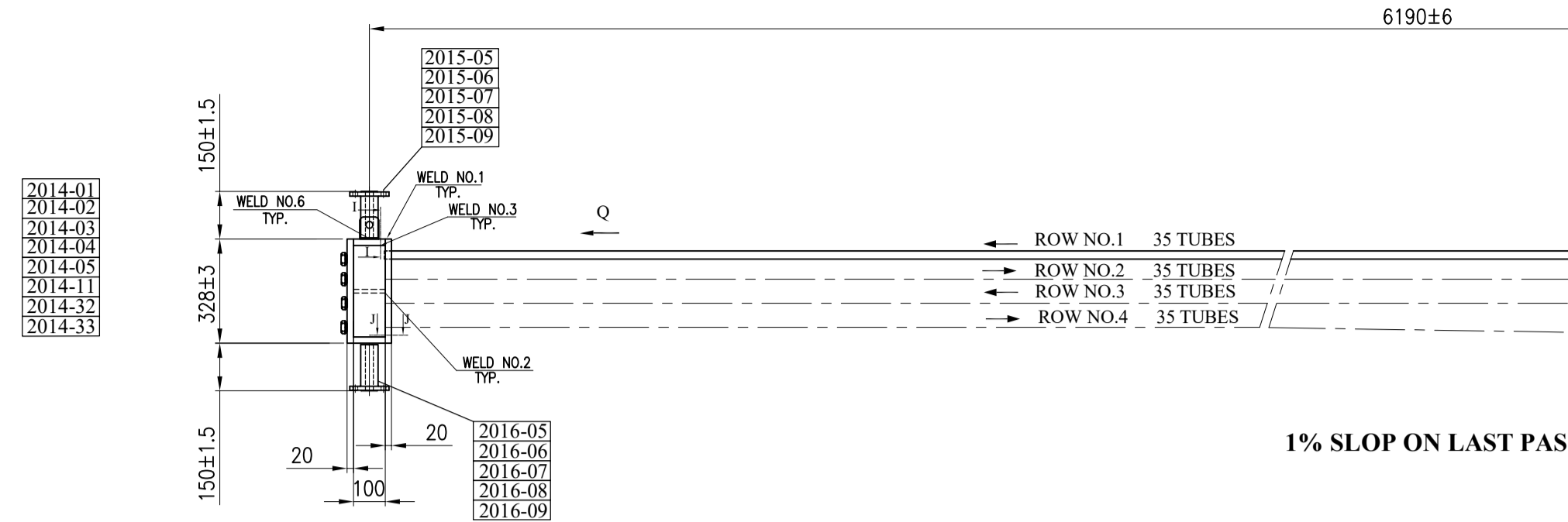
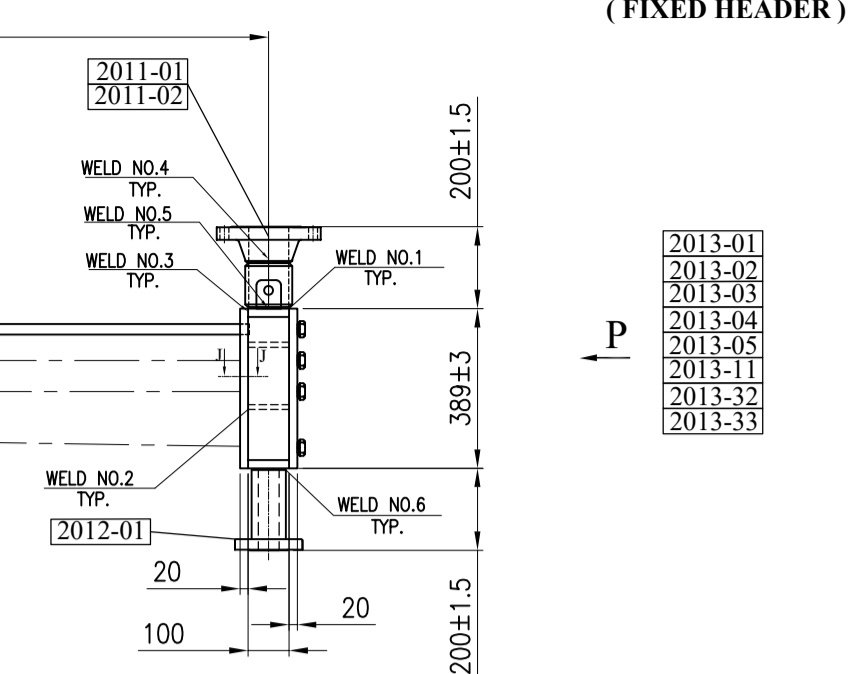


REAR HEADER (SLIDING HEADER)



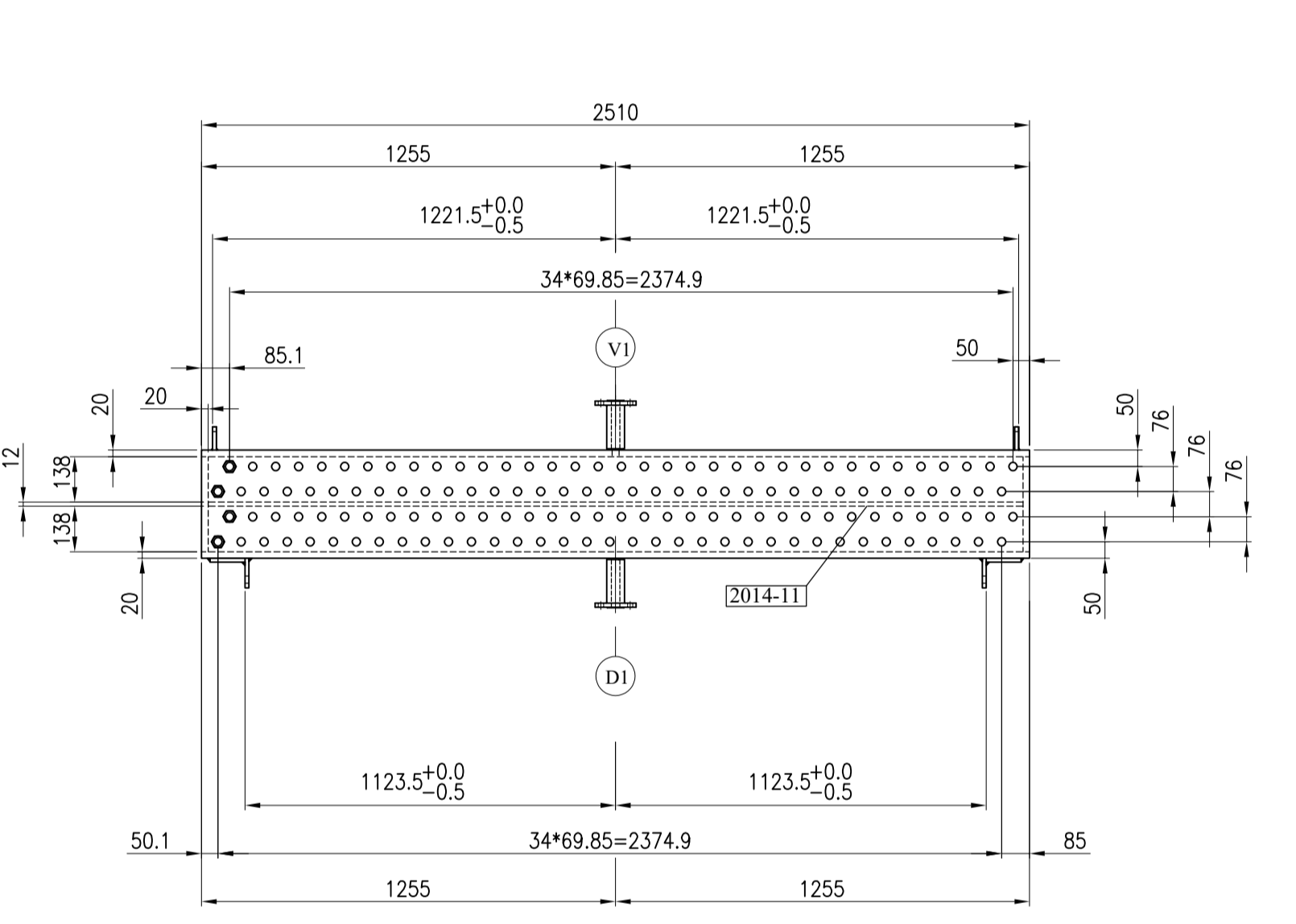
FRONT HEADER (FIXED HEADER)



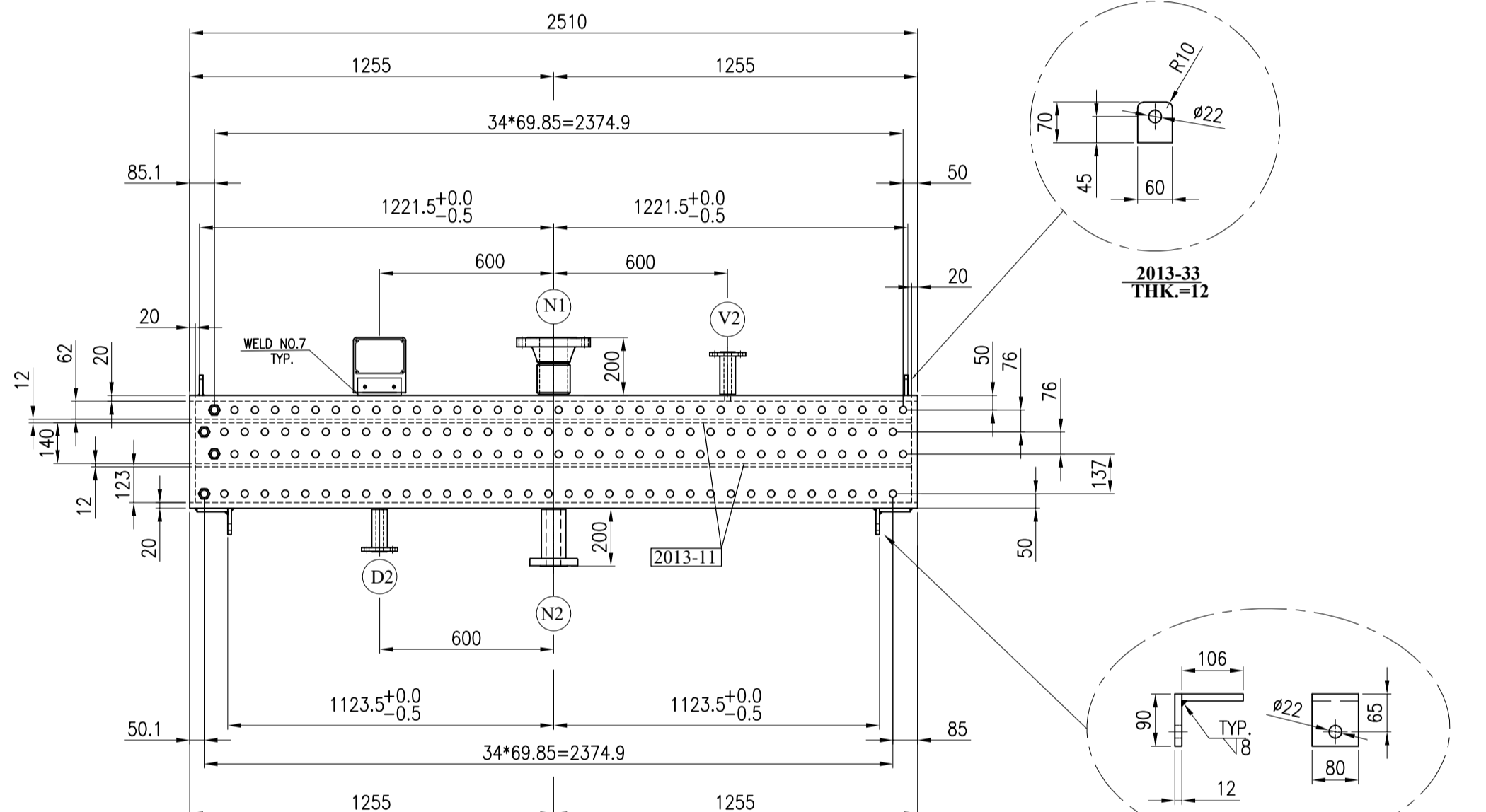
Bolts which are used for fixing headers to side frame, on sliding side shall be removed after erection.

REF. DWG NO.: E1027-DMF-VD-ME-DWG-007
1158-A01-2400-00

DETAIL OF BOLTS FOR FIXING HEADER & TRANSPORTATION



VIEW FROM "Q" REAR HEADER

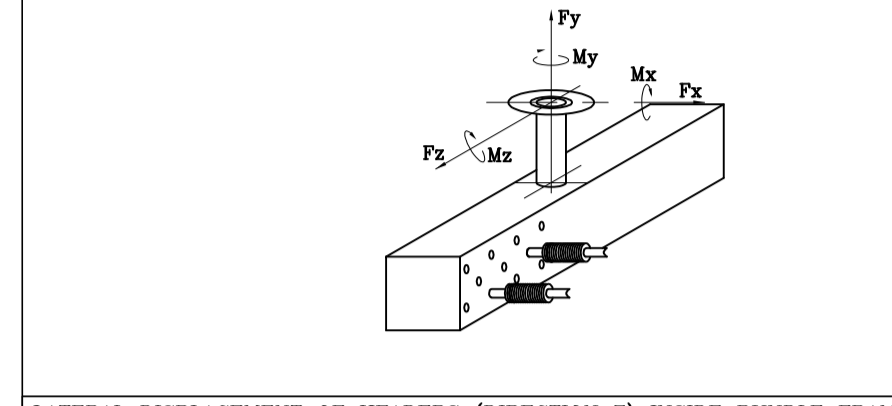


VIEW FROM "P" FRONT HEADER

- NOTES:**
- 1- ALL DIMENSIONS ARE IN MILLIMETERS.
 - 2- ALL NOZZLE FACINGS SHALL BE PROTECTED BY COVER AND 4 BOLTS.
 - 3- FLANGE CONTACT FACES SHALL BE COATED WITH GREASE.
 - 4- ALL FLANGE BOLTS SHALL STRADDLE MAIN AXES.
 - 5- ALL ENGINEERING AND MANUFACTURING CHARACTERISTICS NOT MENTIONED ON THIS DRAWING ARE INDICATED ON THE FOLLOWING APPLICABLE DOCUMENTS:
 - A- CALCULATION BOOK
 - B- WELDING PROCEDURE SPECIFICATION (W.P.S.)
 - C- NON DESTRUCTIVE TEST CHECK LIST (N.D.T.)
 - D- PAINTING & GALVANIZING SPECIFICATION SHEETS
 - 6- HEADER PLUG THREADS SHALL BE COVERED BY ANTISIZE GREASE PROPER FOR 200°C TEMPERATURE.
 - 7- THE MATERIAL OF THE SLIDING PAD BETWEEN THE BUNDLE FRAME AND THE HEADER IS TEFLON(PTFE), FOR MORE INFORMATION, REFER TO DWG. NO. E1027-DMF-VD-ME-DWG-007
 - 8- MATERIAL FOR PLATE/C/S FOR PRESSURE PART TO BE IMPACT TESTED.

THE MAXIMUM ALLOWABLE MOMENTS AND FORCES PER EACH NOZZLE (IF LOADS ARE DIVIDED EQUALLY FOR NOZZLES ACCORDING TO 3rd API 681(7.1.10.1))

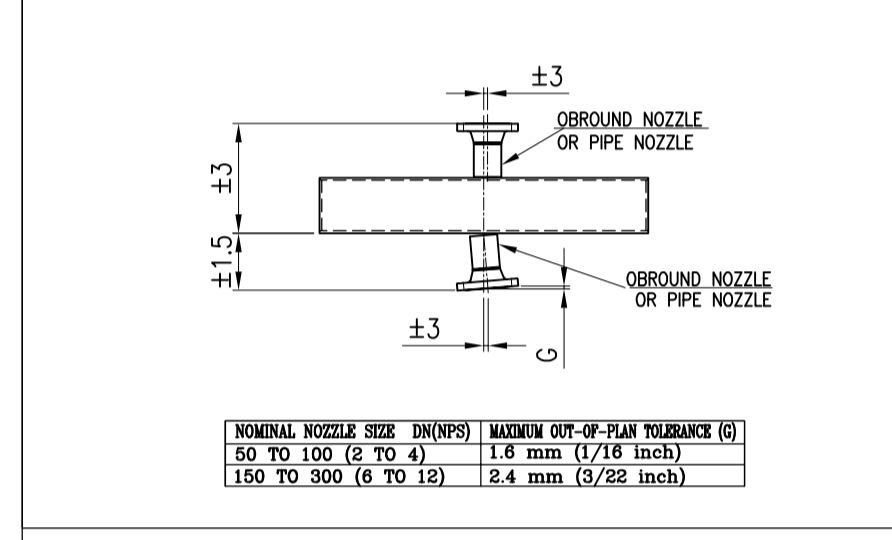
SIZE	Fx(N)	Fy(N)	Fz(N)	Mx(N.m)	My(N.m)	Mz(N.m)
4"	10020	8010	10020	2430	3660	2430
2"	3060	3990	3060	450	720	450



LATERAL DISPLACEMENT OF HEADERS (DIRECTION Z) INSIDE BUNDLE FRAME IN RELATION WITH EXPANSION FORCES ON NOZZLES (mm) (ACCORDING TO API681 7-1-1-2)

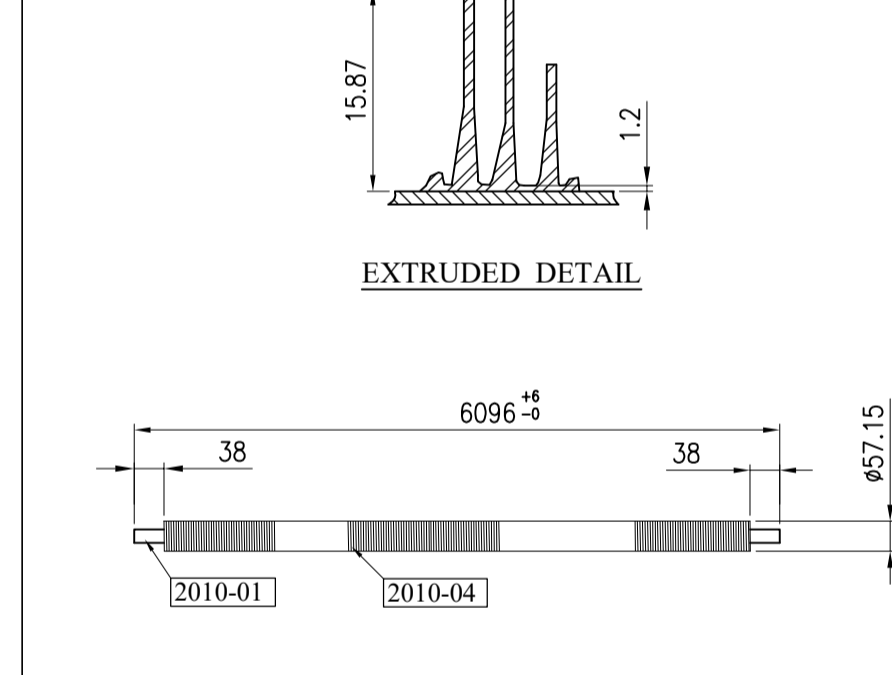
MAXIMUM DISPLACEMENT OF FRONT AND REAR HEADER(Z DIRECTION) INLET/OUTLET : ±9

NOZZLE ALIGNMENT TOLERANCES



FIN TUBE DETAIL

EXTRUDED DETAIL



EXTRUDED FIN TUBE 1" SEAMLESS FPI=11 Fin dia.=Ø57.15

PART NO.	DESCRIPTION	DIMENSIONS			MATERIAL	QTY.	UNIT WEIGHT (Kg)	TOTAL WEIGHT (Kg)	STD DWG	REV.
		DI. (mm)	LENGTH (mm)	THK. (mm)						
2000-00	A TUBE BUNDLE INCLUDING :	-	-	-	-	2	2920.4	5841	-	-
2010-00	EXTRUDED FINNED TUBE INCLUDING :	-	-	-	-	-	-	2010.7	-	-
2010-01	BASE TUBE 1" (SEAMLESS-MIN WALL-BWG16)	25.4	6096	1.65	SA-334 Gr.6	140	6.5	913.2	-	-
2010-04	ALUMINUM TUBE	35.75	5212.08	4.9	AL-1060	140	7.6	1097.5	-	-
2011-00	INLET NOZZLE INCLUDING :	-	-	-	-	-	-	9.5	-	-
2011-01	PIPE NOZZLE 4", SCH 80 (SEAMLESS)	107	-	8.56	SA-333 Gr.6	1	2.4	2.4	-	R4
2011-02	FLANGE 4" (ANSI B16.5, 300#, WN, RF)	254	86	-	SA-350 LF2 CL.1N	1	7.1	7.1	-	-
2012-00	OUTLET NOZZLE INCLUDING :	-	-	-	-	-	-	3.5	-	-
2012-01	NOZZLE 2", (ANSI B16.5, 300#, LWN, RF)	165	198	16.6	SA-350 LF2 CL.1N	1	3.5	3.5	-	-
2013-00	FRONT HEADER INCLUDING :	-	-	-	-	-	-	446.8	-	-
2013-01	TUBE SHEET	-	2510	389	20	-	-	1	1533	1533.3
2013-02	PLUG SHEET	-	2510	389	20	-	-	1	1533	1533.3
2013-03	TOP PLATE	-	2510	100	20	-	-	1	394	394.4
2013-04	BOTTOM PLATE	-	2510	100	20	-	-	1	394	394.4
2013-05	END PLATE	-	349	100	20	-	-	2	5.5	11.0
2013-06	PARTITION	-	2470	100	12	-	-	2	23.3	46.5
2013-07	SLIDING PAD	-	10690	80	12	-	-	2	1.6	3.1
2013-08	FIXING	-	70	60	12	-	-	2	0.4	0.8
2014-00	REAR HEADER INCLUDING :	-	-	-	-	-	-	-	-	-
2014-01	TUBE SHEET	-	2510	328	20	-	-	1	1293	1293.3
2014-02	PLUG SHEET	-	2510	328	20	-	-	1	1293	1293.3
2014-03	TOP PLATE	-	2510	100	20	-	-	1	394	394.4
2014-04	BOTTOM PLATE	-	2510	100	20	-	-	1	394	394.4
2014-05	END PLATE	-	288	100	20	-	-	2	4.5	9.0
2014-06	PARTITION	-	2470	100	12	-	-	1	23.3	23.3
2014-07	SLIDING PAD	-	10690	80	12	-	-	2	1.6	3.1
2014-08	FIXING	-	70	60	12	-	-	2	0.4	0.8
2015-00	VENT INCLUDING :	-	-	-	-	-	-	-	-	-
2015-01	FLANGE LWN 1", 300 #RF	124	146	-	14.3	-	-	2	2.0	4.0
2015-02	BLIND FOR FLANGE LWN 1", 300 #RF	-	-	-	-	-	-	2	1.5	3.0
2015-03	GASKET FOR FLANGE LWN 1", 300 #RF	-	-	-	-	-	-	-	-	-
2015-04	STUD BOLT FOR FLANGE, LWN 1", 300 #RF	M16	80	-	-	-	-	8	-	-
2015-05	NUT	M16	-	-	-	-	-	16	-	-
2016-00	DRAIN INCLUDING :	-	-	-	-	-	-	-	-	-
2016-01	FLANGE LWN 1", 300 #RF	124	146	-	14.3	-	-	2	2.0	4.0
2016-02	BLIND FOR FLANGE LWN 1", 300 #RF	-	-	-	-	-	-	2	1.5	3.0
2016-03	GASKET FOR FLANGE LWN 1", 300 #RF	-	-	-	-	-	-	-	-	-
2016-04	STUD BOLT FOR FLANGE, LWN 1", 300 #RF	M16	80	-	-	-	-	8	-	-
2016-05	NUT	M16	-	-	-	-	-	16	-	-
2020-00	MISCELLANEOUS PARTS INCLUDING :	-	-	-	-	-	-	-	-	-
2020-01	PLUG (1 1/8" 12 UNF CL.2A)	-	-	-	-	-	-	280	0.22	61.6
2020-02	PLUG GASKET	2955.5	-	-	-	-	-	1	-	2290
2020-05	STAND FOR BRACKET	-	150	60	5	-	-	1	0.35	0.7

MARK NO.	SERVICE	SIZE	NOZZLE MATERIAL	FLANGE MATERIAL	RATING	TYPE	FACING	SCH.	THK.	FLANGE FACE FINISHING	QTY. PER BUNDLE	ITEM
N1	INLET NOZZLE	4"	SA-333 Gr.6	SA-350 LF2 CL.1N	300#	LWN	RF	160	125-250 µin	1	2	
N2	OUTLET NOZZLE	2"	SA-350 LF2 CL.1N	SA-350 LF2 CL.1N	300#	LWN	RF	16.6	125-250 µin	1	2	
N1,N2	VENT WITH BLIND & GASKET	1"	SA-350 LF2 CL.1N	SA-350 LF2 CL.1N	300#	LWN	-	-	-	-	2	4
D1,D2	DRAIN WITH BLIND & GASKET	1"	SA-350 LF2 CL.1N	SA-350 LF2 CL.1N	300#	LWN	-	-	-	-	2	4

APPLICABLE CODES AND STANDARDS
ASME VIII-DIV.1 2019, API 661

SERVICE	PROPANE
MAXIMUM DESIGN TEMPERATURE (°C)	120
MINIMUM AMBIENT TEMPERATURE (°C)	-5
MINIMUM DESIGN METAL TEMPERATURE (°C)	-45
DESIGN PRESSURE (barg)	22#F.V.
TEST PRESSURE (barg)	25.6
CORROSION ALLOWANCE	3
WELD JOINT EFFICIENCY	0.6 FOR PARTITION / 0.85 FOR OTHER PARTS
HYDROTEST	YES
POST WELD HEAT TREATMENT	YES
N.D.T. EXAMINATION OF WELDED JOINTS	SEE NDT CHECK LIST
TUBE TO TUBE SHEET JOINT	STRENGTH WELD + EXPANDED
BUNDLE CAPACITY (m ³)	0.480
BUNDLE WEIGHT WITH FRAME (EMPTY) (Kg)	2920
BUNDLE WEIGHT WITH FRAME (FULL OF WATER) (Kg)	3400
ULTRASONIC TEST (NOZZLE TO HEADER)	YES

REFERENCE DOCUMENTS		
TITLE	VENDOR DOCUMENT NO.	CLIENT DOCUMENT NO.
GENERAL ARRANGEMENT	1158-A01-1000-00	E1027-DMF-VD-ME-DWG-003
BUNDLE FRAME	1158-A01-2400-00	E1027-DMF-VD-ME-DWG-007
AIR COOLER DATA SHEET	1158-A01-0010-00	E1027-DMF-VD-ME-DSH-002
MECHANICAL CALCULATION	1158-A01-0020-00	E1027-DMF-VD-ME-CAL-006
WELDING PROCEDURE SPECIFICATION (W.P.S.)	1158-A01-0060-00	E1027-DMF-VD-QC-WPS-021
NON DESTRUCTIVE TEST CHECK LIST (N.D.T.)	1158-A01-0070-00	E1027-DMF-VD-QC-PRO-022

R#	DATE	ISSUED FOR APPROVAL	SH.S	S.S	J.B.L	A.GHZ
R4	03/11/2025	ISSUED FOR APPROVAL	SH.S	S.S	J.B.L	A.GHZ
R3	07/31/2024	ISSUED FOR APPROVAL	F.SZ	S.S	J.B.L	A.GHZ
R2	07/22/2024	ISSUED FOR APPROVAL	F.SZ	S.S	J.B.L	A.GHZ
R1	06/26/2024	ISSUED FOR APPROVAL	F.SZ	S.S	J.B.L	A.GHZ
R0	06/02/2024	ISSUED FOR APPROVAL	F.SZ	S.S	J.B.L	A.GHZ

REV. DATE DESCRIPTION DRAWN BY CHECKED BY APPROVED BY FINAL APPROVED BY CONTRACTOR:

ENBR TEKNOLOJI

PROJECT : **AIR COOLER FOR Toase-che Park Sanati Gohar Ofogh Petrochemical Co.**

TUBE BUNDLE DRAWING
1158-A01-2000-00

DWG. NO. E1027-DMF-VD-ME-DWG-005
SCALE: N.T.S. SIZE: A1 REV.: R4

dt Damafin thermal technology
Factory : Km 14 special Karaj road

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WPS NO. 1158-000-0060-00

