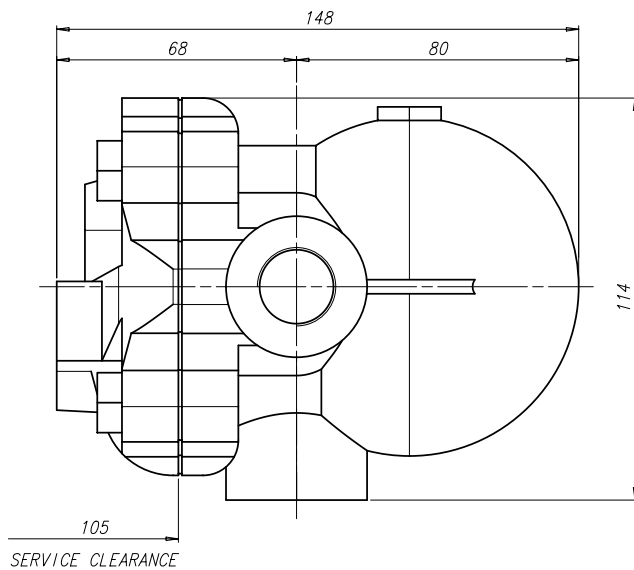
SURFACE PROTECTION SEE GROUP 0344

TOLERANCING PRINCIPLE ISO8015

Rohrklasse PIPE CLASS	III MEDIUM	Wasser WATER	Pruefueberdruck TEST OVERPRESSURE	7.5	bar
Schweiss Qualitaet WELDING QUALITY LEVEL	D	Toleranzklasse TOLERANCE GRADE	B	Befr.druck OPER. PRESS.	5

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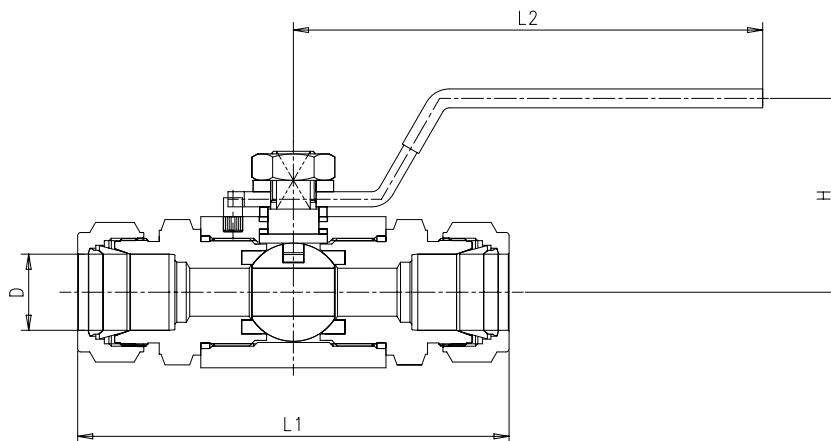
Individual Drawing - Confidential



SUPPLIER:
SPIRAX SARCO AG
www.SpiraxSarco.com

SPECIFICATIONS:
AUTOMATIC AIR VENT SPIRAX SARCO TYPE AE14E, PN16, SIZE Rp1/2"
PRESSURE LEVEL : PN16
MAX. OPERATING PRESSURE (PMO): 14 bar
MAX. OPERATING TEMPERATURE (TMO): 127° C
MAX. PRESSURE DIFFERENCE: 14 bar

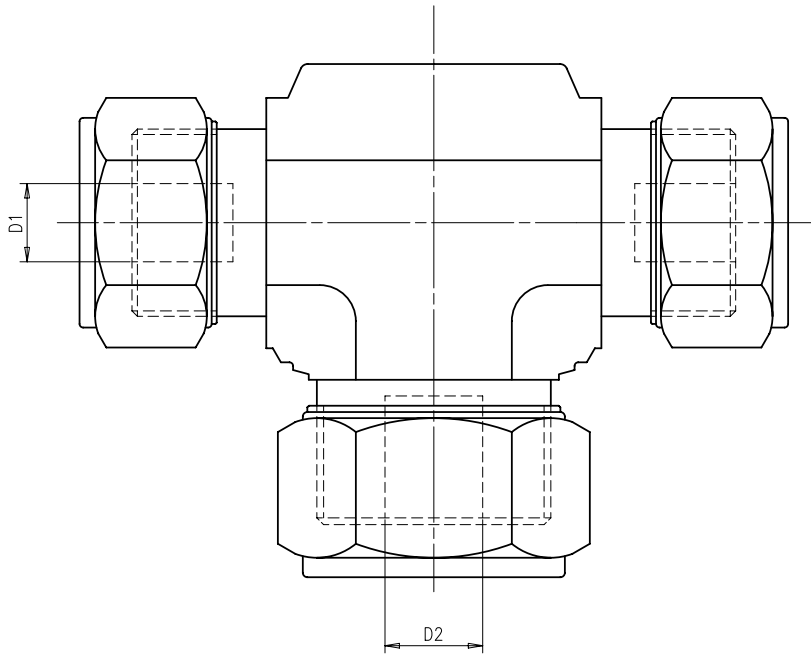
Free space for lib.		Q-Code		Main	
		XQXXX		Drw.	
		Standard		ISO	
				JIS	
Modif.	Number	Drawn date	Number	Drawn date	Number
Product		W-2S			
WIN GD		AUTOMATIC VENTING UNIT			
Winterthur Gas & Diesel		ORDER DRAWING			
		Entlüftungsautomat			
		Bestellzeichnung			
Units	mm kg	IDE	Basic Material	Net Weight 2.5	
SURFACE PROTECTION SEE GROUP 0344		Made	08.04.2015	Aditya Gole	Scale 1:1
TOLERANCING PRINCIPLE ISO8015		Chkd	27.05.2015	ast044 Stephan	Size A2
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	27.05.2015	bha009 Haag	Page 1/1
		8611		Design Group	Material ID PAAD185947
				Drawing ID DAAD065150	Rev. -



Artikel Nummer	DN	TUBE D	L1	L2	H	MAX. WORKING PRESSURE	OPERATING TEMPERATURE (°C)	Seat Material
107.324.703.001	DN07	10	104.91	108.75	38.41	6000 (413bar)	-30 to +180	PCTFE
107.324.703.002	DN09	12	109.71	108.75	38.41			
107.324.703.003	DN12	16	114.96	124.2	51.3			
107.324.703.004	DN15	20	114.16	124.2	53.1			
107.324.703.005	DN20	25	134.08	149.2	58.1			

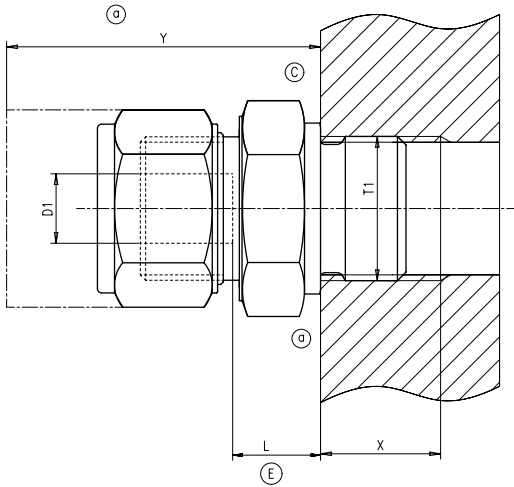
siehe Hauptzeichnung für Spezifikation
SEE MAIN DRAWING FOR SPECIFICATION

1	005	107.324.703.005	BALL VALVE	DN20	107.324.703	Steel	1,24
1	004	107.324.703.004	BALL VALVE	DN15	107.324.703	Steel	1,03
1	003	107.324.703.003	BALL VALVE	DN12	107.324.703	Steel	0,55
1	002	107.324.703.002	BALL VALVE	DN9	107.324.703	Steel	0,511
1	001	107.324.703.001	BALL VALVE	DN7	107.324.703	Steel	0,494
QTY	SEQ NO	Material ID	Material Name	Dimension, Occ	Standard or Drawing	Basic Material Material Standard	Weight GR./NET
Modif.		Free space for lic.				Q-Code XXXXXX Standard ISO; JIS	Main Drw.
		A EAAD700077	13.04.2011	B EAAD083575	01.10.2012	C EAAD096344	12.03.2021
		Number	Drawn date	Number	Drawn date	Number	Drawn date
 Winterthur Gas & Diesel			Product W-2S		BALL VALVE		
					Kugelhahn		
Units	mm kg	NX		Basic Material	Net Weight		
SURFACE PROTECTION SEE GROUP 0344		Made	29.04.2005	sga006	S.GASSER	Scale	1:1
TOLERANCING PRINCIPLE ISO8015		Chkd	S.Gasser		Design Group	Size	A2
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	04.05.2005	MFR001	Frei	0333	1/1
		Drawing ID		107.324.703		Material ID	Rev.
							C



Artikel Nummer	DN	TUBE D1	TUBE D2
107.324.131.001	DN07	10	6
107.324.131.002	DN09	12	8
107.324.131.003	DN09	12	10
107.324.131.004	DN09	12	16
107.324.131.005	DN12	16	6
107.324.131.006	DN12	16	8
107.324.131.007	DN12	16	10
107.324.131.008	DN12	16	12
107.324.131.009	DN12	16	20
107.324.131.010	DN15	20	10
107.324.131.011	DN15	20	12
107.324.131.012	DN15	20	16
107.324.131.013	DN15	20	25
107.324.131.014	DN20	25	16
107.324.131.015	DN20	25	20

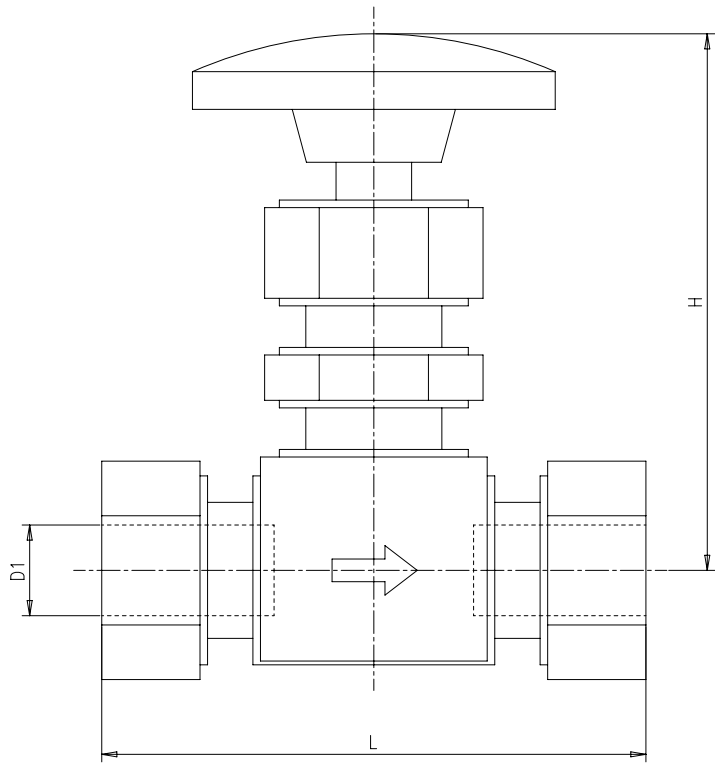
B siehe Hauptzeichnung für Spezifikation SEE MAIN DRAWING FOR SPECIFICATION									
1	015	107.324.131.015	TEE UNION	25 x 20 x 25	107.324.131	Steel	Steel	0.642	
1	014	107.324.131.014	TEE UNION	25 x 16 x 25	107.324.131	Steel	Steel	0.615	
1	013	107.324.131.013	TEE UNION	20 x 25 x 20	107.324.131	Steel	Steel	0.592	
1	012	107.324.131.012	TEE UNION	20 x 16 x 20	107.324.131	Steel	Steel	0.471	
1	011	107.324.131.011	TEE UNION	20 x 12 x 20	107.324.131	Steel	Steel	0.443	
1	010	107.324.131.010	TEE UNION	20 x 10 x 20	107.324.131	Steel	Steel	0.46	
1	009	107.324.131.009	TEE UNION	16 x 20 x 16	107.324.131	Steel	Steel	0.442	
1	008	107.324.131.008	TEE UNION	16 x 12 x 16	107.324.131	Steel	Steel	0.262	
1	007	107.324.131.007	TEE UNION	16 x 10 x 16	107.324.131	Steel	Steel	0.25	
1	006	107.324.131.006	TEE UNION	16 x 8 x 16	107.324.131	Steel	Steel	0.243	
1	005	107.324.131.005	TEE UNION	16 x 6 x 16	107.324.131	Steel	Steel	0.241	
1	004	107.324.131.004	TEE UNION	12 x 16 x 12	107.324.131	Steel	Steel	0.271	
1	003	107.324.131.003	TEE UNION	12 x 10 x 12	107.324.131	Steel	Steel	0.195	
1	002	107.324.131.002	TEE UNION	12 x 8 x 12	107.324.131	Steel	Steel	0.19	
1	001	107.324.131.001	TEE UNION	10 x 6 x 10	107.324.131	Steel	Steel	0.127	
QTY	SEQ NO	Material ID	Material Name	Dimension/Occ.Dimension	Standard or Drawing	Basic Material Material Standard	Q-Code XXXXX ISO JIS	Weight DR / NET	Main Draw.
Mod. 1	Free resp. for								
Mod. 1	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date	
WIN GD Winterthur Gas & Diesel			Product W-2S		TEE UNION T-Verschraubung				
Units	mm	kg	IDE	Basic Material	Net Weight				
SURFACE PROTECTION SEE GROUP 0344			Mod. 17.12.2004	W.DOE RIG	Scale 1:1	Size A1	Page 1/1	Material ID	
TOLERANCING PRINCIPLE ISO8015			Chkd		Design Group	0333	Drawing ID	107.324.131	Rev. B
GENERAL TOLERANCES ACCORDING TO ISO2768-mK			Appd	28.04.2005 mfr001 Frei					



(G)						(E)		
	Material ID	DN	TUBE D1	T1	X	Y	L	Order Number
(a)	107.324.101.001	DN04	6	G1/8	9	45	9.9	DMC 6M-2GB-C
	107.324.101.002	DN04	6	G1/4	14	50	11.1	DMC 6M-4GB-C
	107.324.101.003	DN04	6	G3/8	14	50	12.4	DMC 6M-6GB-C
	107.324.101.004	DN04	6	G1/2	17	55	15.2	DMC 6M-8GB-C
(b)	107.324.101.005	DN06	8	G1/8	9	45	9.9	DMC 8M-2GB-C
	107.324.101.006	DN06	8	G1/4	14	50	11.1	DMC 8M-4GB-C
	107.324.101.007	DN06	8	G3/8	14	50	12.4	DMC 8M-6GB-C
	107.324.101.008	DN06	8	G1/2	17	55	15.2	DMC 8M-8GB-C
(c)	107.324.101.009	DN07	10	G1/4	14	50	11	DMC 10M-4GB-C
	107.324.101.010	DN07	10	G3/8	14	50	12.2	DMC 10M-6GB-C
	107.324.101.011	DN07	10	G1/2	17	60	15.1	DMC 10M-8GB-C
	107.324.101.012	DN09	12	G1/4	14	55	8.6	DMC 12M-4GB-C
(d)	107.324.101.013	DN09	12	G3/8	14	55	9.1	DMC 12M-6GB-C
	107.324.101.014	DN09	12	G1/2	17	60	12	DMC 12M-8GB-C
	107.324.101.015	DN09	12	G3/4	19	65	14.3	DMC 12M-10GB-C
	107.324.101.016	DN12	16	G3/8	14	55	8.3	DMC 16M-6GB-C
(e)	107.324.101.017	DN12	16	G1/2	17	60	10.4	DMC 16M-8GB-C
	107.324.101.018	DN15	20	G1/2	17	65	10.3	DMC 20M-8GB-C
	107.324.101.019	DN15	20	G3/4	19	65	11.1	DMC 20M-12GB-C
	107.324.101.020	DN20	25	G3/4	19	70	10.5	DMC 25M-12GB-C
(f)	107.324.101.021	DN20	25	G1	21	70	10.5	DMC 25M-16GB-C
(g)	107.324.101.022	DN20	25	G1 1/4	23	75	12.9	DMC 25M-20GB-C
(h)	107.324.101.023	DN20	25	G1 1/2	25	80	14.5	DMC 25M-24GB-C

Drawn for Dk-Lok
Material: Steel
PN needs to meet the working
pressure of Dk-Lok products.

① siehe Hauptzeichnung für Spezifikation SEE MAIN DRAWING FOR SPECIFICATION									
1	023	107.324.101.023	SCREW-IN UNION	25xG1 1/2	107.324.101	Steel		0,733	
1	022	107.324.101.022	SCREW-IN UNION	25xG1 1/4	107.324.101	Steel		0,543	
1	021	107.324.101.021	SCREW-IN UNION	25xG1	107.324.101	Steel		0,329	
1	020	107.324.101.020	SCREW-IN UNION	25xG3/4	107.324.101	Steel		0,247	
1	019	107.324.101.019	SCREW-IN UNION	20xG3/4	107.324.101	Steel		0,223	
1	018	107.324.101.018	SCREW-IN UNION	20xG1/2	107.324.101	Steel		0,173	
1	017	107.324.101.017	SCREW-IN UNION	16xG1/2	107.324.101	Steel		0,125	
1	016	107.324.101.016	SCREW-IN UNION	16xG3/8	107.324.101	Steel		0,094	
1	015	107.324.101.015	SCREW-IN UNION	12xG3/4	107.324.101	Steel		0,195	
1	014	107.324.101.014	SCREW-IN UNION	12xG1/2	107.324.101	Steel		0,126	
1	013	107.324.101.013	SCREW-IN UNION	12xG3/8	107.324.101	Steel		0,084	
1	012	107.324.101.012	SCREW-IN UNION	12xG1/4	107.324.101	Steel		0,076	
1	011	107.324.101.011	SCREW-IN UNION	10xG1/2	107.324.101	Steel		0,116	
1	010	107.324.101.010	SCREW-IN UNION	10xG3/8	107.324.101	Steel		0,069	
1	009	107.324.101.009	SCREW-IN UNION	10xG1/4	107.324.101	Steel		0,056	
1	008	107.324.101.008	SCREW-IN UNION	8xG1/2	107.324.101	Steel		0,112	
1	007	107.324.101.007	SCREW-IN UNION	8xG3/8	107.324.101	Steel		0,063	
1	006	107.324.101.006	SCREW-IN UNION	8xG1/4	107.324.101	Steel		0,043	
1	005	107.324.101.005	SCREW-IN UNION	8xG1/8	107.324.101	Steel		0,031	
1	004	107.324.101.004	SCREW-IN UNION	6xG1/2	107.324.101	Steel		0,111	
1	003	107.324.101.003	SCREW-IN UNION	6XG3/8	107.324.101	Steel		0,063	
1	002	107.324.101.002	SCREW-IN UNION	6XG1/4	107.324.101	Steel		0,045	
1	001	107.324.101.001	SCREW-IN UNION	6xG1/8	107.324.101	Steel		0,028	
QTY	SEQ NO	Material ID	Material Name	Dimension, Oct	Standard or Drawing	Basic Material	Weight GR/NET	Main Drw.	
								G-Code XXXXXX Shrinkage ISO, JIS	
107.324.101.023	18.07.2005	107.324.101.023	18.07.2005	107.324.101.023	18.07.2005	107.324.101.023	18.07.2005	107.324.101.023	18.07.2005
107.324.101.022	08.06.2007	107.324.101.022	08.06.2007	107.324.101.022	08.06.2007	107.324.101.022	08.06.2007	107.324.101.022	08.06.2007
107.324.101.021	01.10.2012	107.324.101.021	01.10.2012	107.324.101.021	01.10.2012	107.324.101.021	01.10.2012	107.324.101.021	01.10.2012
107.324.101.020	28.11.2019	107.324.101.020	28.11.2019	107.324.101.020	28.11.2019	107.324.101.020	28.11.2019	107.324.101.020	28.11.2019
107.324.101.019	28.11.2019	107.324.101.019	28.11.2019	107.324.101.019	28.11.2019	107.324.101.019	28.11.2019	107.324.101.019	28.11.2019
107.324.101.018	28.11.2019	107.324.101.018	28.11.2019	107.324.101.018	28.11.2019	107.324.101.018	28.11.2019	107.324.101.018	28.11.2019
107.324.101.017	28.11.2019	107.324.101.017	28.11.2019	107.324.101.017	28.11.2019	107.324.101.017	28.11.2019	107.324.101.017	28.11.2019
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107.324.101.015	28.11.2019	107.324.101.015	28.11.2019	107.324.101.015	28.11.2019	107.324.101.015	28.11.2019	107.324.101.015	28.11.2019
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107.324.101.014	28.11.2019	107.324.101.014	28.11.2019	107.324.101.014	28.11.201				



siehe Hauptzeichnung für Spezifikation
SEE MAIN DRAWING FOR SPECIFICATION

Artikel Nummer	DN	TUBE D1	L	H(open)
107.324.704.001	DN07	10	66	71
107.324.704.002	DN09	12	72	71
107.324.704.003	DN12	16	94	99
107.324.704.004	DN15	20	97	99
107.324.704.005	DN20	25	97	99
107.324.704.006	DN06	8	59,2	60

1	006	107.324.704.006	NEEDLE VALVE	DN6	107.324.704	Steel	0,304					
1	005	107.324.704.005	NEEDLE VALVE	DN20	107.324.704	Steel	1,34					
1	004	107.324.704.004	NEEDLE VALVE	DN15	107.324.704	Steel	1,19					
1	003	107.324.704.003	NEEDLE VALVE	DN12	107.324.704	Steel	0,903					
1	002	107.324.704.002	NEEDLE VALVE	DN9	107.324.704	Steel	0,495					
1	001	107.324.704.001	NEEDLE VALVE	DN7	107.324.704	Steel	0,438					
QTY	SEQ NO	Material ID	Material Name	Dimension, Occ	Standard or Drawing	Basic Material Material Standard	Weight GR./NET					
Free space for file						Q-Code XXXXXX	Main Drw.					
						Standard ISO; JIS						
Modif.	B	7-61981	12.03.2008	C	EAAD700013	19.01.2011	D	EAAD083575	01.10.2012	E	EAAD096344	12.03.2021
		Number	Drawn date		Number	Drawn date		Number	Drawn date		Number	Drawn date
 Winterthur Gas & Diesel			Product W-2S		NEEDLE VALVE							
					Nadelventil							
Units		mm kg		NX				Basic Material		Net Weight		

SURFACE PROTECTION SEE GROUP 0344		Made	19.05.2005	sga006	S.GASSER	Scale	2:1	Size	A2	Page	1/1	Material ID		Rev.	E
TOLERANCING PRINCIPLE ISO8015		Chkd				Design Group		0333		Drawing ID		107.324.704			
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	19.05.2005	MFR001	Frei										

MIDS - WinGD-X72-B - Cooling Water System (DG9721)

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2018-09-12	DRAWING SET	First web upload
2019- 04-10	DAAD100420	System drg. – new revision
2019-08-28	DAAD100420	System drg. – new revision
2019-09-26	DAAD101945 DAAD101890	Air separator drgs – new revision
2020-09-02	107.413.097 107.245.419	System drg – new revision
2020-10-09	DAAD100445 DAAD100420 DAAD135807 107.245.626 107.324.703 107.324.704	System and main drgs – new revision
2021-02-24	107.324.101	System drg – new revision
2021-03-30	DAAD101945 107.324.703 107.324.704	System drgs – new revision

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