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SURFACE PROTECTION SEE GROUP 0344

TOLERANCING PRINCIPLE ISO8015

Available executions

Execution No.	Material ID	Cylinder No.	Attribute 1: Turbocharger lubrication	
			INTERNAL	EXTERNAL
001	PAAD363293	6	X	
002	PAAD363295	6		X
003	PTAA053033	7	X	
004	PTAA053034	7		X

NOTE

The above executions can be configured using the Engine Configurator. Detailed guidance for the executions is provided within the Marine Installation Manual (MIM). If a specific execution of interest is not shown in the above table, then it may still be under development or not available. For further information or in case of a project-specific request, WinGD must be contacted directly.

This publication is designed to provide accurate and authoritative information with regard to the subject-matter covered as it was available at the time of printing. However, the publication deals with complicated technical matters suited only for specialists in the area, and the design of the subject-products is subject to regular improvements, modifications and changes. Consequently, the publisher and copyright owner of this publication cannot accept any responsibility or liability for any eventual errors or omissions in this document or for discrepancies arising from the features of any actual item in the respective product being different from those shown in this publication. The publisher and copyright owner shall under no circumstances be held liable for any financial consequential damages or other loss, or any other damage or injury, suffered by any party making use of this publication or the information contained herein.

Prod.	X62-S2.0									
Change History										
	-	sna102				new Design				
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis			Activity Code	E

WIN GD

Winterthur Gas & Diesel

LUBRICATING OIL SYSTEM

MIDS master drawing

separate BOM available

Dimension

Scale	-		NX	Units [mm] [kg]	Basic Material		Net Weight		0.001		
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				Qty per		A4	Item ID	PTAA026096		Drawing Page/s	1/1

1

2

3

4

SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight
1	1	PAAD363287	LUBRICATING OIL SYSTEM				0.001
2	1	PAAD245338	LUBRICATING OIL SYSTEM				0.001
3	1	PAAD366474	LUBRICATING OIL DRAIN TANK				169
5	1	107.341.455.500	INSTRUCTION FOR FLUSHING				0.001
6	1	PAAD100971	LUBRICATING OIL DRAIN TANK				0.001

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Prod.	6 X62-S2.0						
Change History							
	-	sde101	mhu019	26.02.2021		-	-
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code E C

<div>WIN GD</div> <div>Winterthur Gas & Diesel</div>		LUBRICATING OIL SYSTEM					
Bill Of Material		Dimension					
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		Main Design Yes		Design Group 9722		Q-Code XXXXX	Standard WDS
		Qty per Engine	A4	Item ID PAAD363293		BOM Page/s 01/01	

SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
001	1	PAAD363287	LUBRICATING OIL SYSTEM			0.001
002	1	PAAD245338	LUBRICATING OIL SYSTEM			0.001
003	1	PTAA052248	LUBRICATING OIL DRAIN TANK			246.3
004	1	107.341.455.500	INSTRUCTION FOR FLUSHING			0.001
005	1	PAAD100971	LUBRICATING OIL DRAIN TANK			0.001

Prod.	7 X62DF-S1.0 7 X62DF-S2.0			
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<div>WIN GD</div> <div>Winterthur Gas & Diesel</div>		LUBRICATING OIL SYSTEM						
Bill Of Material		Dimension						
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	Main Design	Yes	Design Group	9722	Q-Code	XXXXX	Standard	WDS
	Qty per	Engine	A4	Item ID	PTAA053033		BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight
001	1	PAAD363287	LUBRICATING OIL SYSTEM				0.001
002	1	PTAA052248	LUBRICATING OIL DRAIN TANK				246.3
003	1	107.341.455.500	INSTRUCTION FOR FLUSHING				0.001
004	1	PAAD100971	LUBRICATING OIL DRAIN TANK				0.001

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Prod.	7 X62DF-S1.0 7 X62DF-S2.0								
Change History									
	-	npa101	mhu019	20.01.2023	CNAA003121	Main Design/Drawing Introduced			- -
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Activity Code	E	C

				LUBRICATING OIL SYSTEM					
Bill Of Material				Dimension					
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				Main Design Yes		Design Group 9722		Q-Code XXXXX	Standard WDS
				Qty per Engine	A4	Item ID PTAA053034		BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name		Dimension	Standard-ID	Basic Material		Net Weight	
017	1 m	PAAD308926	HEATING ELEMENT		10QTVR2-CT				0.126	
Prod.	X62-S2.0									
Change History										
	A	sde101	mhu019	07.07.2022	CNAA002160	Drawing Updated			4 3	
	-	sde101	mhu019	26.02.2021		-			- -	
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis	Approved	Activity Code	E C	
<div>WIN GD</div> <div>Winterthur Gas & Diesel</div>				LUBRICATING OIL SYSTEM						
Bill Of Material				Dimension						
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					Main Design		Design Group 9722		Q-Code XXXXX	Standard WDS
					Qty per		A4	Item ID PAAD363287	BOM Page/s 01/01	

38

23

25

(27)

(30)

22

34

35

TOLERANCING PRINCIPLE ISO8015

Legend:

- Bearing LO pipes
- - - Cylinder LO pipes
- Cylinder LO pipes trace heated and insulated
- Pipes on engine
- Transfer/dirty LO pipes
- - - Overflow/drain pipes
- Air vent pipes
- - - Crosshead LO pipes
- Pipe connections

Dimensions:

- Min. 3.6 m from engine inlet to tank base
- Approx. 5.5 m
- min. 0.5 m

Table 1: LO content on engine side

Cylinder	Volume
5	2350 l
6	2650 l
7	2950 l
8	3300 l

Table 2: Number of cylinders

Number of cylinders	5	6	7	8
Main Engine X62-S2.0	134/25	161/10	187/95	214/80
RT rated	speed	rpm	108	

Table 3: Proposal for dimensioning

LO drain tank	capacity	(m³)	For capacities refer to drawing 'LO drain tank-Filling Guideline'
Main LO pump	capacity	(m³/h)	refer to GTD
Cyl. LO storage tank	capacity	(m³)	Based on a feed rate of 1g/kWh (pulse)
Cyl. LO service tank	capacity	(m³)	1.0 1.2 1.4 1.6
Crosshead LO pump	capacity	(m³/h)	refer to GTD
Nominal pipe diameter	A	DN	250 250 250 250
	B	DN	200 200 200 250
	C	DN	100 125 125 125
	D	DN	80 100 100 100
	E	DN	200 200 200 200
	F	DN	20 20 20 20

Table 4: The pipe diameters for the LO separator are sized according to the effective throughput capacity of the separator and according to the separator manufacturer's recommendations.

	DN	65	80	100
K1	DN	65	80	100
K2	DN	80	80	80
L	DN	80	80	80
M	DN	-	-	-
N	DN	80	80	80
O	DN	-	-	-
P	DN	80	80	80

Table 5: Heating device

Heating device	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017
INLET - Lubricating oil																	
OUTLET - Turbocharger lubricating oil																	
INLET - Crosshead lubricating oil																	
INLET - Cylinder lubricating oil																	
OUTLET - Servo system oil return (engine driving end)																	
OUTLET - Servo system oil return (engine free end)																	
OUTLET - Supply unit oil return																	
Trace heating cable control box connection																	

Table 6: Remarks

- Air vent pipes and drain valves where necessary.
- 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 "Pipe Connection Plan" for exact position and execution of the pipe connection.
- *3) Optional heating coil
- *4) The cylinder LO service tank with metering device provides the possibility to supervise the cylinder LO consumption of the engine. Alternatively, if the cylinder LO service tank is omitted so that the engine is fed directly from the cylinder LO storage tank, the height of the storage tank must match the minimum height specified for the service tank. If additional elements are installed in the supply line to the engine (e.g. a flowmeter) this height must be increased to compensate the pressure drop.
- *5) The bypass line with the pressure regulating valve can be omitted if one of the following conditions is fulfilled:
 - The pump speed is adjusted according to the required pressure at engine inlet, (e.g. by a frequency controller)
 - The pumps have built-in pressure regulating valves
 - The pump built-in safety valve is in any case mandatory and not to be used for pressure regulation (pure safety function).
- *6) Three-way valve has to be fitted as close as possible to the engine inlet. This is to reduce the volume of remaining oil in the system (with the previous BN) after the change-over.
- *7) Installed as required (check with the "Pipe Connection Plan")
- *8) The LO pumps (pos. 004) and the crosshead LO pumps (pos. 016) are to be interlocked so that the crosshead LO pumps never can run alone.
- *9) The pipe diameter varies depending on the installed TC type. Project-specific values are provided in the relevant pipe connection plan of DG8020. As rough guidance please observe the following values:
 - K1: Pipe diameter for engines equipped with ASB turbocharger
 - K2: Pipe diameter for engines equipped with M8 turbocharger
- *10) All capacities and the given pipe diameters are valid for the mentioned engine rating, including the oil amount for integrated TC lubrication, but excluding additional required oil for applied damper and/or PTO gear and/or all other externally installed ancillaries which are fed by system oil. To make the project-specific layout, under consideration of the actual required flow rates / capacities, the guideline as given within DG9730 - "Fluid velocities and flow rates, recommended values for pipework of diesel plants" has to be observed.
- *12) Mesh size according to pump suppliers recommendation.
- *13) If the back-flushing process is driven by compressed air and the back-flushing oil is returned to the LO drain tank the oil outlet must be above the max. oil level. Alternatively, a drain pipe with venting holes above the max. oil level needs to be installed to avoid back-flushing air blowing into the oil. Back-flushing oil must be treated.
- *14) The oil return pipe must not be connected to other drain pipes. If the oil is returned to the LO drain tank it is recommended to connect the oil outlet
 - as close as possible to the separator suction pipe
 - opposite to the main LO pump, i.e.
 - on tanks' forward end if the main LO pump is on tanks' aft end
 - on tanks' aft end if the main LO pump is on tanks' forward end
 - on tanks' forward or aft end if the main LO pump is in the middle of the tank.
- *15) The oil outlet in the LO drain tank must be above the max. oil level or as an alternative a drain pipe with venting holes above the max. oil level needs to be installed.
- *16) The proposed cylinder LO services tank capacity takes into account a filling interval of 2 days based on the above mentioned feed rate.
- *17) To be delivered by the engine manufacturer, i.e. already equipped on engine side.
- *18) To be connected to the control box (EC01) on engine side.


Proposal for dimensioning *11)						
LO drain tank	capacity	(m³)	For capacities refer to draw "LO drain tank-Filling Guide"			
Main LO pump	capacity	(m³/h)	refer to GTD			
Cyl. LO storage tank	capacity	(m³)	Based on a feed rate 1g/kWh			
Cyl. LO service tank *15)	capacity	(m³)	1.0	1.2	1.4	1.6
Crosshead LO pump	capacity	(m³/h)	refer to GTD			
Nominal pipe diameter	A	DN	250	250	250	250

B	DN	200	200	200	200
C	DN	100	125	125	100
D	DN	80	100	100	100
E	DN	200	200	200	200
F	DN	20	20	20	20
G	The pipe diameters for the 10 separator are according to the effective throughput capacity				
H	The separator and according to the separator manufacturer's recommendations.				
K1	DN	65	65	80	80
K2	DN	80	80	80	80
L	DN	80	80	80	80
M	DN	-			
N	DN	80	80	80	80
O	DN	-			
P	DN	80	80	80	80

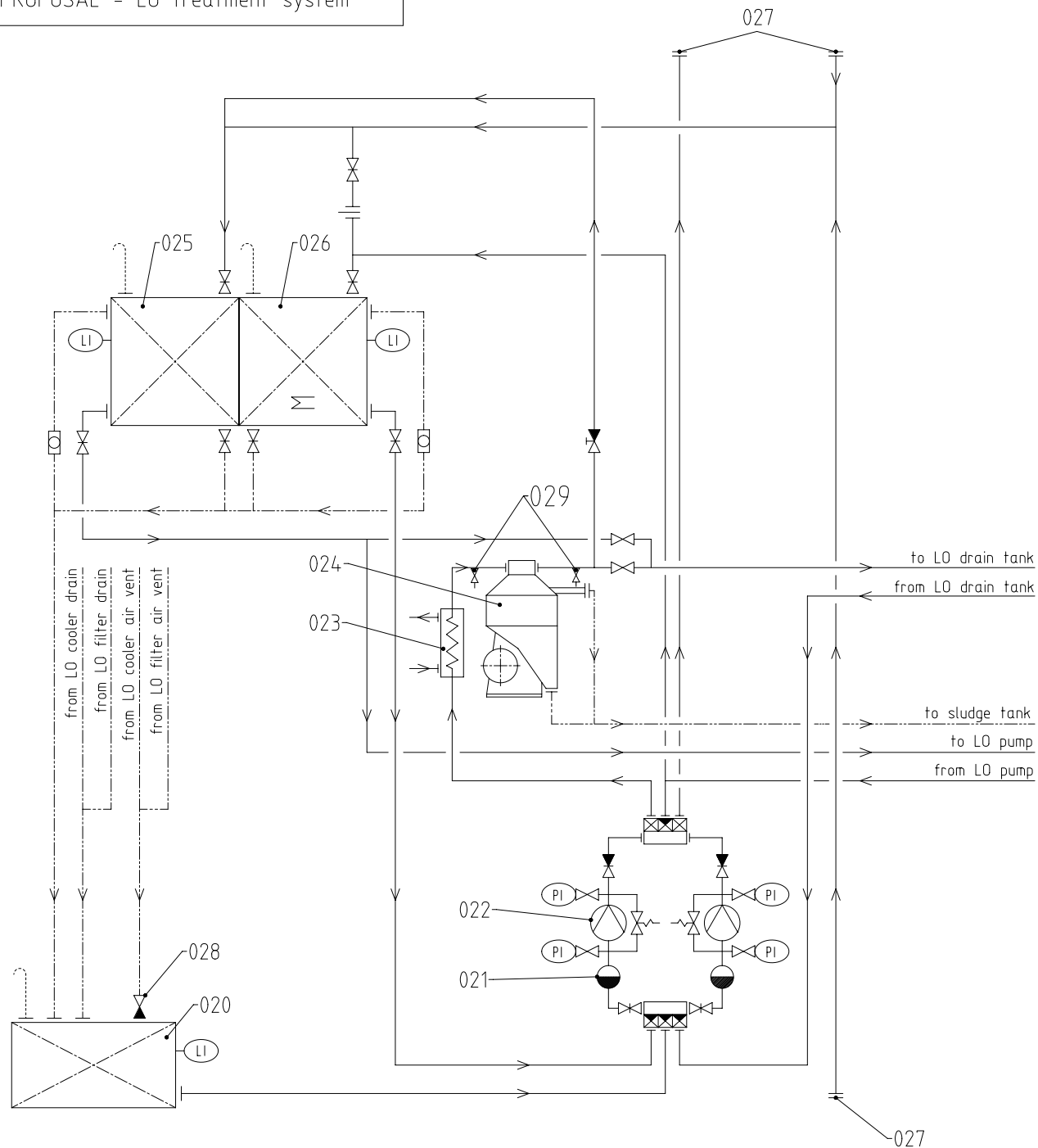
Table 1: LO content on engine side

Cylinder	Volume
5	2350 l
6	2650 l
7	2950 l
8	3300 l

Remarks:	
of	- Air vent pipes and drain valves where necessary.
6	- Air vent and drain pipes must be fully functional at all inclination angles of the ship at which the engine must be operational.
50	*1) To be delivered by external supplier and to be installed by the shipyard.
50	*2) Refer to "Pipe Connection Plan" for exact position and execution of the pipe connection
50	*3) Optional heating coil.
25	The cylinder LO service tank with metering device provides the possibility to supervise the cylinder LO consumption of the engine. Alternatively, if the cylinder LO service tank is omitted so that the engine is fed directly from the cylinder LO storage tank, the height of the storage tank must match the minimum height specified for the service tank. If additional elements are installed in the supply line to the engine (e.g. a flowmeter) this height must be increased to compensate the pressure drop.
00	*5) The bypass line with the pressure regulating valve can be omitted if one of the following conditions is fulfilled:
00	- The pump speed is adjusted according to the required pressure at engine inlet, (e.g. by a frequency controller)
00	- The pumps have built-in pressure regulating valves
00	- The pump built-in safety valve is in any case mandatory and not to be used for pressure regulation (pure safety function).
00	*6) Three-way valve has to be fitted as close as possible to the engine inlet. This is to reduce the volume of remaining oil in the system (with the previous BNI after the change-over).
40	*7) Installed as required (check with the "Pipe Connection Plan")
40	*8) The LO pumps (pos. 004) and the crosshead LO pumps (pos. 006) are to be interlocked so that the crosshead LO pumps never run on alone.
40	*9) The pipe diameter varies depending on the installed IT type. Project-specific values are provided in the relevant pipe connection plan of D68020. As rough guideline please observe the following values: K1: Pipe diameter for engines equipped with AMB turbocharger K2: Pipe diameter for engines equipped with HSB turbocharger
40	*10) All capacities and the given pipe diameters are valid for the mentioned engine rating, including the oil cooler. For higher engine ratings, but excluding additional required oil for applied diameter and/or PTO gear and/or all other externally installed ancillaries which are fed by system oil. To make the project specific layout, under consideration of the actual required flow rates! Capacities, the guideline as given under D67930 - "Fluid velocities and flow rates, recommended values for pipework of diesel plants" has to be observed.
40	*11) Mesh size according to pump suppliers recommendation.
40	*13) If the back-flushing process is driven by compressed air and the back-flushing oil is returned to the LO drain tank the oil outlet must be above the max. oil level. Alternatively, a drain pipe with venting holes above the max. oil level needs to be installed, to avoid back-flushing air blowing into the oil. Back-flushing oil must be treated.
40	*14) The oil return pipe must not be connected to other drain pipes. If the oil is returned to the LO drain tank it is recommended to connect the oil outlet - as close as possible to the separator suction pipe - opposite to the main LO pump, i.e. - on tanks' forward end if the main LO pump is on tanks' aft end - on tanks' aft end if the main LO pump is on tanks' forward end - on tanks' forward or aft end if the main LO pump is in the middle of the tank.
40	*15) The oil outlet to the LO drain tank must be above the max. oil level and/or as an alternative a drain pipe with venting holes above the max. oil level needs to be installed.
40	*16) The proposed cylinder LO services tank capacity takes into account a filling interval of 2 days based on the above mentioned feed rate.
40	*17) To be delivered by the engine manufacturer, i.e. already equipped on engine side.
40	*18) To be connected to the control bus (EC01) on engine side.

- | | |
|--|------------------------------|
| —— Bearing LO pipes | —— Transfer/dirty LO pipes |
| - - - - Cylinder LO pipes | - - - - Overflow/drain pipes |
|  Cylinder LO pipes trace heated and insulated | Air vent pipes |
| ==== Pipes on engine | - - - Crosshead LO pipes |
| | ○ Pipe connections |

SYSTEM PROPOSAL - LO treatment system



Pos.	SYSTEM COMPONENTS *1)
020	Residue oil tank
021	Suction strainer *12)
022	Lubricating oil pump one for transfer and separator service one for separator service
023	Lubricating oil heater with relief valve and temperature control
024	Self-cleaning centrifugal separator
025	Clean lubricating oil tank
026	Dirty lubricating oil tank
027	Deck connection
028	Float non-return valve
029	LO sampling cock *20)

X62-S2.0		Number of cylinders			
		5	6	7	8
Clean LO tank	capacity (m³)	equal or bigger than LO drain tank volume			
Dirty LO tank	capacity (m³)	equal or bigger than LO drain tank volume			
LO separator	capacity (l/h)	1500	1800	2110	2410
Residue oil tank	capacity (m³)	Depending on ship's requirements			

Remarks:

- Air vents and drain valves where necessary.
- Air vent and drain pipes must be fully functional at all inclination angles of the ship at which the engine must be operational (check Class rules).
- Pipe diameters to be designed according to shipyards' practice and component suppliers' recommendations.

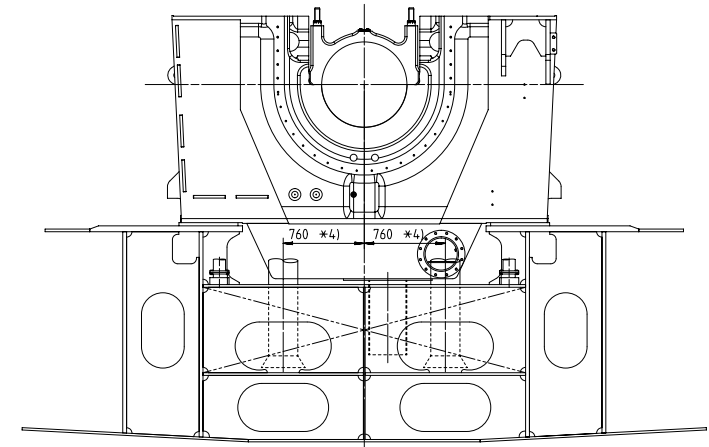
*1) To be delivered by external supplier and to be installed by the shipyard.

*12) Mesh size according to pump suppliers recommendation.

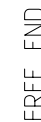
*20) Recommended position for LO sampling to check LO quality / treatment efficiency.



— Main separating piping
— Transfer/dirty LO pipes
- - - Overflow/drain pipes
..... Air vent pipes

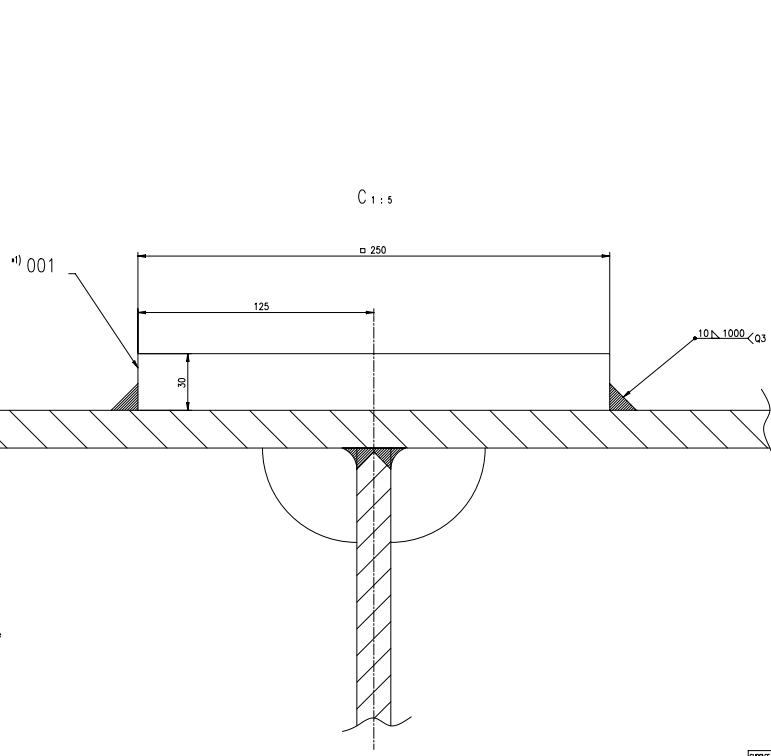
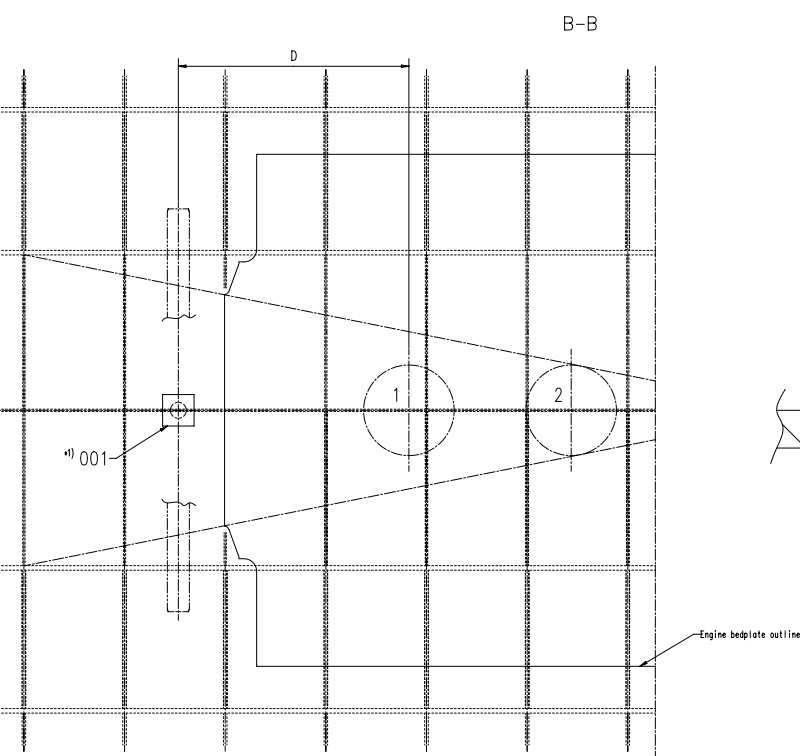
6X62-S2.0
6X62DF-S1.0



- *1) Drains must be arranged by the shipyard in accordance with the ship hull structure and within the specified tolerance range. As soon as the final positions are determined the engine manufacturer must be informed so that the bedplate (oil pan) holes can be machined in compliance with the engine builder drawing "BEDPLATE OIL DRAIN" (DG1110).
- *2) Recommendation regarding plate thickness is given in the Marine Installation Drawing Set (MIDS) "ENGINE / SEATING FOUNDATION" (foundation arrangement drawing, DG9710).
- *3) Recommendation regarding the pipe size is given in the system proposal as provided in the MIDS "LUBRICATING OIL SYSTEM" (LO system drawing, DG9722).
- *4) Final position depends on the size of the flywheel casing and required space for the main LO pump.
- *5) Final height must be in accordance with the rules of the relevant classification society.
- *6) Proposal, final tank dimensions are to be determined by the shipyard in accordance with the ship hull structure, minimum required filling / circulation volume, pump suction requirements and rules of the relevant classification society. Requirements / design criteria for the tank layout are provided in the MIDS "LUBRICATING OIL DRAIN TANK - Filling Guidelines" (DG9722).
- *7) Distance according to pump makers specification.
- *8) The drain pipe outlet must be below the min. LO level (LO low level alarm height) though a gap of min. half of the drain pipe diameter (min. $1/2 \times DN$) to the drain tank bottom has to be maintained.



2	002	PAAD373387	VERTICAL OIL DRAIN		DAAD139409		77	
1	001	107246.799.200	PLATE		107246.799		15.0	
QTY	SEQ NO	Material ID	Material Name	Dimension, Oz	Standard or Drawing	Basic Material Material Standard	Weight GR/NET	Part Name
Flow rate for 100' of pipe						G-Code XXXXXX		
						Standard ISO; JIS		
Hour	Number	Draw date	Number	Draw date	Number	Draw date	Number	Draw date
			Product 6X6Z-S2.0 6X6ZDF-S1.0		LUBRICATING OIL DRAIN TANK FOR STANDARD ENGINE SEATING			
Units	mm kg	NX		Basic Material	Size	A1	Page	Net Weight 160
Model	22.01.2021	dk1021	DK.Him	Scale	1:25			PAAD366474
Appd	25.02.2021	jpi101	Pickup	Design Group				
Chkd	26.02.2021	mhu019	Hug	9722	Drawing ID	DAAD135853		Rev. -



ENGINE TYPE	D	E
RT-fl ex50-D/DF	1387	165
X82-B	2395	460
X35-B	1015	124
X40-B	1170	172
X52/X52DF/X52DF-1,0/X52DF-2,1	1630	325
X62-B/X62DF/X62DF-1,1/X62DF-2,1	1888	343
X72-B/X72DF/X72DF-1,1&1,2/X72DF-2,1&2,2	2131	370
X82-2,0/X82DF-1,0	2395	460
X92-B-/X92DF	2677	334

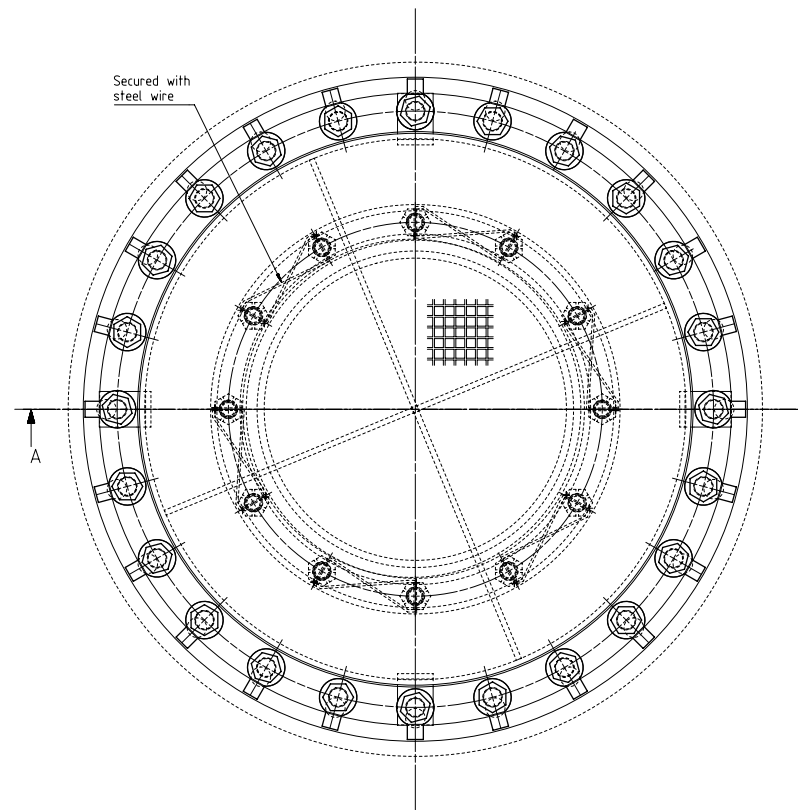
REMARKS:



*1) Access to the plate has to be kept clear for the hydraulic jack, to lift up the flywheel during removal of lower main bearing shell.

10	1	001	107246.799.001	FLAT BAR	107246.799		15
Serial#	ISO No.	Material ID	Material Name	Orientation, Co./Drawing	Standard or Specification	Basic Material	Weight (kg)
						Material Standard	Net Weight
						Scale	ISO
						Standard	ISO, JS
107246.799.000	F	EAC000001	09.09.2015	EAC000010	20.03.2016	EAC000001	09.09.2015
	Material	Drawn	Checked	Material	Drawn date	Material	Drawn date
			Sheet: 1 of 25				
	 WIND Windenergie & More						
	PLATE TO HYDRAULIC JACK Blech						
Units	net kg	KX		Basic Material	Size	Shape	Material
	107246.799	5.51		Class: 5.8	1/1	6	
				Design			
107246.799.001	09.11.2009	WCH001	Service User	107246.799			
	Drawn	Checked	Material	Drawn date	Material	Drawn date	

*4) No specific quality level required.
Oil tight is fundamental.

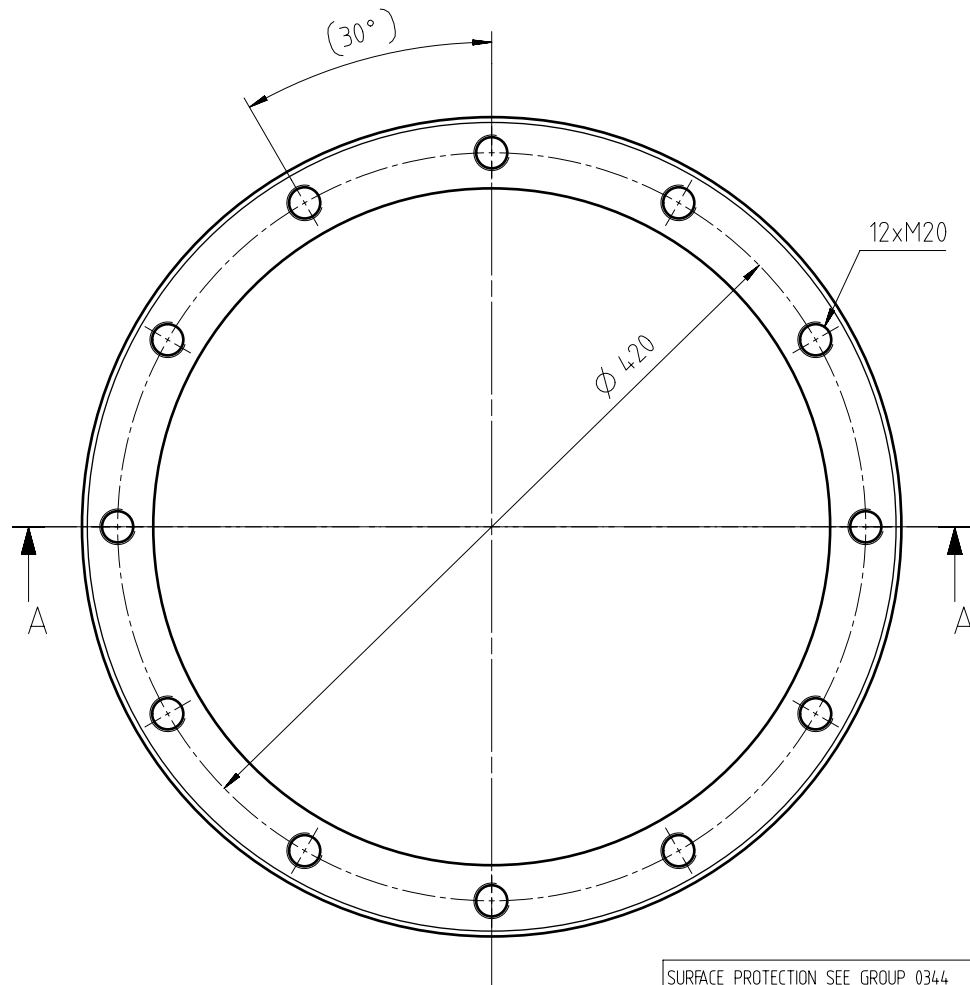
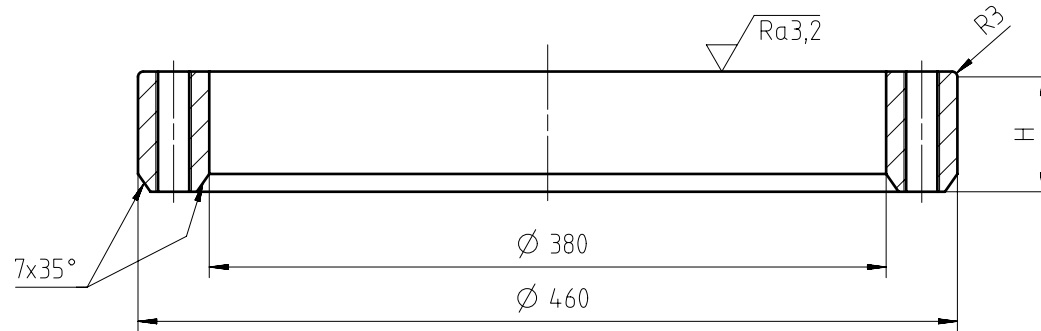
A	To be measured after alignment of the engine
H	A - 45 mm



24	008	015.007.360.910	TAB WASHER	21	DIN 93	Steel Zn 5 bk	0,1
24	007	015.15.044.261	HEXAGON HEAD SCREW M20x4.0		ISO 4017	8.8	0,155
12	006	015.15.1374.201	HEXAGON HEAD SCREW M20x3.0			8.8	0,12
2	005	PAAD104.199	RUBBER GASKET		DAAD032827	NBR Perbunan	1,5
1	004	PAAD373520	OIL STRAINER		DAAD1394.97		10,2
1	003	PAAD104.189	COVER		DAAD032819		24,9
1	002	PAAD104.051	RING		DAAD032783	W-FU-235-JR	2,4
1	001	PAAD104.868	WELDING FLANGE		DAAD032919	W-FU-235-JR	29,0
Qty	Std No	Material ID	Material Name	Dimension, Gcc	Standard or Drawing	Basic Material Material Standard	Weight Grain Std
Free space for file						Q-Code XXXXXX Standard ISO, JIS	
Model							
	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number
 WING Winther-Per & Glend			Product W-25		VERTICAL OIL DRAIN Oelablauf vertikal		
Units	mm kg	NX		Basic Material			Net Weight 77.1
Made	22.02.2021 dki021 DH.Kim		Scale	1:3	Size	A1	Page 1/1
Chsd	25.02.2021 jai101 Pickup		Design Group			Material ID	PAAD733387
Appld	26.02.2021 mhu019 HUG		9722	Drawing ID	DAAD139409		Rev. -

(B)

SECTION A-A



$\sqrt{Ra12,5}$ (✓) SHARP EDGES REMOVED

H depends on chock thickness

H = A - 45 mm

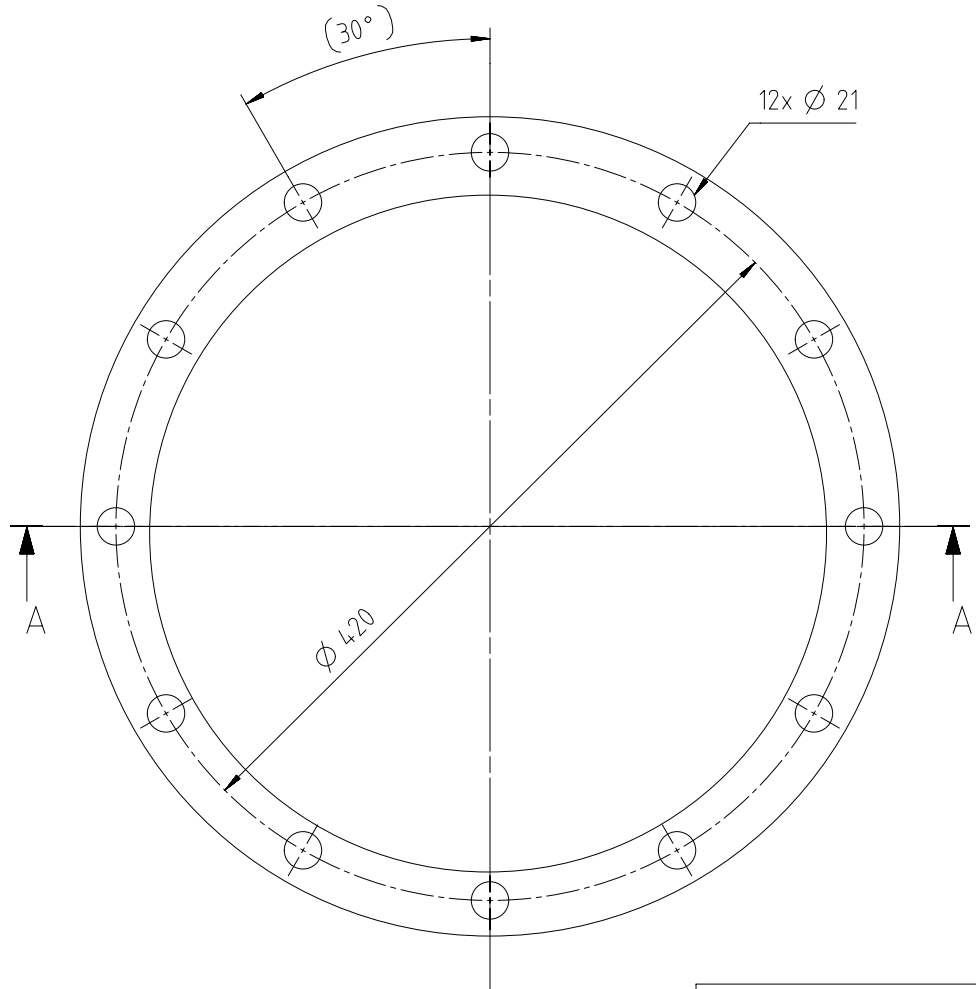
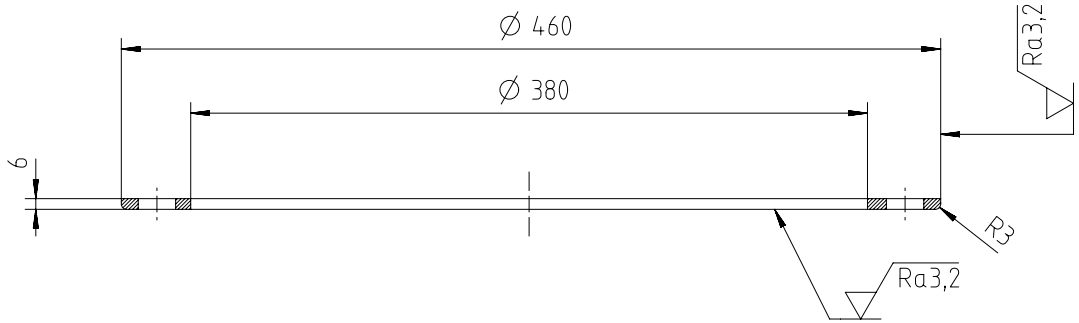
for the relation of A see Drawing DAAD033160

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	Number	Drawn date		Number	Drawn date		Number	Drawn date		Number	Drawn date	
WIN GD Winterthur Gas & Diesel		Product W-2S		WELDING FLANGE Anschweisssflansch								
Units	mm kg	NX				Basic Material		W-FU-235-JR		Net Weight 29		
SURFACE PROTECTION SEE GROUP 0344		Made	05.11.2012 asex06 A.Sekulic		Scale 1:3		Size	A3	Page	1/1	Material ID	PAAD104868
TOLERANCING PRINCIPLE ISO8015		Chkd	03.12.2012 mhu019 Hug		Design Group		9720		Drawing ID		DAAD032919	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	03.12.2012 wwr001 Wroblewski						Rev.		B	

UID - DIMENSIONAL DRAWING - Confidential

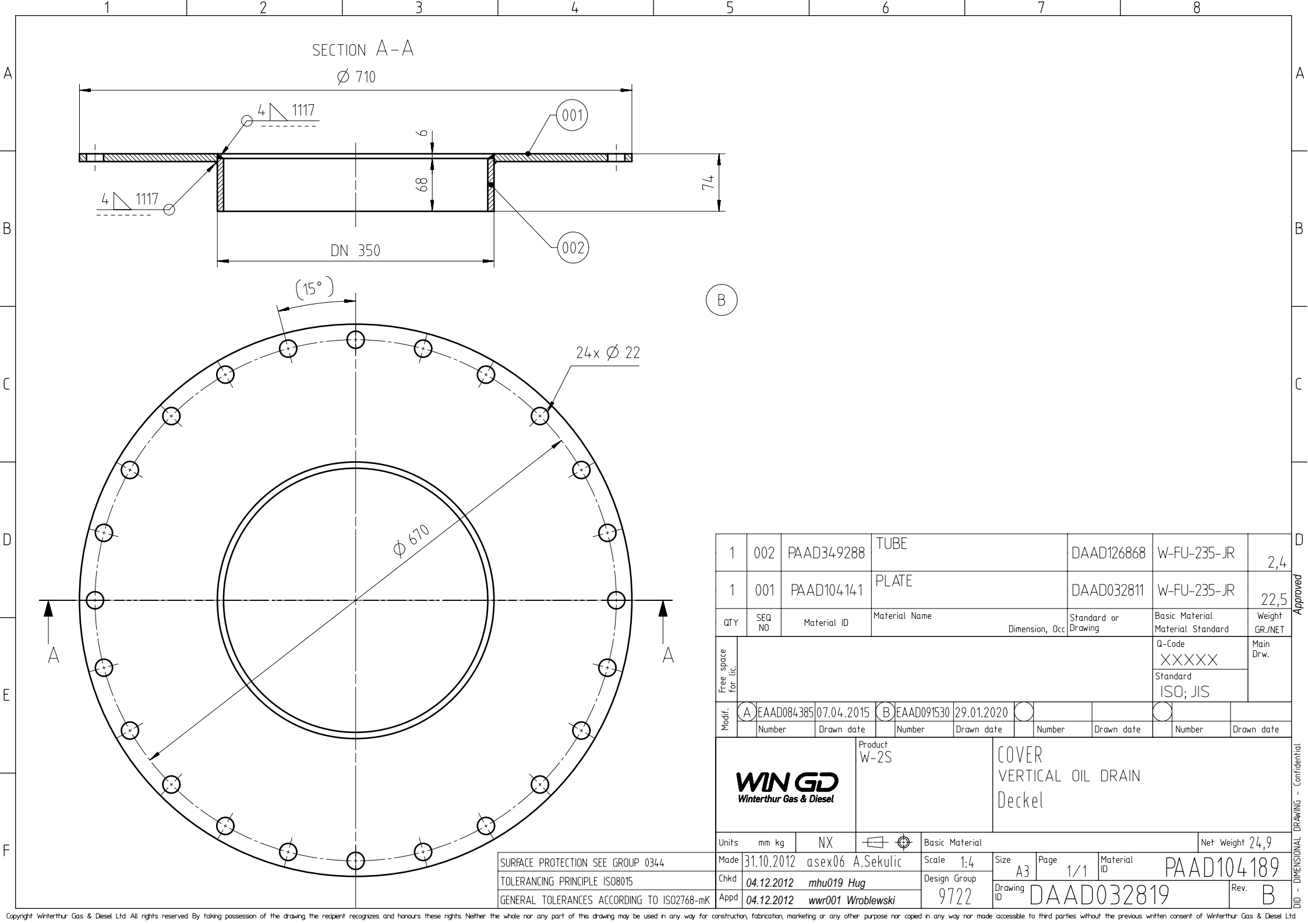
(B)

SECTION A-A



✓ Ra 12,5 (✓) SHARP EDGES REMOVED

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	Number	Drawn date		Number	Drawn date		Number	Drawn date	
WIN GD Winterthur Gas & Diesel		Product W-2S		RING					
				Ring					
Units	mm kg	NX		Basic Material	W-FU-235-JR				Net Weight 2,4
SURFACE PROTECTION SEE GROUP 0344		Made	30.10.2012	asex06	A.Sekulic	Scale	1:3	Size	A3
TOLERANCING PRINCIPLE ISO8015		Chkd	03.12.2012	mhu019	Hug	Design Group	1/1		Material ID
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	03.12.2012	wwr001	Wroblewski	9722	Drawing ID	DAAD032783	
								Rev.	B



(B)

SECTION A-A

Ø 710

DN 350



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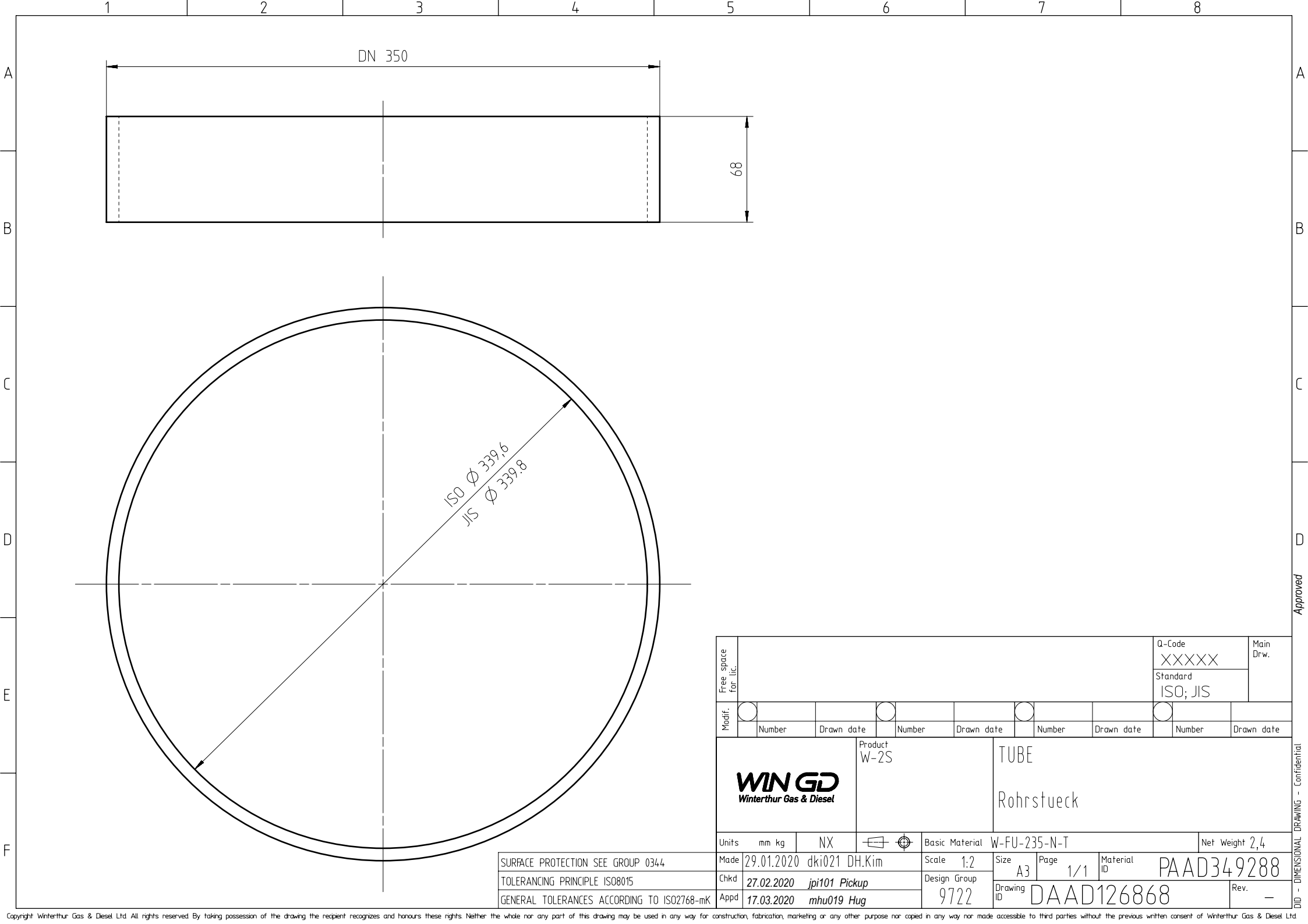
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
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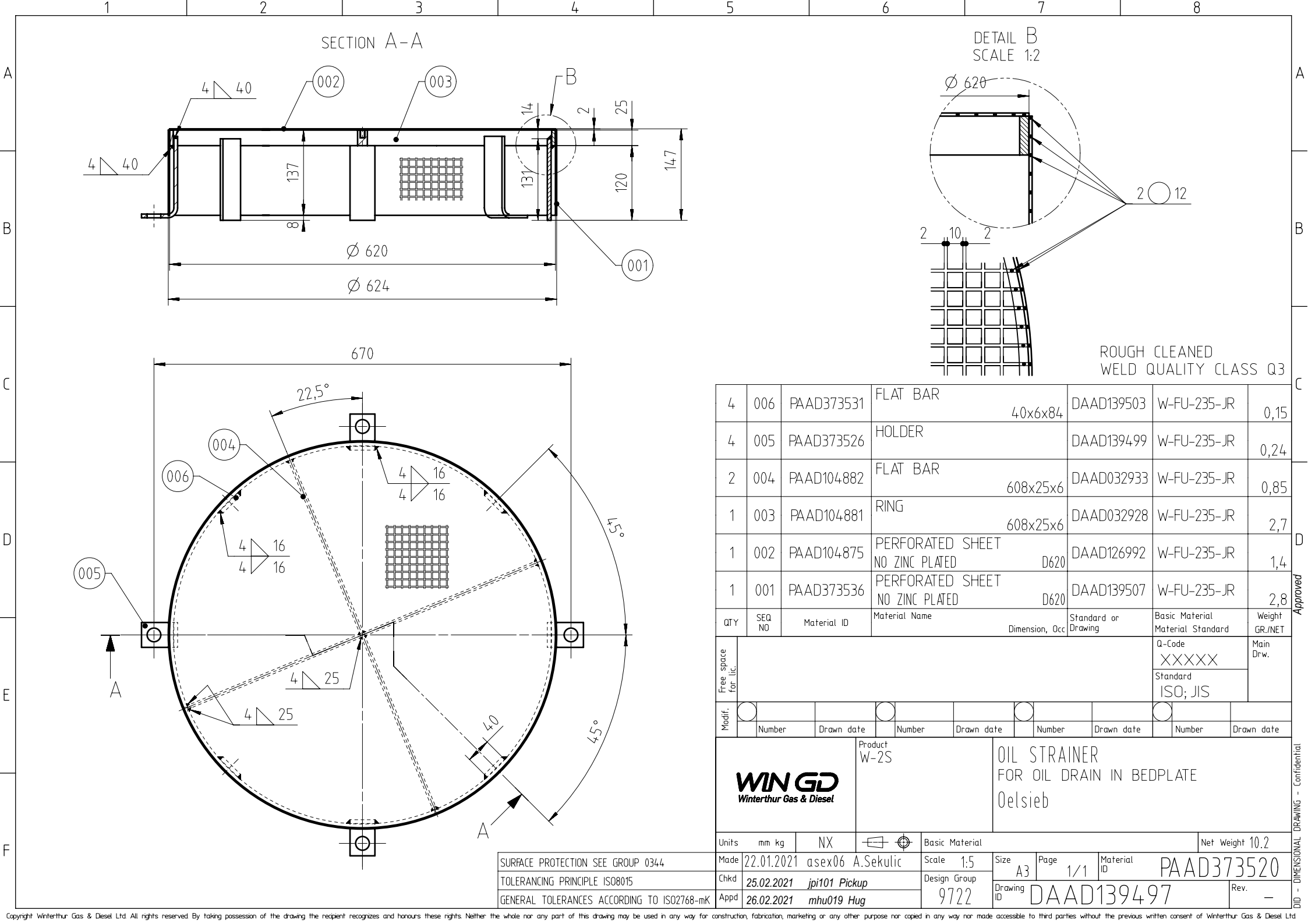
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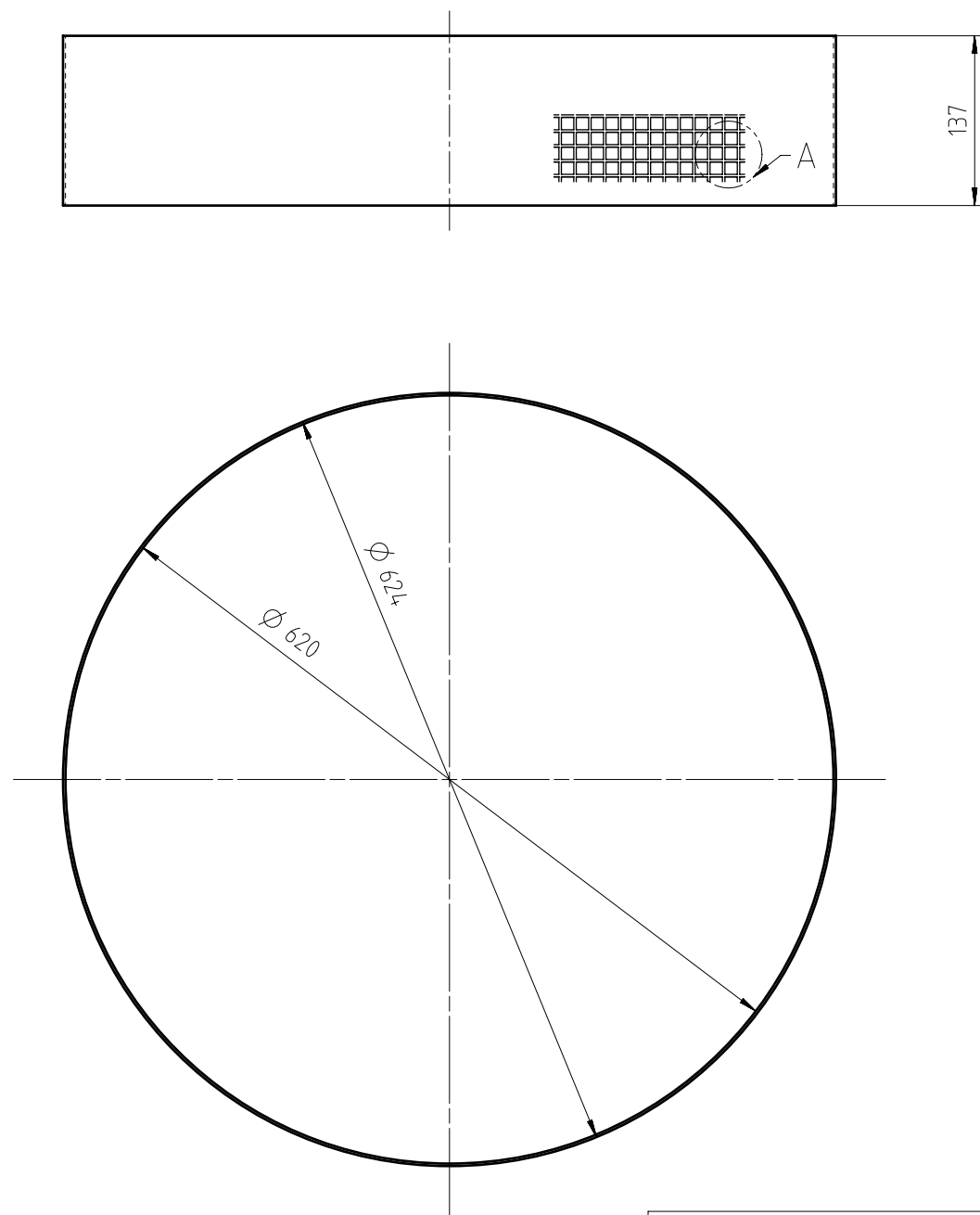
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		Number	Drawn date		Number	Drawn date		Number	Drawn date					
		Product W-2S		PLATE Blech										
Units	mm kg	NX				Basic Material		W-FU-235-JR		Net Weight	22,5			
SURFACE PROTECTION SEE GROUP 0344		Made	31.10.2012 asex06 A.Sekulic		Scale		1:4		Size	A3	Page	1/1	Material ID	PAAD104141
TOLERANCING PRINCIPLE ISO8015		Chkd	03.12.2012 mhu019 Hug		Design Group		9720		Drawing ID	DAAD032811			Rev.	B
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	03.12.2012 wwr001 Wroblewski											

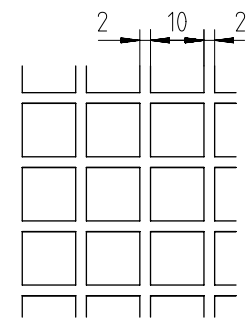


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								XXXXXX	
								Standard	
							ISO; JIS		
Modif.	○			○			○		
	Number	Drawn date		Number	Drawn date		Number	Drawn date	
WIN GD <i>Winterthur Gas & Diesel</i>			Product W-2S		TUBE Rohrstueck				
Units	mm kg	NX			Basic Material	W-FU-235-N-T			Net Weight 2,4
Made	29.01.2020 dki021 DH.Kim				Scale 1:2	Size A3	Page 1/1	Material ID	PAAD349288
Chkd	27.02.2020 jpi101 Pickup				Design Group 9722	Drawing ID	DAAD126868		
Appd	17.03.2020 mhu019 Hug								
						Rev.			-

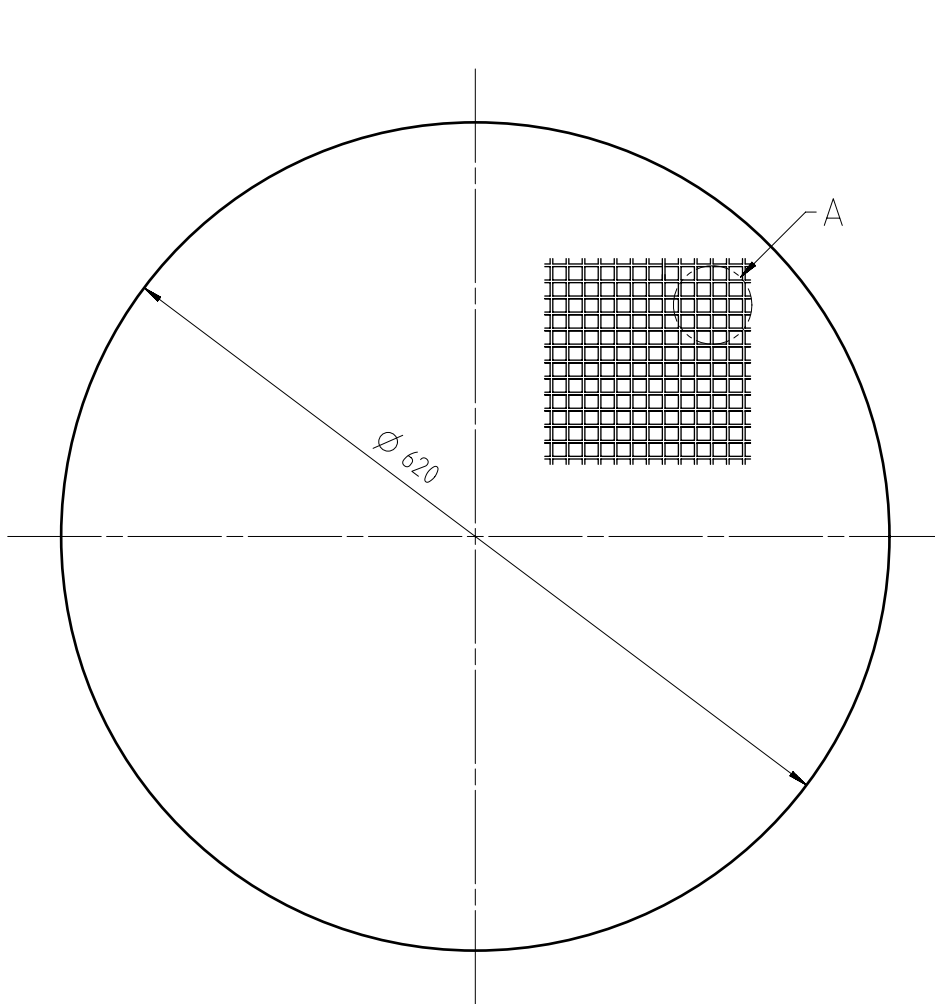




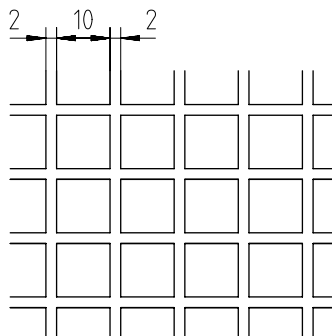
DETAIL A
SCALE 1:1





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	Number	Drawn date		Number	Drawn date		Number	Drawn date	
WIN GD Winterthur Gas & Diesel		Product W-2S		PERFORATED SHEET Lochblech					
Units	mm kg	NX			Basic Material		W-FU-235-JR		Net Weight 2.8
SURFACE PROTECTION SEE GROUP 0344		Made 22.01.2021 dki021 DH.Kim		Scale 1:4		Size A3	Page 1/1	Material ID PAAD373536	
TOLERANCING PRINCIPLE ISO8015		Chkd 25.02.2021 jpi101 Pickup		Design Group 9722		Drawing ID DAAD139507		Rev. -	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd 26.02.2021 mhu019 Hug							

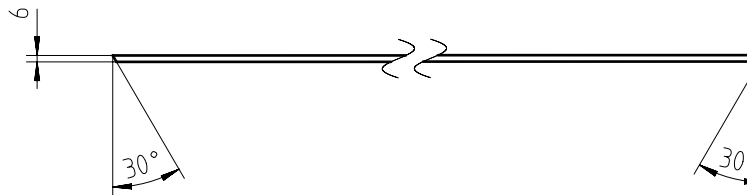
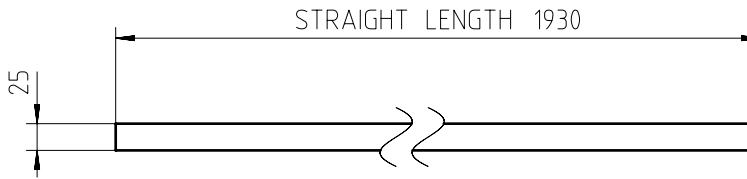
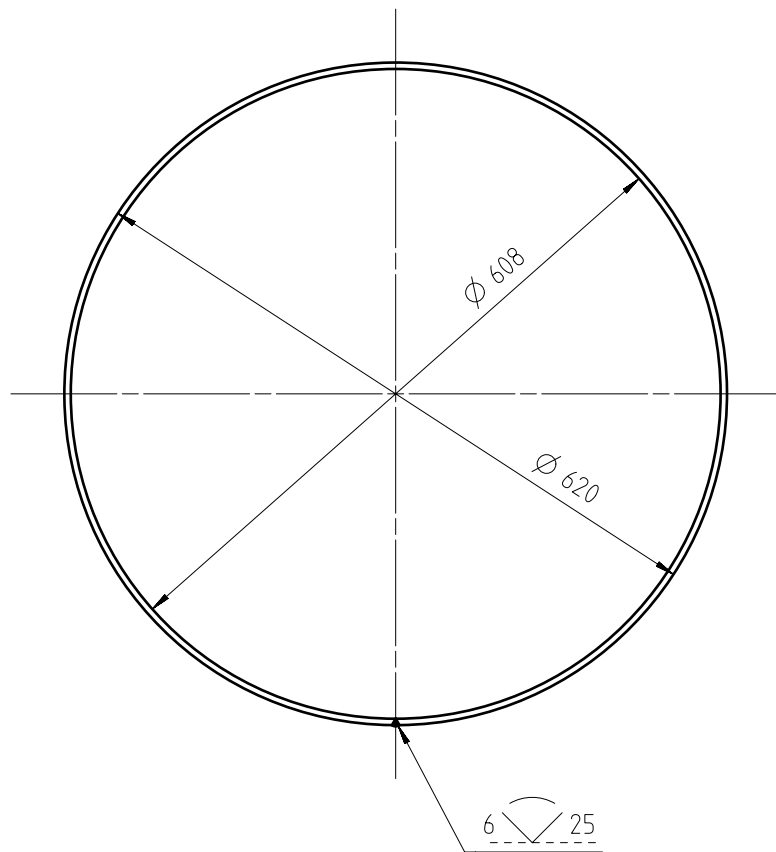


DETAIL A
SCALE 1:1

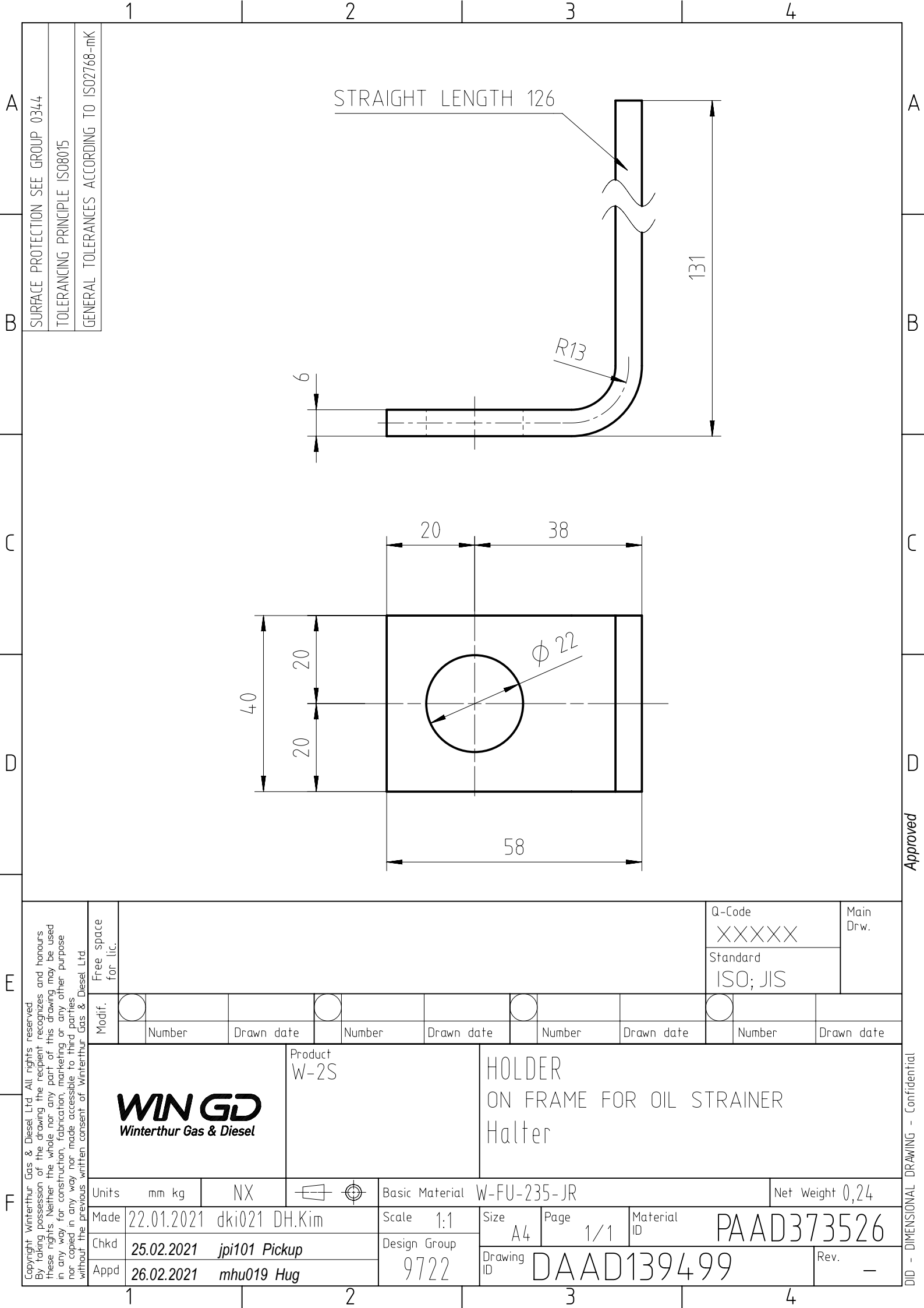


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	Number	Drawn date		Number	Drawn date		Number	Drawn date	
		Product W-2S		PERFORATED SHEET Lochblech					
Units	mm kg	NX			Basic Material	W-FU-235-JR			Net Weight 1,4
SURFACE PROTECTION SEE GROUP 0344		Made	03.02.2020 dki021 DH.Kim		Scale 1:4	Size A3	Page 1/1	Material ID	PAAD104875
TOLERANCING PRINCIPLE ISO8015		Chkd	27.02.2020 jpi101 Pickup		Design Group	9722			Rev. -
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	17.03.2020 mhu019 Hug		Drawing ID	DAAD126992			

(B)



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								Standard ISO; JIS						
Modif.	(A)	EAAD084385	07.04.2015	(B)	EAAD091530	30.01.2020								
		Number	Drawn date		Number	Drawn date		Number	Drawn date					
WIN GD Winterthur Gas & Diesel		Product W-2S		RING Ring										
Units	mm kg	NX				Basic Material		W-FU-235-JR		Net Weight	2,7			
SURFACE PROTECTION SEE GROUP 0344		Made	06.11.2012 asex06 A.Sekulic		Scale		1:5		Size	A3	Page	1/1	Material ID	PAAD104881
TOLERANCING PRINCIPLE ISO8015		Chkd	03.12.2012 mhu019 Hug		Design Group		9722		Drawing ID	DAAD032928			Rev.	B
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	03.12.2012 wwr001 Wroblewski											

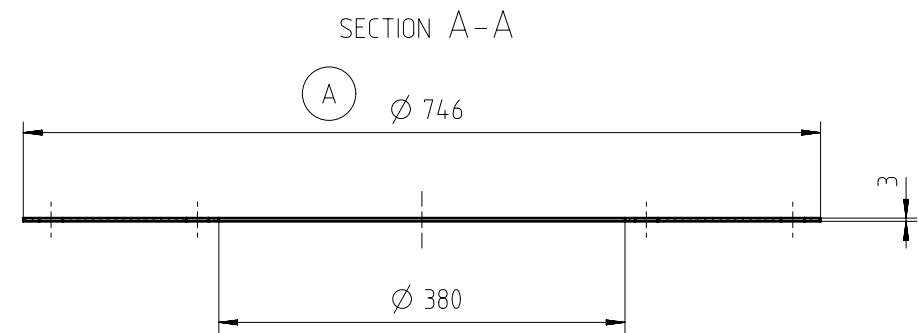
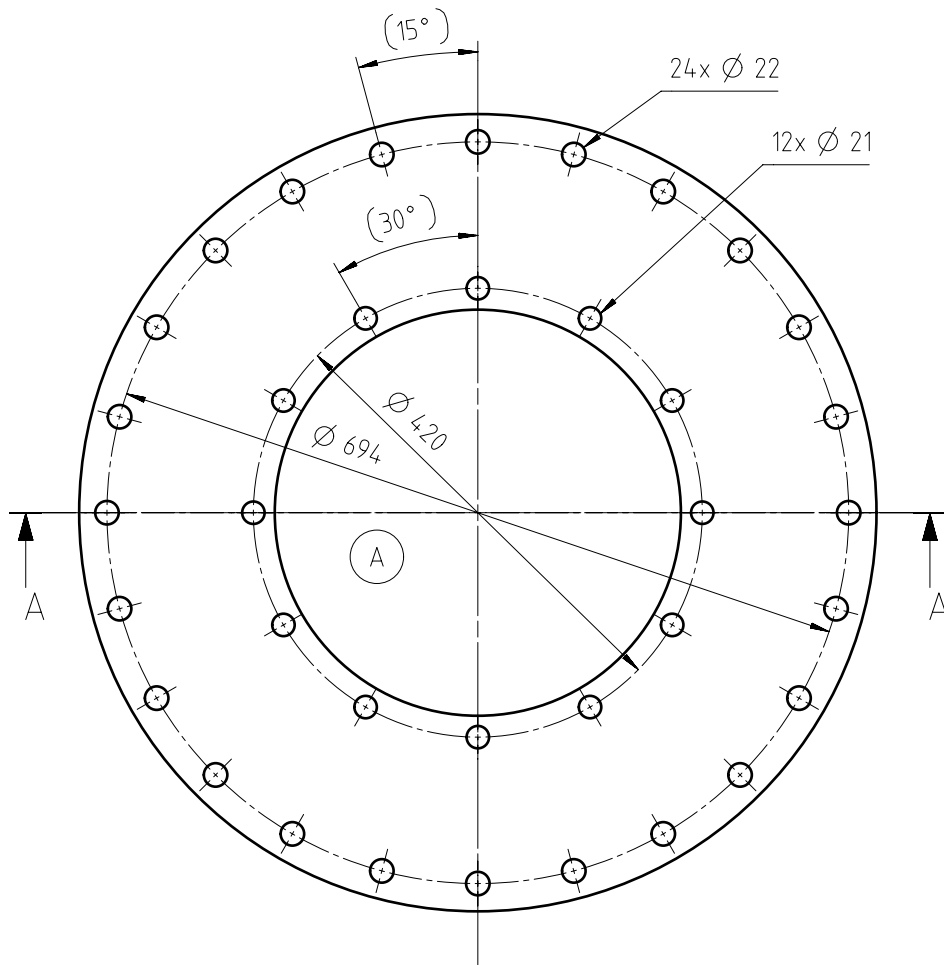


	1	2	3	4
A	SURFACE PROTECTION SEE GROUP 03/44			
B	TOLERANCING PRINCIPLE ISO8015			
	GENERAL TOLERANCES ACCORDING TO ISO2768-mK			
	<div><div>131</div><div>40</div><div>6</div></div>			
C				
D				
E	<div><div><div>Free space for lic.</div><div>Q-Code XXXXXX</div><div>Standard ISO; JIS</div><div>Main Drw.</div></div><div><div>Modif.</div><div><div><div><div></div><div>Number</div></div><div><div></div><div>Drawn date</div></div><div><div></div><div>Number</div></div><div><div></div><div>Drawn date</div></div><div><div></div><div>Number</div></div><div><div></div><div>Drawn date</div></div><div><div></div><div>Number</div></div><div><div></div><div>Drawn date</div></div></div></div></div></div>			
F	<div><div><div><div><div>WIN GD</div><div>Winterthur Gas & Diesel</div></div><div><div>Product</div><div>W-2S</div></div><div><div>FLAT BAR</div><div>Flachstahl</div></div></div><div><div>Unitsmm kgNX</div><div><div>Basic MaterialW-FU-235-JR</div><div>Net Weight0,15</div></div></div><div><div>Made22.01.2021 dki021 DH.Kim</div><div>Scale1:1</div><div>SizeA4</div><div>Page1/1</div><div>Material IDPAAD373531</div></div><div><div>Chkd25.02.2021 jpi101 Pickup</div><div>Design Group9722</div><div>Drawing IDDAAD139503</div><div>Rev.—</div></div><div><div>Appd26.02.2021 mhu019 Hug</div></div></div></div>			
	1	2	3	4

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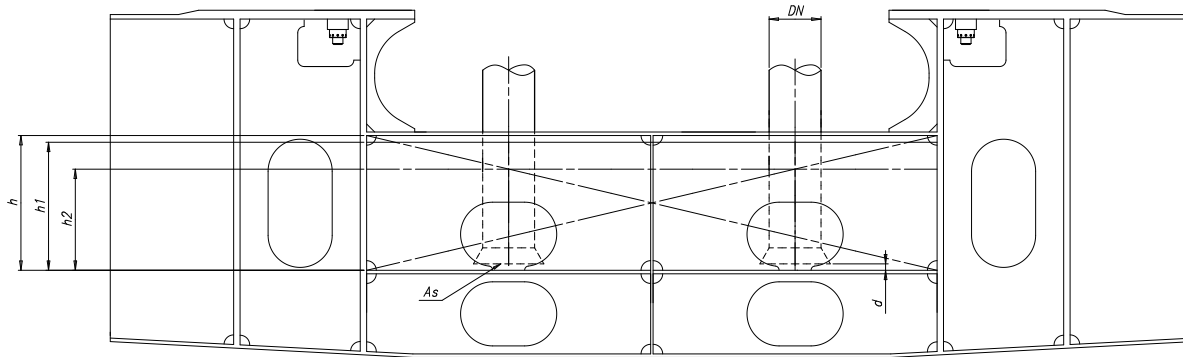
Approved



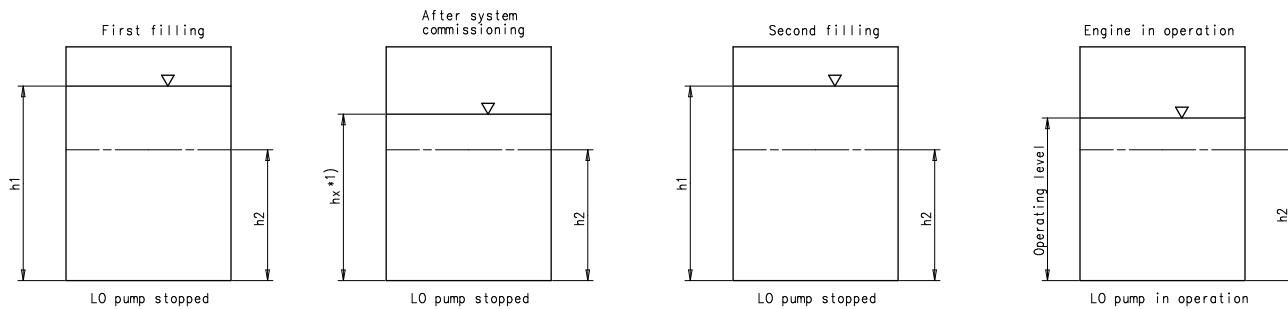
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Modif.	A	EAAD091530	30.01.2020											
	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date						
 Winterthur Gas & Diesel				Product W-2S		RUBBER GASKET Gummidichtung								
Units	mm kg	NX		 Basic Material		NBR Perbunan			Net Weight 1,5					
SURFACE PROTECTION SEE GROUP 0344				Made	31.10.2012 asex06 A.Sekulic		Scale	1:5	Size	A3	Page	1/1	Material ID	PAAD104199
TOLERANCING PRINCIPLE ISO8015				Chkd	03.12.2012 mhu019 Hug		Design Group	9722		Drawing ID	DAAD032827		Rev.	A
GENERAL TOLERANCES ACCORDING TO ISO2768-mK				Appd	03.12.2012 wwr001 Wroblewski									

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W-X62/62DF



LO DRAIN TANK - FILLING PROCESS



Specifications that need to be met:

Dimensioning guidelines and capacities for tank design

No. of cylinders		4	5	6	7	8
h	Recommended total tank height (mm)	according to installation requirements				
	Recommended total tank volume: 105% *4) (m ³)	12	14	15	17	18
h1	Recommended filling level (mm)	according to installation requirements				
	Recommended volume: 100% *4) (m ³)	12	13	14	16	18
h2	Low-level alarm (mm)	*2)				
	Volume (m ³)					
Vr	Min. retention volume *5) (m ³)	8	8	9	10	11
d	Distance between suction pipe and bottom of tank (mm)	*3)				
As	Suction area					
		min. 1.5 x suction pipe area (DN)				

REMARKS:

- *1) Level after filling of external system. Volume and level in the LO drain tank depend on capacity of pipes, coolers, filters, etc. The oil volume in tank contains a part of the oil quantity, which drains back when the pumps are stopped.
- *2) The low-level alarm (h2) has to be positioned in such a way that a proper pump suction is ensured under the conditions defined by the classification societies.

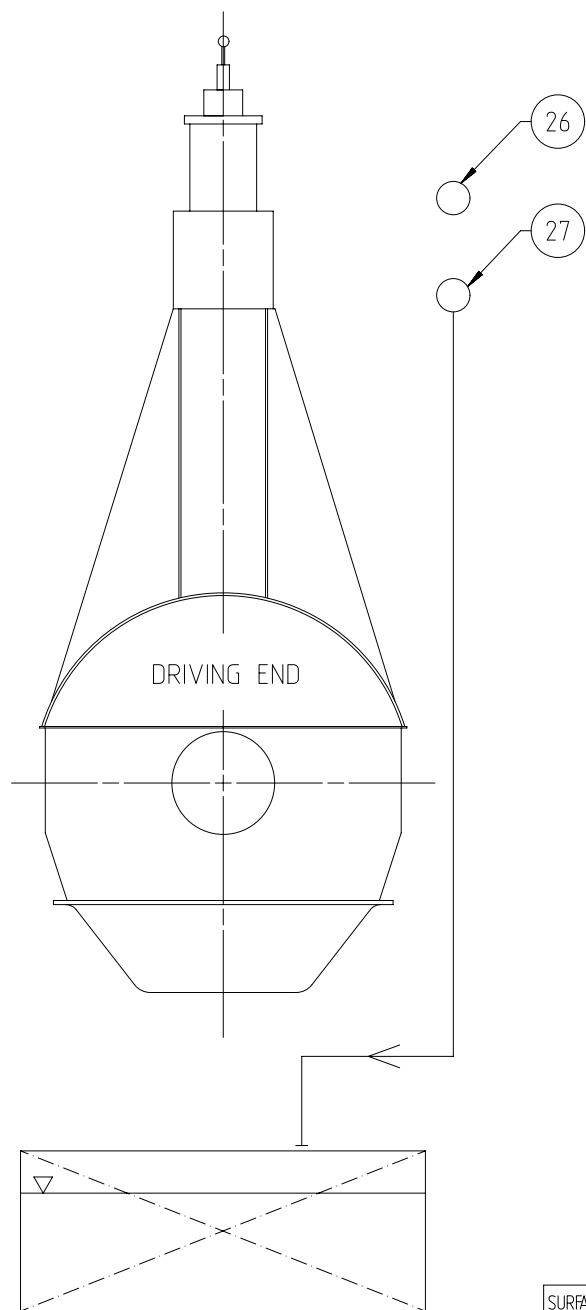
Minimum inclination angles comply with the rules of classification societies:

Heel to each side	15°
Rolling to each side	±22.5
Trim	500/L, max. 5°
	L: ship length in meter
	Example L = 250 m
	Trim = 500/250 = 2°
Pitching	± 7.5°

Additionally this level has to be above or equal to the minimum retention volume (Vr) for M/E operation.

- *3) Distance (d) between suction pipe inlet of main LO pumps and LO drain tank bottom has to be in accordance with the requirements of pump manufacturer. As guideline the following formula can be applied: $d = DN/4 + 40$, $d = \text{min. } 80 \text{ mm}$.
- *4) The stated tank volume represent the min. requirement. Final tank dimensions have to be aligned in regard to dimensional restrictions by ship and engine structure and the pump suction requirement.
- *5) To be maintained during engine operation (LO pump suction without LO drain back-flow (emergency case) is ensured for at least 3 minutes).



Free space for I.C.		Q-Code XXXXX		Min. Drw.	
Standard ISO JIS					
Mod.1	EAAD086020	15.07.2015	Mod.2	EAAD086282	16.11.2015
Mod.3	EAAD086531	31.03.2016			
Number	Drawn date	Number	Drawn date	Number	Drawn date
Product W-62		LUBRICATING OIL DRAIN TANK FILLING GUIDELINE			
Units mm kg IDE		Basic Material		Net Weight 0,001	
Mode 24.09.2012 mhu019 M.Hug		Scale 1:25		Page 1/1	
Chkd 30.11.2012 ste006 Feuerstein		Design Group		Material ID PAAD100971	
Appd 30.11.2012 wwr001 Wroblewski		Drawing ID 9722		Rev. C	
SURFACE PROTECTION SEE GROUP 0344		TOLERANCING PRINCIPLE ISO8015		GENERAL TOLERANCES ACCORDING TO ISO2768-mK	
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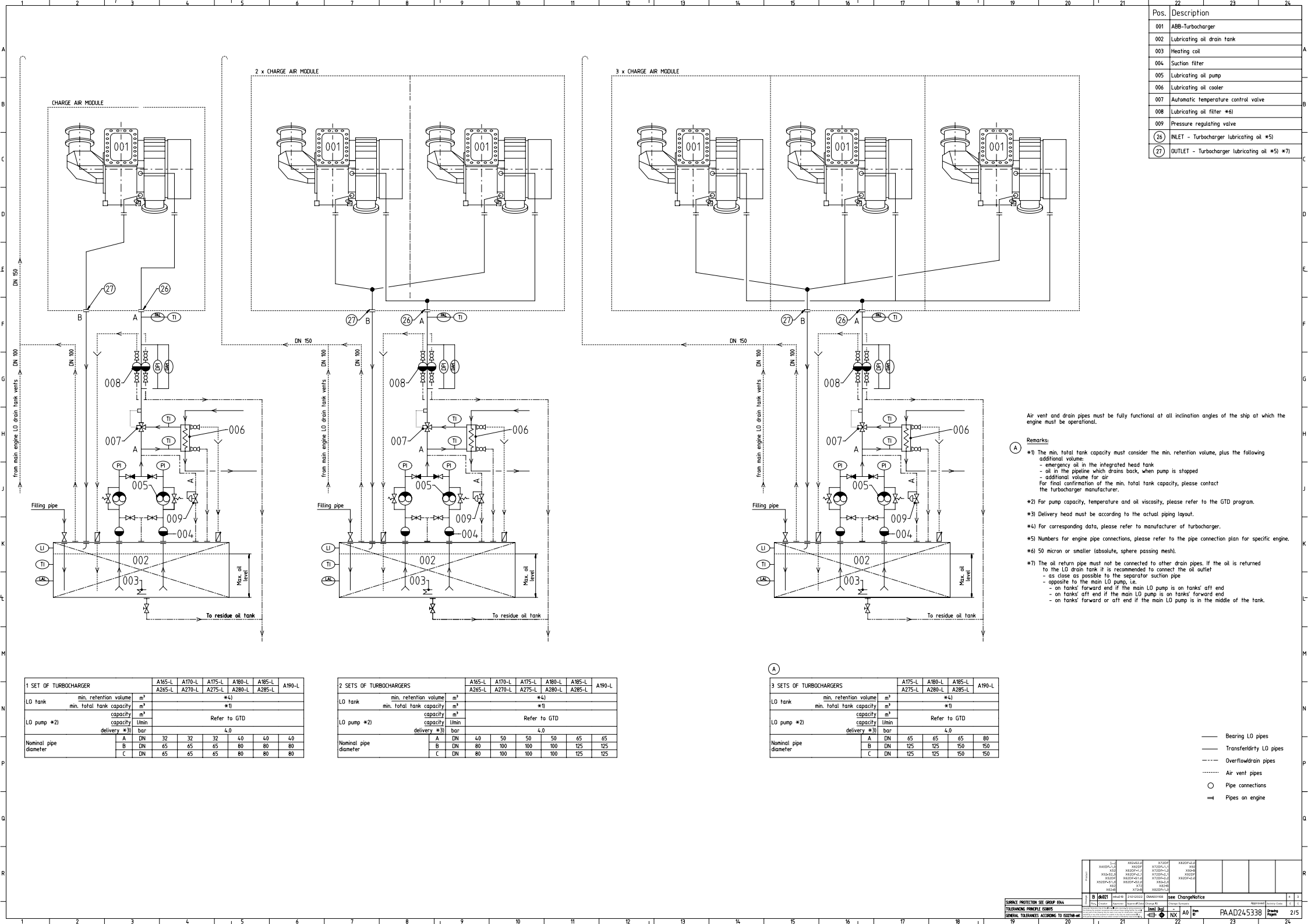


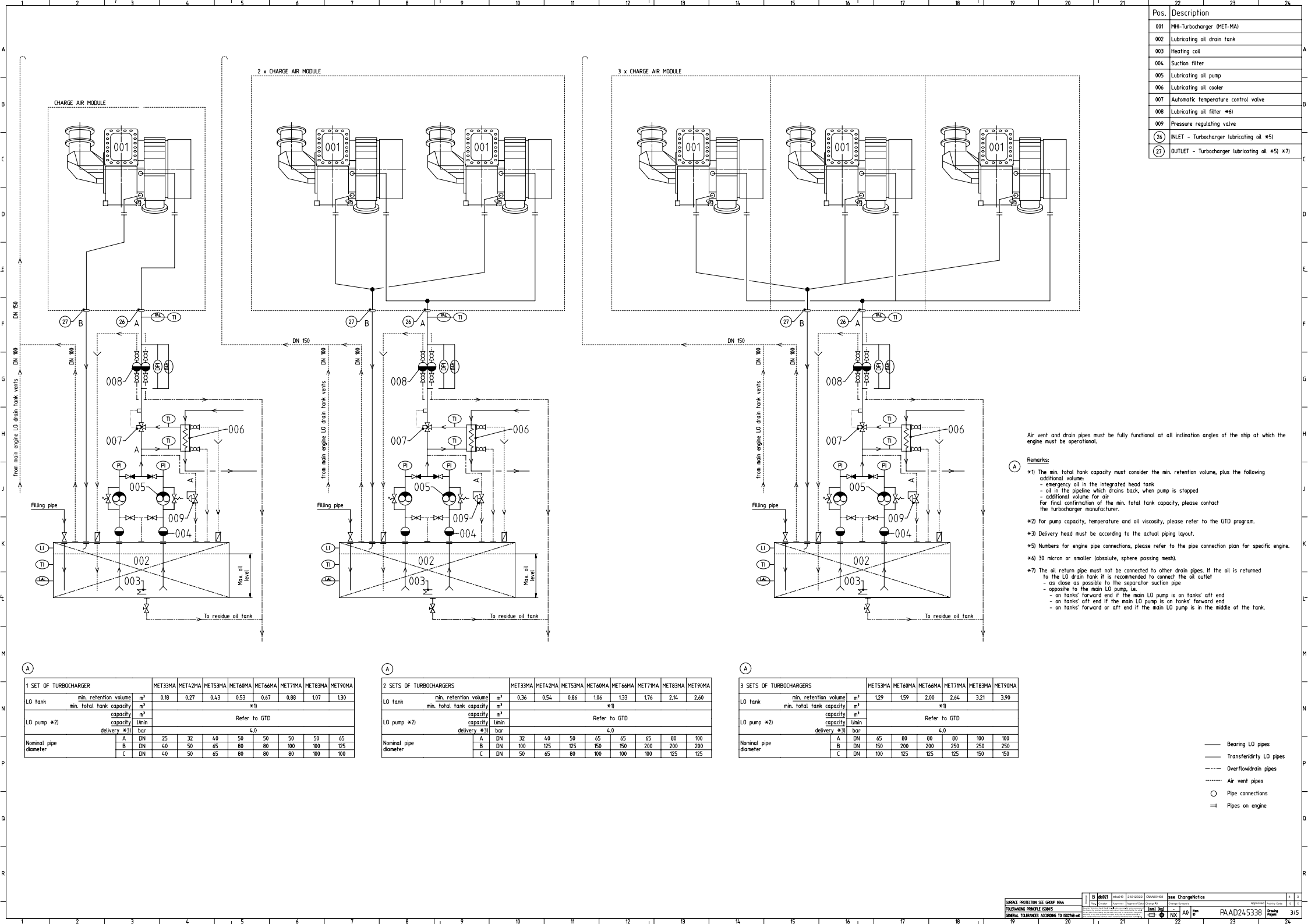
A

SPECIFICATION which must be met

- 26 INLET - Turbocharger lubricating oil
- Lubricating oil temperature:
 - ABB: 30 ~ 85 °C
 - MHI: 35 ~ 50 °C
 - Lubricating oil pressure
 - ABB: 0.8 ~ 2.5 bar
 - MHI: 0.6 ~ 1.5 bar
 - Lubricating oil volume flow: according to the turbocharger maker's recommendation
 - Lubricating oil cleanliness:
 - Full flow filtered by a 50 micron (absolute sphere passing mesh) automatic self-cleaning filter
 - Offline cleaning of the oil return (including back-flushing oil)
- 27 OUTLET - Turbocharger lubricating oil
- Oil return to lubricating oil drain tank
 - Oil return pipe must not be connected to other drain pipes.
 - Oil outlet must be above the max. oil level in the tank or as an alternative a drain pipe with venting holes above the max. oil level needs to be installed.

Prod.	CX40flex52		RT-flex48T-D RT-flex50-B		RT-flex50-D RT-flex50DF		RT-flex58T-B RT-flex58T-D		RT-flex58T-D V1 RT-flex58T-D V2		RT-flex58T-ES RT-flex58TD ER-3		CR-HHM-PILOT X35-B		X40-B [...]		
Change History																	
	B	dkl021	mhu019	21.01.2022	CNAA001108	see ChangeNotice								4	3		
	A	dkl021	mhu019	08.09.2020	EAAD091530	Legacy information. See corresponding ChangeNotice								4	-		
	-	dkl021	bha009	16.12.2016		-								-	-		
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis								Approved	Activity Code	E	C
<div> Winterthur Gas & Diesel</div>					LUBRICATING OIL SYSTEM FOR SEPARATED TC LUBRICATING												
					Dimension												
Scale		-		NX	Units [mm] [kg]		Basic Material						Net Weight		0.000		
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					Qty per		A3		Item ID		PAAD245338				Drawing Page/s 1/5		





Pos.	Description
001	M4-Turbocharger (MET-MA)
002	Lubricating oil drain tank
003	Heating coil
004	Suction filter
005	Lubricating oil pump
006	Lubricating oil cooler
007	Automatic temperature control valve
008	Lubricating oil filter #6)
009	Pressure regulating valve
26	INLET - Turbocharger lubricating oil #5)
27	OUTLET - Turbocharger lubricating oil #5) #7)

Air vent and drain pipes must be fully functional at all inclination angles of the ship at which the engine must be operational.

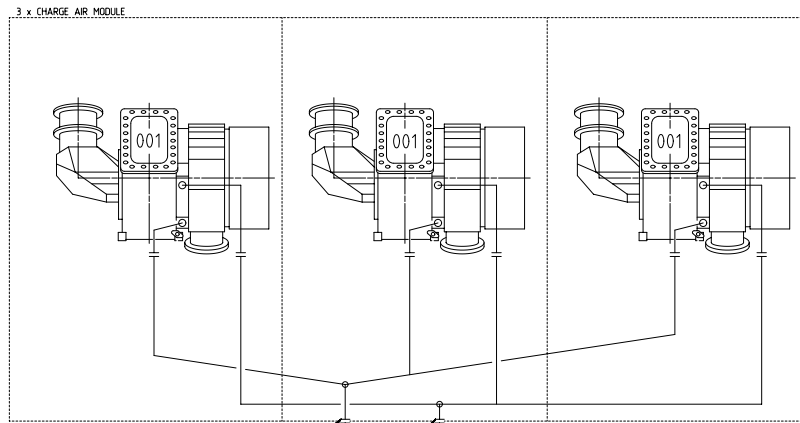
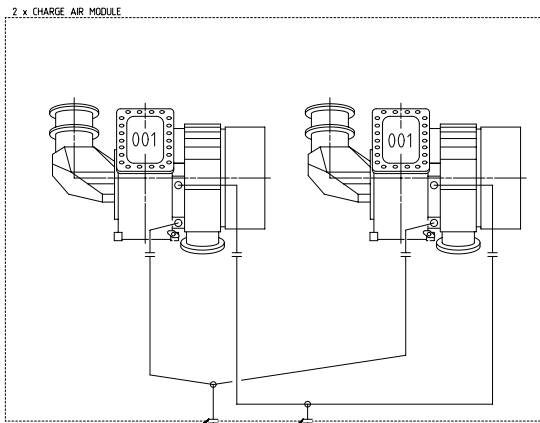
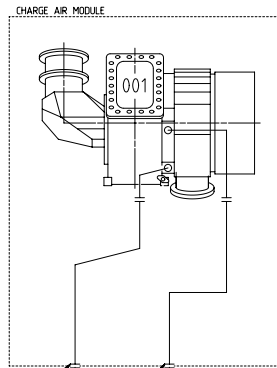
Remarks:

- *1) The min. total tank capacity must consider the min. retention volume, plus the following additional volume:
- emergency oil in the integrated head tank
 - oil in the pipeline which drains back, when pump is stopped
 - additional volume for air
- For final confirmation of the min. total tank capacity, please contact the turbocharger manufacturer.
- *2) For pump capacity, temperature and oil viscosity, please refer to the GTD program.
- *3) Delivery head must be according to the actual piping layout.
- *5) Numbers for engine pipe connections, please refer to the pipe connection plan for specific engine.
- *6) 30 micron or smaller (absolute, sphere passing mesh).
- *7) The oil return pipe must not be connected to other drain pipes. If the oil is returned to the LO drain tank it is recommended to connect the oil outlet
- as close as possible to the separator suction pipe
 - opposite to the main LO pump, i.e.
 - on tanks' forward end if the main LO pump is on tanks' aft end
 - on tanks' aft end if the main LO pump is on tanks' forward end
 - on tanks' forward or aft end if the main LO pump is in the middle of the tank.

1 SET OF TURBOCHARGER		MET33MA	MET42MA	MET53MA	MET60MA	MET66MA	MET77MA	MET83MA	MET90MA
LO tank	min. retention volume	m³	0.18	0.27	0.43	0.53	0.67	0.88	1.07
	min. total tank capacity	m³	*)						
LO pump #2)	capacity	m³	Refer to GTD						
	delivery #3)	l/min	4.0						
Nominal pipe diameter	A	DN	25	32	40	50	50	50	65
	B	DN	40	50	65	80	80	100	125
	C	DN	40	50	65	80	80	80	100

2 SETS OF TURBOCHARGERS		MET33MA	MET42MA	MET53MA	MET60MA	MET66MA	MET77MA	MET83MA	MET90MA
LO tank	min. retention volume	m³	0.36	0.54	0.86	1.06	1.33	1.76	2.14
	min. total tank capacity	m³	*)						
LO pump #2)	capacity	m³	Refer to GTD						
	delivery #3)	l/min	4.0						
Nominal pipe diameter	A	DN	32	40	50	65	65	80	100
	B	DN	100	125	125	150	150	200	200
	C	DN	50	65	80	100	100	100	125

3 SETS OF TURBOCHARGERS		MET53MA	MET60MA	MET66MA	MET77MA	MET83MA	MET90MA
LO tank	min. retention volume	m³	1.29	1.59	2.00	2.64	3.21
	min. total tank capacity	m³	*)				
LO pump #2)	capacity	m³	Refer to GTD				
	delivery #3)	l/min	4.0				
Nominal pipe diameter	A	DN	65	80	80	80	100
	B	DN	150	200	200	250	250
	C	DN	100	125	125	125	150



Pos.	Description
001	M4-Turbocharger (MET-MB)
002	Lubricating oil drain tank
003	Heating coil
004	Suction filter
005	Lubricating oil pump
006	Lubricating oil cooler
007	Automatic temperature control valve
008	Lubricating oil filter #6)
009	Pressure regulating valve
26	INLET - Turbocharger lubricating oil #5)
27	OUTLET - Turbocharger lubricating oil #5) #7)

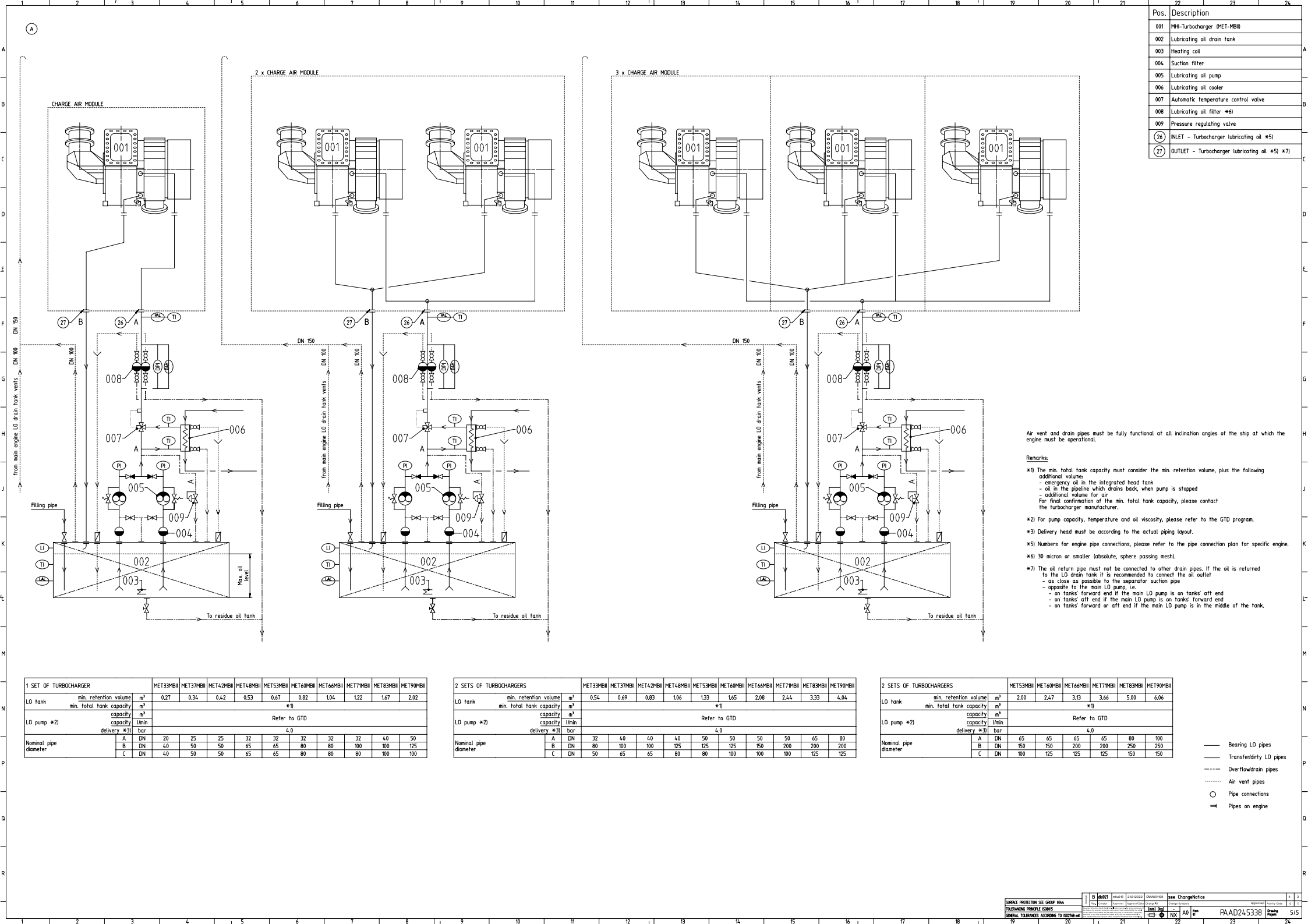
- Remarks:
- *1) The min. total tank capacity must consider the min. retention volume, plus the following additional volume:
 - emergency oil in the integrated head tank
 - oil in the pipeline which drains back, when pump is stopped
 - additional volume for air
 For final confirmation of the min. total tank capacity, please contact the turbocharger manufacturer.
 - *2) For pump capacity, temperature and oil viscosity, please refer to the GTD program.
 - *3) Delivery head must be according to the actual piping layout.
 - *5) Numbers for engine pipe connections, please refer to the pipe connection plan for specific engine.
 - *6) 30 micron or smaller (absolute, sphere passing mesh).
 - *7) The oil return pipe must not be connected to other drain pipes. If the oil is returned to the LO drain tank it is recommended to connect the oil outlet
 - as close as possible to the separator suction pipe
 - opposite to the main LO pump, i.e.
 - on tanks' forward end if the main LO pump is on tanks' aft end
 - on tanks' aft end if the main LO pump is on tanks' forward end
 - on tanks' forward or aft end if the main LO pump is in the middle of the tank.

(A)												
1 SET OF TURBOCHARGER			ME133MB	ME137MB	ME142MB	ME148MB	ME153MB	ME160MB	ME166MB	ME177MB	ME183MB	ME190MB
LO tank	min. retention volume	m ³	0.21	0.26	0.31	0.41	0.49	0.61	0.77	1.01	1.23	1.50
	min. total tank capacity	m ³	*)									
LO pump *)	capacity	m ³	Refer to GTD									
	capacity	l/min	4.0									
Nominal pipe diameter	delivery #3)	bar	A	DN 20	25	25	32	32	32	32	40	50
		B	DN 40	50	50	65	65	80	80	100	100	125
		C	DN 40	50	50	65	65	80	80	80	100	100

A												
2 SETS OF TURBOCHARGERS			MET33MB	MET37MB	MET42MB	MET48MB	MET53MB	MET60MB	MET66MB	MET77MB	MET83MB	MET90MB
LO tank	min. retention volume	m³	0.41	0.52	0.62	0.82	0.99	1.22	1.53	2.02	2.46	2.99
	min. total tank capacity	m³	*)									
LO pump #2)	capacity	m³	Refer to GTD									
	capacity	l/min										
	delivery #3)	bar	4.0									
Nominal pipe diameter	A	DN	32	4.0	4.0	4.0	50	50	50	50	65	80
	B	DN	80	100	100	125	125	125	150	200	200	200
	C	DN	50	65	65	80	80	100	100	100	125	125

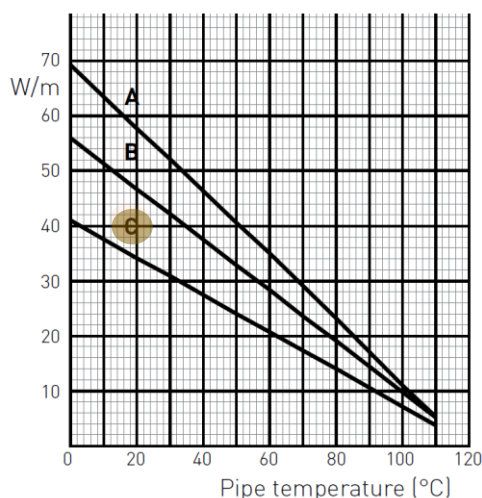
3 SETS OF TURBOCHARGERS		MET53MB	MET60MB	MET66MB	MET77MB	MET83MB	MET90MB	
LO tank	min. retention volume	m ³	0.41	0.52	0.62	0.82	0.99	1.22
	min. total tank capacity	m ³	*1)					
LO pump *2)	capacity	m ³	Refer to GTD					
	capacity	l/min	4.0					
Nominal pipe diameter	delivery #3)	bar						
	A	DN	65	65	65	65	80	100
	B	DN	150	150	200	200	250	250
	C	DN	100	125	125	125	150	150
		DN	100	125	125	125	150	150

- Bearing LO pipes
- Transfer/dry LO pipes
- Overflow/drain pipes
- Air vent pipes
- Pipe connections
- ≡ Pipes on engine



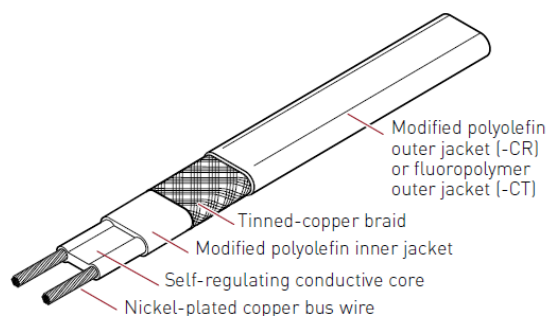
Self-Regulating Heating Cable 10QTVR2-CT

Order drawing



C 10QTVR2-CT

Heating cable construction



Specification:

Description: 10QTVR2-CT
Order No.: 391991-000
Area Classification: Non-hazardous and hazardous locations
Traced surface type: Metal and plastic
Chemical Resistance: Exposure to aqueous inorganic chemicals: Use -CR (modified polyolefin outer jacket)
Exposure to organic chemicals or corrosives: Use -CT (fluoropolymer outer jacket)
Supply Voltage: 200-277 VAC
Temperature Rating: Maximum maintain or continuous exposure temperature (power on) 225°F (110°C)
Maximum intermittent exposure temperature, 1000 hours (power on) 225°F (110°C)
Minimum installation temperature -76°F (-60°C)
Minimum Bending Radius: 13 mm at 20°C
35 mm at -60°C
Height: 4.5 mm
Width: 11.8 mm
Weight: 0.126 kg/m

Supplier:  **PENTAIR**
www.pentairthermal.com

MAXIMUM CIRCUIT LENGTH BASED ON TYPE 'C' CIRCUIT BREAKERS ACCORDING TO EN60898		
SUPPLY VOLTAGE 230 VAC		
Electrical protection sizing	Start-up temperature	Maximum heating cable length per circuit [m]
16A	-20°C	65
	+10°C	80
25A	-20°C	95
	+10°C	115
32A	-20°C	115
	+10°C	115
40A	-20°C	115
	+10°C	115

Substitute for: PC Q-Code X S X X X

Modif	A	EAAD090454	05.03.2019						
Number	Drawn Date	Number	Drawn Date	Number	Drawn Date	Number	Drawn Date	Number	Drawn Date

WINGD
Winterthur Gas & Diesel

Product
W-2S

Heating Element
Order Drawing

Made	24.10.2018	P. Kowalski	Main Drw.	Page	1 / 1	Material ID	PAAD308926		
Chkd	24.10.2018	R. Leutwyler	Design Group	Drawing ID		DAAD106761		Rev	
Appd	24.10.2018	W. Östreicher	0009						

MIDS_WinGD-X62-S2.0_LUBRICATING-OIL-SYSTEM

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2021-03-01	DRAWING SET	First web upload
2022-07-13	PAAD363287	System drg – new revsion
2023-01-20	Drawing set 7 cyl	added

DISCLAIMER

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