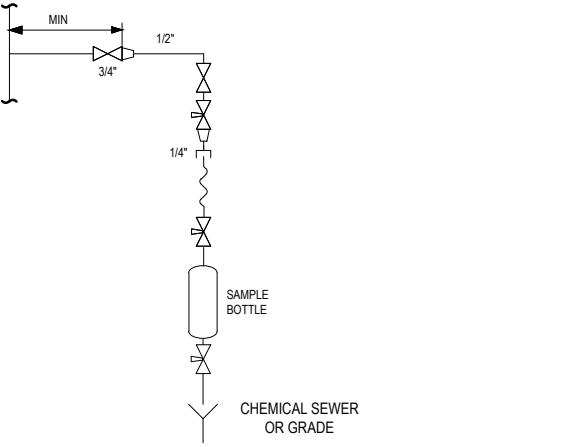
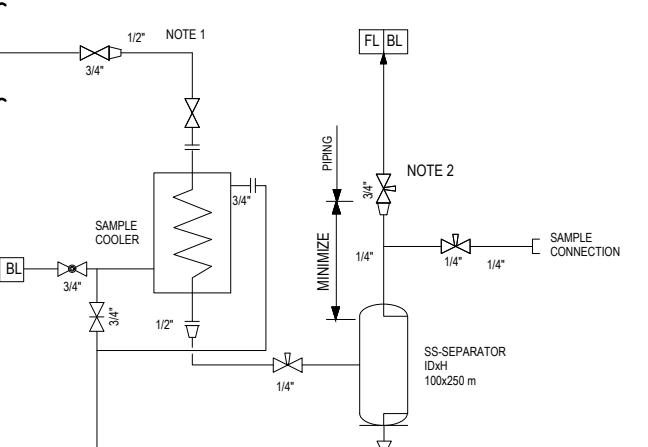
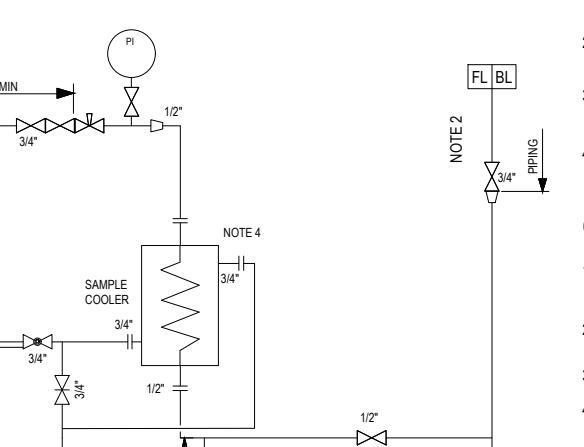
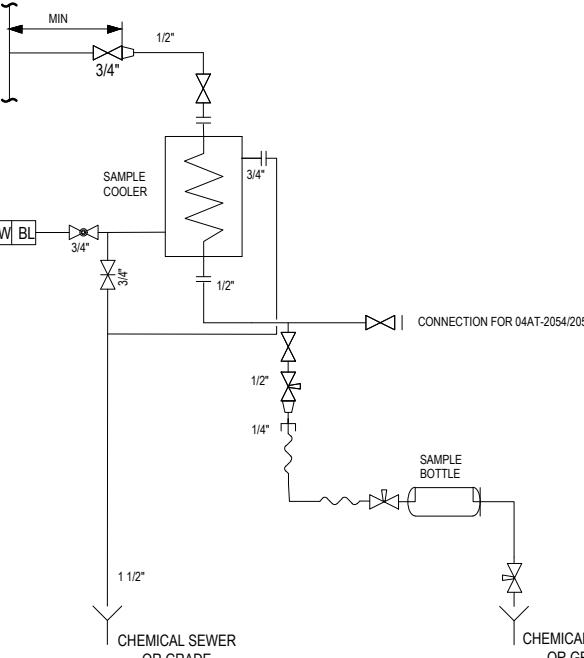
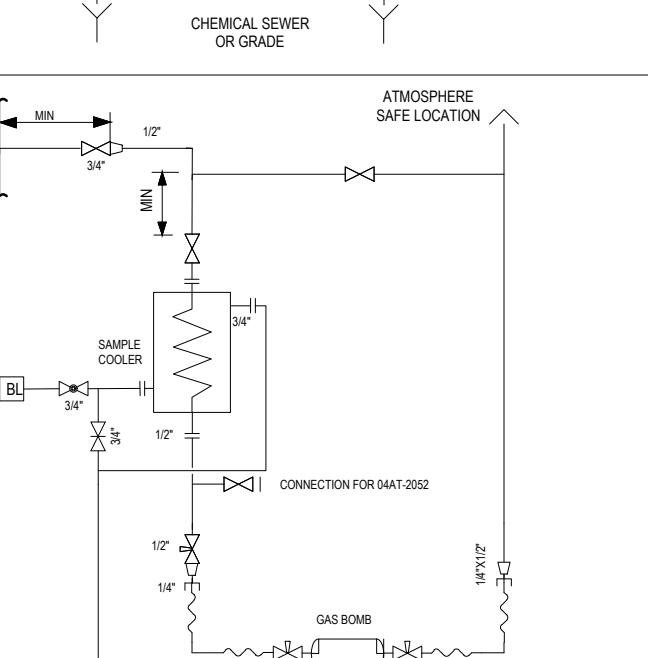
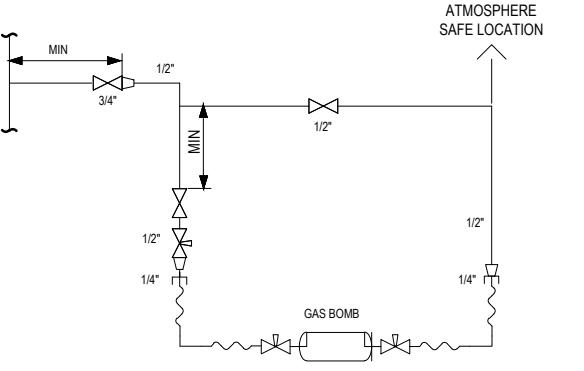
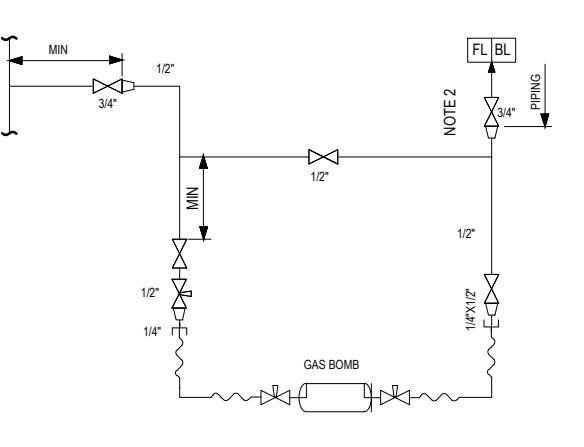
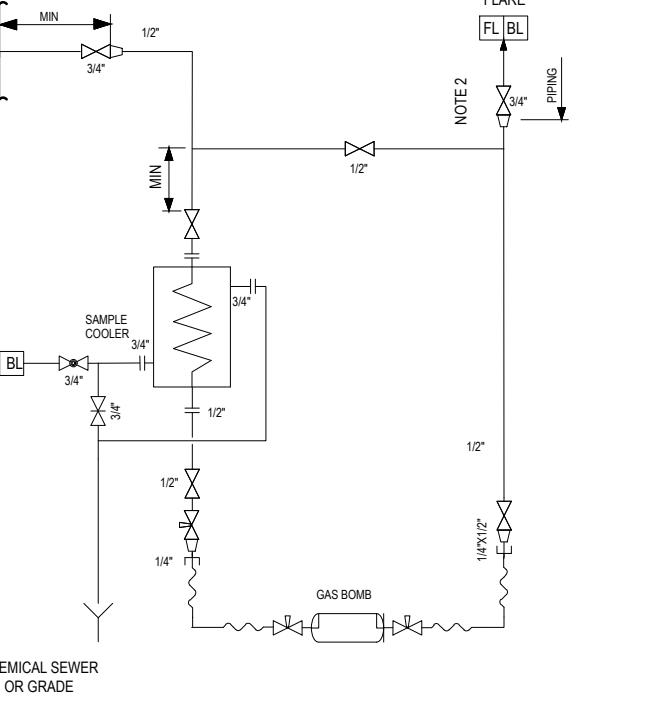
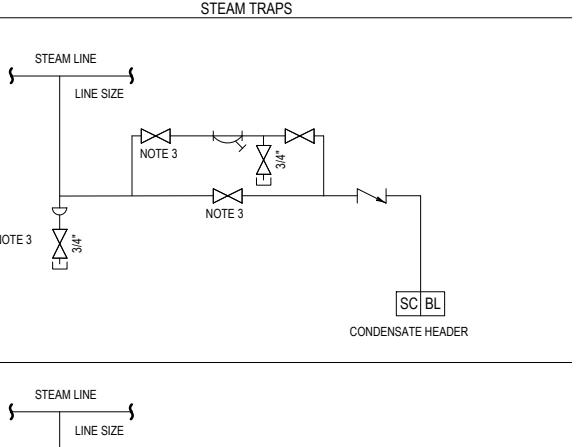
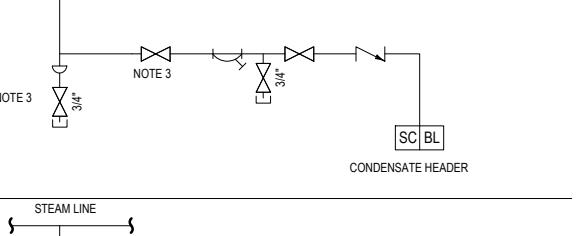
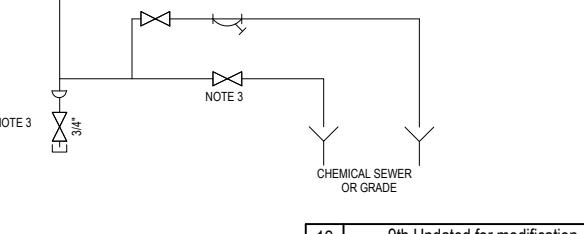
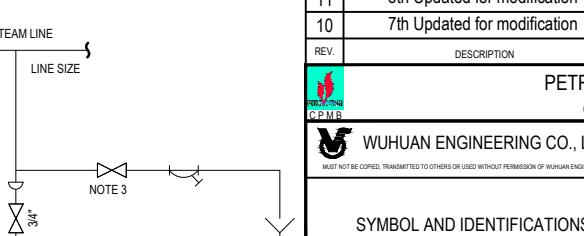
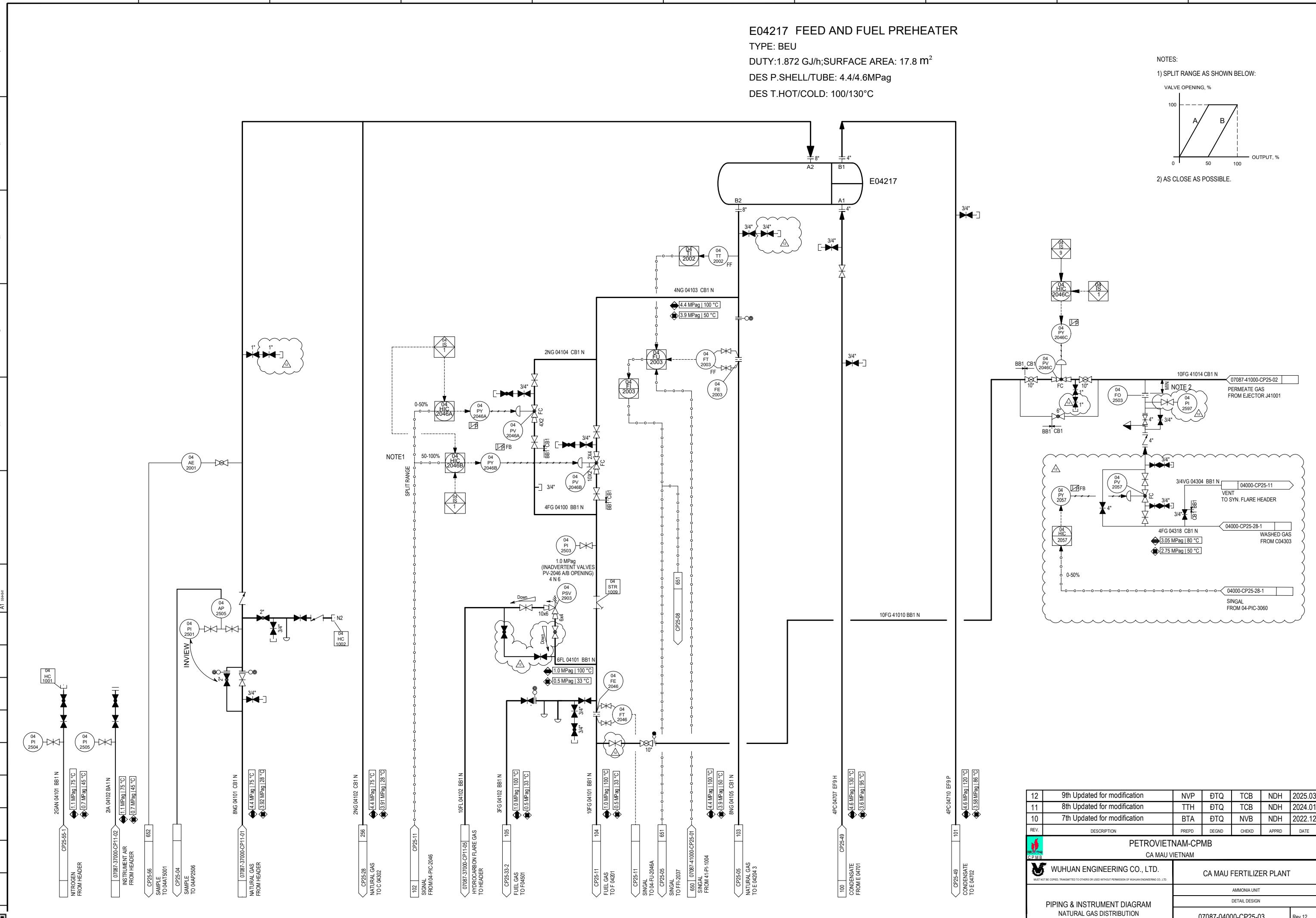


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SYMBOLS FOR PROCESS AND INSTRUMENTATION			SYMBOLS FOR PIPING ELEMENTS			VARIOUS SYMBOLS			TYPICAL INTERLOCK SYMBOLS		
PIPS			LINE SYMBOLS			PIPING ELEMENTS INDIVIDUALLY SPECIFIED			BASIC IDENTIFICATION LETTERS		
A	MAIN PROCESS LINE	OTHER LINE	ELECTRICALLY HEATED LINE	CONTROL VALVE	NORMALLY CLOSED	GATE VALVE	ANGLE VALVE	MEASURED OR INITIATING VARIABLE	FIRST LETTER	Classification	
B	JACKETED LINE	STEAM TRACING	FREE DRAIN (MIN HORIZONTAL)	NEEDLE VALVE	BALL VALVE	PLUG VALVE	3-WAY VALVE	MODIFIER	SUCCEEDING LETTERS	Code	
C	INSTRUMENT LINES	UNDEFINED SIGNAL, CONN. TO PROCESS	PNEUMATIC SIGNAL	SOLENOID VALVE	FIGURE 8-TYPE BLIND, NORMALLY CLOSED	FIGURE 8-TYPE BLIND, NORMALLY OPEN	HOSE	FUNCTION	Classification	Medium Name	
D	ELECTRIC SIGNAL	CAPILLARY TUBE	HYDRAULIC SIGNAL	ELECTRIC MOTOR OPERATED VALVE	BLIND DISC	TEMPORARY STRAINER	HOSE CONNECTION	MODIFIER			
E	DATA LINE OR SOFTWARE	MECHANICAL LINK	ELECTRIC BINARY SIGNAL	ELECTROHYDRAULIC OPERATED VALVE	PERMANENT STRAINER	SCREWED CAP	FLANGED CONNECTION				
F	AS → AIR SUPPLY	ES → ELECTRIC SUPPLY	HORIZONTAL BARS OR DASHED LINES DEPICT THE ACCESSIBILITY	AIR CYLINDER OPERATED VALVE	SOLENOID OPERATED WITH MANUAL	FLANGED END	WELDED CONNECTION				
G	INSTRUMENT OR FUNCTION	PRIMARY LOCATION (MAIN PANEL)	BEHIND-PANEL DEVICE (NORM. INACCESSIBLE)	HAND OPERATED CONTROL VALVE	CAR SEAL OPEN	VENT	OPEN VENT				
H	FIELD MOUNTED	AUXILIARY LOCATION (LOCAL PANEL)	LOCAL INSTRUMENT FOR FOR MORE THAN ONE FUNCTION	SELF OPERATING PRESSURE REDUCING VALVE	CAR SEAL CLOSED	SILENCER	SILENCER				
I	INSTRUMENT PURGE	LAMP ON DCS	DISTRIBUTED CONTROL SYSTEM/ ESD SYSTEM (PRIMARY LOCATION)	SELF OPERATING BACK PRESSURE REGULATING VALVE	STEAM TRAP	COMPENSATOR	COMPENSATOR				
J	DISTRIBUTED CONTROL SYSTEM/ ESD SYSTEM (NORMALLY INACCES-SIBLE)	DCS AUXILIARY INTERFACE DEVICE	GENERAL SYMBOL FOR PLC	SPRING LOADED SAFETY RELIEF VALVE	STEAM TRAP	OIL SEPARATOR	OIL SEPARATOR				
K	MISCELLANEOUS	CHANGE-OVER DEVICE	SWITCHING DEVICE	SPRING LOADED VACUUM RELIEF VALVE	MANIFOLD	STATIC MIXER	STATIC MIXER				
L	INSTRUMENT WITH DIAPHRAGM SEAL	SHUTDOWN LOGIC ON ESD (GROUP 1)	Inlet logic on DCS (GROUP 1)	SPRING LOADED RELIEF VALVE	MANIFOLD	SPOOL PIECE	SPOOL PIECE				
M				SPRING LOADED QUICK CLOSING VALVE-INTERMITTENT BLOW DOWN	LOCKED OPEN	REDUCER	REDUCER				
N				4-WAY SOLENOID VALVE	LOCKED CLOSED	LIQUID SEAL	LIQUID SEAL				
O				3-WAY SOLENOID VALVE	FULL BORE VALVE	ORIFICE	ORIFICE				
P				RUPTURE DISC	VENTURI	VENTURI	VENTURI				
Q					FLOW NOZZLE	ROTAMETER	ROTAMETER				
R					TURBINE OR PROPELLER TYPE FLOW METER	PIVOT TUBE TYPE FLOW ELEMENT	PIVOT TUBE TYPE FLOW ELEMENT				
S					POSITIVE DISPLACEMENT METER	PIVOT TUBE TYPE FLOW ELEMENT	PIVOT TUBE TYPE FLOW ELEMENT				
T					VORTEX FLOWMETER	PIVOT TUBE TYPE FLOW ELEMENT	PIVOT TUBE TYPE FLOW ELEMENT				
U					CORIOLIS FLOWMETER	PIVOT TUBE TYPE FLOW ELEMENT	PIVOT TUBE TYPE FLOW ELEMENT				
V					MAGNETIC FLOWMETER	PIVOT TUBE TYPE FLOW ELEMENT	PIVOT TUBE TYPE FLOW ELEMENT				
W					ULTRASONIC FLOWMETER	PIVOT TUBE TYPE FLOW ELEMENT	PIVOT TUBE TYPE FLOW ELEMENT				
X					FLOW ELEMENT NOT YET DEFINED	PIVOT TUBE TYPE FLOW ELEMENT	PIVOT TUBE TYPE FLOW ELEMENT				
Y					FLOW TRANSMITTER NOT YET DEFINED	PIVOT TUBE TYPE FLOW ELEMENT	PIVOT TUBE TYPE FLOW ELEMENT				
Z											
SYMBOLS FOR PROCESS AND INSTRUMENTATION			SYMBOLS FOR PIPING ELEMENTS			VARIOUS SYMBOLS			TYPICAL INTERLOCK SYMBOLS		
A	MAIN PROCESS LINE	OTHER LINE	ELECTRICALLY HEATED LINE	CONTROL VALVE	NORMALLY CLOSED	GATE VALVE	ANGLE VALVE	MEASURED OR INITIATING VARIABLE	FIRST LETTER	Classification	
B	JACKETED LINE	STEAM TRACING	FREE DRAIN (MIN HORIZONTAL)	NEEDLE VALVE	BALL VALVE	PLUG VALVE	3-WAY VALVE	MODIFIER	SUCCEEDING LETTERS	Code	
C	INSTRUMENT LINES	UNDEFINED SIGNAL, CONN. TO PROCESS	PNEUMATIC SIGNAL	SOLENOID VALVE	DIAPHRAGM VALVE	BUTTERFLY VALVE	MINIMUM FLOW VALVE	FUNCTION	Classification	Medium Name	
D	ELECTRIC SIGNAL	CAPILLARY TUBE	HYDRAULIC SIGNAL	ELECTRIC MOTOR OPERATED VALVE	FIGURE 8-TYPE BLIND, NORMALLY OPEN	NON-RETURN OR CHECK VALVE (→)	HOSE	MODIFIER			
E	DATA LINE OR SOFTWARE	MECHANICAL LINK	ELECTRIC BINARY SIGNAL	ELECTROHYDRAULIC OPERATED VALVE	BLIND DISC	TEMPORARY STRAINER	HOSE CONNECTION				
F	AS → AIR SUPPLY	ES → ELECTRIC SUPPLY	HORIZONTAL BARS OR DASHED LINES DEPICT THE ACCESSIBILITY	AIR CYLINDER OPERATED VALVE	PERMANENT STRAINER	SCREWED CAP	FLANGED CONNECTION				
G	INSTRUMENT OR FUNCTION	PRIMARY LOCATION (MAIN PANEL)	BEHIND-PANEL DEVICE (NORM. INACCESSIBLE)	HAND OPERATED CONTROL VALVE	SOLENOID OPERATED WITH MANUAL	FLANGED END	WELDED CONNECTION				
H	FIELD MOUNTED	AUXILIARY LOCATION (LOCAL PANEL)	LOCAL INSTRUMENT FOR FOR MORE THAN ONE FUNCTION	SELF OPERATING PRESSURE REDUCING VALVE	CAR SEAL OPEN	VENT	OPEN VENT				
I	INSTRUMENT PURGE	LAMP ON DCS	DISTRIBUTED CONTROL SYSTEM/ ESD SYSTEM (PRIMARY LOCATION)	SELF OPERATING BACK PRESSURE REGULATING VALVE	CAR SEAL CLOSED	SILENCER	SILENCER				
J	DISTRIBUTED CONTROL SYSTEM/ ESD SYSTEM (NORMALLY INACCES-SIBLE)	DCS AUXILIARY INTERFACE DEVICE	GENERAL SYMBOL FOR PLC	SPRING LOADED SAFETY RELIEF VALVE	STEAM TRAP	COMPENSATOR	COMPENSATOR				
K	MISCELLANEOUS	CHANGE-OVER DEVICE	SWITCHING DEVICE	SPRING LOADED VACUUM RELIEF VALVE	MANIFOLD	OIL SEPARATOR	OIL SEPARATOR				
L				SPRING LOADED RELIEF VALVE	LOCKED OPEN	STATIC MIXER	STATIC MIXER				
M				SPRING LOADED QUICK CLOSING VALVE-INTERMITTENT BLOW DOWN	LOCKED CLOSED	SPOOL PIECE	SPOOL PIECE				
N				4-WAY SOLENOID VALVE	FULL BORE VALVE	REDUCER	REDUCER				
O				3-WAY SOLENOID VALVE	GLOBE VALVE (INSTALLED AGAINST LIQUID FLOW DIRECTION)	Liquid Seal	Liquid Seal				
P				RUPTURE DISC	FOOT VALVE	ORIFICE	ORIFICE				
Q					DAMPER	VENTURI	VENTURI				
R					JACKETED VALVE	FLOW NOZZLE	FLOW NOZZLE				
S						ROTAMETER	ROTAMETER				
T						TURBINE OR PROPELLER TYPE FLOW METER	TURBINE OR PROPELLER TYPE FLOW METER				
U						PIVOT TUBE TYPE FLOW ELEMENT	PIVOT TUBE TYPE FLOW ELEMENT				
V						POSITIVE DISPLACEMENT METER	PIVOT TUBE TYPE FLOW ELEMENT				
W						VORTEX FLOWMETER	PIVOT TUBE TYPE FLOW ELEMENT				
X						CORIOLIS FLOWMETER	PIVOT TUBE TYPE FLOW ELEMENT				
Y						MAGNETIC FLOWMETER	PIVOT TUBE TYPE FLOW ELEMENT				
Z						ULTRASONIC FLOWMETER	PIVOT TUBE TYPE FLOW ELEMENT				
SYMBOLS FOR PROCESS AND INSTRUMENTATION			SYMBOLS FOR PIPING ELEMENTS			VARIOUS SYMBOLS			TYPICAL INTERLOCK SYMBOLS		
A	MAIN PROCESS LINE	OTHER LINE	ELECTRICALLY HEATED LINE	CONTROL VALVE	NORMALLY CLOSED	GATE VALVE	ANGLE VALVE	MEASURED OR INITIATING VARIABLE	FIRST LETTER	Classification	
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E	DATA LINE OR SOFTWARE	MECHANICAL LINK	ELECTRIC BINARY SIGNAL	ELECTROHYDRAULIC OPERATED VALVE	BLIND DISC	TEMPORARY STRAINER	HOSE CONNECTION				
F	AS → AIR SUPPLY	ES → ELECTRIC SUPPLY	HORIZONTAL BARS OR DASHED LINES DEPICT THE ACCESSIBILITY	AIR CYLINDER OPERATED VALVE	PERMANENT STRAINER	SCREWED CAP	FLANGED CONNECTION				
G	INSTRUMENT OR FUNCTION	PRIMARY LOCATION (MAIN PANEL)	BEHIND-PANEL DEVICE (NORM. INACCESSIBLE)	HAND OPERATED CONTROL VALVE	SOLENOID OPERATED WITH MANUAL	FLANGED END	WELDED CONNECTION				
H	FIELD MOUNTED	AUXILIARY LOCATION (LOCAL PANEL)	LOCAL INSTRUMENT FOR FOR MORE THAN ONE FUNCTION	SELF OPERATING PRESSURE REDUCING VALVE	CAR SEAL OPEN	VENT	OPEN VENT				
I	INSTRUMENT PURGE	LAMP ON DCS	DISTRIBUTED CONTROL SYSTEM/ ESD SYSTEM (PRIMARY LOCATION)	SELF OPERATING BACK PRESSURE REGULATING VALVE	CAR SEAL CLOSED	SILENCER	SILENCER				
J	DISTRIBUTED CONTROL SYSTEM/ ESD SYSTEM (NORMALLY INACCES-SIBLE)	DCS AUXILIARY INTERFACE DEVICE	GENERAL SYMBOL FOR PLC	SPRING LOADED SAFETY RELIEF VALVE	STEAM TRAP	COMPENSATOR	COMPENSATOR				
K	MISCELLANEOUS	CHANGE-OVER DEVICE	SWITCHING DEVICE	SPRING LOADED VACUUM RELIEF VALVE	MANIFOLD	OIL SEPARATOR	OIL SEPARATOR				
L				SPRING LOADED RELIEF VALVE	LOCKED OPEN	STATIC MIXER	STATIC MIXER				
M				SPRING LOADED QUICK CLOSING VALVE-INTERMITTENT BLOW DOWN	LOCKED CLOSED	SPOOL PIECE	SPOOL PIECE				
N				4-WAY SOLENOID VALVE	FULL BORE VALVE	REDUCER	REDUCER				
O				3-WAY SOLENOID VALVE	GLOBE VALVE (INSTALLED AGAINST LIQUID FLOW DIRECTION)	Liquid Seal	Liquid Seal				
P				RUPTURE DISC	FOOT VALVE	ORIFICE	ORIFICE				
Q					DAMPER	VENTURI	VENTURI				
R					JACKETED VALVE	FLOW NOZZLE	FLOW NOZZLE				
S						ROTAMETER	ROTAMETER				
T						TURBINE OR PROPELLER TYPE FLOW METER	TURBINE OR PROPELLER TYPE FLOW METER				
U						PIVOT TUBE TYPE FLOW ELEMENT	PIVOT TUBE TYPE FLOW ELEMENT				
V						POSITIVE DISPLACEMENT METER	PIVOT TUBE TYPE FLOW ELEMENT				
W						VORTEX FLOWMETER	PIVOT TUBE TYPE FLOW ELEMENT				
X						CORIOLIS FLOWMETER	PIVOT TUBE TYPE FLOW ELEMENT				
Y						MAGNETIC FLOWMETER	PIVOT TUBE TYPE FLOW ELEMENT				
Z						ULTRASONIC FLOWMETER	PIVOT TUBE TYPE FLOW ELEMENT				
SYMBOLS FOR PROCESS AND INSTRUMENTATION			SYMBOLS FOR PIPING ELEMENTS			VARIOUS SYMBOLS			TYPICAL INTERLOCK SYMBOLS		
A	MAIN PROCESS LINE	OTHER LINE	ELECTRICALLY HEATED LINE	CONTROL VALVE	NORMALLY CLOSED	GATE VALVE	ANGLE VALVE	MEASURED OR INITIATING VARIABLE	FIRST LETTER	Classification	
B	JACKETED LINE	STEAM TRACING	FREE DRAIN (MIN HORIZONTAL)	NEEDLE VALVE	BALL VALVE	PLUG VALVE	3-WAY VALVE	MODIFIER	SUCCEEDING LETTERS	Code	
C</td											

## VARIOUS SYMBOLS

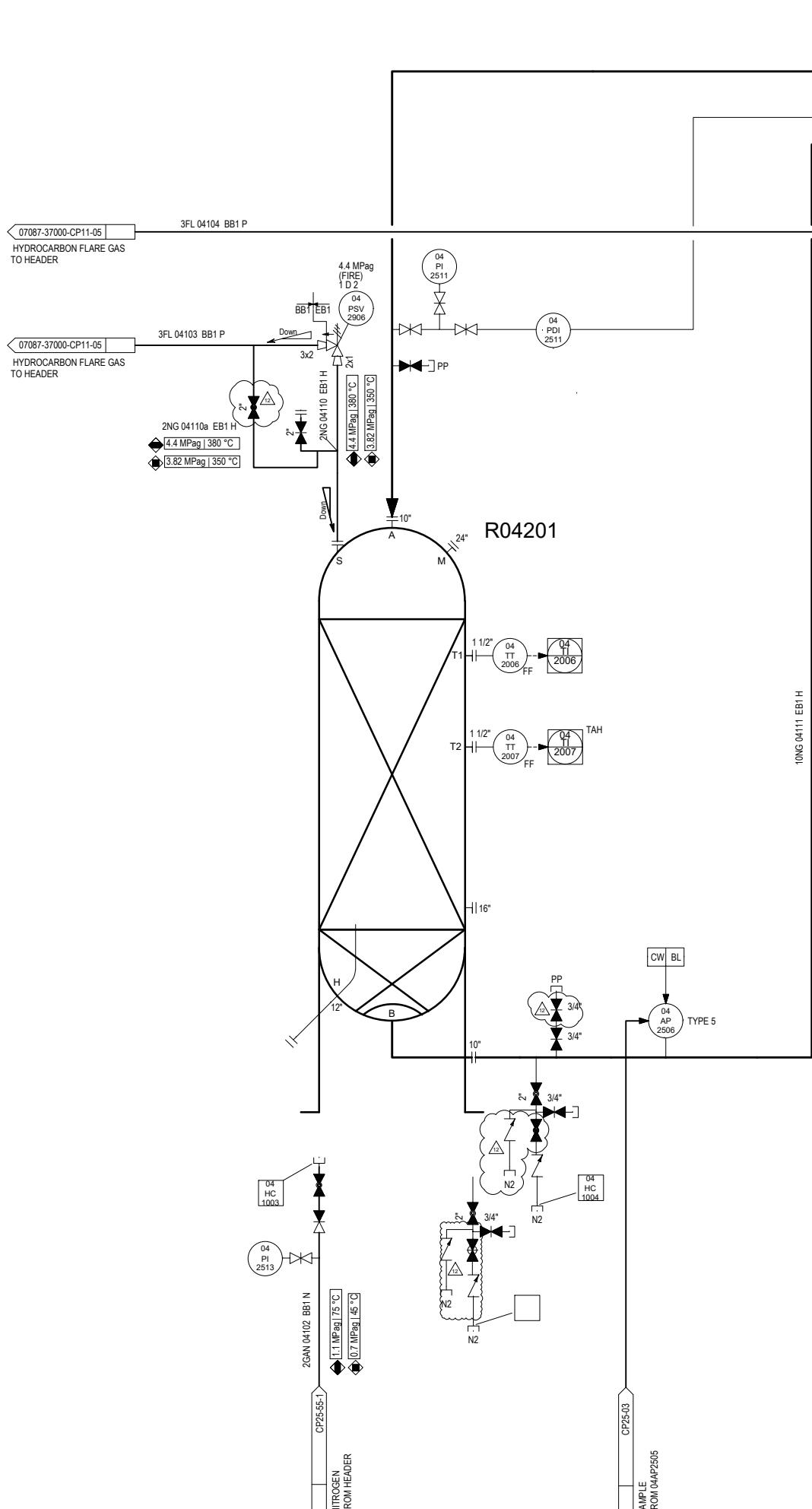
**SAMPLE STATIONS**

DETAIL DRAWING		DETAIL DRAWING		DETAIL DRAWING		
SYMBOLS ON P&ID	SYMBOLS ON P&I DIAGRAM	SYMBOLS ON P&ID	SYMBOLS ON P&I DIAGRAM	SYMBOLS ON P&ID	SYMBOLS ON P&I DIAGRAM	
A NON-FLASHING LIQUIDS BELOW 60 °C		B CONDENSABLE GAS ABOVE 60 °C		C (NH3 ANALYSIS IN HP LOOP)		
D FLASHING LIQUIDS OR NON-FLASHING LIQUIDS ABOVE 60 °C		E GAS ABOVE 60 °C VENT TO ATMOSPHERE AT SAFE LOCATION		F ATMOSPHERE SAFE LOCATION		
A1 GAS BELOW 60 °C VENT TO ATMOSPHERE AT SAFE LOCATION		G GAS ABOVE 60 °C VENT TO FLARE		H STEAM TRAPS		
I STEAM LINE		J STEAM LINE		K STEAM LINE		
L STEAM LINE		M WUHAN ENGINEERING CO., LTD.				
N NOTES:	<ul style="list-style-type: none"> <li>1) MINIMUM 4m BARE TUBE FOR AIR COOLING BEFORE ENTERING WATER COOLER.</li> <li>2) VALVE TO FLARE TO BE IN ACCORDANCE WITH PROCESS PIPECLASS.</li> <li>3) VALVES TO BE DOUBLED IN HIGH PRESSURE SYSTEMS.</li> <li>4) SAMPLE COOLER TO BE OMITTED IF TEMPERATURE &lt;60 °C.</li> </ul>					
O GENERAL NOTES:	<ol style="list-style-type: none"> <li>1) REQUIREMENTS FOR TRACING TO BE CONSIDERED.</li> <li>2) ALL SAMPLE CONNECTIONS SHALL BE FROM TOP OF PROCESS PIPE.</li> <li>3) ALL SAMPLE TUBING TO BE 1/4" SS.</li> <li>4) ALL TEMPERATURE MEASUREMENT SHALL BE DUPLEX SENSORS, EXCEPT FOR SPECIAL DEVICES BY MANUFACTURER.</li> <li>5) ALL FLOW, LEVEL(EXCEPT RADIATION LEVEL METER), PRESSURE, ANALYZER(ph, CONDUCTIVITY)TRANSMITTER SHALL BE WITH INTEGRAL LOCAL INDICATOR.</li> </ol>					
P 12 9th Updated for modification	NVP	DTQ	TCB	NDH	2025.0	
P 11 8th Updated for modification	TTH	DTQ	TCB	NDH	2024.0	
P 10 7th Updated for modification	BTA	DTQ	NVB	NDH	2022.1	
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE
12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.0
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.0
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.1
PETROVIETNAM-CPMB CA MAU VIETNAM						
WUHAN ENGINEERING CO., LTD. MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHAN ENGINEERING CO., LTD.						CA MAU FERTILIZER PLANT
AMMONIA UNIT						
DETAIL DESIGN						
07087-04000-CP25-02						Rev 12
SPECI AREA SCALE SHT. 1 OF 1						
SYMBOL AND IDENTIFICATIONS PIPING & INSTRUMENT DIAGRAM						

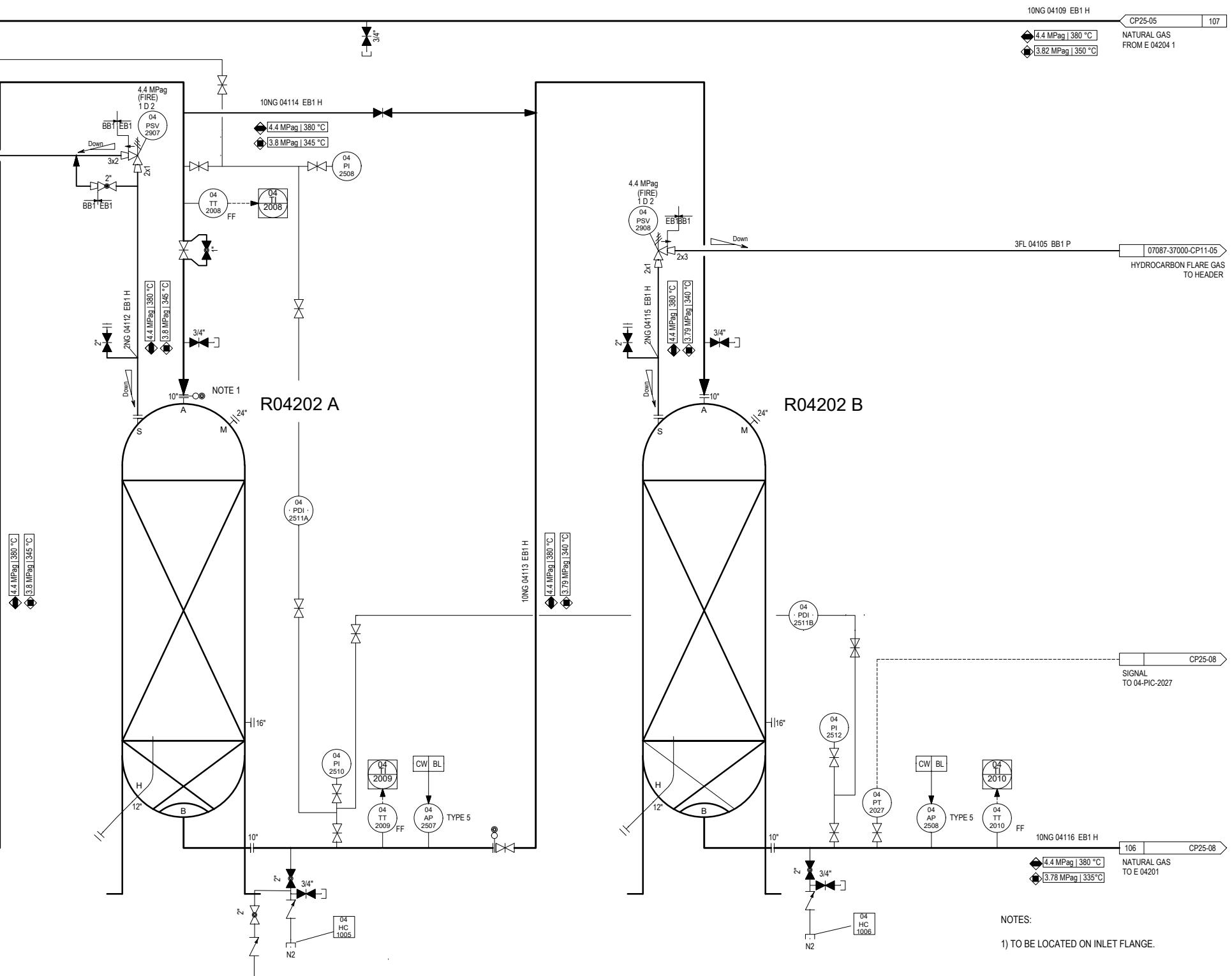


Văn bản này được xác thực tại <https://eoffice.pvcom.vn/> với số định danh: 0514/TTr-CN

**R04201 HYDROGENATOR**  
 DIAM. : 2300 mm; HEIGHT : 4770 mm  
 DES. P: 4.4MPag; DES. T : -10/380°C  
 CATALYST VOL. : 19.2 m<sup>3</sup>



**R04202 A/B SULPHUR ABSORBER**  
 DIAM. : 2300 mm; HEIGHT : 5190 mm  
 DES. P: 4.4MPag; DES. T : -10/380°C  
 CATALYST VOL. : 21.5 m<sup>3</sup>



12	9th Updated for modification	NVP	ĐTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	ĐTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	ĐTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE

PETROVIETNAM-CPMB  
CA MAU VIETNAM

WUHAN ENGINEERING CO., LTD.

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AMMONIA UNIT

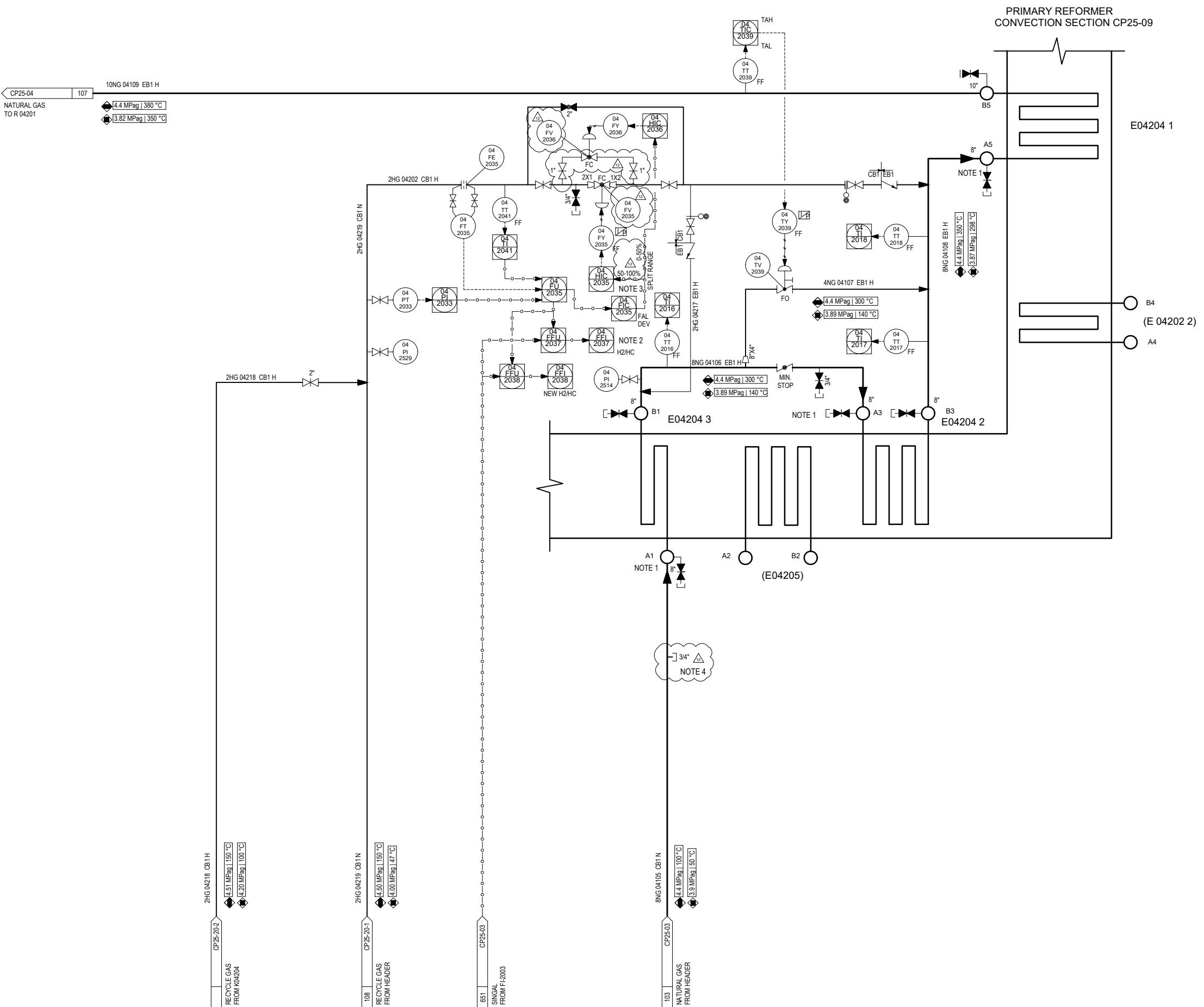
DETAIL DESIGN

07087-04000-CP25-04

Rev.12

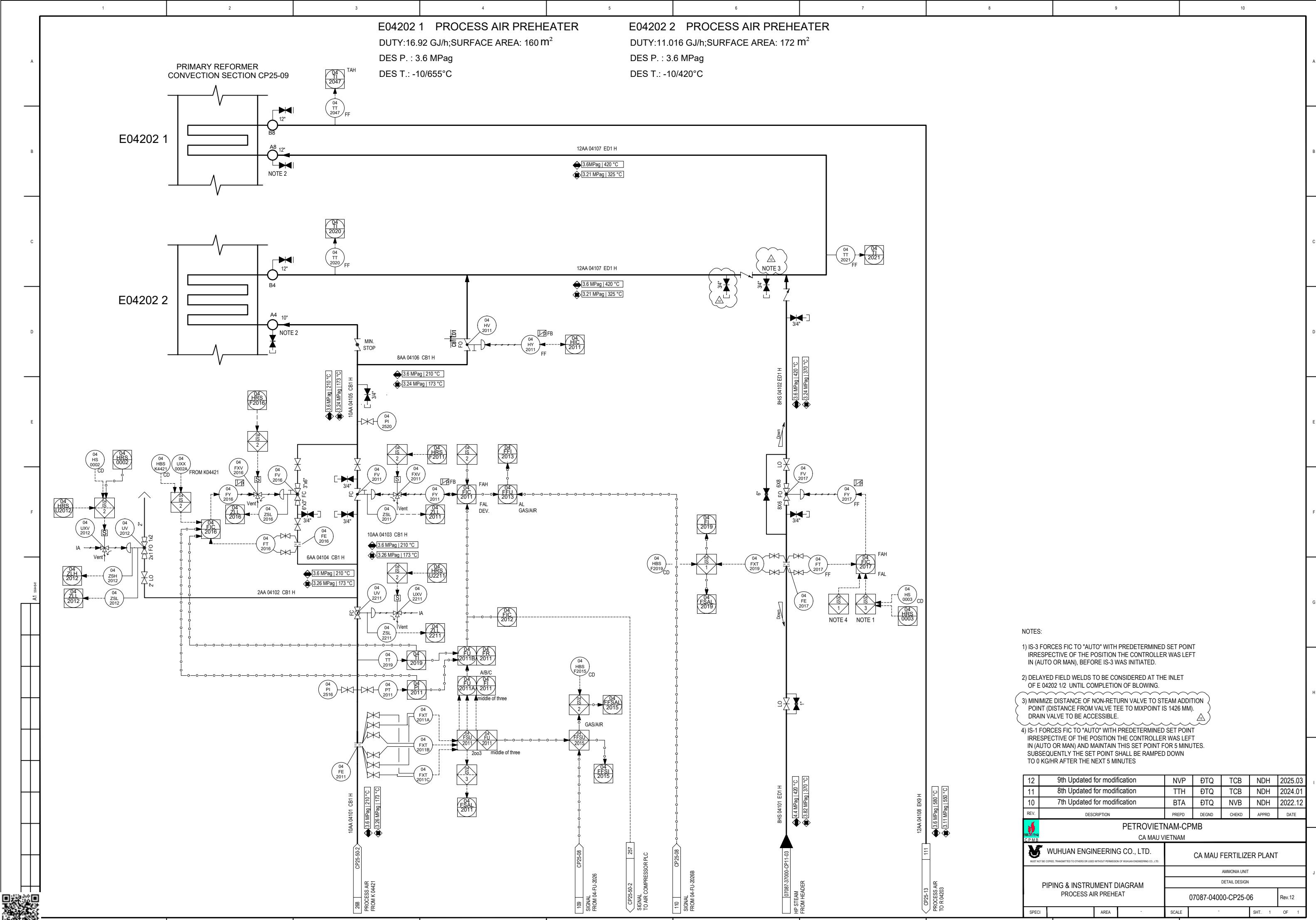
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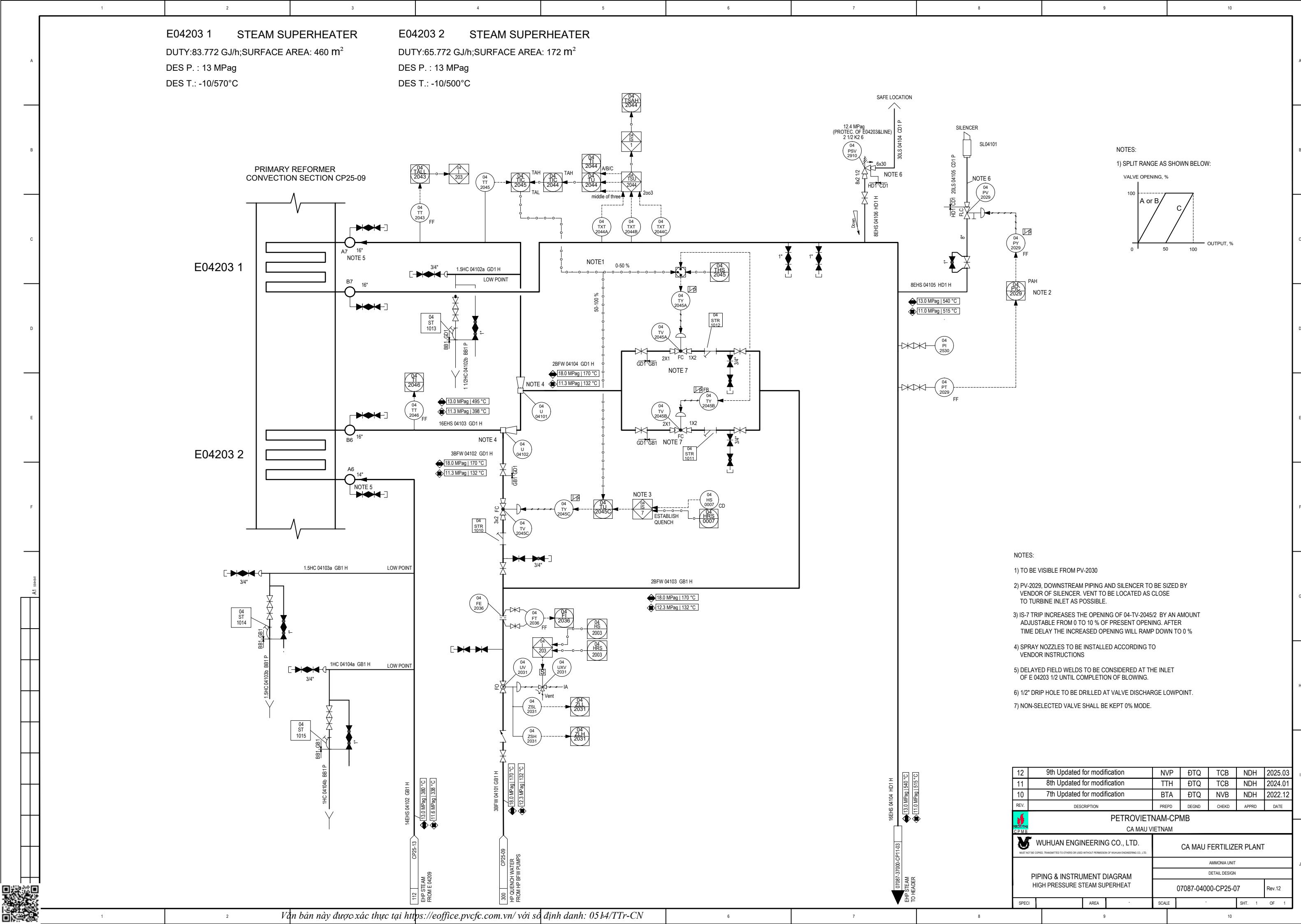


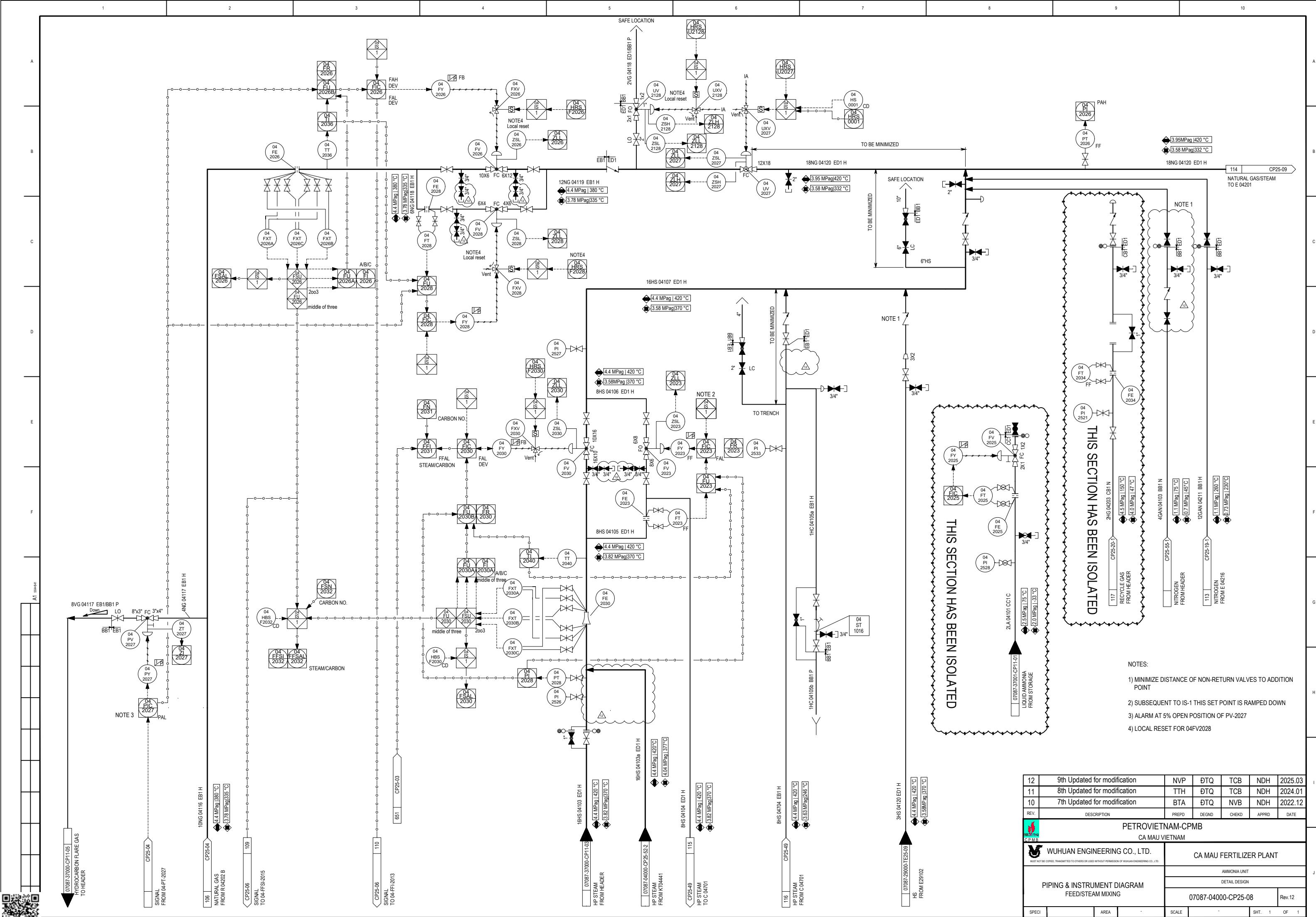


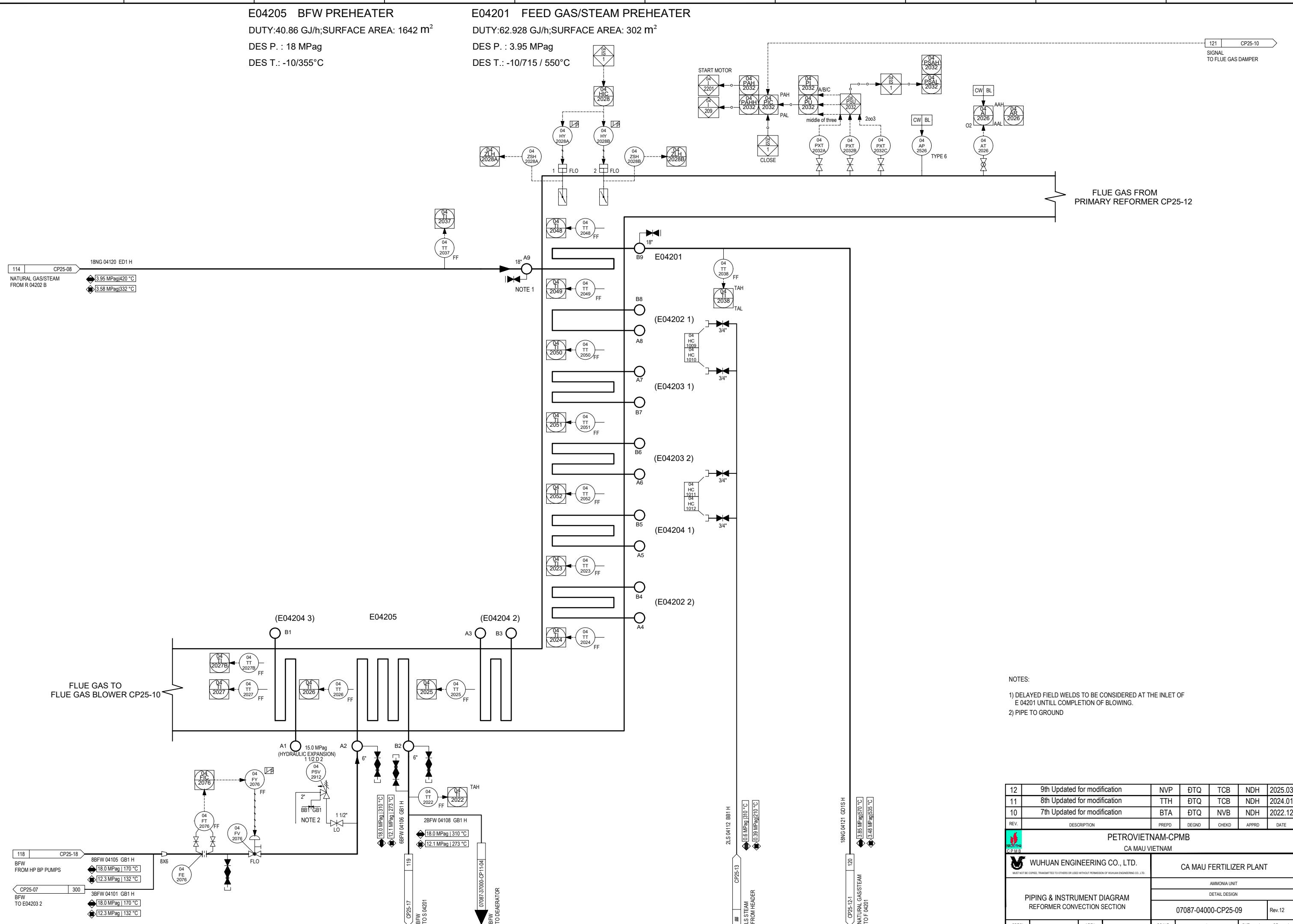
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10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12		
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE		
 WUHUAN ENGINEERING CO., LTD.	PETROVIETNAM-CPMB CA MAU VIETNAM							
PIPING & INSTRUMENT DIAGRAM NATURAL GAS PREHEAT		CA MAU FERTILIZER PLANT						
		AMMONIA UNIT						
		DETAIL DESIGN						
		07087-04000-CP25-05				Rev.12		
SPECI	AREA	-	SCALE	-	SHT	1	OF	1

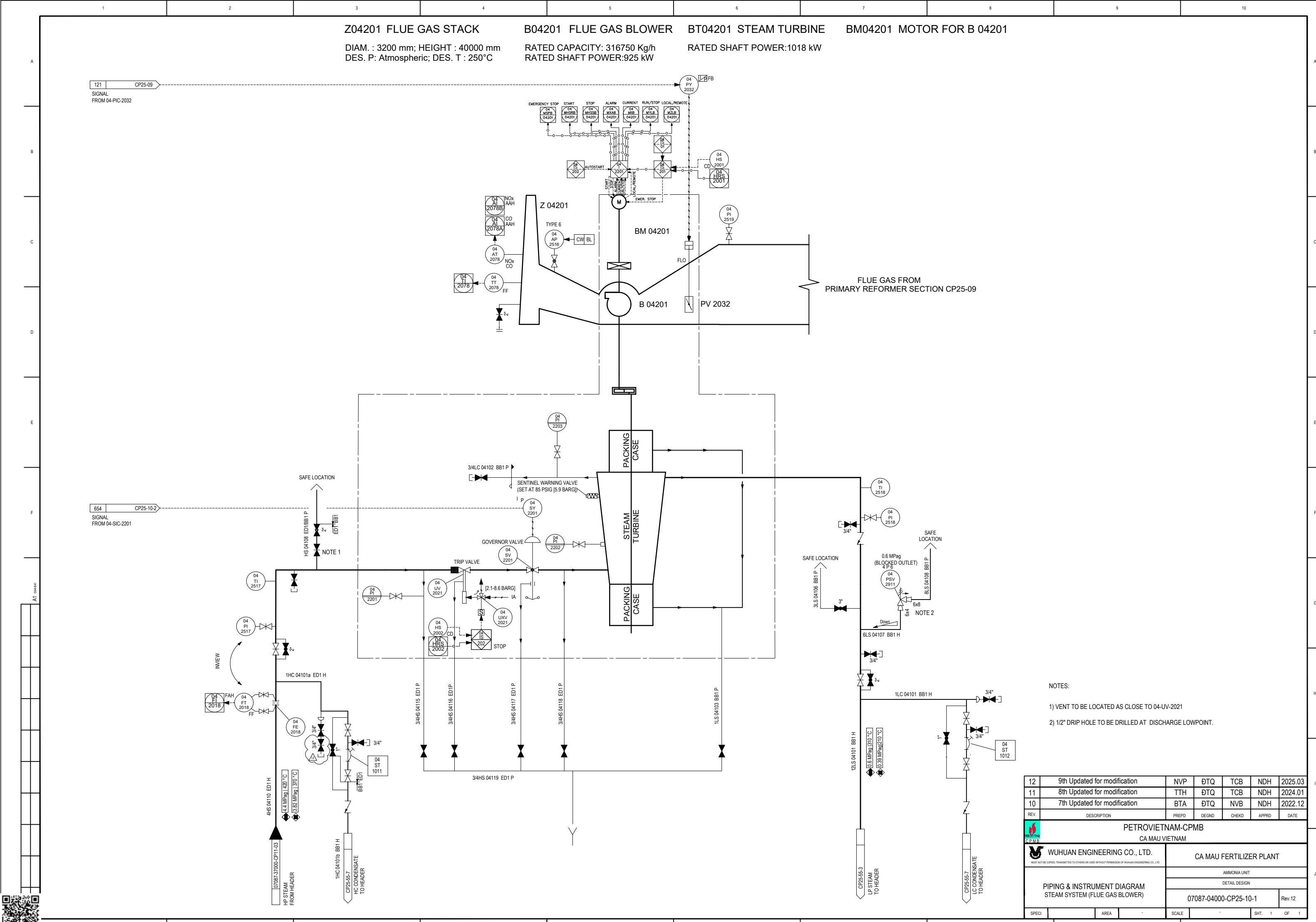
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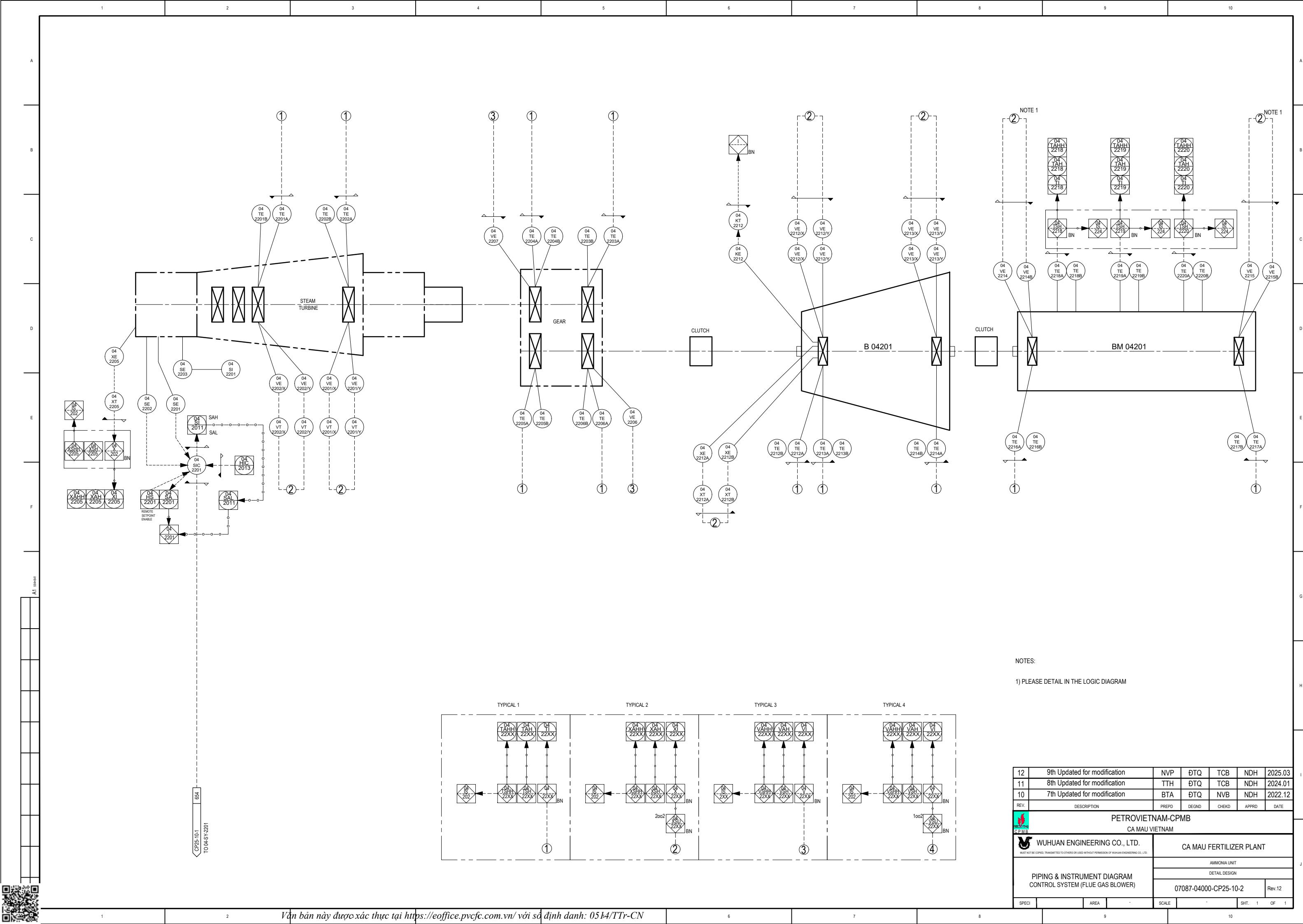


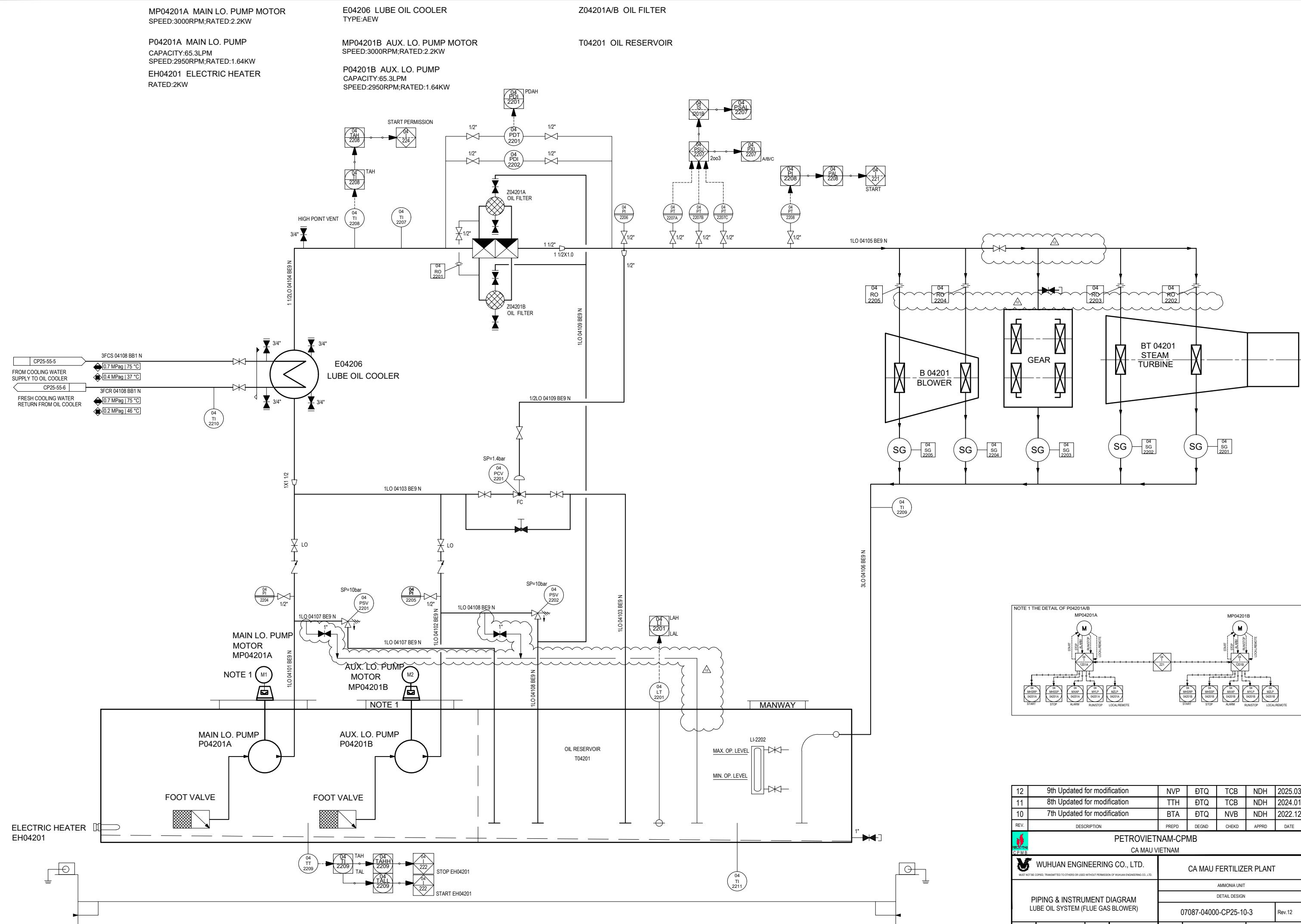


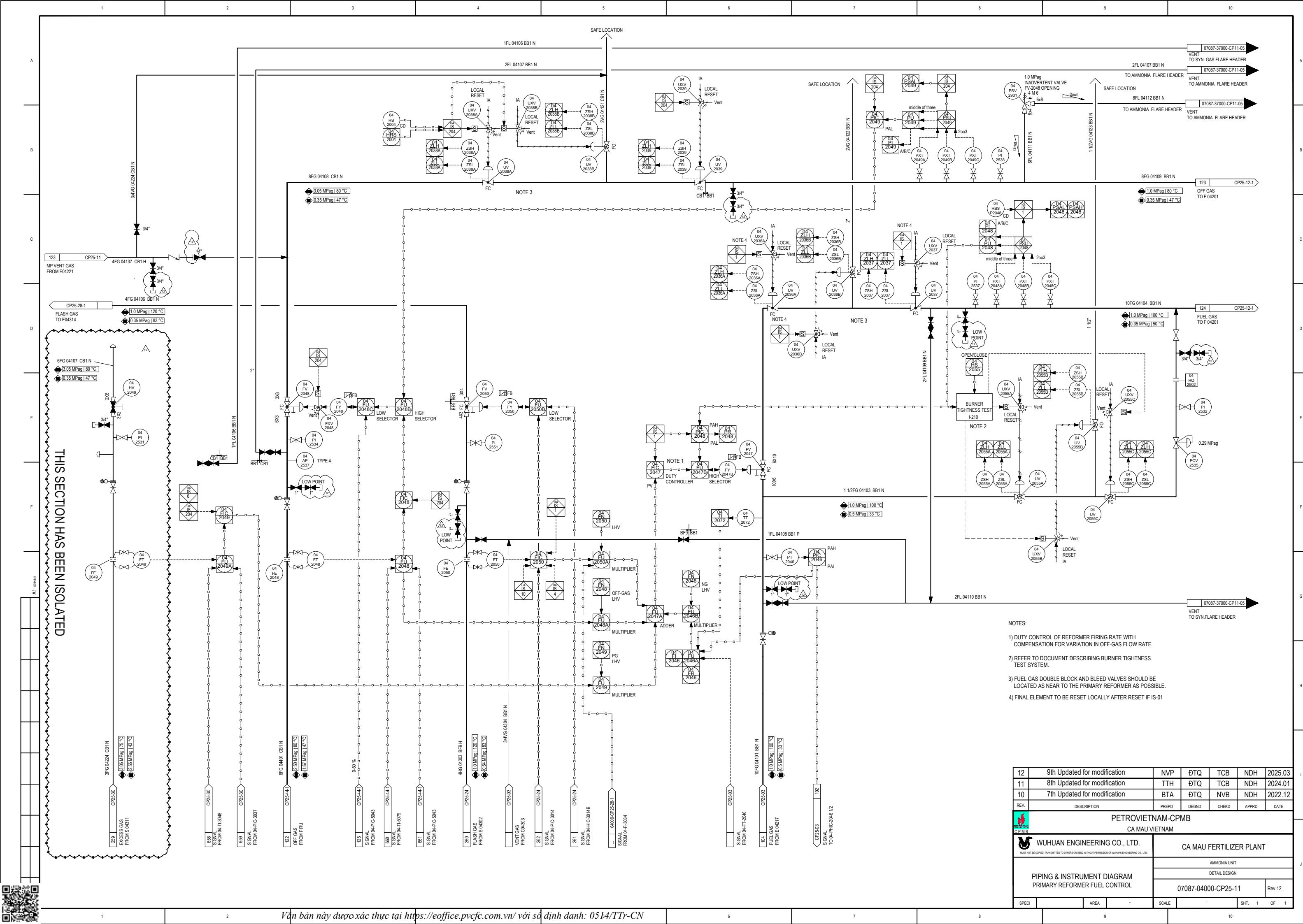


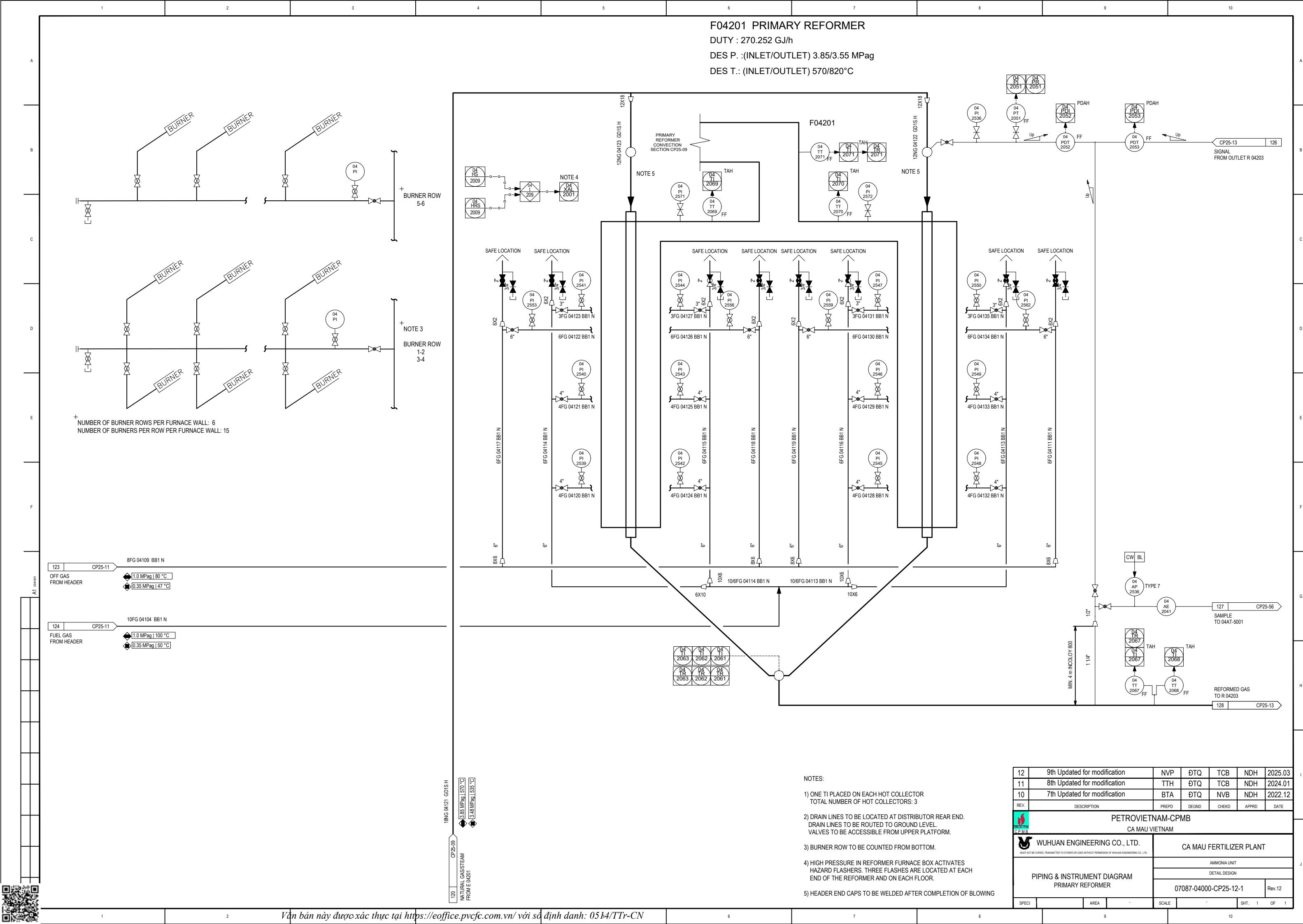


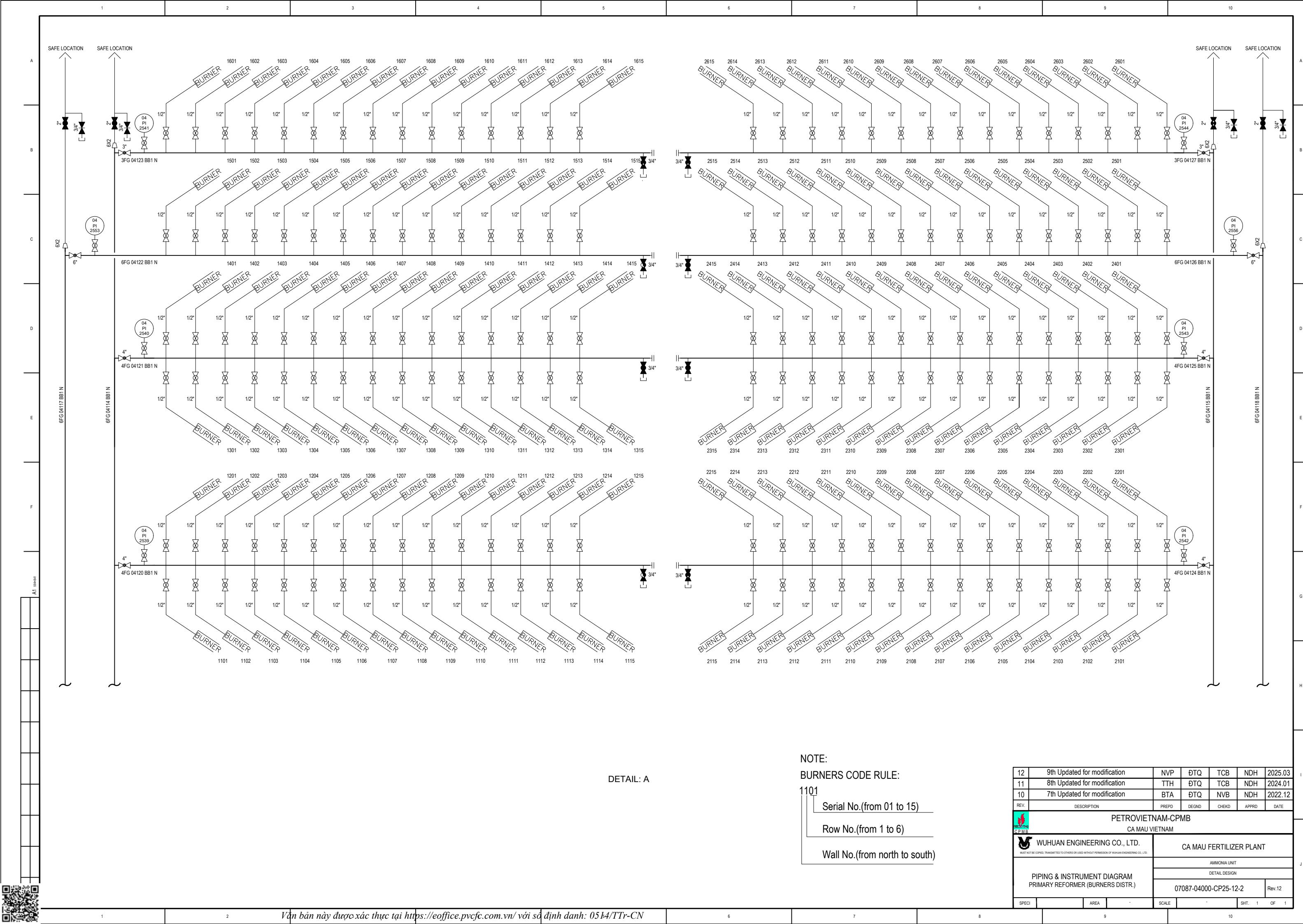


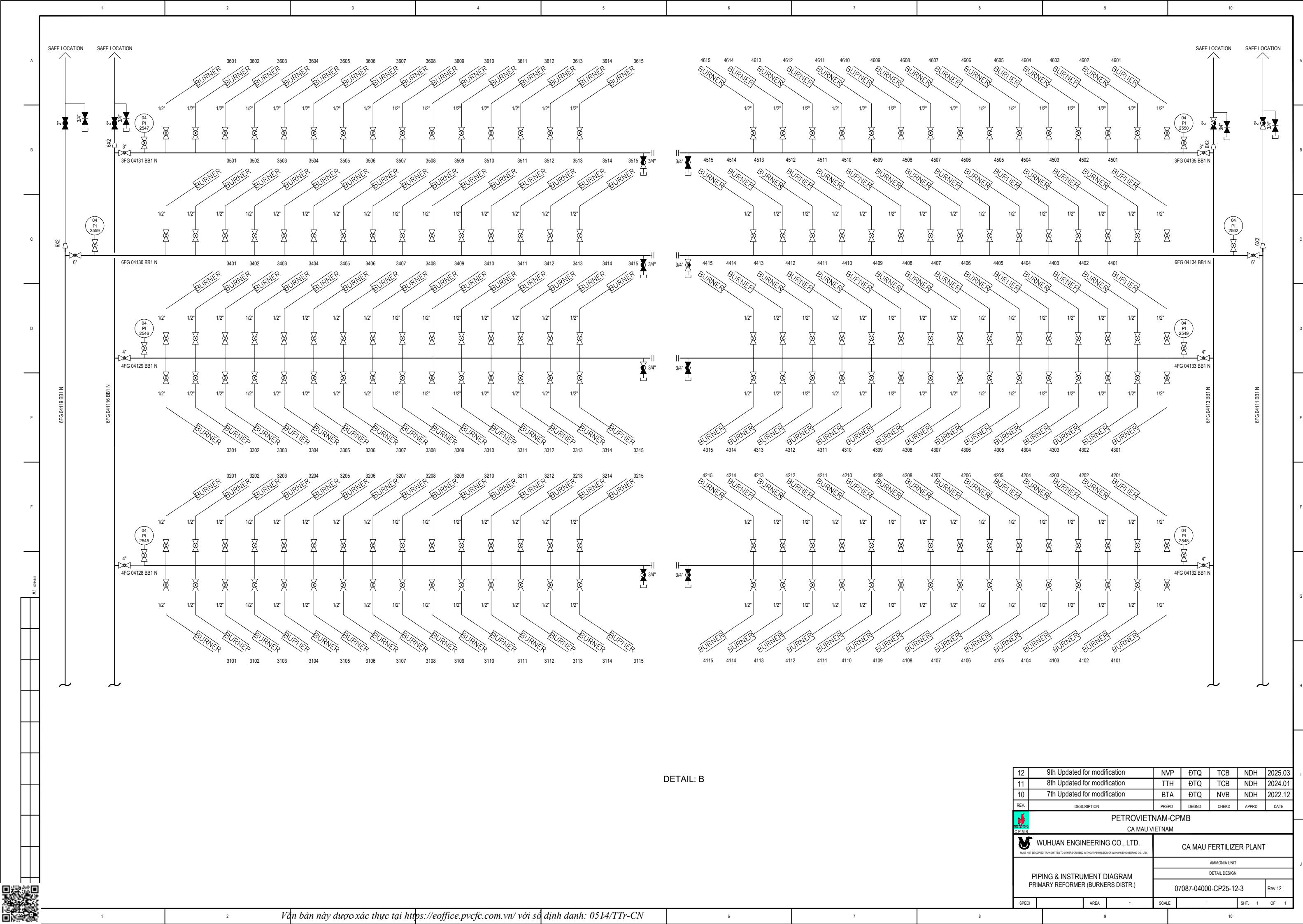












**J04201 SECONDARY REFORMER BURNER  
(NEW MODEL: FREEBURN BURNER)**

**R04203 SECONDARY REFORMER**

DIAM. : 3500 mm; HEIGHT : 2940 mm  
DES. P: 3.5 MPag; DES. T : -10/300°C

CATALYST VOL. : 28.3 m<sup>3</sup>

ALUMINA BALL 2' VOL : 1m<sup>3</sup>  
ALUMINA LUMPS VOL : 7.14 m<sup>3</sup>

**E04208 WASTE HEAT BOILER NO.1**

TYPE: WASTE HEAT BOILER  
DUTY: 224.172 GJ/h ; SURFACE AREA : 519.6m<sup>2</sup>

DES. P SHELL/TUBE : 13/3.45 MPag

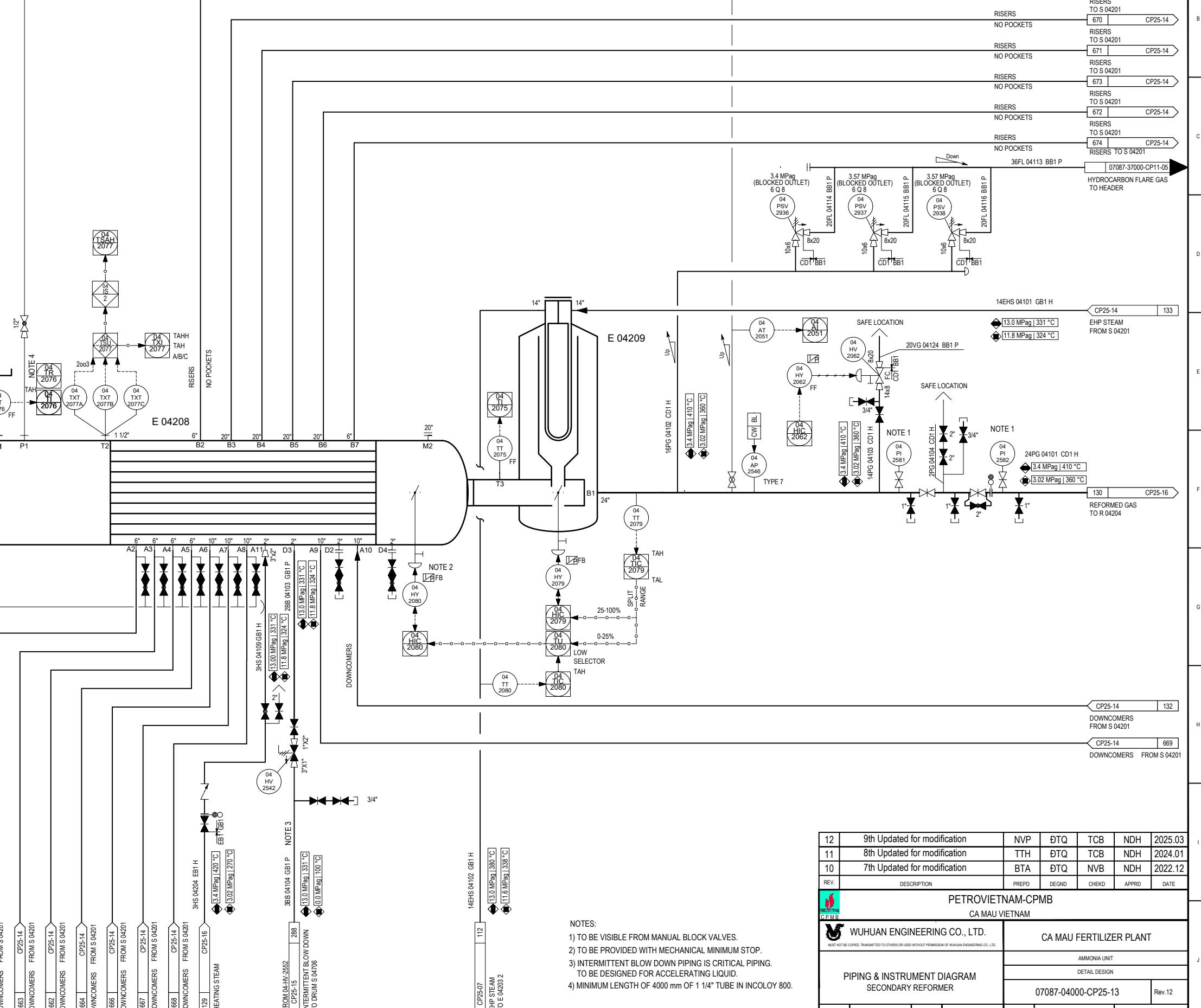
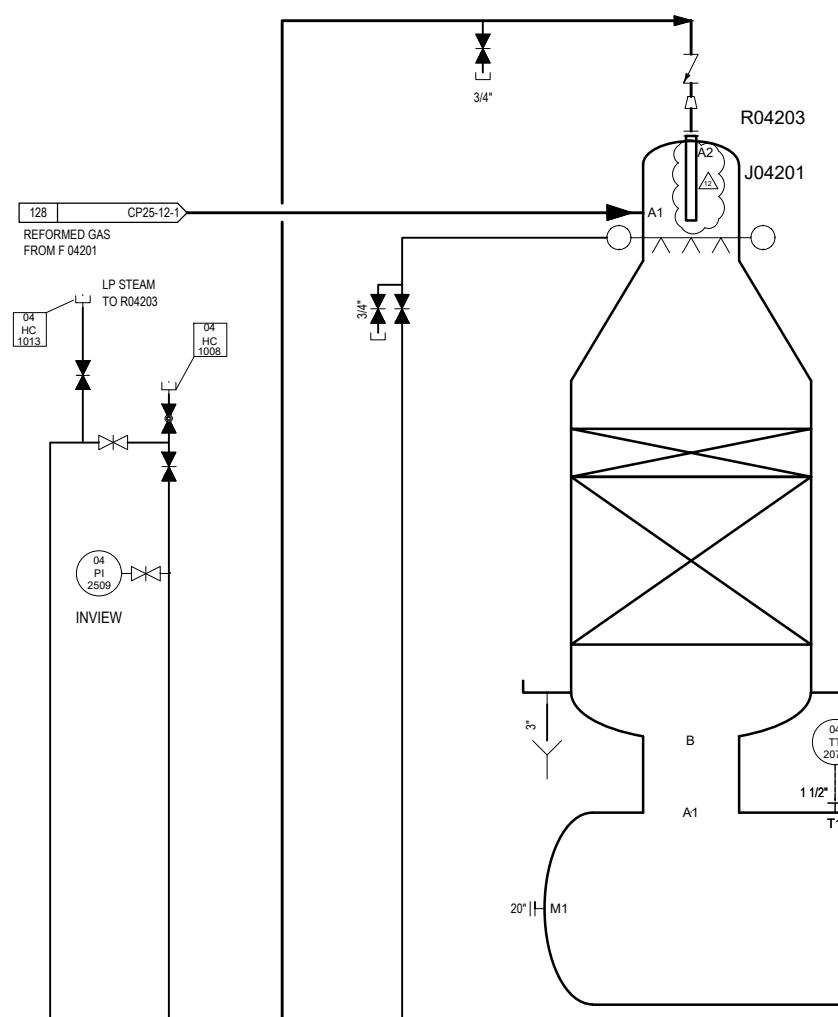
DES. T SHELL/TUBE : 331/1060°C

**E04209 STEAM SUPERHEATER**

TYPE: STEAM SUPERHEATER  
DUTY: 27.252 GJ/h ; SURFACE AREA : 282.0m<sup>2</sup>

DES. P SHELL/TUBE : 3.45/13 MPag

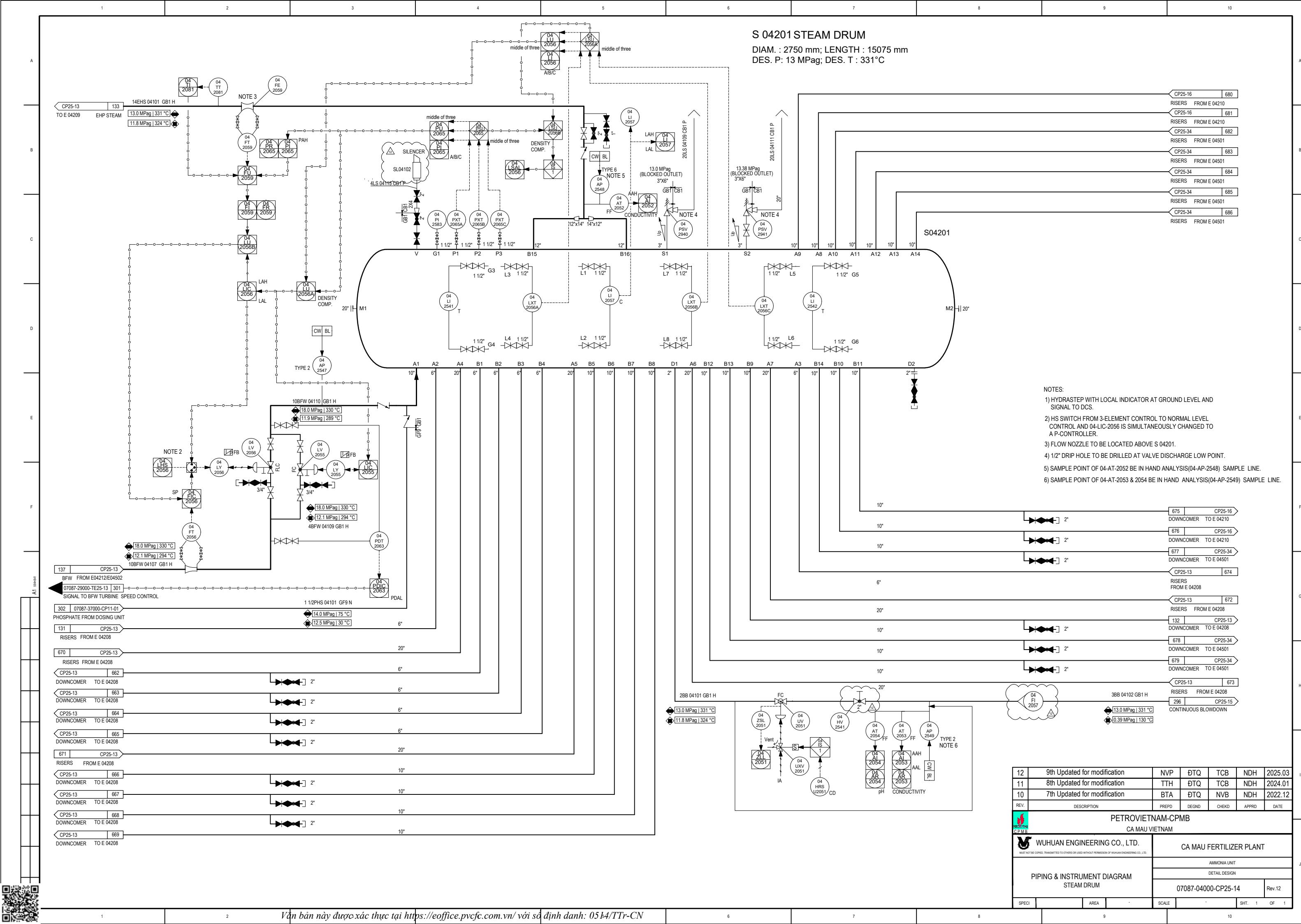
DES. T SHELL/TUBE : 410/331 380°C



NOTES:

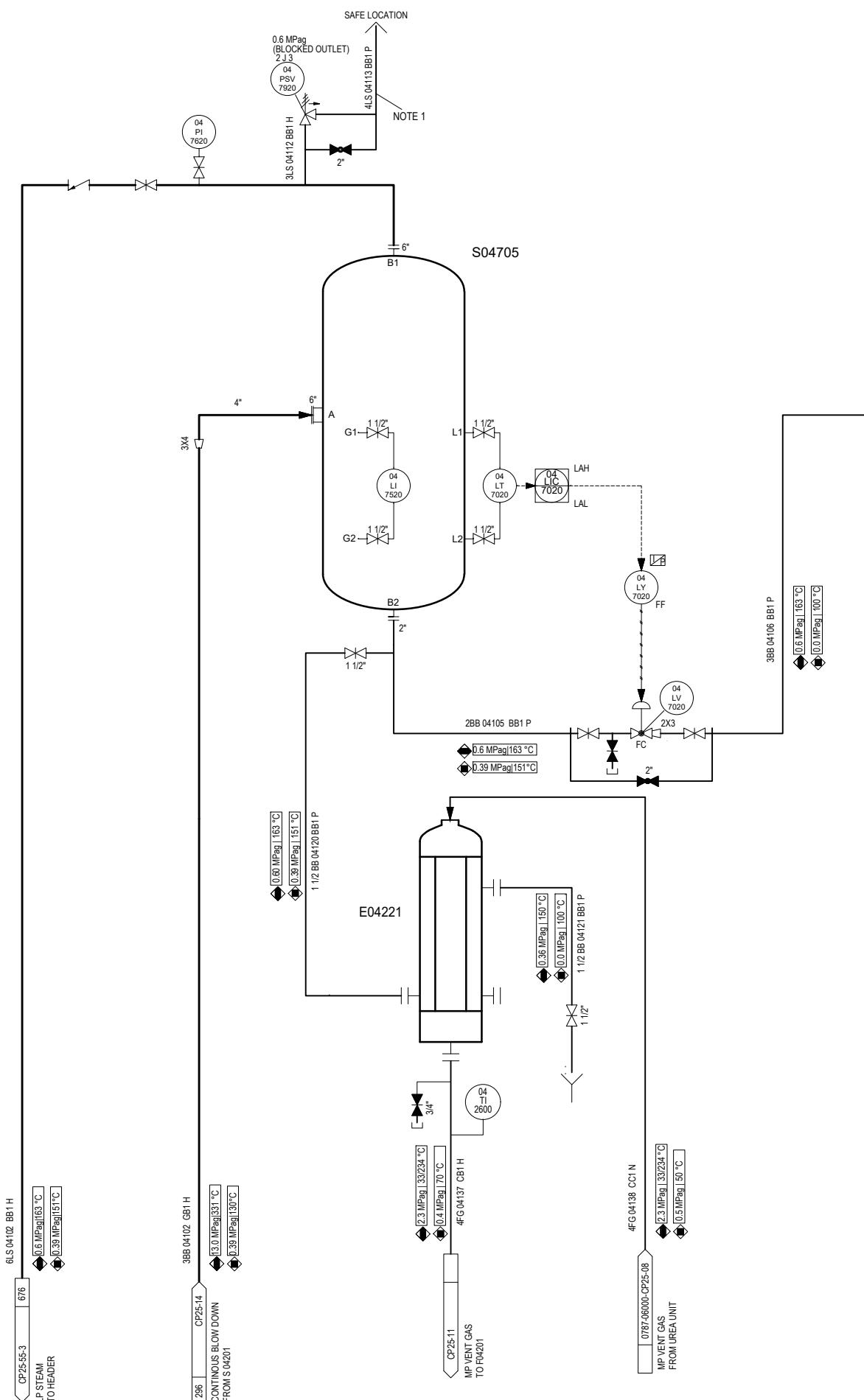
- 1) TO BE VISIBLE FROM MANUAL BLOCK VALVES.
- 2) TO BE PROVIDED WITH MECHANICAL MINIMUM STOP.
- 3) INTERMITTENT BLOW DOWN PIPING IS CRITICAL PIPING.  
TO BE DESIGNED FOR ACCELERATING LIQUID.
- 4) MINIMUM LENGTH OF 4000 mm OF 1 1/4" TUBE IN INCOLOY 800.

REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE
12	9th Updated for modification	NVP	ĐTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	ĐTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	ĐTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE
	PETROVIETNAM-CPMB CA MAU VIETNAM					
	WUHAN ENGINEERING CO., LTD. MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHAN ENGINEERING CO., LTD.					
	CA MAU FERTILIZER PLANT					
	AMMONIA UNIT					
	DETAIL DESIGN					
	07087-04000-CP25-13					
	Rev.12					
SPECI	AREA	-	-	-	SCALE	-
SHT. 1	OF 1					



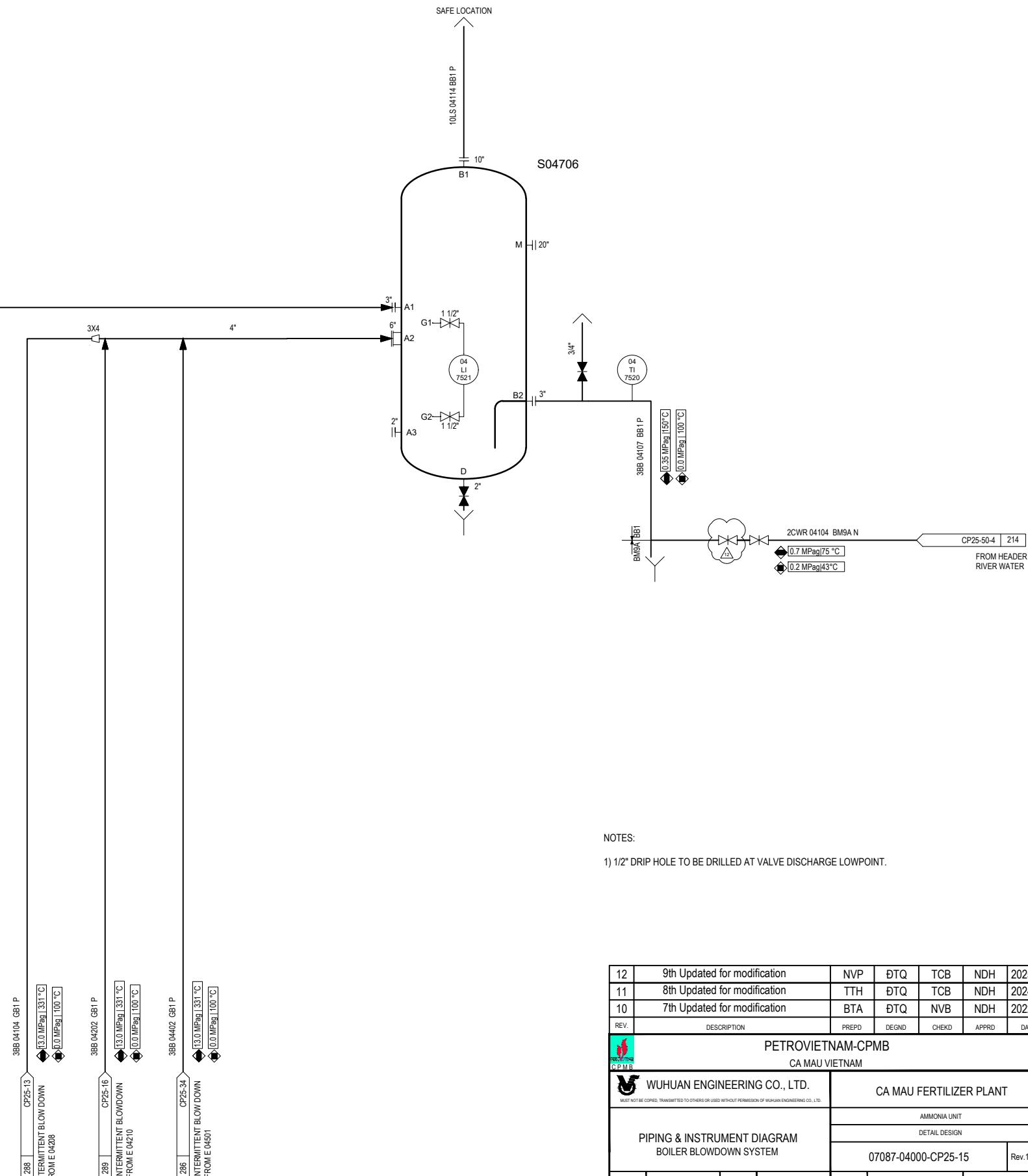
## S04705 CONTINUOUS BLOW DOWN DRUM

DIAM. : 700 mm; HEIGHT : 2225 mm  
DES. P: Full vacuum/0.6MPag; DES. T : -10/163°C

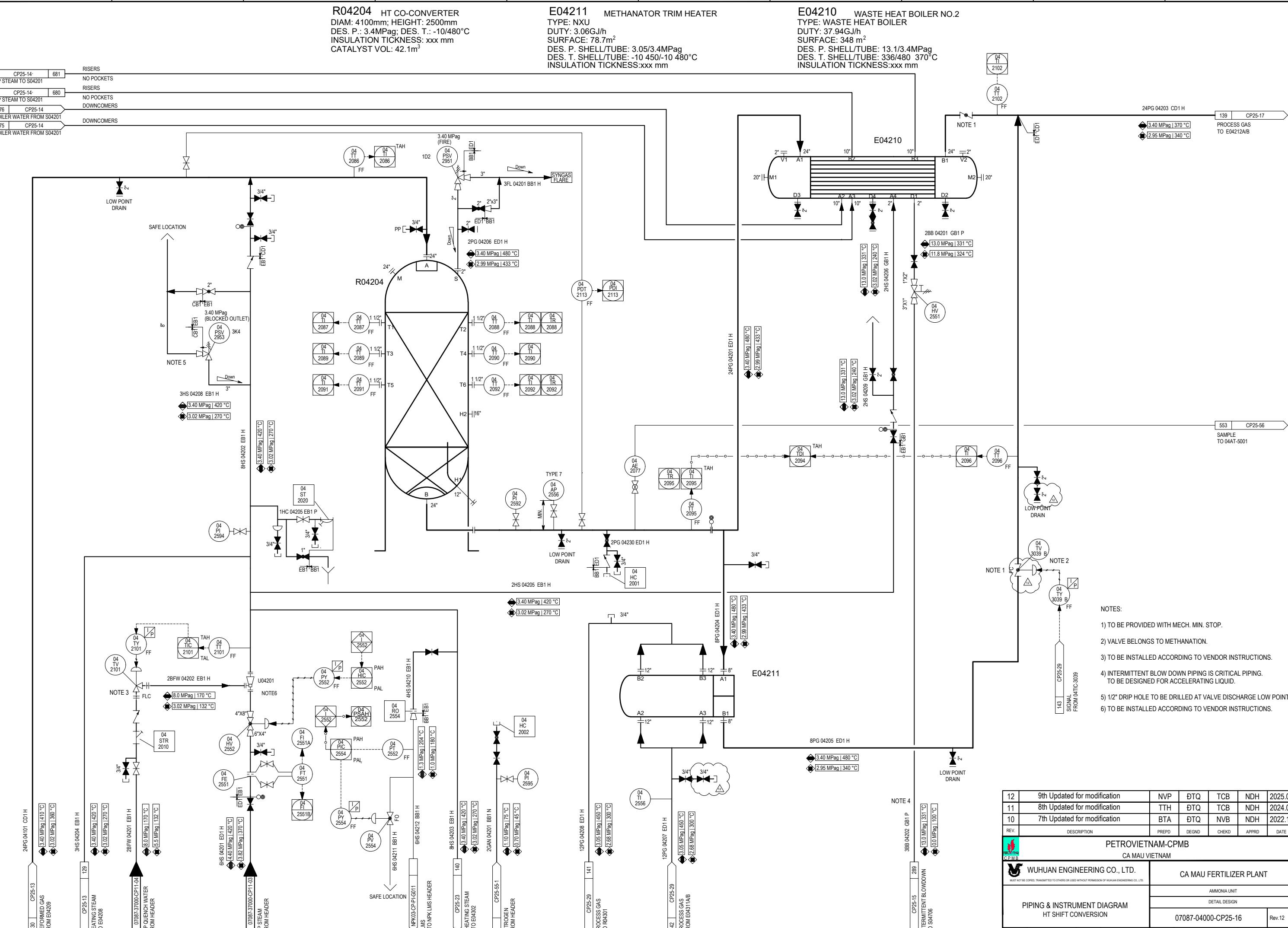


## S04706 INTERMITTENT BLOW DOWN DRUM

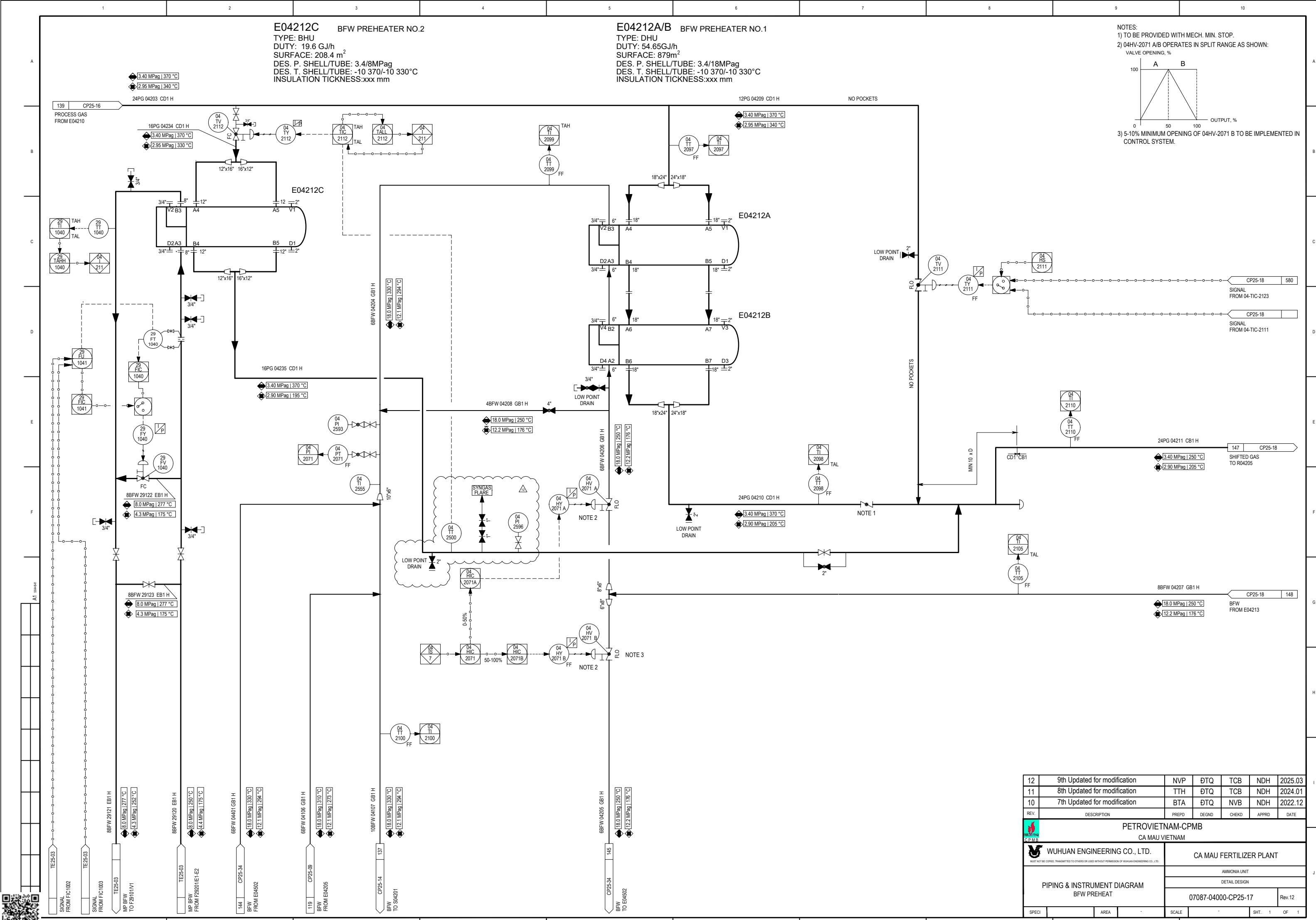
DIAM. : 1200 mm; HEIGHT : 2000 mm  
DES. P: 0.35MPag; DES. T : -10/150°C

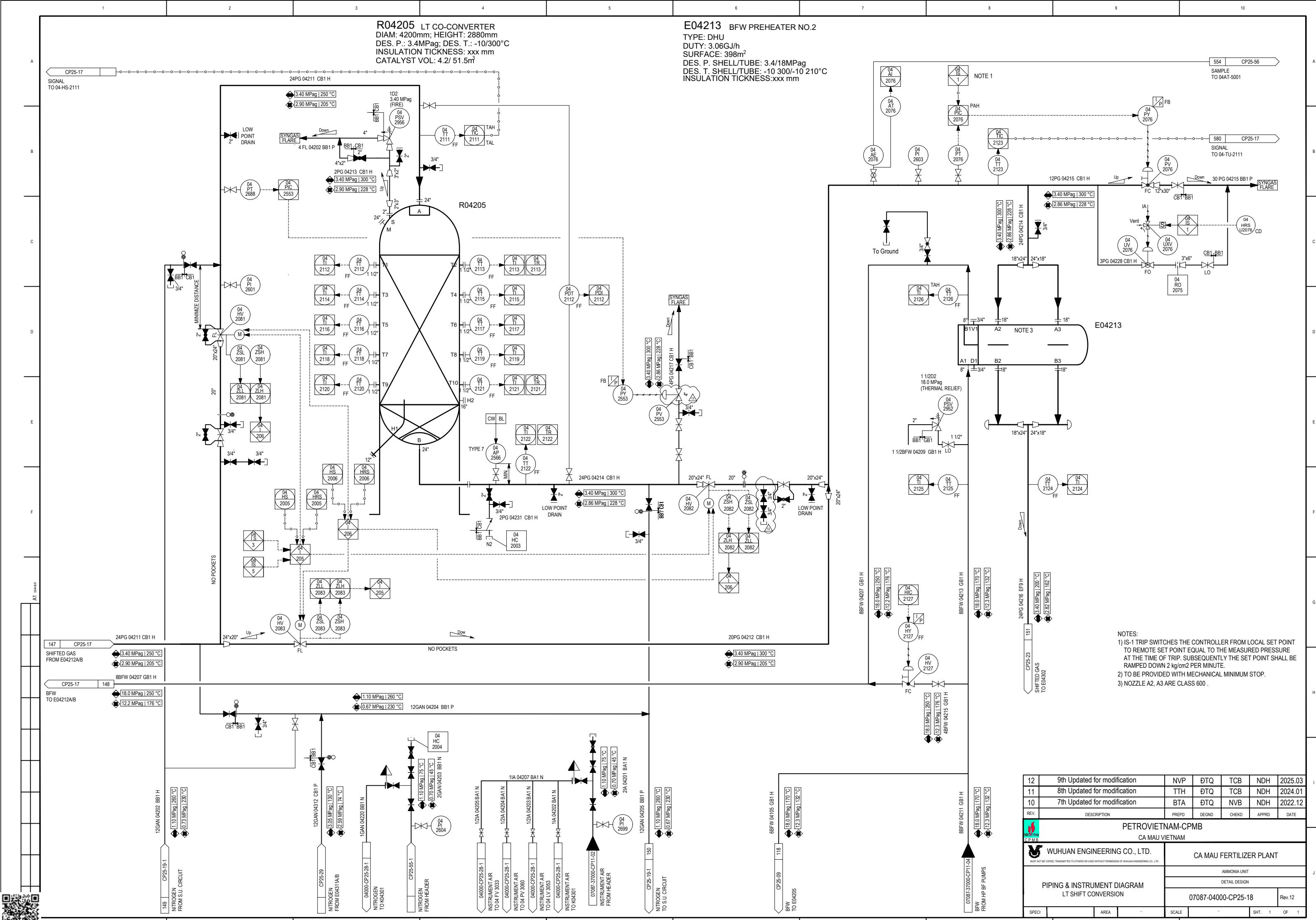


12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE
 WUHUAN ENGINEERING CO., LTD. CPCMB	PETROVIETNAM-CPMB CA MAU VIETNAM					
 WUHUAN ENGINEERING CO., LTD.  <small>MUST NOT BE COPIED. TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHUAN ENGINEERING CO., LTD.</small>  PIPING & INSTRUMENT DIAGRAM BOILER BLOWDOWN SYSTEM		CA MAU FERTILIZER PLANT				
		AMMONIA UNIT				
		DETAIL DESIGN				
		07087-04000-CP25-15				Rev.12



Văn bản này được xác thực tại <https://eoffice.mycfc.com.vn/> với số định danh: 0514/TTr-CN

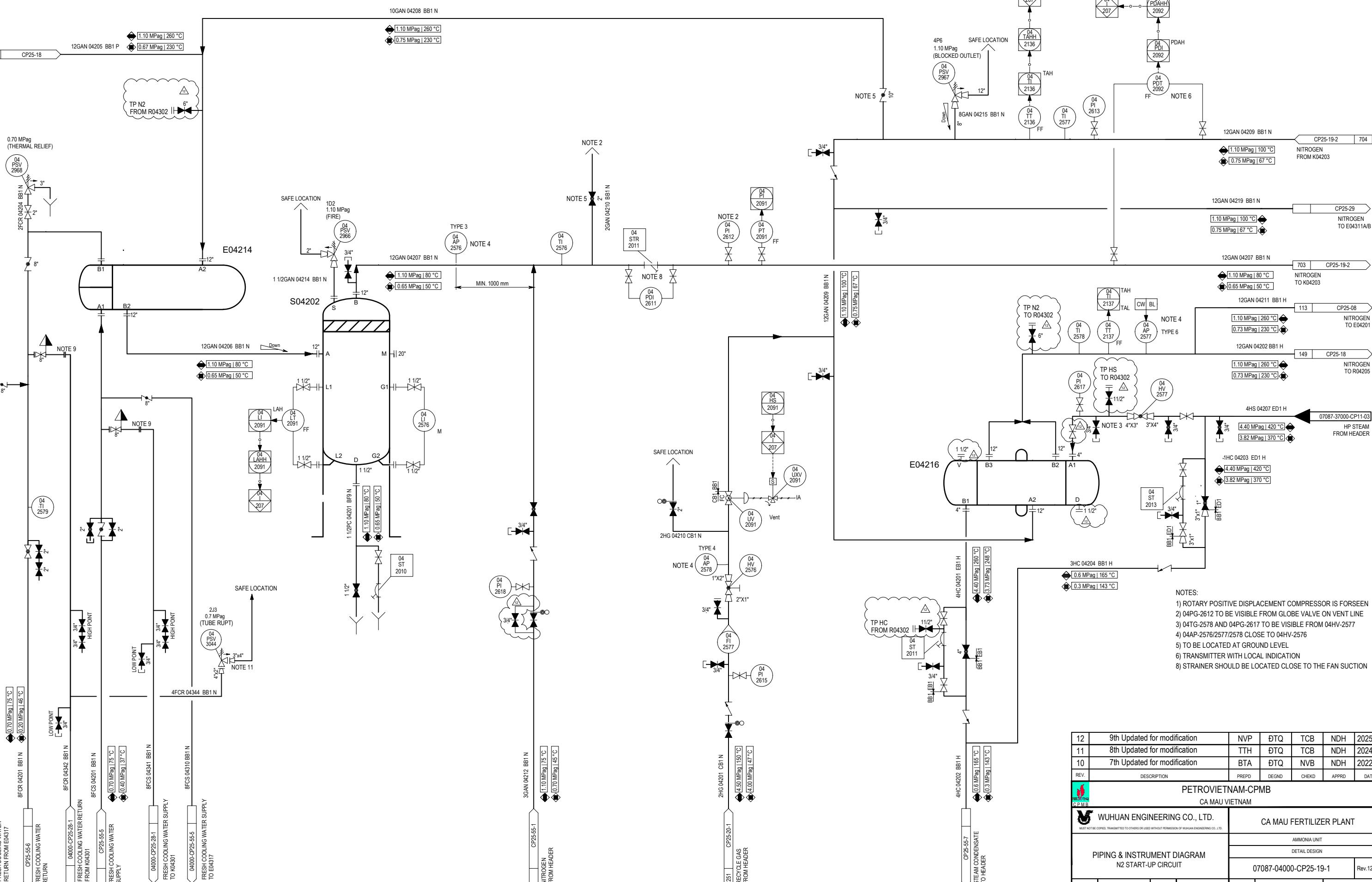




**E04214 START-UP COOLER**  
 TYPE: BEU  
 DUTY: 7.38GJ/h  
 SURFACE: 93.8m<sup>2</sup>  
 DES. P. SHELL/TUBE: 1.1/0.7MPag  
 DES. T. SHELL/TUBE: -10 260/-10 75°C  
 INSULATION TICKNESS:xxx mm

**S04202 SEPARATOR IN SU CIRCUIT**  
 DIAM: 1300mm; HEIGHT: 2450mm  
 DES. P.: 1.1MPag; DES. T.: -10/80°C  
 INSULATION TICKNESS: xxx mm

**E04216 START-UP HEATER**  
 TYPE: BJM  
 DUTY: 5.44GJ/h  
 SURFACE: 69.4m<sup>2</sup>  
 DES. P. SHELL/TUBE: 1.1/4.4MPag  
 DES. T. SHELL/TUBE: -10 260/-10 420°C  
 INSULATION TICKNESS:xxx mm



- NOTES:
- 1) ROTARY POSITIVE DISPLACEMENT COMPRESSOR IS FORSEEN
  - 2) 04PG-2612 TO BE VISIBLE FROM GLOBE VALVE ON VENT LINE
  - 3) 04TG-2578 AND 04PG-2617 TO BE VISIBLE FROM 04HV-2576
  - 4) 04AP-2576/2577/2578 CLOSE TO 04HV-2576
  - 5) TO BE LOCATED AT GROUND LEVEL
  - 6) TRANSMITTER WITH LOCAL INDICATION
  - 8) STRAINER SHOULD BE LOCATED CLOSE TO THE FAN SUCTION

12	9th Updated for modification	NVP	ĐTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	ĐTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	ĐTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE

PETROVIETNAM-CPMB

CA MAU VIETNAM

WUHAN ENGINEERING CO., LTD.

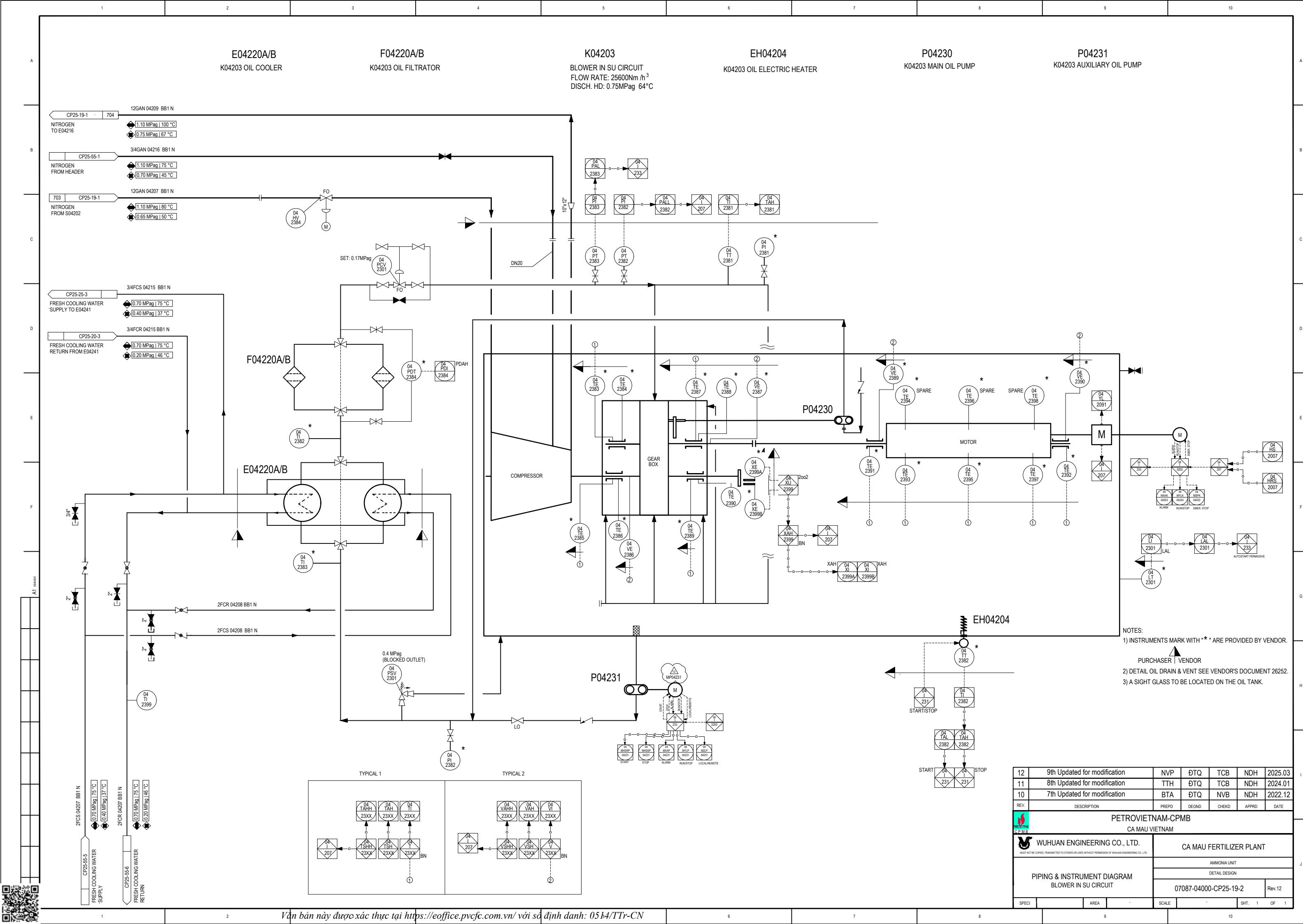
MUST NOT BE COPIED, TRANSMITED TO OTHERS OR USED WITHOUT PERMISSION OF WUHAN ENGINEERING CO., LTD.

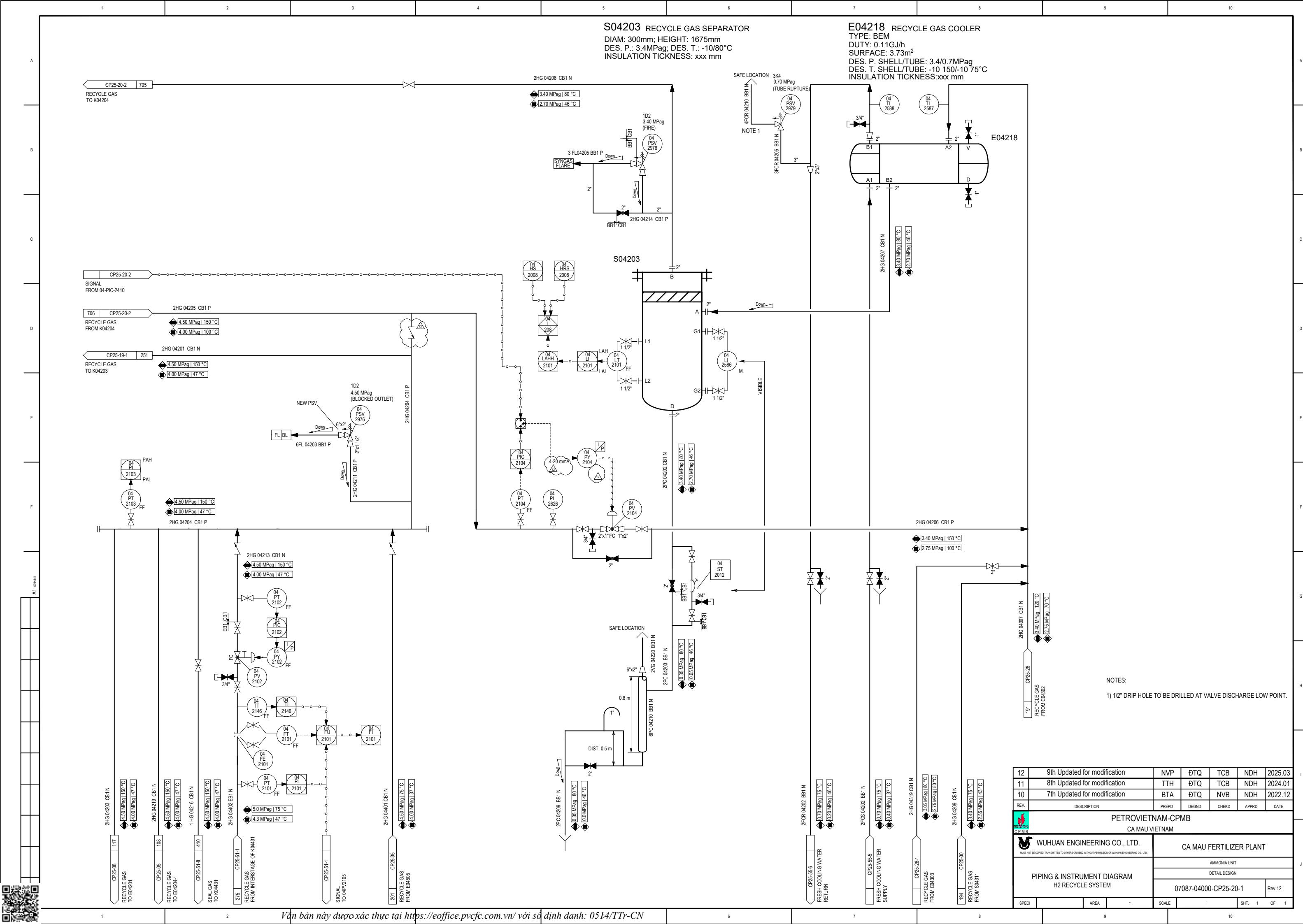
AMMONIA UNIT

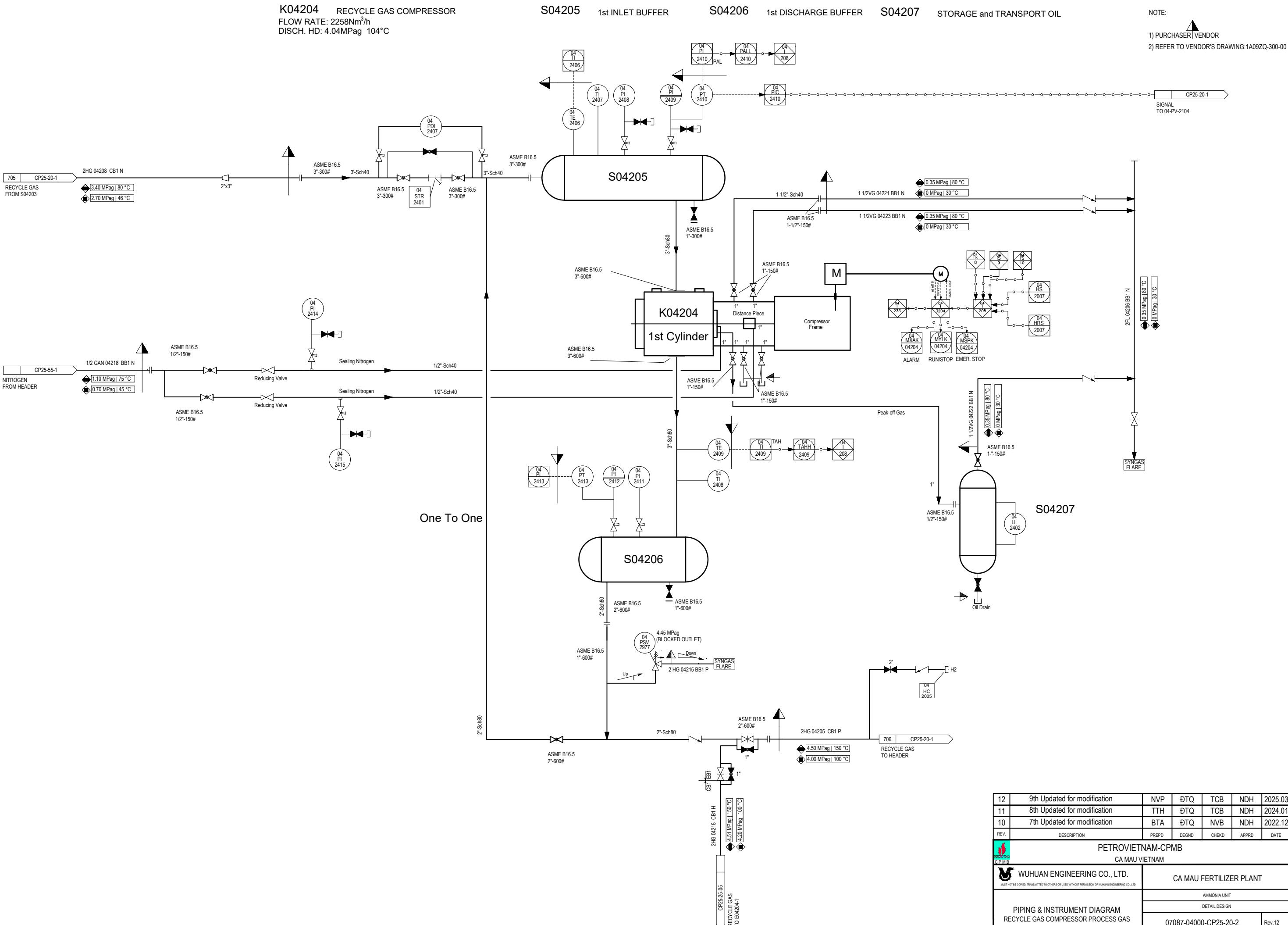
DETAIL DESIGN

07087-04000-CP25-19-1 Rev.12

SPECI	AREA	-	SCALE	-	SH. 1	OF 1
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12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	BTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREP'D	DEGND	CHEKD	APPR'D	DATE

PETROVIETNAM-CPMB

CA MAU VIETNAM

CA MAU FERTILIZER PLANT

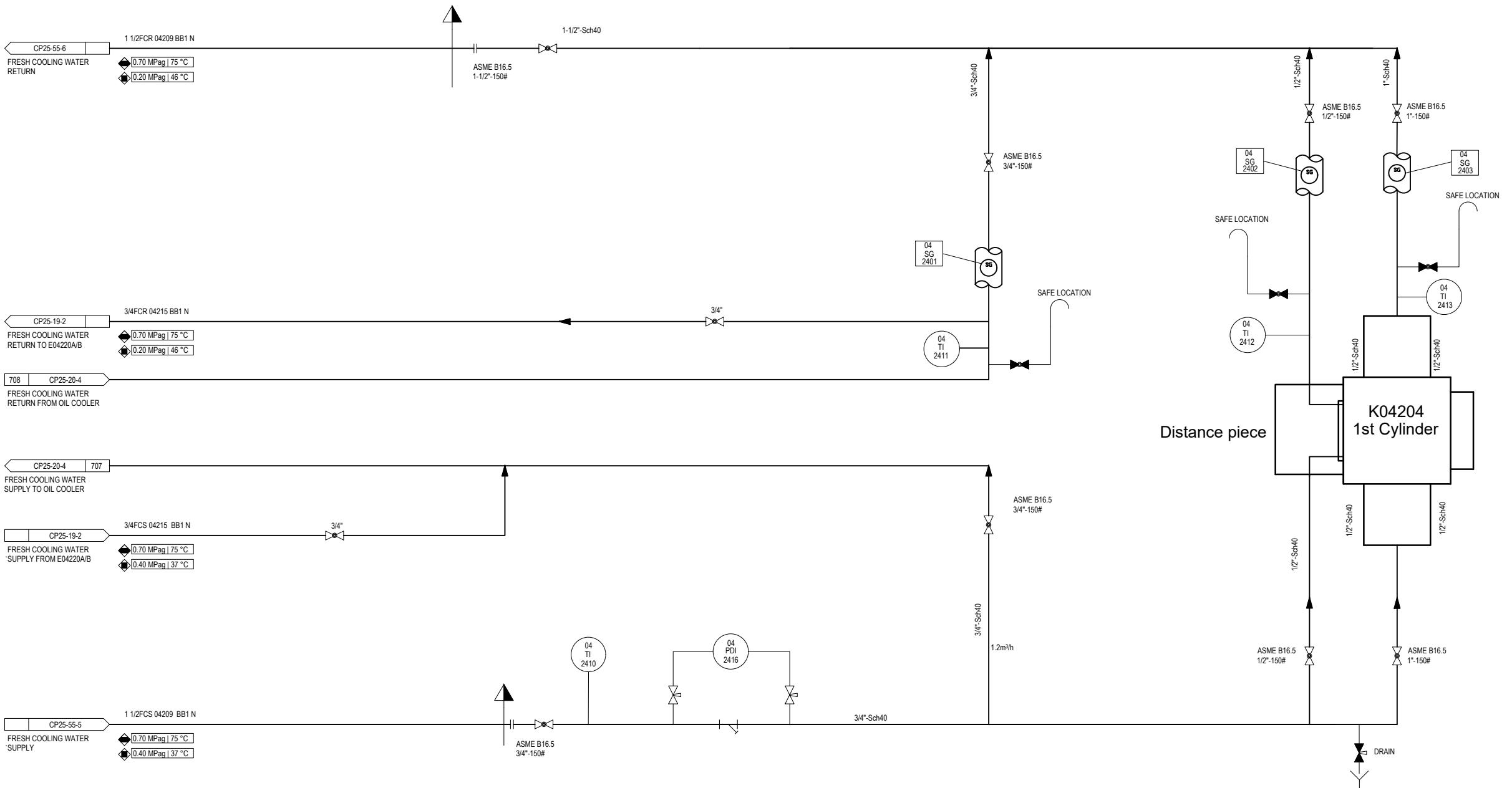
#### AMMONIA UNIT

07007-04000-0B05-00-0

SHT. 1

10

NOTE:  
 1) PURCHASER|VENDOR  
 2) REFER TO VENDOR'S DRAWING:1A09ZQ-400-00



12	9th Updated for modification	NVP	ĐTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	ĐTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	ĐTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE

PETROVIETNAM-CPMB

CA MAU VIETNAM

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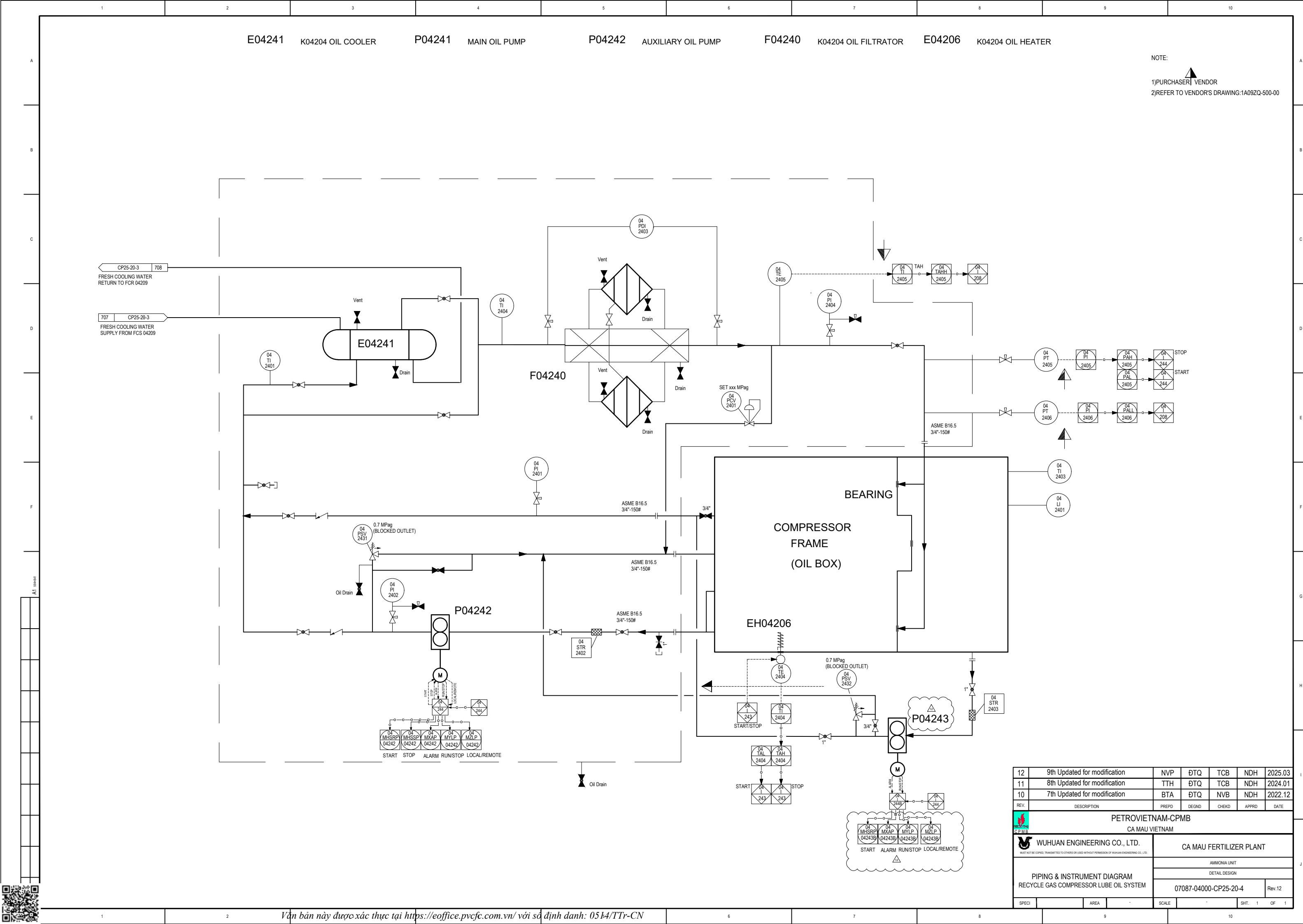
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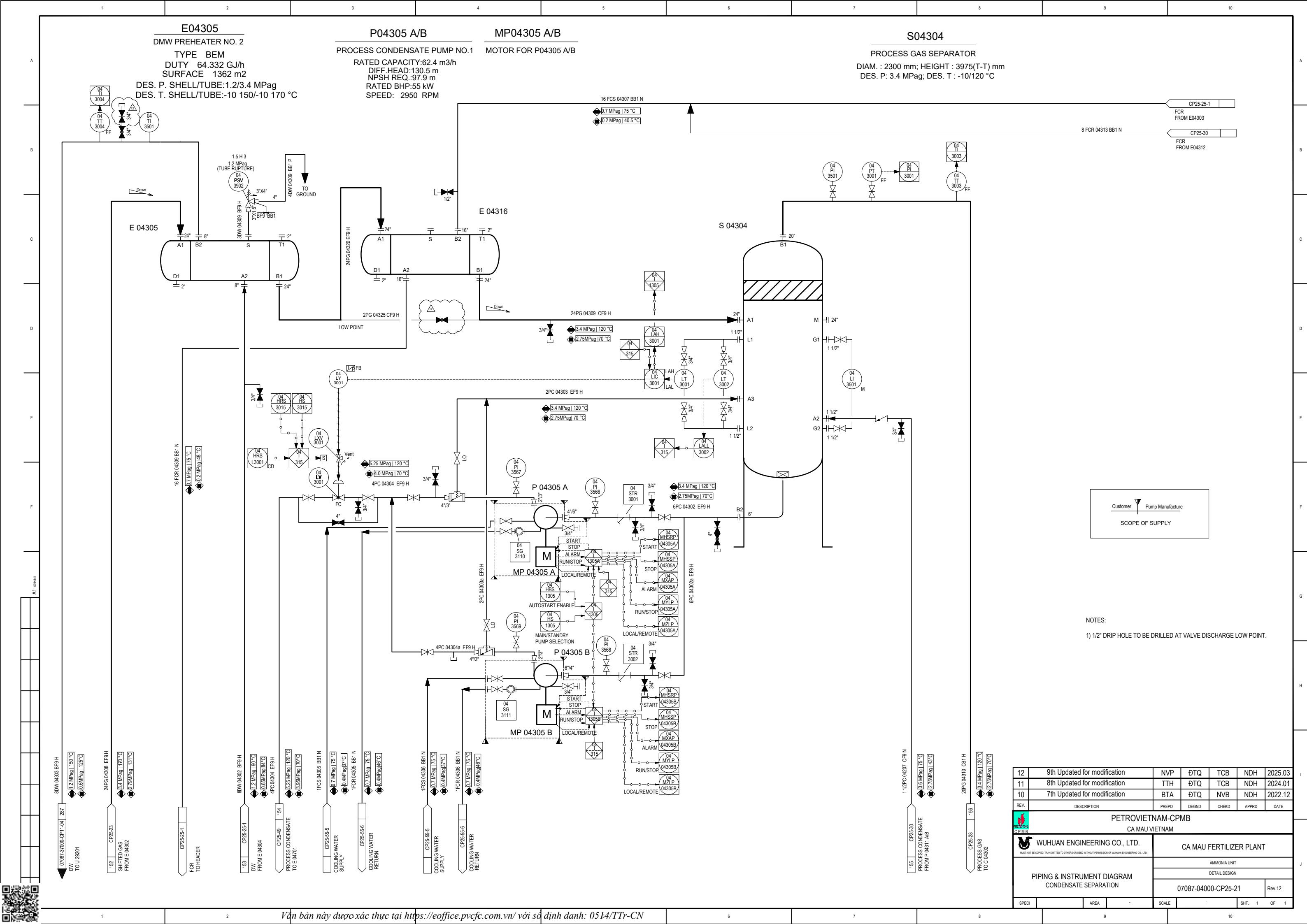
DETAIL DESIGN

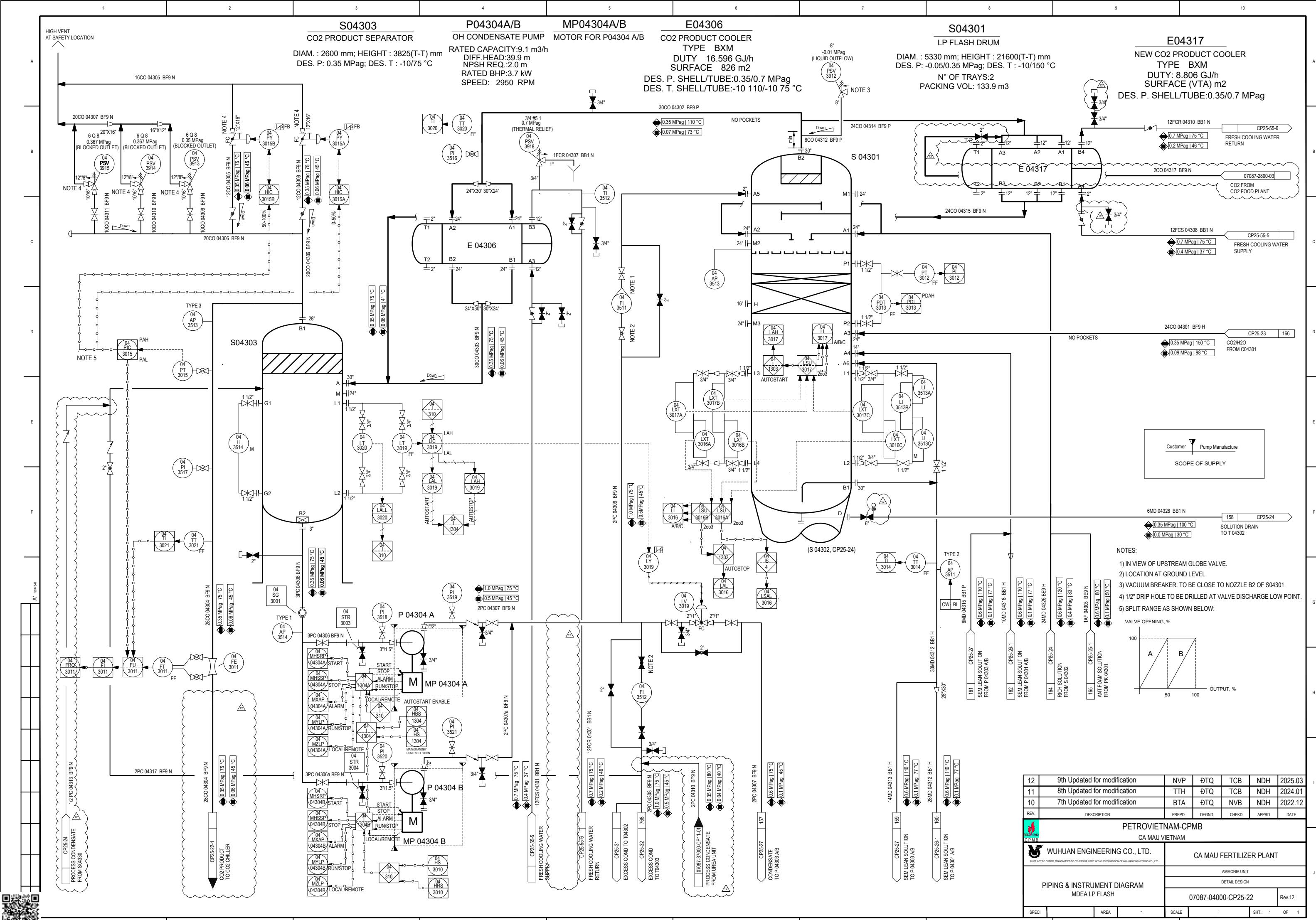
07087-04000-CP25-20-3 Rev.12

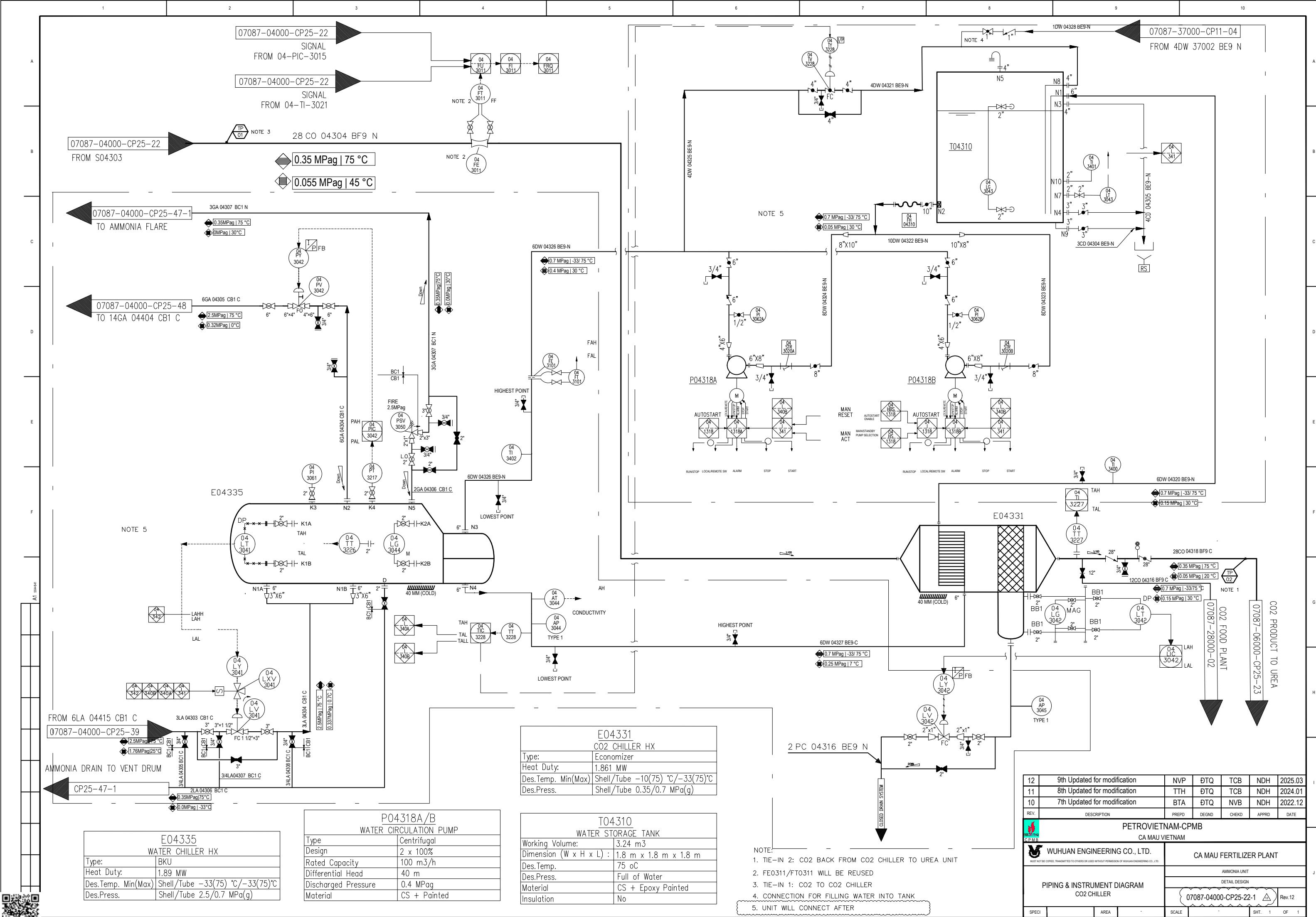
SPECI	AREA	-	SCALE	-	SHT. 1	OF 1

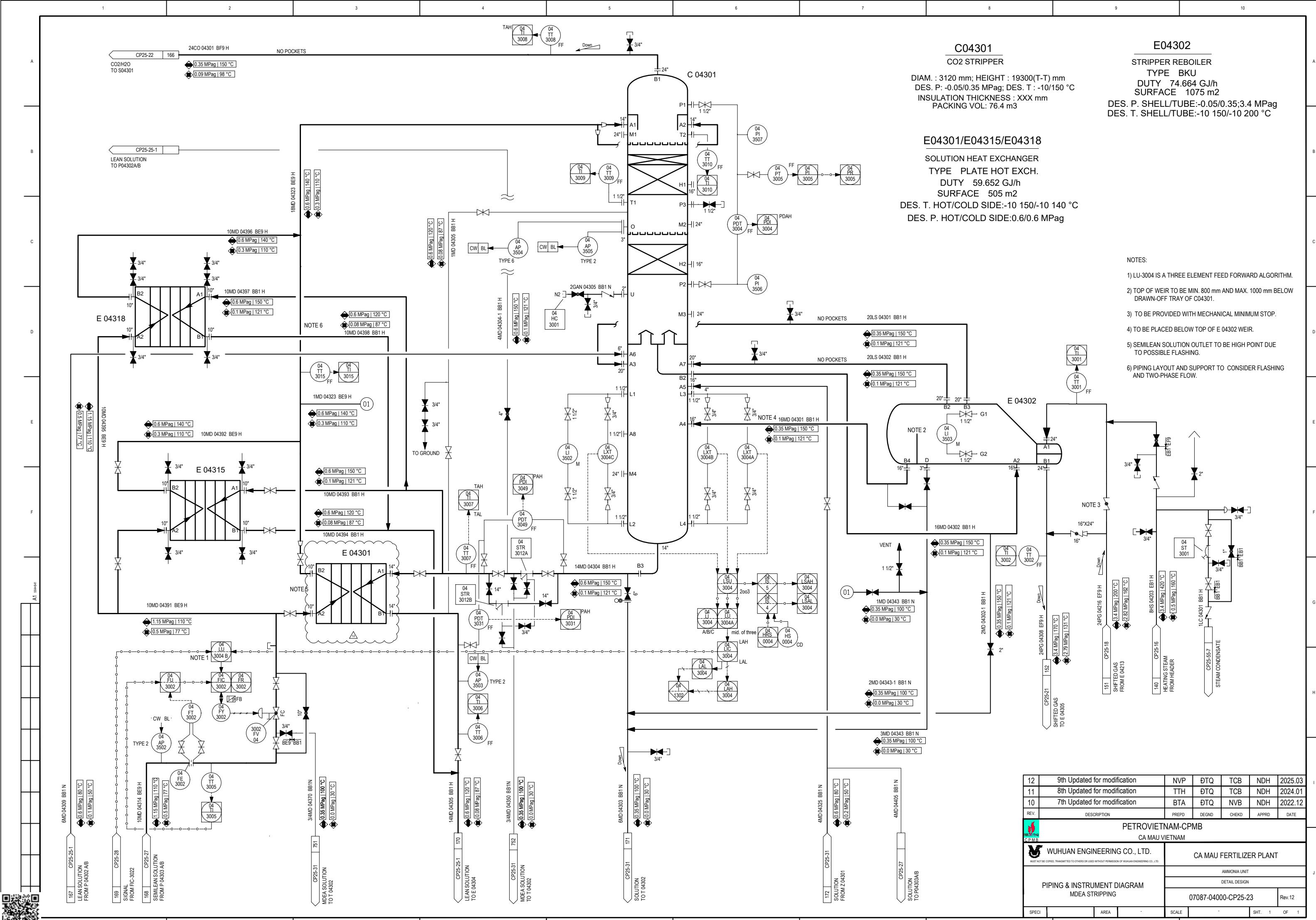


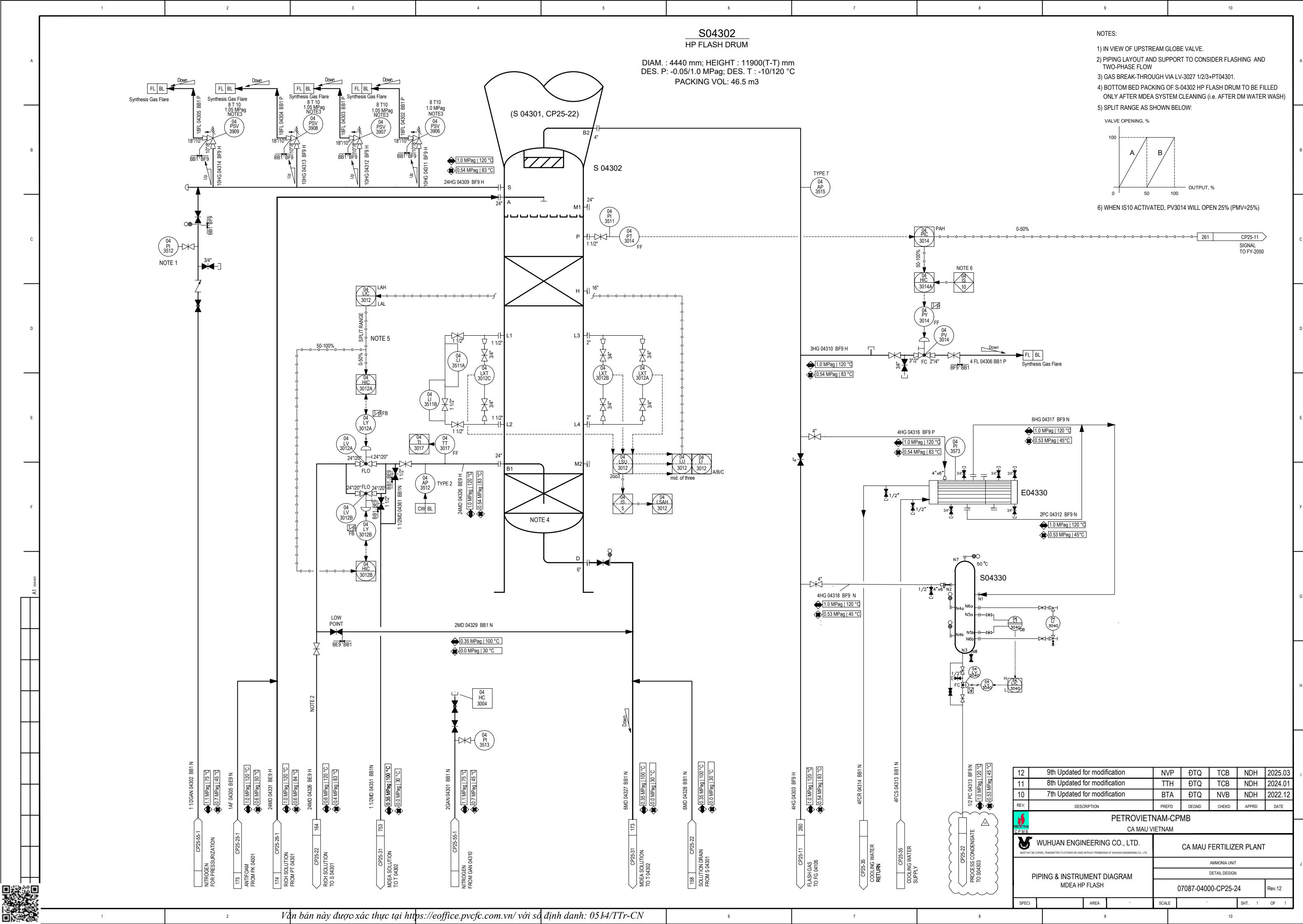


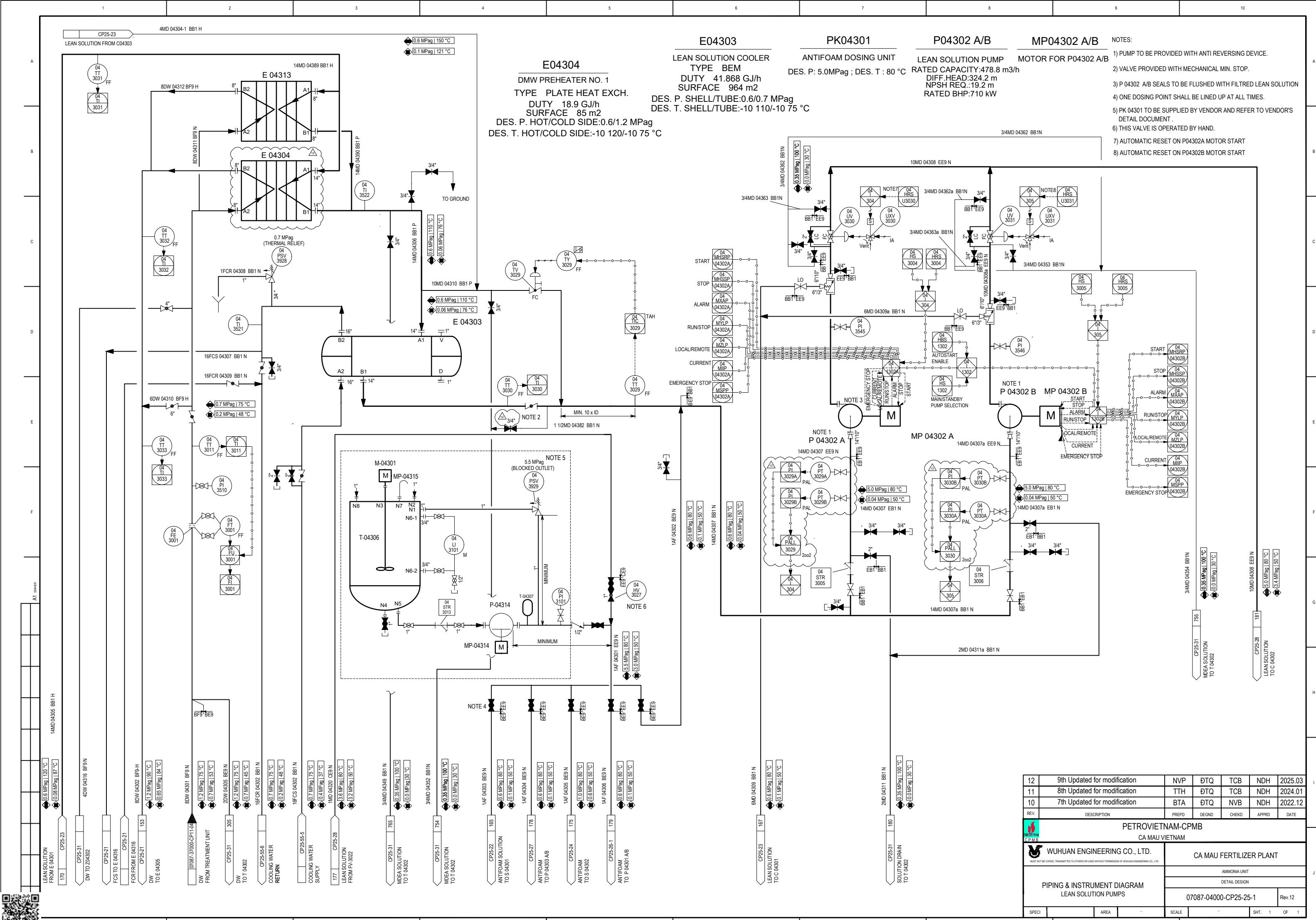


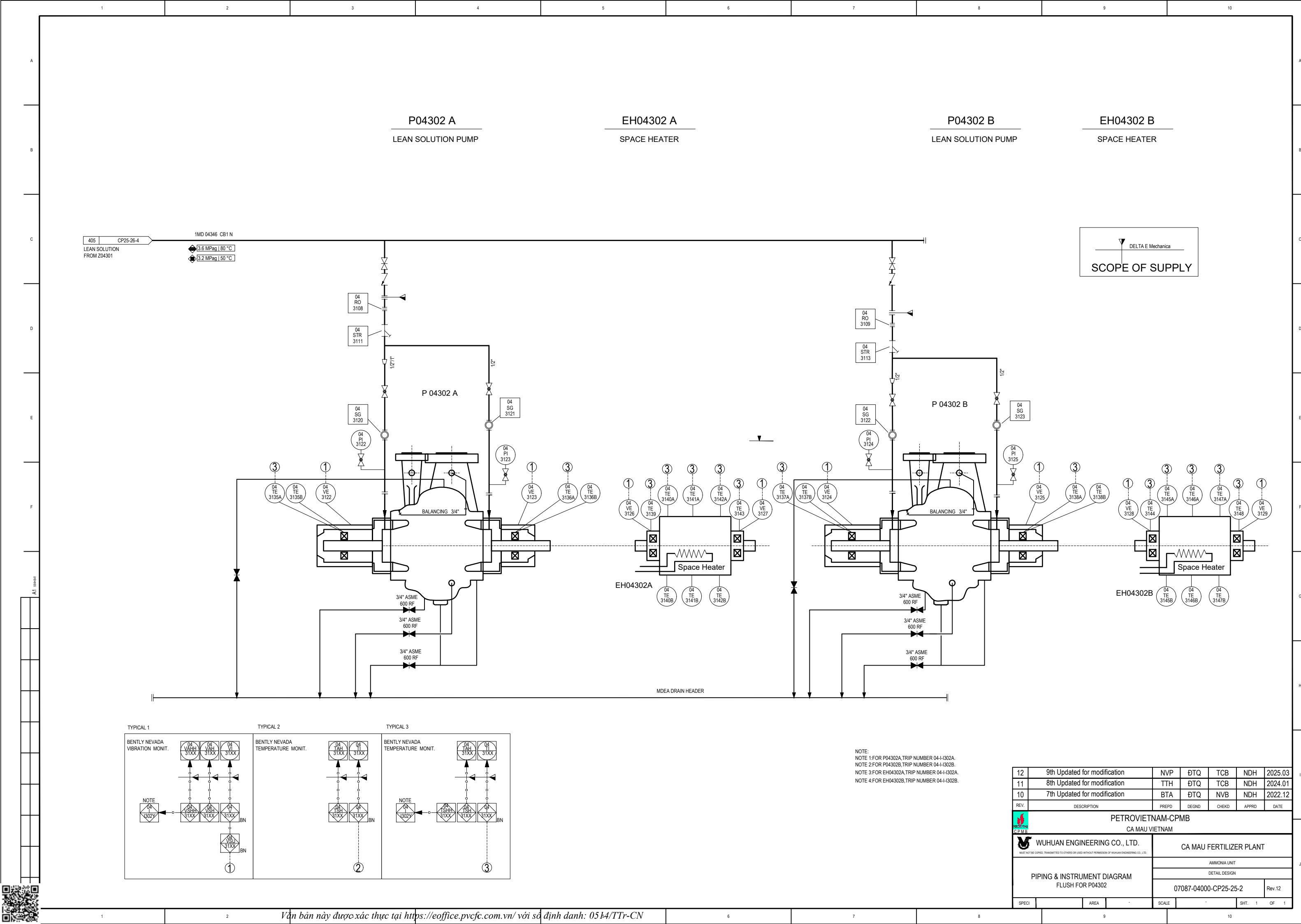


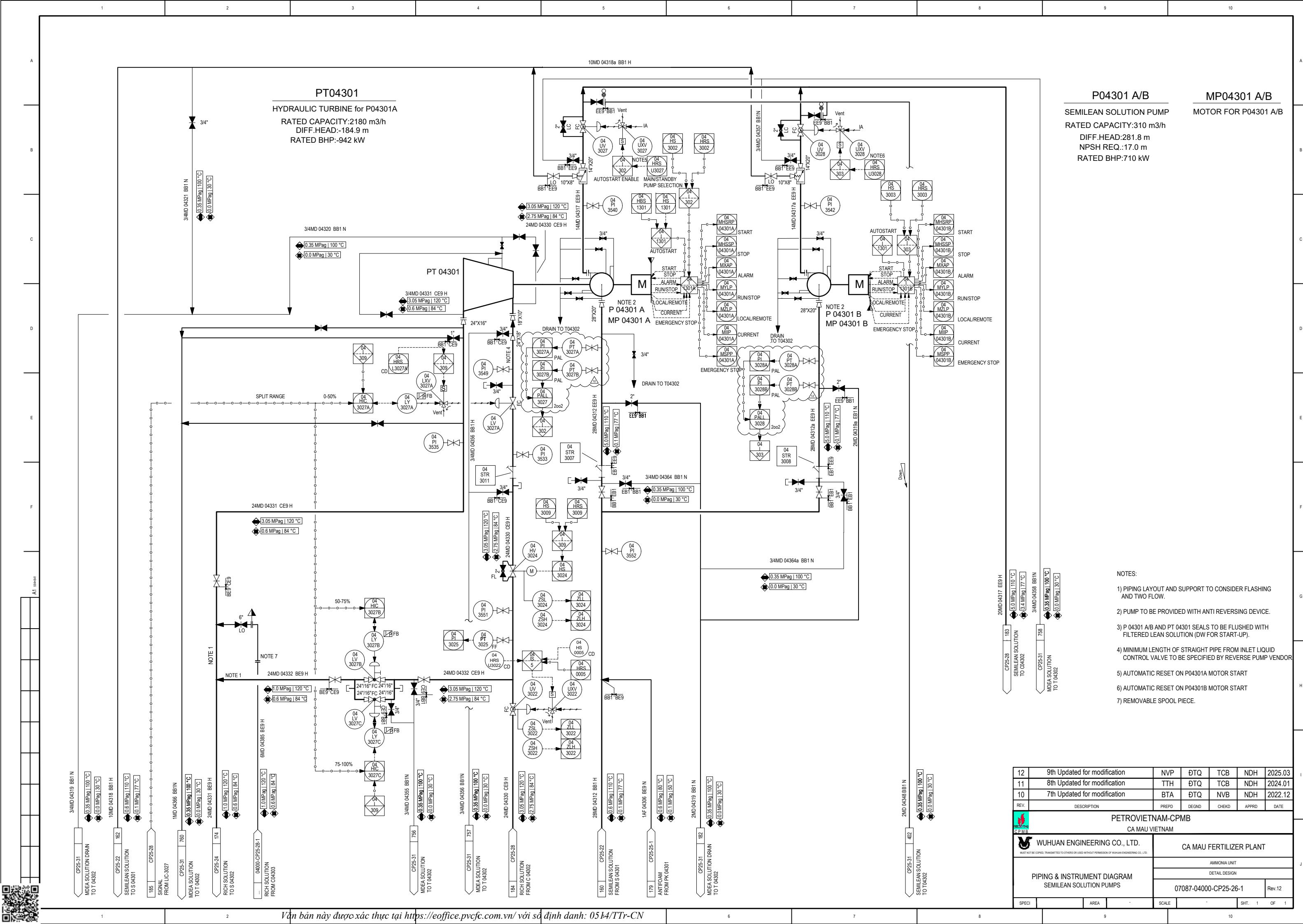


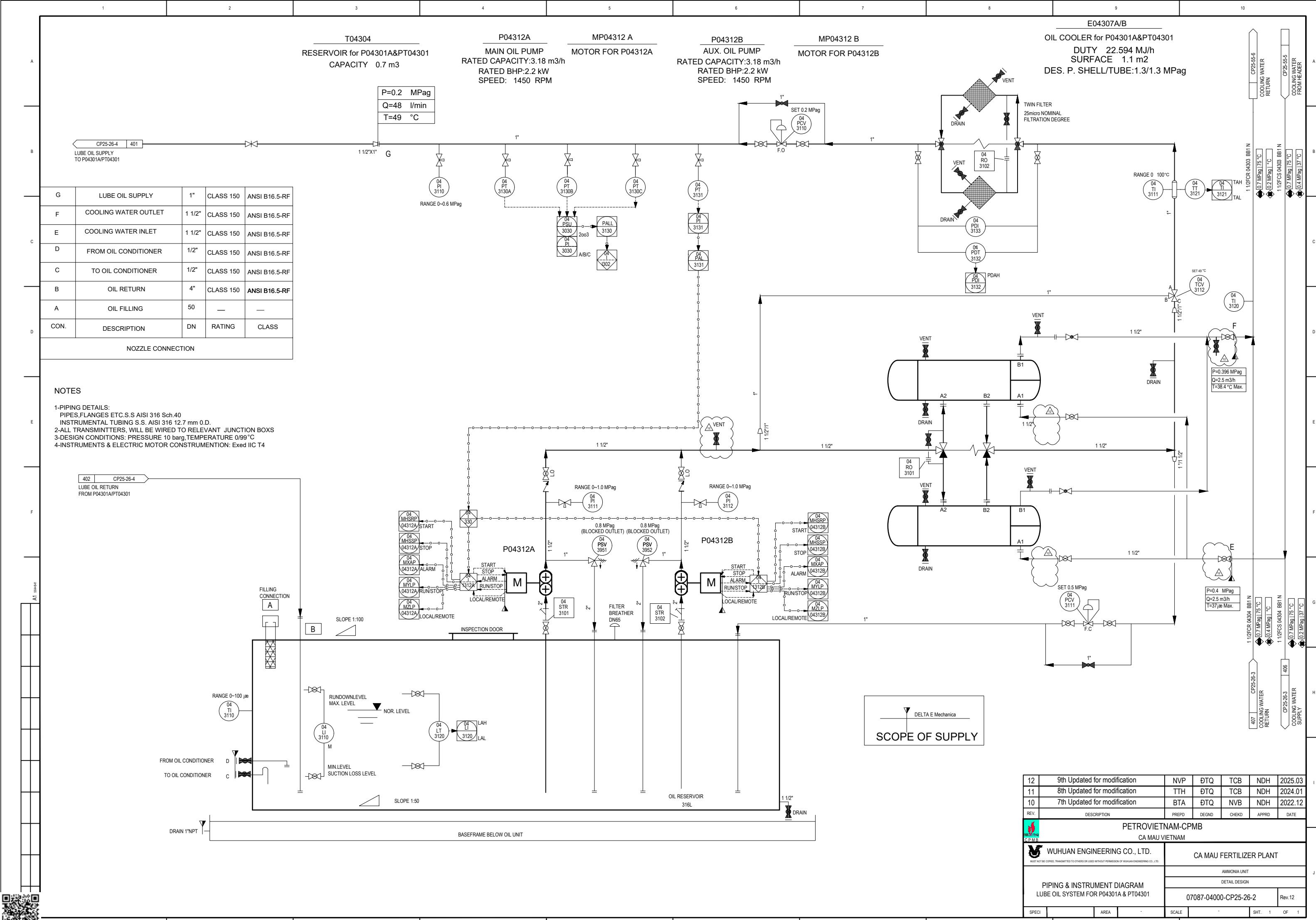


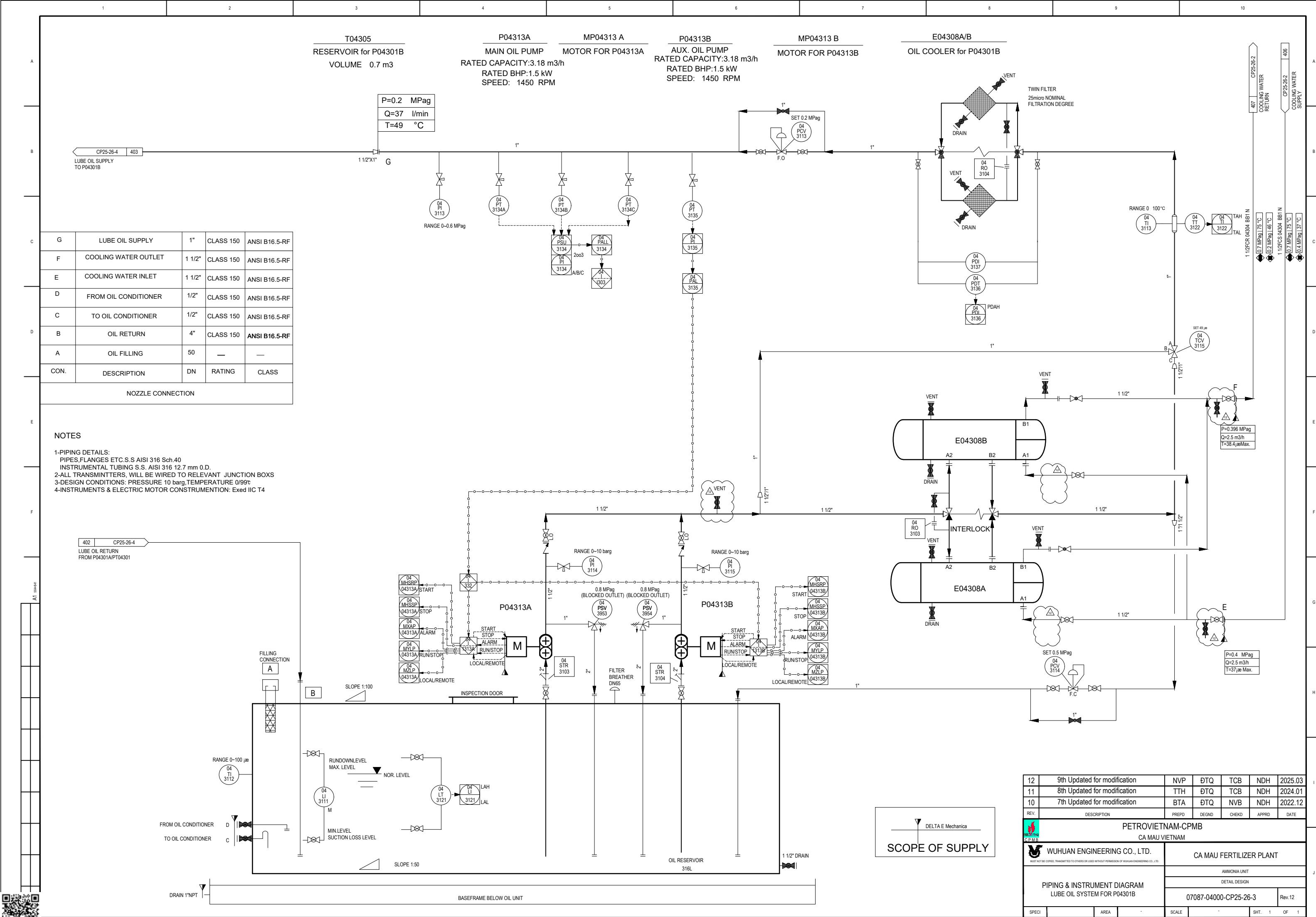


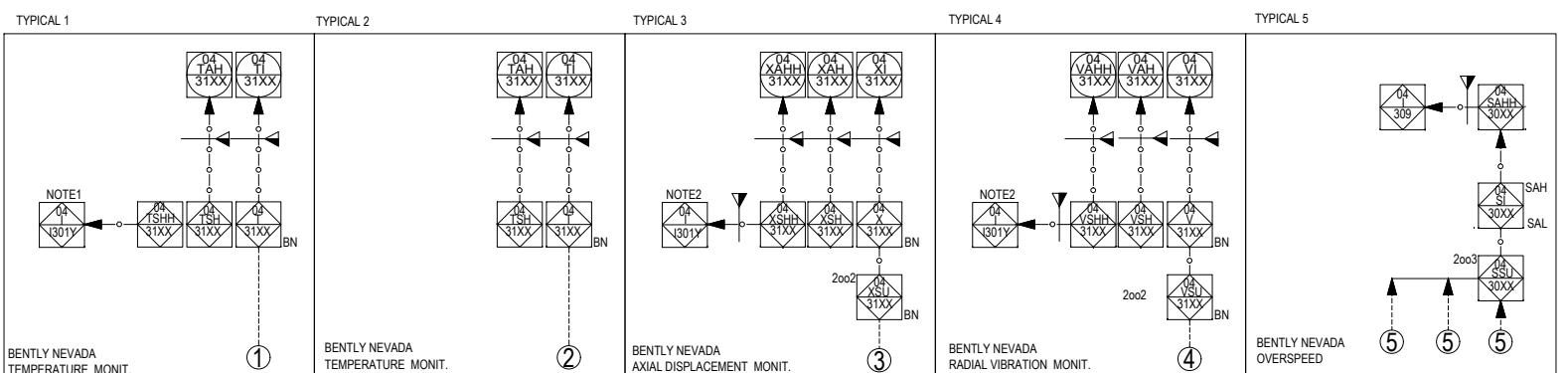
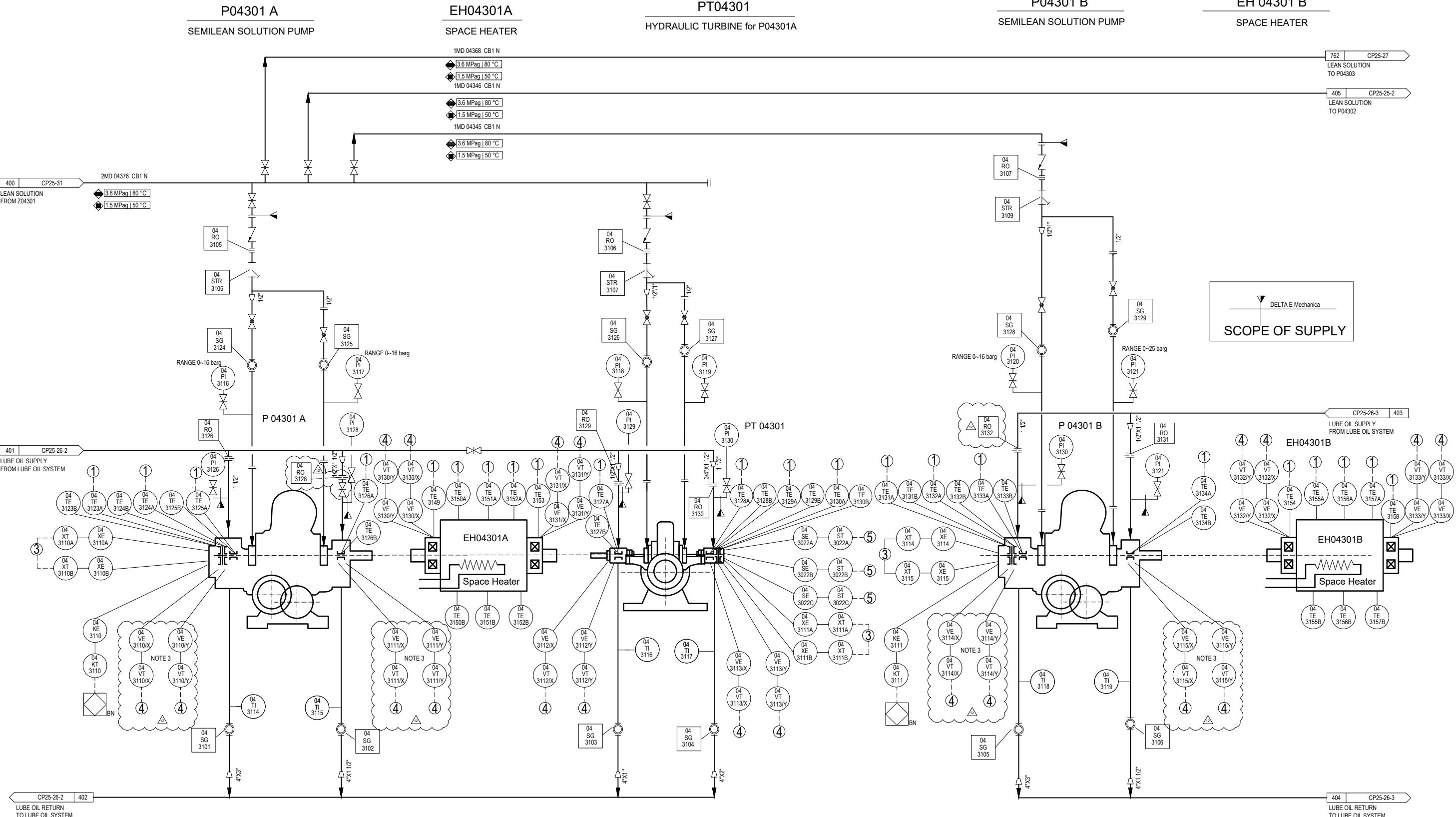






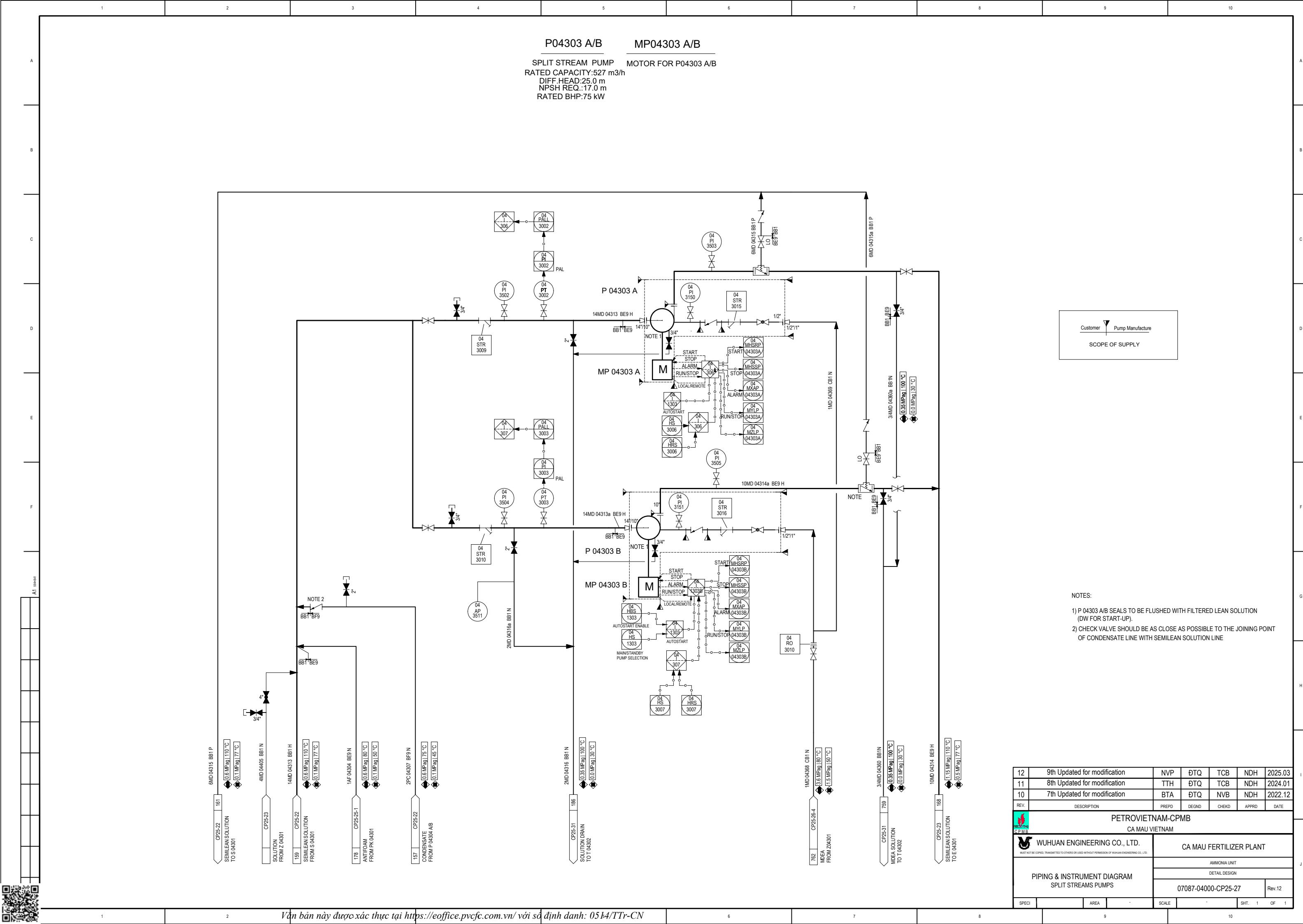


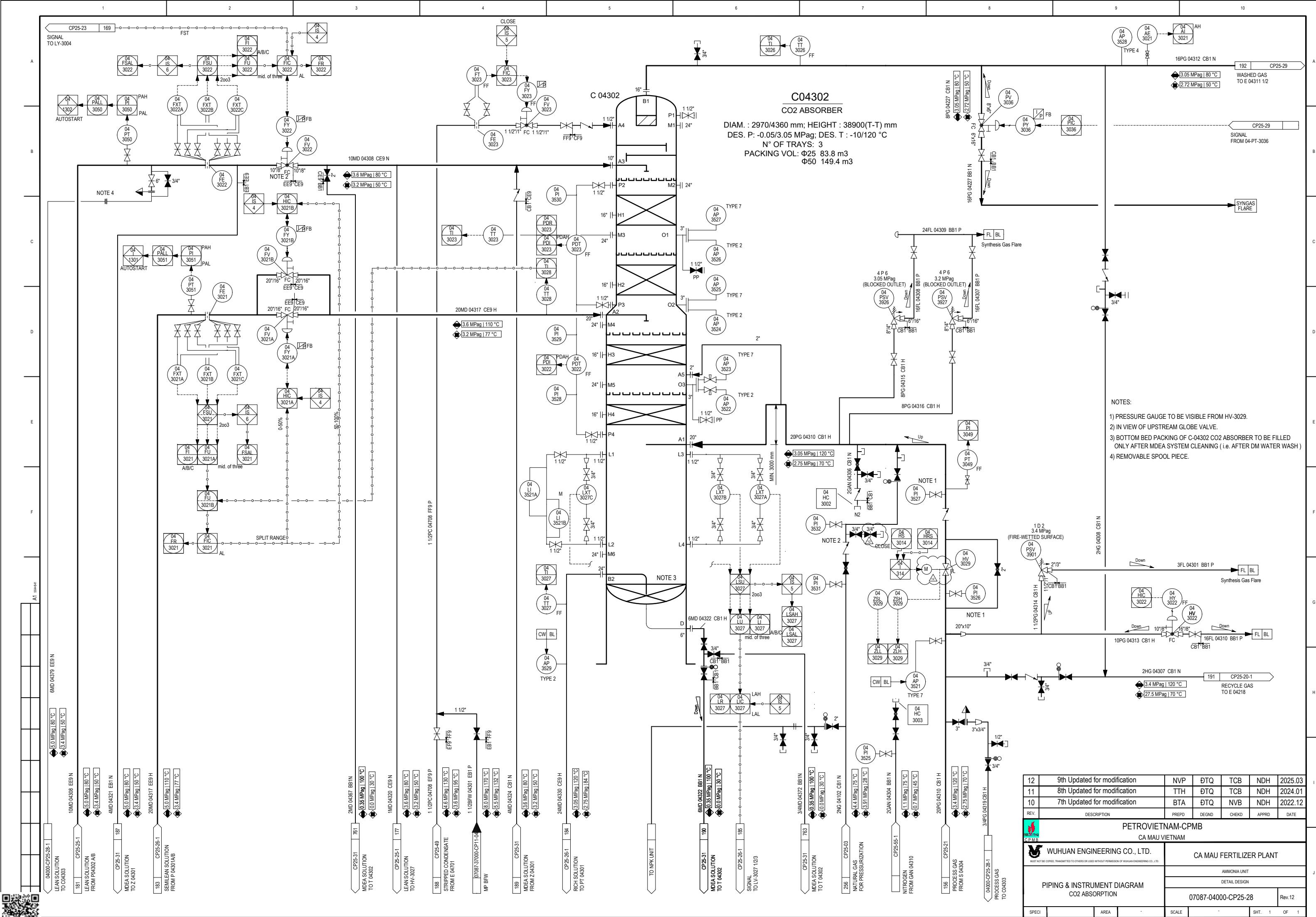


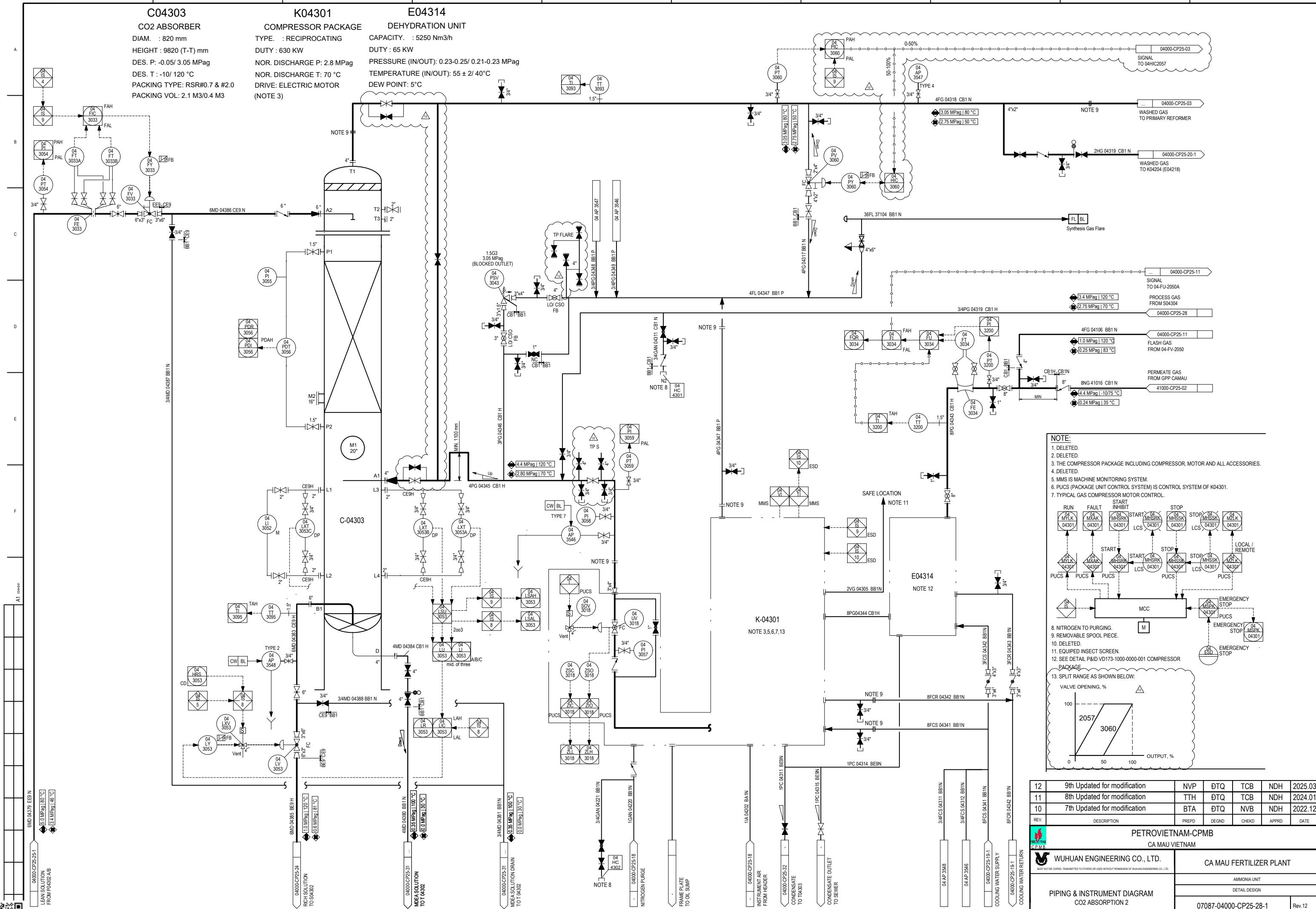


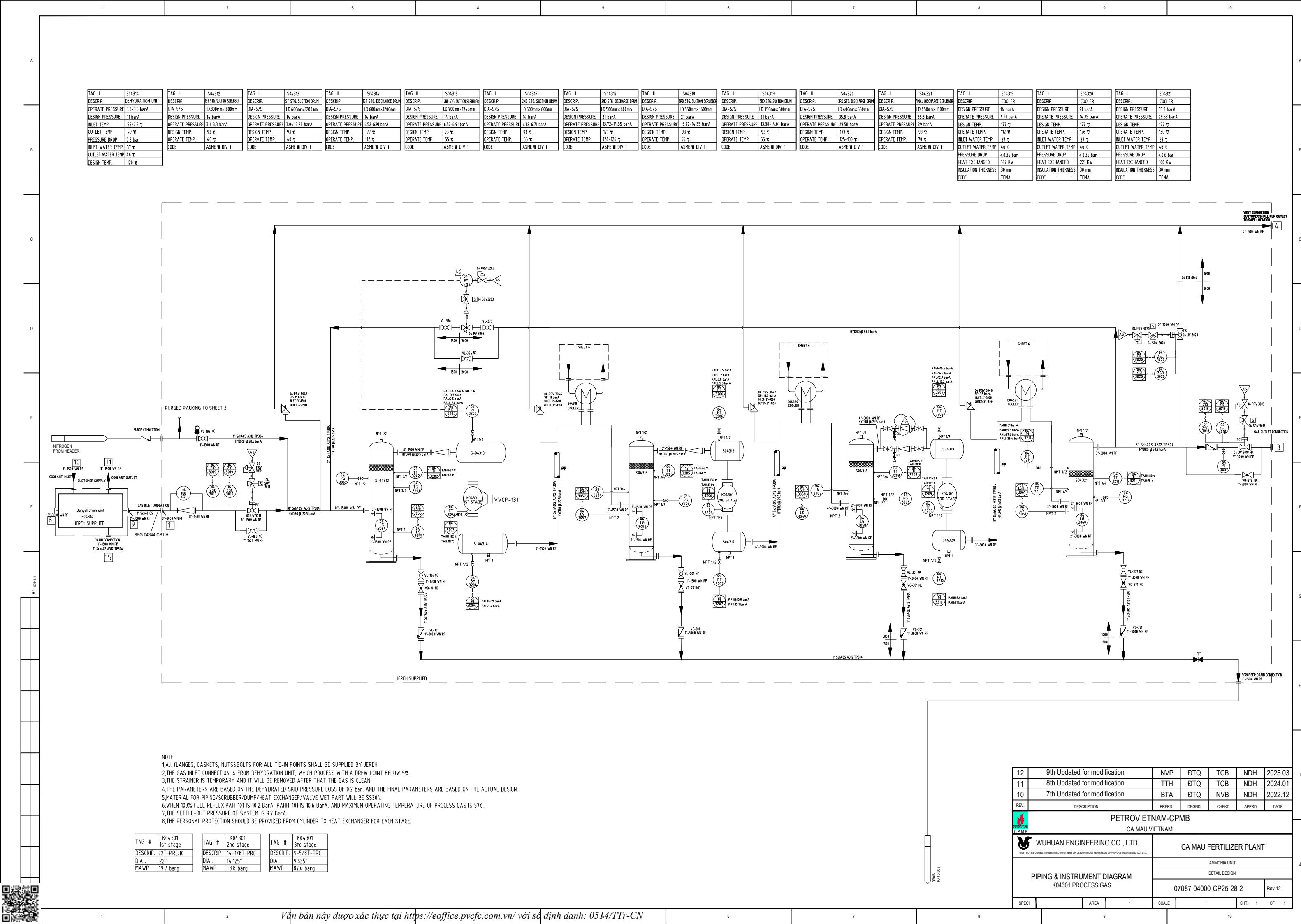
NOTE 1:FOR EH04301A,TRIP NUMBER 04-I-1301A.  
FOR EH04301B,TRIP NUMBER 04-I-1301B.  
NOTE 2:FOR P04301A,TRIP NUMBER 04-I-1301A.  
FOR P04301B,TRIP NUMBER 04-I-1301B.  
FOR PT04301,TRIP NUMBER 04-I-1301  
NOTE 3: LOGIC 2002 (H&HH) FOR INTERNAL TRIP

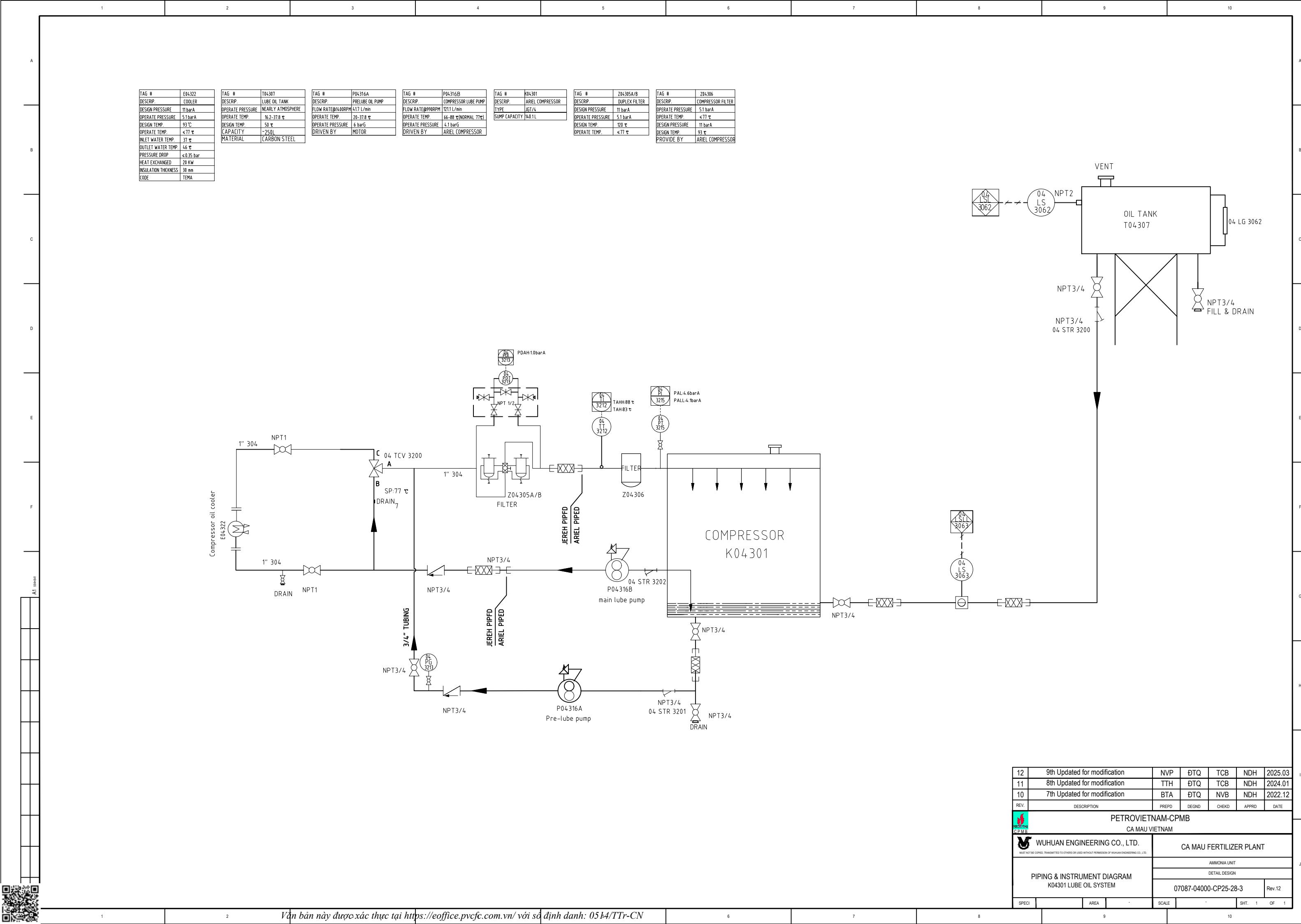
12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE
 WUHUAN ENGINEERING CO., LTD.	PETROVIETNAM-CPMB CA MAU VIETNAM					
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PIPING & INSTRUMENT DIAGRAM LUBE OIL SYSTEM FOR P04301 & PT04301		AMMONIA UNIT				
		DETAIL DESIGN				
		07087-04000-CP25-26-4				Rev.12
SPECI	AREA	-	SCALE	-	SHT.	1 OF 1



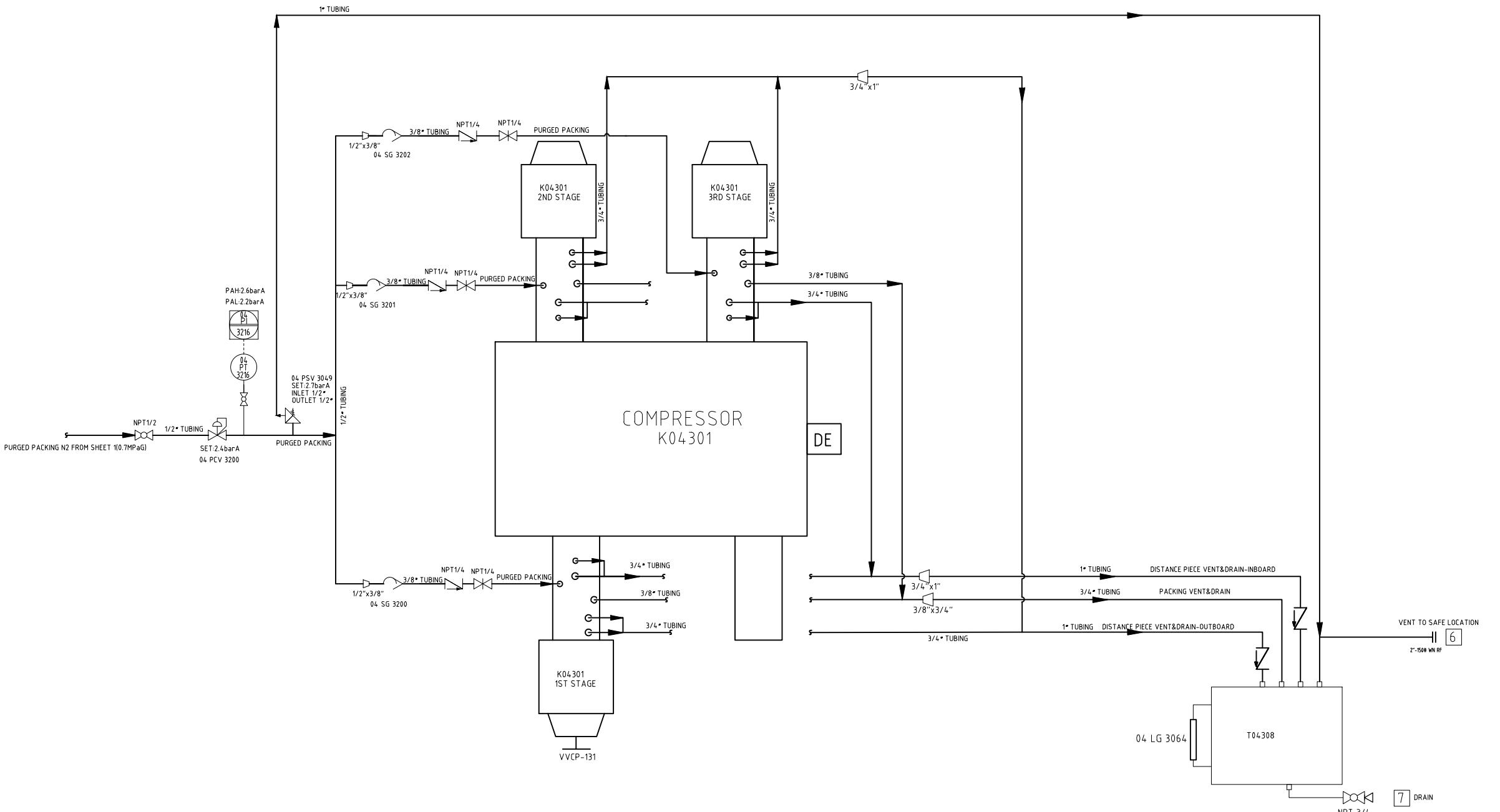








AG #	T0430B
ESCRIP.	DISTANCE PIECE DRAIN TANK
WORK PRESSURE	NEARLY ATMOSPHERE
APACITY	~25L
MATERIAL	CARBON STEEL



EV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE
12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12

PETROVIETNAM-CPMB  
CA MALL VIETNAM

CA MAU FERTILIZER PLANT

## 1 & INSTRUMENT DIAGRAM 101 VENT & DRAIN SYSTEM

## A MAJOR FERTILIZER PLANT

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DETAIL DESIGN

07083-04000\_GD25\_28\_4

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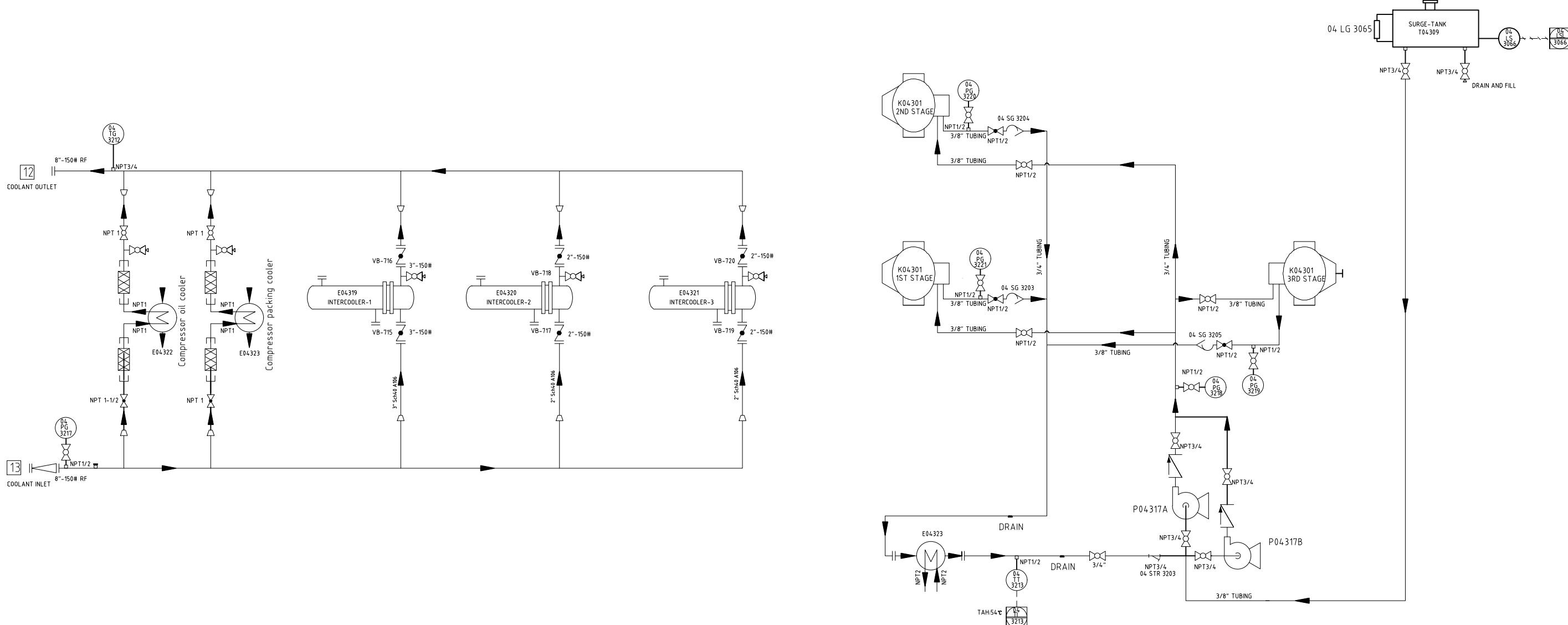
07067-04000-CPZ5-Z6-4

SCALE - SHT. 1 OF

A

TAG #	E04319	TAG #	E04320	TAG #	E04321	TAG #	E04322	TAG #	E04323	TAG #	P04317A/B
DESCR.	COOLER	DESCR.	COOLER	DESCR.	COOLER	DESCR.	COOLER	DESCR.	COOLER	DESCR.	WATER PUMP
DESIGN PRESSURE	14 barA	DESIGN PRESSURE	21 barA	DESIGN PRESSURE	35.8 barA	DESIGN PRESSURE	11 barA	DESIGN PRESSURE	5.1 barA	DESCR.	ARIEL COMPRESSOR
OPERATE PRESSURE	6.91 barA	OPERATE PRESSURE	14.35 barA	OPERATE PRESSURE	29.58 barA	OPERATE PRESSURE	5.1 barA	OPERATE PRESSURE	5.1 barA	TYPE	JGT4
DESIGN TEMP.	77°C	DESIGN TEMP.	177°C	DESIGN TEMP.	177°C	DESIGN TEMP.	93°C	DESIGN TEMP.	93°C	DESIGN TEMP.	<54°C
OPERATE TEMP.	41°C	OPERATE TEMP.	126°C	OPERATE TEMP.	130°C	OPERATE TEMP.	<77°C	OPERATE TEMP.	<49°C	OPERATE TEMP.	<50°C
INLET WATER TEMP.	37°C	INLET WATER TEMP.	37°C	INLET WATER TEMP.	37°C	INLET WATER TEMP.	37°C	INLET WATER TEMP.	37°C	CAPACITY	-20L
OUTLET WATER TEMP.	46°C	OUTLET WATER TEMP.	46°C	OUTLET WATER TEMP.	46°C	OUTLET WATER TEMP.	46°C	OUTLET WATER TEMP.	46°C	MATERIAL	CARBON STEEL
PRESSURE DROP	<0.35 bar	PRESSURE DROP	<0.35 bar	PRESSURE DROP	<0.6 bar	PRESSURE DROP	<0.35 bar	PRESSURE DROP	<0.35 bar	HEAT EXCHANGED	149 kW
HEAT EXCHANGED	221 kW	HEAT EXCHANGED	19.9 kW	HEAT EXCHANGED	166 kW	HEAT EXCHANGED	7.62 kW	HEAT EXCHANGED	7.62 kW	CODE	TEMA
INSULATION THICKNESS	30 mm	INSULATION THICKNESS	30 mm	INSULATION THICKNESS	30 mm	CODE	TEMA	CODE	API 662	CODE	TEMA
CODE	TEMA	CODE	TEMA	CODE	TEMA	CODE	TEMA	CODE	TEMA	CODE	TEMA

TAG #	K04301	TAG #	T04309
DESCR.	WATER TANK	DESCR.	NEARLY ATMOSPHERE
FLOW RATE@2900RPM	22.7 L/min	OPERATE PRESSURE	NEARLY ATMOSPHERE
TYPE	JGT4	OPERATE TEMP.	16.2-37.8°C
SUMP CAPACITY	1401 L	DESIGN TEMP.	<54°C
DRIVEN BY	MOTOR	OPERATE TEMP.	<50°C
MATERIAL	CARBON STEEL	CAPACITY	-20L



## COOLED PACKING NOTE:

1. Cooled packing cases help remove heat as piston rod/packing friction increases with higher pressures and piston speed.

All non-lubricated cylinder packing cases must be connected to a cooling system.

Packing cooling must be a closed system. Maintain coolant quality through a sampling and treatment program to prevent corrosion, mineral, or other deposits.

This typically requires coolant free of particulates and minerals. Treat coolant with appropriate additives, and anti-freeze if subject to freezing.

Coolant inlet pressure should be at least 40-80 psi (2.8-5.5 bar). 300 psi (20.7 bar) is the maximum to preserve the o-ring seal between the cups.

12	9th Updated for modification	NVP	ĐTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	ĐTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	ĐTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE

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AMMONIA UNIT

DETAIL DESIGN

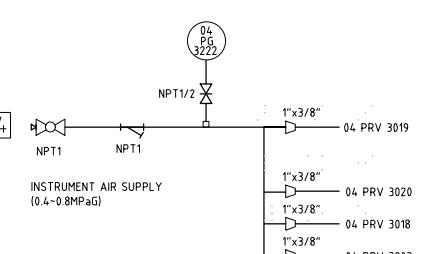
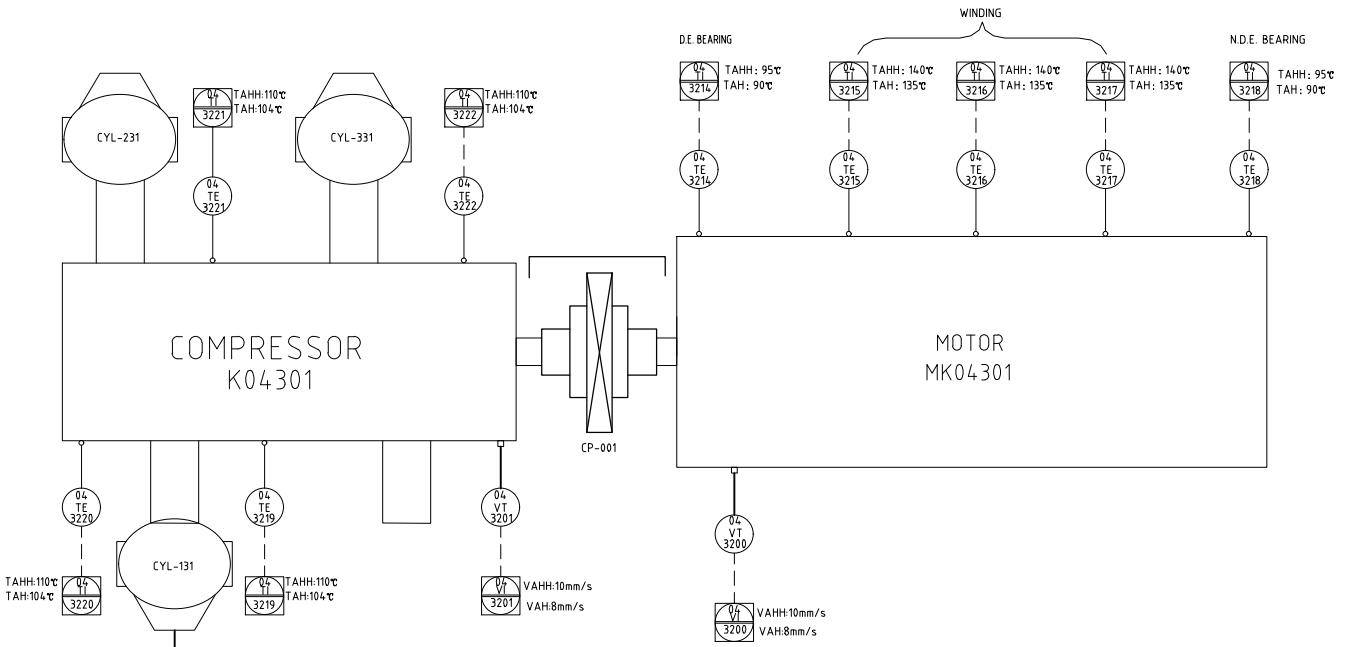
07087-04000-CP25-28-5 Rev.12

PIPING &amp; INSTRUMENT DIAGRAM

K04301 COOLING SYSTEM

SPECI AREA - SCALE - SHT. 1 OF 1





12	9th Updated for modification	NVP	ĐTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	ĐTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	ĐTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE

 <b>PETROVIETNAM-CPMB</b> CA MAU VIETNAM  <b>WUHUAN ENGINEERING CO., LTD.</b> MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHUAN ENGINEERING CO., LTD.	CA MAU FERTILIZER PLANT					
	AMMONIA UNIT					
	DETAIL DESIGN					
	07087-04000-CP25-28-6					Rev.12
SPECI		AREA	-	SCALE	-	SHT. 1 OF 1

TAG #	E04324
DESCRIP.	HEAT EXCHANGE
DESIGN PRESSURE	11 barA
OPERATE PRESSURE	3.3-3.5 barA
DESIGN TEMP.	120 oC
OPERATE TEMP.	52.5-57.5 oC
PRESSURE DROP	< 0.2 bar
INSULATION THK	10mm
CODE	ASME VIII DIV I

TAG #	E04325
DESCRIP.	Cooler
DESIGN PRESSURE	31 barA
OPERATE PRESSURE	14.35 barA
DESIGN TEMP.	225 oC
OPERATE TEMP.	126 oC
INLET WATER TEMP.	37 oC
OUTLET WATER TEMP.	46 oC
PRESSURE DROP	< 0.1 bar
INSULATION THK	NA
HEAT EXCHANGED	250 kW

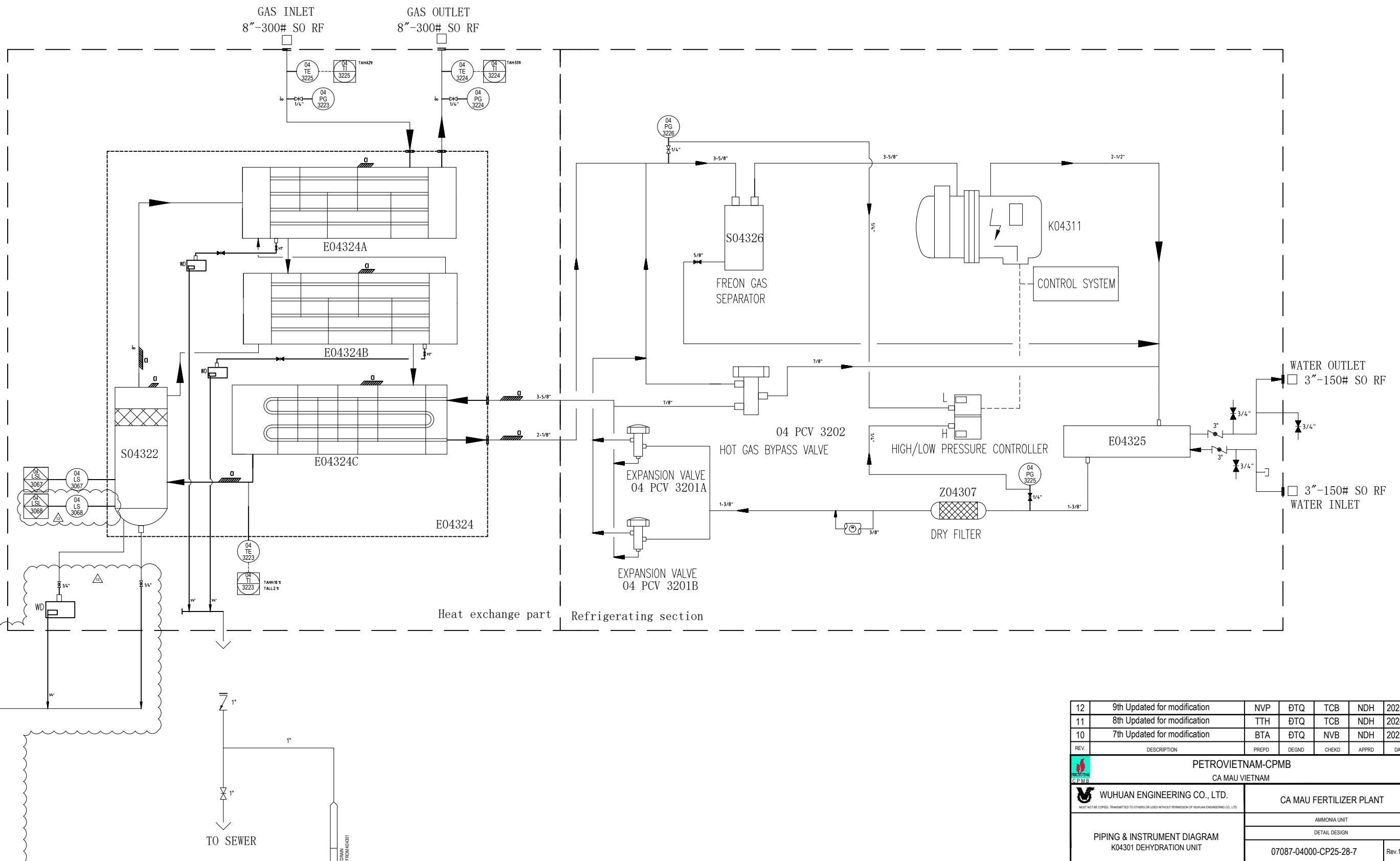
TAG #	K04311
DESCRIP.	HAN BELL
TYPE	SCREW
SUMP CAPACITY	195.1 KW

TAG #	Z04307
DESCRIP.	DRY FILTER_LWANG
DESIGN PRESSURE	35bar
DESIGN TEMP.	70 oC

TAG #	04 PCV 3201
DESCRIP.	EXPANSION VALVE_DANFOSS
OPERATE PRESSURE	28bar
DESIGN PRESSURE	35bar

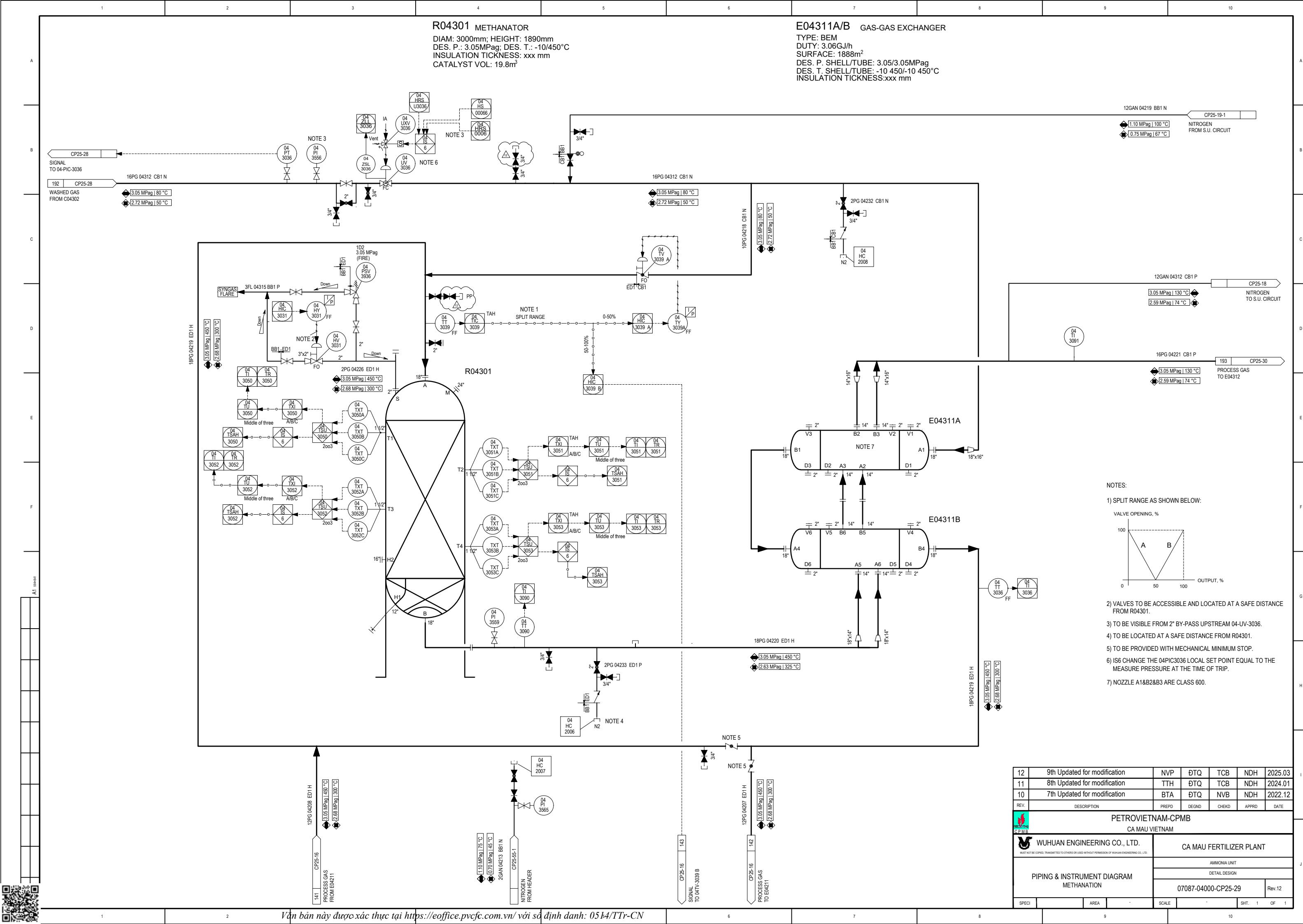
TAG #	S04326
DESCRIP.	FREON GAS SEPARATOR_FASK
OPERATE PRESSURE	31bar
OPERATE TEMP.	110 oC
DESIGN PRESSURE	35bar

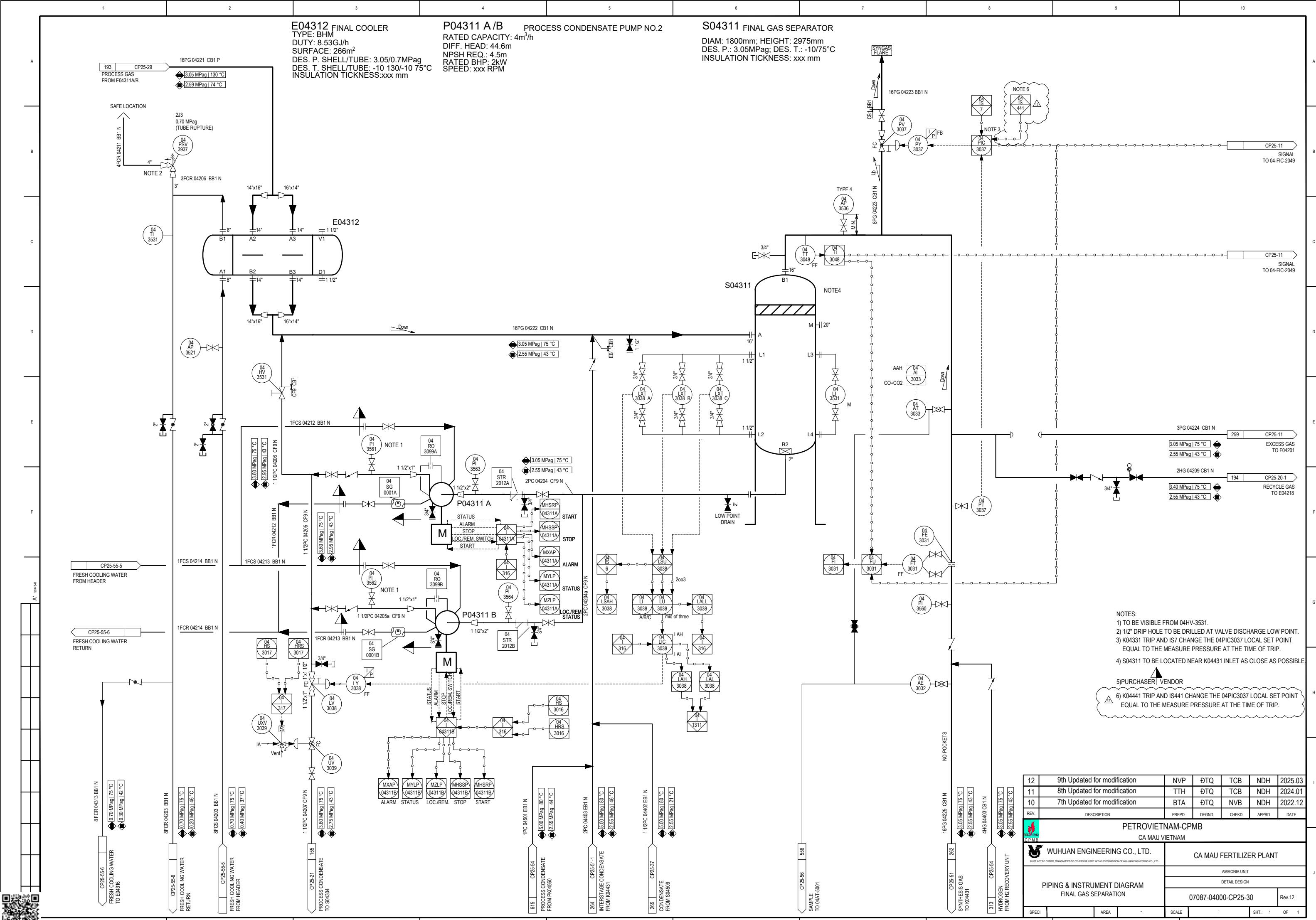
TAG #	04 PCV 3202
DESCRIP.	HOT GAS BYPASS VALVE_DANFOSS
OPERATE PRESSURE	28bar
OPERATE TEMP.	140 oC
DESIGN PRESSURE	35bar

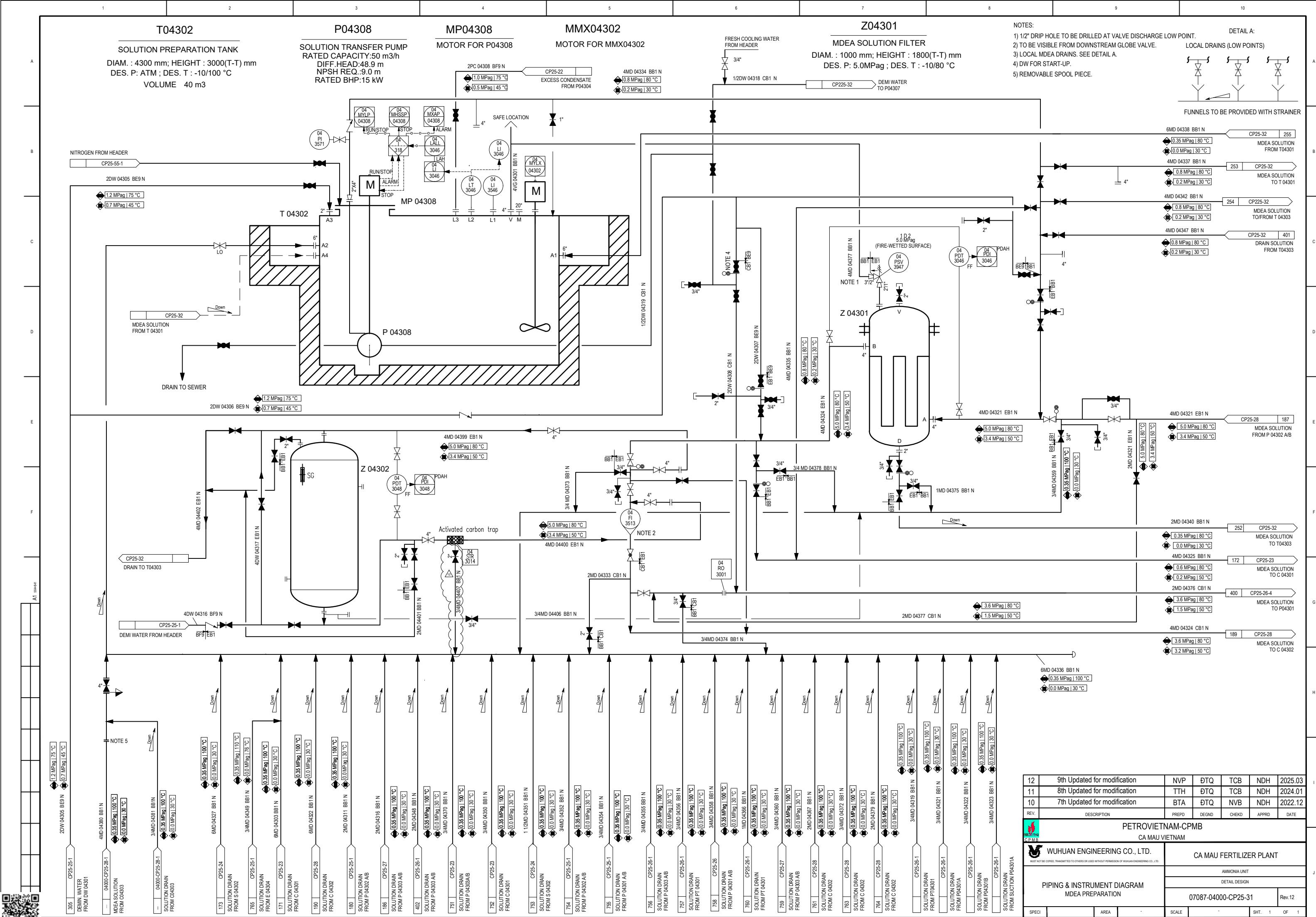


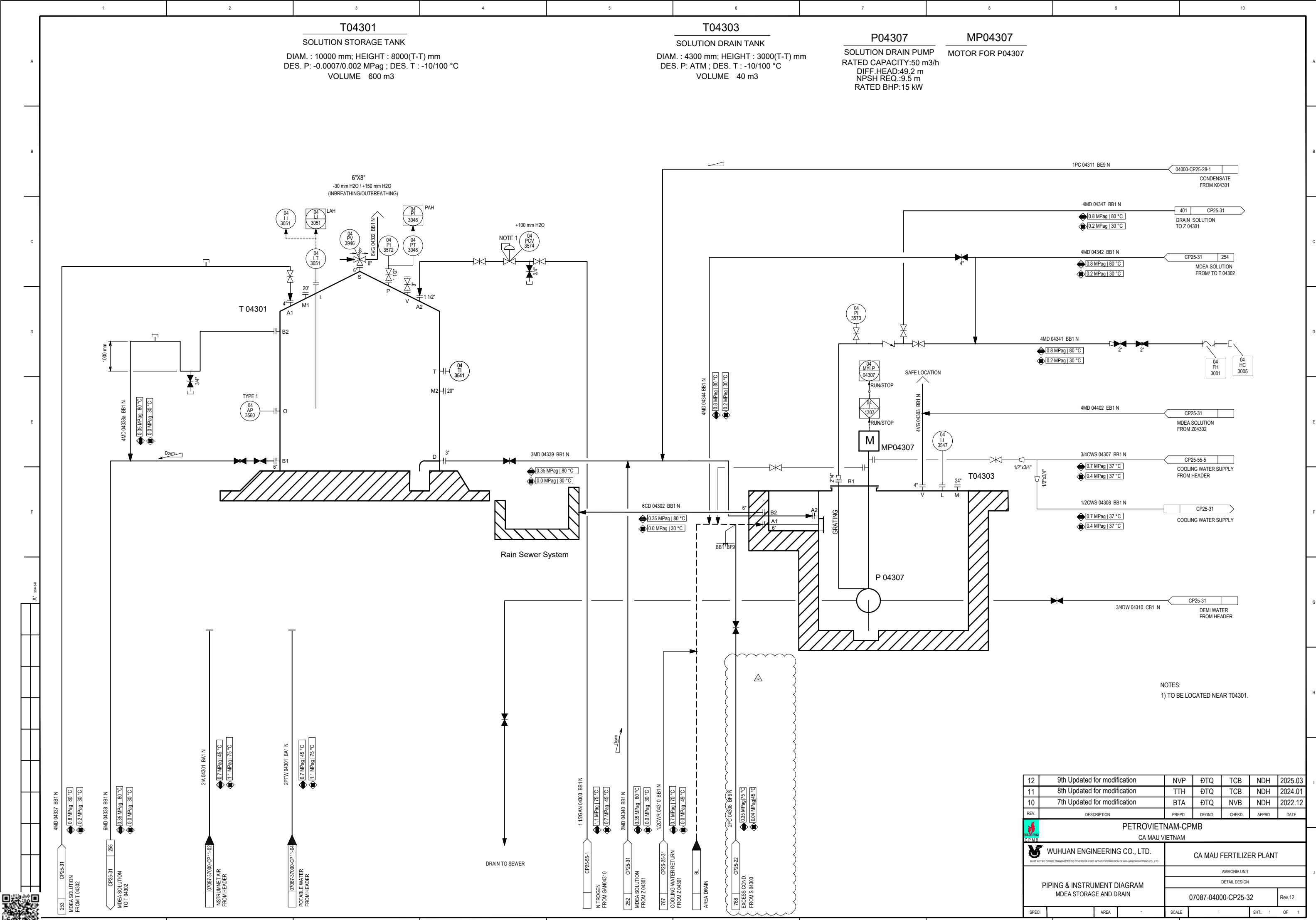
12	9th Updated for modification	NVP	ĐTQ	TCB	NDH	2025.03						
11	8th Updated for modification	TTH	ĐTQ	TCB	NDH	2024.01						
10	7th Updated for modification	BTA	ĐTQ	NVB	NDH	2022.12						
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE						
	<b>PETROVIETNAM-CPMB</b> CA MAU VIETNAM											
	WUHUAN ENGINEERING CO., LTD. MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHUAN ENGINEERING CO., LTD.											
CA MAU FERTILIZER PLANT												
AMMONIA UNIT												
DETAIL DESIGN												
PIPING & INSTRUMENT DIAGRAM K04301 DEHYDRATION UNIT												
07087-04000-CP25-28-7												
SPECI	AREA	-	SCALE	-	SHT. 1	OF 1						

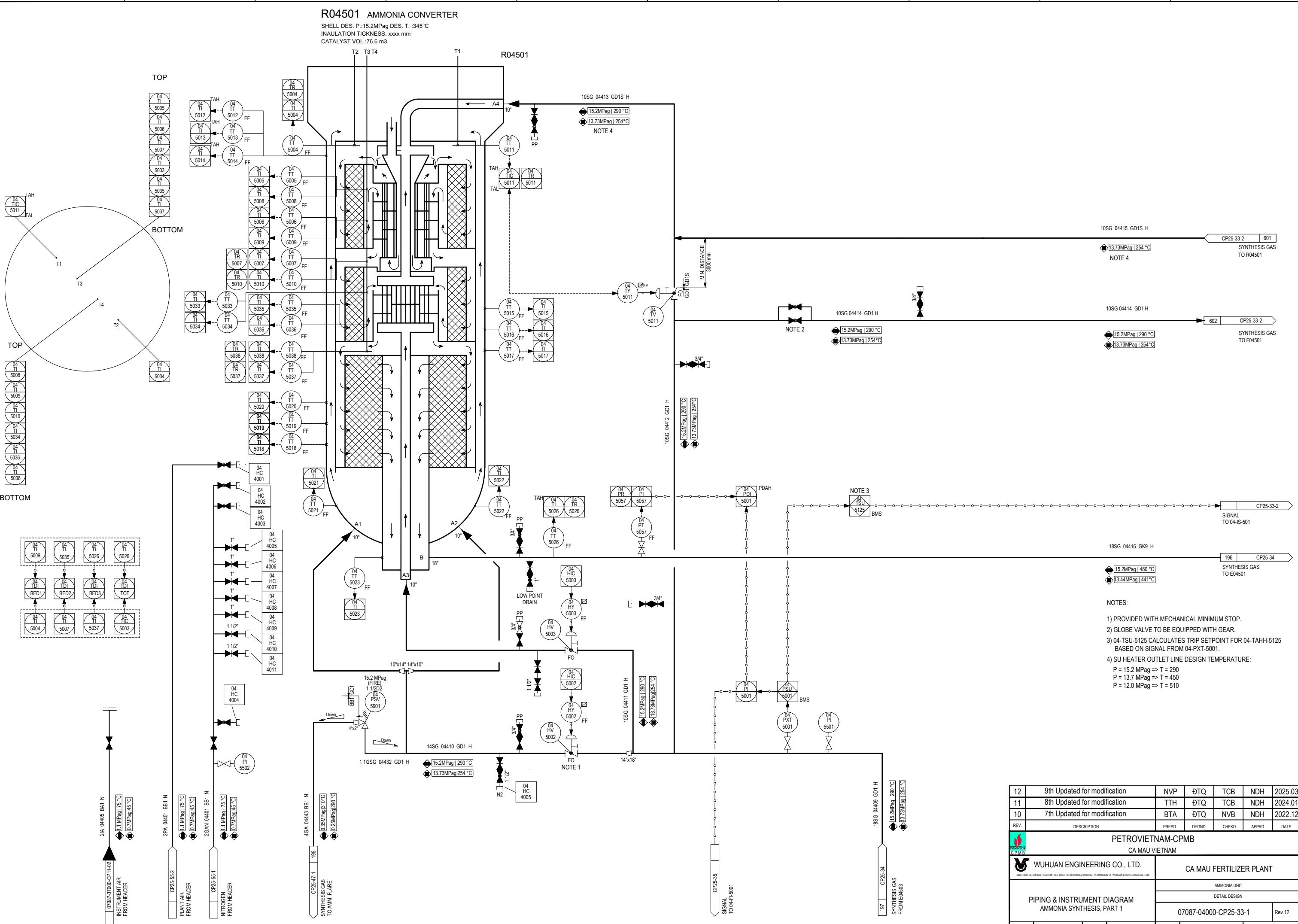


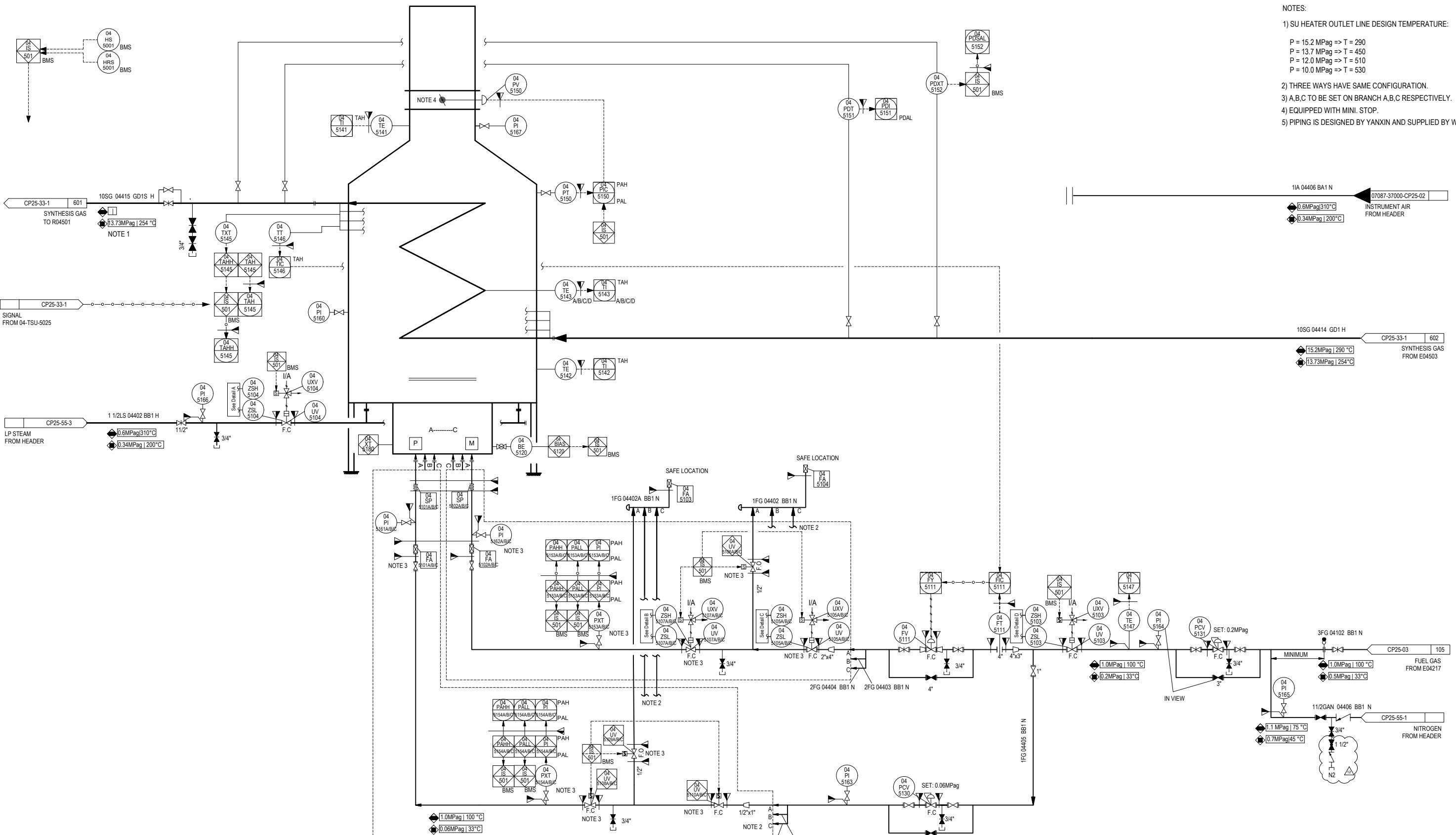






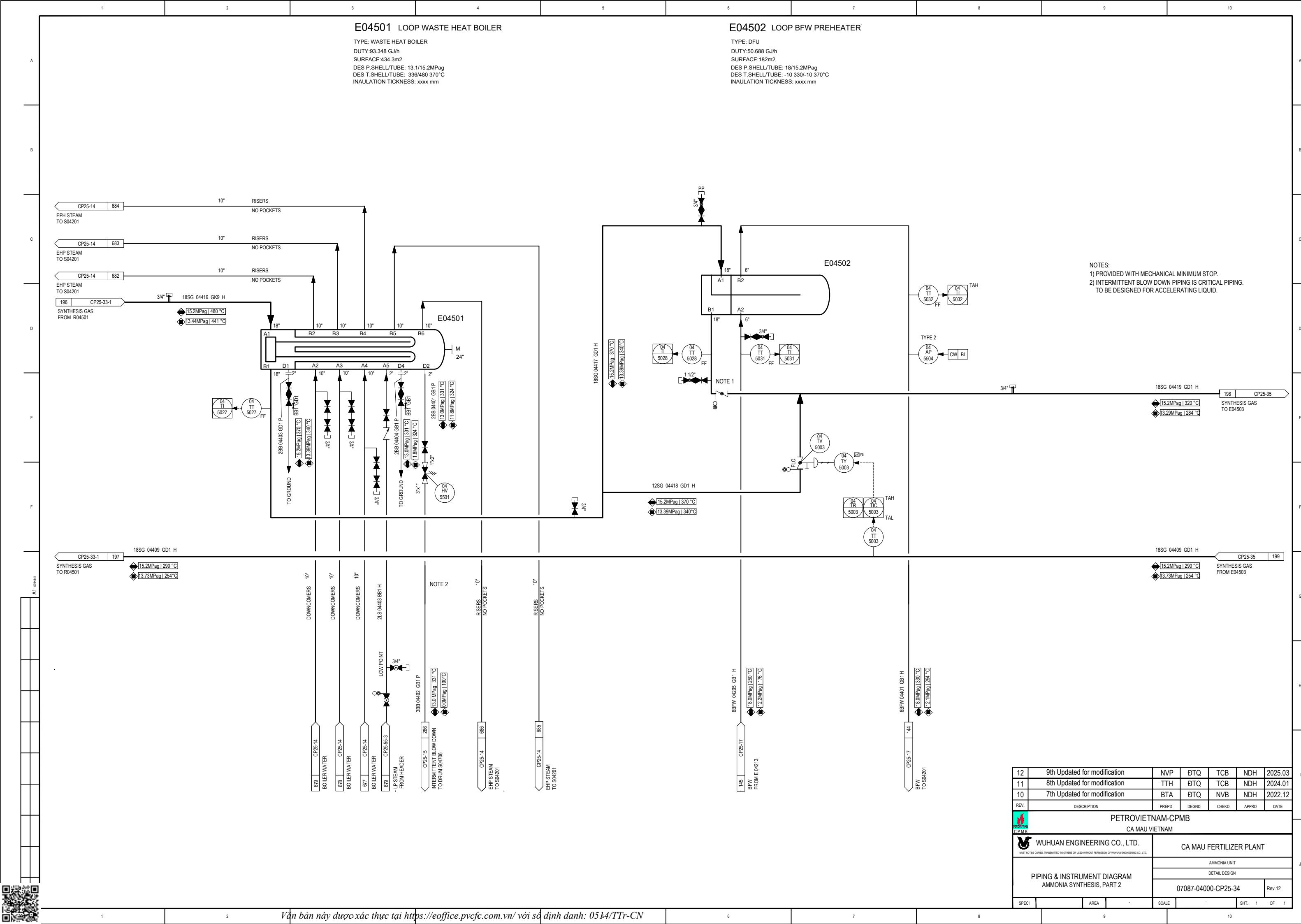


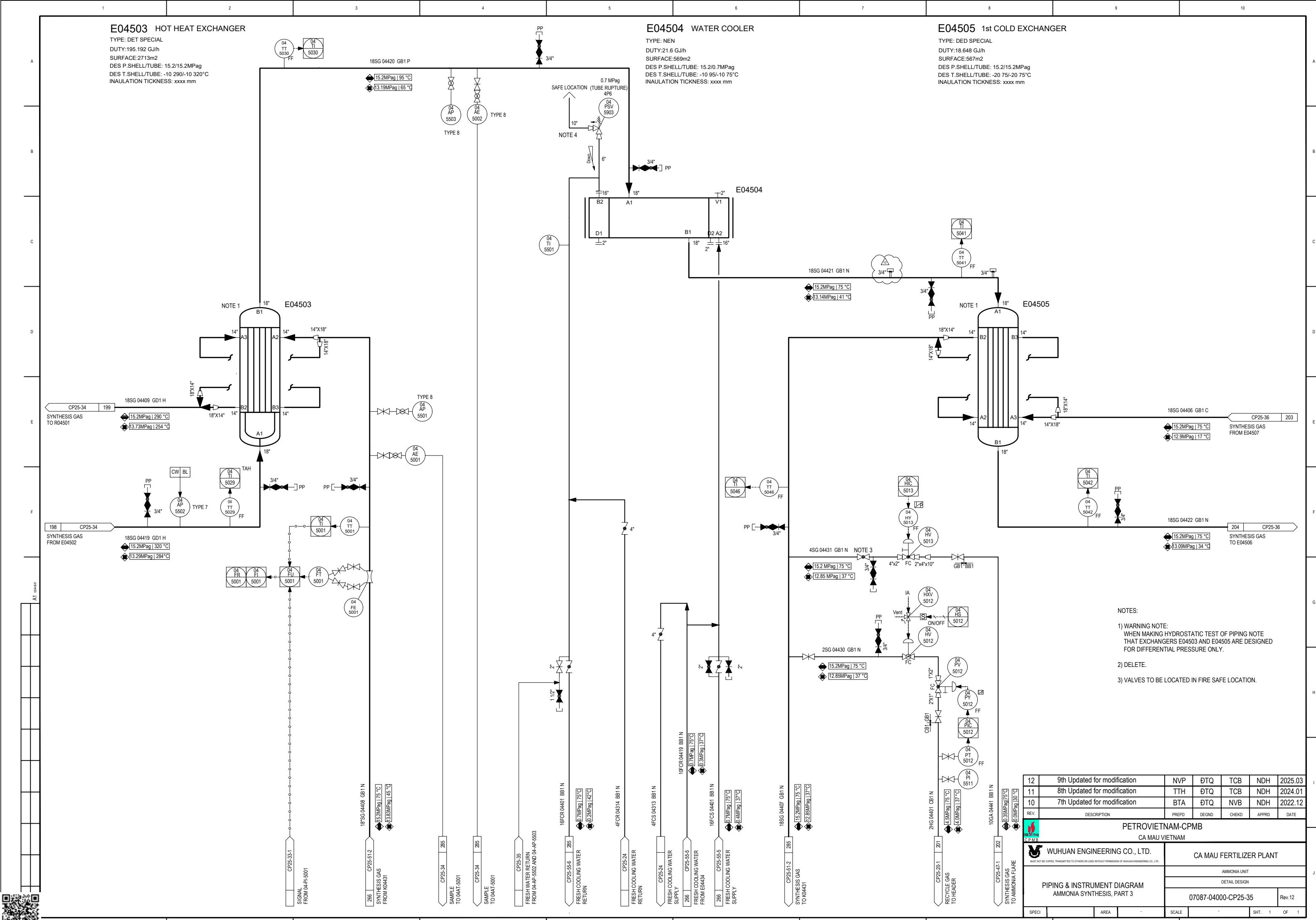


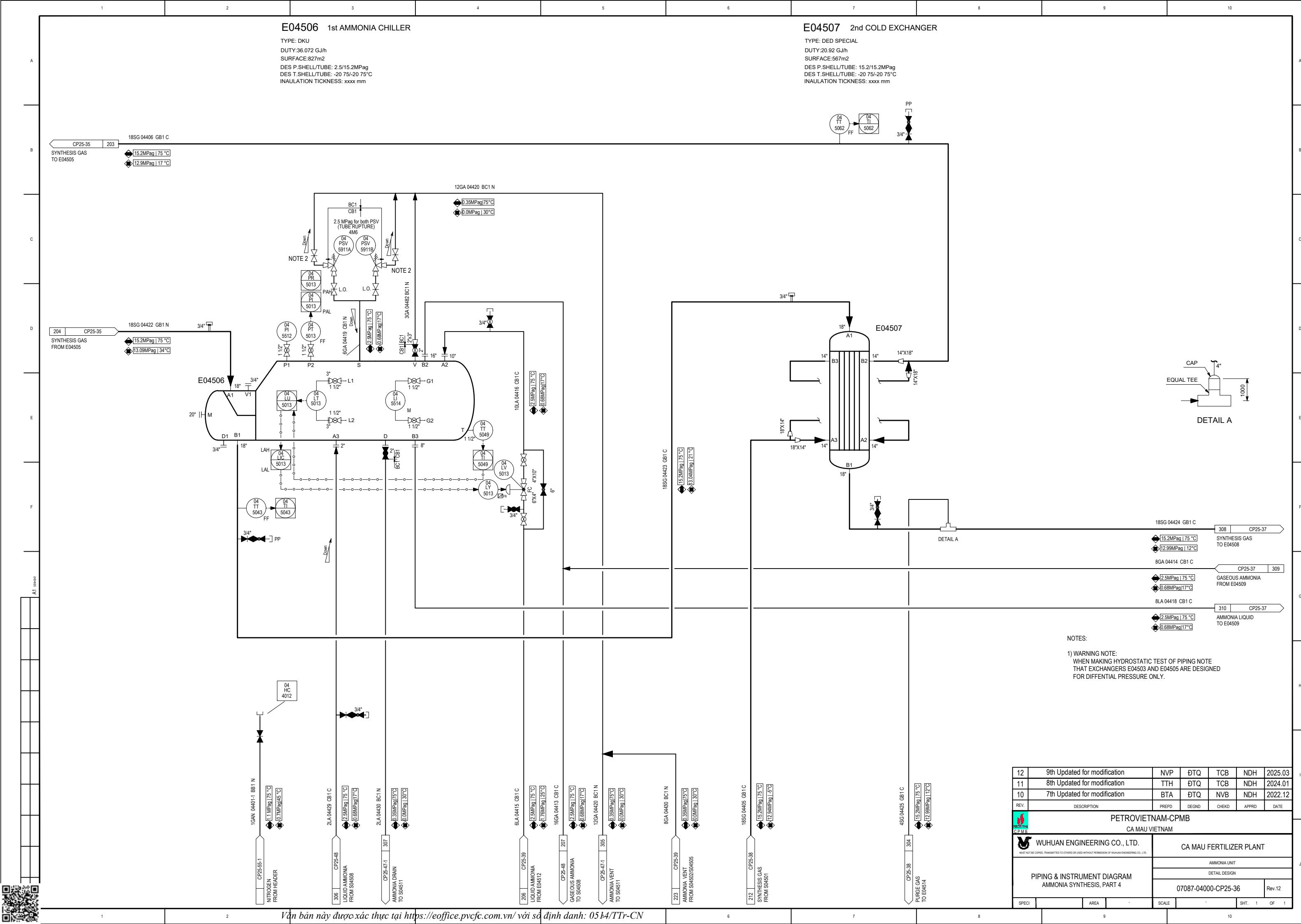


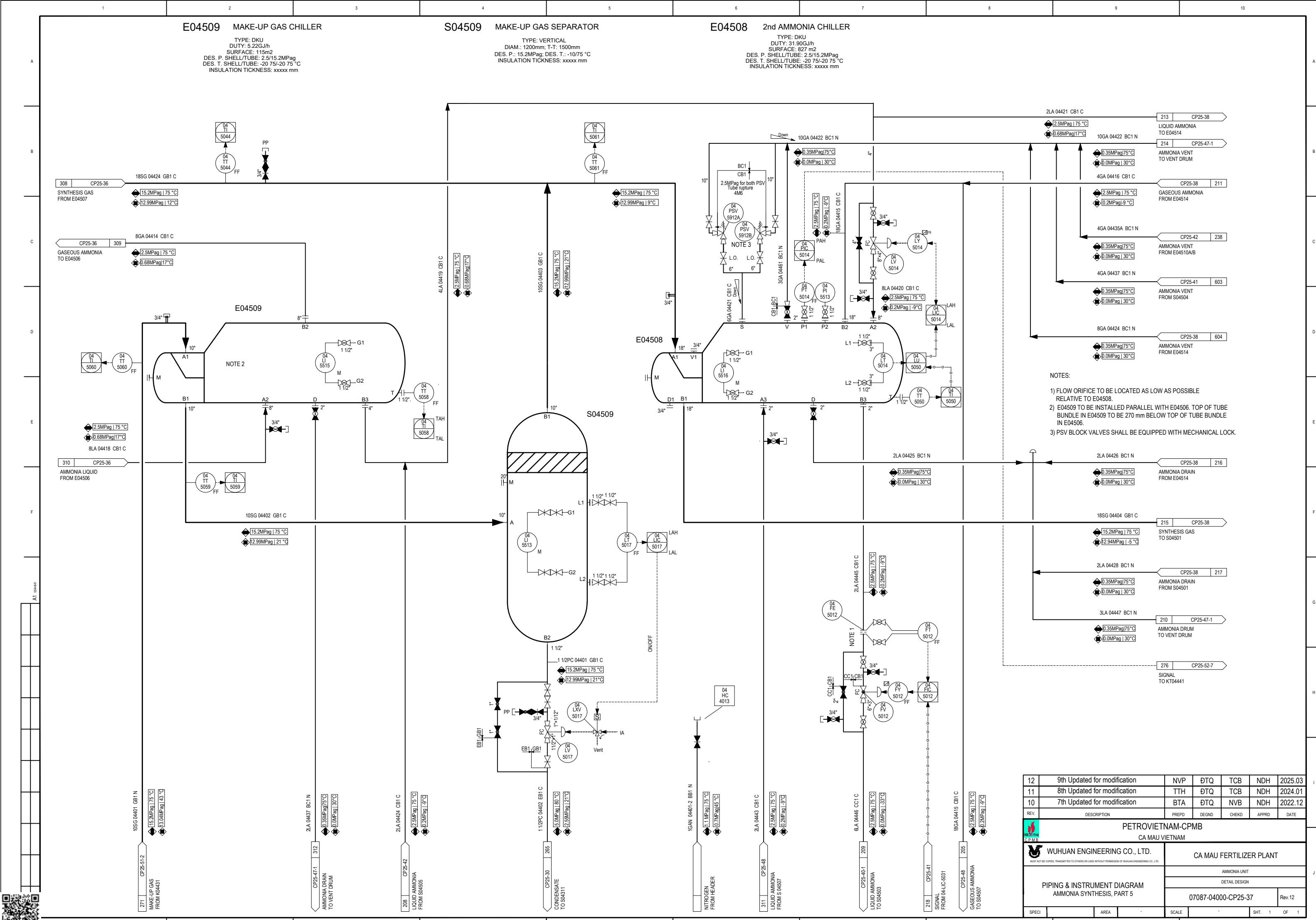
12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEFGND	CHEKD	APPRD	DATE
<b>PETROVIETNAM-CPMB</b> <b>CA MAU VIETNAM</b>						
<b>WUHUAN ENGINEERING CO., LTD.</b> <small>MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHUAN ENGINEERING CO., LTD.</small>			<b>CA MAU FERTILIZER PLANT</b>			
<b>PIPING &amp; INSTRUMENT DIAGRAM</b> <b>START-UP HEATER</b>			AMMONIA UNIT			
			DETAIL DESIGN			
			07087-04000-CP25-33-2			Rev.12
SPECI	AREA	-	SCALE	-	SHT. 1	OF 1











## E04514 PURGE GAS CHILLER

TYPE: DIKU  
DUTY: 1.33G/h  
SURFACE: 31 m<sup>2</sup>  
DES. P. SHELL/TUBE: 2.5/15.2MPag  
DES. T. SHELL/TUBE: -20 75/-20 75 °C  
INSULATION THICKNESS: xxxx mm

CP25-37 604 8GA 04424 BC1 N  
GASEOUS AMMONIA TO E04508  
◆ 0.35MPag | 75 °C  
◆ 0.0MPag | 30 °C

CP25-37 211 4GA 04416 CB1 C  
GASEOUS AMMONIA TO S04507  
◆ 2.5MPag | 75 °C  
◆ 0.2MPag | -9 °C

213 CP25-37 2LA 04421 CB1 C  
LIQUID AMMONIA FROM E04509  
◆ 2.5MPag | 75 °C  
◆ 0.68MPag | 17 °C

2LA 04422 CB1 C  
◆ 2.5MPag | 75 °C  
◆ 0.2MPag | -9 °C

2LA 04426 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

4GA 04426 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

4SG 04426 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

18SG 04405 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

2LA 04426 BC1 N  
◆ 0.35MPag | 75 °C  
◆ 0.0MPag | 30 °C

215 CP25-37 18SG 04404 GB1 C  
SYNTHESIS GAS FROM E04508  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

2LA 04428 BC1 N  
◆ 0.35MPag | 75 °C  
◆ 0.0MPag | 30 °C

2LA 04428 BC1 N  
◆ 0.35MPag | 75 °C  
◆ 0.0MPag | 30 °C

## S04514 PURGE GAS SEPARATOR

TYPE: VERTICAL  
DIAM.: 550mm; T-T: 1575mm  
DES. P.: 15.2MPag; DES. T.: -20/75 °C  
INSULATION THICKNESS: xxxx mm

4GA 04424 BC1 N  
◆ 0.35MPag | 75 °C  
◆ 0.0MPag | 30 °C

4GA 04426 BC1 N  
◆ 2.5MPag | 75 °C  
◆ 0.2MPag | -9 °C

2LA 04421 CB1 C  
◆ 2.5MPag | 75 °C  
◆ 0.68MPag | 17 °C

2LA 04422 CB1 C  
◆ 2.5MPag | 75 °C  
◆ 0.2MPag | -9 °C

4GA 04423 CB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

4SG 04427 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

4SG 04428 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

18SG 04405 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

2LA 04426 BC1 N  
◆ 0.35MPag | 75 °C  
◆ 0.0MPag | 30 °C

215 CP25-37 18SG 04404 GB1 C  
SYNTHESIS GAS FROM E04508  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

2LA 04428 BC1 N  
◆ 0.35MPag | 75 °C  
◆ 0.0MPag | 30 °C

4SG 04425 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

2LA 04427 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

4LA 04401 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

4LA 04402 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

4SG 04426 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

PURGE GAS FROM E04507  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

## S04501 AMMONIA SEPARATOR

TYPE: VERTICAL  
DIAM.: 2500mm; T-T: 3175mm  
DES. P.: 15.2MPag; DES. T.: -20/75 °C  
INSULATION THICKNESS: xxxx mm

4GA 04424 BC1 N  
◆ 0.35MPag | 75 °C  
◆ 0.0MPag | 30 °C

4GA 04426 BC1 N  
◆ 2.5MPag | 75 °C  
◆ 0.2MPag | -9 °C

2LA 04421 CB1 C  
◆ 2.5MPag | 75 °C  
◆ 0.68MPag | 17 °C

2LA 04422 CB1 C  
◆ 2.5MPag | 75 °C  
◆ 0.2MPag | -9 °C

4SG 04427 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

4SG 04428 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

18SG 04405 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

2LA 04426 BC1 N  
◆ 0.35MPag | 75 °C  
◆ 0.0MPag | 30 °C

215 CP25-37 18SG 04404 GB1 C  
SYNTHESIS GAS FROM E04508  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

2LA 04428 BC1 N  
◆ 0.35MPag | 75 °C  
◆ 0.0MPag | 30 °C

4SG 04425 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

2LA 04427 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

4LA 04401 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

4LA 04402 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

4SG 04426 GB1 C  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

PURGE GAS FROM E04507  
◆ 15.2MPag | 75 °C  
◆ 12.94MPag | -5 °C

PROD. AMMONIA TO SO4502  
◆ 15.2MPag | 5 °C  
◆ 6.0MPag | 5 °C

8GA 04425 BB1 N  
◆ 0.35MPag | 75 °C  
◆ 0.0MPag | 30 °C

220 CP25-43  
AMMONIA VENT TO VENT DRUM

200 CP25-56  
SAMPLE TO 04AT-2001

219 CP25-43  
PURGE GAS TO CO4551

212 CP25-36  
SYNTHESIS GAS TO E04507

NOTES:  
1) THREE POSITION SWITCH.  
EACH VALVE MAY BE USED SEPARATELY OR BOTH  
SIMULTANEOUSLY.

2) IRRESPECTIVE OF PREVIOUS CONTROLLER MODES 04-I-554  
FORCES 04-HIC-501A TO "MANUAL" WITH AN OUTPUT OF 0%  
AND 04-HIC-501B TO "REMOTE" RECEIVING ITS SET POINT  
FROM 04-FIC-5011.

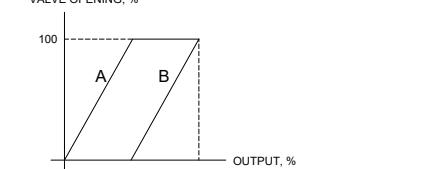
3) HYDRAULIC HEIGHT TO BE CHECKED DURING DETAILED  
DESIGN BASED ON ACTUAL PIPING LAYOUT AND 130 % OF  
NORMAL PURGE GAS FLOW.

4) PROVIDED WITH MECHANICAL MINIMUM STOP.

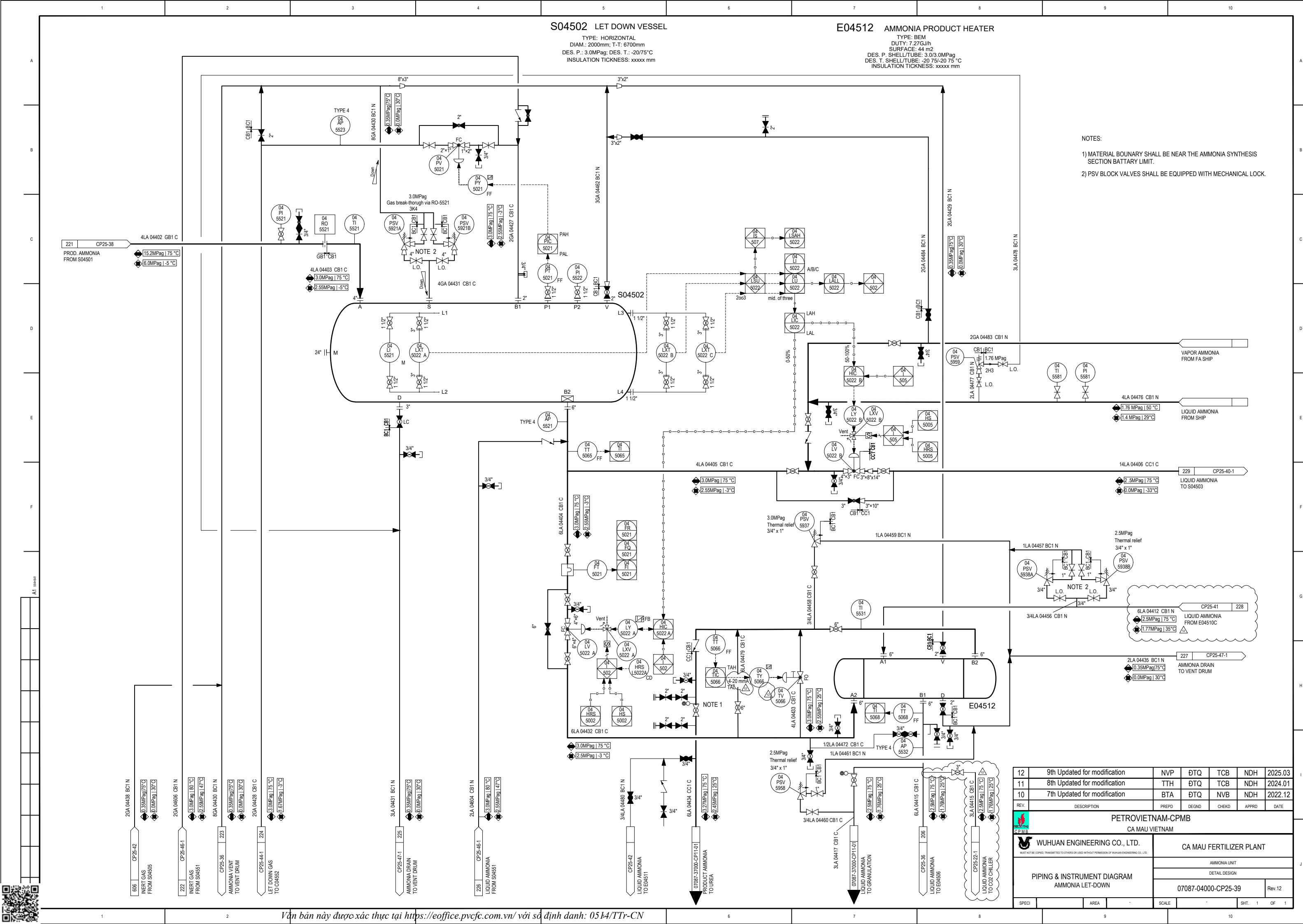
5) SPOOL TO BE DISCONNECTED DURING NORMAL OPERATION.

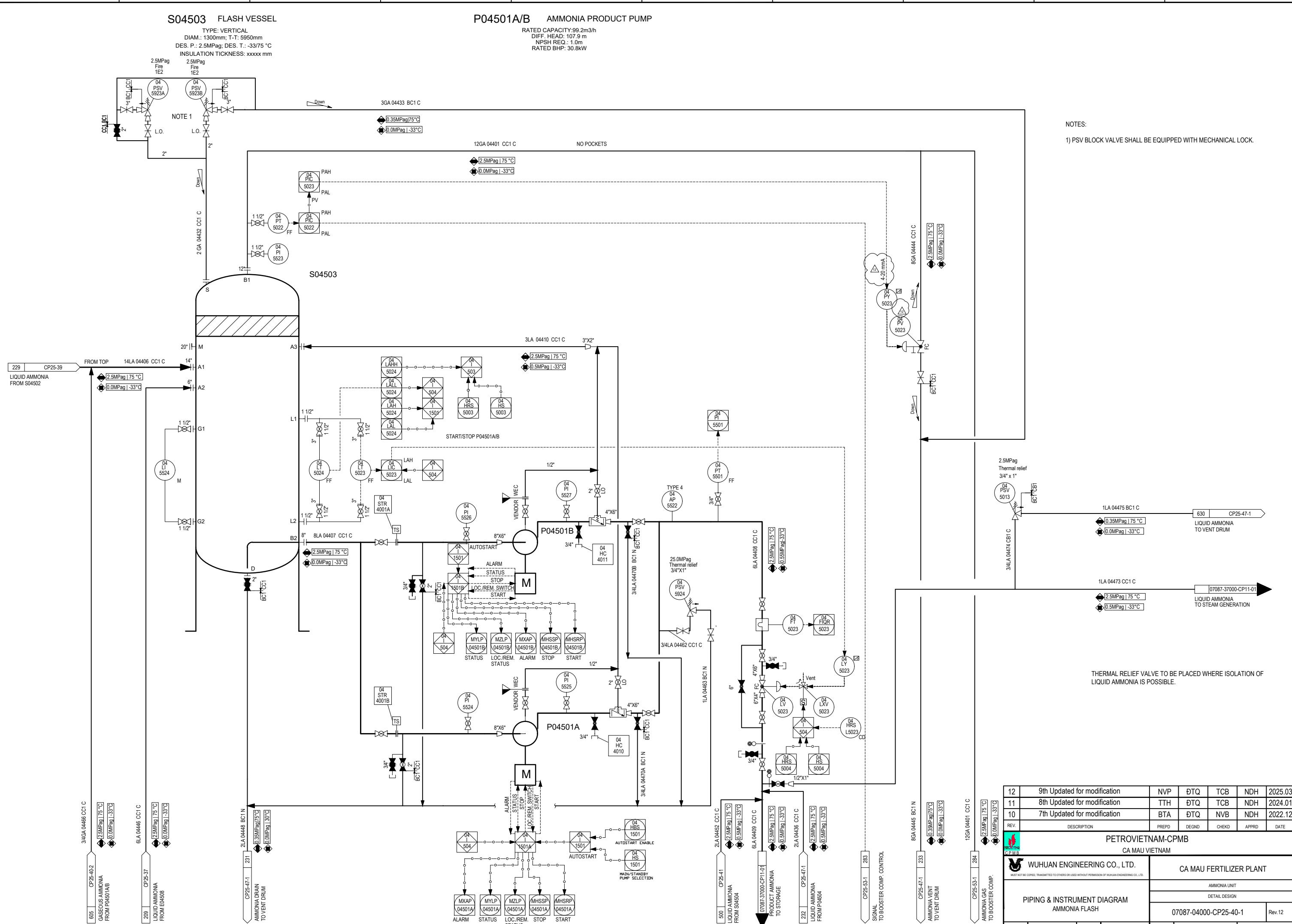
6) PSV BLOCK VALVES SHALL BE EQUIPPED WITH MECHANICAL LOCK.

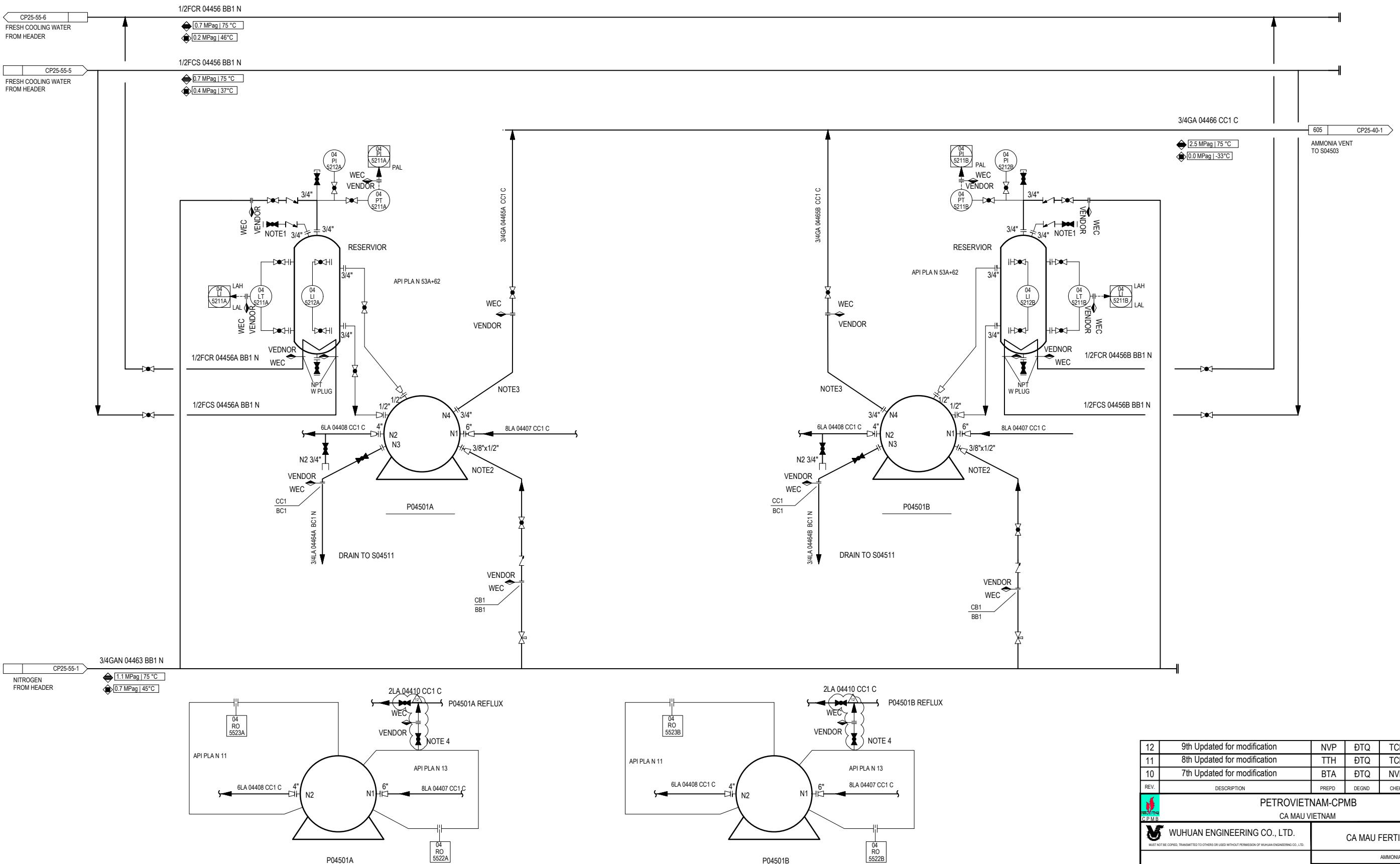
7) SPLIT RANGE AS SHOWN BELOW:



REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE
12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
	REVISION	PREPD	DEGND	CHEKD	APPRD	DATE
	PETROVIETNAM-CPMB					
	CA MAU VIETNAM					
	WUHUAN ENGINEERING CO., LTD.					
	MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHUAN ENGINEERING CO., LTD.					
	CA MAU FERTILIZER PLANT					
	PIPING & INSTRUMENT DIAGRAM					
	AMMONIA SYNTHESIS, PART 6					
	07087-04000-CP25-38					
	Rev.12					
SPECI	AREA	-	SCALE	-	SHT. 1	OF 1







12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	RTA	DTQ	NVP	NDH	2022.12

PETROVIETNAM-CPMB

CA MAU VIETNAM

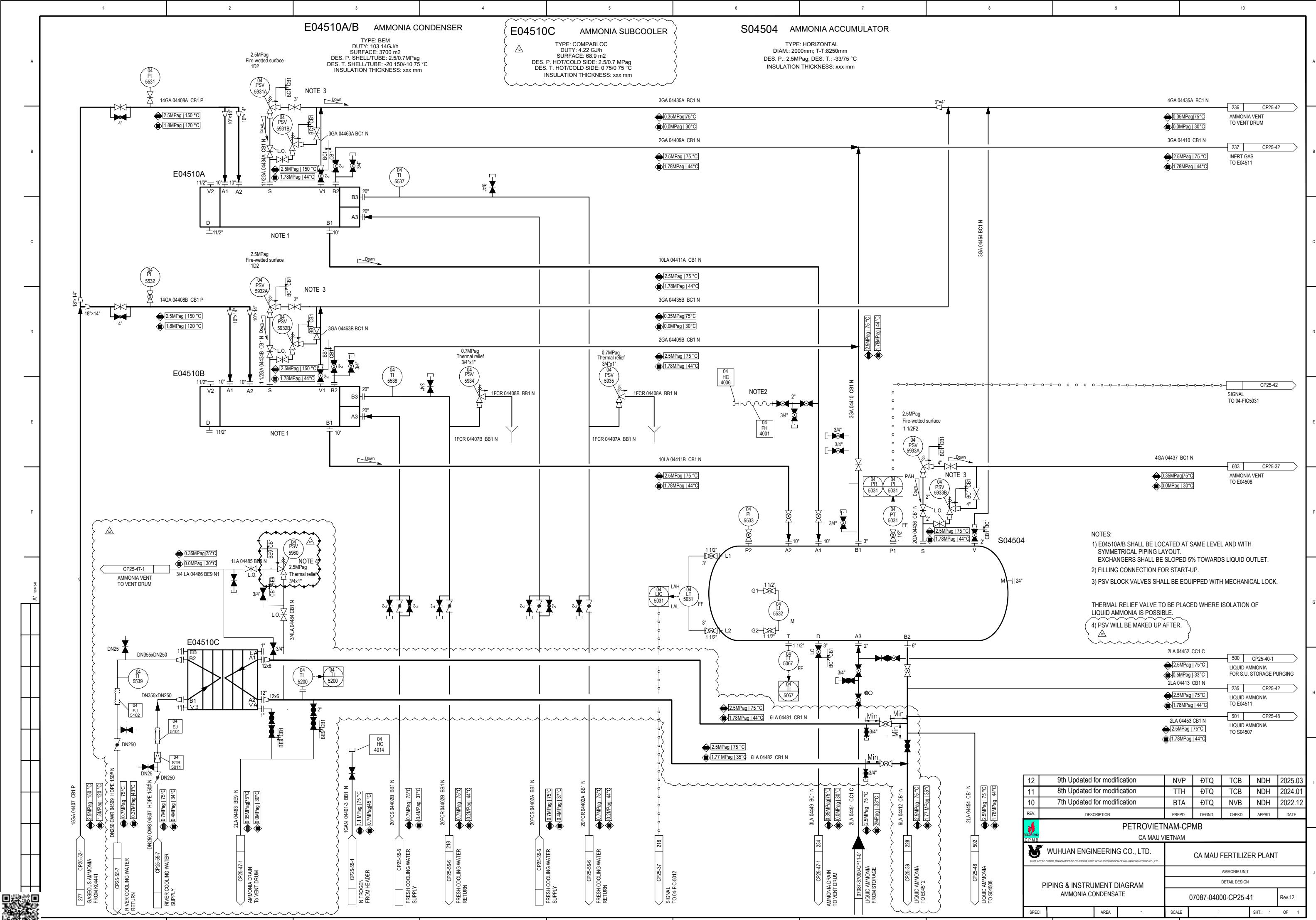
CA MAU FERTILIZER PLANT

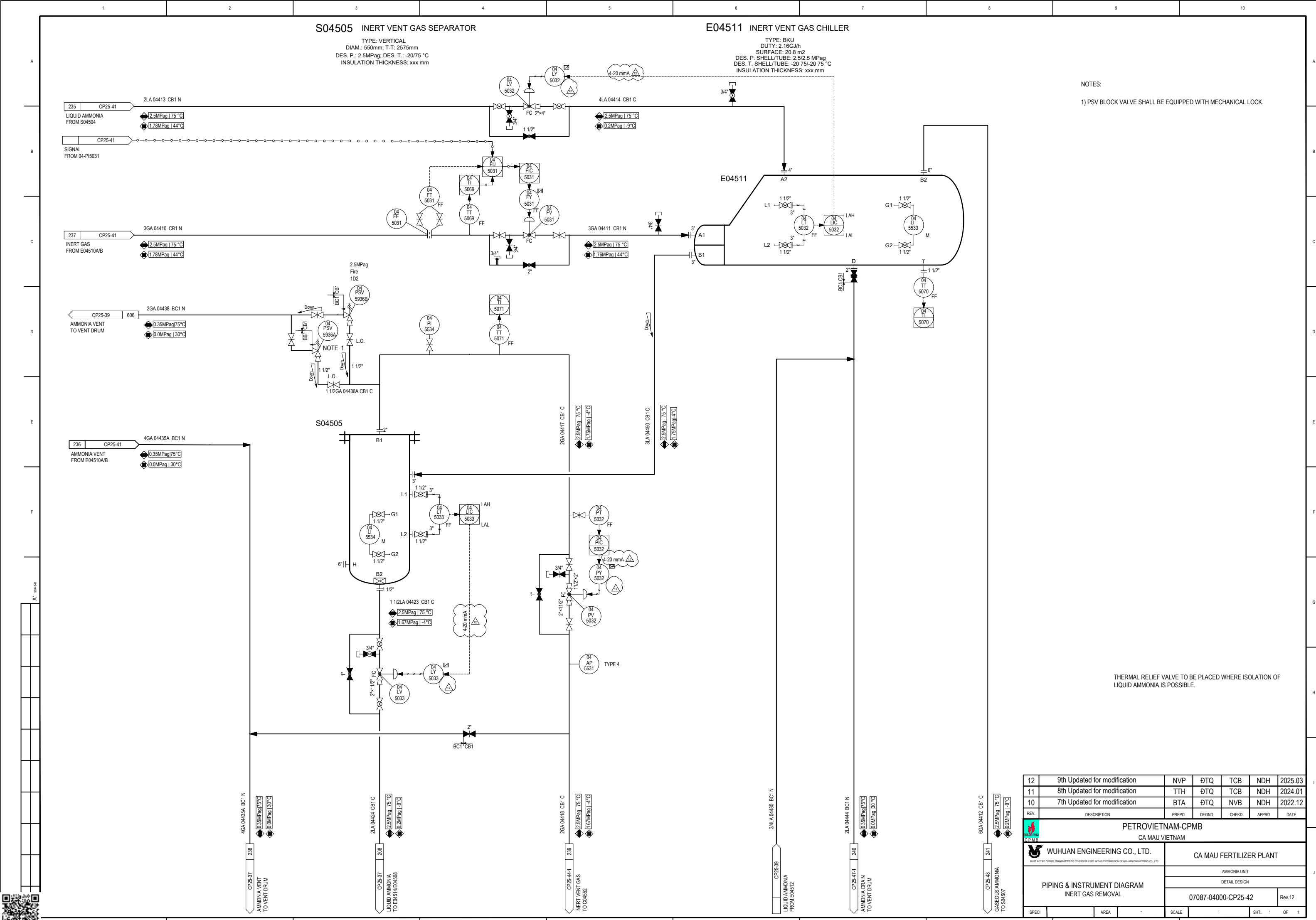
AMMONIA UNIT

DIAGRAM | DETAIL DESIGN

07087-04000-CP25-40-2

SCALE - SHT. 1 OF 1





## C04551 PURGE GAS ABSORBER

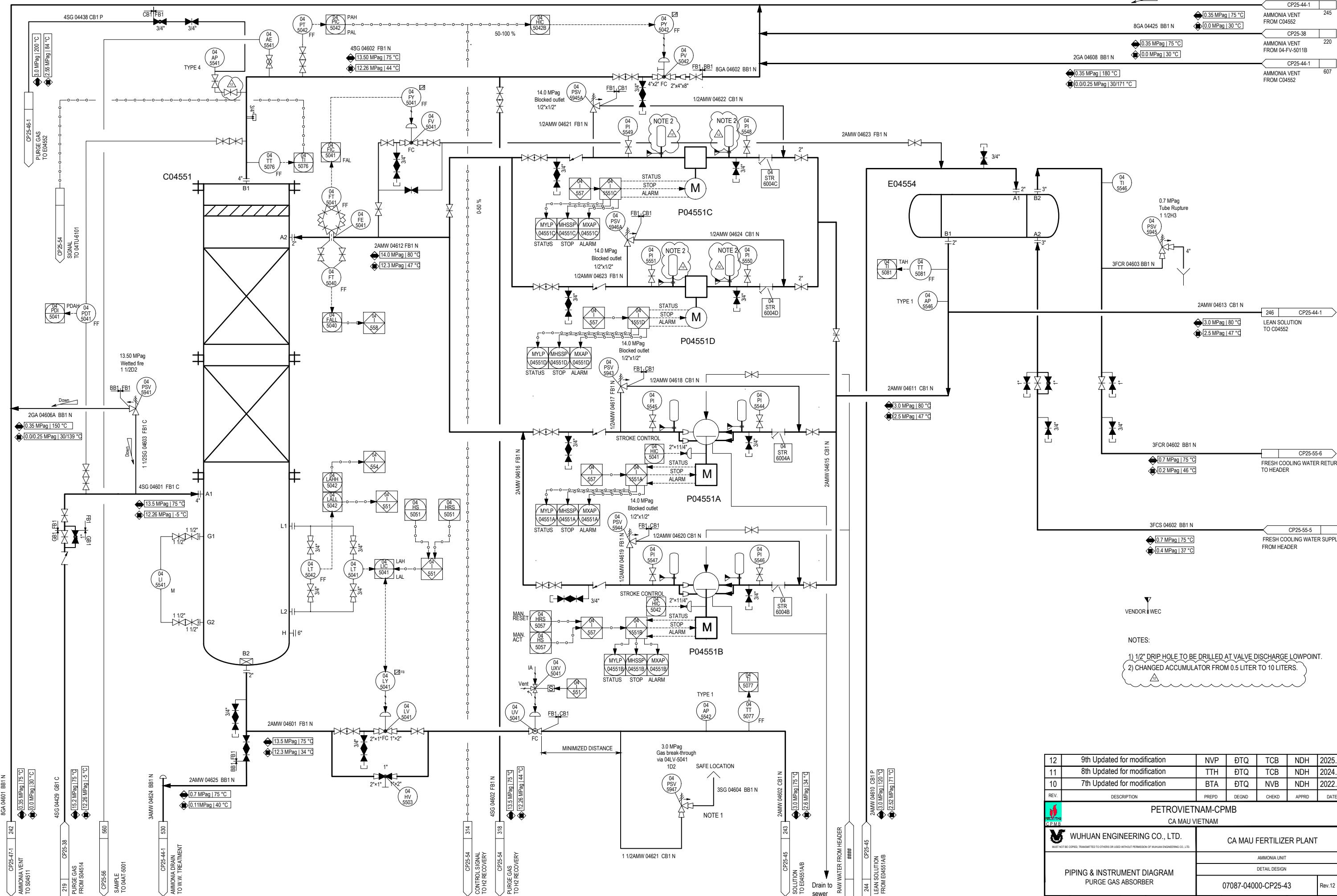
DIAM.: 620 mm; T-T: 12300 mm  
DES. P.: 13.35 MPag; DES. T.: -10/75 °C  
PACKING VOL.: 1.1 m³  
INSULATION THICKNESS: xxx mm

## P04551A/B HP CIRCULATION PUMP

RATED CAPACITY: 5.4 m³/h  
DIFF. HEAD: 1122.6 m  
NPSH REQ.: 268.4 m  
RATED BHP: 23 kW

## E04554 LEAN SOLUTION COOLER

TYPE: BEU  
DUTY: 0.576 GJ/h  
SURFACE: 16.3 m²  
DES. P. SHELL/TUBE: 3.0/0.7 MPag  
DES. T. SHELL/TUBE: -10/110-10/75 °C  
INSULATION THICKNESS: xxx mm



12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE

**PETROVIETNAM-CPMB**  
CA MAU VIETNAM

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**CA MAU FERTILIZER PLANT**

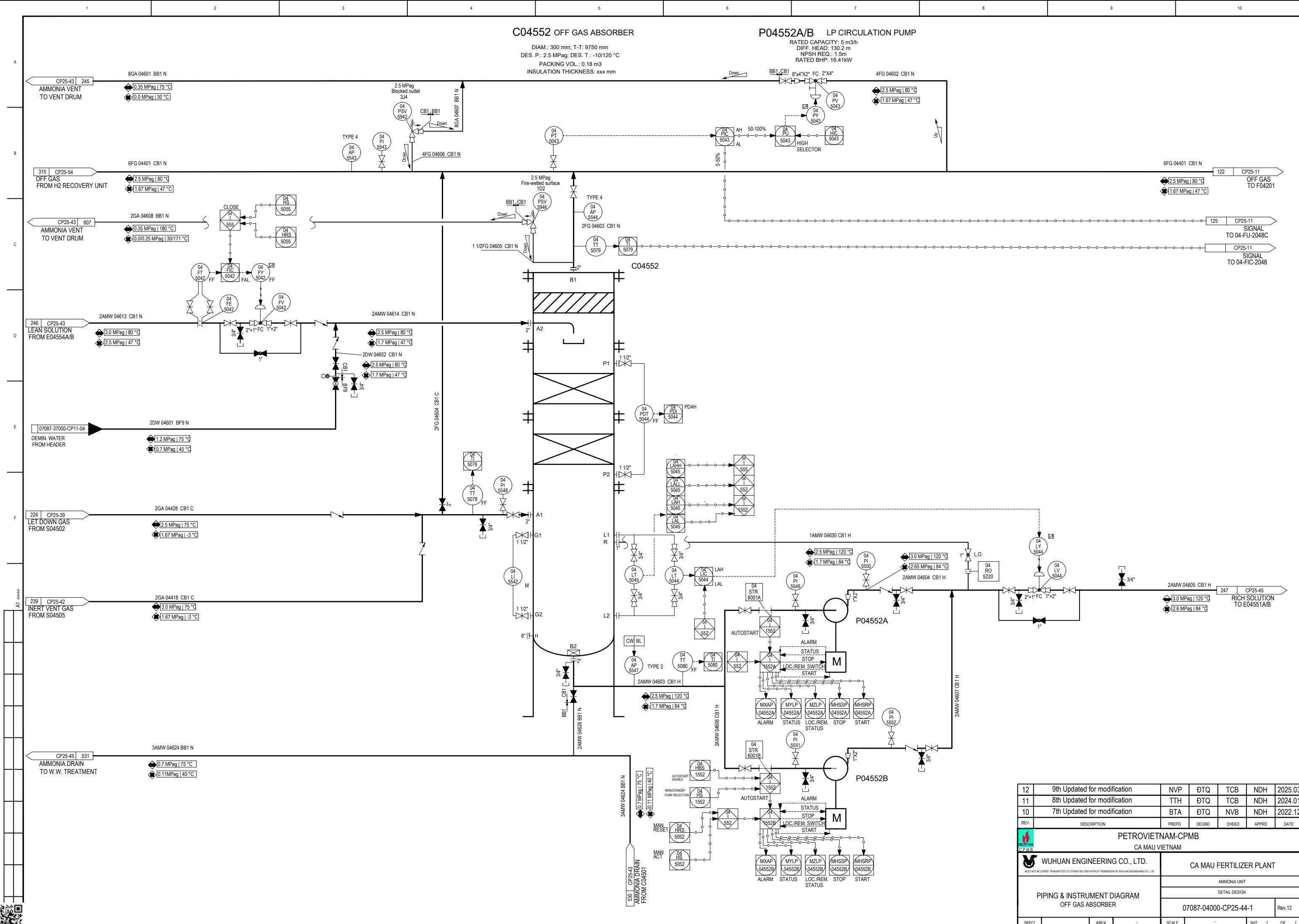
**AMMONIA UNIT**

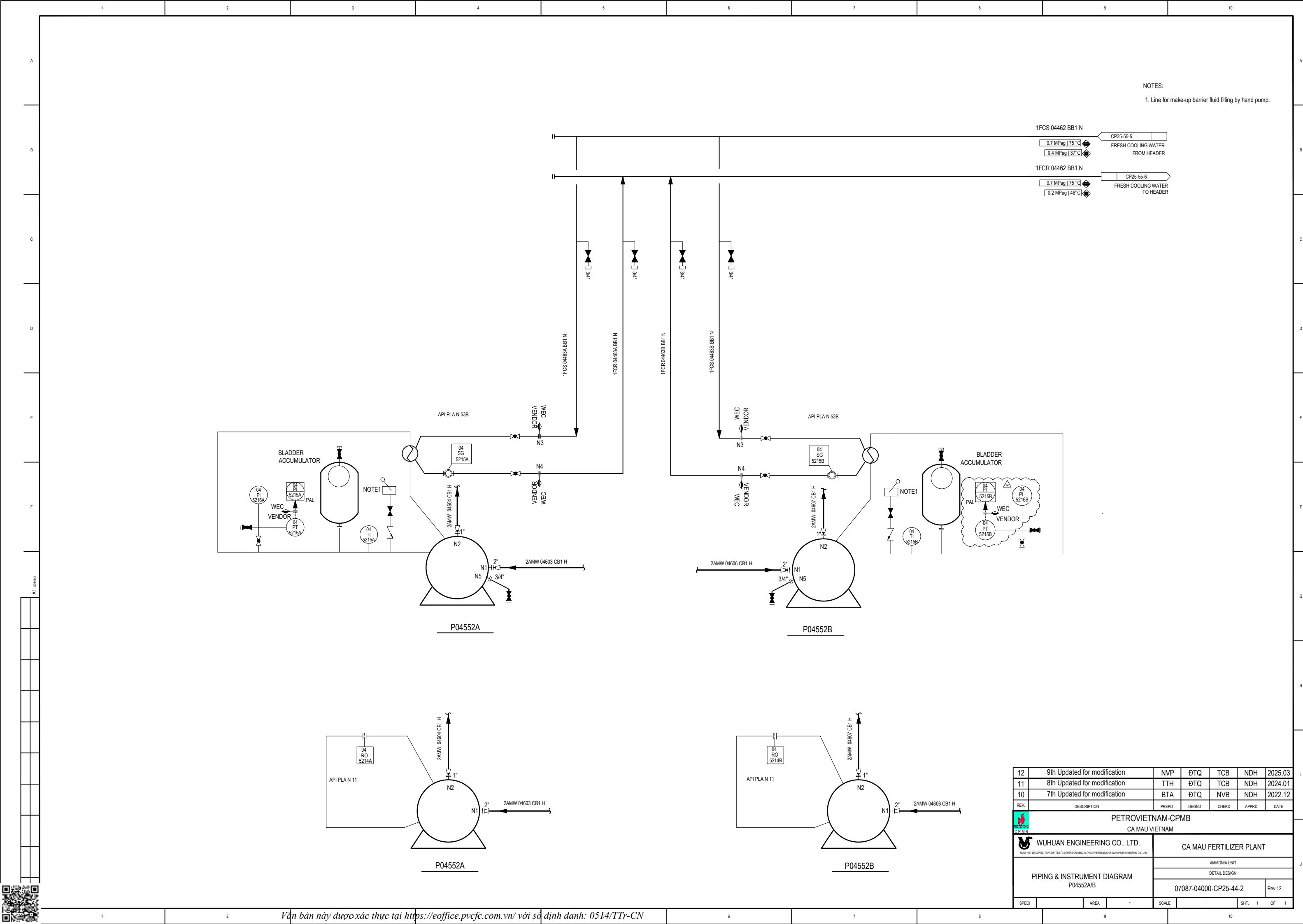
**DETAIL DESIGN**

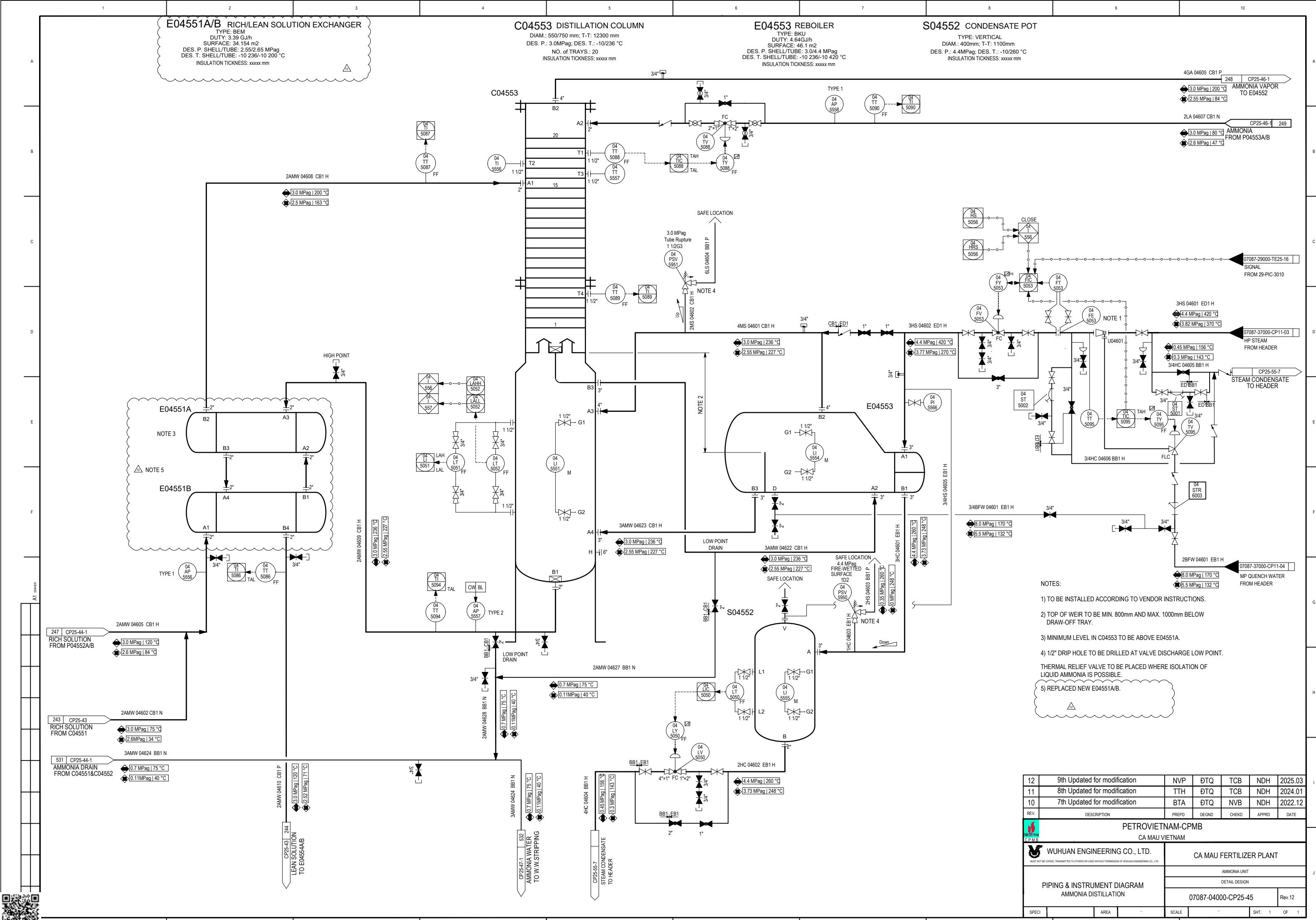
**PIPING & INSTRUMENT DIAGRAM**  
**PURGE GAS ABSORBER**

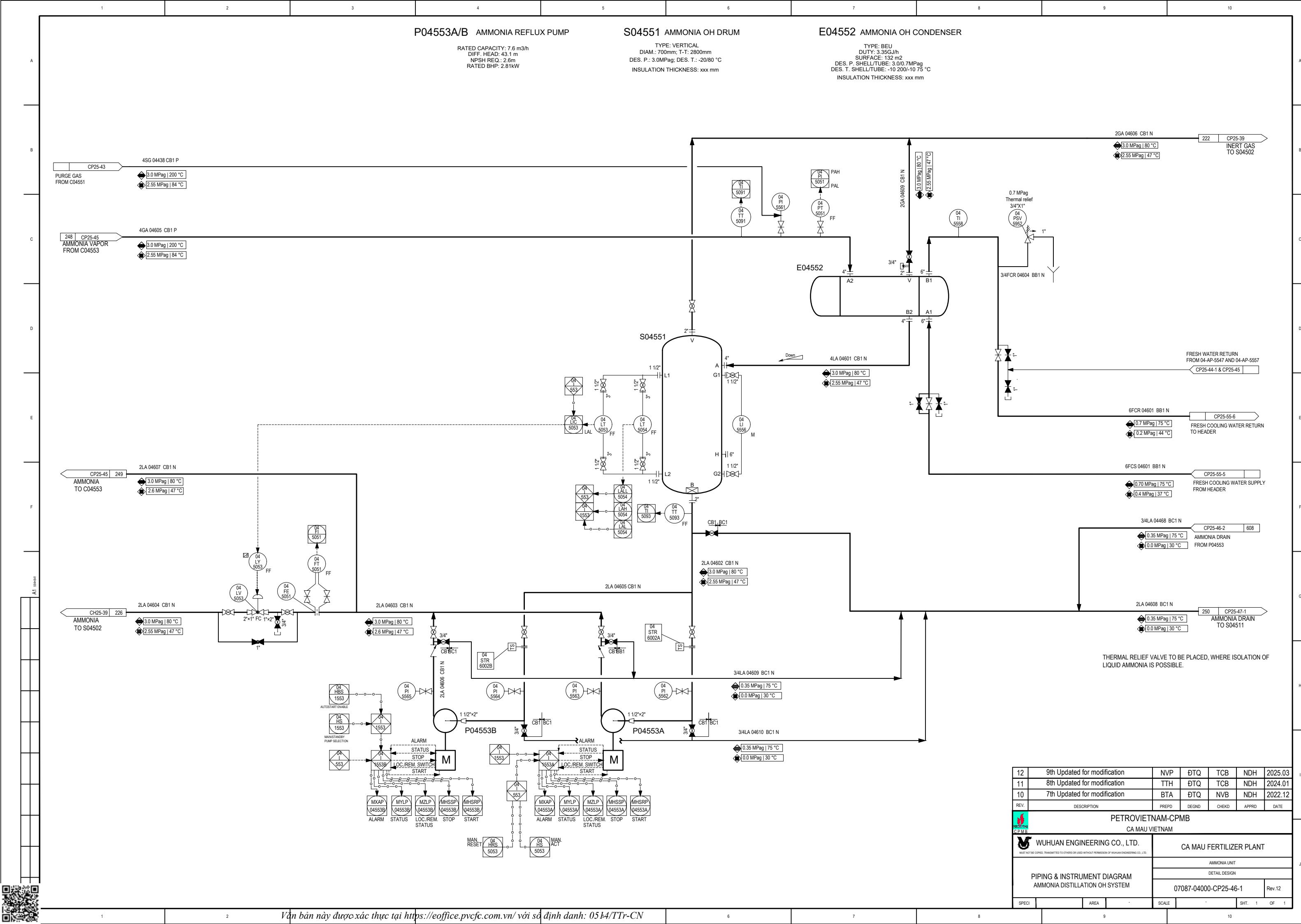
07087-04000-CP25-43

Rev.12



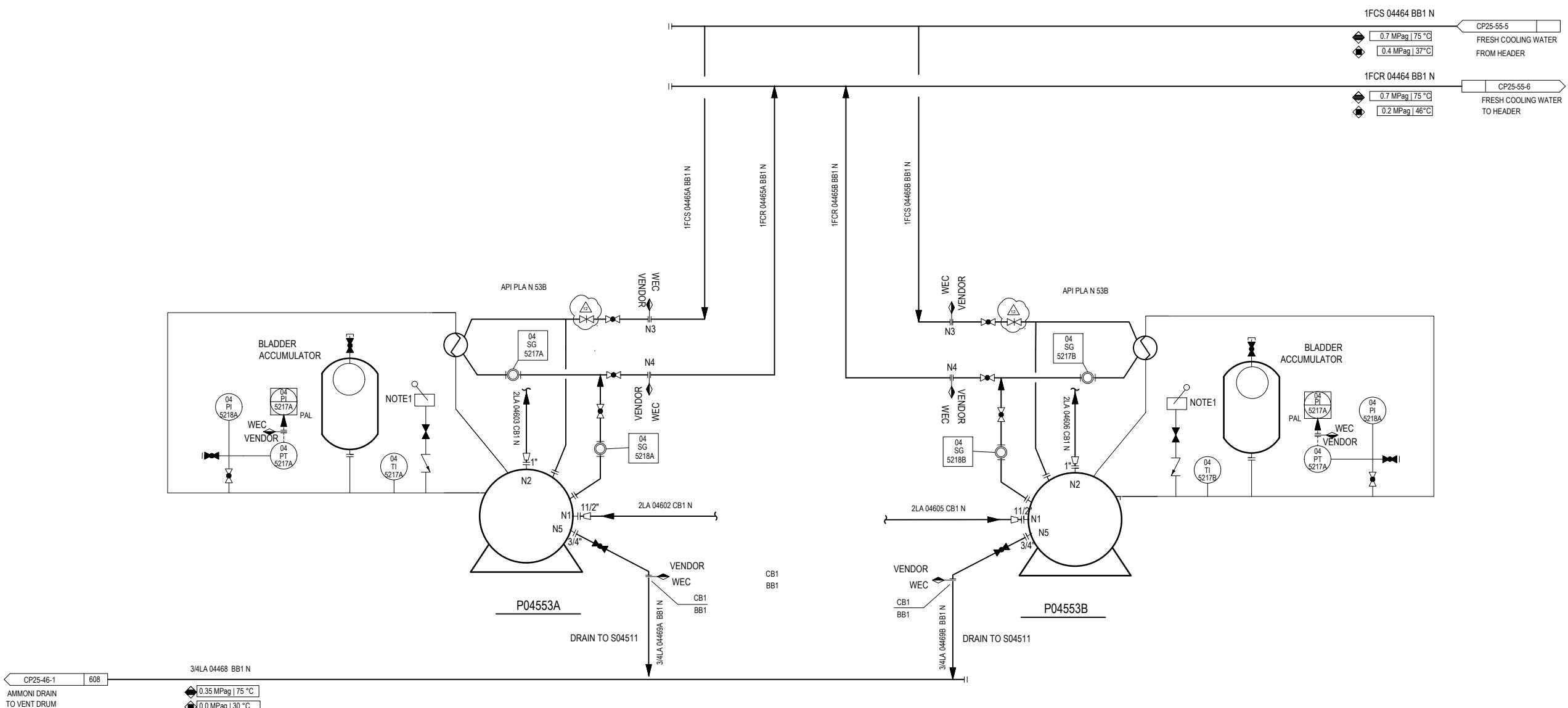






#### NOTES:

#### 1. Line for make-up barrier fluid filling by hand pump.



12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE

PETROVIETNAM-CPMB

CA MALLE FERTILIZER PLANT

**PIPING & INSTRUMENT DIAGRAM**  
**P04552A/B**

CA MAU FERTILIZER PL

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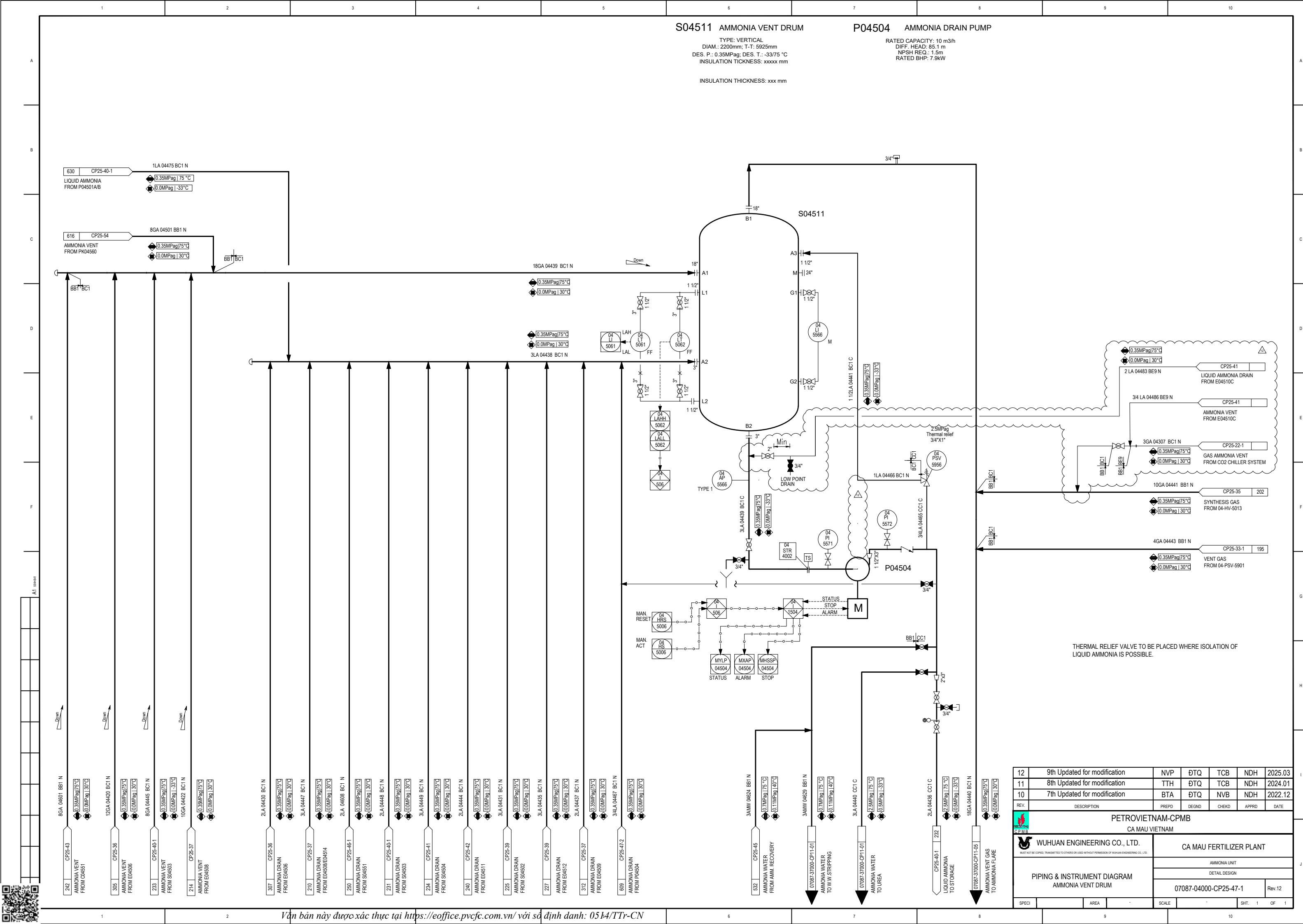
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07007-04000-0B05-16-0

07087-04000-CP25-46-2

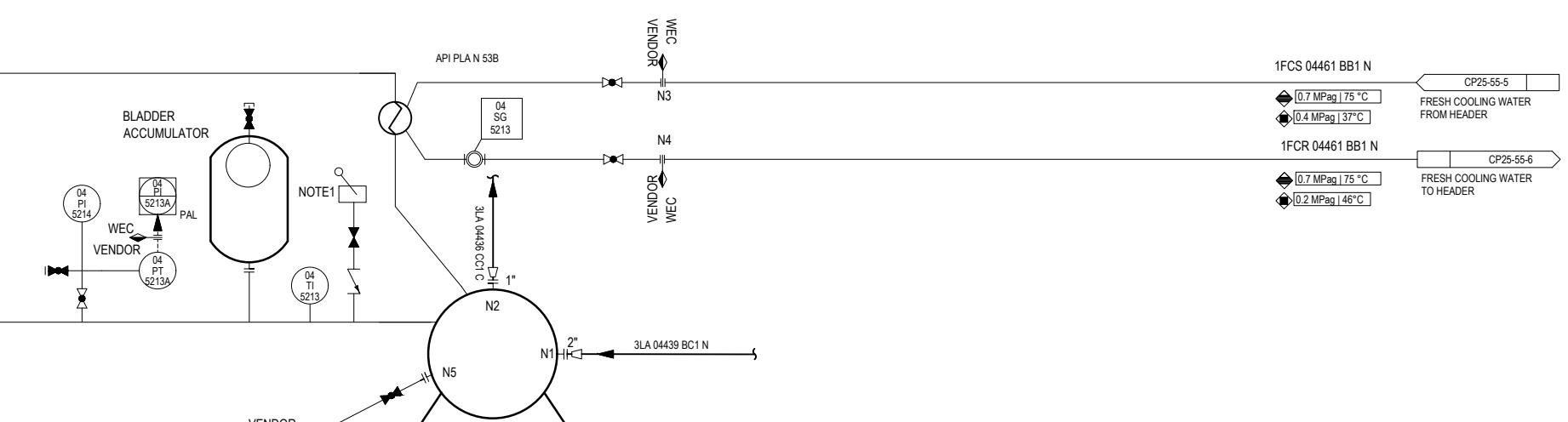
SHT.

10



A  
B  
C  
D  
E  
F  
G  
H  
I  
J

NOTES:  
 1. Line for make-up barrier fluid filling by hand pump.



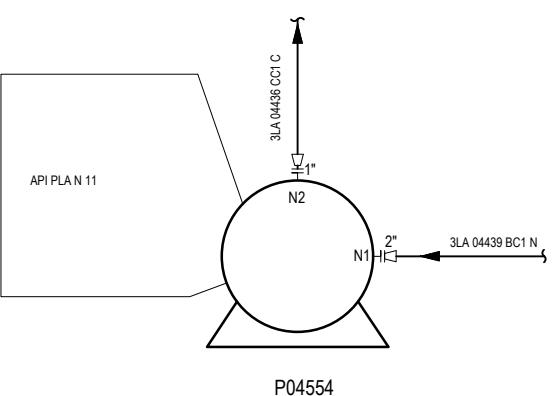
3/4 LA 04467 BC1 N

CP25-47-1 609

DRAIN AMMONIA TO VENT DRUM

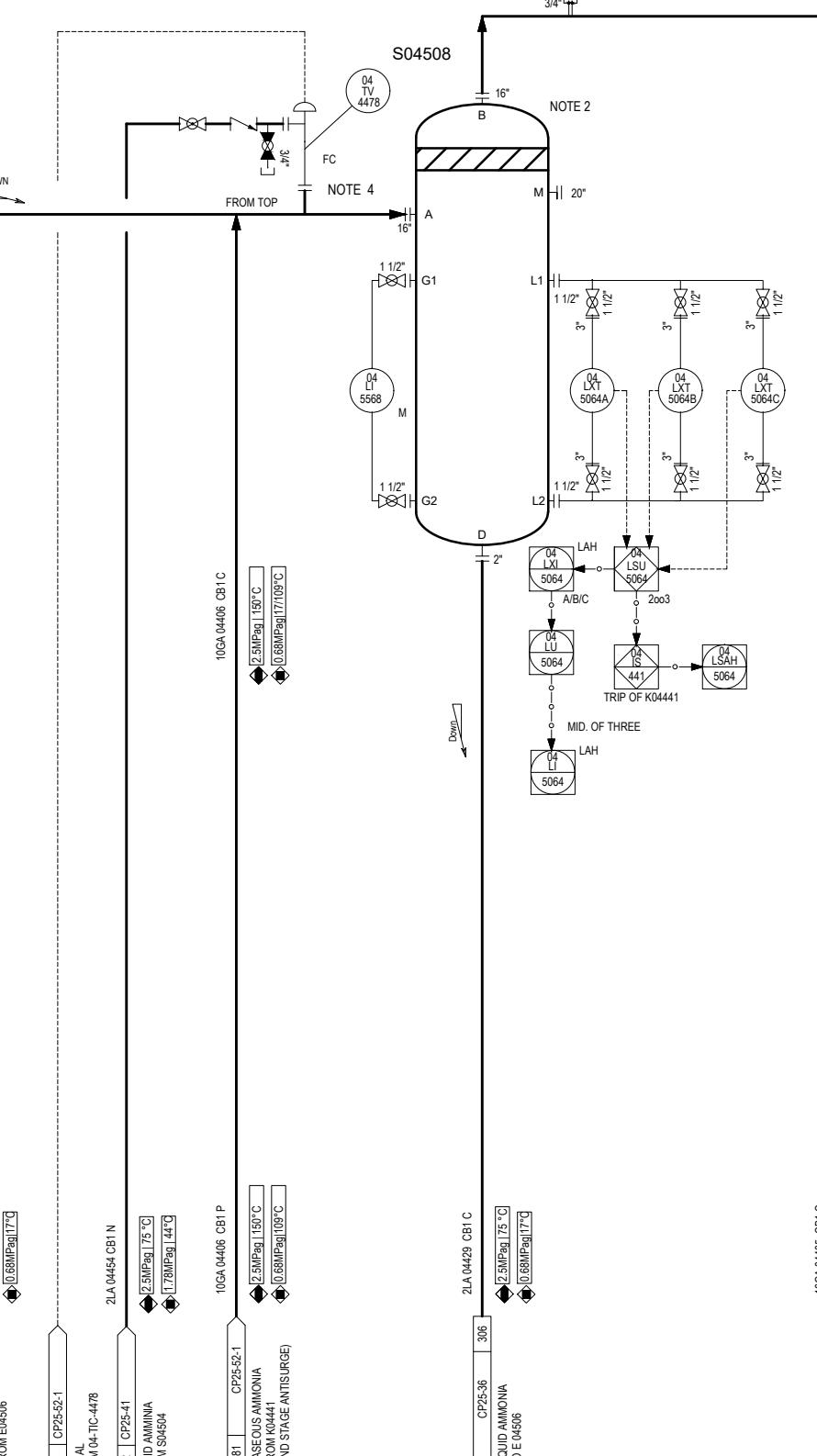
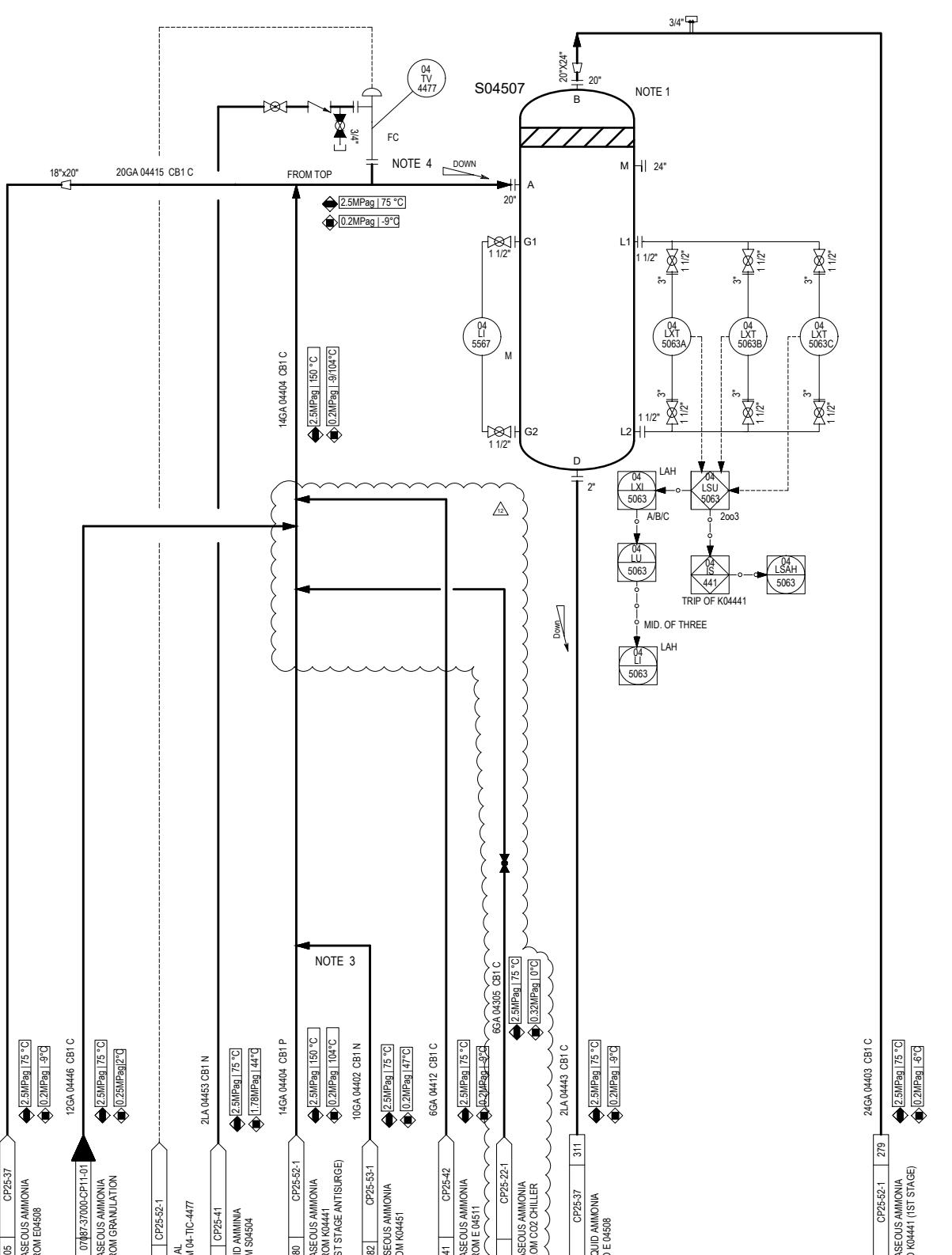
0.35MPag|75°C

0.0MPag|30°C



12	9th Updated for modification	NVP	ĐTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	ĐTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	ĐTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE

 <b>PETROVIETNAM-CPMB</b> CA MAU VIETNAM	CA MAU FERTILIZER PLANT					
	WUHUAN ENGINEERING CO., LTD.	MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHUAN ENGINEERING CO., LTD.	AMMONIA UNIT	DETAIL DESIGN		
	PIPING & INSTRUMENT DIAGRAM					
	P04504					
SPECI		AREA	-	SCALE	-	SHT. 1 OF 1

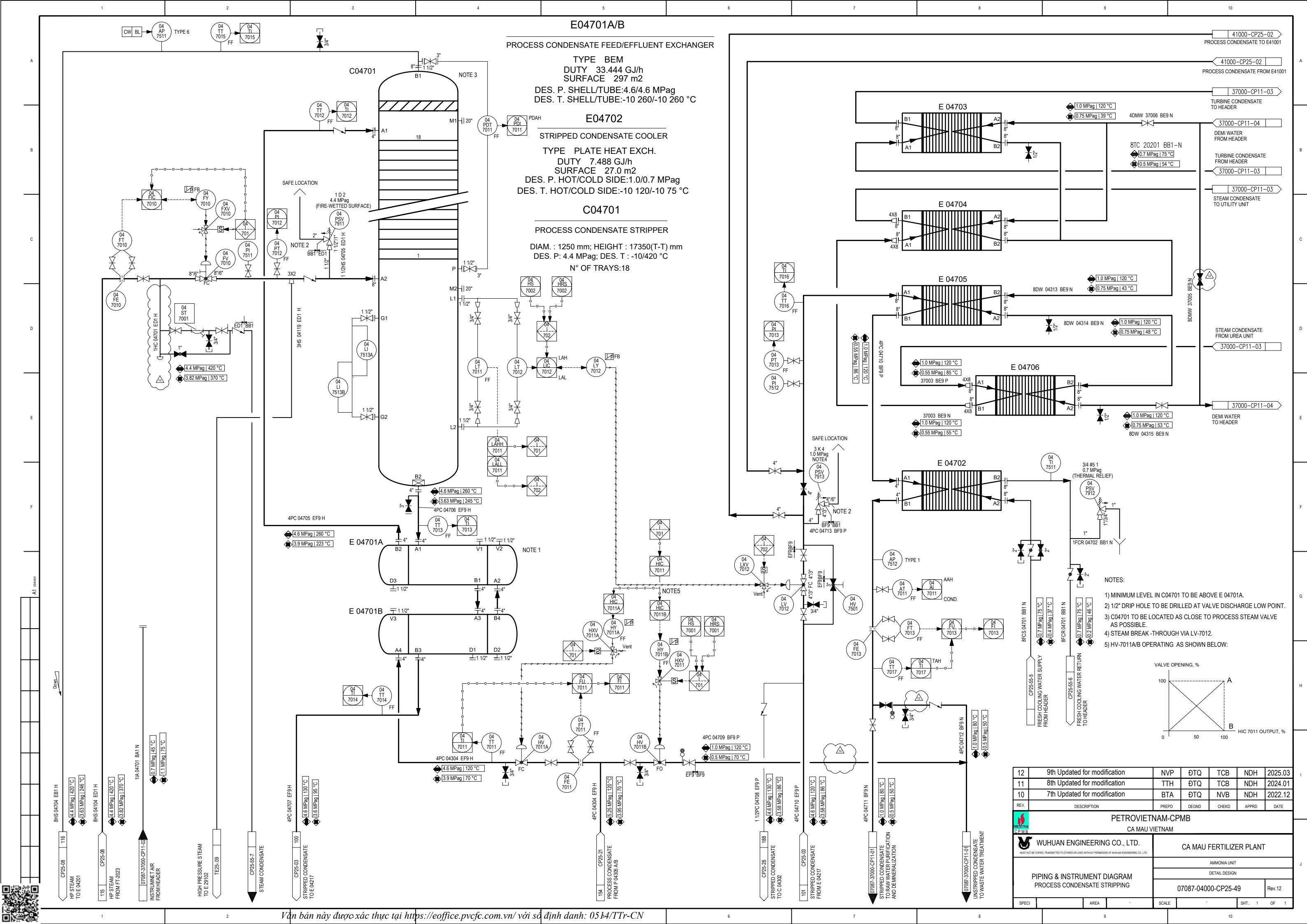


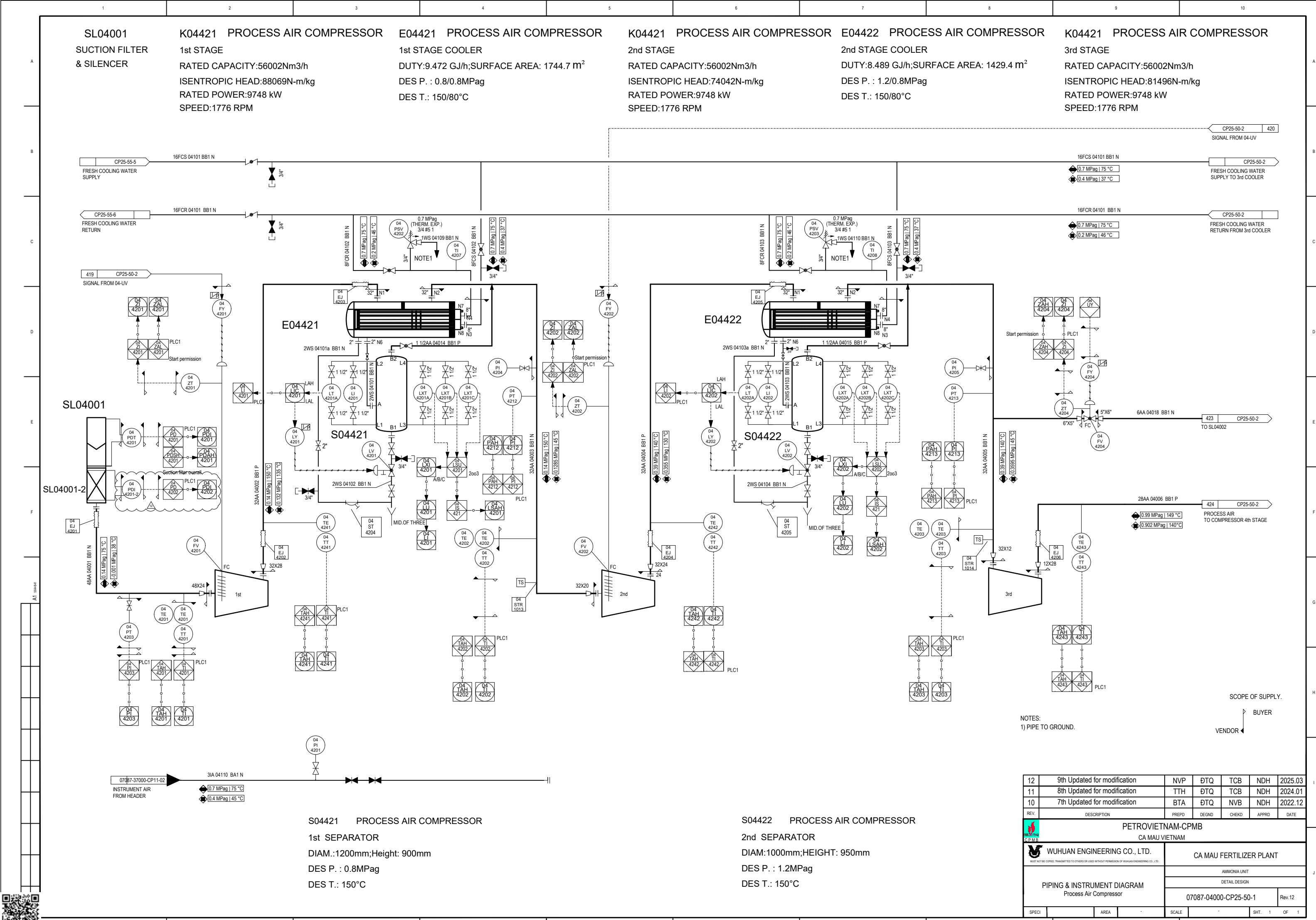
NOTES:

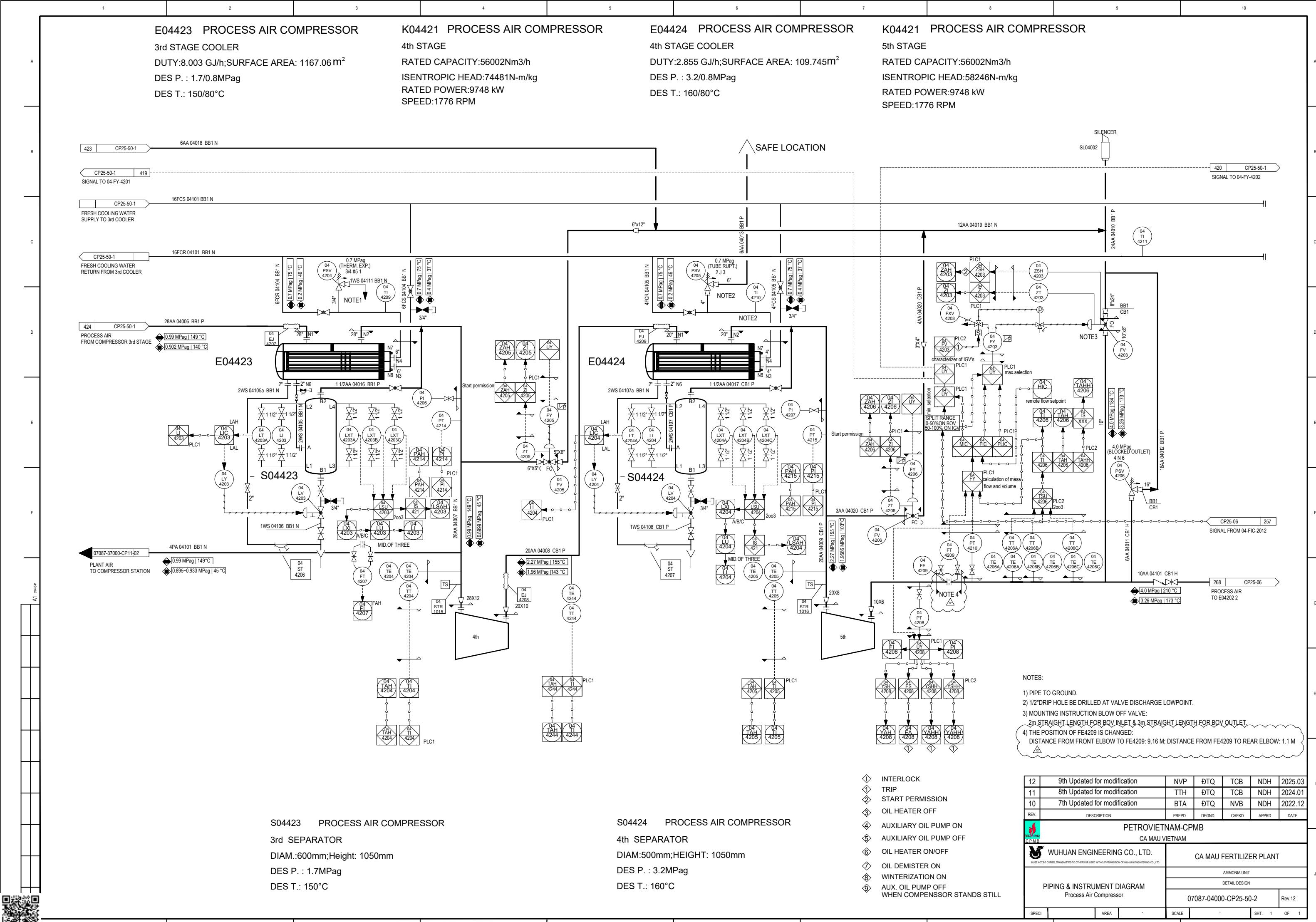
- 1) TO BE LOCATED ABOVE E04508.
- 2) TO BE LOCATED ABOVE E04506.
- 3) CONNECTION LOCATED IN COMPRESSOR SECTION.
- 4) TO BE INSTALLED ACCORDING TO VENDOR INSTRUCTION.

THERMAL RELIEF VALVE TO BE PLACED WHERE ISOLATION OF LIQUID AMMONIA IS POSSIBLE.

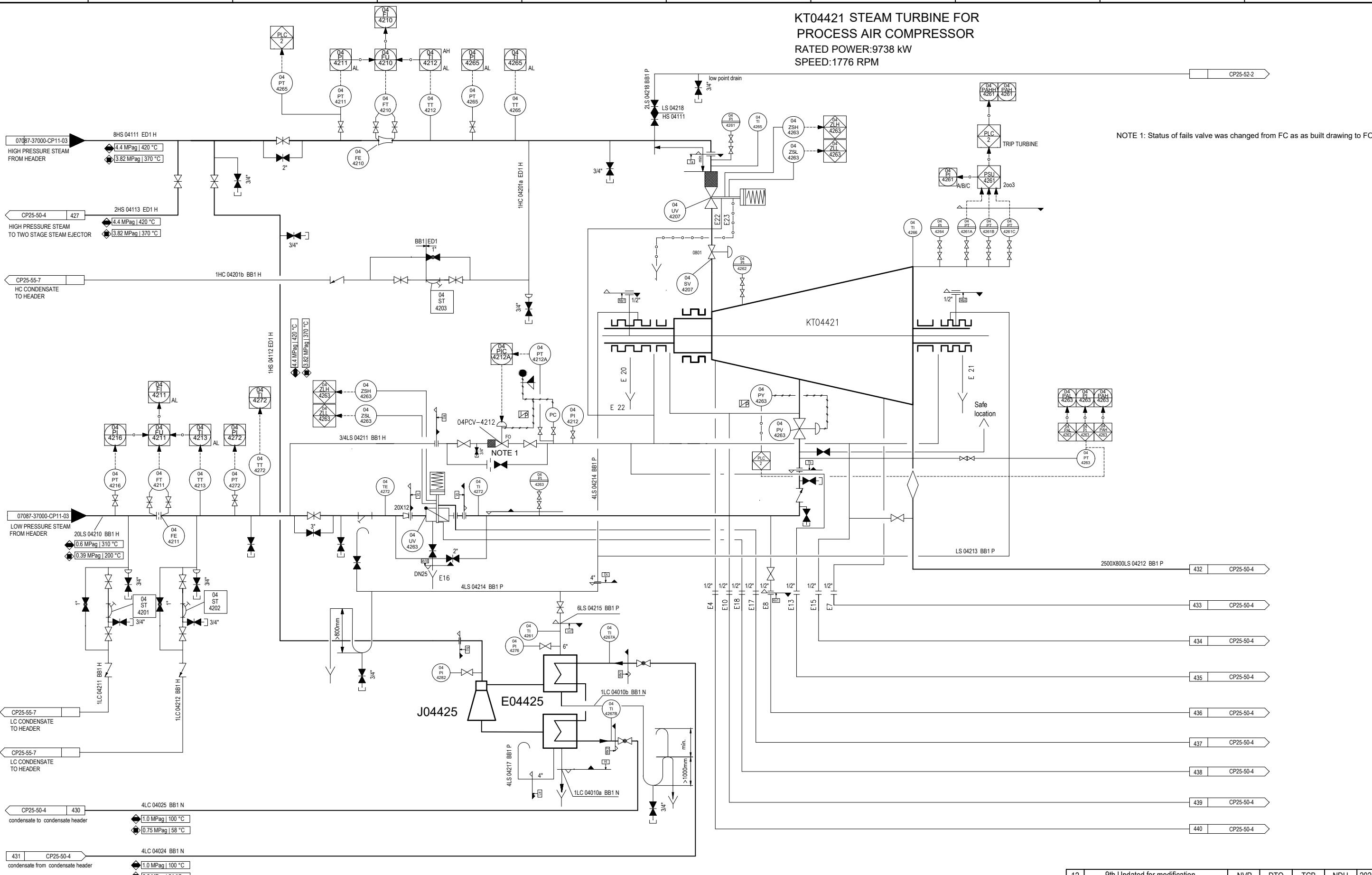
12	9th Updated for modification	NVP	ĐTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	ĐTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	ĐTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE
 <b>PETROVIETNAM-CPMB</b> <b>CA MAU VIETNAM</b>						
<b>WUHUAN ENGINEERING CO., LTD.</b> <small>MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHUAN ENGINEERING CO., LTD.</small>						
<b>AMMONIA UNIT</b>						
<b>DETAIL DESIGN</b>						
<b>07087-04000-CP25-48</b>						
SPECI		AREA	-	SCALE	-	SHT. 1 OF 1
<b>PIPING &amp; INSTRUMENT DIAGRAM</b> <b>AMMONIA KO DRUMS</b>						
<b>Rev.12</b>						



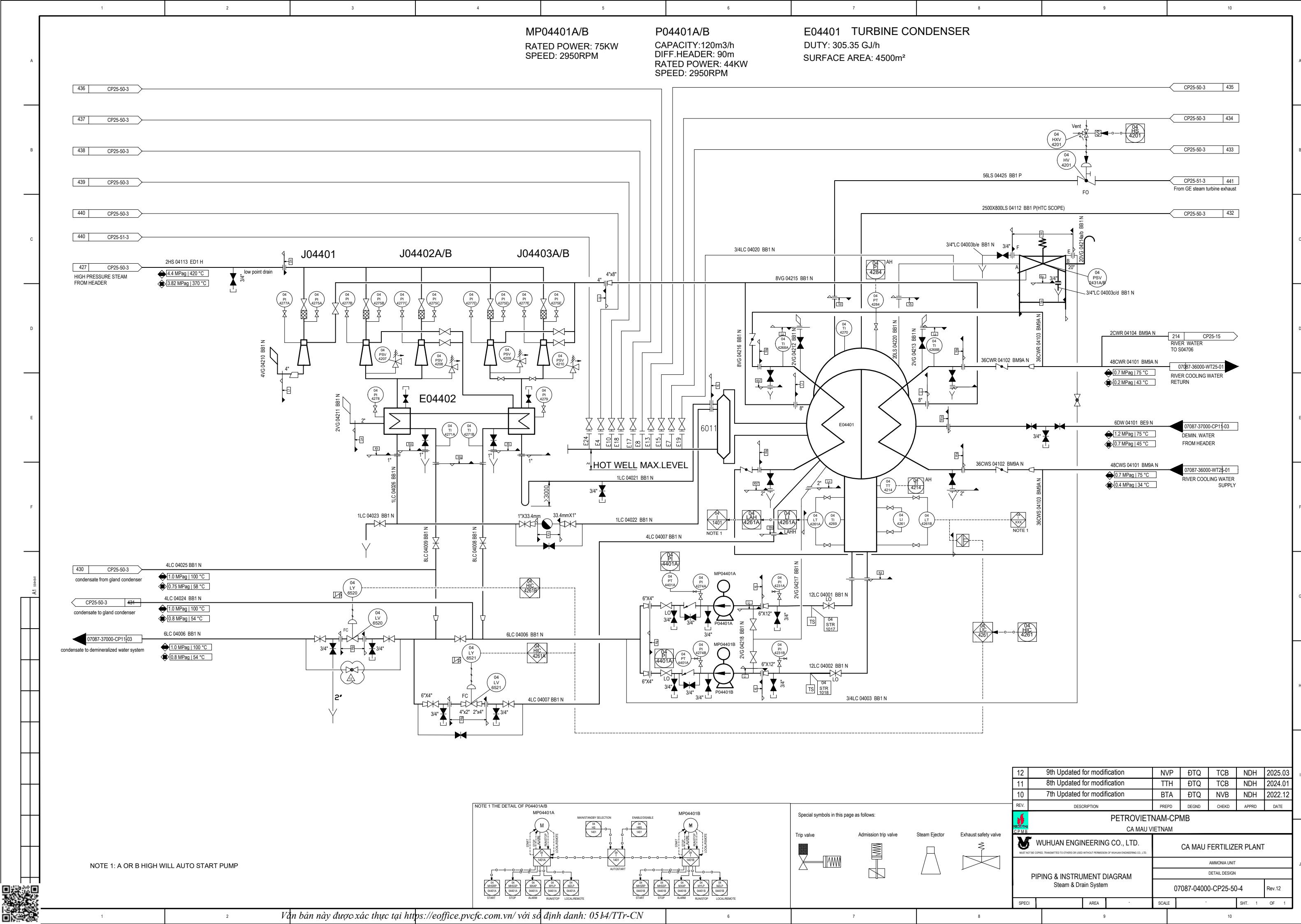


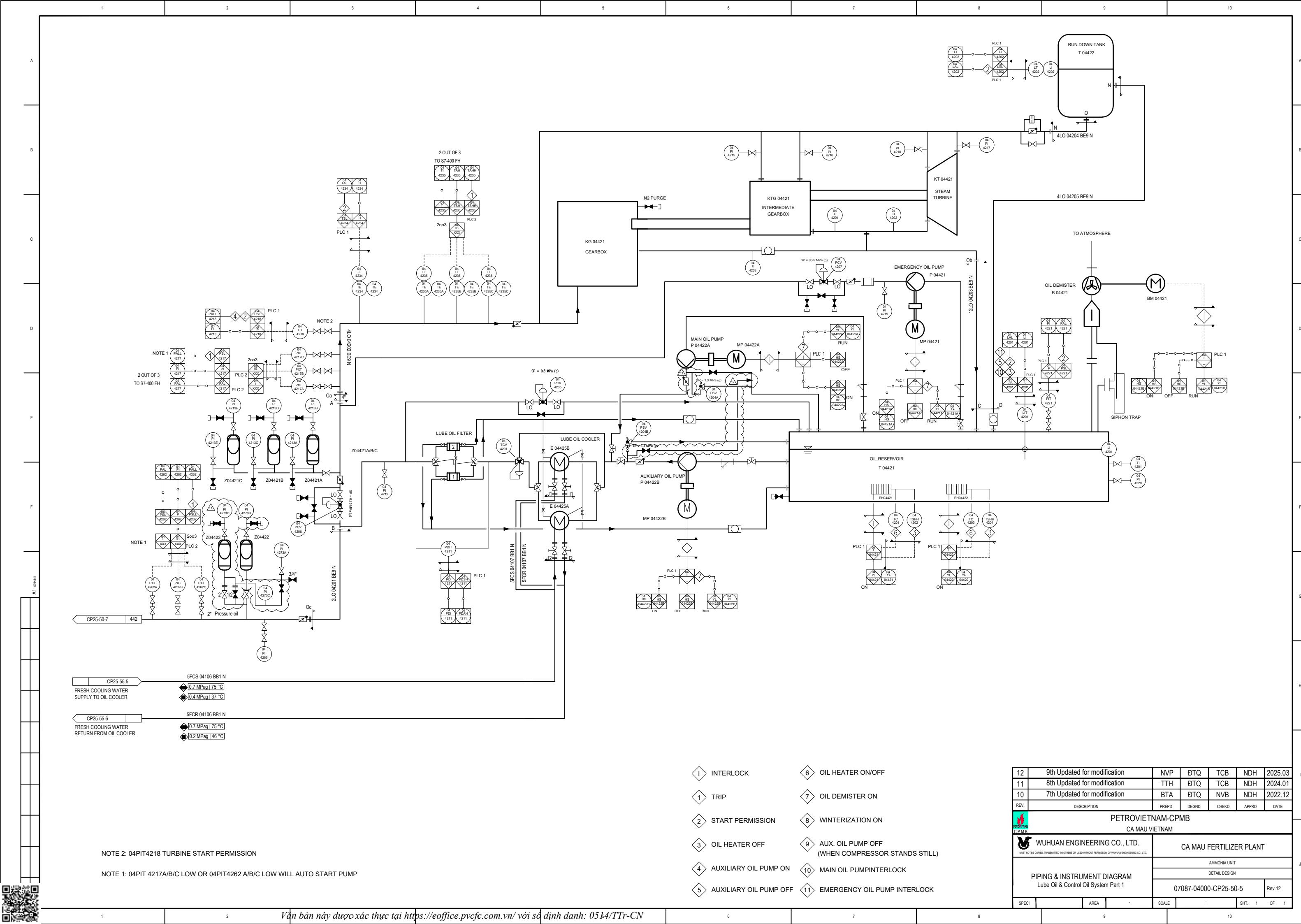


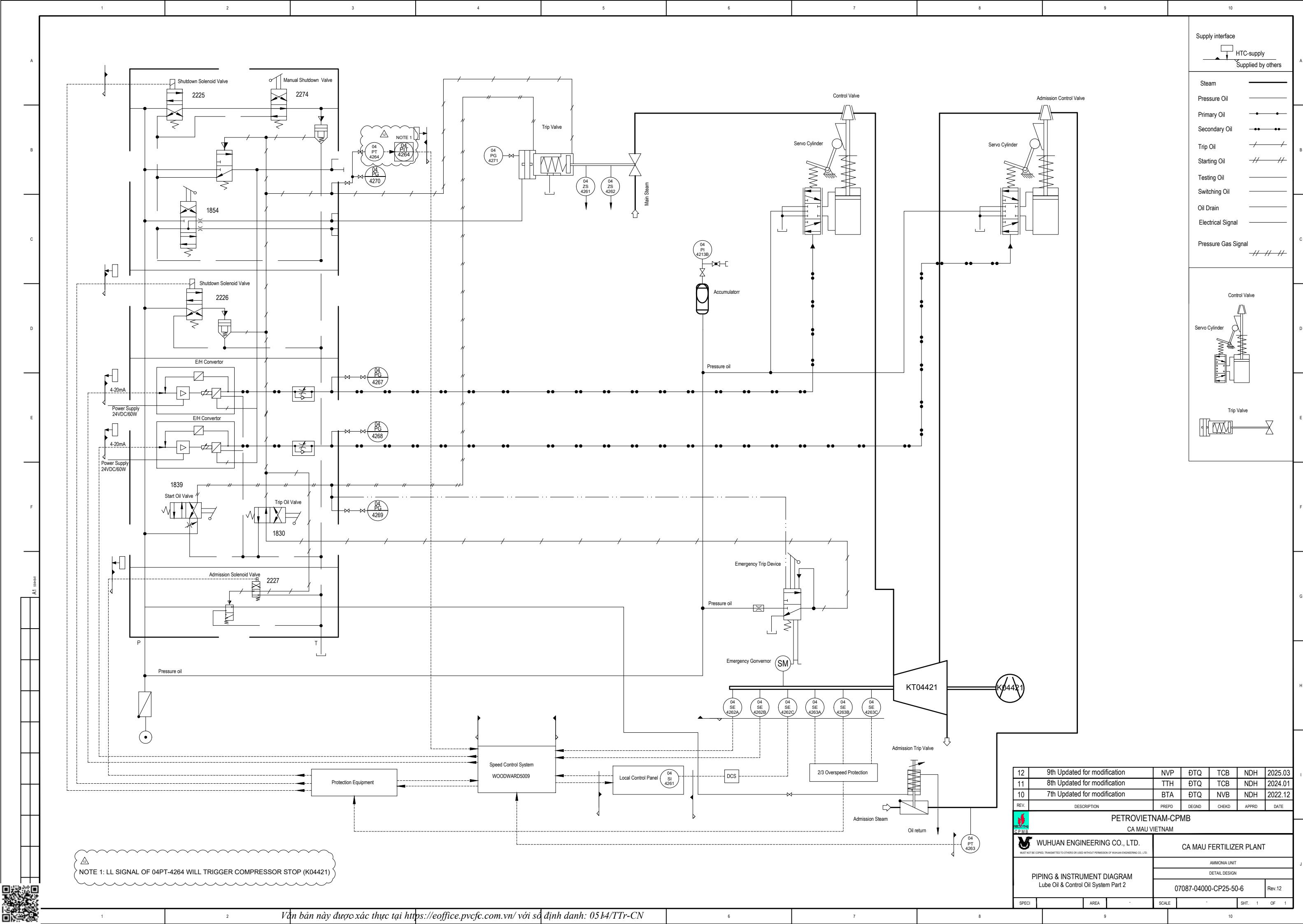
KT04421 STEAM TURBINE FOR  
PROCESS AIR COMPRESSOR  
RATED POWER:9738 kW  
SPEED:1776 RPM

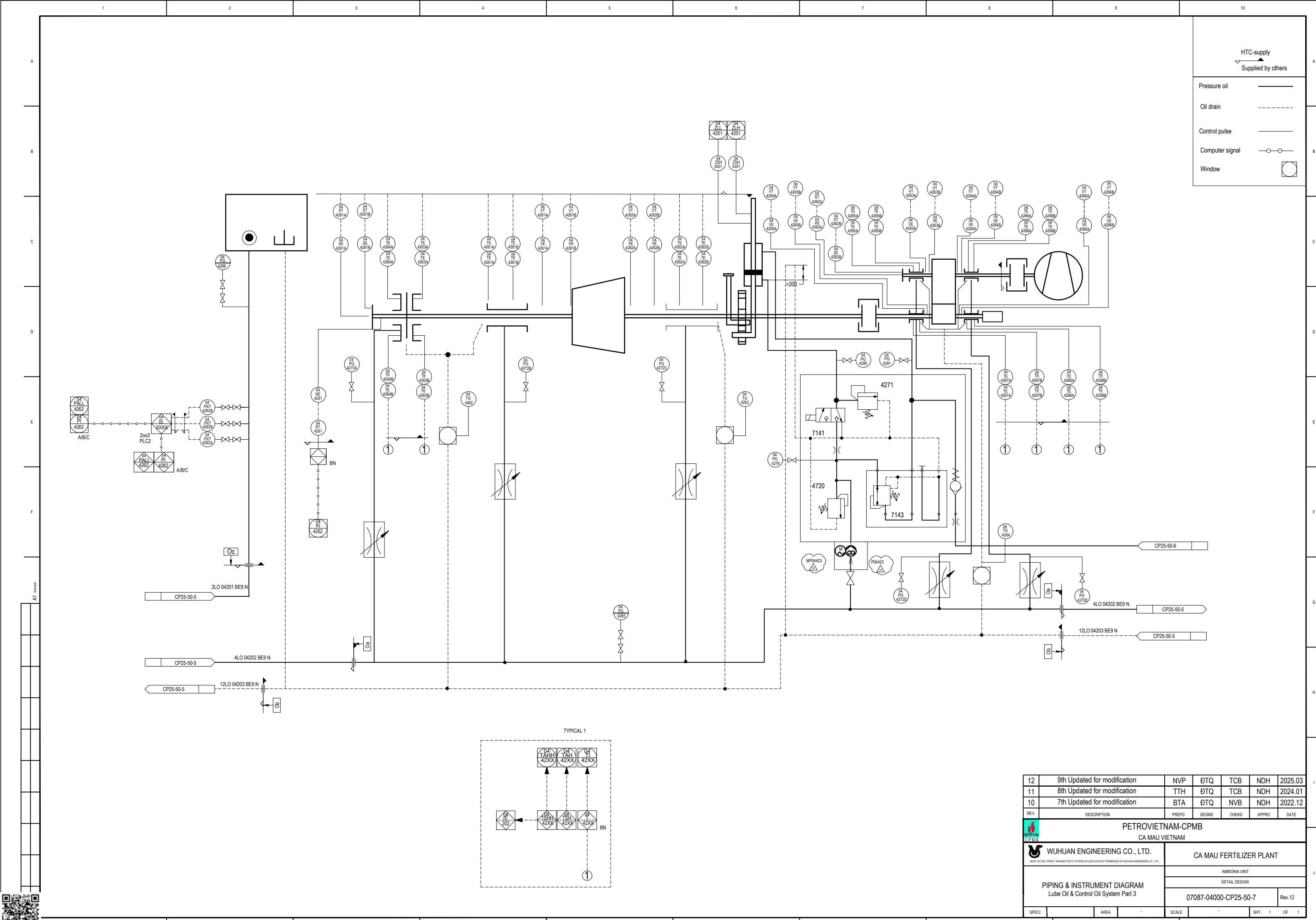


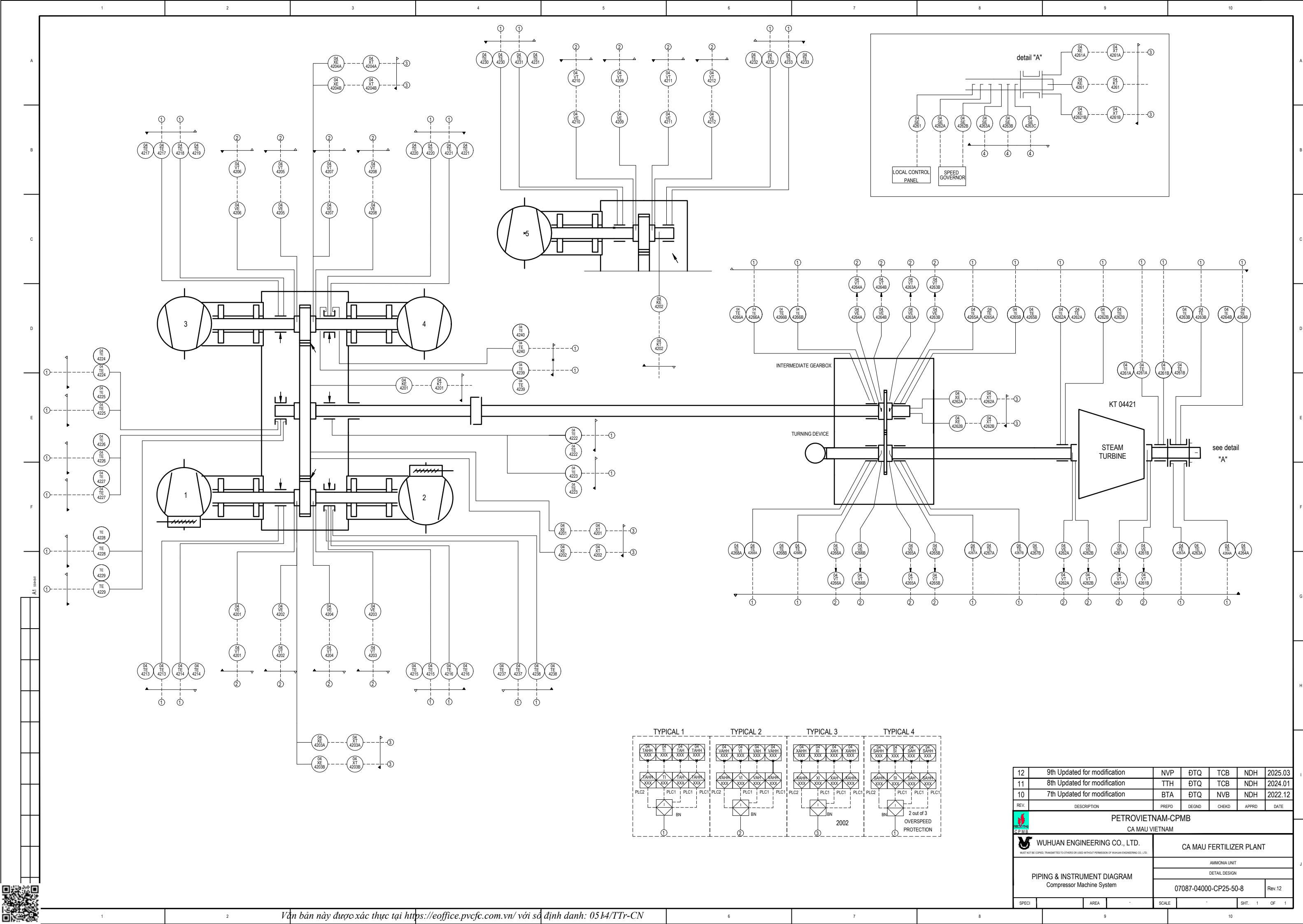
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE
12	9th Updated for modification	NVP	ĐTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	ĐTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	ĐTQ	NVB	NDH	2022.12
PETROVIETNAM-CPMB CA MAU VIETNAM						
<b>WUHUAN ENGINEERING CO., LTD.</b> <small>MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHUAN ENGINEERING CO., LTD.</small>						
CA MAU FERTILIZER PLANT						
AMMONIA UNIT						
DETAIL DESIGN						
PIPING & INSTRUMENT DIAGRAM						
Steam & Drain System						
07087-04000-CP25-50-3						
Rev.12						

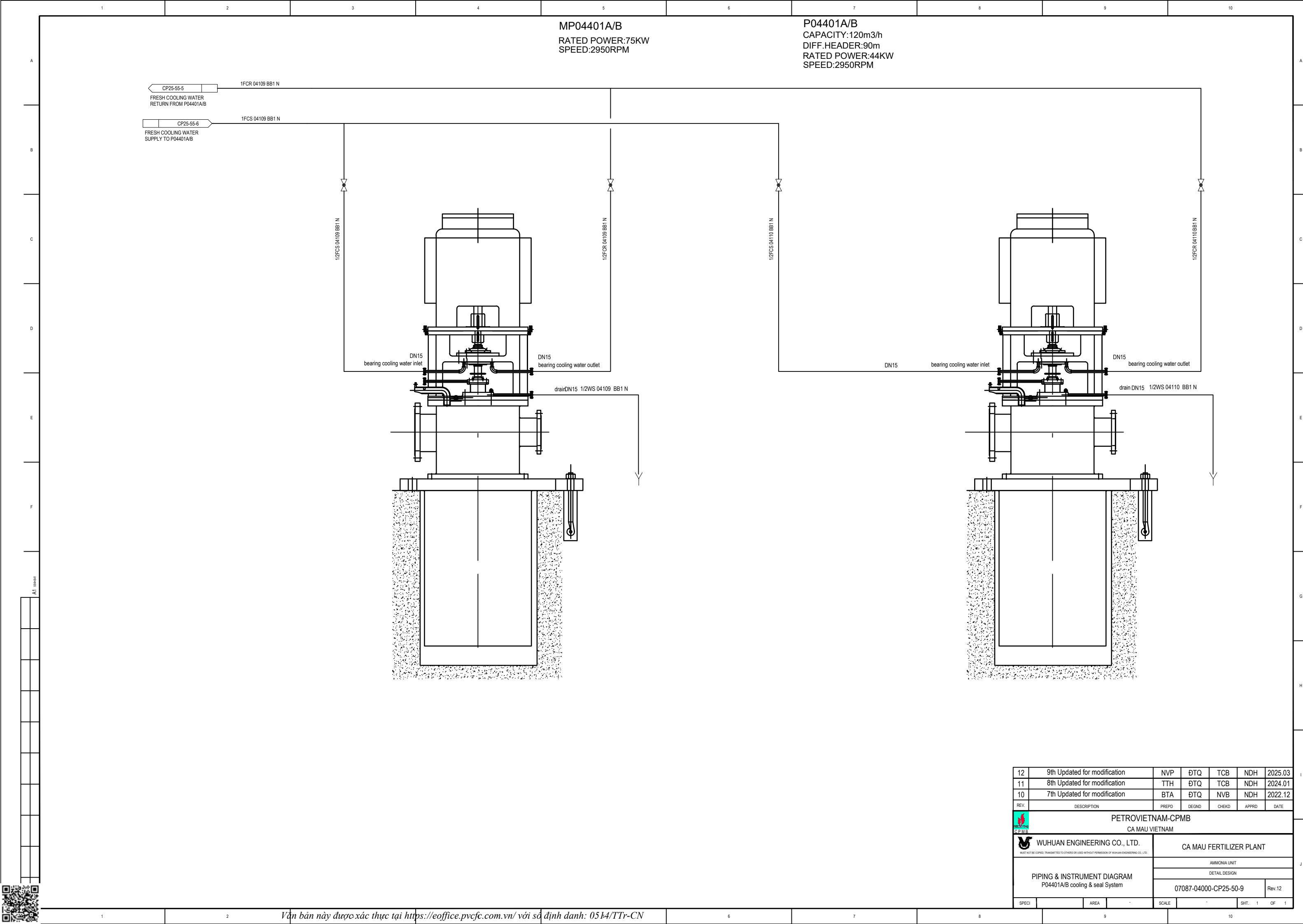


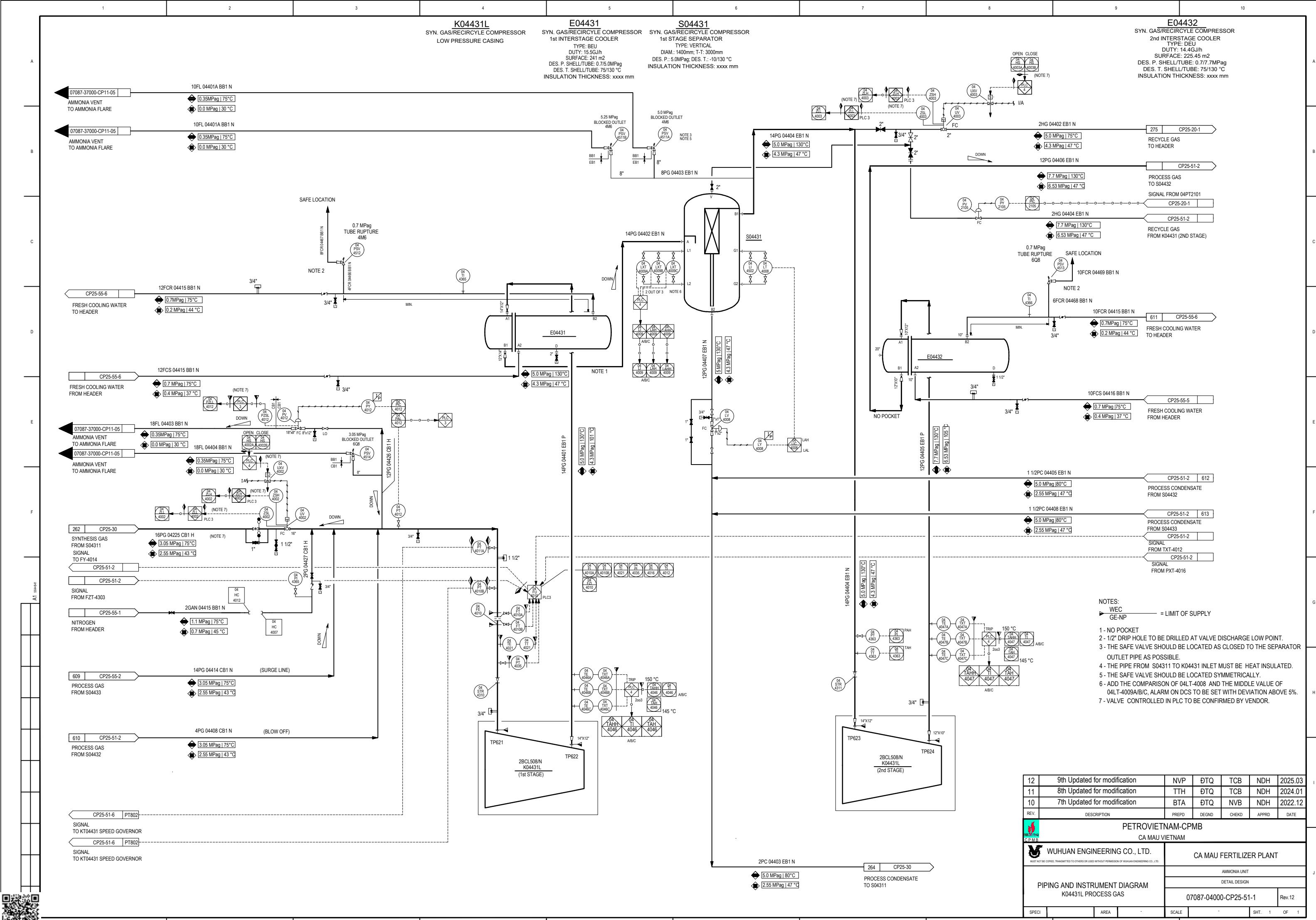


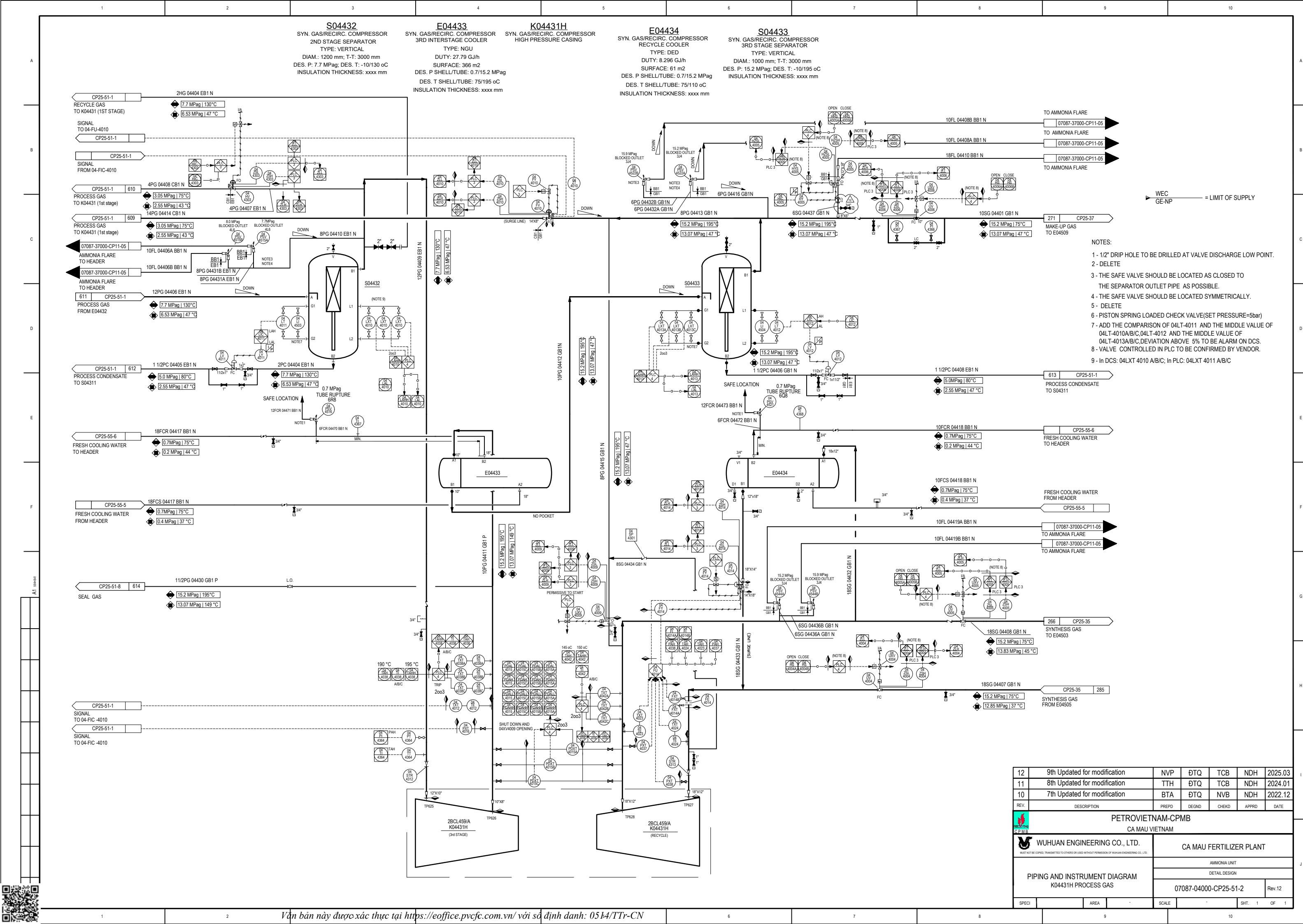


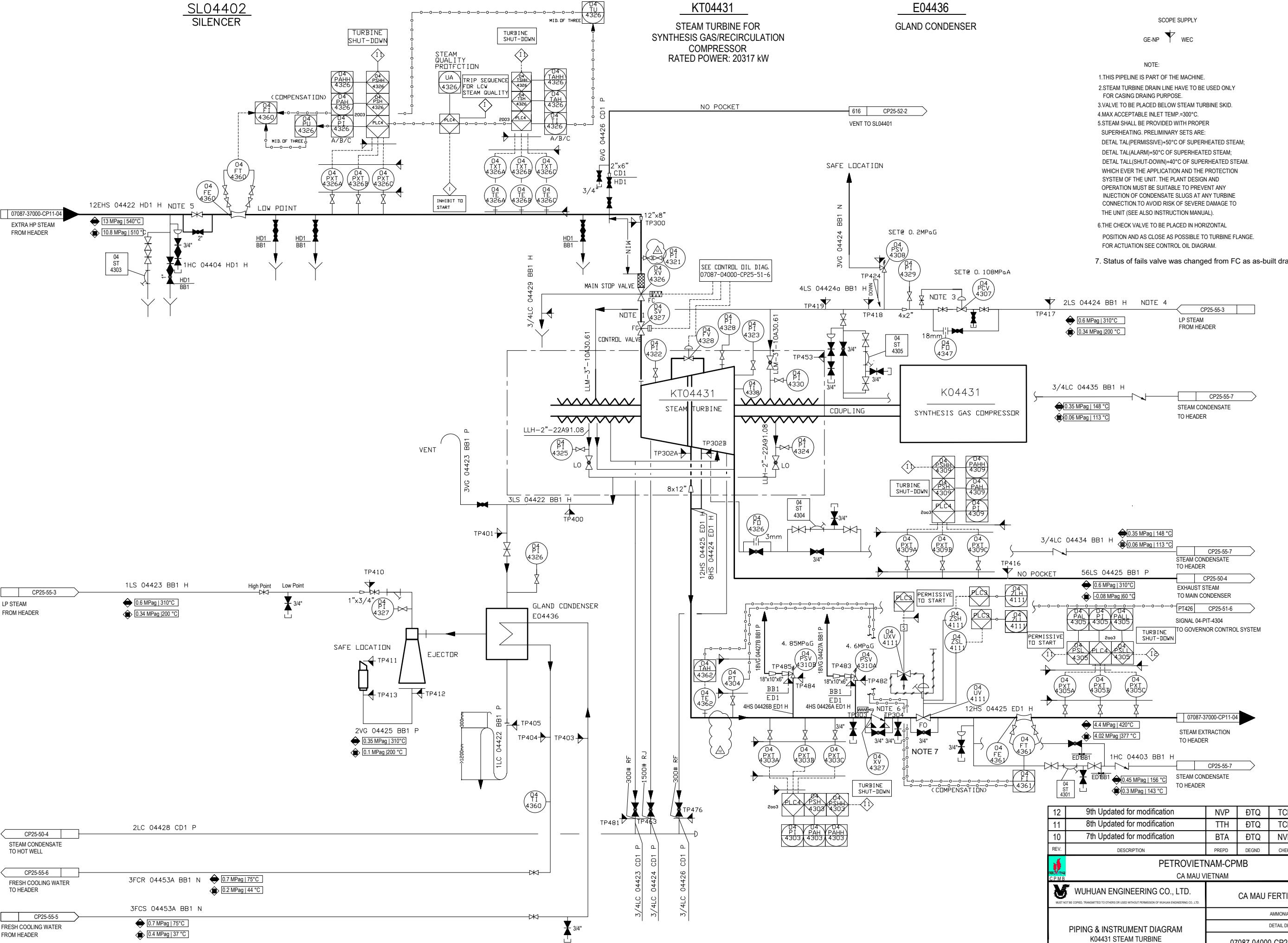












12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE

PETROVIETNAM-CPMB  
CA MAU VIETNAM

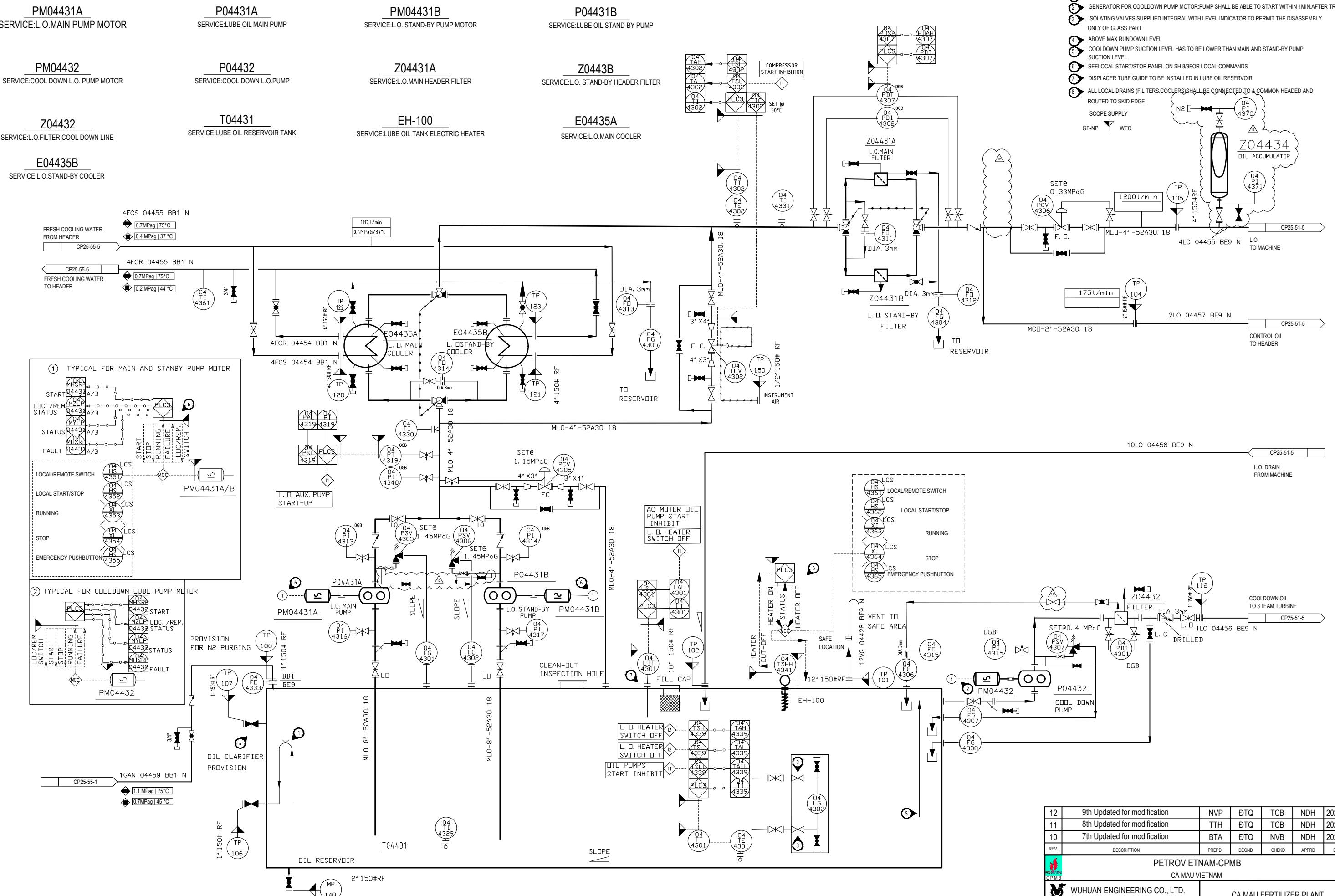
WUHAN ENGINEERING CO., LTD.  
MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHAN ENGINEERING CO., LTD.

AMMONIA UNIT

DETAIL DESIGN

07087-04000-CP25-51-3 Rev.12

SPECI AREA - SCALE - SHT. 1 OF 1



12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
9	6th Updated for modification	BTB	DTQ	NVB	NDH	2022.06

**PREPD DEGND**

# PETROVIETNAM-CPMB

CA MAU VIETNAM

CO., LTD. CA MAU FERTILIZER PLANT

WUHUAN ENGINEERING CO., LTD. CA MAU FERTILIZER PLANT

AMMONIA UNIT

DIAGRAM | DETAIL DESIGN

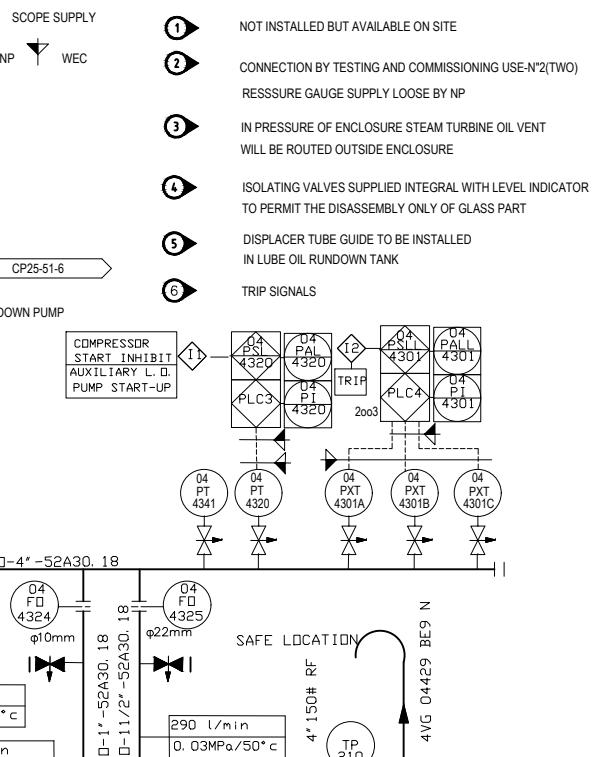
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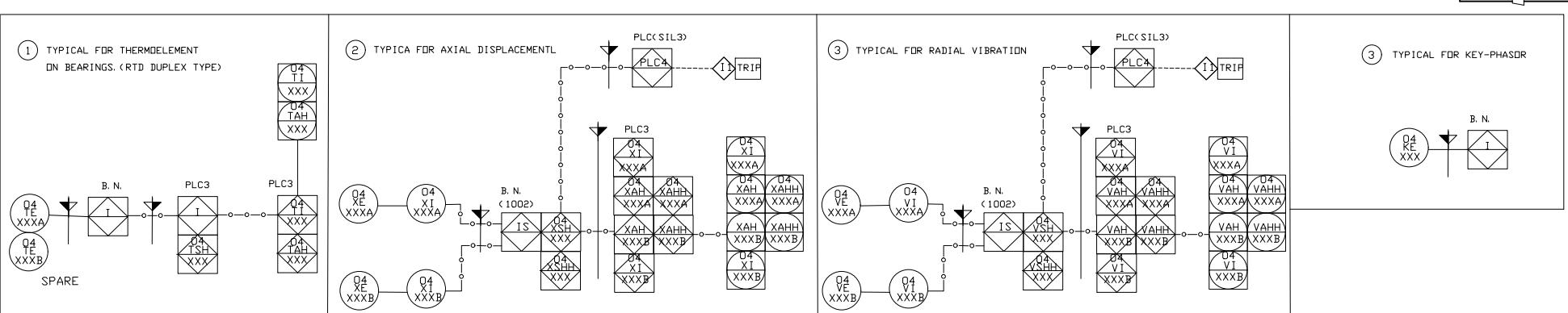
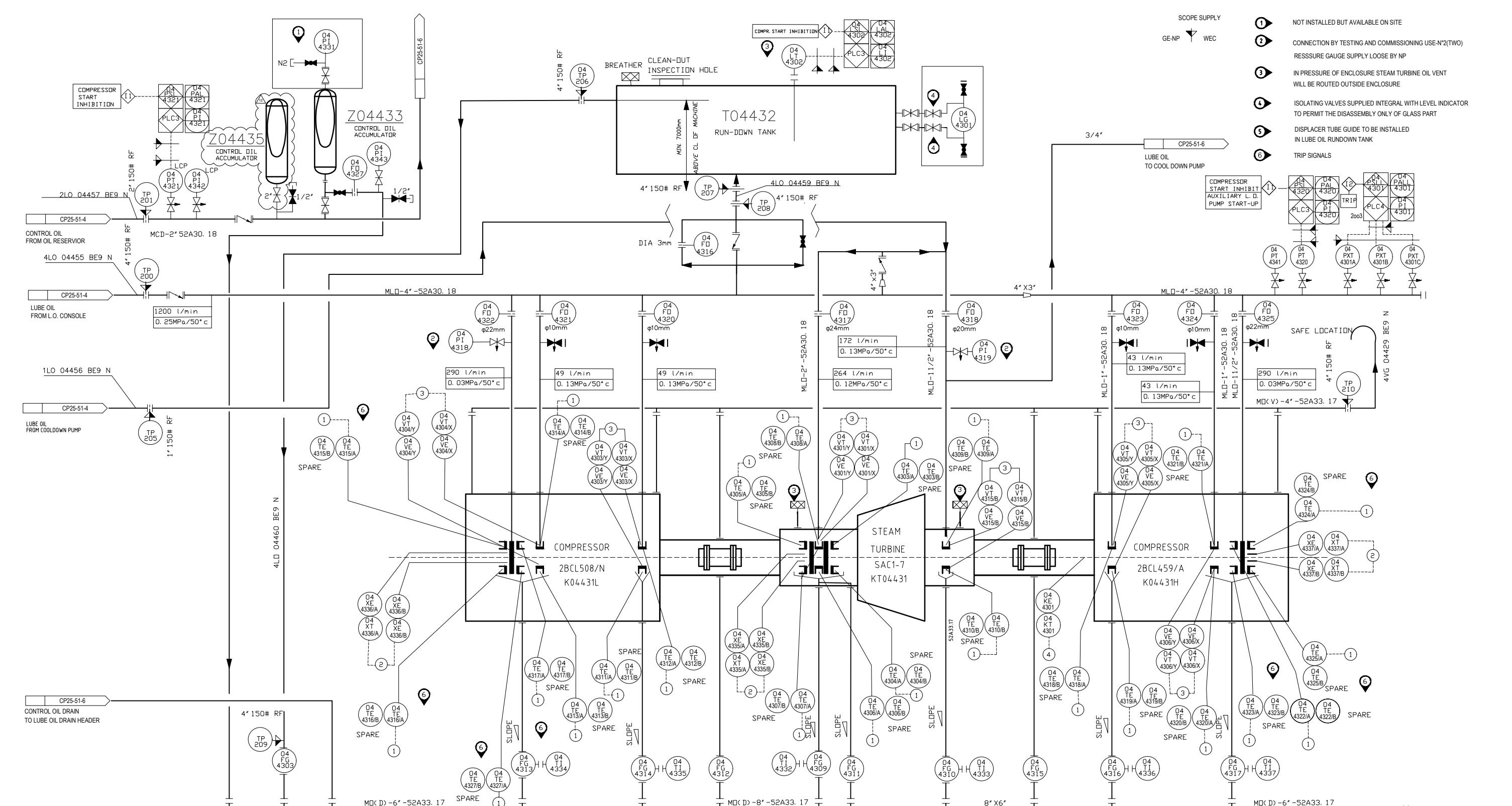
- SCALE - SHT. 1 OF

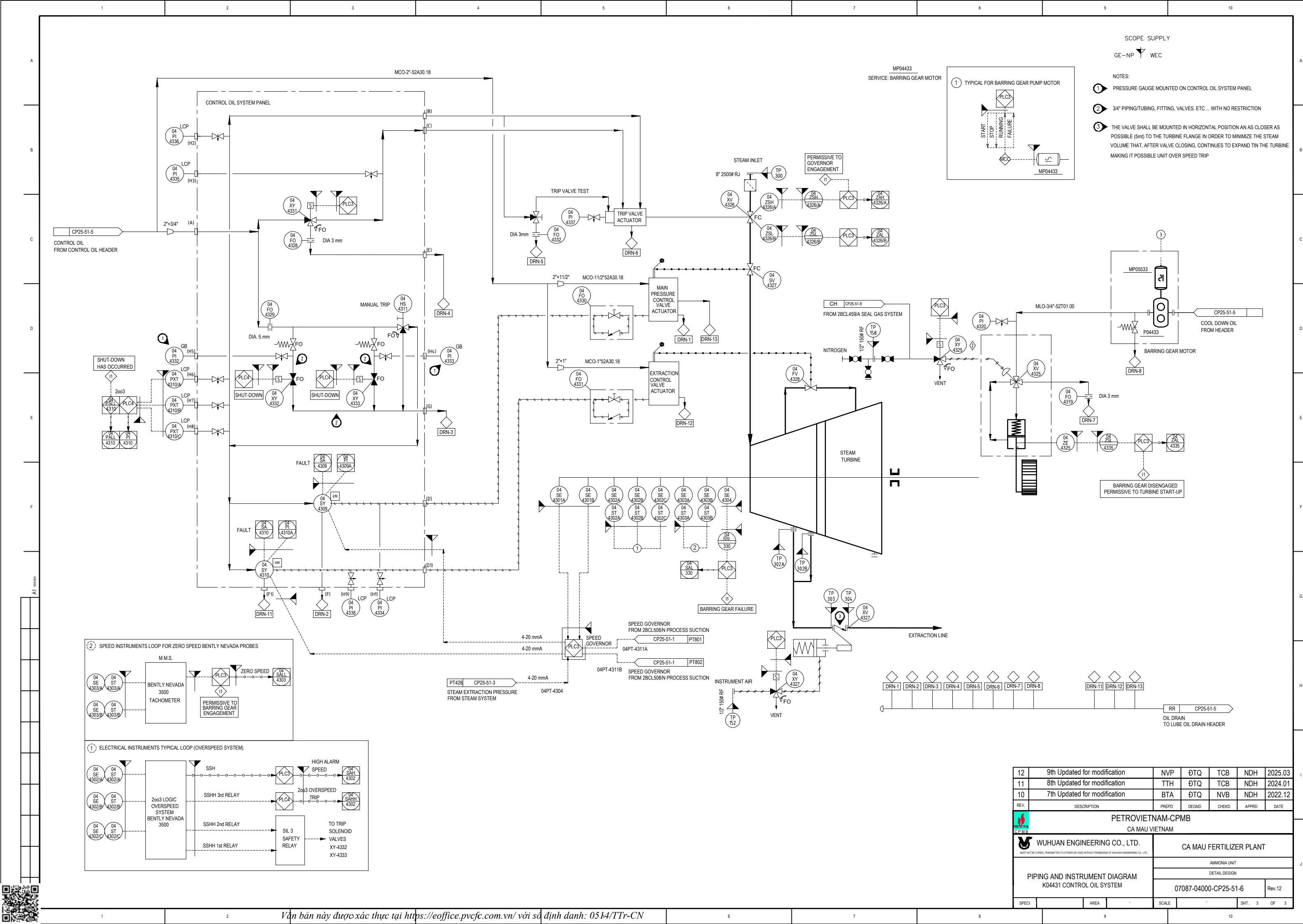
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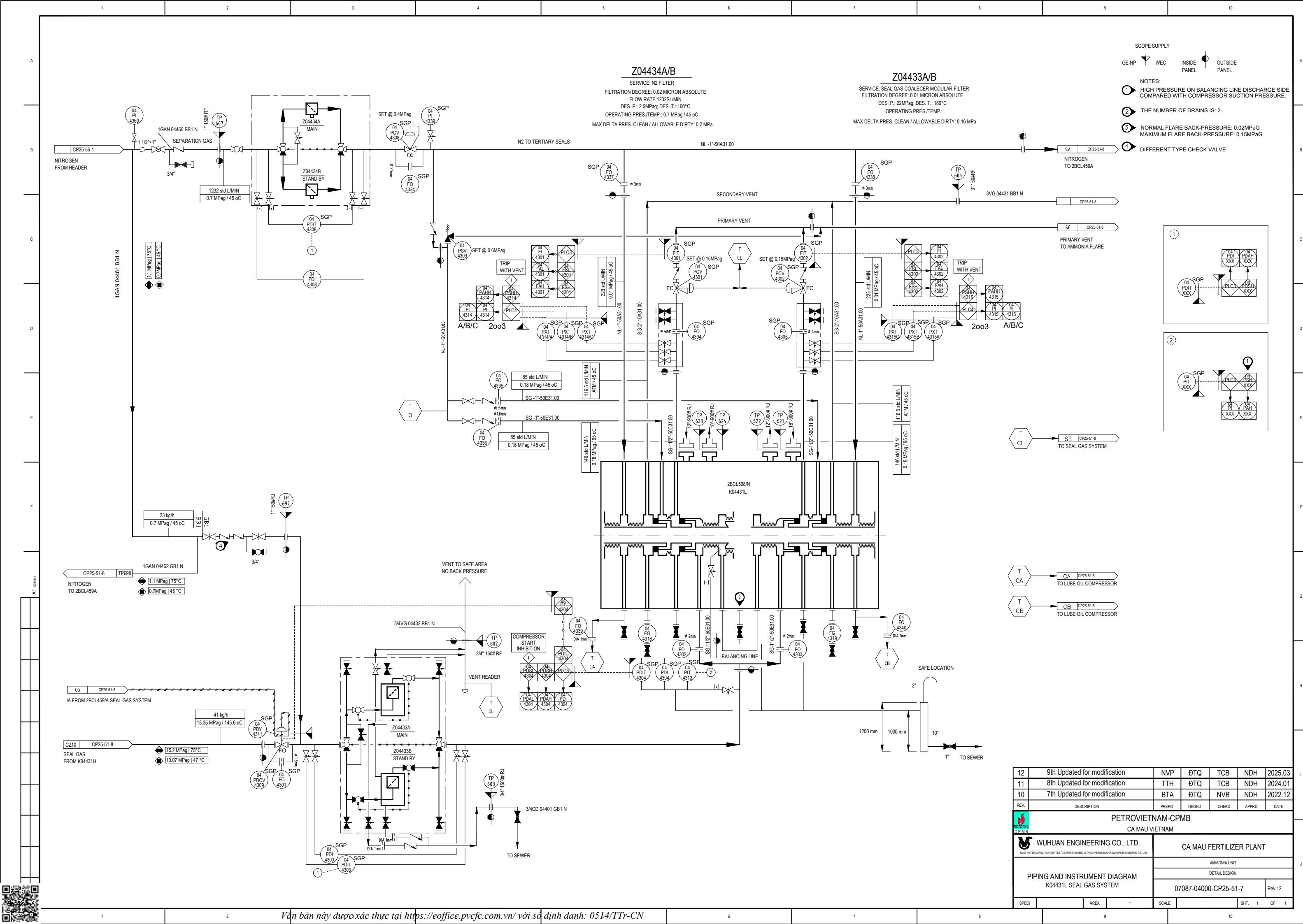
## NOTES



REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE
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11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
<b>PETROVIETNAM-CPMB</b> CA MAU VIETNAM						
WUHUAN ENGINEERING CO., LTD. MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHUAN ENGINEERING CO., LTD.						
AMMONIA UNIT DETAIL DESIGN						
07087-04000-CP25-51-5 Rev.12						





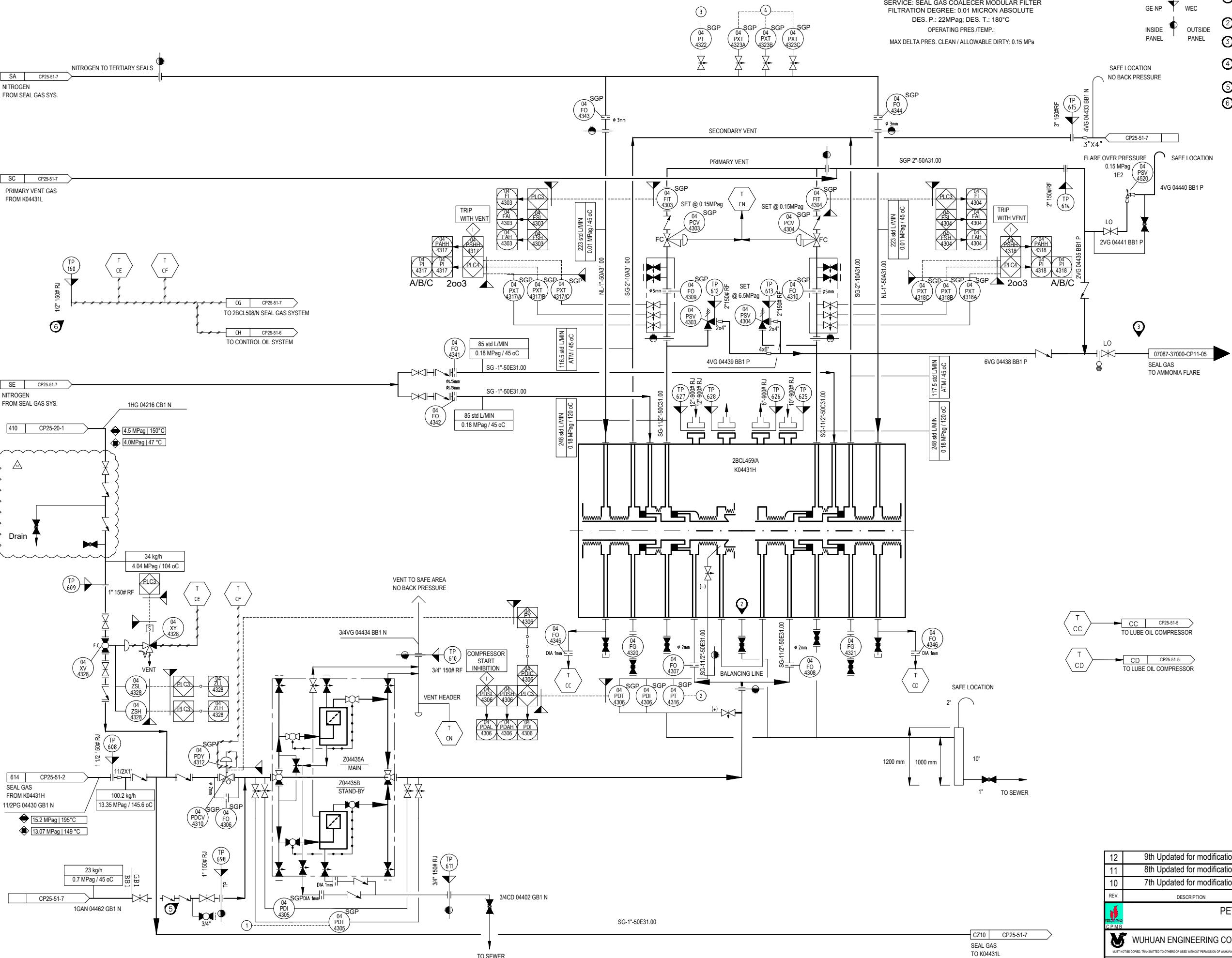


## Z04435A/B

SERVICE: SEAL GAS COALECER MODULAR FILTER  
FILTRATION DEGREE: 0.01 MICRON ABSOLUTE  
DES. P.: 22MPag; DES. T.: 180°C  
OPERATING PRES./TEMP.:  
MAX DELTA PRES. CLEAN / ALLOWABLE DIRTY: 0.15 MPa

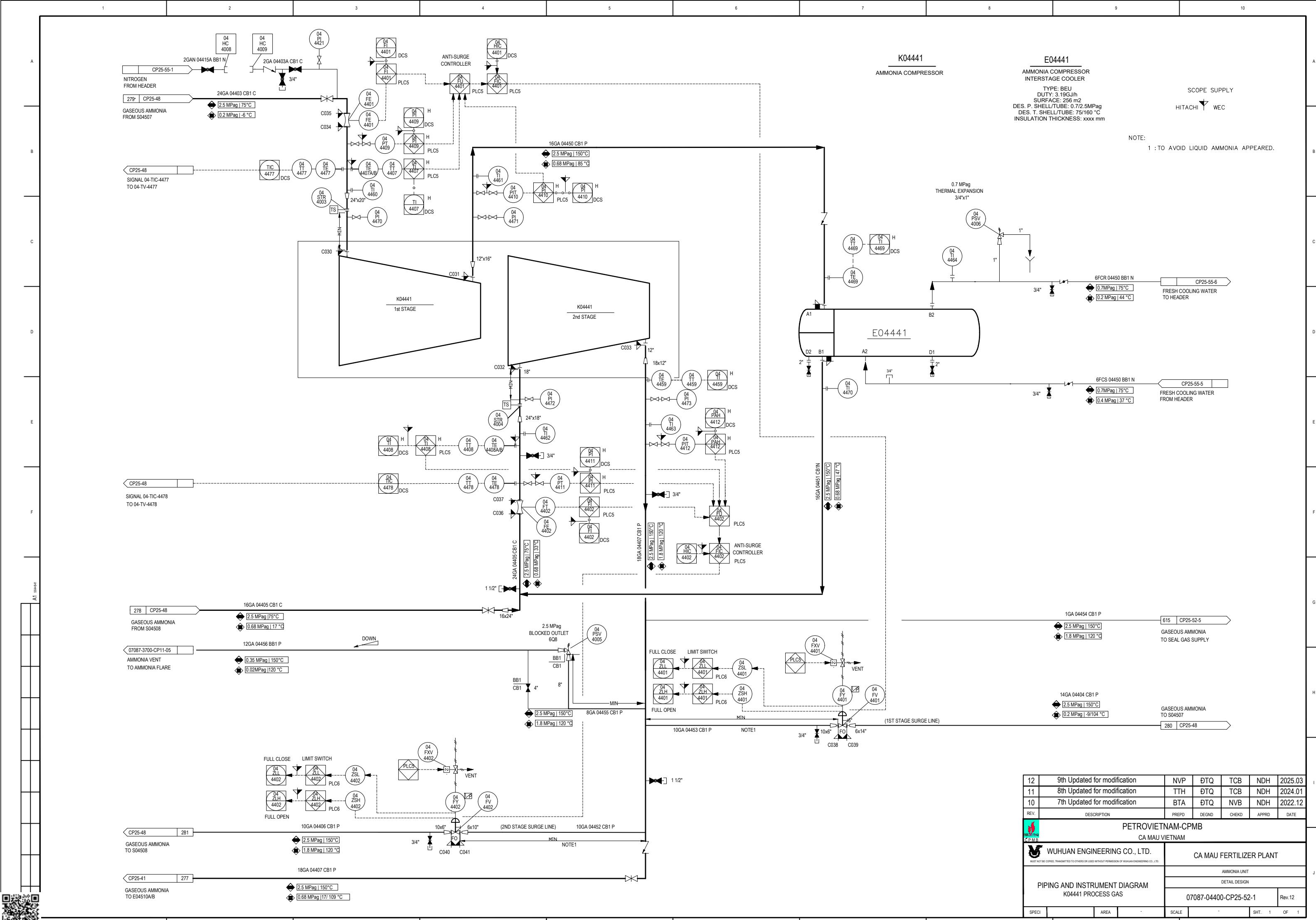
SCOPE SUPPLY  
GE-NP WEC  
INSIDE PANEL  
OUTSIDE PANEL

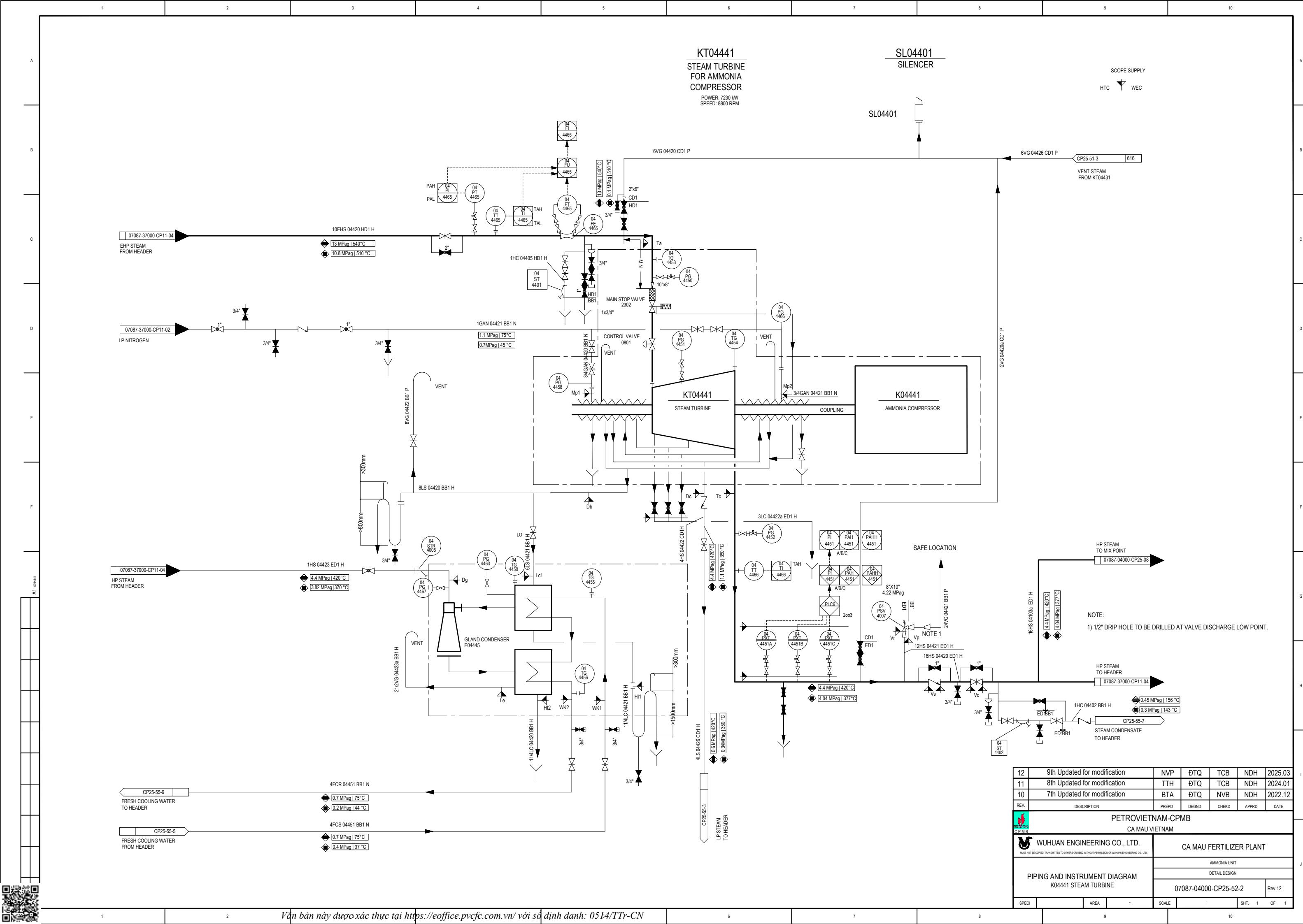
- ① HIGH PRESSURE ON BALANCING LINE DISCHARGE SIDE COMPARED WITH COMPRESSOR SUCTION PRESSURE.
- ② THE NUMBER OF DRAINS IS: 2
- ③ NORMAL FLARE BACK-PRESSURE: 0.02MPaG MAXIMUM FLARE BACK-PRESSURE: 0.25MPaG
- ④ ISOLATION AND VENT VALVES TO BE PROVIDED BY CUSTOMER WHEN CONTAMINATION RISK OF EXTERNAL SOURCE BY PROCESS GAS TO BE AVOIDED.
- ⑤ DIFFERENT TYPE CHECK VALVE
- ⑥ IN CASE OF NITROGEN SUPPLY FOR TURNING GEAR OPERATION, A POSITIVE ISOLATION ON INSTRUMENT AIR LINE SHALL BE GUARANTEED BY CUSTOMER TO AVOID NITROGEN CONTAMINATION.

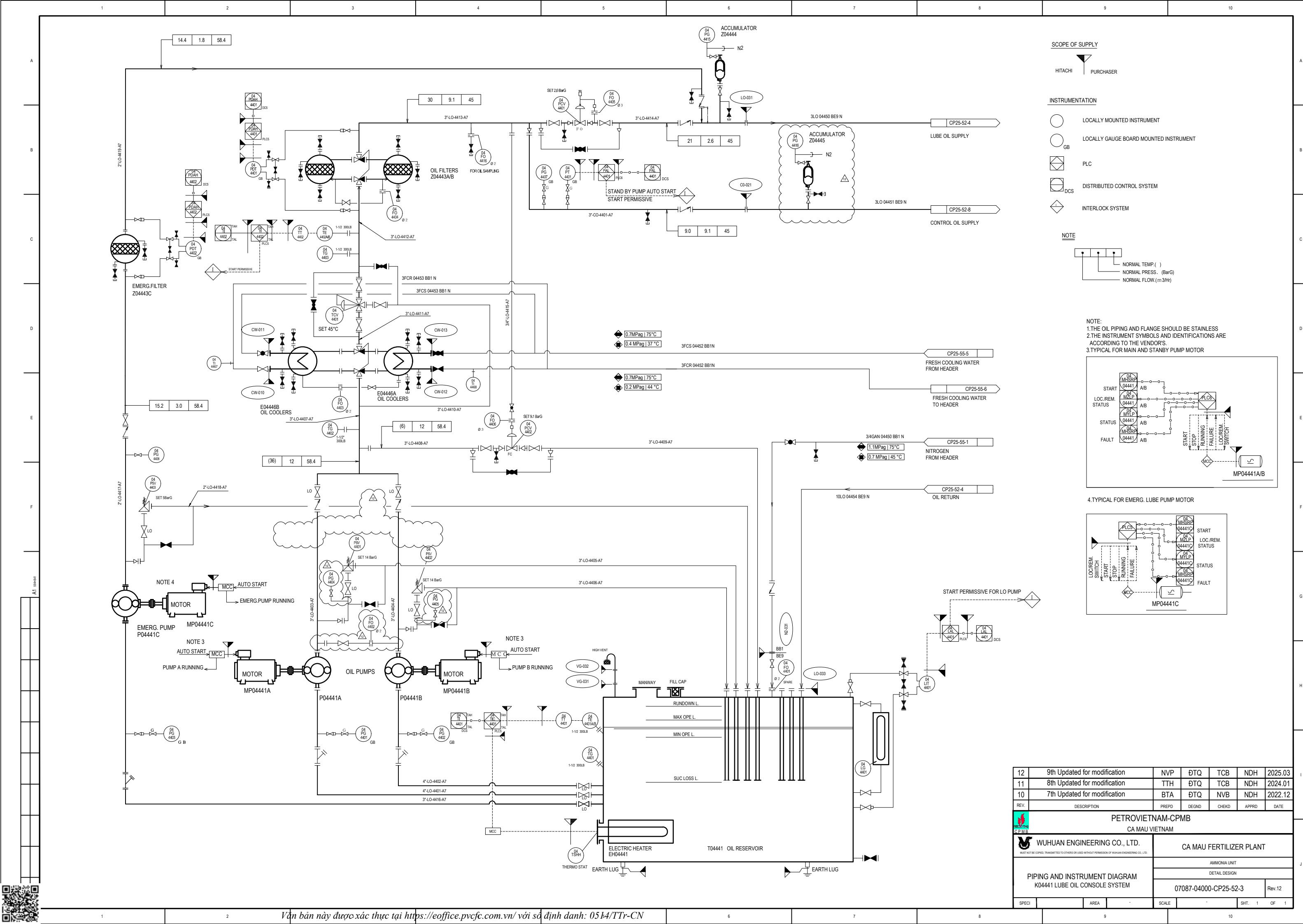


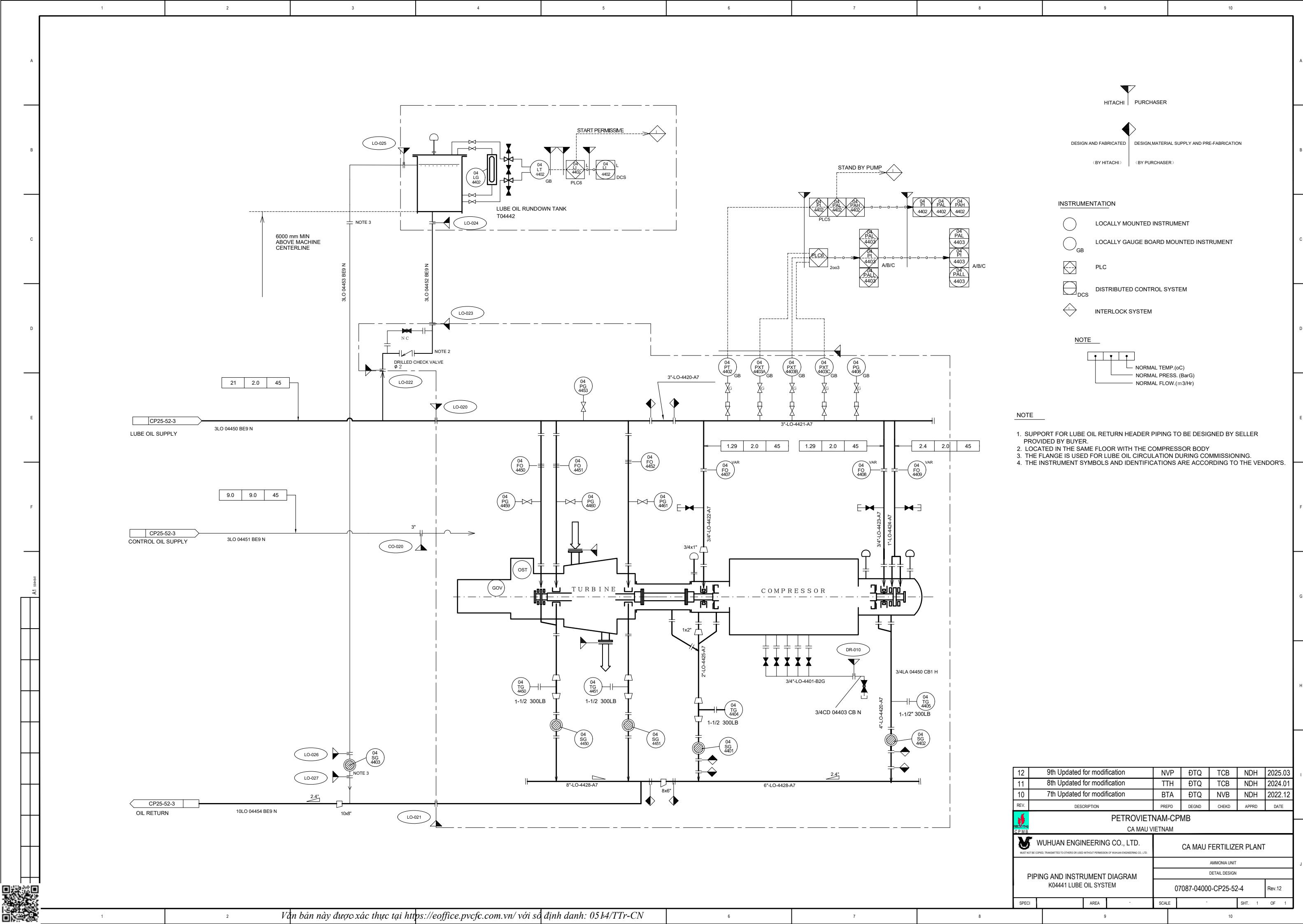
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE			
12	9th Updated for modification	NVP	ĐTQ	TCB	NDH	2025.03			
11	8th Updated for modification	TTH	ĐTQ	TCB	NDH	2024.01			
10	7th Updated for modification	BTA	ĐTQ	NVB	NDH	2022.12			
<b>PETROVIETNAM-CPMB</b> CA MAU VIETNAM									
WUHUAN ENGINEERING CO., LTD. MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHUAN ENGINEERING CO., LTD.				CA MAU FERTILIZER PLANT					
AMMONIA UNIT									
DETAIL DESIGN									
07087-04000-CP25-51-8 Rev.12									
SPECI		AREA	-	SCALE	-	SHT. 1 OF 1			

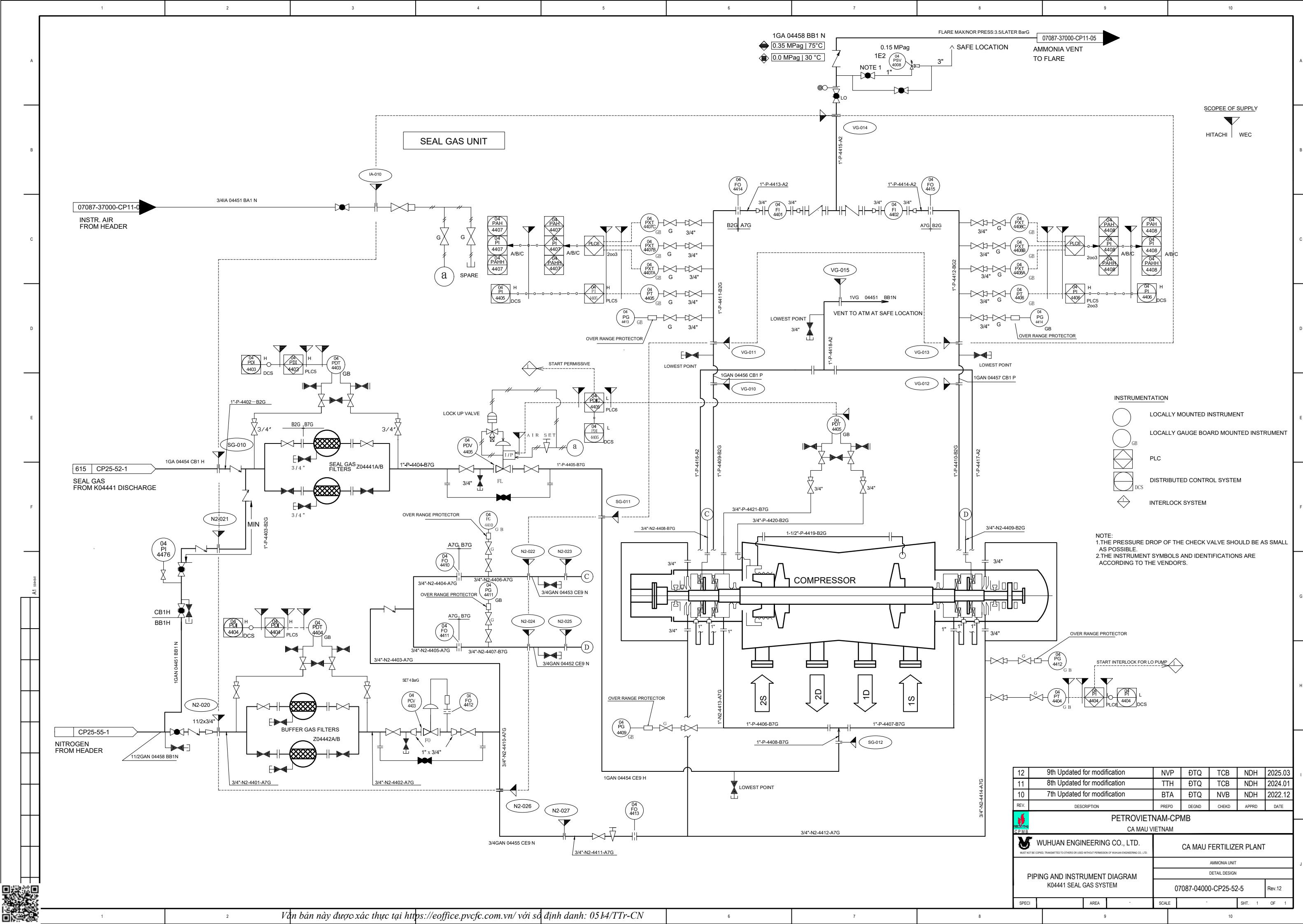


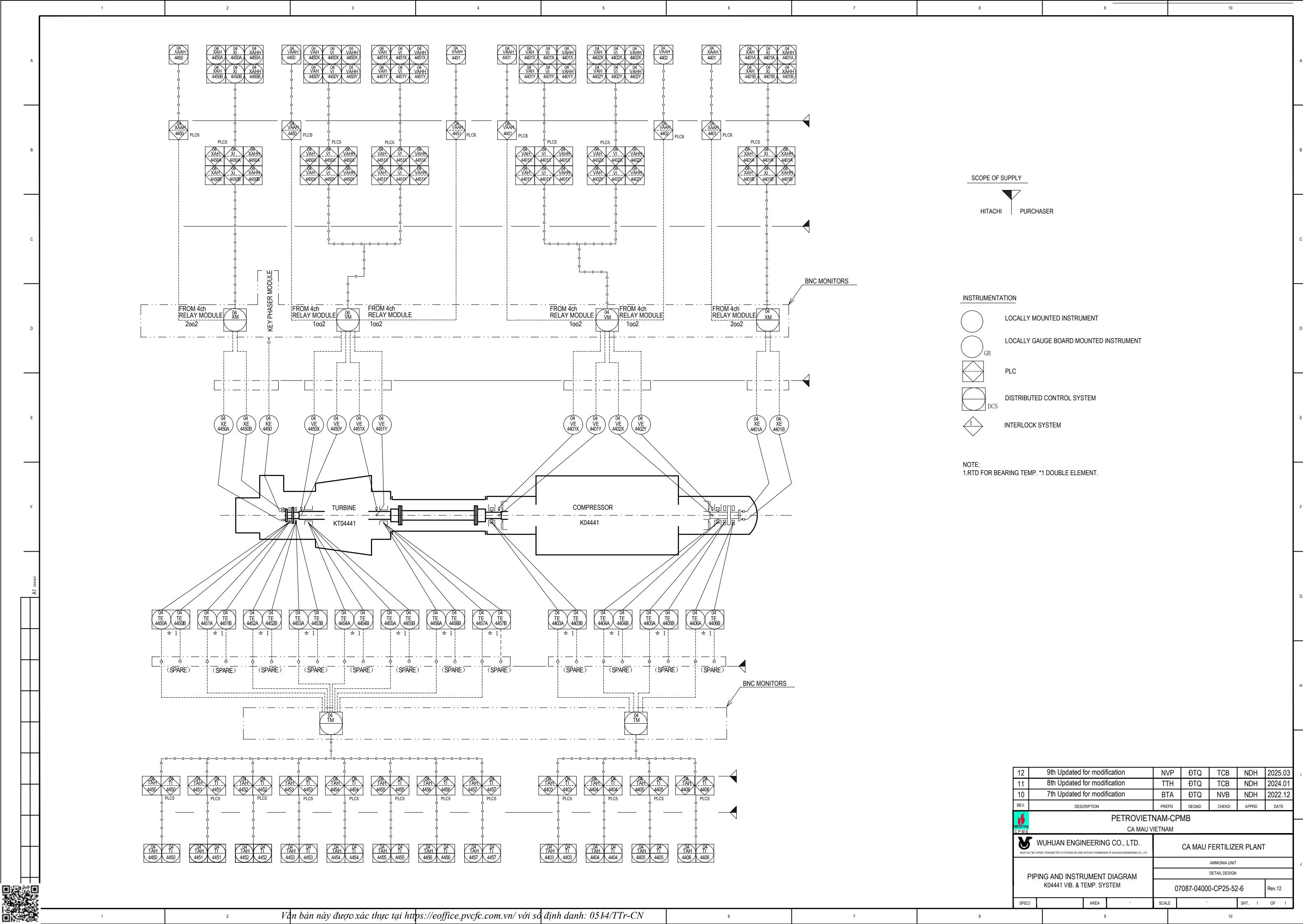




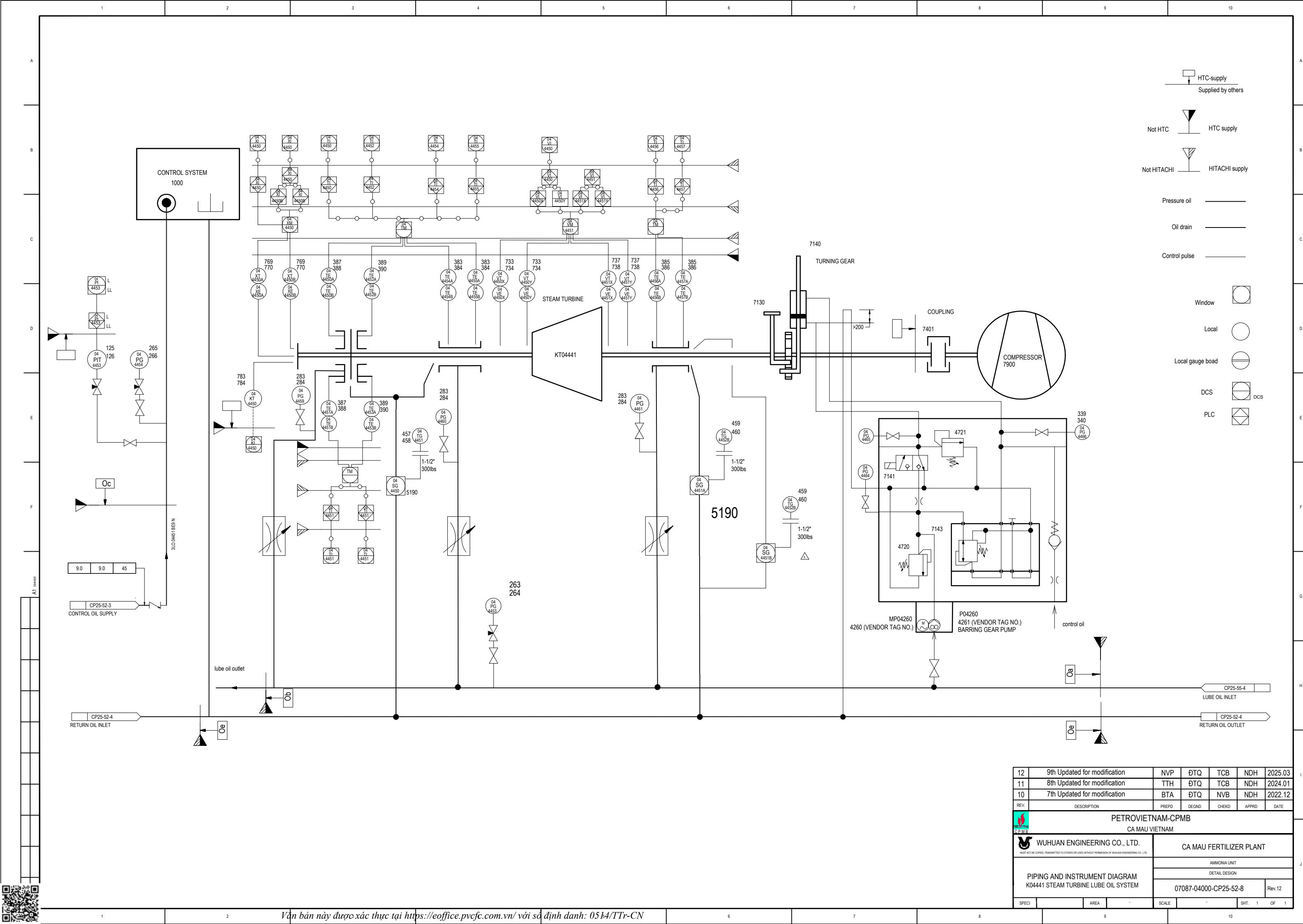


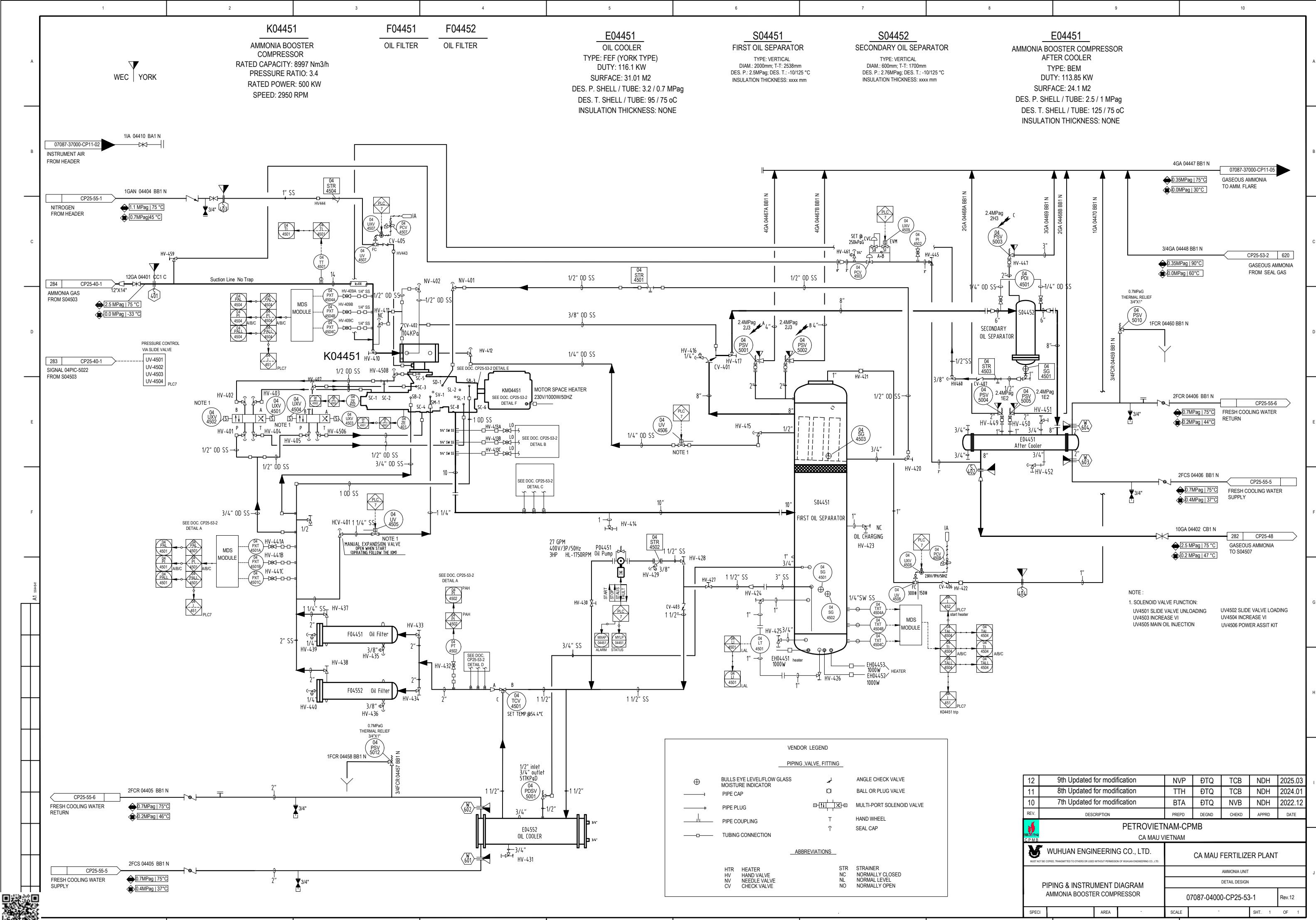


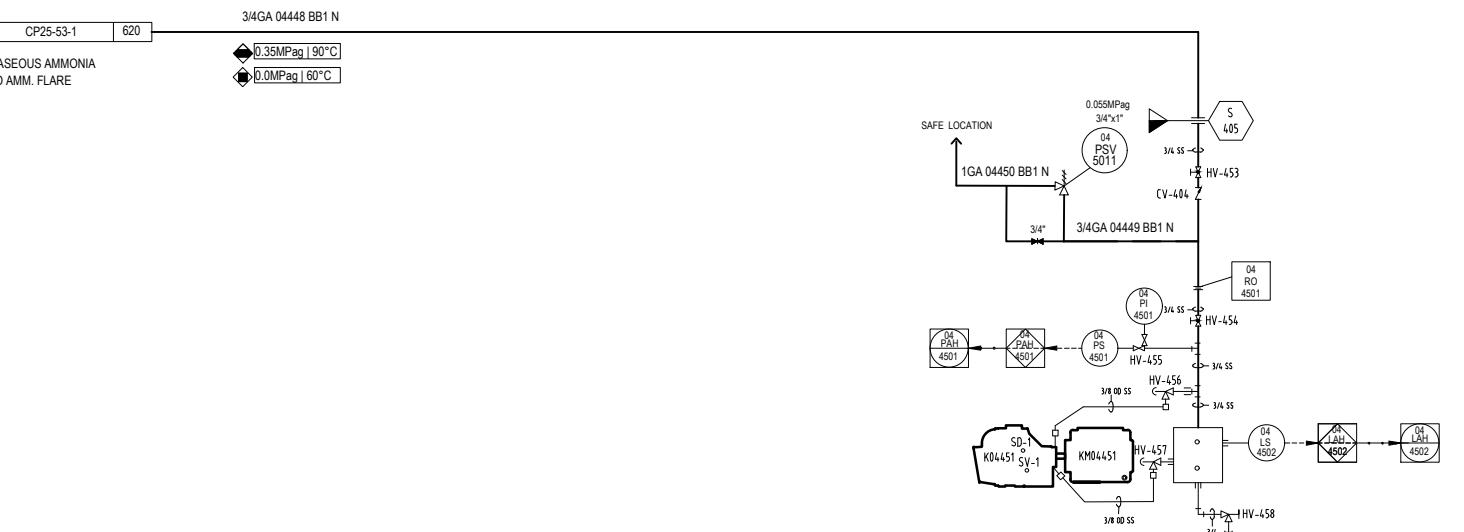




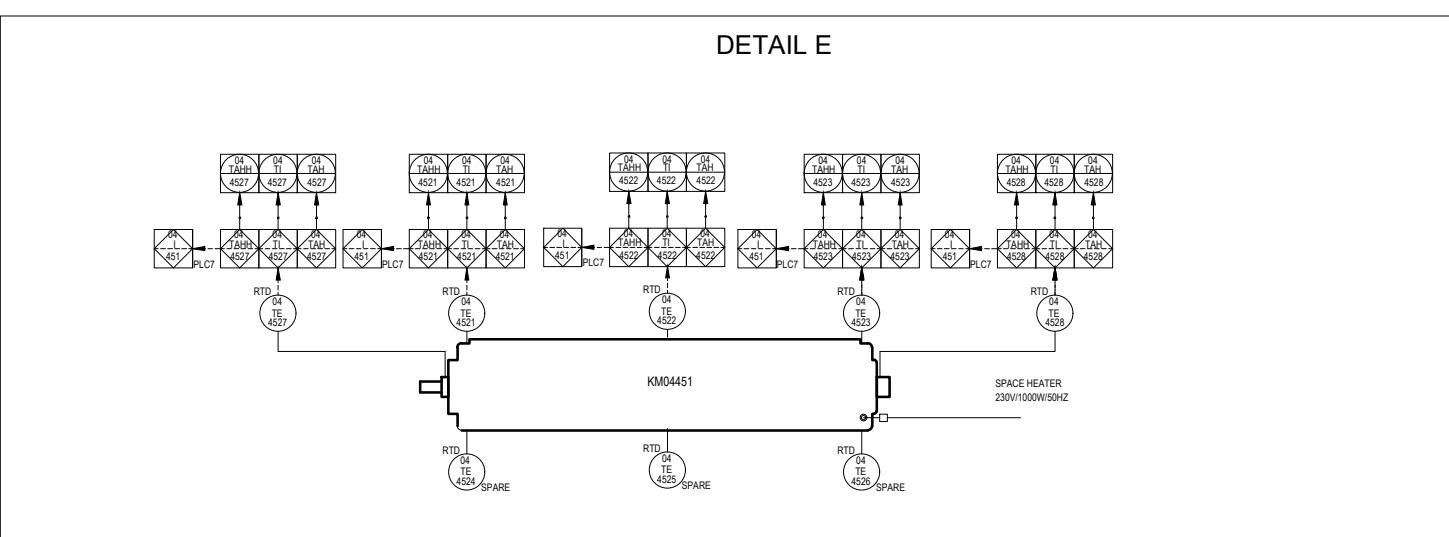
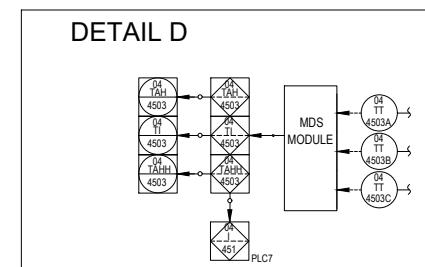
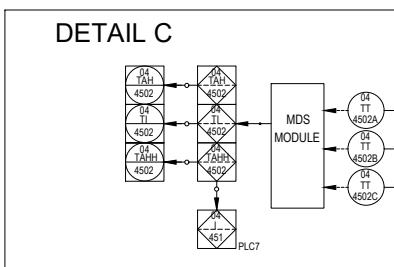
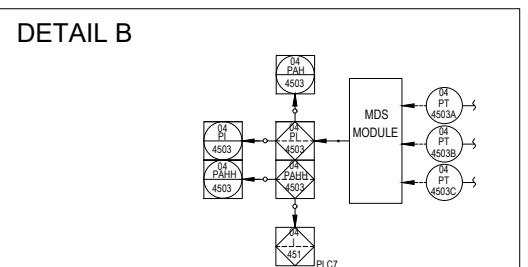
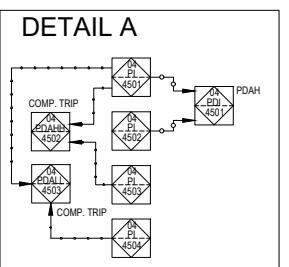






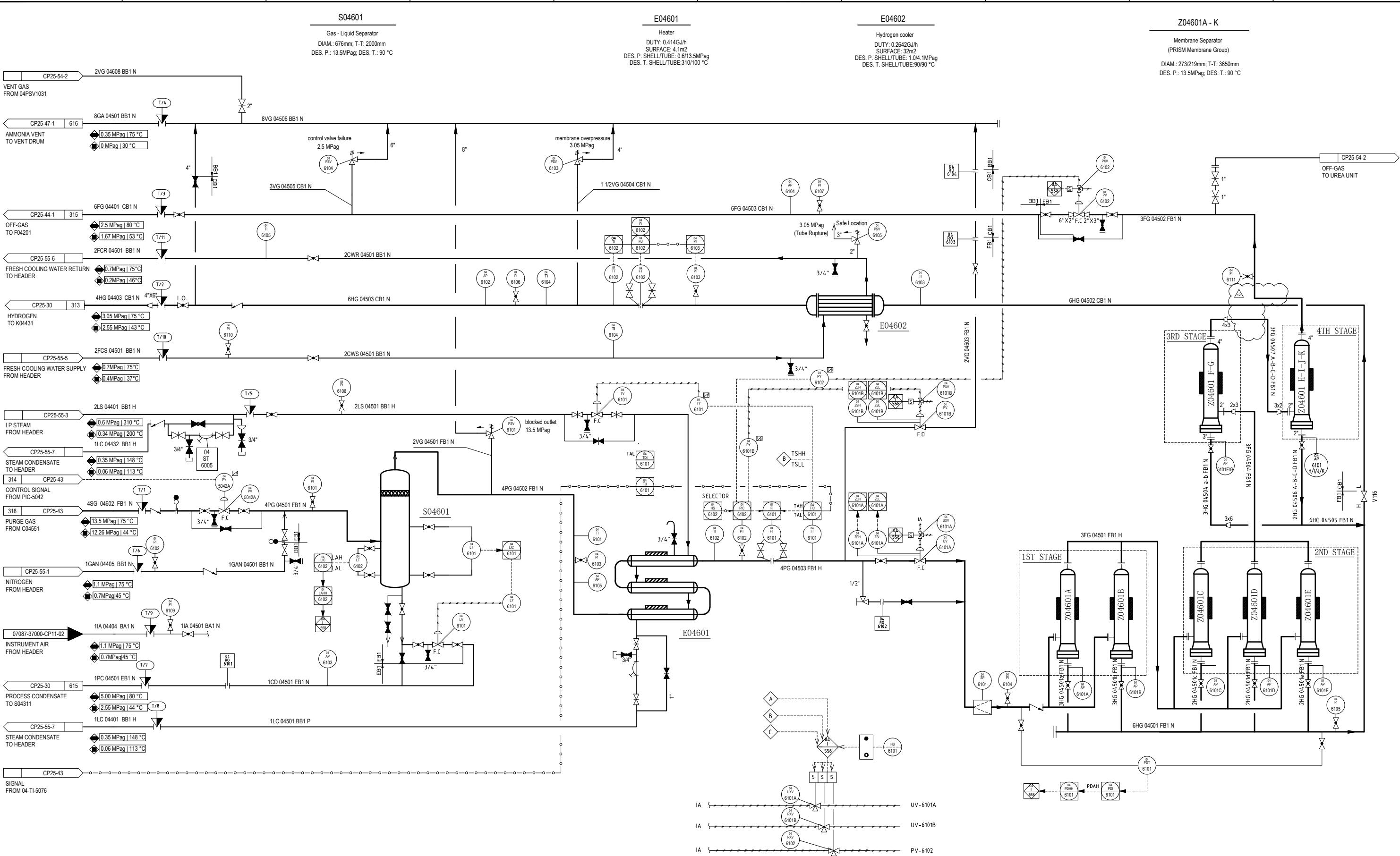


TYPICAL TANDEM SEAL SUPPORT SYSTEM DIAGRAM



12	9th Updated for modification	NVP	ĐTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	ĐTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	ĐTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE

PETROVIETNAM-CPMB CA MAU VIETNAM										
WUHUAN ENGINEERING CO., LTD. MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHUAN ENGINEERING CO., LTD.			CA MAU FERTILIZER PLANT							
AMMONIA UNIT										
DETAIL DESIGN										
PIPING & INSTRUMENT DIAGRAM										
07087-04000-CP25-53-2										
SPECI	AREA	-	SCALE	-	SHT. 1	OF 1				



12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE

PETROVIETNAM-CPMB

CA MAU VIETNAM

JSC CO., LTD

ON OF WUHLIAN ENGINEERING CO., LTD.

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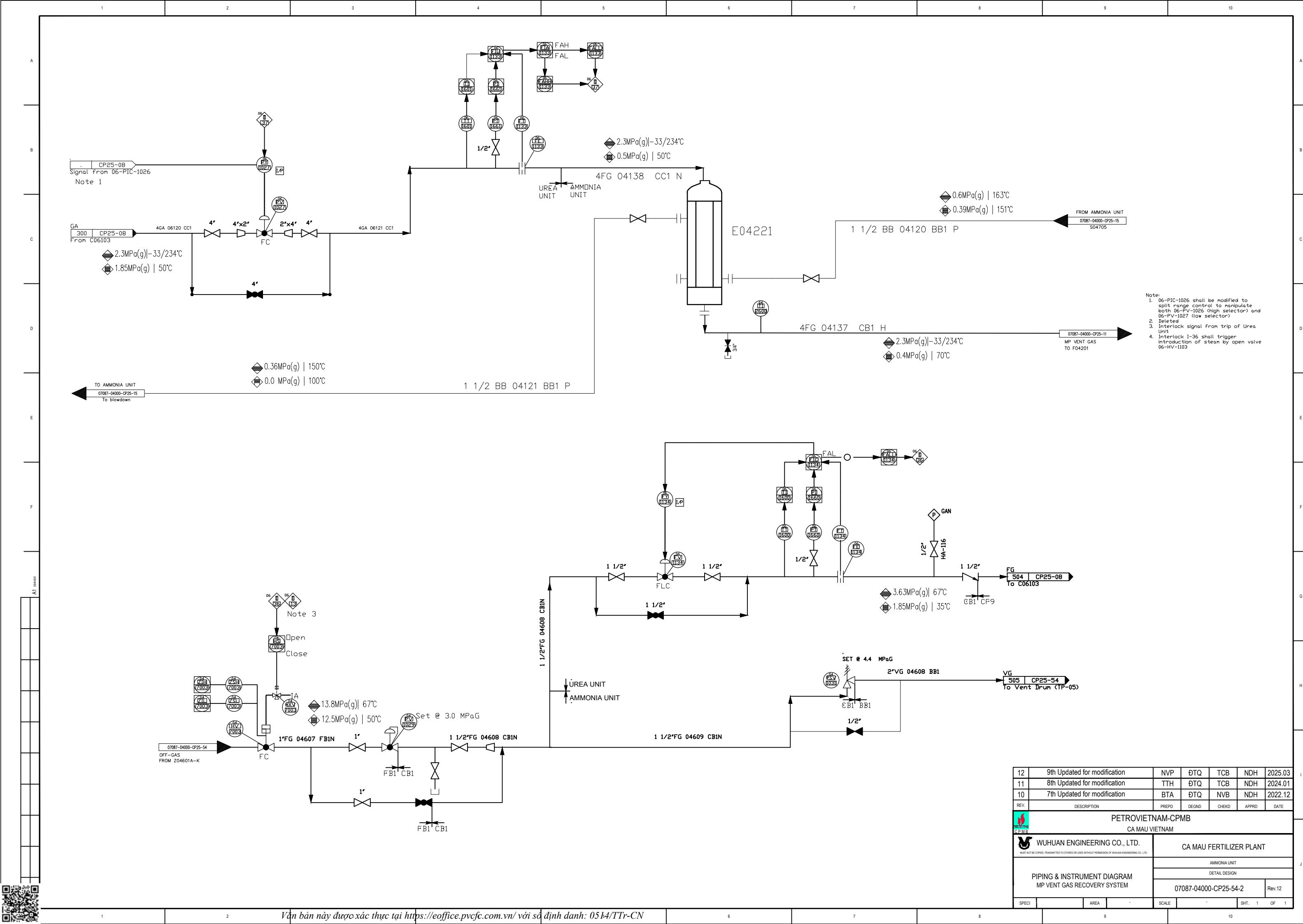
## DIAGRAM

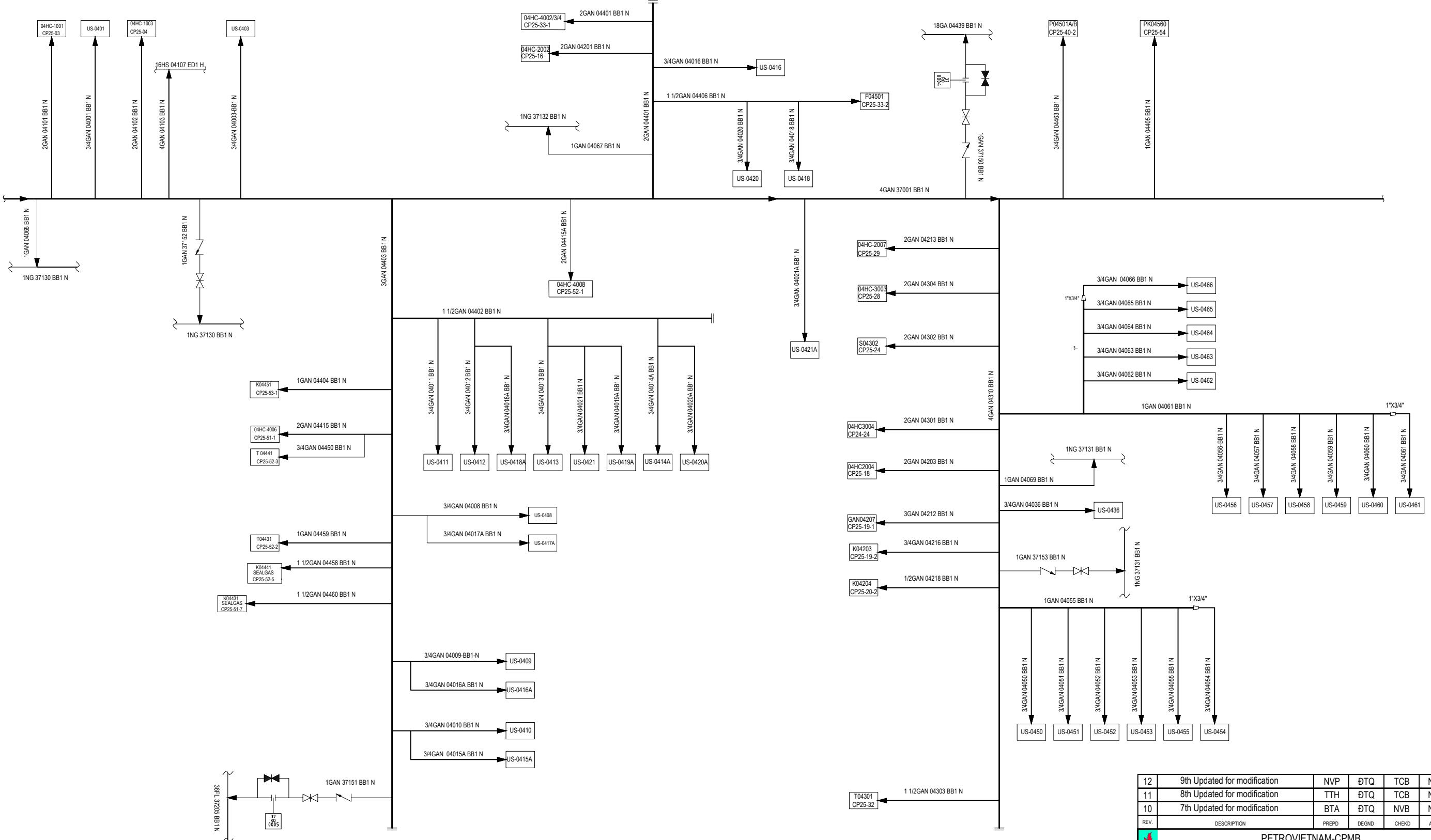
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SCALE

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12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE

PETROVIETNAM-CPMB

CA MAU VIETNAM

## A MAU FERTILIZER PLANT

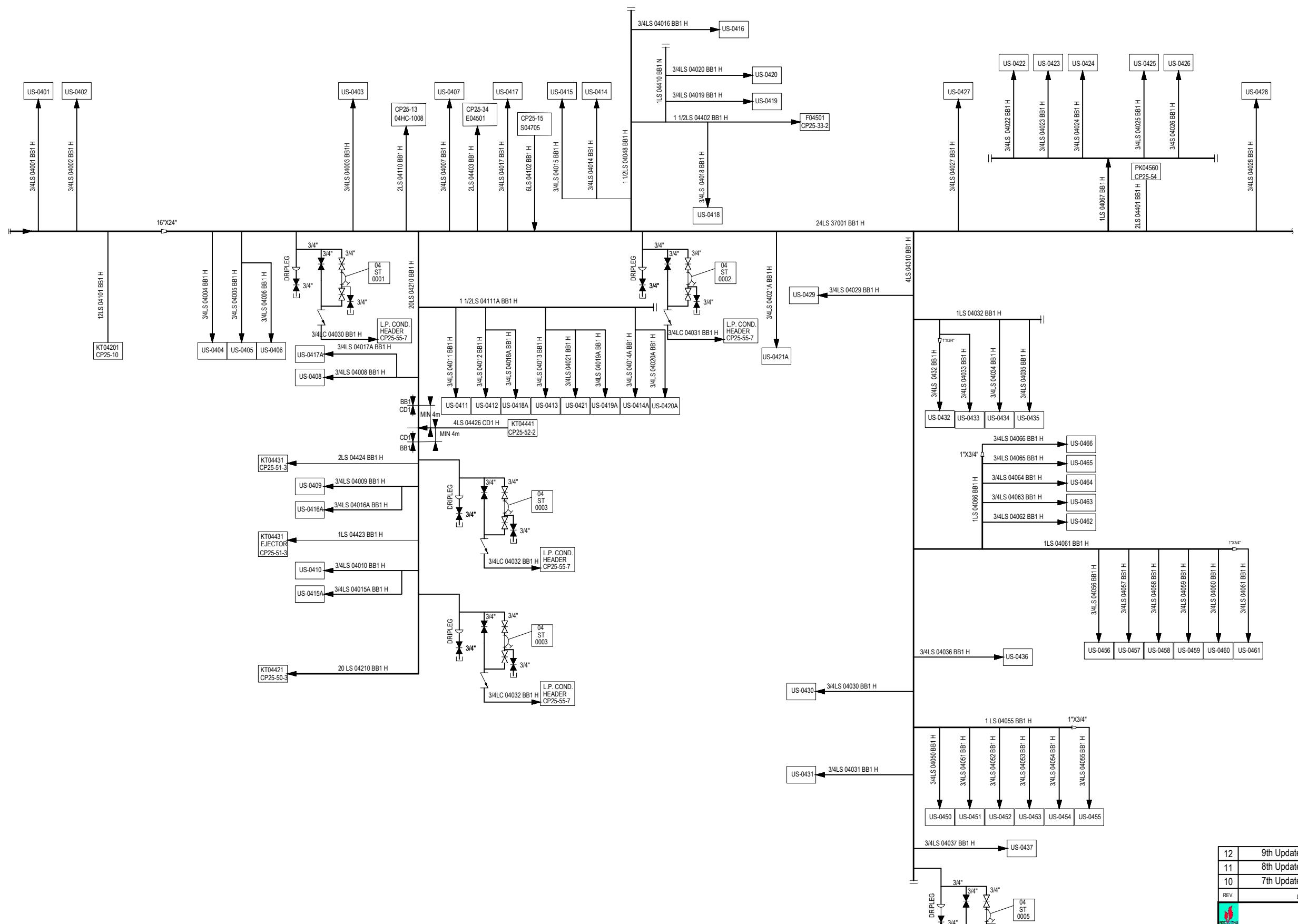
ING & INSTRUMENT DIAGRAM  
NITROGEN NETWORKS

NITROGEN NETWORKS 07087-04000-CP25-55-1 Re

	AREA	-	SCALE	-	SHT.	1	OF	1
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9 | Page





12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREP'D	DEGND	CHEKD	APPR'D	DATE

PETROVIETNAM-CPMB  
CÔNG TY CỔ PHẦN VIỆT NAM

CA MAU VIETNAM

MAUL FERTILIZER PLANT

www.vivastreet.com

## AMMONIA UNIT

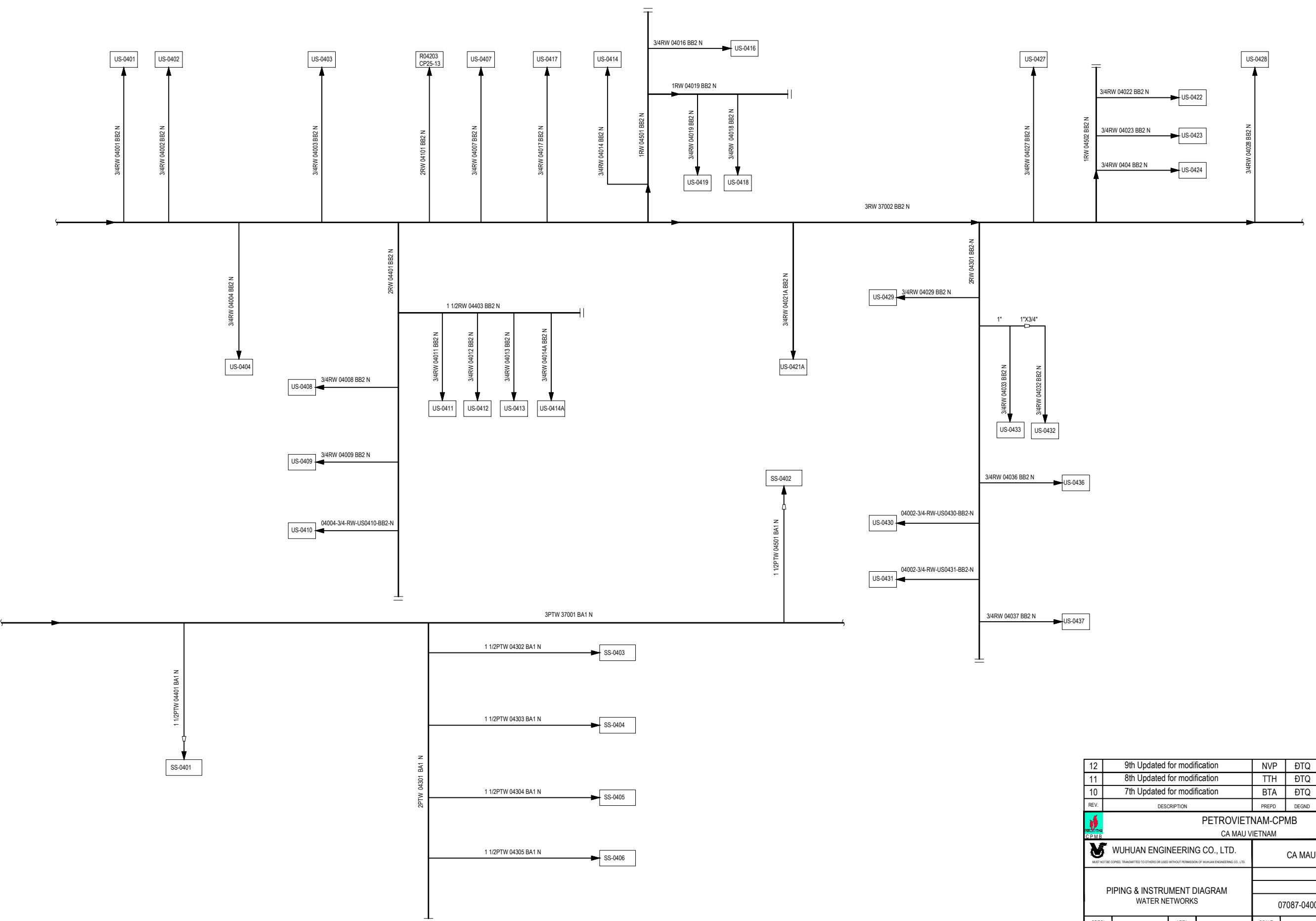
DETAIL DESIGN

# INSTRUMENT DIAGRAM PRESSURE STEAM NETWORKS

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10



12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE

PETROVIETNAM-CPMB  
CÔNG TY CỔ PHẦN  
TẬP ĐOÀN DẦU KHÍ VIỆT NAM

DO VIETNAM

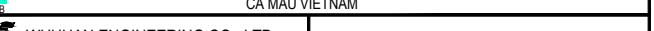
TD. **CHAMOIS FERTILIZER**

DETAIL DESIGN

07087-04000-CP25-55-4 Rev. 1

SCALE - SHT. 1 OF

10



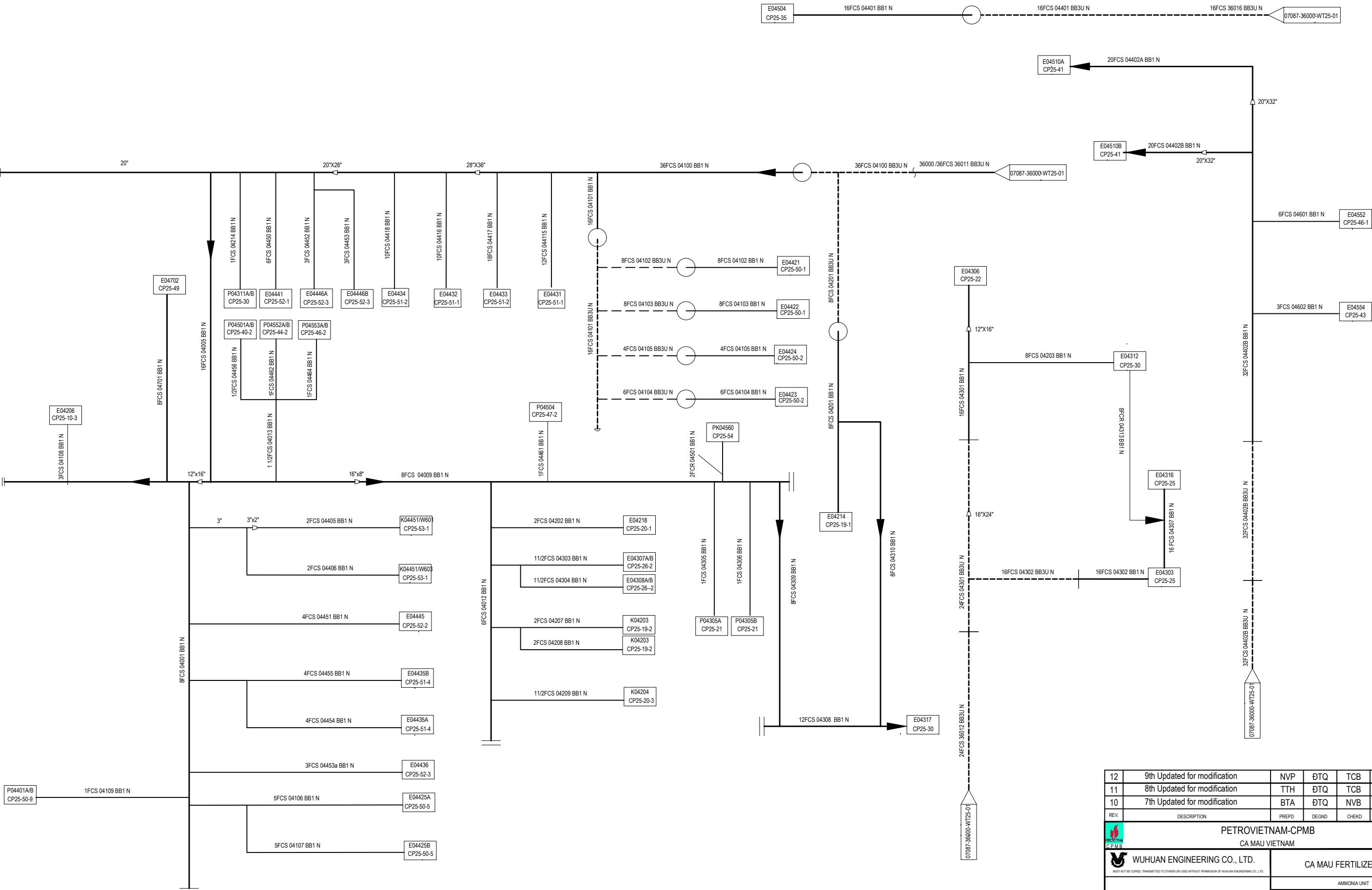
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DETAIL DESIGN

07087-04000-CP25-55-4 Rev. 1

SCALE - SHT. 1 OF

10



12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE

PETROVIETNAM-CPMB

CA MAU VIETNAM

Table 1. Summary of the main characteristics of the four groups of patients.

# CA MAU FERTILIZER PLANT

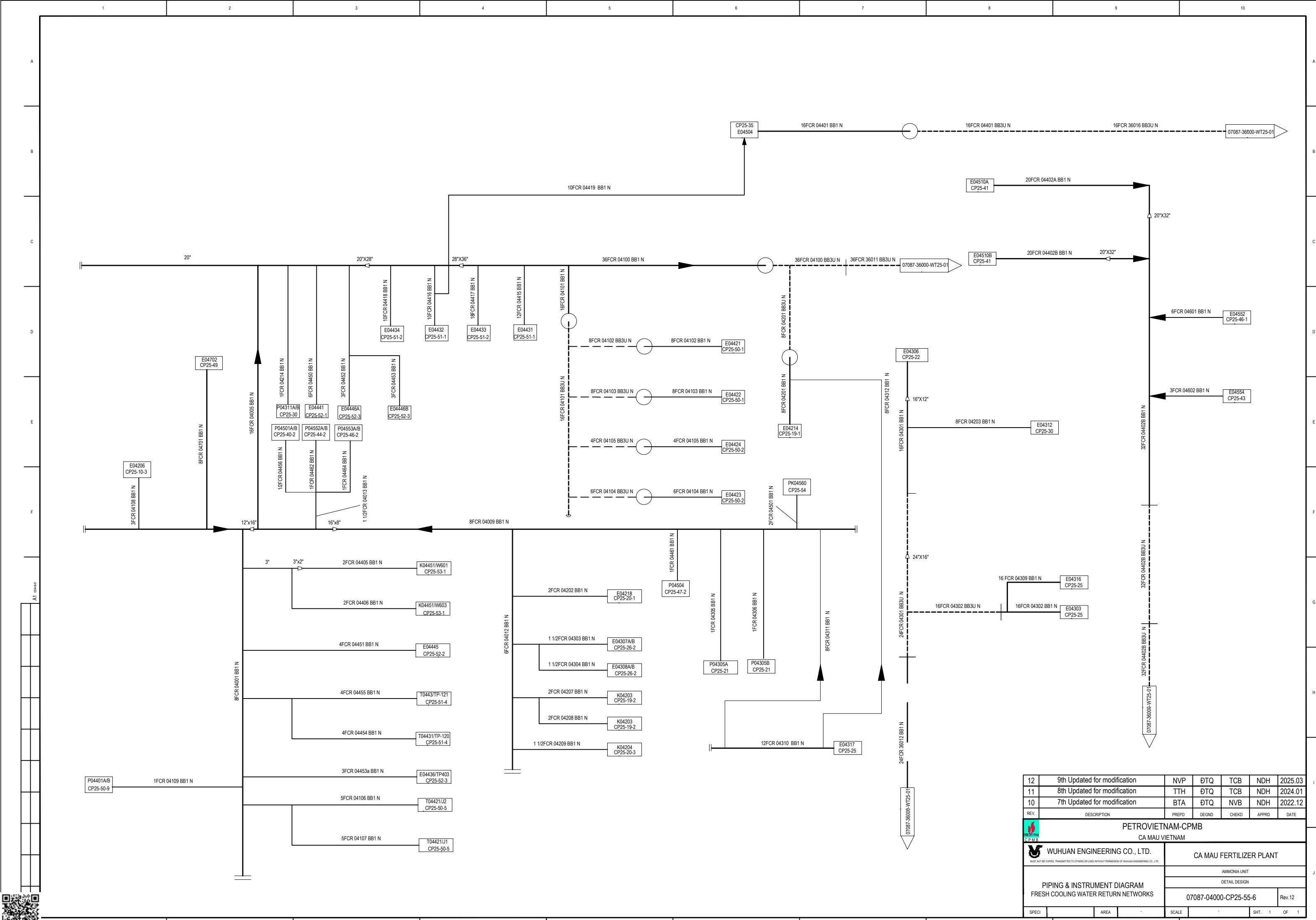
AMMONIA UNIT

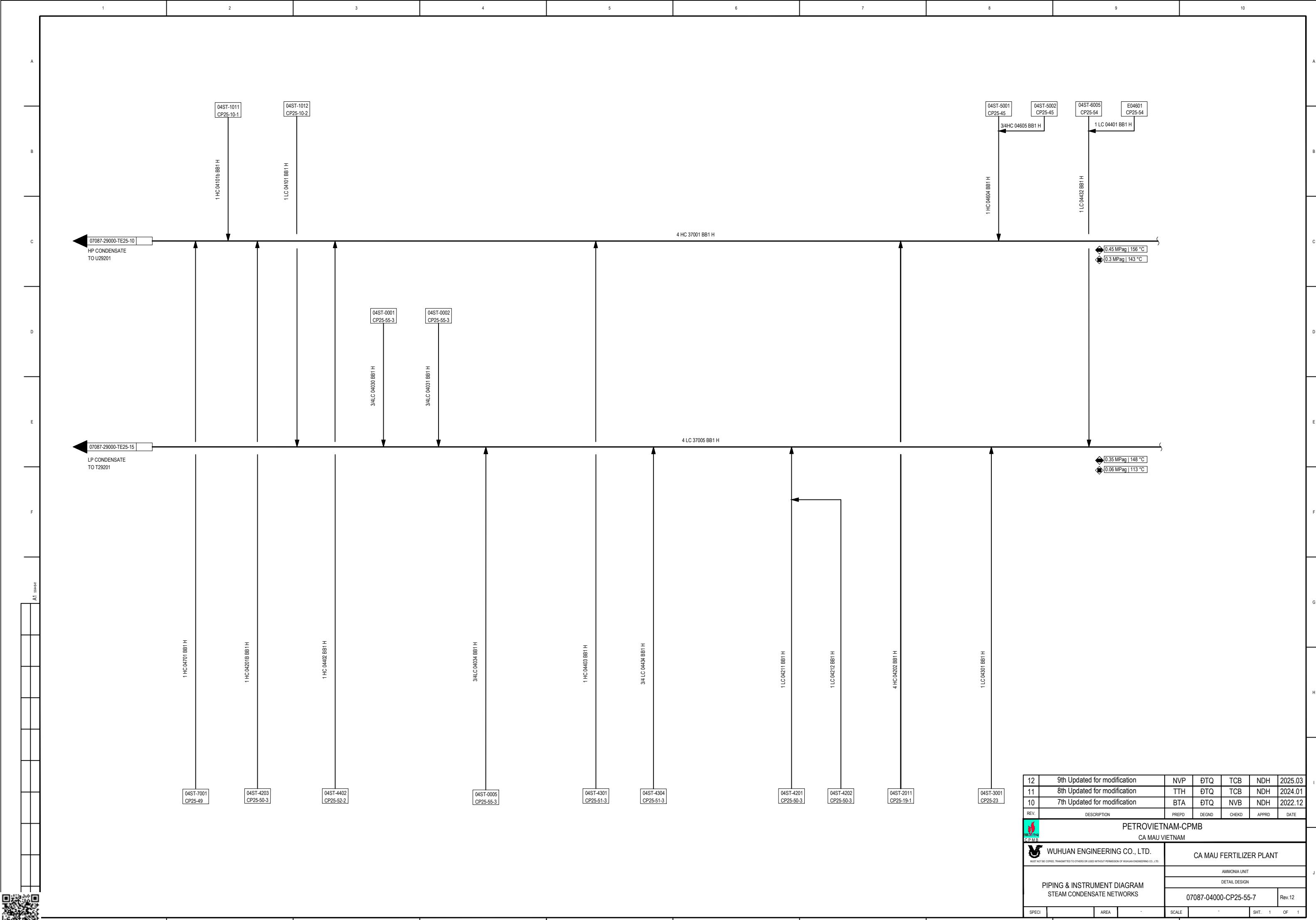
PIPING & INSTRUMENT DIAGRAM | DETAIL DESIGN

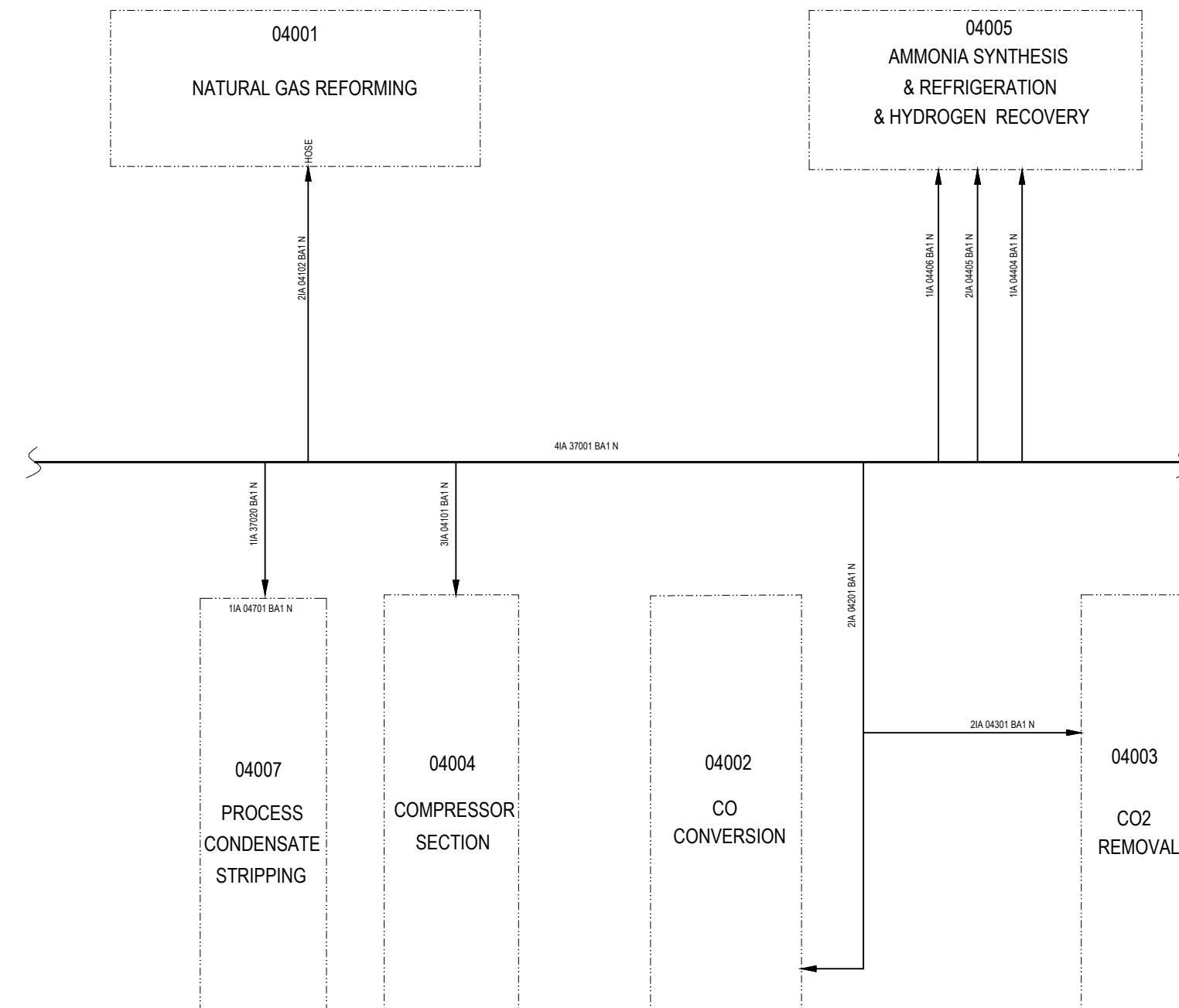
COOLING WATER SUPPLY NETWORKS 07087-04000-CP25-55-5 Rev.12

AREA - SCALE - SHT. 1 OF 1

9 10







12	9th Updated for modification	NVP	ĐTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	ĐTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	ĐTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE

<b>PETROVIETNAM-CPMB</b> CA MAU VIETNAM	CA MAU FERTILIZER PLANT					
	WUHUAN ENGINEERING CO., LTD.	MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHUAN ENGINEERING CO., LTD.	AMMONIA UNIT			
			DETAIL DESIGN			
	PIPING & INSTRUMENT DIAGRAM INSTRUMENT AIR NETWORKS			07087-04000-CP25-55-8	Rev.12	
	SPECI	AREA	-	SCALE	-	SHT. 1 OF 1



A

B

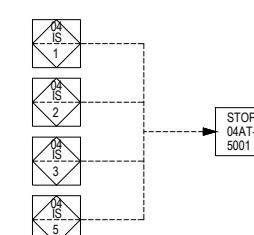
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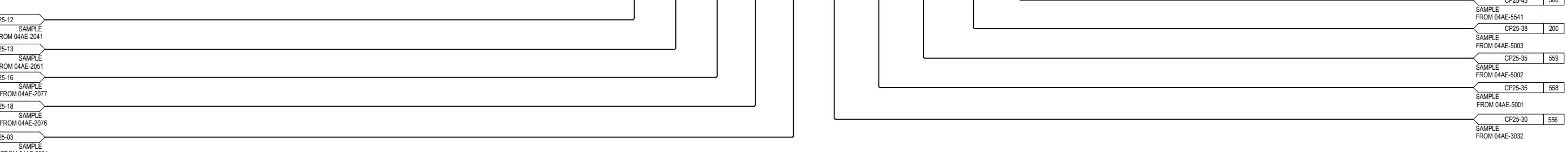
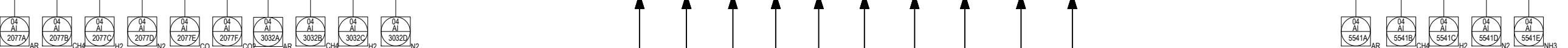
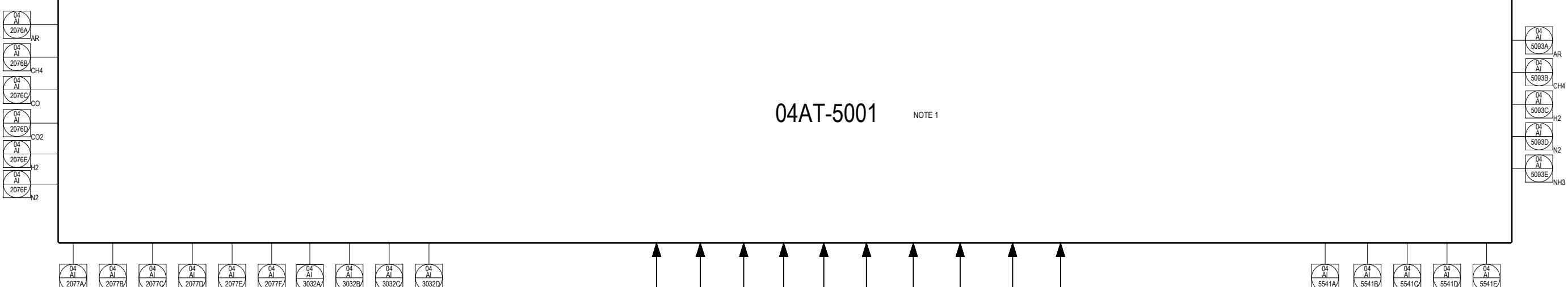
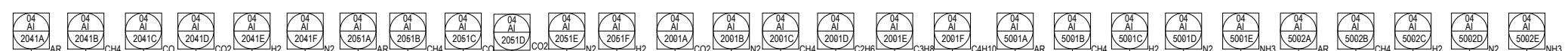
E

F

A1 sheet

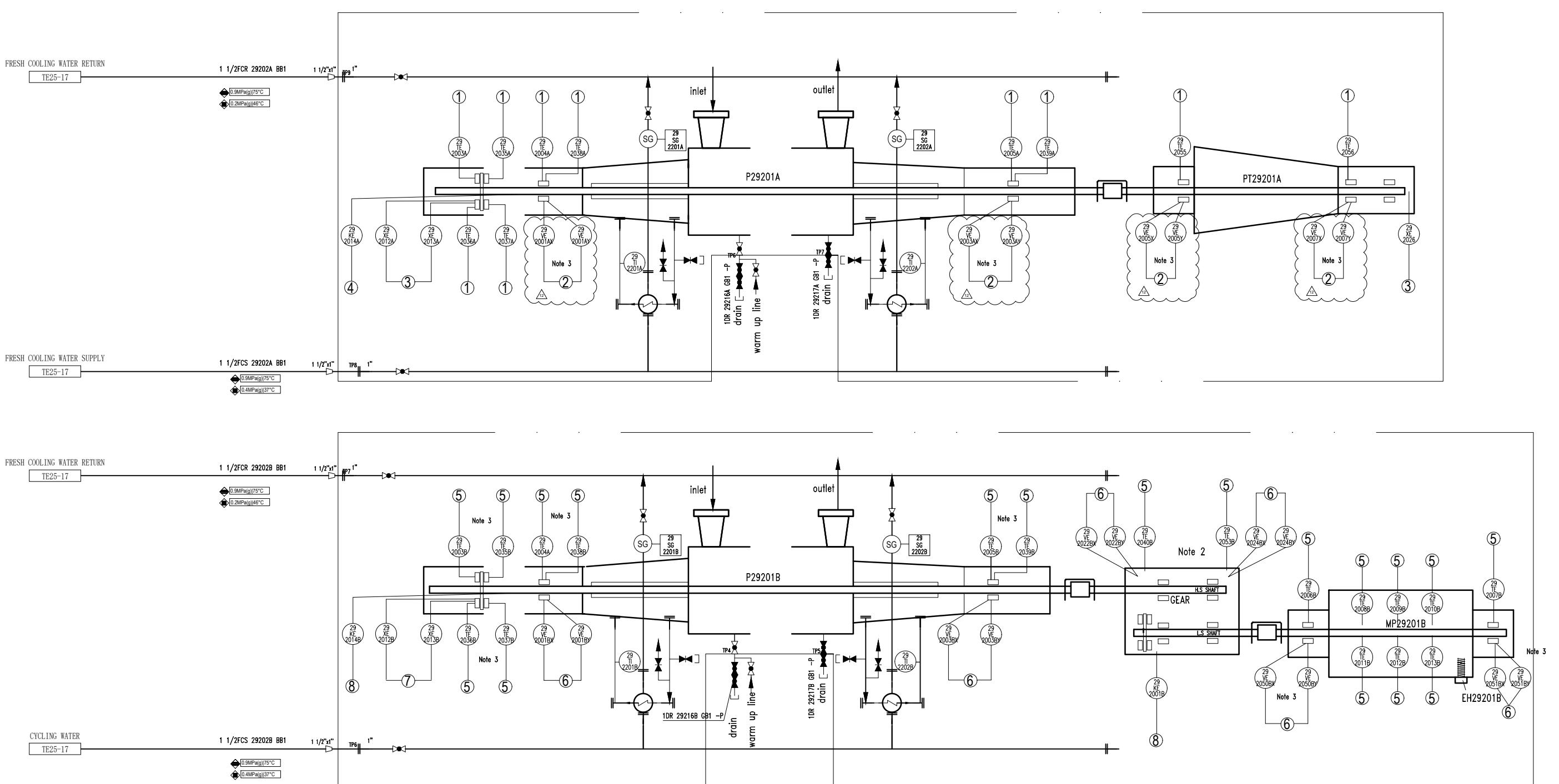


NOTES:  
1) AUTOMATIC MANIFOLD.



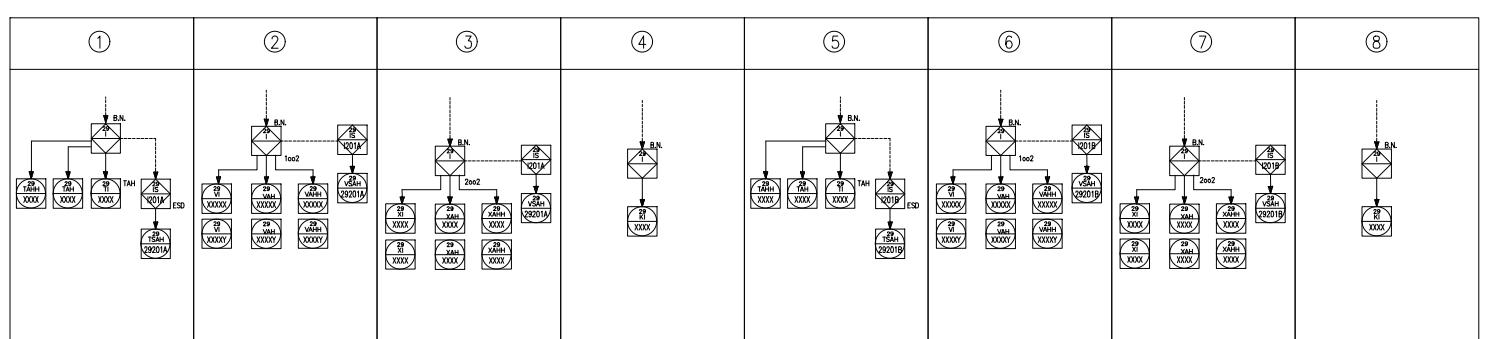
12	9th Updated for modification	NVP	ĐTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	ĐTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	ĐTQ	NVB	NDH	2022.12
REV.	DESCRIPTION PREPD DEGND CHEKD APPRD DATE					

	PETROVIETNAM-CPMB					
	CA MAU VIETNAM					
	WUHAN ENGINEERING CO., LTD.					
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AMMONIA UNIT						
DETAIL DESIGN						
07087-04000-CP25-56						Rev.12
SPECI	AREA	-	SCALE	-	SHT. 1	OF 1



P29201A P29201B  
HP BFW PLIMP HP BFW PLIMP

Type:steam turbine driving	Type:motorized centrifugal type
297 m³/h	Design flow rate: 297 m³/h
: 0.28MPa(g)	Suction pressure : 0.28MPa(g)
: 14.45MPa(a)	Discharge pressure : 14.45MPa(a)



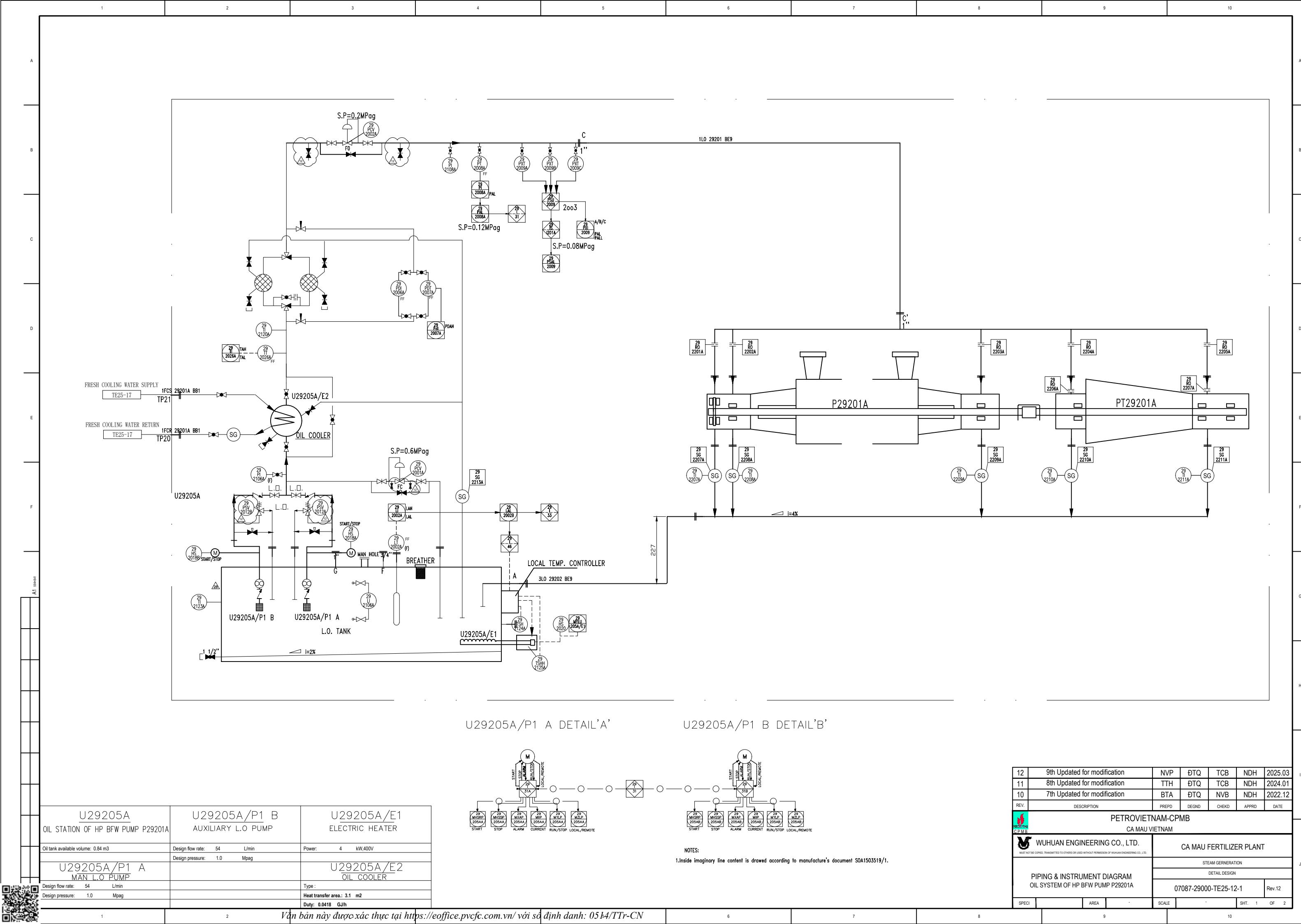
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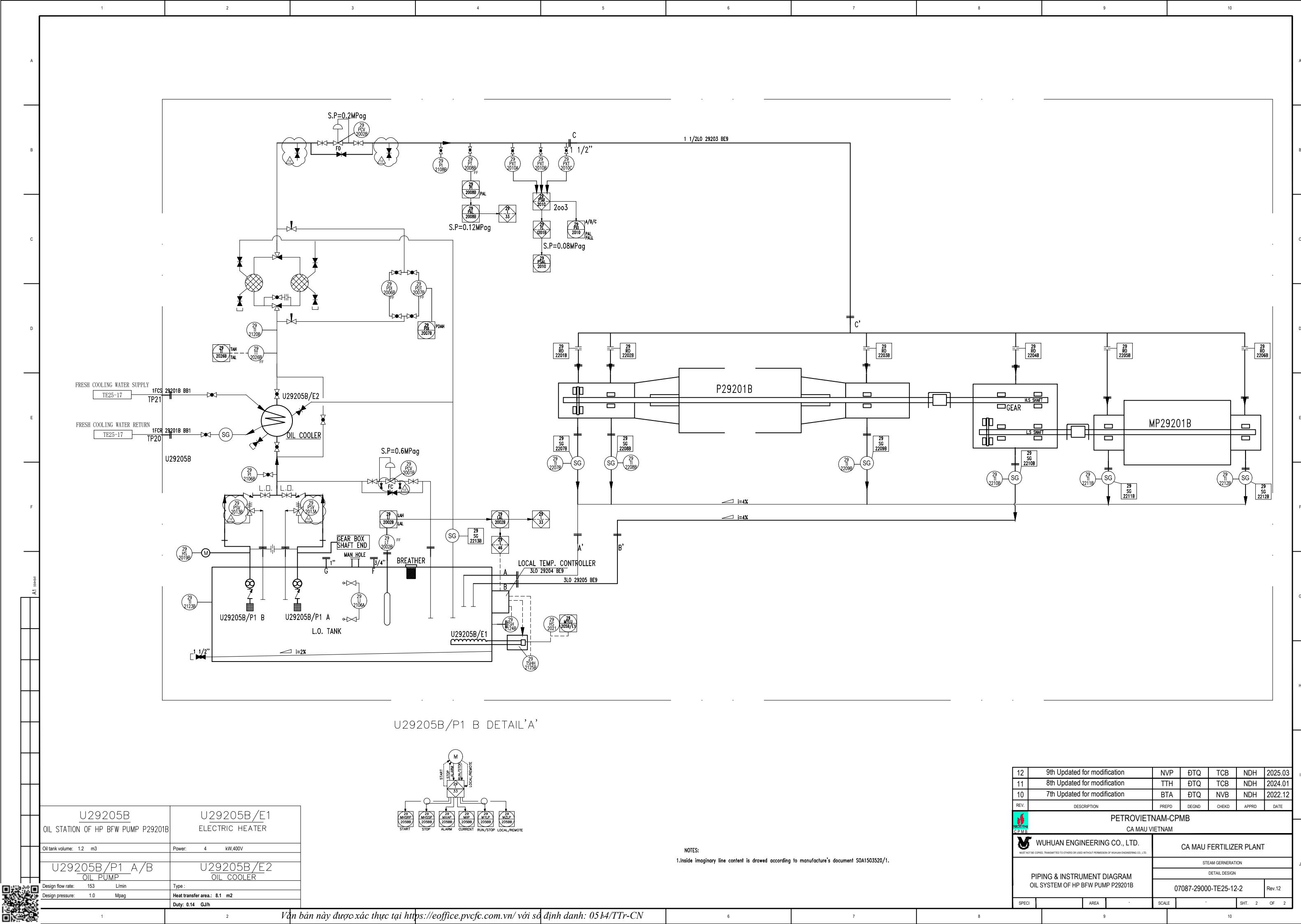
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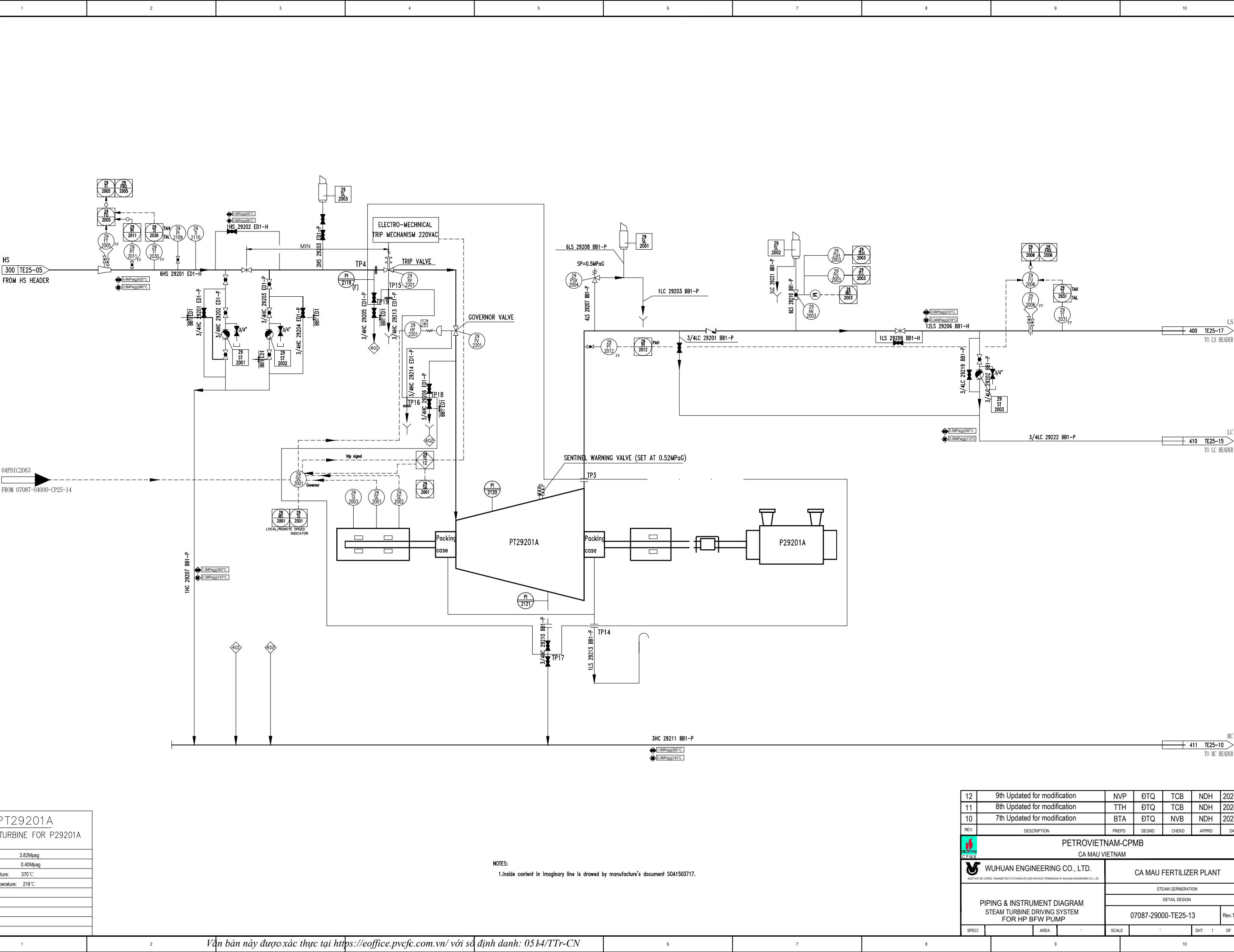
### 3.14 RTD Temperature measuring point on Gear box

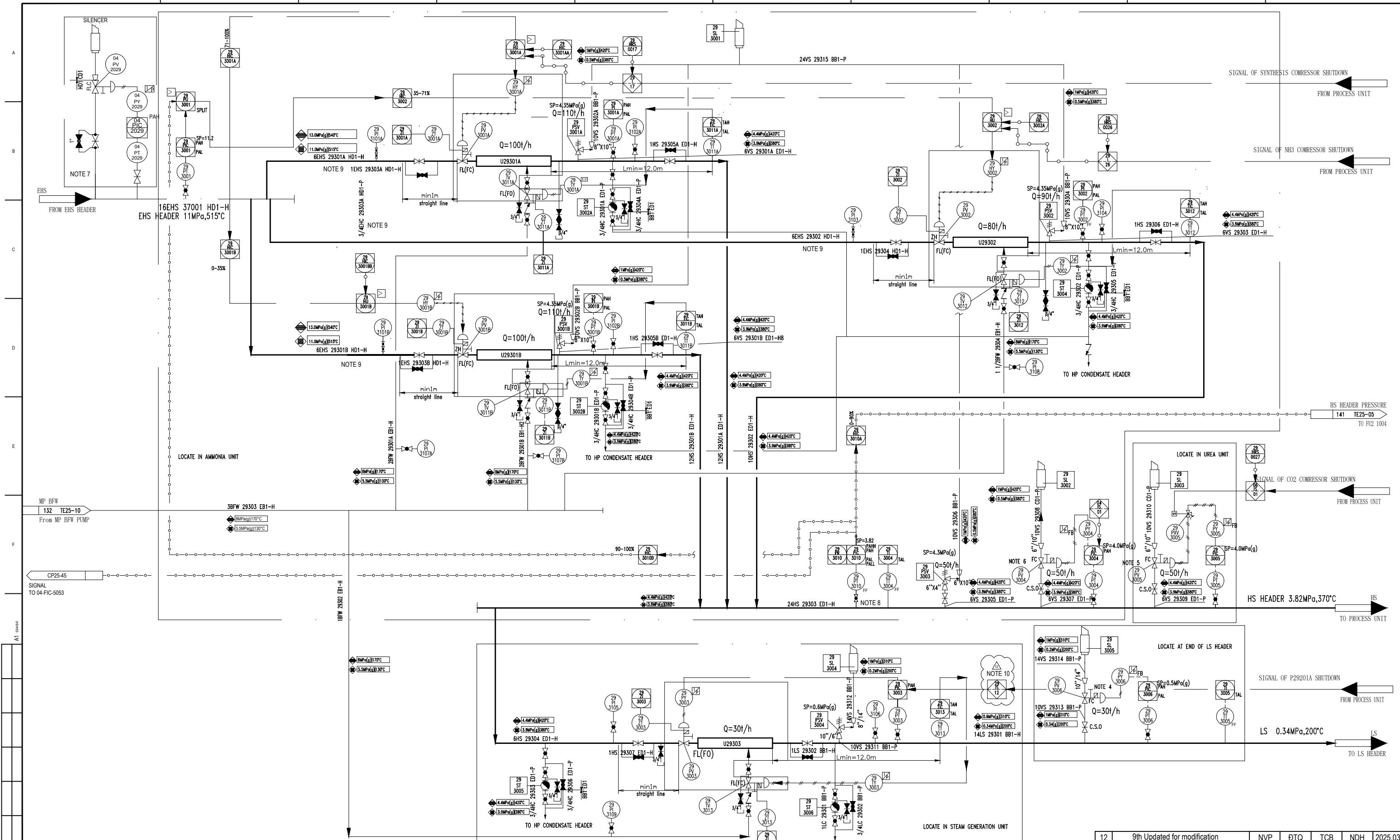
3. Vatting - 2003

12	9th Updated for modification	NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification	TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification	BTA	DTQ	NVB	NDH	2022.12
REV.	DESCRIPTION	PREPD	DEGND	CHEKD	APPRD	DATE
 PETROVIETNAM-CPMB CA MAU VIETNAM						
 WUHUAN ENGINEERING CO., LTD. MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHUAN ENGINEERING CO., LTD.		CA MAU FERTILIZER PLANT				
J PIPING & INSTRUMENT DIAGRAM COOLING AND SEALING SYSTEM OF HP BFW PUMPS		STEAM GERNERATION  DETAIL DESIGN				
		07087-29000-TE25-11			Rev.12	
SPECI		AREA	-	SCALE	-	SHT. 1 OF 2









<u>U29301A/B</u> HHP T&P REDUCING DEVICE 1	<u>U29302</u> HHP T&P REDUCING DEVICE 2	<u>U29303</u> HP T&P REDUCING DEVICE
Flow rate 100/h	Flow rate 80/h	Flow rate 30/h
Inlet steam P&T: 10.8MPa,510	Inlet steam P&T: 10.8MPa,510	Inlet steam P&T: 3.9MPa,380

#### **DIES:**

- The four devices locate under the pipe frame near ammonia synthesis unit.
  - Number and place of traps is set by pipe engineer according to the site condition.
  - The steam traps should be located near the T&P devices .
  - Suggest locat at the end of LS header or the better location according to the dynamic simulation.
  - Suggest locat at nearly the CO<sub>2</sub> compressor turbine.
  - Suggest locat at nearly the air compressor turbine or the better location according to the dynamic simulation.
  - 04PV2029 is in the scope of ammonia unit,refer to PID 07087-04000-CP25-07.The capacity of it is 62.5t/h.
  - This pressure measuring point should be located at nearly from CO<sub>2</sub> compressor turbine,suggest locate at B.L place with Urea unit.
  - ~~The steam trap is not available in comparison with as-built drawing.~~
  - WHEN 29IS12 ACTIVATED (PT29201), 29PV3003 WILL OPEN 60% (PMV=60%).

12	9th Updated for modification		NVP	DTQ	TCB	NDH	2025.03
11	8th Updated for modification		TTH	DTQ	TCB	NDH	2024.01
10	7th Updated for modification		BTA	DTQ	NVB	NDH	2022.12
REV	DESCRIPTION		PREP'D	DEGND	CHEKD	APPR'D	DATE
 <b>PETROVIETNAM-CPMB</b> <b>CA MAU VIETNAM</b>							
 <b>WUHUAN ENGINEERING CO., LTD.</b> <small>MUST NOT BE COPIED, TRANSMITTED TO OTHERS OR USED WITHOUT PERMISSION OF WUHUAN ENGINEERING CO., LTD.</small>				<b>CA MAU FERTILIZER PLANT</b>			
<b>PIPING &amp; INSTRUMENT DIAGRAM</b> <b>HHP &amp; HP LET DOWN SYSTEM</b>				STEAM GERNERATION			
				DETAIL DESIGN			
				07087-29000-TE25-16			
SPECI		AREA	-	SCALE	-	SHT.	1 OF 1