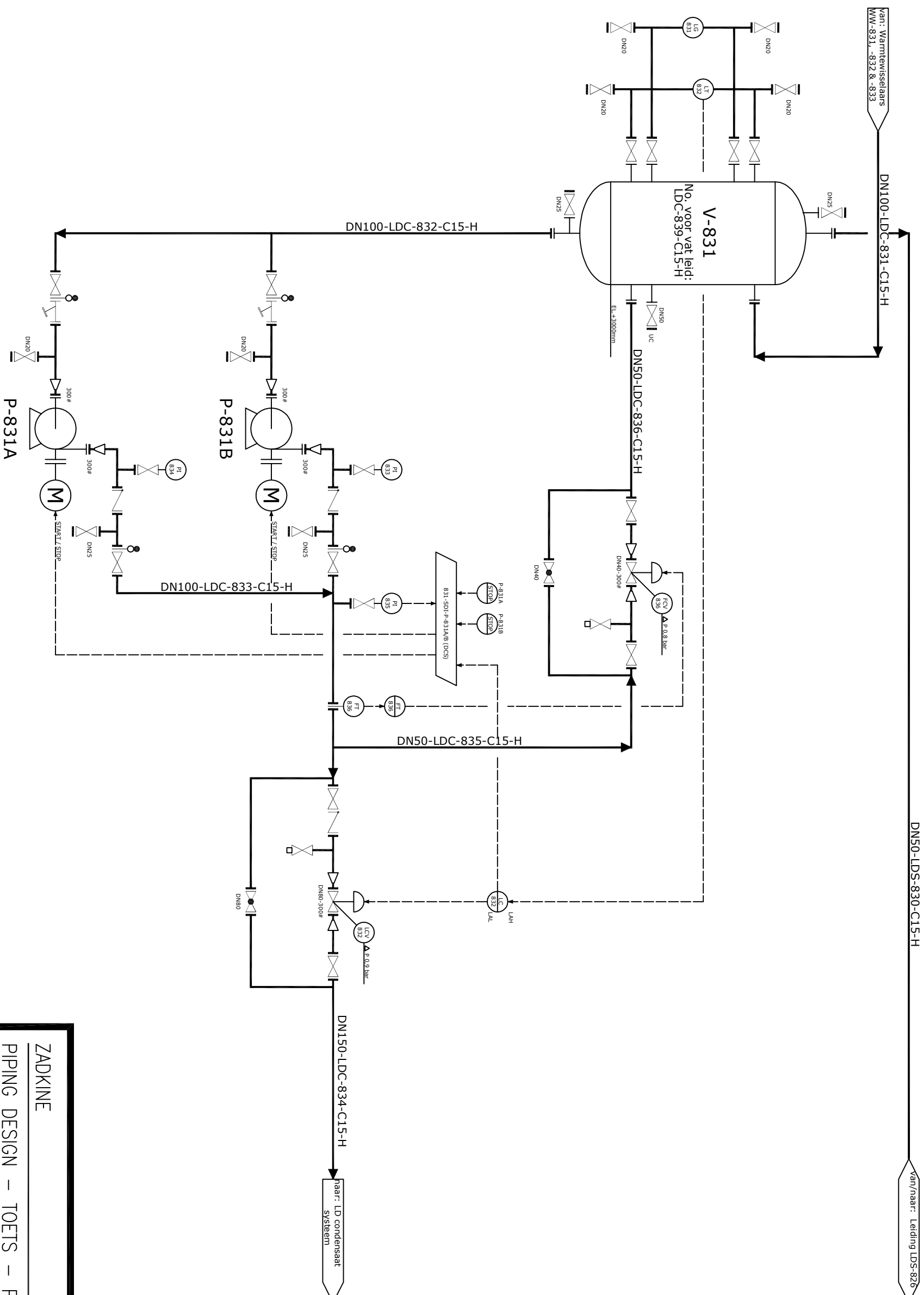


V-831
LD condensaat vat
D x H : 0,9 m x 2,2 m
Temp: 177 °C Druk: 5,9/FV barg

P-831A/B
LD condensaat pomp
Capaciteit: 20 m3/h
Temp: 177 °C Druk: 0,9 bar



ZADKINE
 PIPING DESIGN – TOETS – P&ID
 TEKENING ALLEEN TE GEBRUIKEN VOOR OPDRACHT PIPING CURSUS

Piping DE LEIDINGEN
Een vak apart!

PIPING DESIGN – TOETS - LEIDINGLIJST

Leidingnummer	van -> naar	Medium code	Medium	Toestand	Ontwerp druk (Barg)	Ontwerp temp (°C)	DN max(mm)	Pipeclass	Rating (psi)	Corrosie toeslag (mm)	Test druk	Operating druk (Bar)	Operating temp (°C)	Isolatie dikte (mm)	Isolatie code	P&ID nr.	Opmerkingen
830	V-831 <-> 826	LDS	LD Stoom	V	5.9/FV	177	50	C15	150	1.6	29.4	2.9	145	40	H	P&ID	
831	WW-831-833 -> V-831	LDC	LD Condensaat	L/V	5.8/FV	177	100	C15	150	1.6	29.4	2.2	147	50	H	P&ID	
832	V-831 -> P-831A/B	LDC	LD Condensaat	L/V	5.8/FV	177	100	C15	150	1.6	29.4	2.9	145	50	H	P&ID	
833	P-8336 A/B -> LCV-832	LDC	LD Condensaat	L/V	7.5	177	100	C15	150	1.6	29.4	3.7	145	50	H	P&ID	
833	LCV-832 -> LC Header	LDC	LD Condensaat	L/V	7.5	177	150	C15	150	1.6	29.4	3.7	145	50	H	P&ID	
835	833 -> 836	LDC	LD Condensaat	L/V	7.5	177	50	C15	150	1.6	29.4	3.7	145	40	H	P&ID	
836	835 -> V-831	LDC	LD Condensaat	L/V	5.8/FV	177	50	C15	150	1.6	29.4	2.9	145	40	H	P&ID	
839	V-831 Vat leidingen	LDC	LD Condensaat	L	5.9/FV	177	50	C15	150	1.6	29.4	2.9	145	30	H	P&ID	Vat leidingen

Toestand:

L = Liquid
V = Vapour
G = Gas

Isolatie code

H = Warmte conservering

PIPING DESIGN - TOETS - DATASHEET POMP

Klant : ROC		Rotating Equipment		Always refer to this number					
Project : Uitbreiding condensaat capaciteit				Zadkine	Piping cursus				
Locatie : Nederland		Afdeling :		Project :					
		Doc. No.: Pomp data sheet							
1	<table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Equipment Number</u></th> <th style="text-align: left;"><u>Service Name</u></th> </tr> </thead> <tbody> <tr> <td>P-831 A/B</td> <td>LD Condensaat Pompen</td> </tr> </tbody> </table>	<u>Equipment Number</u>	<u>Service Name</u>	P-831 A/B	LD Condensaat Pompen				
<u>Equipment Number</u>		<u>Service Name</u>							
P-831 A/B		LD Condensaat Pompen							
2									
3									
4									
5									
6									
7									
8		1							
9		1							
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
REV.	DATUM	OMSCHRIJVING	GEMAAKT	GECONTROLEERD	GOEDGEKEURD				

PIPING DESIGN - TOETS - DATASHEET POMP

Client : ROC		Rotating Equipment		Always refer to this number	
Plant : Uitbreiding condensaat capaciteit				Zadkine	Piping cursus
Location : Nederland		Dept./Sect.		Project	
Doc. No.: Pomp data sheet					
1	Equipment No. : P-831 A/B				
2	Service Name : LD Condensaat Pompen				Quantity : 2
3	GENERAL				
4	Location :	<input type="checkbox"/> Indoor	<input checked="" type="checkbox"/> Outdoor	<input type="checkbox"/> Protected	<input checked="" type="checkbox"/> Unprotected
5	Operation :	<input checked="" type="checkbox"/> Individual	<input type="checkbox"/> Parallel	<input type="checkbox"/> Series	
6		<input checked="" type="checkbox"/> Continuous	<input type="checkbox"/> Intermittent	<input type="checkbox"/> Occasional	
7	Area class.:	Zone: 2	Gas group: II C	Temperature class: T3	
8	Driver :	Main: E-motor	No. required: 1	Supplied by :	Pump seller Mounted by: Pump seller
9		Spare: E-motor	No. required: 1	Supplied by :	Pump seller Mounted by: Pump seller
10	LIQUID PROPERTIES			CONSTRUCTION	
11	Liquid :	Condensate			Manufacturer's design, bar(g) / °C:
12	Hazardous :	<input type="checkbox"/> Toxic	<input type="checkbox"/> Aggressive	<input type="checkbox"/>	Suction : 42 / 180
13		<input type="checkbox"/> Flammable	<input type="checkbox"/> Self-igniting	<input type="checkbox"/>	Discharge : 42 / 180
14	Corrosive :	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Due to:	Hydrostatic test pressure, bar(g): Suction / Discharge 63 / 63
15	Solids :	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Size, mm:	Shaft : <input checked="" type="checkbox"/> Horizontal <input type="checkbox"/> Vertical
16	Gas in fluid:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Vol., %:	<input checked="" type="checkbox"/> Overhung <input type="checkbox"/> Between bearing
17					Suction : <input checked="" type="checkbox"/> Single <input type="checkbox"/> Double <input type="checkbox"/> Open suction
18	Temperature, °C :	Minimum	Normal	Maximum	Casing : <input checked="" type="checkbox"/> Volute <input checked="" type="checkbox"/> Single <input type="checkbox"/> Double
19	Density, kg/m³ :	136	145	145	<input type="checkbox"/> Diffuser <input type="checkbox"/> Staggered
20	Viscosity, cP :	0.2	0.2	0.2	Split : <input type="checkbox"/> Axial <input checked="" type="checkbox"/> Radial <input type="checkbox"/> Barrel / Can
21	Vapor pressure, bar(a):	3.2	3.9	3.9	Mounting : <input type="checkbox"/> Foot <input type="checkbox"/> Bracket <input checked="" type="checkbox"/> Centerline
22	Specific heat, kJ/kgK :				<input type="checkbox"/> Flange
23	OPERATING CONDITIONS				
24		Minimum	Normal	Rated	Impeller(s) : <input checked="" type="checkbox"/> Closed <input type="checkbox"/> Semi-open <input type="checkbox"/> Open
25	Capacity, m³/h :	11.7	19.6	21.4	Number of impellers :
26	Pressure, bar(g):				Diameter, mm: Rated Maximum
27	Suction:	2.4	3.1	3.1	First stage: 193 205
28	Differential:	3.4	4	4.07	Follow stages:
29	Differential head, m:	1	0.99	0.97	Wear rings : <input type="checkbox"/> None <input checked="" type="checkbox"/> Casing <input checked="" type="checkbox"/> Impeller
30	Hydraulic power, kW:				<input checked="" type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Grooved <input type="checkbox"/> Straight
31	Design conditions, bar(g) / °C:				Thrust bal. : <input type="checkbox"/> None <input type="checkbox"/> Balance holes <input type="checkbox"/> Back vanes
32	Suction :		7.5	177	<input type="checkbox"/> Balanced opposed impellers <input type="checkbox"/> Balance drum <input type="checkbox"/> Balance disc
33	Discharge :		7.5	177	Jacket : <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No ; For: <input type="checkbox"/> Heating <input type="checkbox"/> Cooling
34	Minimum Design Metal Temperature, °C :		0		On : <input type="checkbox"/> Stuffing box <input type="checkbox"/> Bearing bracket <input type="checkbox"/> Pedestals
35	PUMP PERFORMANCE				
36	Performance Curve no. :	R 200/50 GM1B		Rated speed, rpm:	1450
37	Shut-off head, m :	12.8	3)	Max. pressure, bar(g):	1.17
38	Efficiency, % :	53.82			
39	Power, kW:	Normal / Rated:	/ 1.1		
40		Maximum / Driver:	1.3 / 4		
41	Q-normal/Q-BEP, % :	Q-rated/Q-BEP, % : 89			
42	Minimum flow, Thermal/Mechanical, m³/h:	/ 6 5)			
43	NPSHR, Rated / 125% flow, m:	0.7 /			
44	Suction specific speed:	8176	(< 12780) (Units: rpm, m³/h,m)		
45	Viscosity correction, CH / CQ / CE:	1.0 / 1.0 / 1.0			
46	Critical speed, rpm:	- 1st./2nd. : /			
47					
48					
49					
50	Notes: Q = Capacity; BEP = Best Efficiency Point; CW = Clockwise; CCW = Counter Clockwise				
51	1) At rated impeller diameter.				
52	2) Pumps shall be able to start against open discharge valve.				
53	3) Shut-off head shall not exceed 15 mliq.				
54	4) Vendor to advise on minimum flow requirements.				
55					
56					
57					
58					
59					
60					

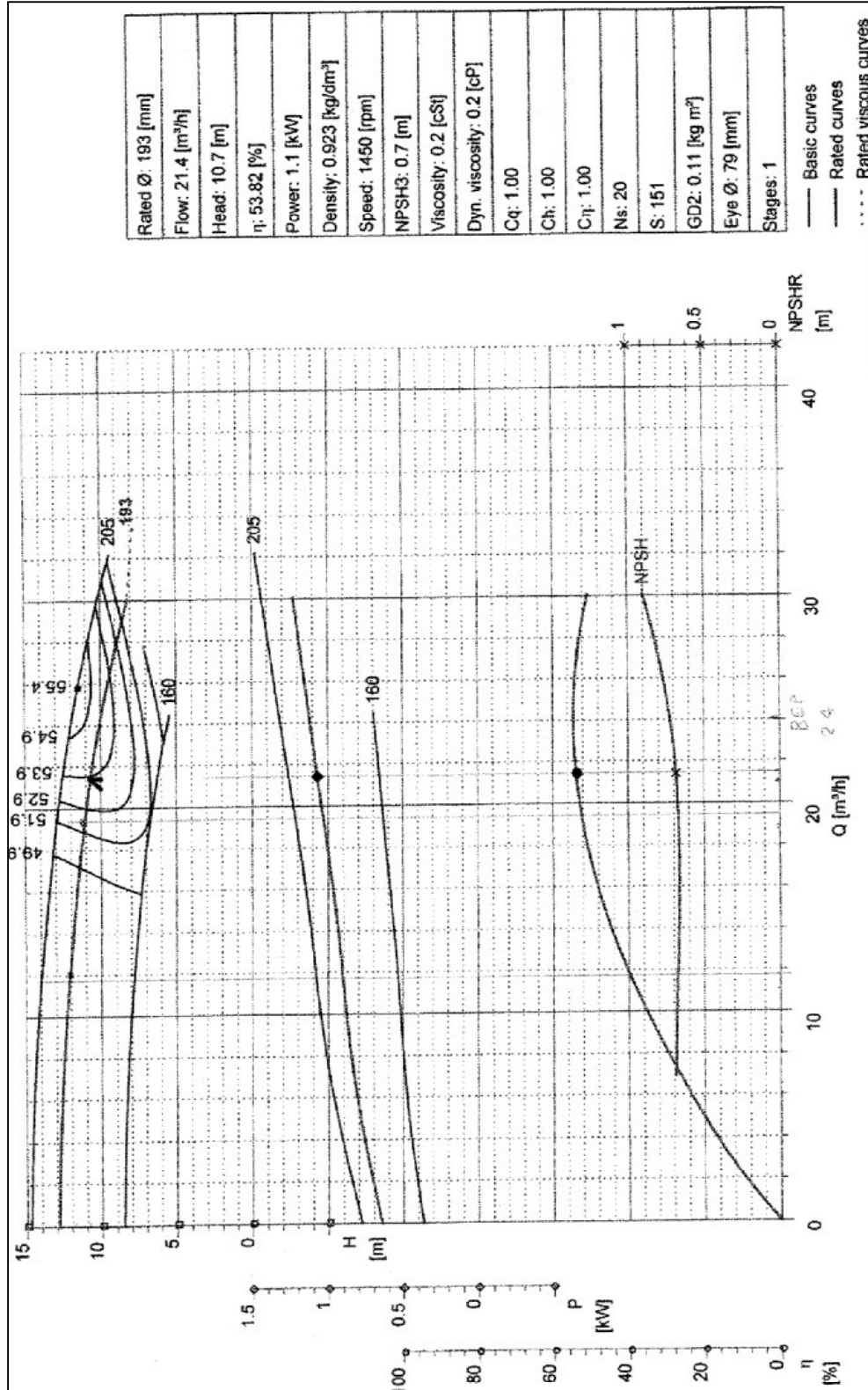
PIPING DESIGN - TOETS - DATASHEET POMP

Client : ROC		Rotating Equipment		Always refer to this number		
Plant : Uitbreiding condensaat capaciteit				Zadkine	Piping cursus	
Location : Nederland		Dept./Sect.		Project		
Doc. No.: Pomp data sheet						
1	Equipment No. : P-831 A/B					
2	Service Name : LD Condensaat Pompen Quantity : 2					
3	MATERIALS OF CONSTRUCTION			PUMP FEATURES		
4	Material Class	: S-6 (as per API 610)	Certificate 1)	Shaft sealing	: <input type="checkbox"/> Packing <input checked="" type="checkbox"/> Mechanical seal <input type="checkbox"/> Seal-less	
5	Casing	: Carbon steel	3.1B	No. of packing rings:	Lantern ring: <input type="checkbox"/> Yes <input type="checkbox"/> No	
6	1 Barrel	:	3.1B	Seal code	: BST -- Special :	
7	Impeller(s)	: 12% CHR	3.1B	Manufacturer	:	
8	Shaft	: AISI 4140	2.2	Model & size	:	
9	1 Seal sleeve	: AISI 316 SS	2.2	Seal flush plan(s)	: Plan 23 + 61	
10	1 Stage sleeves	:	2.2	Cooling water plan	: K	
11	Wear rings: Impeller	: 12% CHR	2.2	[include FI's]		
12	Casing	: 12% CHR	2.2	Bearings:		
13	1 Throat bushing(s)	:	2.2	Radial: Type	: Ball	
14	1 Interstage bushing(s)	:	2.2	No. of bearings	: 1	
15	1 Throttle bushing(s)	:	2.2	Manufacturer	: SKF or Equal	
16	Lantern ring	:	2.2	Bearing no./Size	:	
17	Seal endplate / gland	: AISI 316 SS	2.2	Material: Sleeve	:	
18		:		Bush	:	
19	1 Diffuser(s)	:		Thrust: Type	: Ball	
20	Discharge head	:		Location	: <input checked="" type="checkbox"/> Pump <input type="checkbox"/> Driver	
21	1 Discharge column	:		Manufacturer	: SKF or Equal	
22	Casing gasket	: Grafite filled SS type 304	2.2	Bearing no./Size	:	
23		:		Material thrust collar	:	
24	Baseplate	: Fabricated Steel		Bearings (vertical pumps)		
25	(or mounting flange / plate)	:		Type	:	
26	Bolting	: AISI 4140 or B-7 Alloy	2.2	Material	:	
27	wetted bolting	: AISI 316 SS	2.2	Thrust at design / minimum flow	kg:	/
28		:		Thrust at runout, up / down	kg:	/
29		:				
30		:				
31		:		Lubrication:		
32	1	:		<input type="checkbox"/> Oil bath	<input type="checkbox"/> Grease	<input type="checkbox"/> Pumped liquid
33	CONNECTIONS			<input type="checkbox"/> External liquid	<input type="checkbox"/> Clean water	
34	Nozzle position:	Suction: <input type="checkbox"/> Top <input type="checkbox"/> Side <input checked="" type="checkbox"/> End		<input checked="" type="checkbox"/> Oil ring	<input type="checkbox"/> Splash	<input type="checkbox"/> Forced feed
35	Note 4)	Discharge: <input checked="" type="checkbox"/> Top <input type="checkbox"/> Side		See separate oil system data sheets: <input type="checkbox"/> Yes <input type="checkbox"/> No		
36	Connections	Size	Rating	Facing	Finish	
37	1 Suction	3)	4"	300#	RF	125-250 RA
38	1 Discharge	3)	2"	300#	RF	125-250 RA
39	1 Drain		3/4"	300#	RF	125-250 RA
40	1 Vent		3 / 4 "	300#	RF	125-250 RA
41						
42						
43	Internal clearances, mm:					
44	Front wear ring	:	Interstage bush:			
45	Back wear ring	:	Throttle bush:			
46	Throat bush	:				
47						
48	Utilities:	Piping	Consumption	<input checked="" type="checkbox"/>	Baseplate	: Com. f pump, driver, transm.& seal plan
49	Fluid	Plan	Material	Flow 2)	P [barg]	<input type="checkbox"/> Mounting flange/plate :
50	1					Mass, kg: : 170 Pump & baseplate: 450
51						Driver : Auxiliaries:
52						
53	Notes: Nr. = number.					
54	1) According to ISO 10474.					
55	2) m ³ /h for liquids, kg/h for steam.					
56	3) Allowable forces and moments on each nozzle shall be minimum 2 times API 610 Table 2-1A.					
57	4) All auxiliary connections at skid edge with block valve for maintenance.					
58						
59						
60						

PIPING DESIGN - TOETS - DATASHEET POMP

Klant : ROC	Rotating Equipment	Always refer to this number	
Project : Uitbreiding condensaat capaciteit		Zadkine	Piping cursus
Locatie : Nederland	Afdeling:	Project :	
Doc. No.: pomp data sheet			

1	Equipment No. : P-831 A/B	Quantity : 2
2	Service Name : LD Condensaat Pompen	



	Pump type R 200/50 GM1 B	Curve n° R20050GM1B rev.2 Diff. n° 37083 - 36	Maximum impeller Ø 205 [mm]	Selection n°: 15
		Minimum impeller Ø 160 [mm]	Casing mat.: A216WCB	
Impeller type B - Pattern n° 37075(L.37112Low)	Item: P-831A/B	Impeller mat.: A487CA6NM		

PIPING DESIGN - TOETS - DATASHEET VAT

Klant : ROC		Static Equipment		Always refer to this number	
Project : Uitbreiding condensaat capaciteit				Zadkine	Piping cursus
Locatie : Nederland		Afdeling :		Project :	
		Doc. No.: Vat data sheet			
1					
2					
3					
4					
5	<u>Equipment Number</u>	<u>Service Name</u>			
6					
7	V-831	LD STOOM CONDENSAAT VAT			
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
54					
55					
56					
REV.	DATUM	OMSCHRIJVING	GEMAAKT	GECONTROLEERD	GOEDGEKEURD

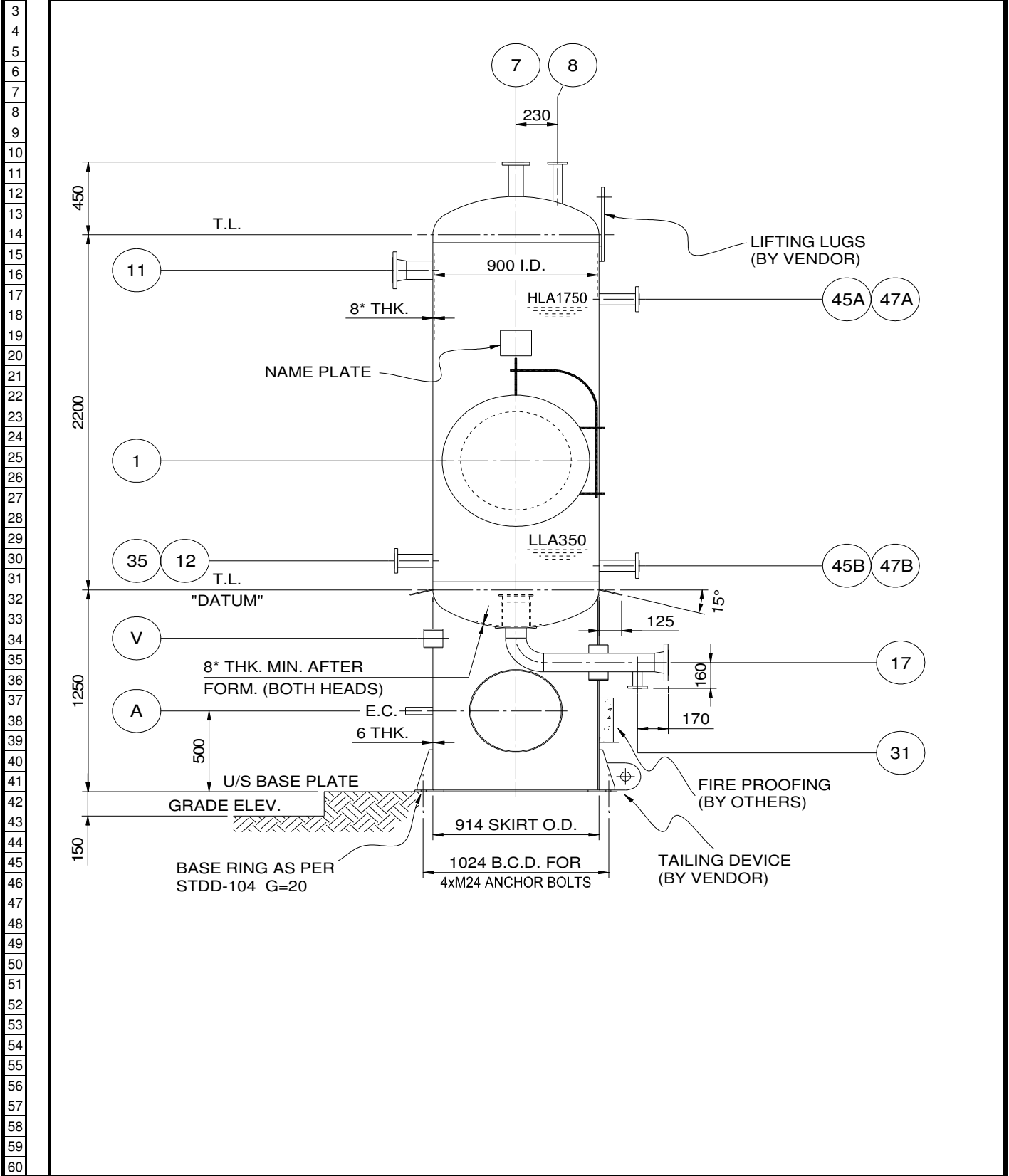
PIPING DESIGN - TOETS - DATASHEET VAT

Client : ROC		Static Equipment		Always refer to this number		
Plant : Uitbreiding condensaat capaciteit				Zadkine	Piping cursus	
Location : Nederland		Afdeling :		Project		
Doc. No.: Vat data sheet						
1	Equipment No. : V-831					
2	Service Name : LD STOOM CONDENSAAT VAT			Horizontal	<input checked="" type="checkbox"/> Vertical	Quantity : 1
3	DESIGN DATA			MATERIALS		
4	Design code	ASME VIII Div. 1		Shell and heads	ASTM A516- Gr.60	
5	Design specification	See page 2 & 3 of the requisition		Cladding shell/heads	---	
6	<input checked="" type="checkbox"/> Code stamp	CE Marked		Nozzle neck plate	---	
7	<input checked="" type="checkbox"/> Windload	BKR, See Req'n Techn. Descrip.		Nozzle neck pipe	ASTM A106 Gr. B	
8	<input type="checkbox"/> Earthquake			Cladding/lining nozzles	---	
9	Operating temperature Max/Norm/Min	°C	143 136	Welding fittings	ASTM A234 WPB	
10	Operating pressure Max/Norm/Min	barg	2.9 2.2	Flanges / forgings	ASTM A105 (normalised)	
11	Design temperature Max/min	°C	177 0	Skirt top / bottom	ASTM A516-Gr.60 / ASTM A285 C	
12	Design pressure internal	barg	5.9	Base plate	ASTM A285 C	
13	Vacuum condition	barg @ °C	Full Vacuum @ 177	Saddles	---	
14	Steam out condition	barg @ °C	3.5 / F.V. @ 149	Stiffening rings	---	
15	Regeneration condition	barg @ °C	@	Insulation support rings	ASTM A516-Gr.60 / C.S.	
16	Test pressure	barg	To requisition tech. Descrip. *)	Lifting lugs	ASTM A516-Gr.60	
17	Contents	H2O		Welded-on parts	ASTM A516-Gr.60	
18	Density at operating conditions	kg/m ³	923	Welded-in parts	ASTM A516-Gr.60	
19	Atmospheric boiling point	°C		Internal piping	---	
20	Corrosion allowance	mm	3	Removable internals	---	
21	Construction category			Internal pipe fittings	---	
22	Radiography	SPOT		External bolts	ASTM A193 Gr. B7	
23	<input checked="" type="checkbox"/> Joint efficiency	0.85		External nuts	ASTM A194 Gr. 2H	
24	<input type="checkbox"/> Stress relieving	As per code		Internal bolts	ASTM A193 Gr. B6	
25	Type of heads	2:1 Semi-Elliptical		Internal nuts	ASTM A194 Gr. 6	
26	Insulation thickness	mm	80 (by others), See Note 13	External gaskets	Sp.Wound 316L/graphite/316L inner and 316L outer ring	
27	Fire proofing thickness	mm	80 Outside (by others)	Internal gaskets	---	
28	<input checked="" type="checkbox"/> External painting	See Requisition and Note 14		Tailing lug-skirt type	ASTM A285 C	
29	<input type="checkbox"/> Internal coating	None				
30	PED 97/23/EC Fluid group/table/category	2	2 IV			
31						
32						
33						
34						
35	ESTIMATED CAPACITY AND MASS *)			LOADS AT BASE *)		
36	Capacity	1.6	m ³	Erection windmoment	21	kNm
37				Erection shear	7	kN
38	Weight: 1-Fabricated	1400	kg	Operating windmoment	21	kNm
39	2-Additional internals	---	kg	Operating shear	7	kN
40	3-Piping, platforms, ladders	500	kg	Earthquake moment	---	kNm
41	4-Insulation	200	kg	Earthquake shear	---	kN
42	5-Fireproofing	1800	kg			
43	6-Operating liquid	1160	kg			
44	7-Test liquid	1600	kg			
45	Erection conditions	2100	kg	<input checked="" type="checkbox"/> Structural clips	LATER	
46	Operating Conditions (1 + 2 + 3 + 4 + 5 + 6)	5060	kg	<input checked="" type="checkbox"/> Pipe clips	LATER	
47	Test conditions (1 + 2 + 3 + 5 + 7)	5300	kg	<input checked="" type="checkbox"/> Name plate	STDD-601	
48				<input checked="" type="checkbox"/> Strainer/ vortex br.	04-3230-01-025	
49				<input checked="" type="checkbox"/> Insulation supports	04-3230-01.028	
50				<input checked="" type="checkbox"/> Earth. Connections	04-3230-01.029	
51				<input checked="" type="checkbox"/> Toler. for Vert. Vess	04-3230-01-033	
52						
53						
54						
55	*) INDICATES INFORMATION TO BE CONFIRMED BY SELLER.					
56						
57						
58						
59						
60						

PIPING DESIGN - TOETS - DATASHEET VAT

Client : ROC	Static Equipment	Always refer to this number	
Plant : Uitbreiding condensaat capaciteit		Zadkine	Piping cursus
Location : Nederland	Afdeling :	Project	
Doc. No.: Vat data sheet			

1	Equipment No. : V-831	
2	Service Name : LD STOOM CONDENSAAT VAT	Quantity : 1



Specificatie
Voor

PIJP MATERIALEN

PIPE CLASS

C15

PIPING DESIGN – TOETS - PIJPSPECIFICATIE

Pipe clas : materiaal en range:

Piping Class	Basis Pijp Materiaal	Corrosie toeslag (mm)	ASME B16.5 Rating (Mat. Groep)	DESIGN LIMITS		Service voorschriften	PWHT	Opm.
				Druk	Temperatuur °C			
C15	ASTM A106-B	1.6 mm	150 (1.1)	ASME B16.5	0 / 399		no	

Overzicht pijp wanddikte:

PipeClass	PijpMat.	Diameter	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
C15	A106-B	Schedule	80	80	80	80	40	40	40	40	30	30	30	20	20	20	20	20

Appendage tabel Pipe Class: C15

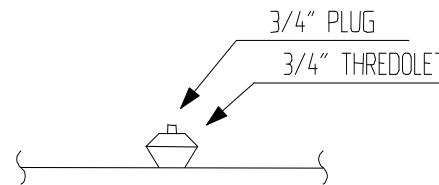
Service	Rating Class	Inline afsluiters	Controle afsluiters	Terugslag kleppen	Drain afsluiters	Vent afsluiters	Druk meting afsluiters	Niveau meting afsluiters
LD stoom & LD condensaat	150	\leq DN 40: Gate (SW) \geq DN 50: Gate (FLG/RF)	\leq DN 40: Globe (SW) \geq DN 50: Globe (FLG/RF) \leq DN 350	\leq DN 40: Piston Check (SW) \geq DN 50: Swing Check (FLG/RF)	Gate (SW x THR'D)	Gate (SW x THR'D)	Gate (SW x THR'D)	Gate (FLG/RF)

PIPING DESIGN – TOETS - PIJPSPECIFICATIE

Samenstellings details **Pipe Class: C15**

Test vents:

LINESIZE 2" – 24"

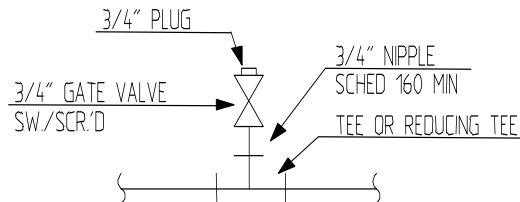


NOTES:

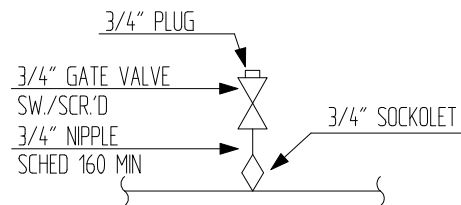
1. PLUG SHALL BE SEAL WELDED AFTER HYDROTEST.
2. CAP SHALL BE SEAL WELDED AFTER HYDROTEST.

Drains:

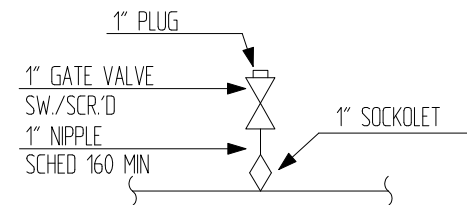
LINESIZE 3/4" – 1 1/2"



LINESIZES 2" – 10"



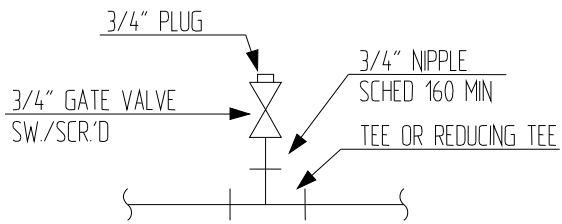
LINESIZES 12" – 22"



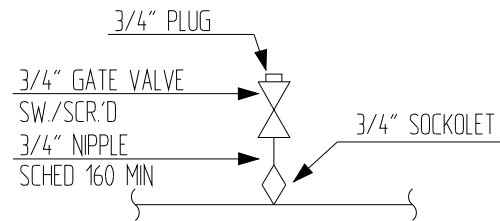
PIPING DESIGN – TOETS - PIJPSPECIFICATIE

Vents:

LINESIZE 3/4" - 1 1/2"

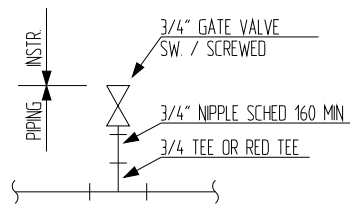


LINESIZES 2" - 24"

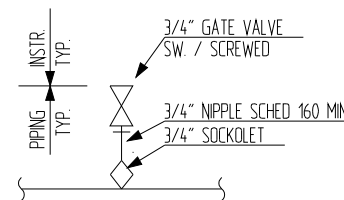


Drukmeting:

LINESIZE 3/4" - 1 1/2"



LINESIZE 2" AND LARGER

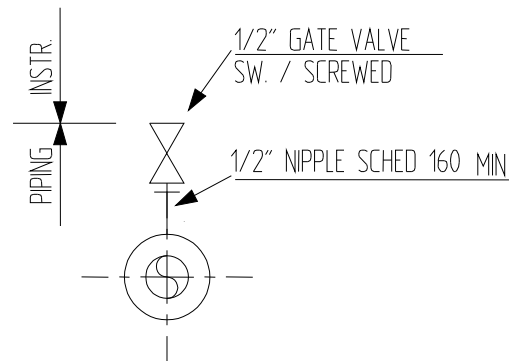


ZADKINE

PIPING DESIGN – TOETS - PIJPSPECIFICATIE

Stromingsmeting:

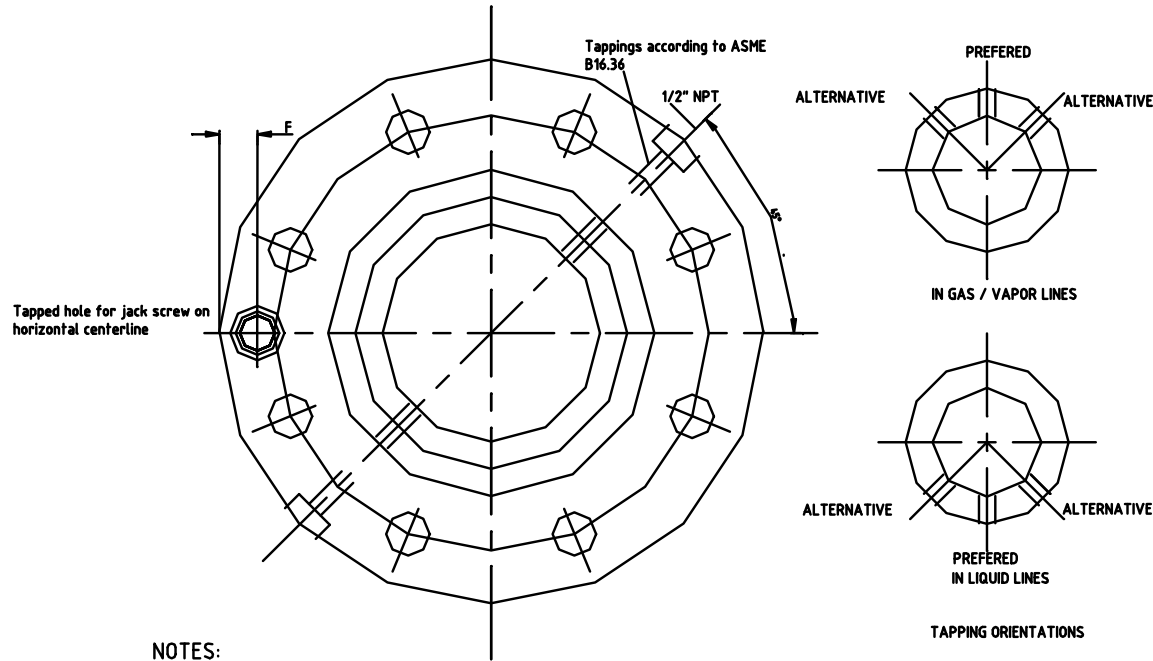
LINESIZE 2" – 24"



PIPING DESIGN – TOETS - PIJPSPECIFICATIE

Bijlage:

1. Stromingsmeting: Orifice flens met tapping orientatie



NOTES:

1. DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED
2. DESIGN-GENERALLY IN ACCORDANCE WITH ASME B16.36, -"STEEL ORIFICE FLANGES"-, EXCEPT LOCATION OF TAPPING AND TAPPED HOLE FOR JACKSCREW.
3. TAPPING: EACH FLANGE SHALL HAVE ONE TAPPING UNLESS OTHERWISE STATED IN REQUISITION IN mm UNLESS OTHERWISE NOTED IF TWO TAPPINGS PER FLANGE ARE REQUIRED THE POSITION SHALL BE DIAMETRICALLY OPPOSITE

CLASS 300		
NOMINAL PIPE SIZE	POSITION F mm	ANGLE
2"	16	45
3"	20	30
4"		
6"		
8"		
10"	24	45
12"		
14"		
16"		
18"	30	45
20"		
22"		
24"		

CLASS 600		
NOMINAL PIPE SIZE	POSITION F mm	ANGLE
2"	16	45
3"	20	30
4"		
6"		
8"		
10"	24	45
12"		
14"		
16"		
18"	30	45
20"		
22"		
24"		

CLASS 900		
NOMINAL PIPE SIZE	POSITION F mm	ANGLE
2"	16	45
3"	20	30
4"		
6"		
8"		
10"	24	45
12"		
14"		
16"		
18"	30	45
20"		
22"		
24"		

CLASS 1500		
NOMINAL PIPE SIZE	POSITION F mm	ANGLE
2"	16	45
3"	20	30
4"		
6"		
8"		
10"	24	45
12"		
14"		
16"		
18"	30	45
20"		
22"		
24"		

CLASS 2500		
NOMINAL PIPE SIZE	POSITION F mm	ANGLE
2"	16	45
3"	20	30
4"		
6"		
8"		
10"	24	45
12"		
14"		
16"		
18"	30	45
20"		
22"		
24"		

