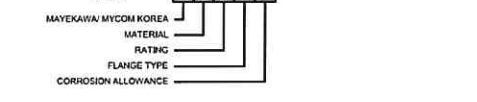


**INSTRUMENT NUMERING**  
EACH INSTRUMENT HAS BEEN NAMED AS SHOWN BELOW IN THE DOCUMENTATION:  
TAG-RU0001X-AA  
WHERE:  
X : ONE DIGITS, WHICH IDENTIFY THE REFRIGERANT PACKAGE TRAIN (A OR B)  
TAG : INSTRUMENT TAG (ATTACHMENT: P&ID SYMBOLS)  
AA : TWO DIGITS, WHICH IS THE PROGRESSIVE ITEM NUMBER IN THE UNIT FROM 01 TO 99

**MOTOR INSTRUMENT NUMERING**  
IF AN INSTRUMENT OR A FUNCTION IS INSTALLED ON A ELECTRIC DRIVER OF A MACHINERY WHICH NAME IS TAG-RU0001X-AA, THE INSTRUMENT NAME IS: TAG-RU0001X-AA

**PIPE LINE NUMERING**  
DN-MP-RU0001YXX-AL3R1-C  
WHERE:  
DN : NOMINAL DIAMETER IN INCH  
MP : FLUID CODE  
RU0001 : PACKAGE NAME  
Y : PACKAGE TRAIN (A OR B)  
XX : LETTER WHICH IDENTIFIES THE LINE NUMBER



Rating:  
14150 CLASS  
34300 CLASS  
64000 CLASS  
94000 CLASS  
154500 CLASS

MATERIAL:  
C: CARBON STEEL  
L: LOW TEMPERATURE CARBON STEEL  
S: STAINLESS STEEL  
I: INSTRUMENT AIR STAINLESS STEEL

FLANGE TYPE:  
R = RAISED FACE  
F = FLAT FACE  
R = RING TYPE JOINT

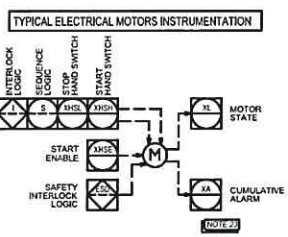
CORROSION ALLOWANCE:  
0 = 0 mm  
1 = 1.5 mm  
2 = 2.0 mm

FLUID CODE	DESCRIPTION
AV	Atmospheric Vent
CWS	Cooling Water Supply
CWR	Cooling Water Return
FWG	Flare/Vent gas
IA	Instrument Air
OI	Hydraulic Oil
ST	Steam
PR	Propane

HARDWARE		SOFTWARE	
Symbol	Denomination	Symbol	Denomination
	Locally mounted		Field mounted, shared display, shared control
	Mounted on back panel		Function normally inaccessible to operator and installed in main control room
	Mounted in main control room		Function normally accessible to operator and installed in main control room
	Mounted on back panel in auxiliary control room or on local panel		Function normally inaccessible to operator and installed in auxiliary control room or on local panel
	Mounted on panel in auxiliary control room or on local panel		Function normally accessible to operator and installed in auxiliary control room or on local panel
	Filled relay		Software interlock logic normally inaccessible to operator and installed in main control room
	Back panel relay in auxiliary control room or on local panel		Sequential logic function
	Mounted on back panel		Safety interlock logic
	Star indicated that the instrument is supplied by package manufacturer		Package Control System PLC
	SIGNAL LIGHT		
	Foundation Fieldbus		
	Differential between two value + Upper Value - Lower Value		

**INSULATION AND TRACING CODES**

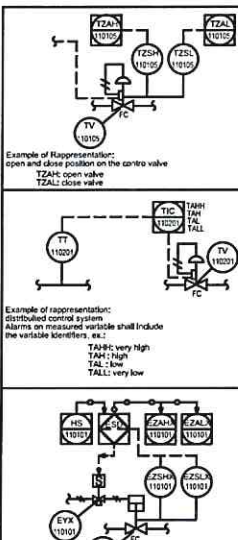
A : ACOUSTIC INSULATION  
H : HOT INSULATION  
C : COLD INSULATION  
P : PERSONNEL PROTECTION (FROM 60°C AND ABOVE)  
F : FIRE SAFE PROTECTION  
T : STEAM TRACING  
TW : HOT WATER TRACING  
J : HOT OIL TRACING  
E : ELECTRICAL TRACING  
JT : TOTAL JACKETED LINE  
JR : REDUCED JACKETED LINE  
JP : PARTIAL JACKETED LINE  
JF : ANTI FREEZING  
D : DUAL INSULATION  
B : SOLAR PROTECTION  
K : ANTI CONDENSATION  
AC : COLD AND ACOUSTIC INSULATION  
AH : HOT AND ACOUSTIC INSULATION  
N : NOT INSULATED  
W : TAPE WRAPPED (UNDERGROUND LINES)



Piping and relevant components		Instrument Identification	
Symbol	Denomination	Symbol	Denomination
	Main process		Female Connection
	Secondary process		Male Connection
	Utility		Flange Connection
	Jacket		Manhole
	Electrical Heat Tracing/Insulation (14°C/55)		Female nitrogen service
	Hydraulic Heat Tracing (14°C/55)		Male nitrogen service
	Electrical Heat Tracing (Insulated)		Cone Type strainer
	Blind flange		Temporary strainer
	Cap (butt weld)		Y-Strainer
	Reducer (Bottom flange)		T-Strainer
	Reducer (Top flange)		Ring spool
	Reducer (Concentric)		Spectacle blind - normally closed
	Spectacle blind - normally open		Ring spacer
	Sample connection		Process vent and drains
	Sample Point		with gate or generic valve
	Gate or generic inline valve		All process vents and drains must be provided with plug or blind flange according to piping specification.
	Check Valve		Stop Check Valve
	Globe or disc Valve		With flame trap
	Ball Valve		Discharge to atmosphere
	Butterfly Valve		With dump or silencer
	Needle Valve		Downward
	Plug Valve		Upward
	Ball Valve (FULL BORE)		Lateral
	Ball Valve (REDUCED BORE)		Expansion joint
	Three-way Valve		Locked Close Valve
	Spring Valve		Locked Open Valve
	Normally open valve		Normally closed valve
	Car seal open valve		Car seal closed valve
	Tight Shut Off Valve		Sight glass
	Pipe line class change		Actuator action in event of air failure

**FLOW INSTRUMENTS**

Symbol	Denomination	Symbol	Denomination
	SIGHT FLOW GLASS		FLOW TURBINE TYPE
	ORIFICE PLATE WITH TRANSMITTER		METER RUN
	ROTAMETER		INTEGRAL FLOW ORIFICE ASSEMBLY
	VENTURI		FLOW POSITIVE DISPLACEMENT TYPE
	FLOW NOZZLE		PILOT OR ANUSAR WITH TRANSMITTER
	TYPICAL FOR MAGNETIC DRIVEN PUMP		FLOW RESTRICTION ORIFICE
	LEVEL SENSOR TO BE INSTALLED IN SECTION PUMP LINE IN P&ID LINE IN HORIZONTAL POSITION, 15° ANGLE DEVIATION FROM VERTICAL LINE.		TRANSMITTER
	THERMAL FLOWMETER		MAGNETIC
	THERMAL FLOWMETER		VORTEX
	THERMAL FLOWMETER		CORIOLIS
	THERMAL FLOWMETER		ULTRASONIC



Symbol	Denomination	Abbreviation
	CARTRIDGE Filter	FT
	Basket Filter	FT
	Suction Element	TST
	Cooler	D
	Decanter	D
	Compressor Screw	C
	Vertical Shell & Tube Exchanger	E
	Pump Reciproc	P
	Ejector	EJ
	Aircooler	AE

**REMOVABLE SPOOL PIECE**

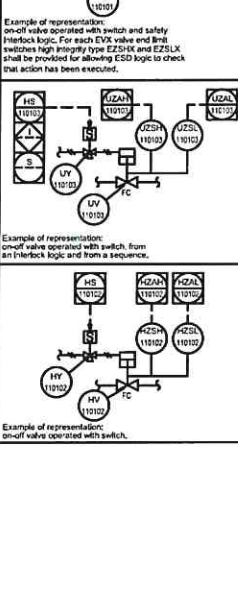
**INSULATION KIT**

**FREE DRAINING**

**JACKETED LINES**

**SUPPLY BATTERY LIMIT**

**ACTUAL**



**ACTUATOR SYMBOLS**

Symbol	Denomination
	Instrument lap on line
	Pressure tap with manifold valve
	Pressure tap with generic valves
	Pressure tap design type
	Fixed restriction orifice
	Primary flow element with transmitter
	Automatic regulator with integral flow indication
	Handover for automatic valve with actuators
	Diaphragm spring-actuated
	spring-actuated single-acting
	Cylinder: spring-actuated double-acting
	Rotary motor
	Solenoid
	Solenoid valve with manual reset
	Hand actuator
	Butterfly Valve
	Pressure relief or safety valve
	Temperature relief or safety valve
	Two-Way Valve Full Open
	Two-Way Valve Full Close
	Two-Way valve full locked
	Two-way valve full intermediate
	Three-way valve full open to path A-C
	MAGNETIC LEVEL GAUGE
	LEVEL TRANSMITTER WITH DASH-SEAL SEPARATOR WITH EXTENSION
	Open Close

REFERENCE DRAWING: \_\_\_\_\_

DWG NO.: \_\_\_\_\_

REV.: \_\_\_\_\_

NOTES:

- 1- AN ADDITIONAL "X" AFTER THE INSTRUMENT CODE MEANS THAT INSTRUMENT BELONGS TO ESD SYSTEM.
- 2- FOR TEMPERATURE MEASURING INSTRUMENTS WHOSE SIGNAL HAS TO BE ROUTED TO A REMOTE SYSTEM (DCS, PLC), THE TRANSMITTER HAS BEEN ALWAYS INDICATED EVEN IF IT IS STRICTLY REQUIRED ONLY FOR CONTROL, LOOPS, PROCESS INTERLOCKS AND SAFETY INTERLOCKS IN CASE OF TEMPERATURE INDICATOR.
- 3- IN ALL THE P&ID, PACKAGES ARE REPRESENTED IN A SIMPLIFIED WAY. IN GENERAL, EACH PACKAGE IS LICENSOR MINIMUM REQUIREMENT. THE CHARACTERISTICS OF EACH PACKAGE ARE DESCRIBED IN THE RELEVANT DATA SHEET. IN ANY CASE, PACKAGES VENDORS SHALL SUPPLY FINAL P&ID.
- 4- FOR PIPES CARRYING THE FOLLOWING FLUIDS :  
- EB (ETHYLBENZENE)  
- AN (ACRYLONITRILE)  
- CD (ORGANIC LIQUID CONDENSATE)  
- ST (STEAM)  
- BD (BUTADIENE)  
THE NUMBER OF FLANGES SHALL BE MINIMIZED.
- 5- INSTALL DRAINS ON THE PIPING CIRCUITS (OR SINGLE LINES) LOWEST POINTS AND VENTS IN THE PIPING CIRCUITS (OR SINGLE LINES) HIGHEST POINTS.
- 6- MINIMIZE FLANGED COUPLINGS ON HOT/THERMAL OIL (HO) MAIN DISTRIBUTION HEADER LINES. FOR THERMAL OIL (HO, CO) LINES INSTALLED ON PIPE RACKS, FLANGED COUPLINGS SHALL BE EQUIPPED WITH SAFE-RING OR EQUIVALENT FLANGES JOINTS SPRAY PROTECTION.
- 7- WHEN AN INTERLOCK OR A SEQUENCE REQUIRES TO PERFORM AN ACTION, THE INTERLOCK OR SEQUENCE ITSELF SHALL VERIFY IF THE ACTION HAS BEEN DONE. THIS HAS TO BE CONSIDERED AS STANDARD INSTALLATION AND IS NOT REPRESENTED ON P&ID.
- 8- IN GENERAL ON P&ID, SEQUENCES CHECK PHASE IS NOT REPRESENTED EXCEPT FOR:  
- RUBBER PLANT: RUBBER DISSOLUTION SECTION  
- RUBBER PLANT: REACTION SECTION
- 9- THE SIZE OF CONTROL VALVES BY-PASS VALVES WILL BE DEFINED / CONFIRMED ACCORDING TO THE FINAL SIZE OF CONTROL VALVES.
- 10- IN CASE DRIP RING IS INDICATED ON P&ID, IT SHALL BE SUPPLIED BY PIPING VENDOR. FOR DRIP RING TYPICAL SEE DOC. J-80/05/06-IN-STD-1500-0001 "DRIP RING FOR DIAPHRAGM INSTRUMENT TYPICAL".
- 11- THE INSTALLATION OF ALL PI-PT-TT REPRESENTED ON P&ID IS INDICATED IN THE TYPICAL.
- 12- ALL SIGNALS FROM PLC TO ESD SHALL BE HARD-WIRED (NON-DATAING)
- 13- ALL SIGNALS FROM UNIT 08 INSTRUMENTS SHALL BE CONNECTED TO DCS / FCS / ESD OF RUBBER PLANT.
- 14- ALL VALVES ON PSV INLET / OUTLET LINES SHALL BE FULL BORE TYPE. GATE VALVE ON FLARE LINE TO BE INSTALLED WITH STEM IN HORIZONTAL POSITION.
- 15- FOR SPECIAL PIPING ITEMS LIST REFER TO DOC. J-85-PI-LSG-0501.
- 16- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
- 17- ELEVATION SHOWN ARE ABOVE THE HIGHEST POINT OF PAVING.
- 18- ALL VALVES ARE LINE SIZE UNLESS OTHERWISE SHOWN.
- 19- THIS FLOW DIAGRAM IS DIAGRAMATIC ONLY. DESIGN OF PIPE LINE MUST BE INVESTIGATED FOR VENTING OF GAS AND VAPOR POCKETS IN PIPING AND EQUIPMENT. LOW POINTS IN PIPING, PUMPS AND EQUIPMENT FOR DRAINING AND ACCESSIBILITY OF ALL VALVES, FLANGES AND INSTRUMENTS INCLUDING THERMOCOUPLES ETC.
- 20- ALL ELECTRONIC INSTRUMENTATION SHALL BE INSTALLED AWAY FROM STEAM LINES AND HIGH TEMPERATURE HEAT SOURCE.
- 21- SAMPLE TAPPING FOR GAS SAMPLES SHALL BE FROM THE TOP OF THE MAIN LINE. FOR LIQUID SAMPLES TAPPING SHALL BE DONE FROM THE SIDE.
- 22- EXCEPT FOR PROCESS REASONS, LOW POINT DRAINS AND HIGH POINT VENT ARE NOT SHOWN.
- 23- CABLING BETWEEN PLC TO ESD SHALL BE HARD-WIRED IN MCC CLECKLE CABINET AND MAIN CONTROL ROOM WILL BE VIA SOFT LINK EXCEPT FOR ESD SIGNALS TO MCC THAT WOULD BE HARD WIRE.
- 24- EDSL MEANS EARTHING SWITCH LOW.
- 25- SIGNALS OF CURRENT TRANSMITTERS ARE TAKEN FROM MCC.
- 26- WHILE PURSUING THE EDWARDS, VENTS SHALL BE PROPERLY KEPT OPEN IN ORDER TO AVOID EQUIPMENT PRESSURIZATION ABOVE EQUIPMENT/PSV SET PRESSURE BY MAINTAINING PROPER ADMINISTRATIVE CONTROL, PRESSURE SAFETY VALVES AND RUPTURE DISCS ARE NOT DESIGNED FOR THE MAXIMUM PURGING CONDITION MENTIONED IN THE LICENSOR P&ID DATA.

HOLDE:

EQUIPMENT LIST:

REV.	ISSUE DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED
01	AUG-2024	ISSUED FOR APPROVAL (IFA)	A.K	F.SH	A.M
00	JUL-2024	ISSUED FOR APPROVAL (IFA)	A.K	F.SH	A.M

CLIENT:

CONSULTING ENGINEER:

PROJECT:

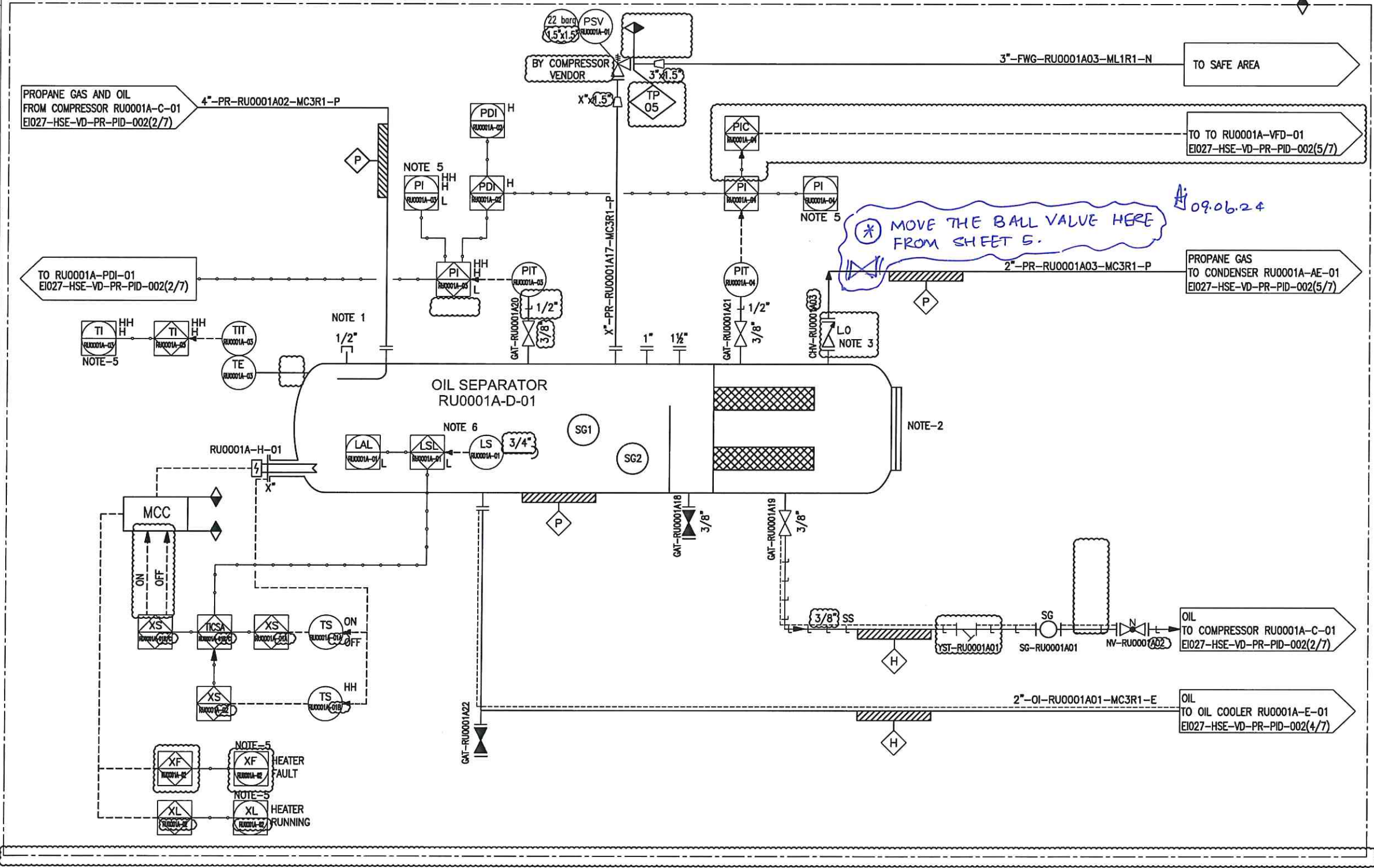
DRAWING TITLE:  
PROCESS & INSTRUMENTATION DIAGRAM (P&ID)-RU  
SYMBOL, ABBREVIATION AND GENERAL NOTES

DRAWING NO.	REV.	SIZE	SCALE	SHEET
E1027-HSE-VD-PR-PIB-002	01	A3	NTC	1 of 7



TAG NO.	RU0001A-D-01
SERVICE	OIL SEPARATOR
DESIGN PRESS. (BARG)	22
DESIGN TEMP. (°C)	-29/100
ID x L (mm)	590 x 2250

REFERENCE DRAWING	DWG NO.	REV.			
NOTES:					
1- OIL TOP UP & VACUUM CONNECTION.					
2- INSPECTION HOLE.					
3- STOP CHECK VALVE FOR PREVENT SPIN BACK.					
4- DELETED.					
5- SIGNAL ROUT TO DCS.					
6- IN CASE OF LOW LEVEL, THE OIL HEATER TO BE TRIPPED.					
7- MAINTAIN TEMPERATURE FOR ELECTRICAL INSULATIONS IS 30°C.					
LEGEND:					
HOLDE:					
EQUIPMENT LIST:					
KEY PLAN:					
REV.	ISSUE DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED
01	AUG-2024	ISSUED FOR APPROVAL (IFA)	A.K	F.SH	A.M
02	JUL-2024	ISSUED FOR APPROVAL (IFA)	A.K	F.SH	A.M
CLIENT					
CONSULTING ENGINEER					
PROJECT:					
DRAWING TITLE:					
PROCESS & INSTRUMENTATION DIAGRAM (P&ID)-RU					
DRAWING NO.	REV.	SIZE	SCALE	SHEET	
EI027-HSE-VD-PR-PID-002	01	A3	NTC	3 of 7	



PROPANE GAS AND OIL FROM COMPRESSOR RU0001A-C-01 EI027-HSE-VD-PR-PID-002(2/7)

TO RU0001A-PDI-01 EI027-HSE-VD-PR-PID-002(2/7)

RU0001A-H-01

OIL SEPARATOR RU0001A-D-01

PROPANE GAS TO CONDENSER RU0001A-AE-01 EI027-HSE-VD-PR-PID-002(5/7)

OIL TO COMPRESSOR RU0001A-C-01 EI027-HSE-VD-PR-PID-002(2/7)

OIL TO OIL COOLER RU0001A-E-01 EI027-HSE-VD-PR-PID-002(4/7)

MOVE THE BALL VALVE HERE FROM SHEET 5.

09.06.24

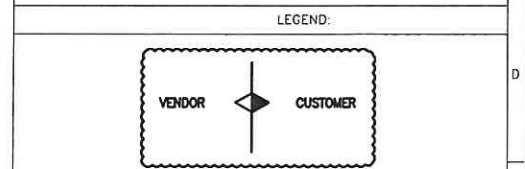
TAG NO.	RU0001A-E-01
SERVICE	OIL COOLER
DESIGN PRESS. (BARG)	S: 30, T:30
DESIGN TEMP. (°C)	S:5/100, T:-45/100
DESIGN DUTY (kW)	24.7
ID x L (mm)	139.7 x 2200
TYPE	AEH

TAG NO.	RU0001A-P-01
SERVICE	OIL PUMP
TYPE	SCREW PUMP
DESIGN PRESS. (BARG)	26
DESIGN TEMP. (°C)	5 / 100
RATED POWER (kW)	2.5

TAG NO.	RU0001A-F-01A/S
SERVICE	OIL FILTER
DESIGN PRESS. (BARG)	23
DESIGN TEMP. (°C)	5/100
ID x L (mm)	MAYEKAWA

REFERENCE DRAWING	DWG NO.	REV.

- NOTES:
- ONE OPERATING / ONE STAND-BY.
  - DP=3 BAR.
  - SIGNAL ROUT TO DCS.
  - HEAT TRACING TO BE TURNED OFF DURING COMPRESSOR START.
  - MAINTAIN TEMPERATURE FOR ELECTRICAL INSULATIONS IS 30°C.



HOLDE:

EQUIPMENT LIST:

KEY PLAN:

01	AUG-2024	ISSUED FOR APPROVAL (IFA)	A.K	F.SH	A.M
00	JUL-2024	ISSUED FOR APPROVAL (IFA)	A.K	F.SH	A.M
REV.	ISSUE DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED

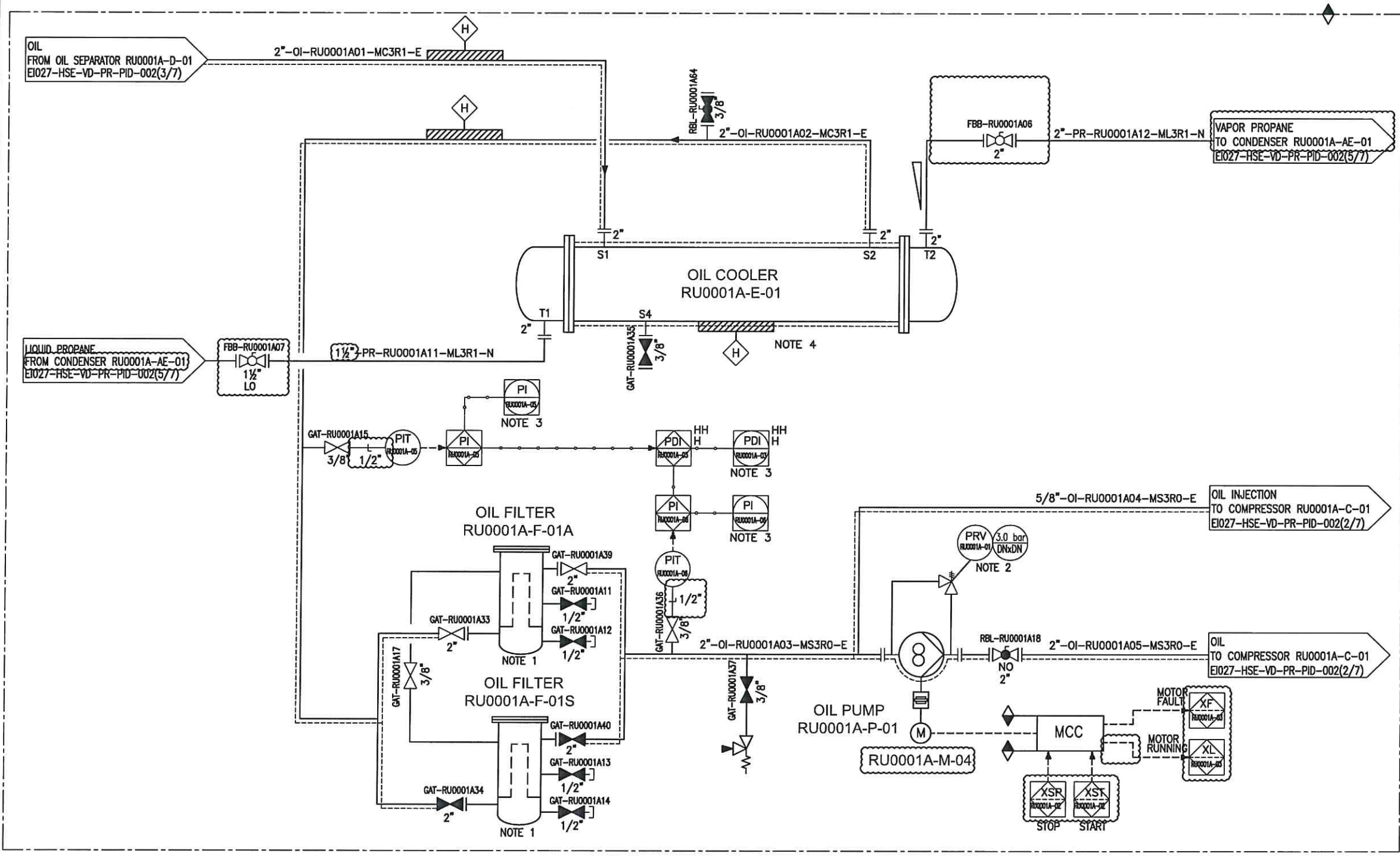
CLIENT:

CONSULTING ENGINEER:

PROJECT:

DRAWING TITLE:  
PROCESS & INSTRUMENTATION DIAGRAM (P&ID)-RU

DRAWING NO.	REV.	SIZE	SCALE	SHEET
E1027-HSE-VD-PR-PID-002	01	A3	NTC	4 of 7

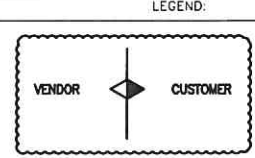
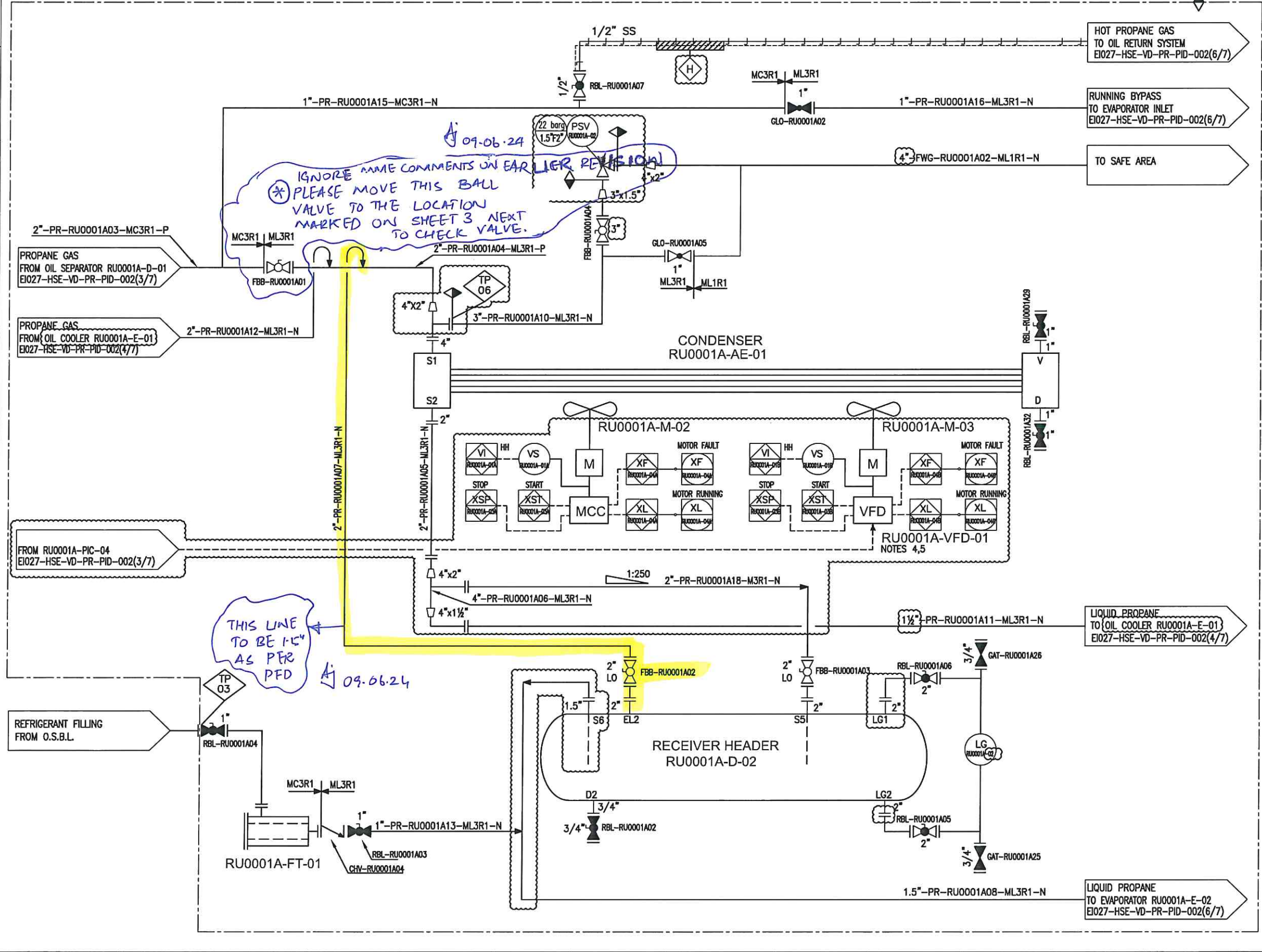


TAG NO.	RU0001A-AE-01
SERVICE	CONDENSER
DESIGN PRESS. (BARG)	22.0+FV
DESIGN TEMP. (°C)	-45/120
DESIGN DUTY (kW)	257

TAG NO.	RU0001A-D-02
SERVICE	RECEIVER HEADER
DESIGN PRESS. (BARG)	22.0+FV
DESIGN TEMP. (°C)	-45/120
ID x L (mm)	437 x 4000

REFERENCE DRAWING	DWG NO.	REV.

- NOTES:
- 1- DELETED.
  - 2- MANUAL FAN PITCH HAS BEEN CONSIDERED FOR EACH FAN.
  - 3- MAINTAIN TEMPERATURE FOR ELECTRICAL INSULATIONS IS 30°C.
  - 4- VARIABLE FREQUENCY DRIVE IS INSTALLED IN MOTOR CONTROL CENTER.
  - 5- MOTOR HARDWARE CONNECTED TO VARIABLE FREQUENCY DRIVE.



HOLDE:

EQUIPMENT LIST:

KEY PLAN:

01	AUG-2024	ISSUED FOR APPROVAL (IFA)	A.K	F.SH	A.M
00	JUL-2024	ISSUED FOR APPROVAL (IFA)	A.K	F.SH	A.M
REV.	ISSUE DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED

CLIENT

CONSULTING ENGINEER

PROJECT:

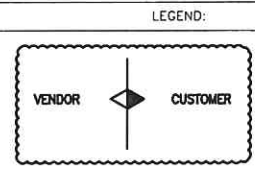
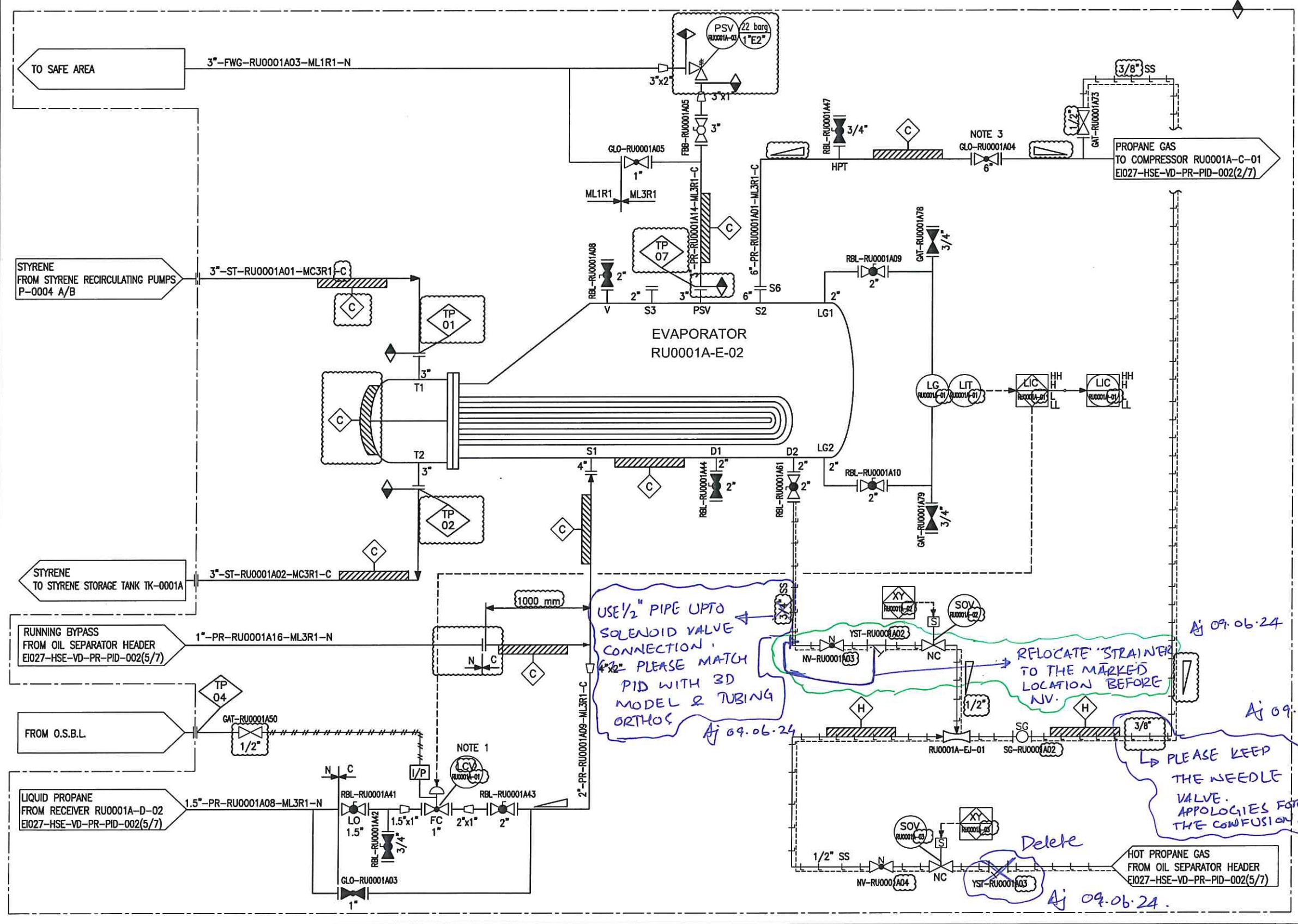
DRAWING TITLE:  
PROCESS & INSTRUMENTATION DIAGRAM (P&ID)-RU

DRAWING NO.	REV.	SIZE	SCALE	SHEET
EI027-HSE-VD-PR-PID-002	01	A3	NTC	5 of 7

TAG NO.	RU0001A-E-02
SERVICE	EVAPORATOR
DESIGN PRESS. (barg)	S: 22.0+FV, T: 6.8+FV
DESIGN TEMP. (°C)	S: -45/120, T: 85
DESIGN DUTY (kW)	166.6
SHELL ID x TUBE L (mm)	600-925 x 2300
TEMA TYPE	BKU

REFERENCE DRAWING	DWG NO.	REV.

- NOTES:
- TRAVEL DOWN BLOCK TO BE SET AND LOCKED AT MINIMUM OPENING DURING COMMISSIONING (2 ~ 5%).
  - DELETED.
  - AT STAND STILL CONDITION, VALVE NEEDS TO BE CLOSED COMPLETELY. DURING START-UP VALVE TO BE OPENED SMOOTHLY.
  - MAINTAIN TEMPERATURE FOR ELECTRICAL INSULATIONS IS 30°C.



HOLDE:

EQUIPMENT LIST:

KEY PLAN:

REV.	ISSUE DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED
01	AUG-2024	ISSUED FOR APPROVAL (IFA)	A.K	F.SH	A.M
00	JUL-2024	ISSUED FOR APPROVAL (IFA)	A.K	F.SH	A.M

CLIENT

CONSULTING ENGINEER

PROJECT:  
DRAWING TITLE:  
PROCESS & INSTRUMENTATION DIAGRAM (P&ID)-RU

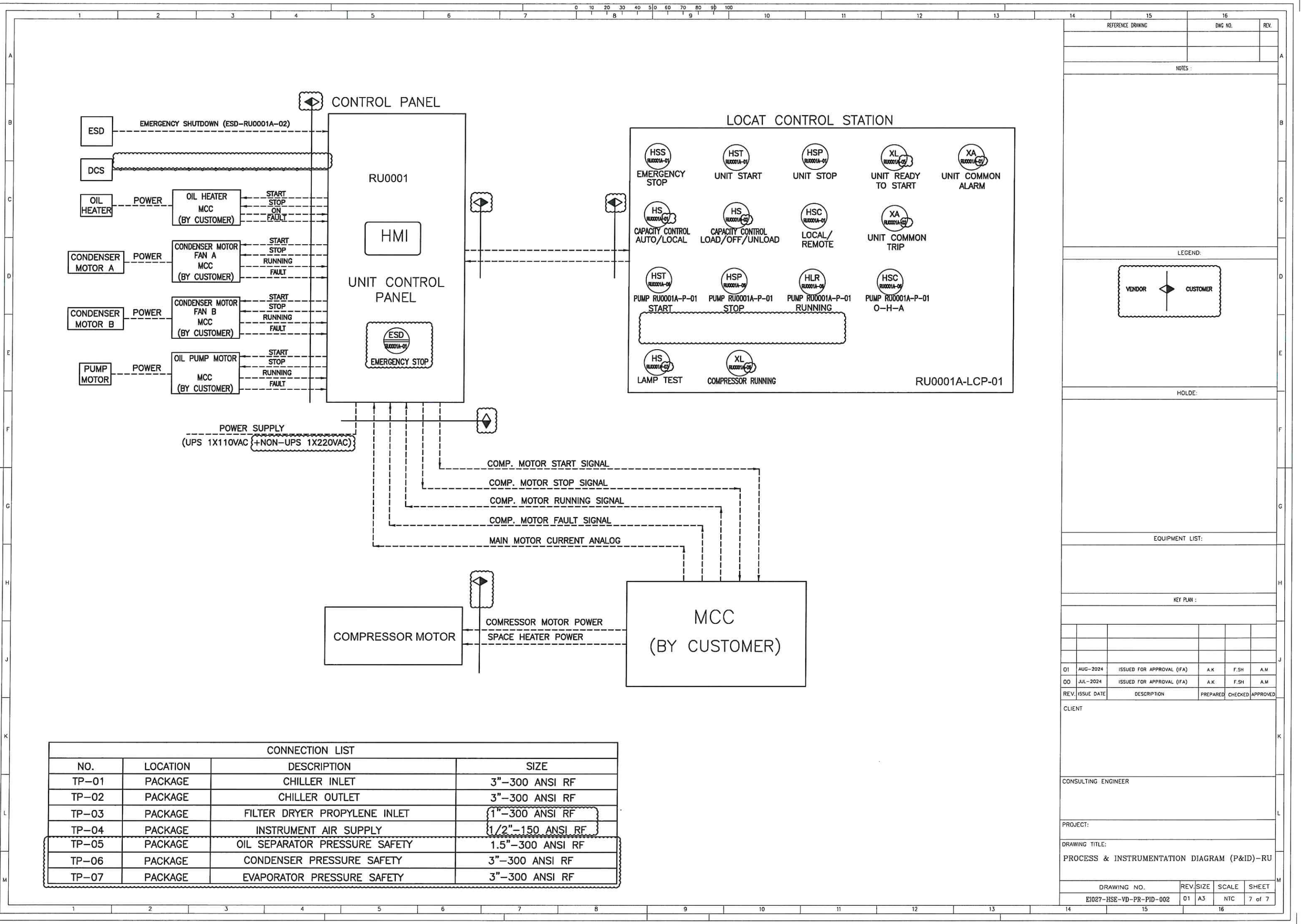
DRAWING NO.	REV.	SIZE	SCALE	SHEET
EI027-HSE-VD-PR-PID-002	01	A3	NTC	6 of 7

USE 1/2" PIPE UPTO SOLENOID VALVE CONNECTION. PLEASE MATCH PID WITH 3D MODEL & TUBING ORTHOS. Aj 09.06.24

RELOCATE STRAINER TO THE MARKED LOCATION BEFORE NV. Aj 09.06.24

PLEASE KEEP THE NEEDLE VALVE. APOLOGIES FOR THE CONFUSION.

Delete  
Aj 09.06.24



REV.	ISSUE DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED
01	AUG-2024	ISSUED FOR APPROVAL (IFA)	A.K	F.SH	A.M
00	JUL-2024	ISSUED FOR APPROVAL (IFA)	A.K	F.SH	A.M

REV.	SIZE	SCALE	SHEET
01	A3	NTC	7 of 7

NO.	LOCATION	DESCRIPTION	SIZE
TP-01	PACKAGE	CHILLER INLET	3"-300 ANSI RF
TP-02	PACKAGE	CHILLER OUTLET	3"-300 ANSI RF
TP-03	PACKAGE	FILTER DRYER PROPYLENE INLET	1"-300 ANSI RF
TP-04	PACKAGE	INSTRUMENT AIR SUPPLY	1/2"-150 ANSI RF
TP-05	PACKAGE	OIL SEPARATOR PRESSURE SAFETY	1.5"-300 ANSI RF
TP-06	PACKAGE	CONDENSER PRESSURE SAFETY	3"-300 ANSI RF
TP-07	PACKAGE	EVAPORATOR PRESSURE SAFETY	3"-300 ANSI RF