

SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight
001	1	PAAD366468	LUBRICATING OIL SYSTEM	without iCAT			0.001
002	1	PAAD245338	LUBRICATING OIL SYSTEM				0.001
003	1	PAAD366474	LUBRICATING OIL DRAIN TANK				169
004	1	107.341.455.500	INSTRUCTION FOR FLUSHING				0.001
005	1	PAAD100971	LUBRICATING OIL DRAIN TANK				0.001

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Prod	6 X62DF-S1.0 6 X62DF-S2.0												
Change History													
	A	sna102	mhu019	28.11.2022	CNAA002855	Main Design/Drawing Introduced						4	3
	-	sde101	mhu019	26.02.2021	EAAD787117	-						-	-
	Rev.	Creator	Approver	Approval Date	Change ID	Change Synopsis					Activity Code		E

<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		PAAD366525		BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight
001	1	PAAD366468	LUBRICATING OIL SYSTEM	without iCAT			0.001
002	1	PAAD366474	LUBRICATING OIL DRAIN TANK				169
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.	6 X62DF-S1.0 6 X62DF-S2.0							
Change History								
	A	sna102	mhu019	28.11.2022	CNAA002855	Main Design/Drawing Introduced	4	3
	-	sde101	mhu019	26.02.2021	EAAD787117	-	-	-
	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 PAAD366526		BOM Page/s 01/01

SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
001	1	PAAD366468	LUBRICATING OIL SYSTEM without iCAT			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 X62-S2.0			
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 <p>WIN GD Winterthur Gas & Diesel</p>	<p>LUBRICATING OIL SYSTEM</p>
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SEQ NO	QTY	Item ID	Item Name Dimension	Standard-ID	Basic Material	Net Weight
001	1	PAAD366468	LUBRICATING OIL SYSTEM without iCAT			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

Prod.	7 X62-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	PTAA053054		BOM Page/s	01/01

SEQ NO	QTY	Item ID	Item Name	Dimension	Standard-ID	Basic Material	Net Weight				
16	1 m	PAAD308926	HEATING ELEMENT	10QTVR2-CT			0.126				
Prod.	X62DF-S1.0 X62DF-S2.0										
Change History											
	A	npa101	mhu019	10.07.2023	EAAD787117	Drawing Updated	4 3				
	-	sde101	mhu019	26.02.2021	EAAD787117	-	- -				
	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								
			without iCAT								
Bill Of Material			Dimension								
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			Main Design		Design Group		9722	Q-Code	X X M	Standard	WDS
			Qty per		A4	Item ID		PAAD366468		BOM Page/s	01/01

SYSTEM PROPOSAL - System oil and cylinder LO supply

Pos.	ENGINE COMPONENTS *3)
EC01	Supply unit
EC02	Trace heating cable control box

Pos.	ENGINE CONNECTIONS *2)
23	OUTLET - Lubricating oil from bedplate vertical oil drain
25	INLET - Lubricating oil
27	OUTLET - Lubricating oil turbocharger *12) *13)
30	INLET - Crosshead lubricating oil
32	INLET - Cylinder lubricating oil
34	OUTLET - Oil drain servo system, oil return from engine driving end
35	OUTLET - Oil drain servo system, oil return from engine free end
38	OUTLET - Oil drain supply unit
E1	Trace heating cable control box connection

Pos.	SYSTEM COMPONENTS *1)
001	Lubricating oil drain tank
002	Heating device *4)
003	Suction strainer (mesh size acc. to pump suppliers recommendation)
004	Lubricating oil pump
005	Lubricating oil cooler
006	Autom. temperature control valve, constant temp. at engine inlet: 45°C
007	Automatic self-cleaning filter, 35 micron, with backflushing oil treatment
008	Transition piece (adaptor) *9)
009	Deck connection
010	Grade1 Cylinder lubricating oil storage tank *5)
011	Grade1 Cylinder lubricating oil service tank *5)
012	Pressure regulating valve *6)
015	Crosshead lubricating oil pump *8)
016	Electrical trace heating cable (detailed spec. is linked on page 1)
017	Three-way valve, manually or remotely operated
018	Grade2 Cylinder lubricating oil storage tank *5) *18)
019	Grade2 Cylinder lubricating oil service tank *5) *18)

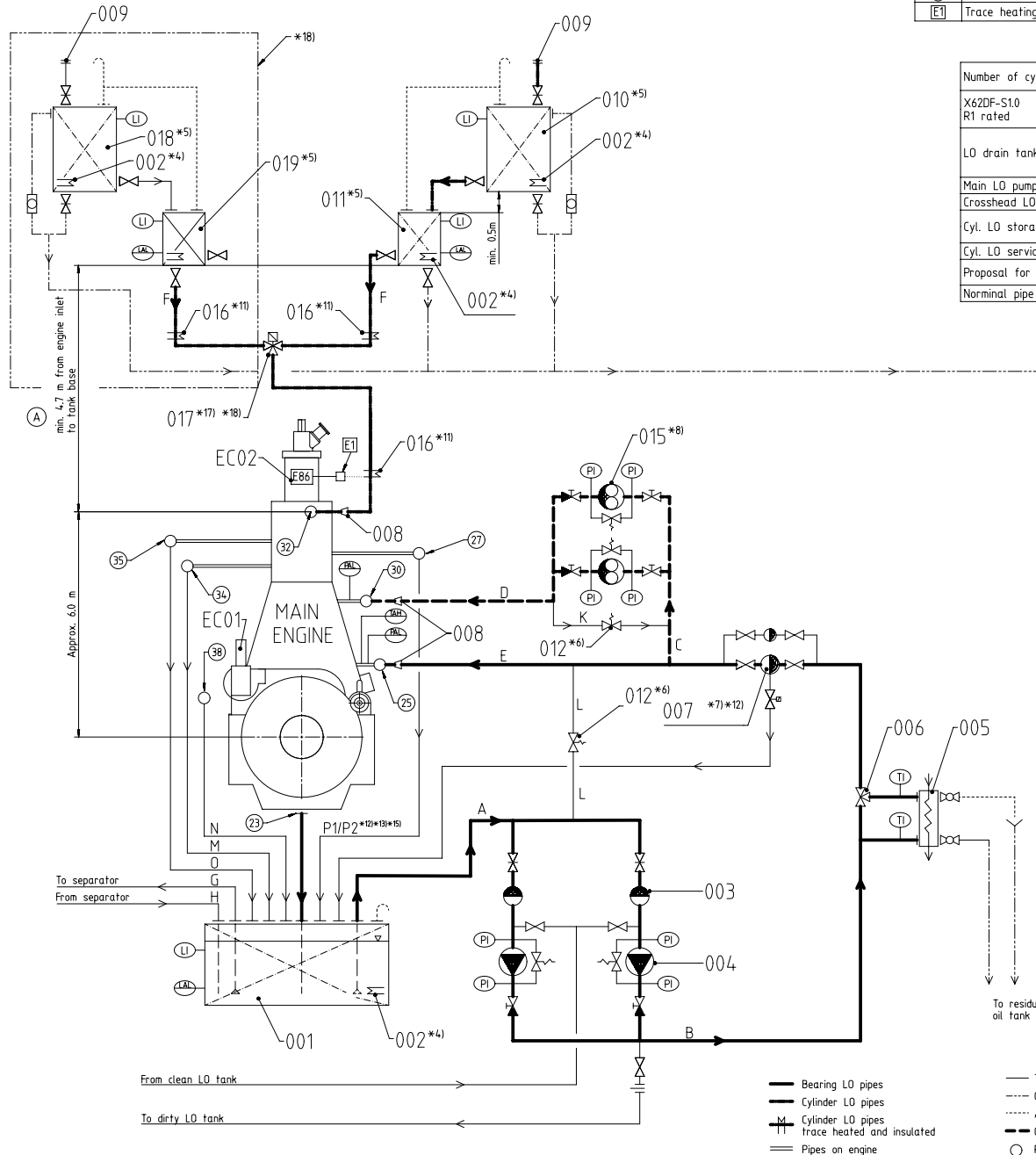
Remarks:

- 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) Concerning the exact position and execution of the pipe connection please refer to the pipe connection plan.
- *3) To be delivered by the engine manufacturer, i.e. already equipped on engine side.
- *4) Optional heating coil
- *5) The cylinder LO service tank with metering device provides the possibility to supervise the cylinder LO consumption of the engine. Alternatively a flowmeter can be installed. If the cylinder LO service tank is omitted, i.e. the engine is fed directly from the cylinder LO storage tank, the storage tank has to be located at the same minimum installation height as specified for the service tank, respectively a certain level higher if additional elements are installed in the supply line to the engine (e.g. a flowmeter) to compensate the pressure drop created.
- *6) The bypass line with 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).
- *7) 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 or as an alternative 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.
- *8) The LO pumps (pos. 004) and the crosshead LO pumps (pos. 015) are to be interlocked. The crosshead LO are not to be operated without the LO pumps.
- *9) To be installed as required (check with Pipe Connection Plan!)
- *10) All capacities and the given diameters are valid for the mentioned rating (including integrated turbocharger lubrication, but excluding any possibly installed damper and PTO gears) 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.
- *11) To be connected to the control box (EC02) on engine side.
- *12) 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.
- *13) 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.
- *14) The proposed cylinder LO services tank capacity takes into account a filling interval of 2 days based on the above mentioned feed rate.
- *15) The pipe diameter varies depending on the installed TC type. Project-specific values are provided in the relevant pipe connection plan of DG8920.
 - As rough guidance please observe the following values:
 - P1: Pipe diameter for engines equipped with ABB turbocharger
 - P2: Pipe diameter for engines equipped with MHI turbocharger
- *17) Three-way valve has to be fitted as close as possible to the engine inlet. This is to reduce the volume of remaining oil (with the previous BN) after the change-over.
- *18) Optional, only to be installed if two different cylinder lubrication oil grades for commercial reasons.

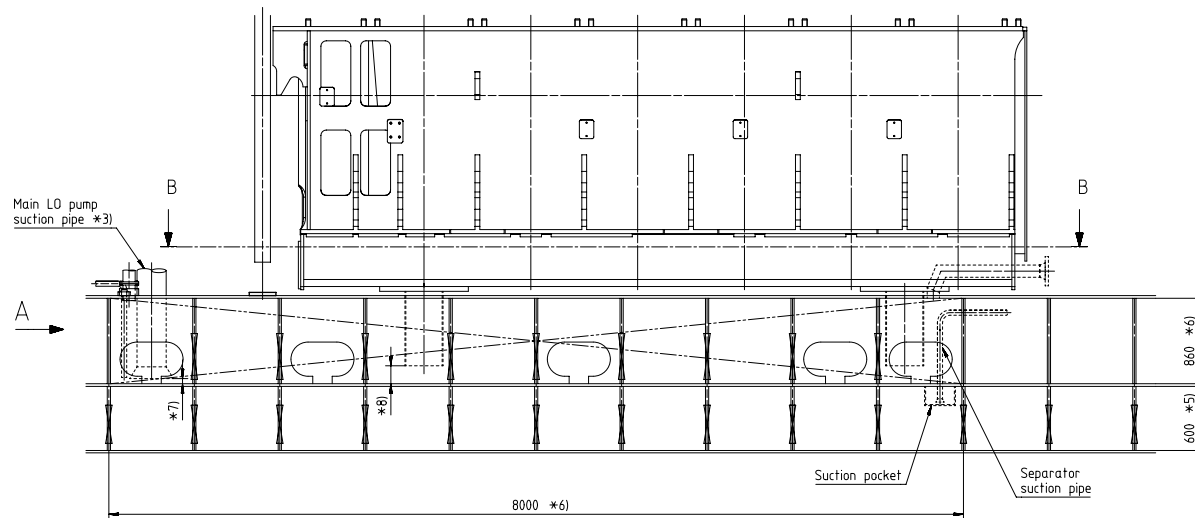
Number of cylinders		5	6	7	8
X62DF-S10 R1 rated	power (kW)	10550	12660	14770	16880
	speed (rpm)	108			
LO drain tank		(m³) For capacities refer to drawing "LO drain tank-Filling Guideline"			
Main LO pump	capacity	(m³/h) refer to GTD			
Crosshead LO pump	capacity	(m³/h) refer to GTD			
Cyl. LO storage tank	capacity	(m³) based on a feed rate of 1g/kWh (pulse)			
Cyl. LO service tank *14)	capacity	1	1.1	1.3	1.5
Proposal for pipe dimensioning *10)					
Nominal pipe diameter	A	DN 250	DN 250	DN 250	DN 250
	B	DN 200	DN 200	DN 200	DN 250
	C	DN 100	DN 125	DN 125	DN 125
	D	DN 80	DN 100	DN 100	DN 100
	E	DN 200	DN 200	DN 200	DN 200
	F	DN 40	DN 40	DN 40	DN 40
The pipe diameters for LO separator are sized acc. to the effective throughput capacity of the separator and according to the separator manufacturer's recommendations.					
K	DN	50	50	50	50
	DN	125	125	125	125
M	DN	-	-	-	-
	DN	80	80	80	80
N	DN	80	80	80	80
	DN	-	-	-	-
O	DN	65	100	100	100
	DN	100	150	150	150

Table 1: LO content on engine side

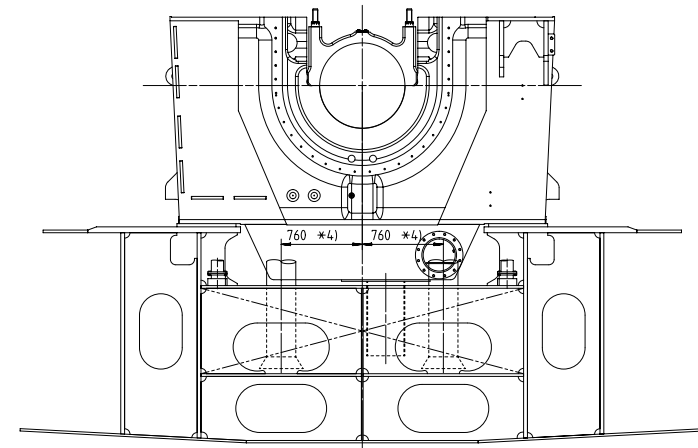
Cylinder	Volume
5	2350 l
6	2650 l
7	2950 l
8	3300 l



TANK PROPOSAL

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

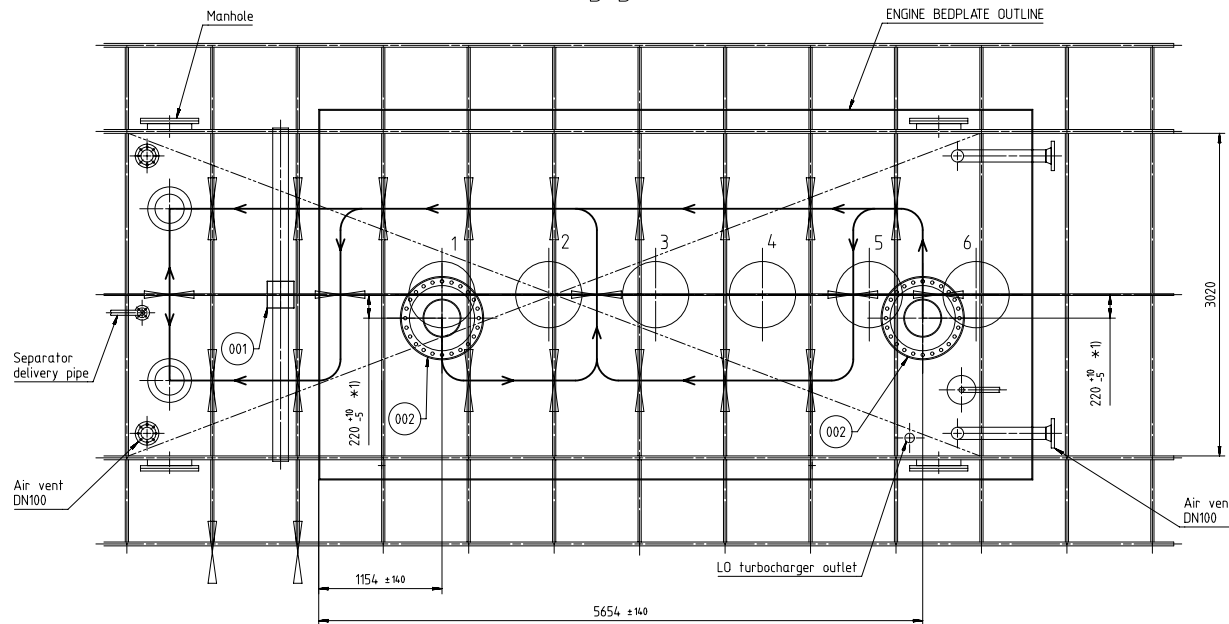
A (DRIVING END)



B-B

ENGINE BEDPLATE OUTLINE

DRIVING END



FREE END

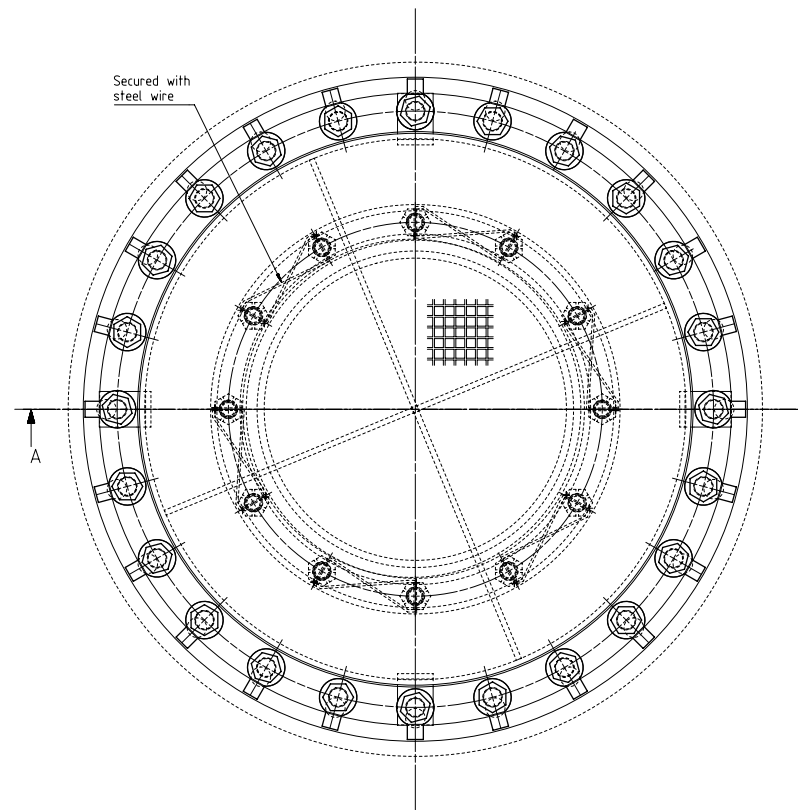
REMARKS:



- *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*DN) to the drain tank bottom has to be maintained.

2	002	PAAD373387	VERTICAL OIL DRAIN	DAAD139409		77.1
1	001	107.246.799.200	PLATE			15.0
QTY	SEQ. NO.	Material ID	Material Name	Standard or Drawing	Basic Material Material: Standard	Weight GR/NET
					Q-Code XXXXXX	Man. Drw.
					Standard ISO, JIS	
Mod.	Free space for file					
Number	Drawn date	Number	Drawn date	Number	Drawn date	Number
WINGD Wärthner Gas & Diesel			Product 6X62-S2.0 6X62DF-S1.0	LUBRICATING OIL DRAIN TANK FOR STANDARD ENGINE SEATING		
Units	mm kg	NX	Basic Material	Scale	1:25	Size
Made	22.01.2021	dk1021	DH.Kim	Page	1/1	Material ID
Chd	25.02.2021	ja101	Pickup	Design Group		PAAD366474
Appd	26.02.2021	mtu019	Hug	Drawing ID	9722	DAAD135853
SURFACE PROTECTION SEE GROUP 0344			Net Weight 169			
TOLERANCING PRINCIPLE ISO8015			Rev. -			
GENERAL TOLERANCES ACCORDING TO ISO2768-mK						

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

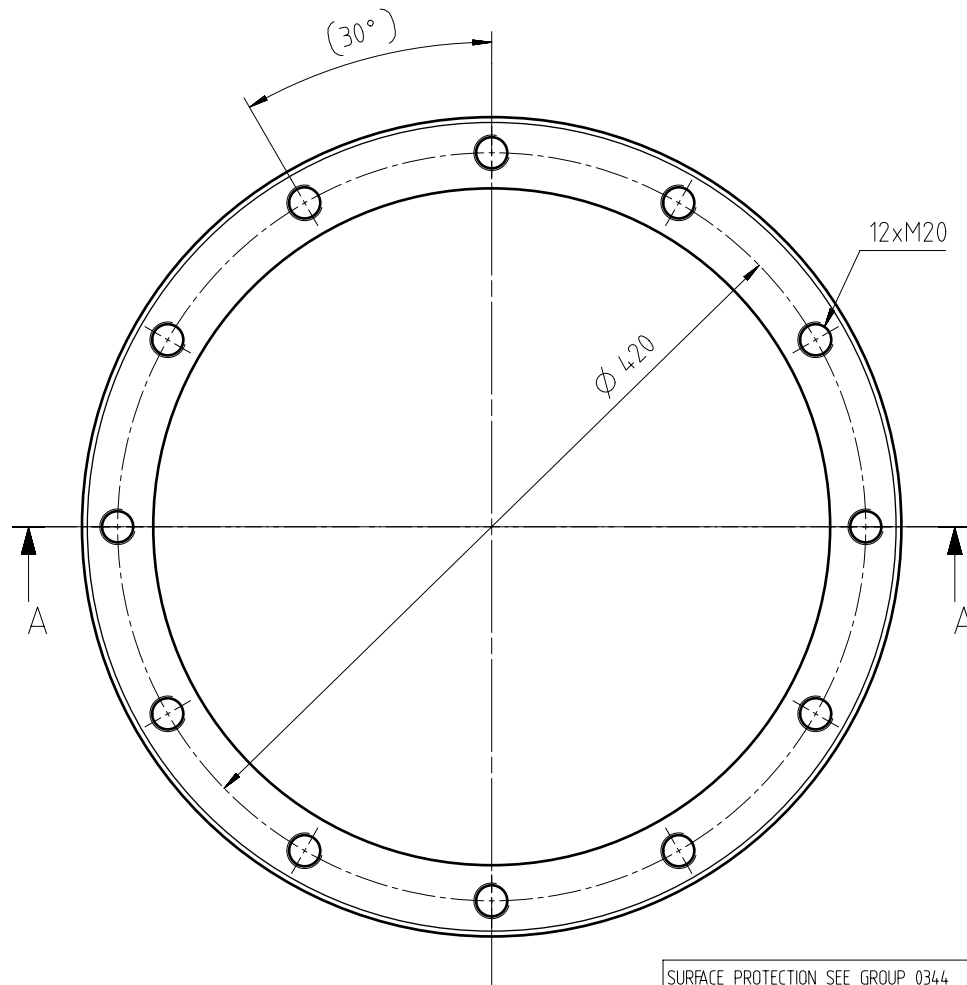
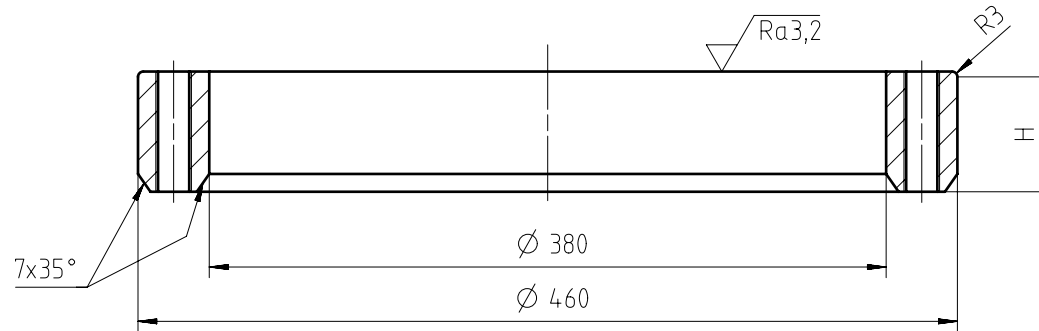
A	To be measured after alignment of the engine
H	A - 45 mm



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 (mm)	Standard or Drawing	Basic Material Material Standard	Weight Grain Size
Free space for file						Q-Code XXXXXX Standard ISO, JIS	
Model							
	Number	Drawn date	Number	Drawn date	Number	Drawn date	Number
 WING Water-Proof & Guard			Product W-25		VERTICAL OIL DRAIN Oelablauf vertikal		
Units	mm	kg	NX		Basic Material		Net Weight 77.1
Model	22.01.2021		dk0121	DH.Kim		Scale 1:3	
Chsd	25.02.2021		jpl101		Pickup		
Appld	26.02.2021		mhu019		Hug		
				9722	Design Group		
					Drawing ID	DAAD1394.09	
							Rev. -
PAAD373387							

(B)

SECTION A-A



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

H depends on chock thickness

H = A - 45 mm

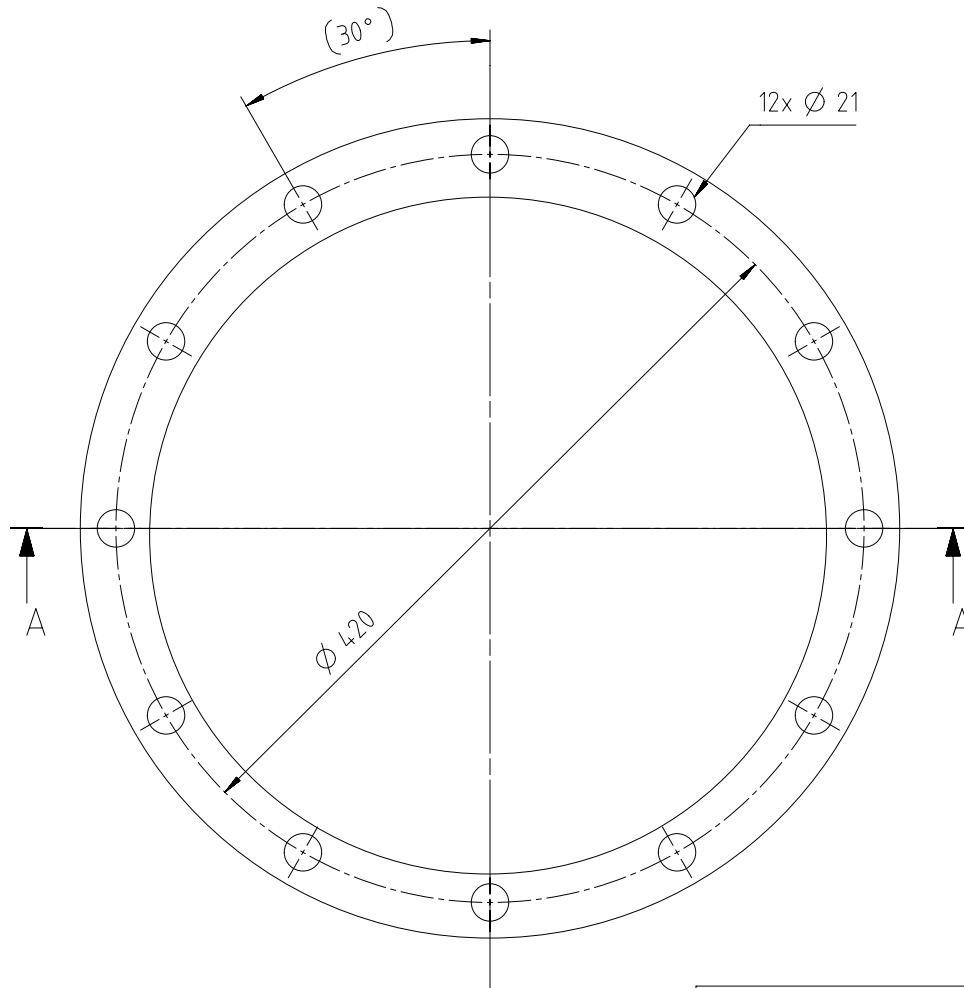
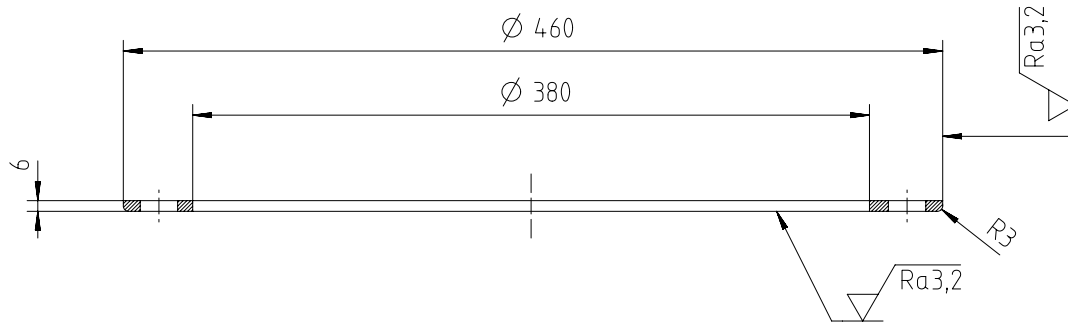
for the relation of A see Drawing DAAD033160

Free space for lic.								Q-Code XXXXX	Main Drw.		
								Standard ISO; JIS			
Modif.	(A)	EAAD084385	07.04.2015	(B)	EAAD091530	28.01.2020					
	Number	Drawn date		Number	Drawn date		Number	Drawn date		Number	
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	
TOLERANCING PRINCIPLE ISO8015		Chkd	03.12.2012 mhu019 Hug		Design Group		9720		Page	1/1	
GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	03.12.2012 wwr001 Wroblewski		Drawing ID		DAAD032919		Material ID	PAAD104868	
									Rev.	B	



UID - DIMENSIONAL DRAWING - Confidential

(B)

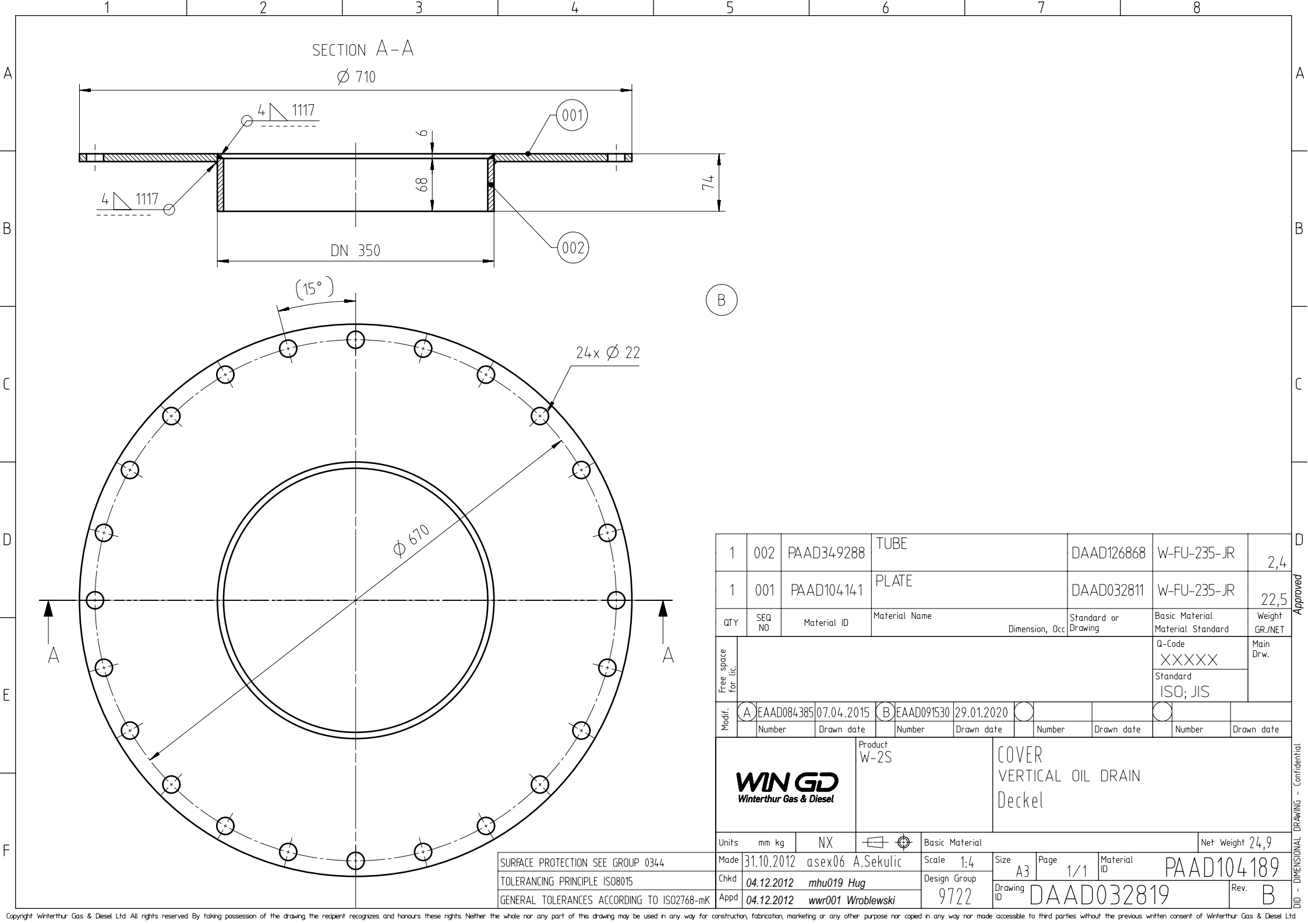
SECTION A-A



✓ Ra 12,5 (✓) SHARP EDGES REMOVED

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									Standard ISO; JIS			
Modif.	(A)	EAAD084385	07.04.2015	(B)	EAAD091530	28.01.2020						
		Number	Drawn date		Number	Drawn date		Number	Drawn date			
 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	Page 1/1	Material ID PAAD104051
TOLERANCING PRINCIPLE ISO8015						Chkd	03.12.2012 mhu019 Hug		Design Group	9722		
GENERAL TOLERANCES ACCORDING TO ISO2768-mK						Appd	03.12.2012 wwr001 Wroblewski		Drawing ID	DAAD032783		Rev. B

UID - DIMENSIONAL DRAWING - Confidential



(B)

SECTION A-A

Ø 710

DN 350



Ra3,2

(15°)

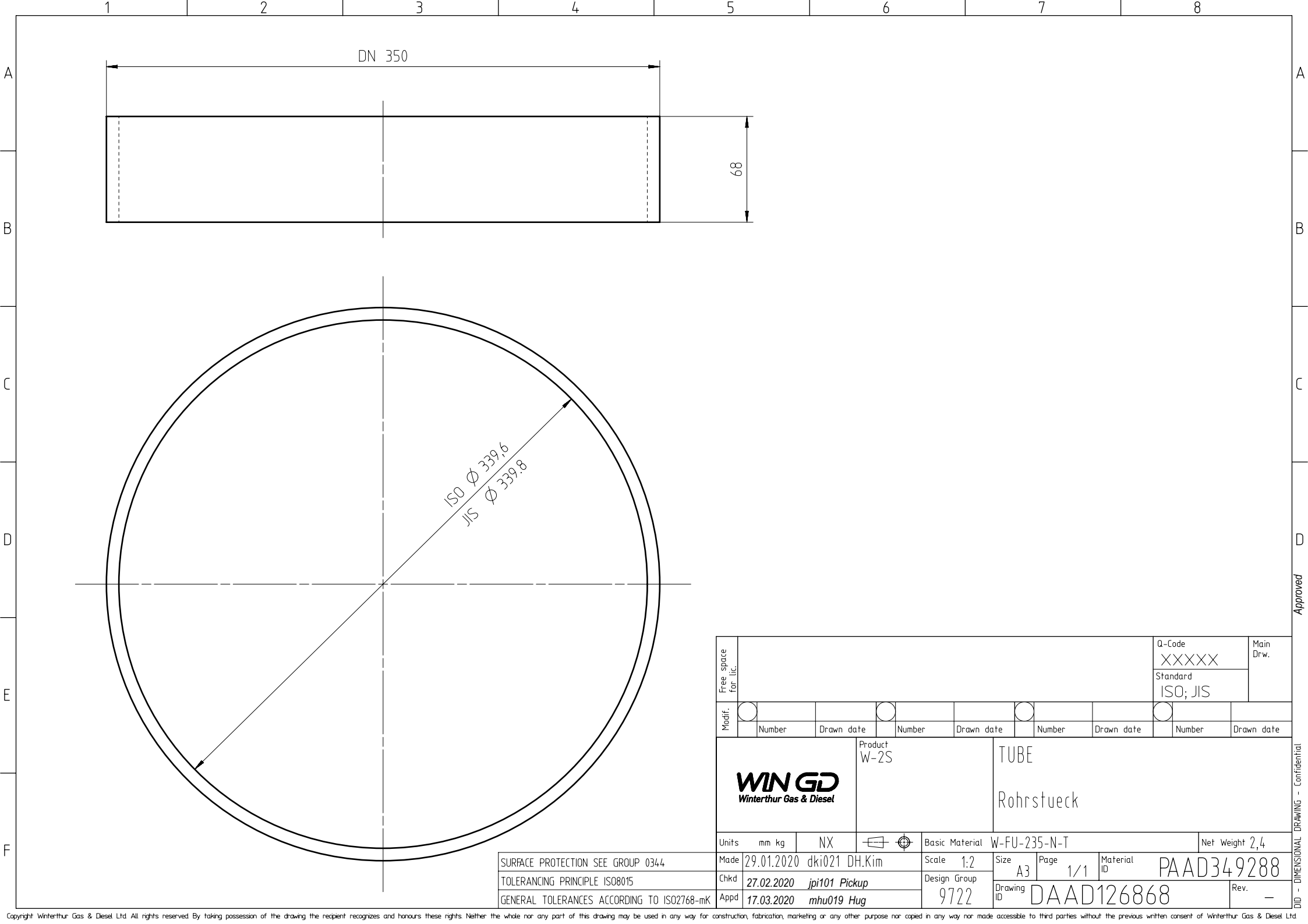
24x Ø 22

Ø 670

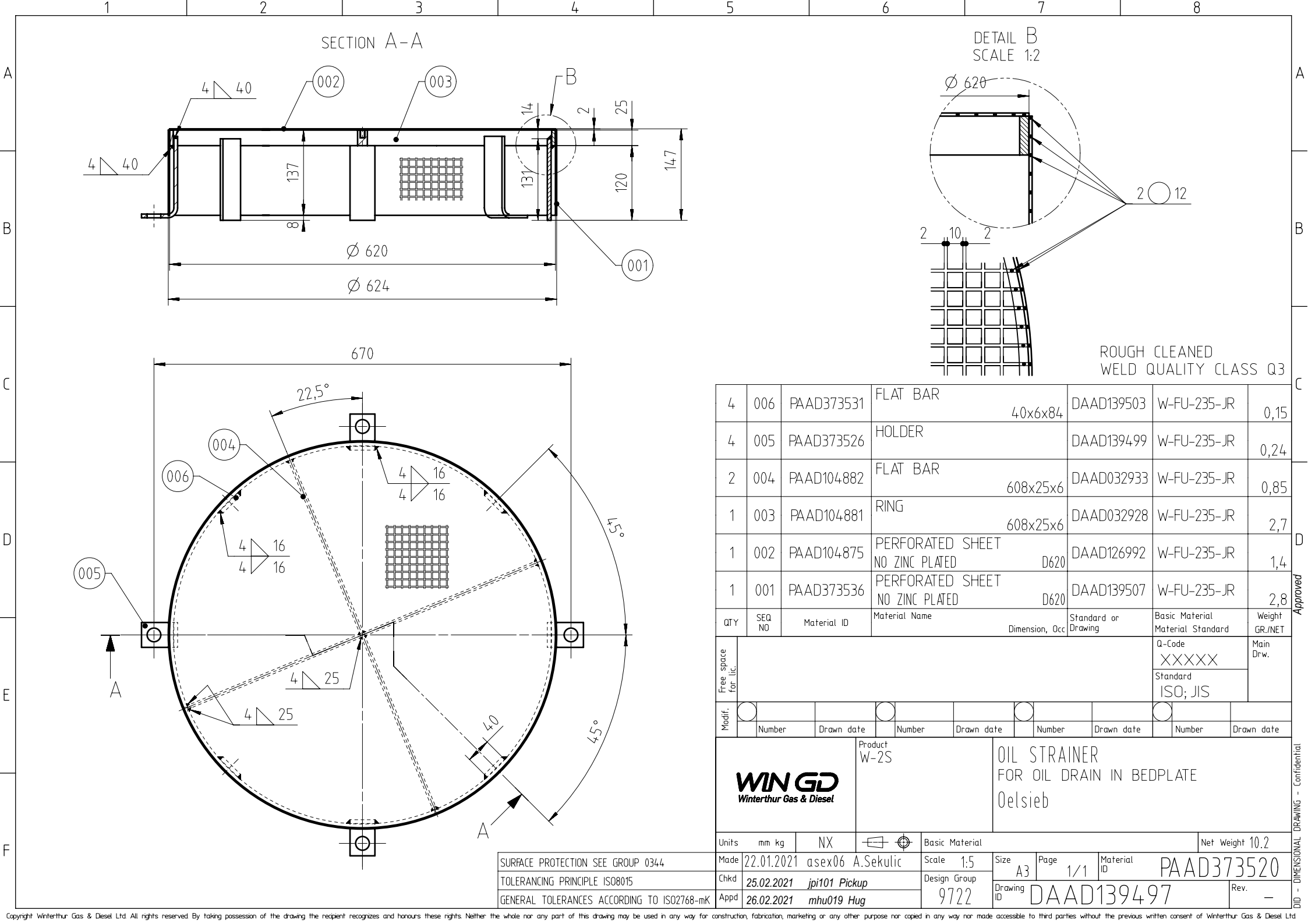
✓ Ra12,5 (✓) SHARP EDGES REMOVED

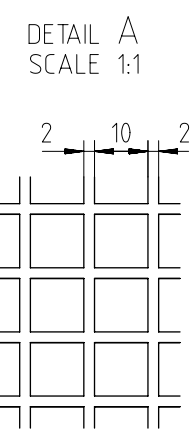
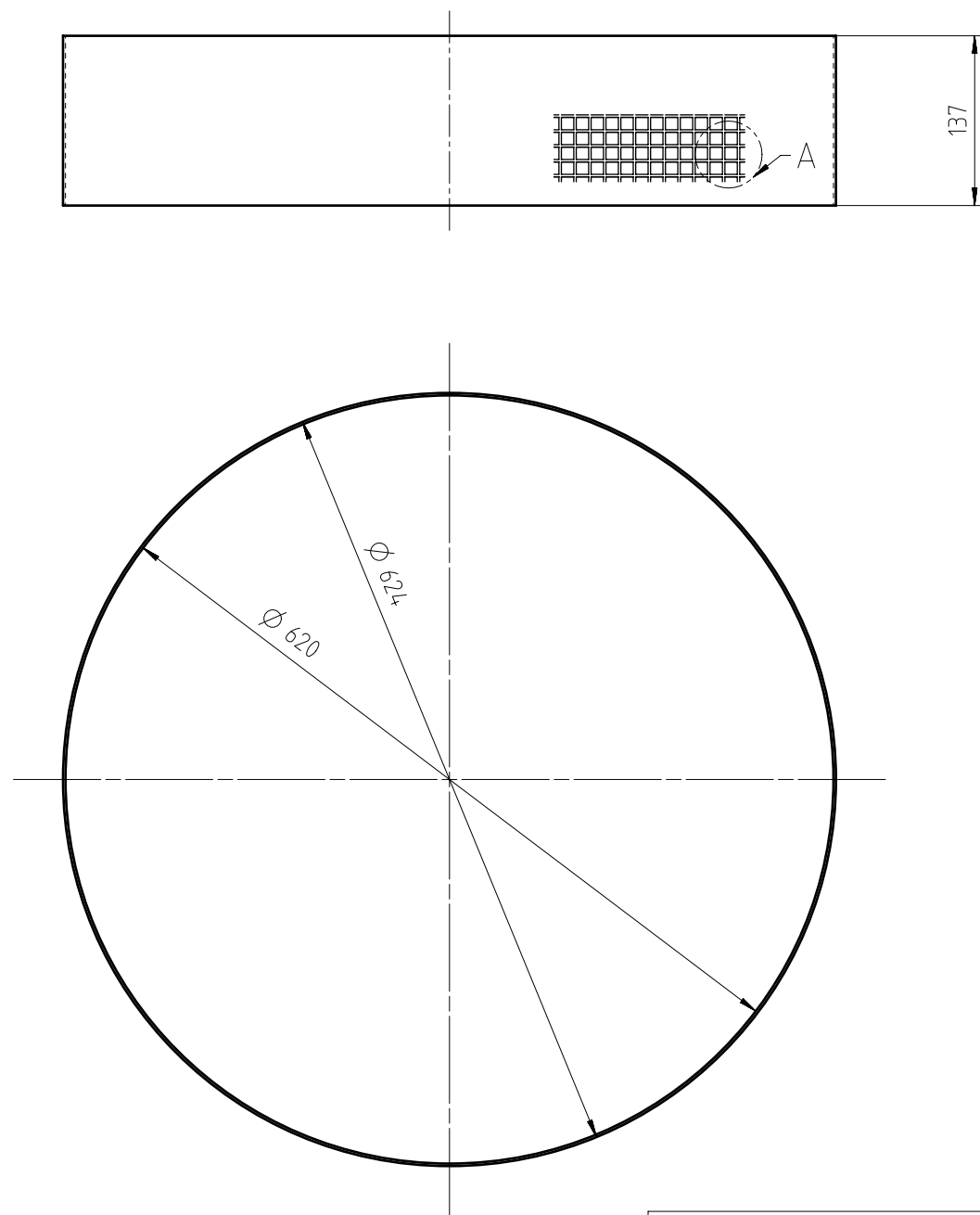
Free space for lic.								Q-Code XXXXXX	Main Drw.					
								Standard ISO; JIS						
Modif.	(A)	EAAD084385	07.04.2015	(B)	EAAD091530	28.01.2020								
		Number	Drawn date		Number	Drawn date		Number	Drawn date					
 Winterthur Gas & Diesel		Product W-2S		PLATE Blech										
Units	mm kg	NX				Basic Material		W-FU-235-JR		Net Weight	22,5			
Made	31.10.2012		asex06		A.Sekulic		Scale	1:4	Size	A3	Page	1/1	Material ID	PAAD104141
Chkd	03.12.2012		mhu019		Hug		Design Group	9720		Drawing ID	DAAD032811		Rev.	B
Appd	03.12.2012		wwr001		Wroblewski									



SURFACE PROTECTION SEE GROUP 0344
TOLERANCING PRINCIPLE ISO8015
GENERAL TOLERANCES ACCORDING TO ISO2768-mK

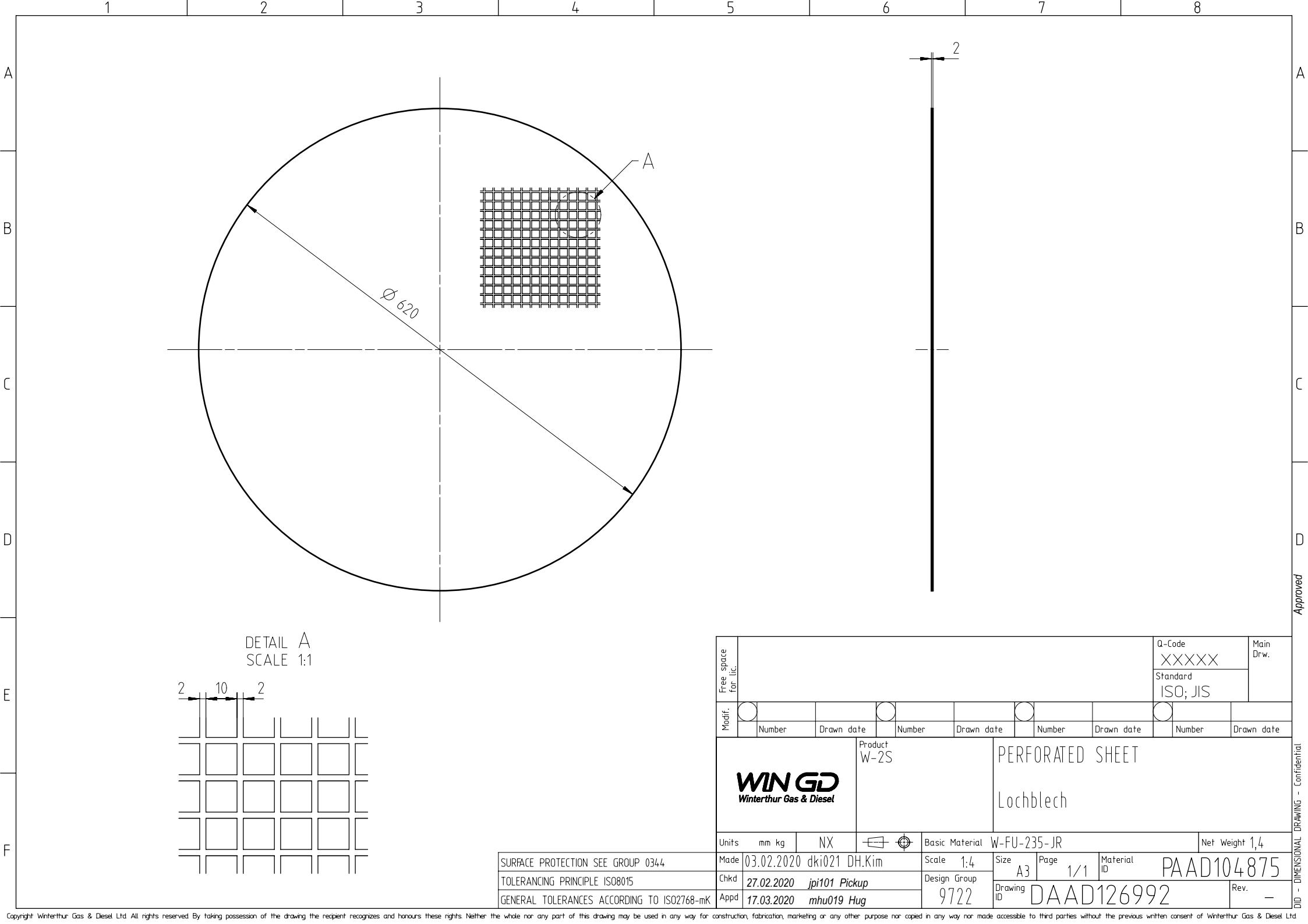


Free space for lic.									Q-Code		Main Drw.										
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									Standard			ISO; JIS									
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	Number		Drawn date		Number		Drawn date		Number		Drawn date										
WIN GD <i>Winterthur Gas & Diesel</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		PAAD349288	
Chkd		27.02.2020		jpi101 Pickup		Design Group		9722		Drawing ID		DAAD126868		Rev.		—					
Appd		17.03.2020		mhu019 Hug																	

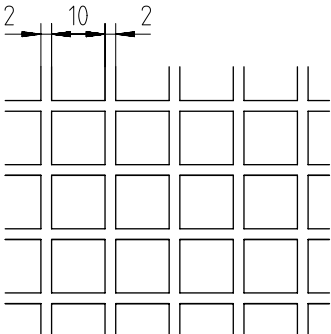




Free space for lic.							Q-Code XXXXX		Main Drw.				
							Standard ISO; JIS						
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 Winterthur Gas & Diesel			Product W-2S		PERFORATED SHEET Lochblech								
Units	mm kg	NX		Basic Material	W-FU-235-JR			Net Weight 2.8					
SURFACE PROTECTION SEE GROUP 0344			Made	22.01.2021 dki021 DH.Kim		Scale	1:4	Size	A3	Page	1/1	Material	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									

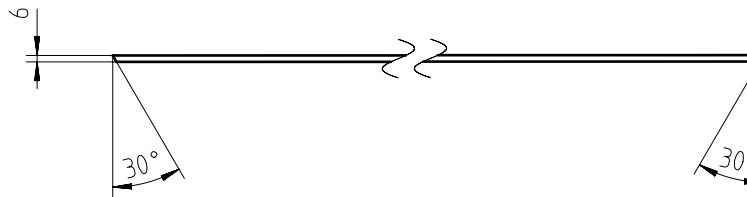
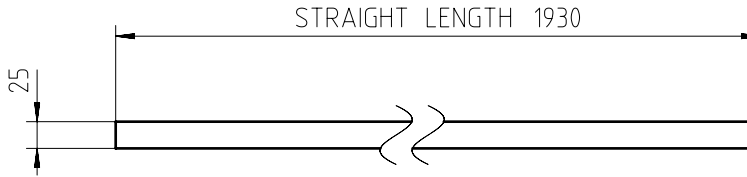
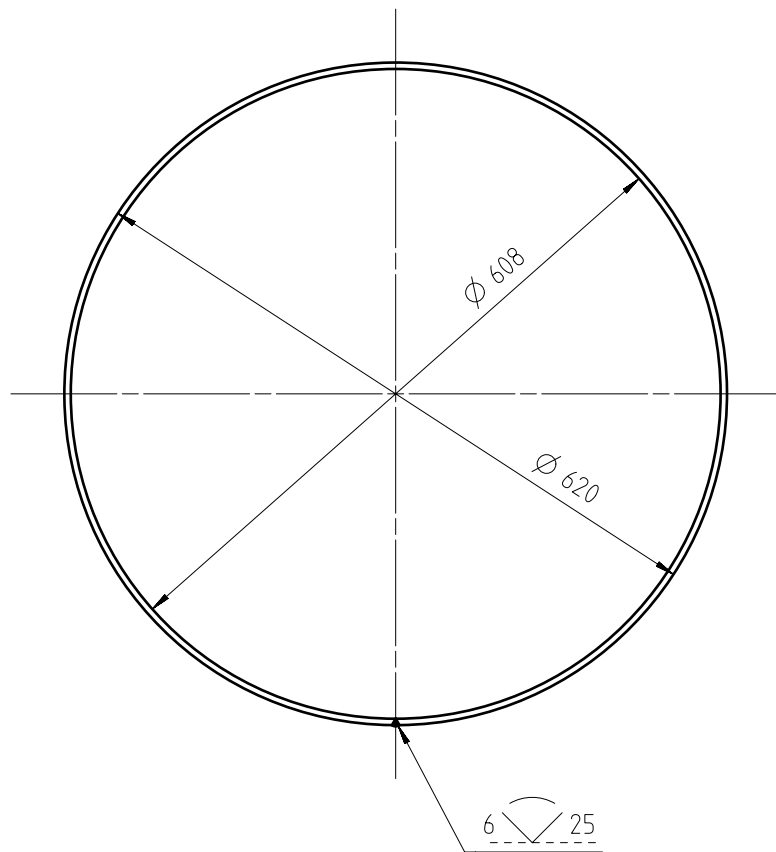




DETAIL A
SCALE 1:1

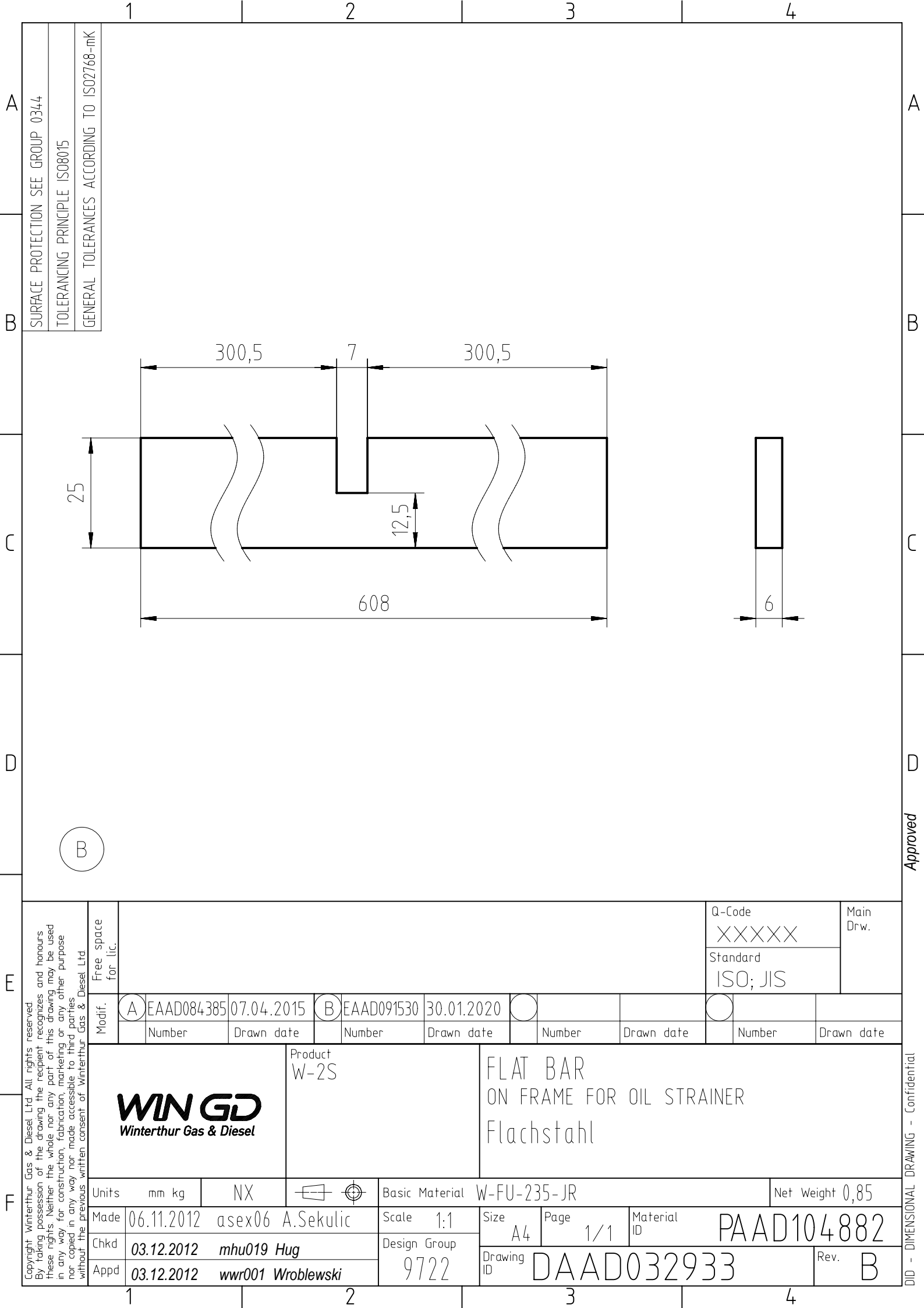


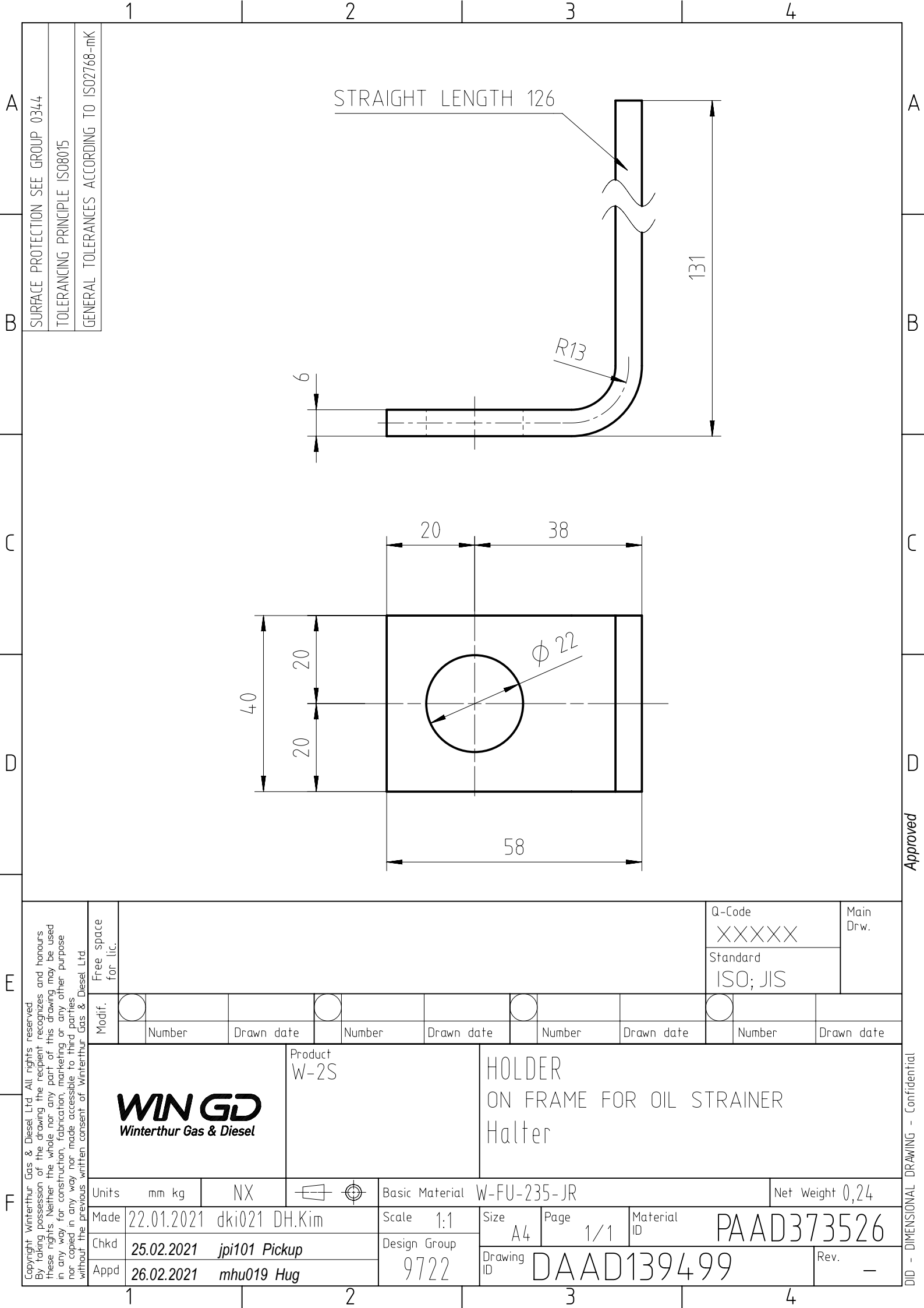
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WIN GD Winterthur Gas & Diesel			Product W-2S		PERFORATED SHEET Lochblech				
Units	mm kg	NX			Basic Material W-FU-235-JR			Net Weight 1,4	
Made	03.02.2020 dki021 DH.Kim			Scale	1:4		Size	Page	Material
Chkd	27.02.2020 jpi101 Pickup			Design Group 9722	A3	1/1	PAAD104875		
Appd	17.03.2020 mhu019 Hug				Drawing ID	DAAD126992			Rev.

B

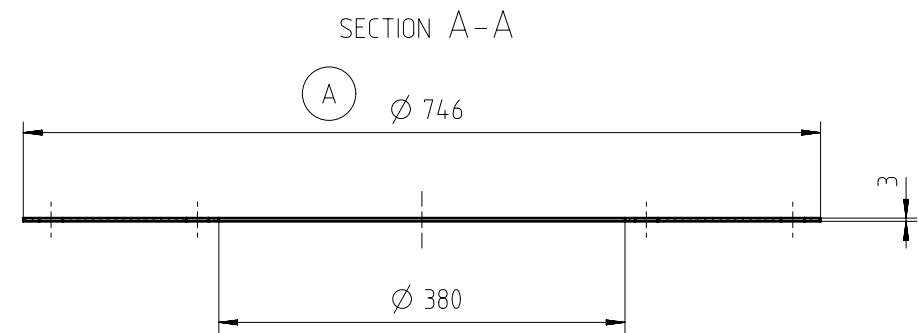
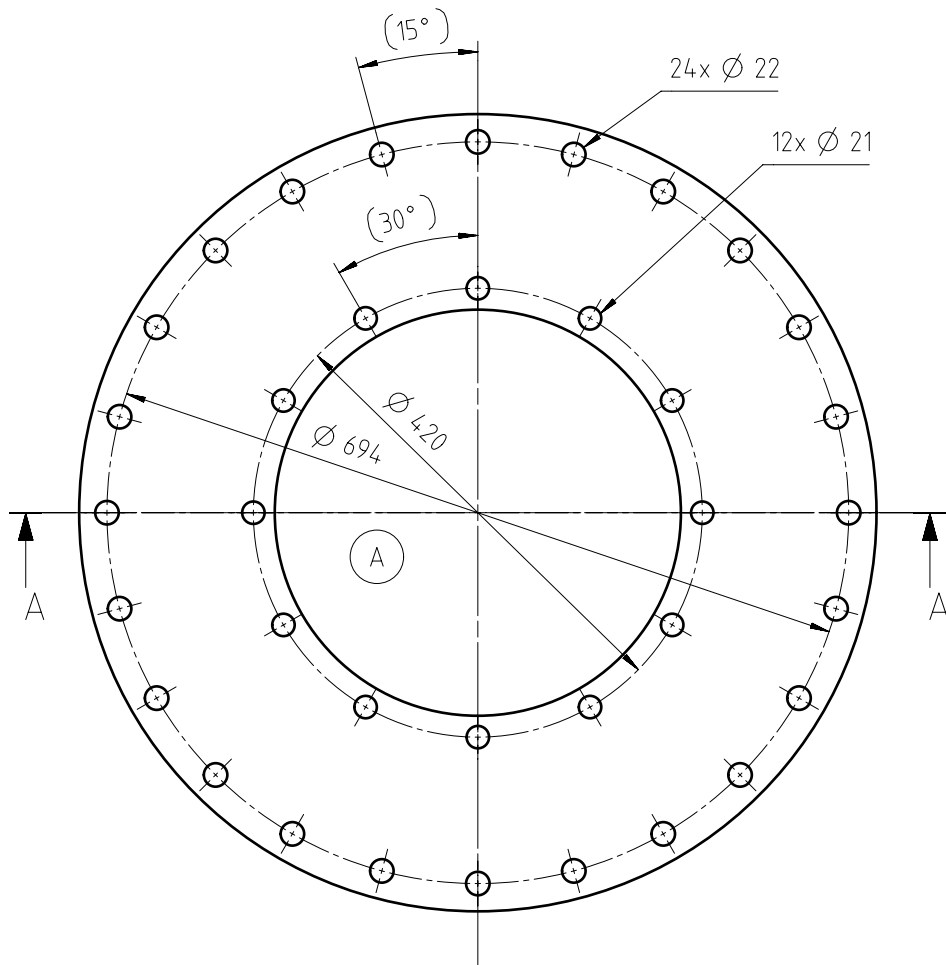


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		Number	Drawn date		Number	Drawn date		Number	Drawn date	
 Winterthur Gas & Diesel		Product W-2S		RING Ring						
Units	mm kg	NX			Basic Material		W-FU-235-JR		Net Weight 2,7	
SURFACE PROTECTION SEE GROUP 0344		Made	06.11.2012 asex06 A.Sekulic		Scale 1:5		Size A3	Page 1/1	Material ID PAAD104881	
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GENERAL TOLERANCES ACCORDING TO ISO2768-mK		Appd	03.12.2012 wwr001 Wroblewski							





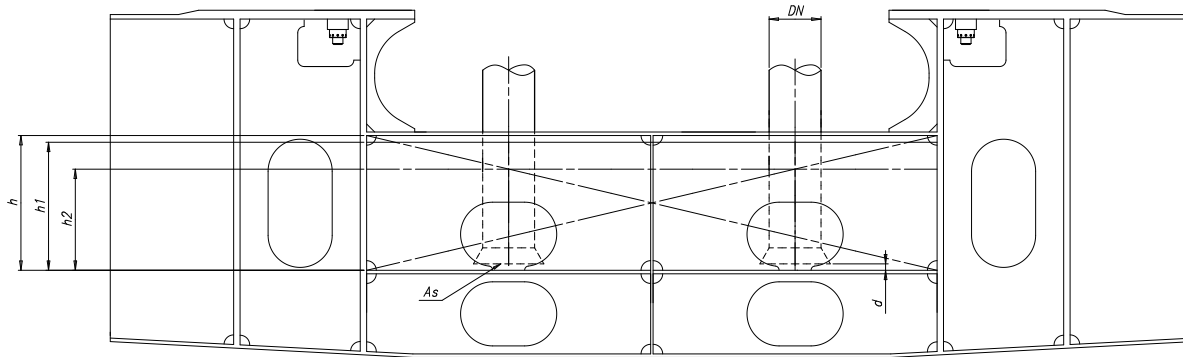
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C				
D				
	Approved			
F	<div><div><div>Free space for lic.</div><div>Q-Code XXXXXX</div><div>Standard ISO; JIS</div><div>Main Drw.</div></div><div><div>Modif.</div><div><div><div><div></div><div>Number</div><div>Drawn date</div></div><div><div></div><div>Number</div><div>Drawn date</div></div><div><div></div><div>Number</div><div>Drawn date</div></div><div><div></div><div>Number</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 Material</div><div>W-FU-235-JR</div><div>Net Weight0,15</div></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></div>			
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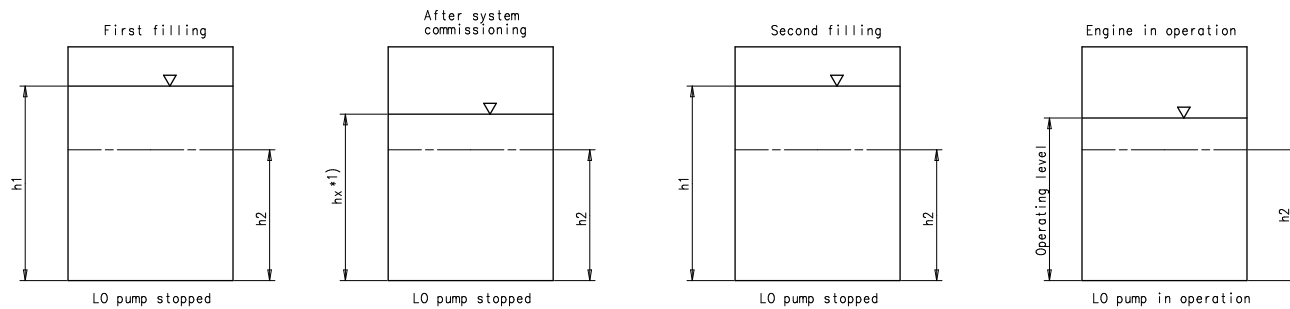
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 WIN GD Winterthur Gas & Diesel				Product W-2S		RUBBER GASKET Gummidichtung			
Units	mm kg	NX		Basic Material		NBR Perbunan		Net Weight 1,5	
SURFACE PROTECTION SEE GROUP 0344 TOLERANCING PRINCIPLE ISO8015 GENERAL TOLERANCES ACCORDING TO ISO2768-mK				Made 31.10.2012 asex06 A.Sekulic Chkd 03.12.2012 mhu019 Hug Appd 03.12.2012 wwr001 Wroblewski		Scale 1:5 Design Group 9722		Size A3 Page 1/1 Material ID PAAD104199 Drawing ID DAAD032827 Rev. A	

UD - DIMENSIONAL DRAWING - Confidential

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.

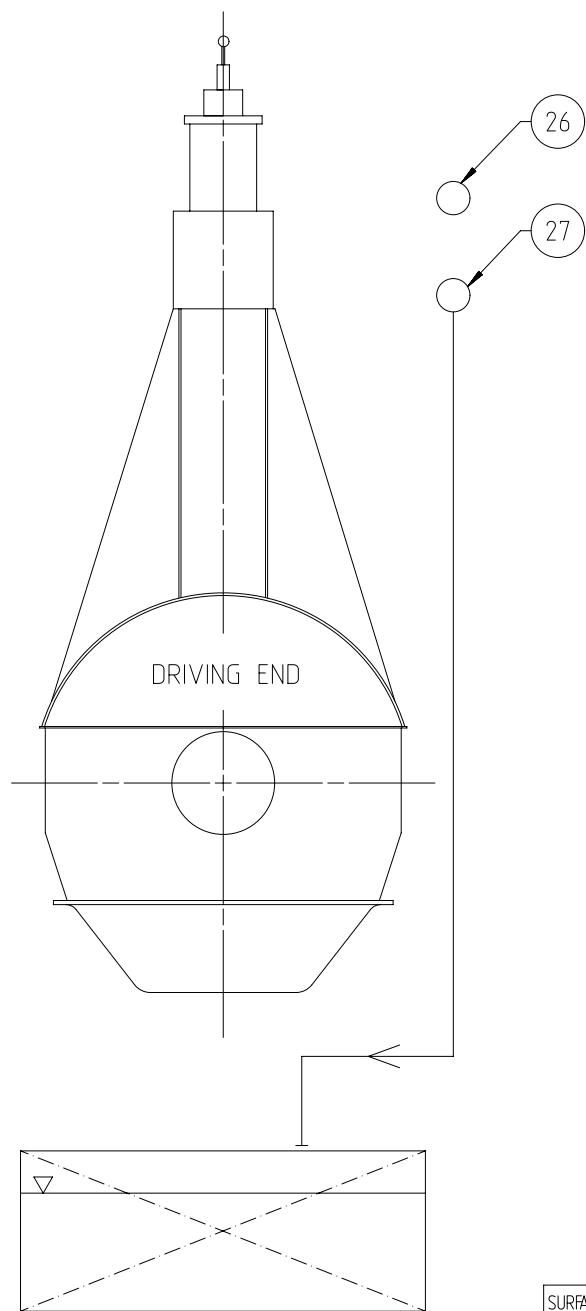
Minimum inclination angles comply with the rules of classification societies:

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).



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Standard ISO JIS							
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Number	Drawn date	Number	Drawn date	Number	Drawn date	Number	Drawn date
WIN G2		Product W-62		LUBRICATING OIL DRAIN TANK FILLING GUIDELINE			
Units	mm kg	IDE	Basic Material	Scale	1:25	Size	A1
Mode	24.09.2012	mw019 M.Hug	Page	1/1	Material ID	PAAD100971	Rev.
Chkd	30.11.2012	ste006 Feuerstein	Design Group	9722	Drawing ID	DAAD031671	C
Appd	30.11.2012	wwr001 Wroblewski					



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.	CX40DF CX52	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
<div> Winterrhur Gas & Diesel</div>					LUBRICATING OIL SYSTEM FOR SEPARATED TC LUBRICATING					
Dimension										
Scale	-		NX	Units [mm] [kg]	Basic Material			Net Weight	0.000	
Copyright Winterrhur Gas & Diesel Ltd. All rights reserved. By taking possession of the drawing the recipient recognizes and honours these rights. Neither the whole nor any part of this drawing may be used in any way for construction, fabrication, marketing or any other purpose not copied in any way nor made accessible to third parties without the previous written consent of Winterrhur Gas & Diesel Ltd.				Main Design	Design Group	9722	Q-Code	XXXXX	Standard	WDS
				Qty per	A3	Item ID	PAAD245338		Drawing Page/s	1/5

SURFACE PROTECTION SEE GROUP 0344

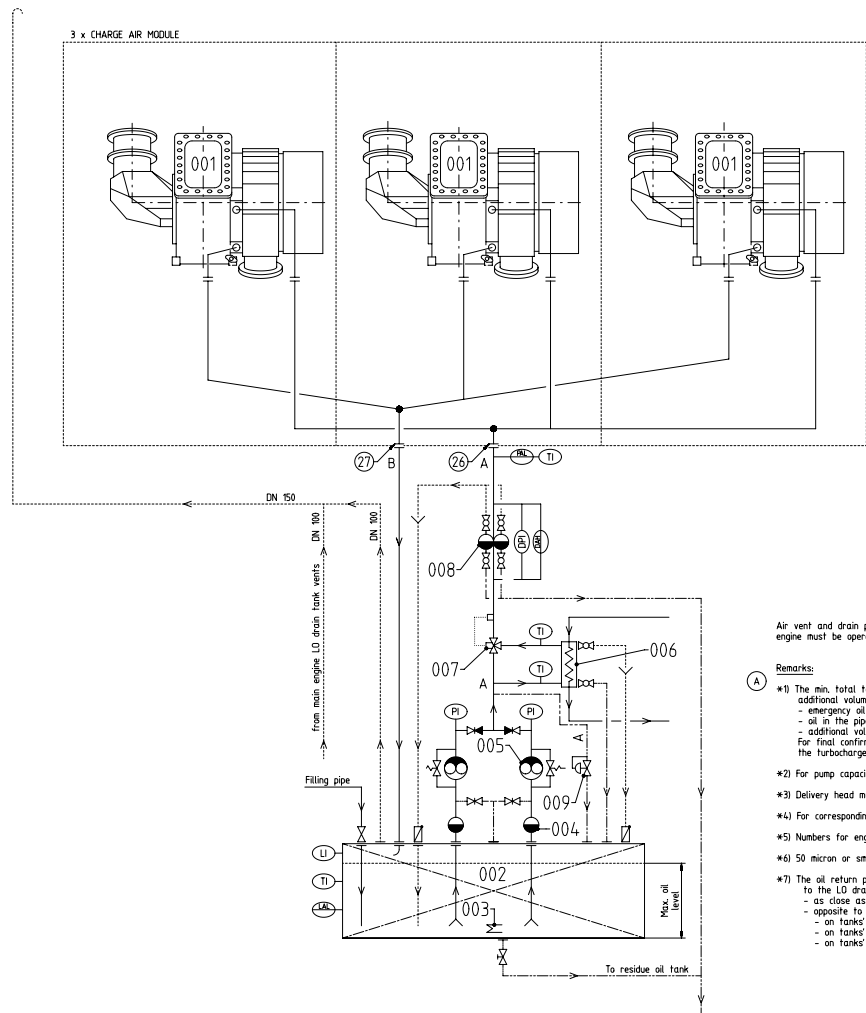
TOLERANCING PRINCIPLE ISO8015

GENERAL TOLERANCES ACCORDING TO ISO2768-mK

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Remarks:

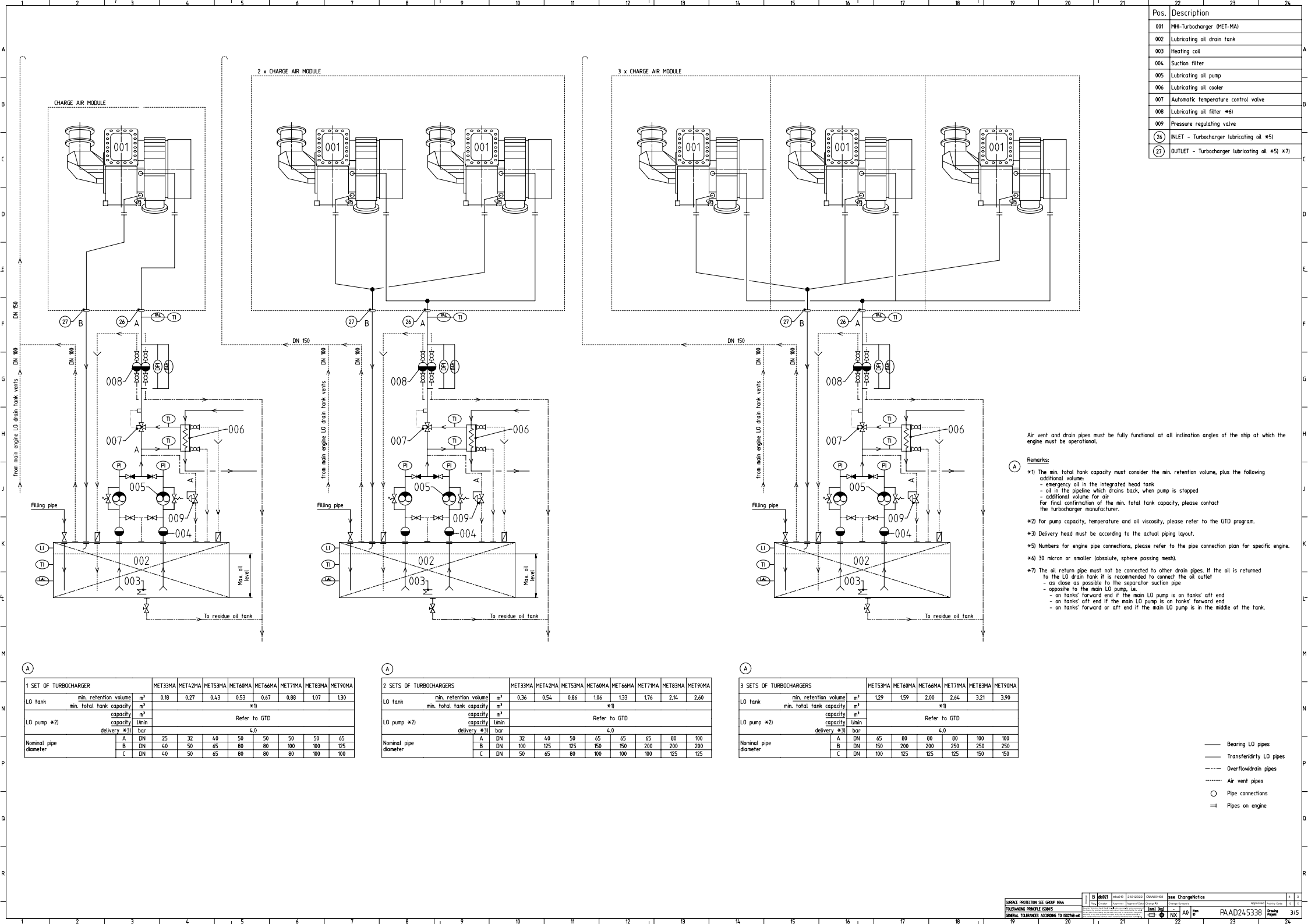
- *) The min. total tank capacity must consider the min. retention volume, plus the following additional volume:
 - emergency oil in the integrated head tank
 - oil in the pipeline which drains back, when pump is stopped
 - additional volume for airFor final confirmation of the min. total tank capacity, please contact the turbocharger manufacturer.
- *) For pump capacity, temperature and oil viscosity, please refer to the GTD program.
- *) Delivery head must be according to the actual piping layout.
- *) For corresponding data, please refer to manufacturer of turbocharger.
- *) Numbers for engine pipe connections, please refer to the pipe connection plan for specific engine.
- *) 50 micron or smaller (absolute, sparse passing mesh).
- *) 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.



2 SETS OF TURBOCHARGERS		A165-L A265-L	A170-L A270-L	A175-L A275-L	A180-L A280-L	A185-L A285-L	A190-L
L0 tank	min. retention volume	m ³					
	min. total tank capacity	m ³					
L0 pump *2)	capacity	m ³					
	capacity	l/min					
	delivery *3)	bar					
		4.0					
Nominal pipe diameter	A	DN 40	50	50	50	65	65
	B	DN 80	100	100	100	125	125
	C	DN 80	100	100	100	125	125

3 SETS OF TURBOCHARGERS		A175-L	A180-L	A185-L	
		A275-L	A280-L	A285-L	A190-L
L0 tank	min. retention volume	m³			
	min. total tank capacity	m³			
L0 pump *2)	capacity	m³			
	capacity	l/min			
	delivery *3)	bar			
		4.0			
Nominal pipe diameter	A	DN 65	65	65	80
	B	DN 125	125	150	150
	C	DN 125	125	150	150

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



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.

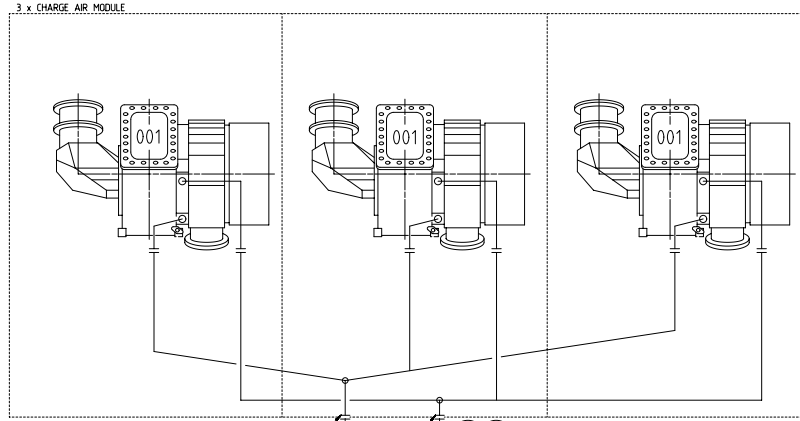
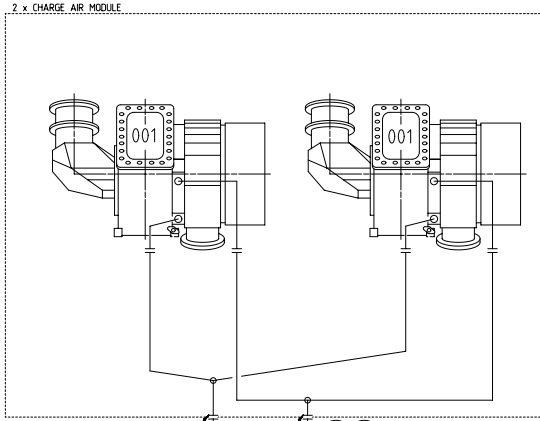
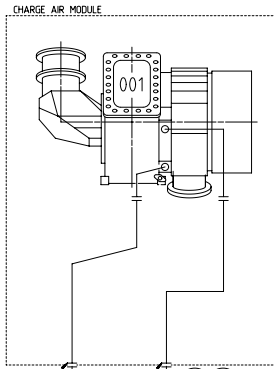
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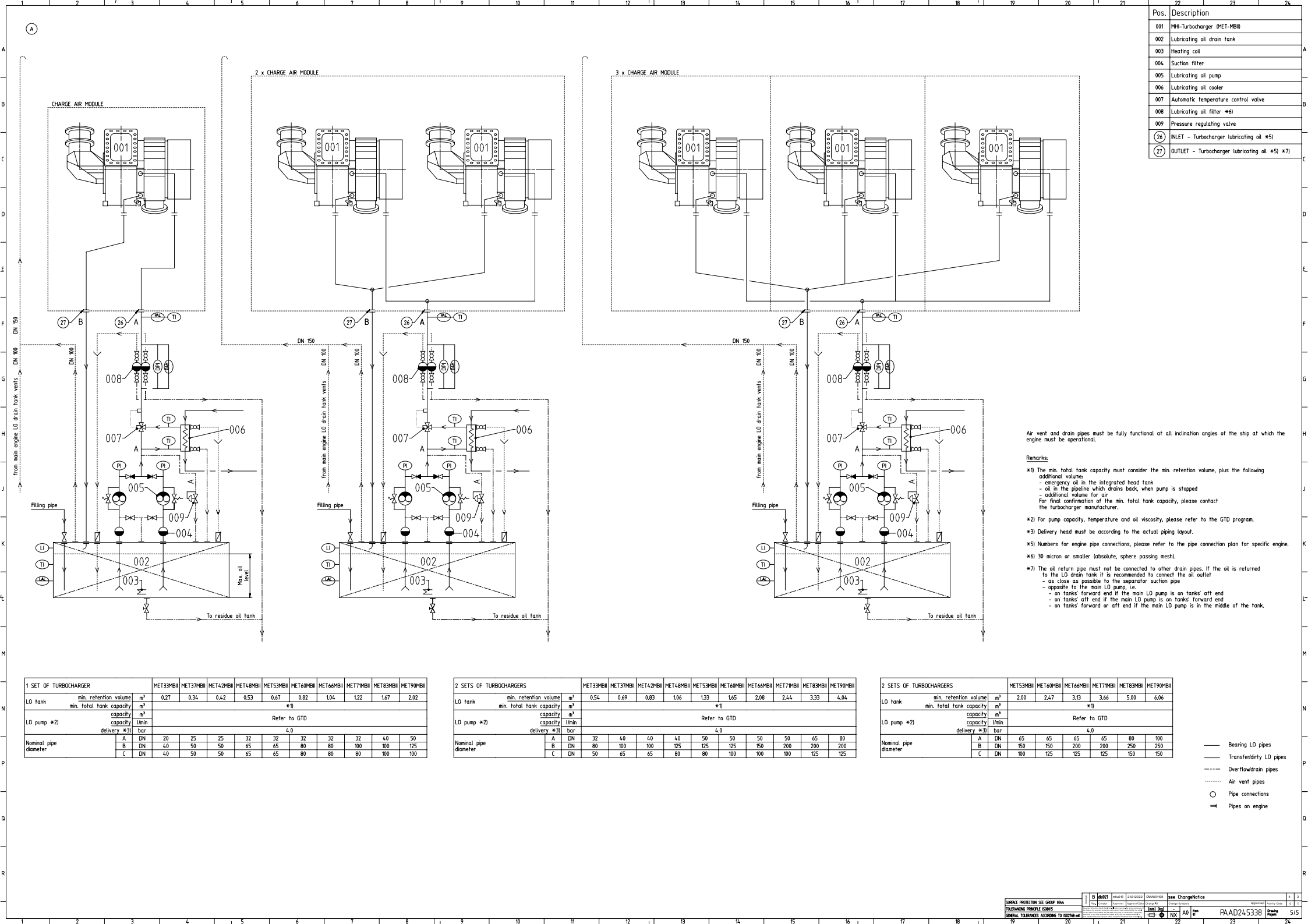
- *1) The min. total tank capacity must consider the min. retention volume, plus the following additional volume:
- emergency oil in the integrated head tank
 - oil in the pipeline which drains back, when pump is stopped
 - additional volume for air
- For final confirmation of the min. total tank capacity, 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	m ³	0.18	0.27	0.43	0.53	0.67	0.88	1.07
	min. total tank capacity	m ³	*1)						
LO pump #2)	capacity	m ³	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	m ³	0.36	0.54	0.86	1.06	1.33	1.76	2.14
	min. total tank capacity	m ³	*1)						
LO pump #2)	capacity	m ³	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

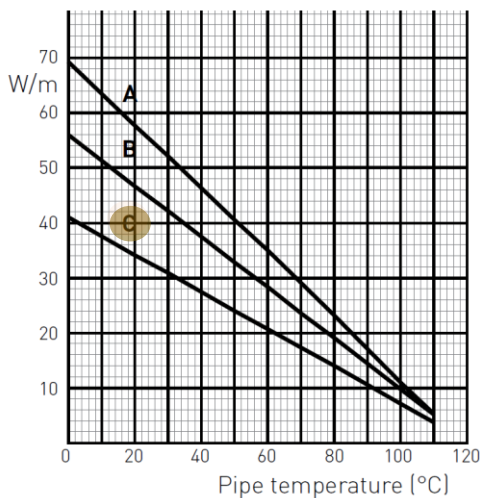
3 SETS OF TURBOCHARGERS		MET53MA	MET60MA	MET66MA	MET77MA	MET83MA	MET90MA
LO tank	min. retention volume	m ³	1.29	1.59	2.00	2.64	3.21
	min. total tank capacity	m ³	*1)				
LO pump #2)	capacity	m ³	Refer to GTD				
	delivery #3)	l/min	4.0				
Nominal pipe diameter	A	DN	65	80	80	80	100
	B	DN	150	200	200	250	250
	C	DN	100	125	125	125	150





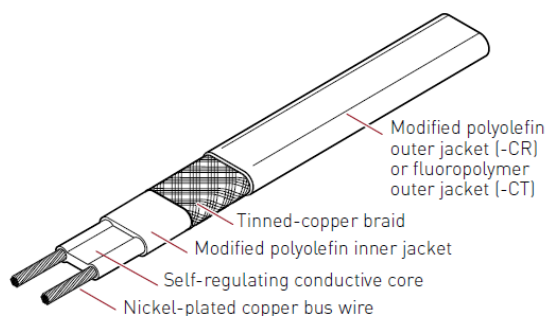
Self-Regulating Heating Cable 10QTVR2-CT

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			
		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										
Appd	24.10.2018	W. Östreicher		0009	Drawing ID DAAD106761		Rev A							

MIDS - LUBRICATING-OIL-SYSTEM (DG9722)

WinGD X62DF-S1.0 & X62DF-S2.0

TRACK CHANGES

DATE	SUBJECT	DESCRIPTION
2021-03-01	DRAWING SET	First web upload
2023-01-20	Drawing set 7 cyl	added
2023-07-17	PAAD366468A	New revision

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