

100-TK-001		100-HEI-001		100-PC-001		100-PC-002	
UF FEED TANK A		ELECTRIC FLANGED HEATER		UF FEED PUMP A		UF FEED PUMP B	
CAPACITY	1.96 m³			CAPACITY	0.90 m³/h	CAPACITY	0.54 m³/h
DIMENSIONS	Ø: 1M H: 2M	POWER		HEAD	139 m	HEAD	57.1m
MOC	316 SS	MOC	INC 800	POWER	1.1 kW	POWER	0.37 kW
				MOC	316 SS	MOC	316 SS

NOTE : 1
ARV AT HIGHEST POINT
DUAL FUNCTION ARV'S
(AIR RELIEF + VACUUM)

MATERIAL CODE	
FLUID	CODE
LigniOx Solution	LS
UF Feed	FD
UF Filtrate	UF
UF Reject	UR
Combined Concentrate	CC
NF Feed (High Pressure)	FN
NF Concentrate	NC
NF Permeate	NP
CIP Supply	CS
CIP Return	CP
Sulfuric Acid	AS
Caustic Soda (Liquid)	AC
Water Hot (Hot Condensate)	WH
Water Cold (Demineralized)	WC
Water Potable	WP
Effluent	EF
Offgas Vapour	EV
40% SMBS	SM
INSTRUMENT AIR	IA

LEGEND	
Process Stream	_____
Signal	-----
Intermittent	- - - - -
Flexible line	~~~~~

Fail Open	FO
Fail Closed	FC
Sample Valve	◇

A. ADDED BATTERY LIMIT

Client





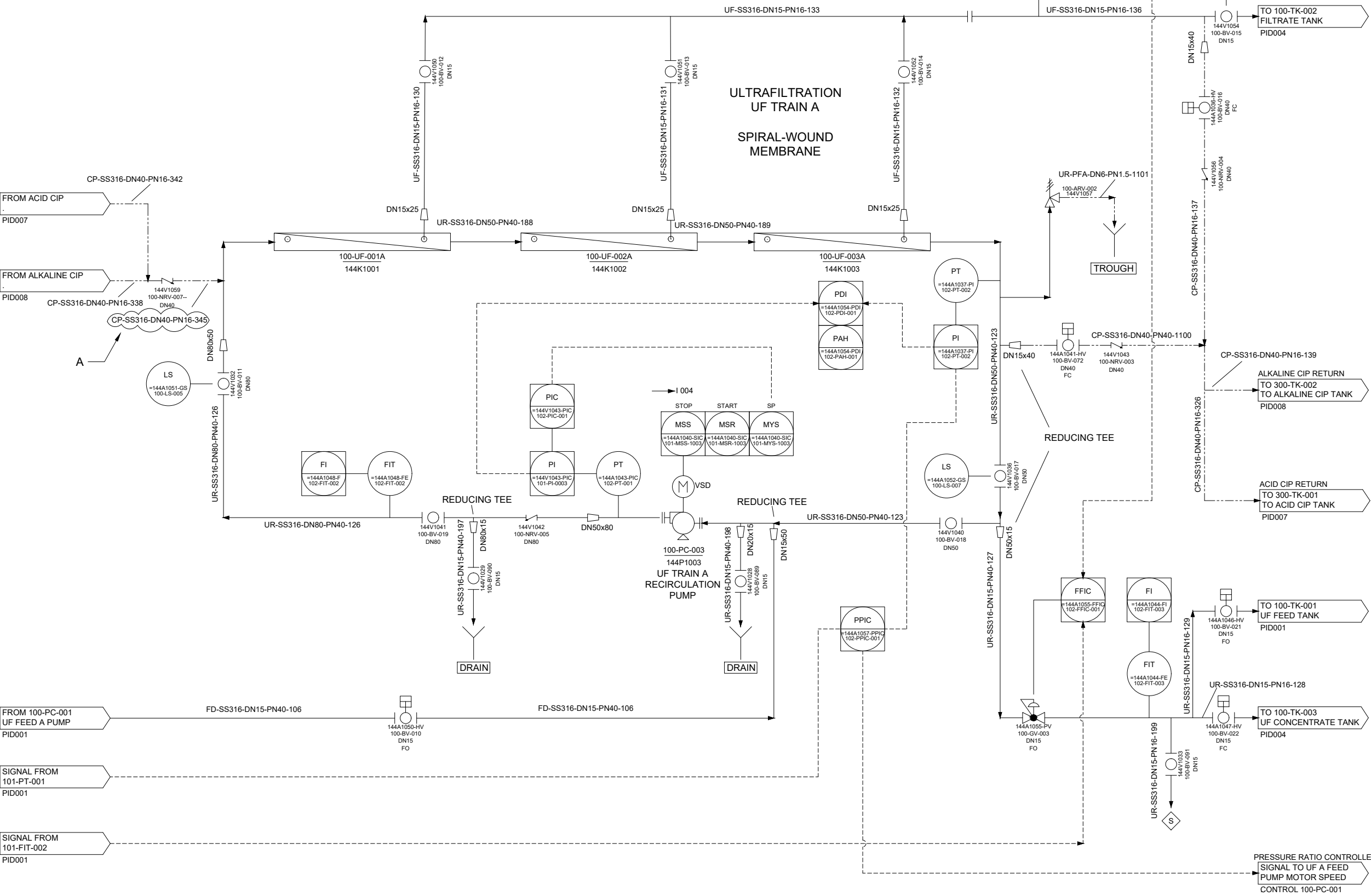
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	2	ISSUED FOR CONSTRUCTION	AH	MB	RW	01/02/2025
	1Q	ISSUED FOR APPROVAL	AH	MB	RW	29/01/2025
	0	ISSUED FOR INFORMATION	RB	SCV	DS	17/05/2024
	REV	DESCRIPTION	DRAWN	CHECKED	APPRVD	DATE

CM2402
ANDRITZ OY
LIGNIOX MEMBRANE DEMO PLANT
PIPING & INSTRUMENTATION DIAGRAM
AREA 100 - FEED




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DRAWING NO.:	PID NO.:	REV.
CM2402-AND001-4A-PID001	PID001	4

100-UF-001A		100-UF-002A		100-UF-003A		100-PC-003	
UF TRAIN A		UF TRAIN A		UF TRAIN A		UF A RECIRCULATION PUMP	
NO OF PVS	1	NO OF PVS	1	NO OF PVS	1	CAPACITY	17.0 m ³ /h
PRESSURE RATING	PN 60	PRESSURE RATING	PN 60	PRESSURE RATING	PN 60	HEAD	22 m
MEMBRANES PER PV	2	MEMBRANES PER PV	2	MEMBRANES PER PV	2	POWER	2.2 kW
TYPE	SPIRAL	TYPE	SPIRAL	TYPE	SPIRAL	MOC	316 SS
MOC	316 SS	MOC	316 SS	MOC	316 SS		




MATERIAL CODE	
FLUID	CODE
LigniOx Solution	LS
UF Feed	FD
UF Filtrate	UF
UF Reject	UR
Combined Concentrate	CC
NF Feed (High Pressure)	FN
NF Concentrate	NC
NF Permeate	NP
CIP Supply	CS
CIP Return	CP
Sulfuric Acid	AS
Caustic Soda (Liquid)	AC
Water Hot (Hot Condensate)	WH
Water Cold (Demineralized)	WC
Water Potable	WP
Effluent	EF
Offgas Vapour	EV
40% SMBS	SM
INSTRUMENT AIR	IA

LEGEND	
Process Stream	
Signal	
Intermittent	
Flexible line	

Fail Open	FO
Fail Closed	FC
Sample Valve	

A. RE-ADDED "CP-345"

Client	
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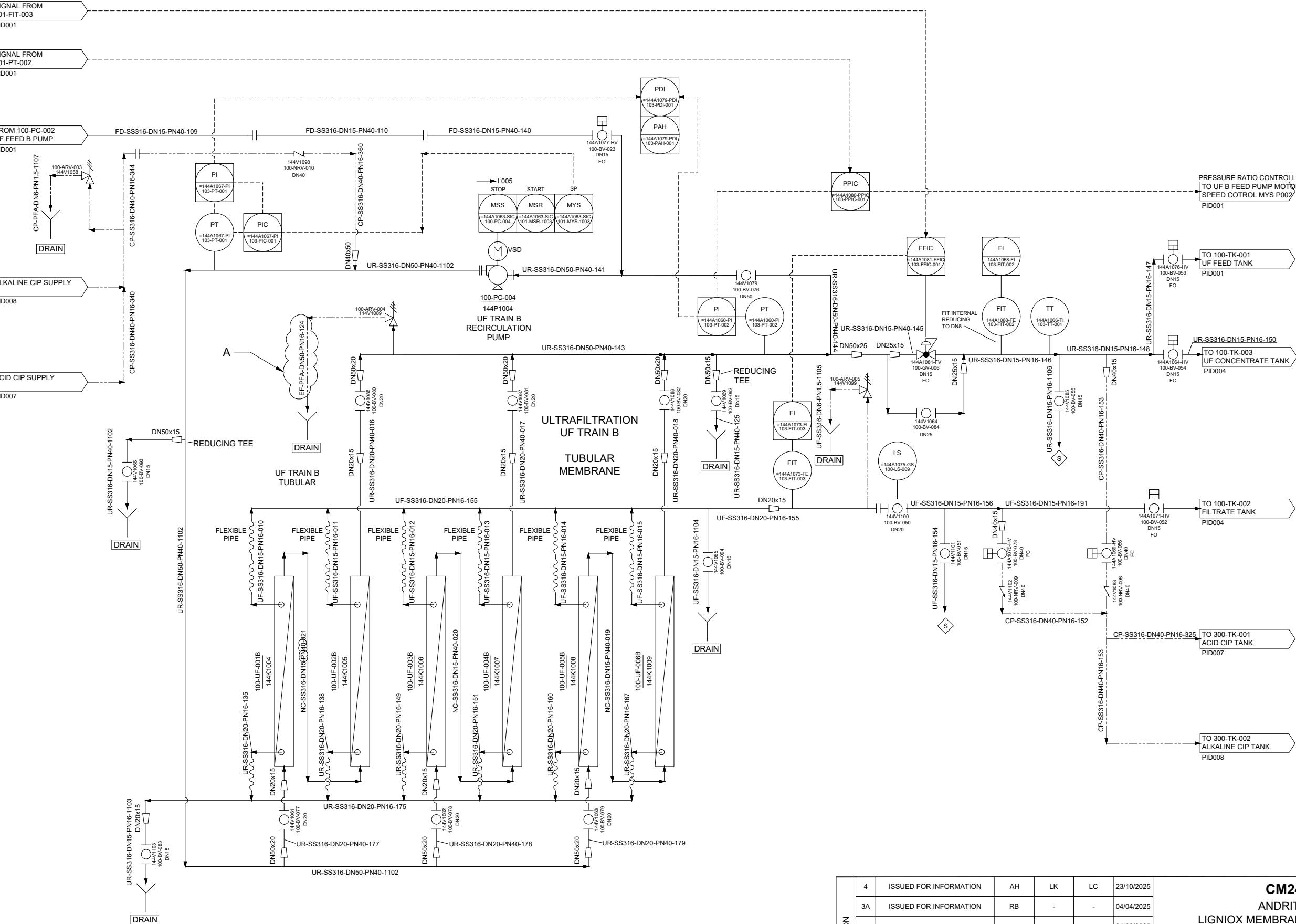
<p>2</p> <p>BY</p> <p>DEMO PLANT</p> <p>ATION DIAGRAM</p> <p>N A (SPIRAL)</p>	 <p>CHIMERICAL TECHNOLOGY</p>		
<p>must not be copied or passed on to any other purpose than the design and TECHNOLOGY (PTY) LTD.</p>	<p>DRAWING NO.: CM2402-AND001-4A-PID002</p>	<p>PID NO.: PID002</p>	<p>REV.: 4</p>

REVISION	4	ISSUED FOR INFORMATION	AH	LK	LC	23/10/2025
	3A	ISSUED FOR INFORMATION	RB	-	-	04/04/2025
	2	ISSUED FOR CONSTRUCTION	AH	MB	RW	01/02/2025
	1Q	ISSUED FOR APPROVAL	AH	MB	RW	29/01/2025
	0	ISSUED FOR INFORMATION	RB	SCV	DS	17/05/2024
	REV	DESCRIPTION	DRAWN	CHECKED	APPRVD	DATE

CM2402
ANDRITZ OY
LIGNIOX MEMBRANE DEMO PLANT
PIPING & INSTRUMENTATION DIAGRAM
AREA 100 - UF TRAIN A (SPIRAL)

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100-UF-001B		100-UF-002B		100-UF-003B		100-UF-004B		100-UF-005B		100-UF-006B		100-PC-004	
UF TRAIN B		UF TRAIN B		UF TRAIN B		UF TRAIN B		UF TRAIN B		UF TRAIN B		UF B RECIRCULATION PUMP	
NO OF PVS	1	NO OF PVS	1	NO OF PVS	1	NO OF PVS	1	NO OF PVS	1	NO OF PVS	1	CAPACITY	12.3 m ³ /h
PRESSURE RATING	64 Bar	PRESSURE RATING	64 Bar	PRESSURE RATING	64 Bar	PRESSURE RATING	64 Bar	PRESSURE RATING	64 Bar	PRESSURE RATING	64 Bar	HEAD	18.98 Bar
MEMBRANES PER PV	1	MEMBRANES PER PV	1	MEMBRANES PER PV	1	MEMBRANES PER PV	1	MEMBRANES PER PV	1	MEMBRANES PER PV	1	POWER	11 kW
TYPE	TUBULAR	TYPE	TUBULAR	TYPE	TUBULAR	TYPE	TUBULAR	TYPE	TUBULAR	TYPE	TUBULAR	MOC	316 SS
MOC	316 SS	MOC	316 SS	MOC	316 SS	MOC	316 SS	MOC	316 SS	MOC	316 SS	MOC	316 SS



MATERIAL CODE	
FLUID	CODE
LigniOx Solution	LS
UF Feed	FD
UF Filtrate	UF
UF Reject	UR
Combined Concentrate	CC
NF Feed (High Pressure)	FN
NF Concentrate	NC
NF Permeate	NP
CIP Supply	CS
CIP Return	CP
Sulfuric Acid	AS
Caustic Soda (Liquid)	AC
Water Hot (Hot Condensate)	WH
Water Cold (Demineralized)	WC
Water Potable	WP
Effluent	EF
Offgas Vapour	EV
40% SMBS	SM
INSTRUMENT AIR	IA

LEGEND	
Process Stream	_____
Signal	-----
Intermittent	-----
Flexible line	~~~~~
Fail Open	FO
Fail Closed	FC
Sample Valve	◇ S

A. MATERIAL CHANGE SS316 TO PFA

Client

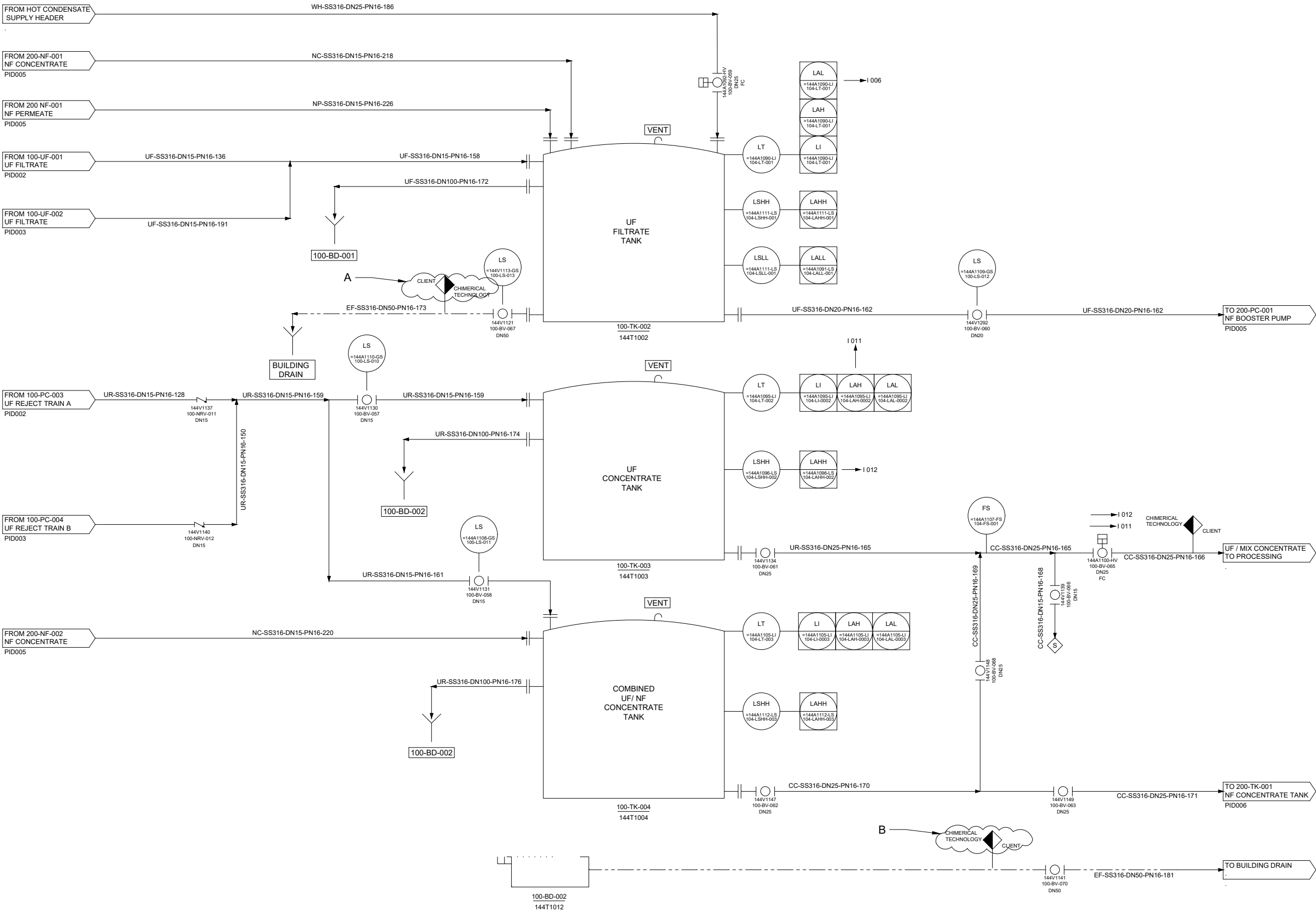
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	2	ISSUED FOR CONSTRUCTION	AH	MB	RW	01/02/2025
	1Q	ISSUED FOR APPROVAL	AH	MB	RW	29/01/2025
	0	ISSUED FOR INFORMATION	RB	SCV	DS	17/05/2024
REV	DESCRIPTION		DRAWN	CHECKED	APPRVD	DATE

CM2402
ANDRITZ OY
LIGNIOX MEMBRANE DEMO PLANT
PIPING & INSTRUMENTATION DIAGRAM
AREA 100 - UF TRAIN B (TUBULAR)

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DRAWING NO.:	PID NO.:	REV.
CM2402-AND001-4A-PID003	PID003	4

100-TK-002		100-TK-003		100-TK-004	
UF FILTRATE TANK		UF CONCENTRATE TANK		UF COMB UF/NF CONCENTRATE TANK	
CAPACITY	1.96 m³	CAPACITY	1.1 m³	CAPACITY	1.1m³
DIMENSION	Ø 1m H 2.5m	DIMENSION	Ø 1m H 1.5m	DIMENSION	Ø 1m H 1.5m
MOC	316 SS	MOC	316 SS	MOC	316 SS



MATERIAL CODE

FLUID	CODE
LigniOx Solution	LS
UF Feed	FD
UF Filtrate	UF
UF Reject	UR
Combined Concentrate	CC
NF Feed (High Pressure)	FN
NF Concentrate	NC
NF Permeate	NP
CIP Supply	CS
CIP Return	CP
Sulfuric Acid	AS
Caustic Soda (Liquid)	AC
Water Hot (Hot Condensate)	WH
Water Cold (Demineralized)	WC
Water Potable	WP
Effluent	EF
Offgas Vapour	EV
40% SMBS	SM
INSTRUMENT AIR	IA

LEGEND

Process Stream	_____
Signal	-----
Intermittent	-----
Flexible line	~~~~~
Fail Open	FO
Fail Closed	FC
Sample Valve	◇

A. ADDED BATTERY LIMIT
B. ADDED BATTERY LIMIT

Client



REVISION	4	ISSUED FOR INFORMATION	AH	LK	LC	23/10/2025
	3A	ISSUED FOR INFORMATION	RB	-	-	04/04/2025
	2	ISSUED FOR CONSTRUCTION	AH	MB	RW	01/02/2025
	1Q	ISSUED FOR APPROVAL	AH	MB	RW	29/01/2025
	0	ISSUED FOR INFORMATION	RB	SCV	DS	17/05/2024
	REV	DESCRIPTION	DRAWN	CHECKED	APPRVD	DATE

CM2402

ANDRITZ OY

LIGNIOX MEMBRANE DEMO PLANT
PIPING & INSTRUMENTATION DIAGRAM
AREA 100 - UF TANKS

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DRAWING NO.:
CM2402-AND001-4A-PID004

PID NO.:
PID004

REV.
4

200-F-001 / 2		200-NF-001 / 2		200-PC-001		200-PC-002		200-PC-003	
NF FEED CARTRIDGE FILTERS		NF TRAIN		NF BOOSTER PUMP		NF HP PUMP		NF RECYCLE PUMP	
CAPACITY	1.2 m³/h	NO OF PVS	2	CAPACITY	1.8m³/h	CAPACITY	1.80 m³/h	CAPACITY	43m³/h
MIN PARTICLE SIZE	1 µm	PRESSURE RATING	69 Bar	HEAD	38.6m	HEAD	172m	HEAD	3 Bar
DIFFERENTIAL PRESSURE	2 Bar	MEMBRANES PER PV	1	POWER	0.55 kW	POWER	2.2kW	POWER	4kW
MOC	316 SS	TYPE	Spiral						
		MOC	316 SS	MOC	316 SS	MOC	316 SS	MOC	316 SS

MATERIAL CODE

FLUID	CODE
LigniOx Solution	LS
UF Feed	FD
UF Filtrate	UF
UF Reject	UR
Combined Concentrate	CC
NF Feed (High Pressure)	FN
NF Concentrate	NC
NF Permeate	NP
CIP Supply	CS
CIP Return	CP
Sulfuric Acid	AS
Caustic Soda (Liquid)	AC
Water Hot (Hot Condensate)	WH
Water Cold (Demineralized)	WC
Water Potable	WP
Effluent	EF
Offgas Vapour	EV
40% SMBS	SM
INSTRUMENT AIR	IA

LEGEND

Process Stream	
Signal	-----
Intermittent	-----
Flexible line	~~~~~
Fail Open	FO
Fail Closed	FC
Sample Valve	◇

A. CHANGED CS TO CP

Client



REVISION	4	ISSUED FOR INFORMATION	AH	LK	LC	23/10/2025
	3A	ISSUED FOR INFORMATION	RB	-	-	04/04/2025
	2	ISSUED FOR CONSTRUCTION	AH	MB	RW	01/02/2025
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	REV	DESCRIPTION	DRAWN	CHECKED	APPRVD	DATE

CM2402

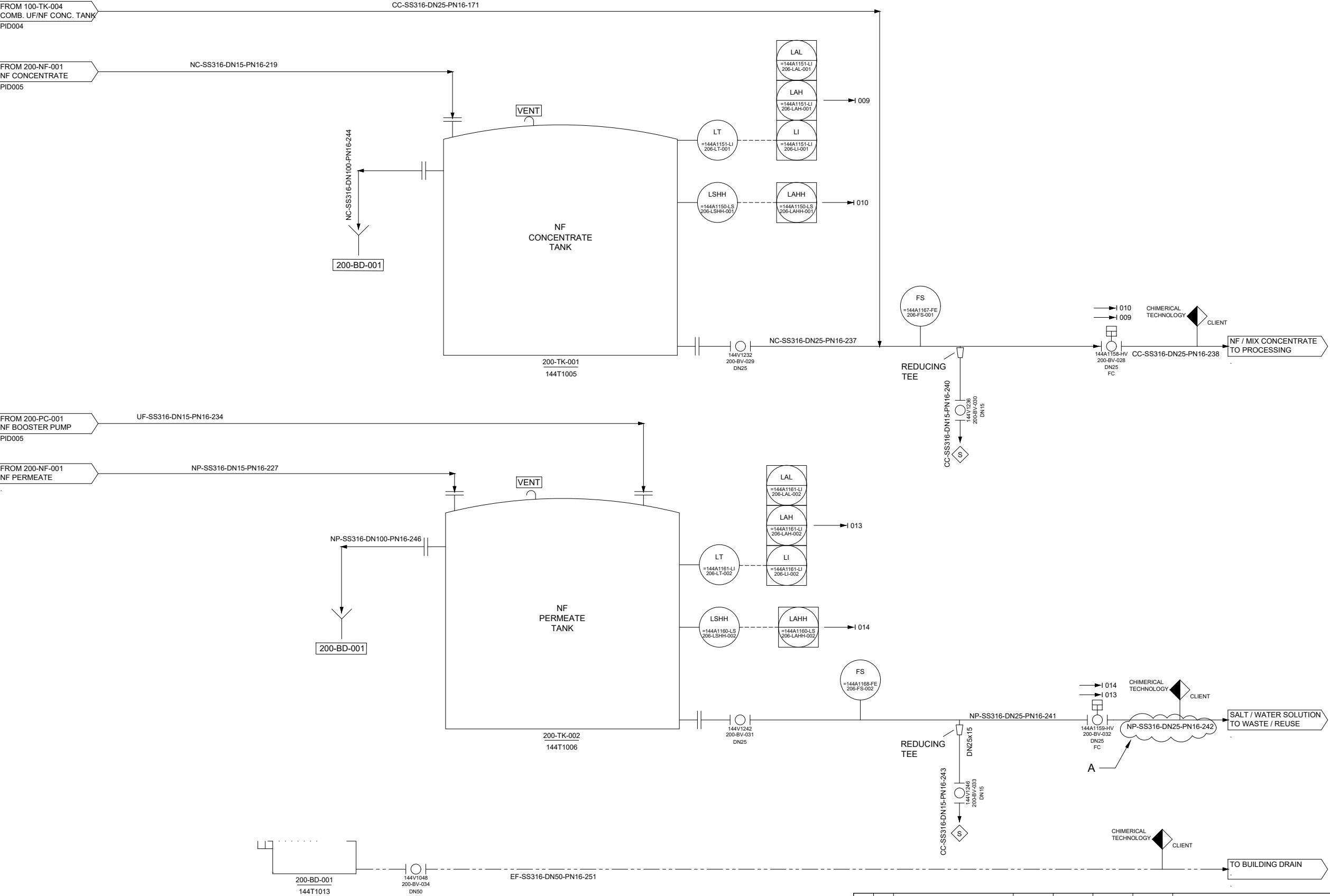
ANDRITZ OY

LIGNIOX MEMBRANE DEMO PLANT
PIPING & INSTRUMENTATION DIAGRAM
AREA 200 - NF

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DRAWING NO.:	PID NO.:	REV.
CM2402-AND001-4A-PID005	PID005	4

200-TK-001		200-TK-002	
NF CONCENTRATE TANK		NF PERMEATE TANK	
CAPACITY	1.1 m³	CAPACITY	1.1 m³
DIMENSIONS	Ø 1m H 2.5m	DIMENSIONS	Ø 1m H 2.5m
MOC	316 SS	MOC	316 SS



MATERIAL CODE	
FLUID	CODE
LigniOx Solution	LS
UF Feed	FD
UF Filtrate	UF
UF Reject	UR
Combined Concentrate	CC
NF Feed (High Pressure)	FN
NF Concentrate	NC
NF Permeate	NP
CIP Supply	CS
CIP Return	CP
Sulfuric Acid	AS
Caustic Soda (Liquid)	AC
Water Hot (Hot Condensate)	WH
Water Cold (Demineralized)	WC
Water Potable	WP
Effluent	EF
Offgas Vapour	EV
40% SMBS	SM
INSTRUMENT AIR	IA

LEGEND	
Process Stream	
Signal	
Intermittent	
Flexible line	
Fail Open	FO
Fail Closed	FC
Sample Valve	

A. CHANGED CC TO NP

Client

DRAWING NO.:
CM2402-AND001-4A-PID006

PID NO.:
PID006

REV.:
4

REVISION	4	ISSUED FOR INFORMATION	AH	LK	LC	23/10/2025
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	1Q	ISSUED FOR APPROVAL	AH	MB	RW	29/01/2025
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CM2402

ANDRITZ OY






LIGNIOX MEMBRANE DEMO PLANT

PIPING & INSTRUMENTATION DIAGRAM

AREA 200 - NF TANKS

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[illegible]

LEGEND	
Process Stream	
Signal	
Intermittent	
Flexible line	
Fail Open	FO
Fail Closed	FC
Sample Valve	

Client	
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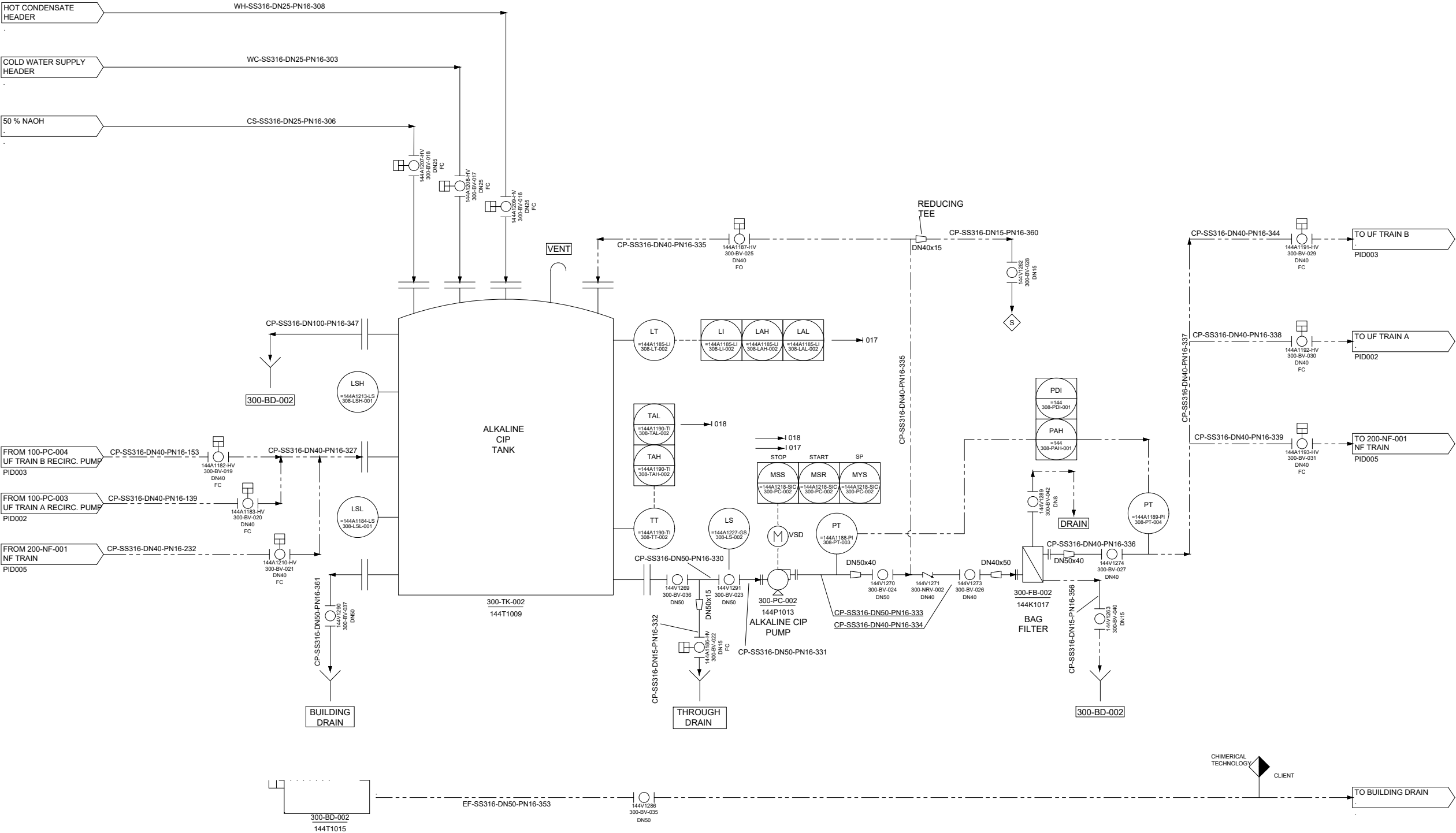
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	REV	DESCRIPTION	DRAWN	CHECKED	APPRVD	DATE

CM2402
ANDRITZ OY
LIGNIOX MEMBRANE DEMO PLANT
PIPING & INSTRUMENTATION DIAGRAM
AREA 300 - CIP ACID

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DRAWING NO.:	PID NO.:	REV.
CM2402-AND001-4A-PID007	PID007	4

300-FB-002		300-PC-001		300-TK-002	
BAG FILTER		ALKALINE CIP PUMP		ALKALINE CIP TANK	
CAPACITY	17 m³/h	CAPACITY	17 m³/h	CAPACITY	1.01 m³
MIN PARTICLE SIZE	1 µm	HEAD	30m	DIMS	Ø 0.89 m H 1.610 m
DIFFERENTIAL PRESSURE	2 bar	POWER	3 kW		
MOC	316 SS	MOC	316 SS	MOC	316 SS



MATERIAL CODE	
FLUID	CODE
LigniOx Solution	LS
UF Feed	FD
UF Filtrate	UF
UF Reject	UR
Combined Concentrate	CC
NF Feed (High Pressure)	FN
NF Concentrate	NC
NF Permeate	NP
CIP Supply	CS
CIP Return	CP
Sulfuric Acid	AS
Caustic Soda (Liquid)	AC
Water Hot (Hot Condensate)	WH
Water Cold (Demineralized)	WC
Water Potable	WP
Effluent	EF
Offgas Vapour	EV
40% SMBS	SM
INSTRUMENT AIR	IA

LEGEND	
Process Stream	
Signal	
Intermittent	
Flexible line	
Fail Open	FO
Fail Closed	FC
Sample Valve	

Client	
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REVISION	4	ISSUED FOR INFORMATION	AH	LK	LC	23/10/2025
	3A	ISSUED FOR INFORMATION	RB	-	-	07/04/2025
	2	ISSUED FOR CONSTRUCTION	AH	MB	RW	01/02/2025
	1Q	ISSUED FOR APPROVAL	AH	MB	RW	29/01/2025
	1A	ISSUED FOR INFORMATION	RB	-	-	13/06/2024
	REV	DESCRIPTION	DRAWN	CHECKED	APPRVD	DATE

CM2402 ANDRITZ OY LIGNIOX MEMBRANE DEMO PLANT PIPING & INSTRUMENTATION DIAGRAM AREA 300 - CIP ALKALINE	
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DRAWING NO.: CM2402-AND001-4A-PID008	PID NO.: PID008	REV.: 4

