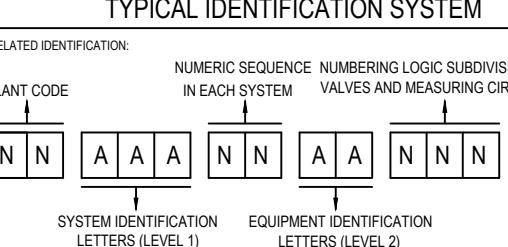


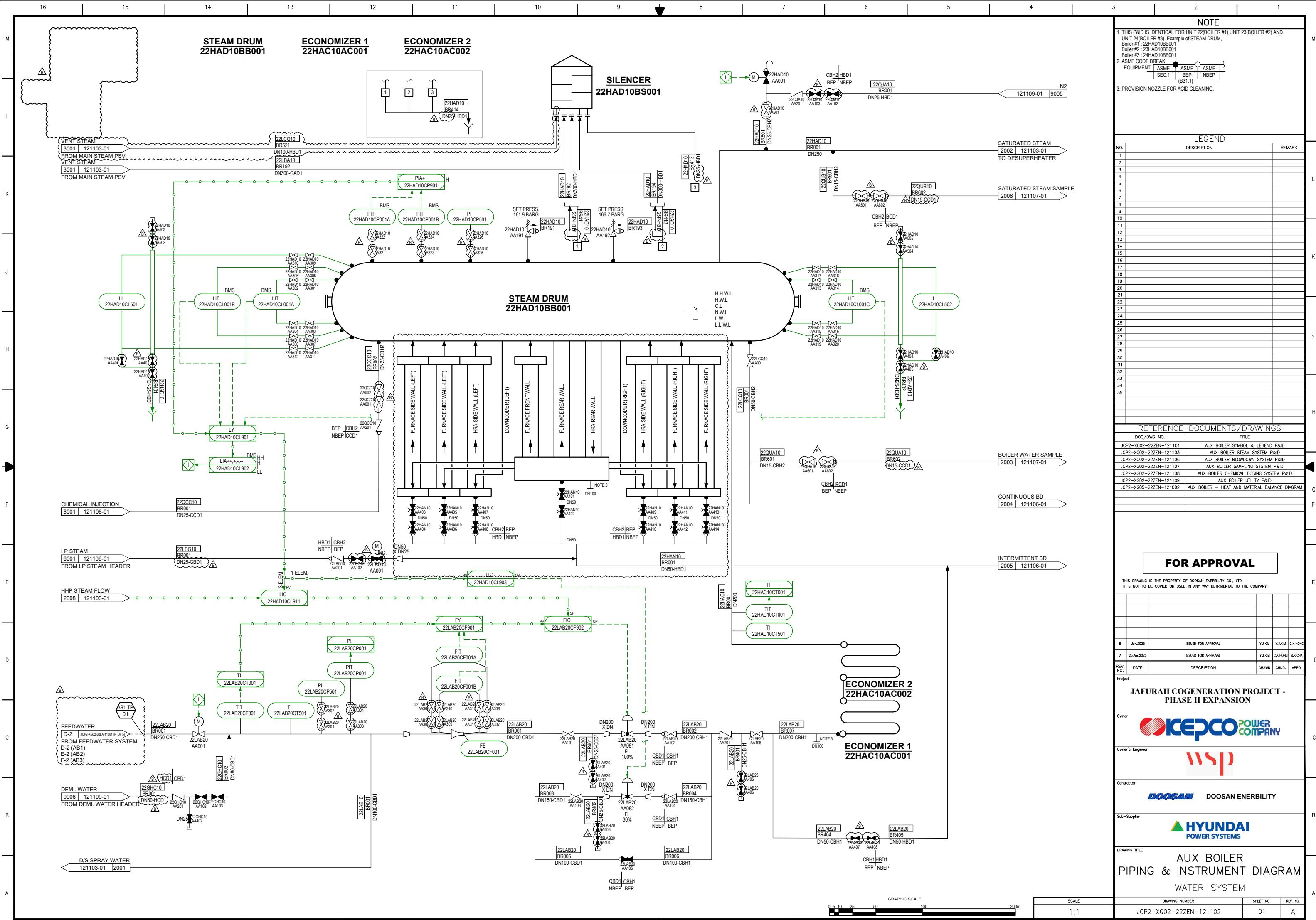
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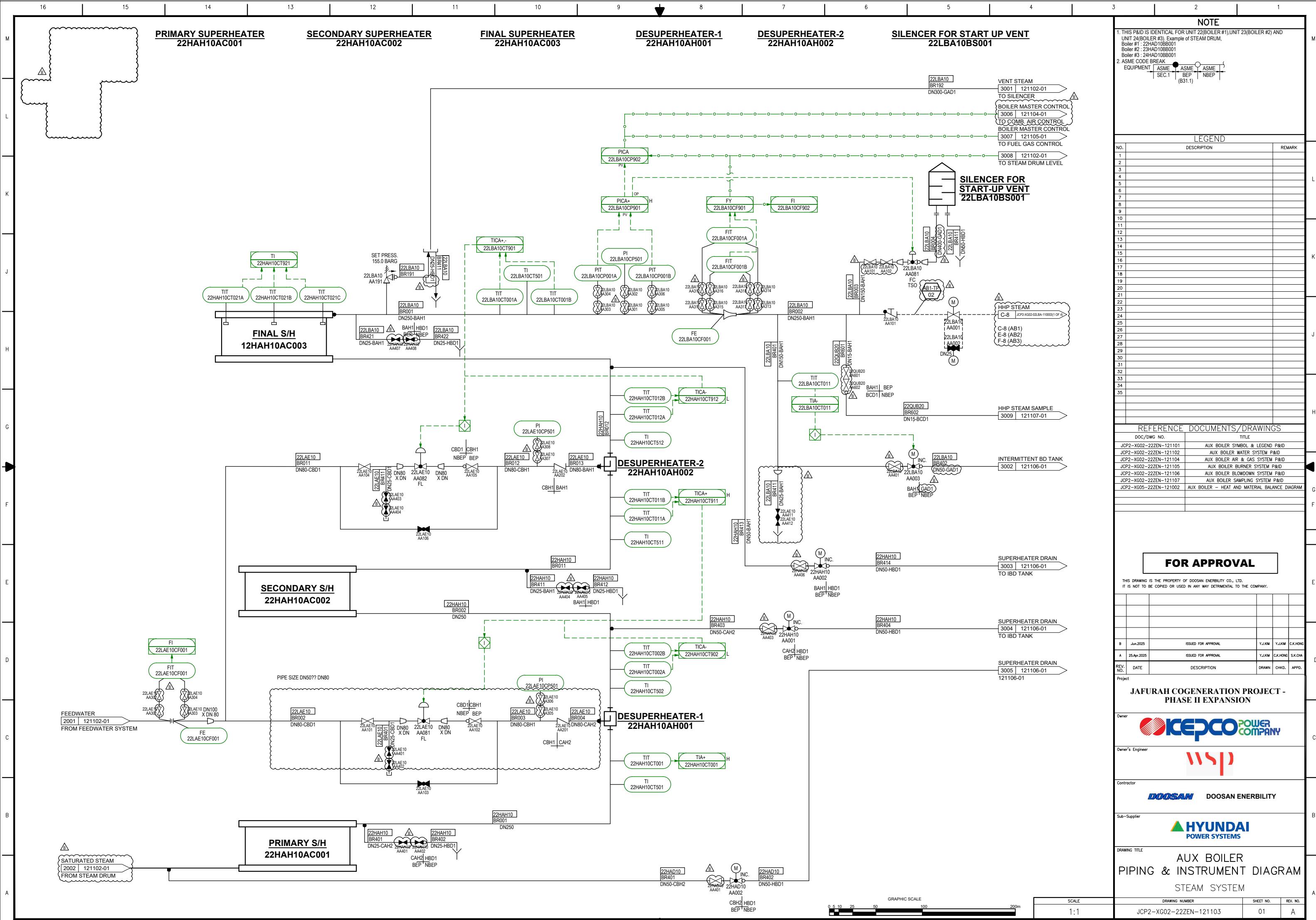
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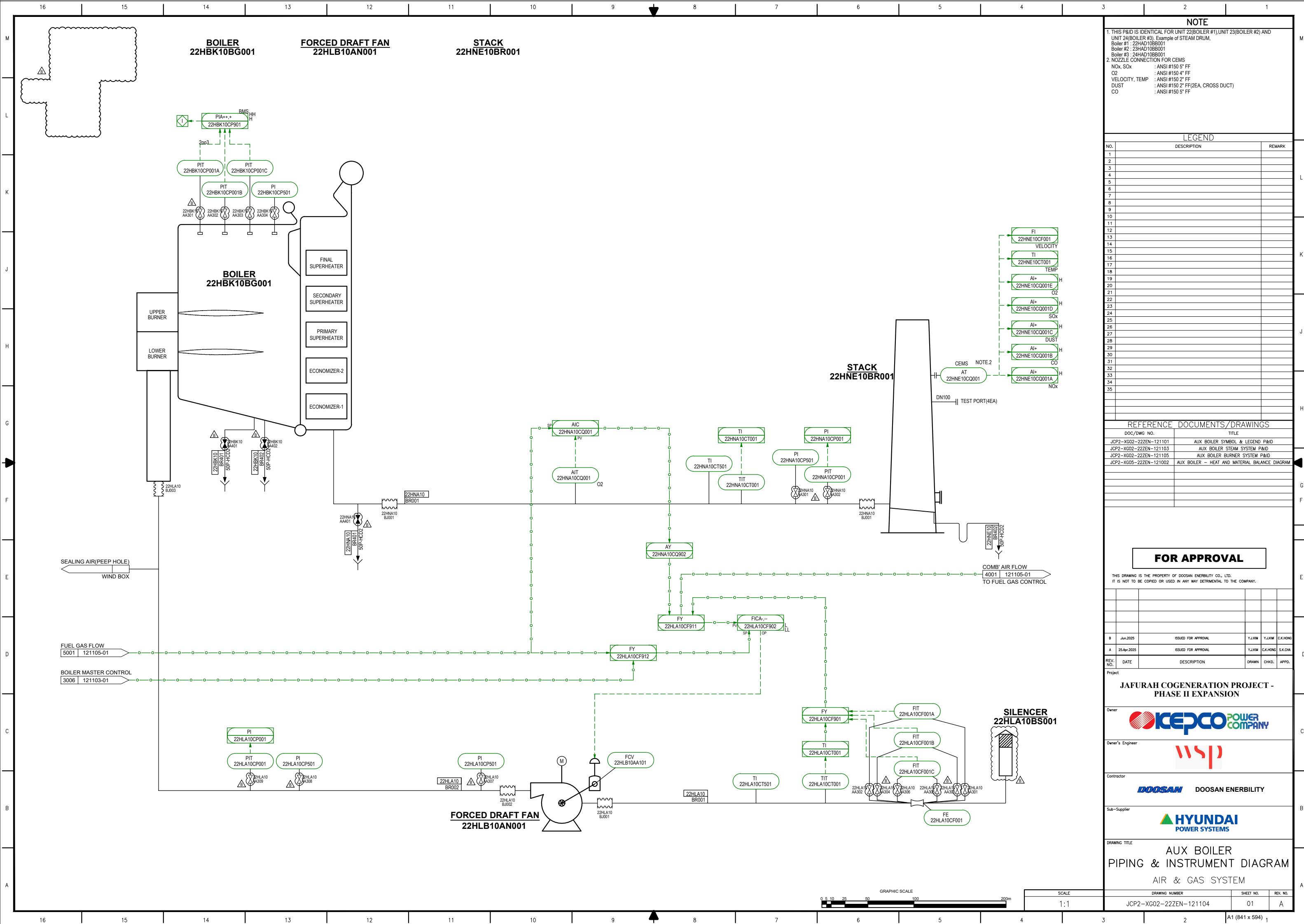
NOTE

TYPICAL IDENTIFICATION SYSTEM

<b>TYPICAL IDENTIFICATION SYSTEM</b> <b>PROCESS RELATED IDENTIFICATION:</b> PLANT CODE      NUMERIC SEQUENCE NUMBERING LOGIC SUBDIVISION FOR PIPELINE, IN EACH SYSTEM      VALVES AND MEASURING CIRCUITS (1.4)  <b>1.1 PLANT CODE</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>PLANT SECTION</th> <th>ENTRY</th> </tr> </thead> <tbody> <tr> <td>PLANT COMMON</td> <td>02</td> </tr> <tr> <td>STG &amp; AUXILIARY SYSTEM</td> <td>20</td> </tr> <tr> <td>GT/HSG UNIT</td> <td>21</td> </tr> <tr> <td>RESERVE BOILER #1</td> <td>22</td> </tr> <tr> <td>RESERVE BOILER #2</td> <td>23</td> </tr> <tr> <td>RESERVE BOILER #3</td> <td>24</td> </tr> </tbody> </table> <b>1.2 LEVEL '1': SYSTEM CODE</b> <b>SYSTEM IDENTIFICATION LETTERS</b> FUNCTION KEY IN SYSTEM CLASSIFICATION IS AS FOLLOWS <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>CODE</th> <th>IDENTIFICATION</th> </tr> </thead> <tbody> <tr><td>A</td><td>GRID AND DISTRIBUTION SYSTEMS</td></tr> <tr><td>B</td><td>POWER TRANSMISSION AND AUXILIARY POWER SUPPLY</td></tr> <tr><td>C</td><td>INSTRUMENTATION AND CONTROL EQUIPMENT (IDENTIFICATION ON A PRIORITY BASIS ACCORDING TO MAIN, INSTRUMENTATION AND CONTROL FUNCTION ALSO ACCEPTABLE IN COMPOSITE STRUCTURE HARDWARE PACKAGING SYSTEMS.)</td></tr> <tr><td>D</td><td>INSTRUMENTATION AND CONTROL EQUIPMENT (FOR USE ONLY WHEN THE FUNCTION KEYS CM TO CT ARE INSUFFICIENT FOR THE IDENTIFICATION)</td></tr> <tr><td>E</td><td>CONVENTIONAL FUEL SUPPLY AND RESIDUES DISPOSAL</td></tr> <tr><td>F</td><td>WATER SUPPLY AND DISPOSAL</td></tr> <tr><td>G</td><td>CONVENTIONAL HEAT GENERATION</td></tr> <tr><td>H</td><td>STEAM, WATER, GAS CYCLES</td></tr> <tr><td>I</td><td>MAIN MACHINE SETS</td></tr> <tr><td>J</td><td>PROCESS ENERGY SUPPLIED FOR EXTERNAL USERS (e.g. DISTRICT HEATING)</td></tr> <tr><td>K</td><td>COOLING WATER SYSTEMS</td></tr> <tr><td>L</td><td>AUXILIARY SYSTEMS</td></tr> <tr><td>M</td><td>ANCILLARY SYSTEMS</td></tr> <tr><td>N</td><td>STRUCTURES</td></tr> <tr><td>O</td><td>RENEWABLE ENERGY PLANTS</td></tr> <tr><td>P</td><td>HEAVY MACHINERY (NOT MAIN MACHINES SETS)</td></tr> <tr><td>Q</td><td>WORKSHOP AND OFFICE EQUIPMENT</td></tr> </tbody> </table> <p>NOTE : FOR THE DETAIL FUNCTION KEY, REFER TO KKS NUMBERING SYSTEM (REFER TO PLANT IDENTIFICATION SYSTEM DESCRIPTION DOC.NO.198L-00GEN00-G02-0002)</p> <b>LEVEL '2' EQUIPMENT UNIT CODE (A<sub>1</sub> A<sub>2</sub> A<sub>3</sub> A<sub>4</sub>)</b> <b>EQUIPMENT UNIT CLASSIFICATION (A<sub>1</sub> A<sub>2</sub>)</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr><td>A</td><td>MECHANICAL EQUIPMENT</td></tr> <tr><td>AA</td><td>VALVES, DAMPER, ETC. (INCL. ACTUATORS, ALSO MANUAL, RUPURE DISK, EQUIPMENT)</td></tr> <tr><td>AB</td><td>ISOLATING ELEMENTS, AIR LOCKS</td></tr> <tr><td>AC</td><td>HEAT EXCHANGERS</td></tr> <tr><td>AE</td><td>TURNING, DRIVING, LIFTING AND SLEWING GEAR (INCL. MANIPULATORS)</td></tr> <tr><td>AF</td><td>CONTINUOUS CONVEYOR, FEEDERS (ESCALATORS)</td></tr> <tr><td>AG</td><td>GENERATOR UNITS</td></tr> <tr><td>AH</td><td>HEATING, COOLING UNITS</td></tr> <tr><td>AJ</td><td>SIZE REDUCTION EQUIPMENT</td></tr> <tr><td>AK</td><td>COMPACTING, PACKAGING EQUIPMENT</td></tr> <tr><td>AM</td><td>MIXERS, AGITATORS</td></tr> <tr><td>AN</td><td>COMPRESSOR UNITS, FANS, BLOWERS</td></tr> <tr><td>AP</td><td>PUMP UNITS</td></tr> <tr><td>AS</td><td>ADJUSTING AND TENSIONING EQUIPMENT</td></tr> <tr><td>AT</td><td>CLEANING, DRYING, FILTERING, SEPARATING EQUIPMENT</td></tr> <tr><td>AU</td><td>CONVERTORS (NON ELECTRICAL), E.G. SERVOMOTOR</td></tr> <tr><td>AV</td><td>COMBUSTION EQUIPMENT, E.G. GRATES</td></tr> <tr><td>AW</td><td>STATIONARY TOOLING, TREATMENT EQUIPMENT</td></tr> <tr><td>AX</td><td>TEST AND MONITORING EQUIPMENT</td></tr> <tr><td>AZ</td><td>SPECIAL EQUIPMENT UNITS</td></tr> </tbody> </table> <b>EQUIPMENT UNIT CLASSIFICATION (A<sub>1</sub> A<sub>2</sub> A<sub>3</sub> A<sub>4</sub>)</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr><td>B</td><td>MECHANICAL EQUIPMENT</td></tr> <tr><td>BB</td><td>VESSELS, STORAGE TANKS</td></tr> <tr><td>BE</td><td>SHAFTS (FOR ERECTION AND MAINTENANCE ONLY)</td></tr> <tr><td>BF</td><td>FOUNDATIONS</td></tr> <tr><td>BG</td><td>BOILER HEATING SURFACES</td></tr> <tr><td>BN</td><td>JET PUMPS, EJECTORS, INJECTORS</td></tr> <tr><td>BP</td><td>FLOW RESTRICTORS AND LIMITERS (INCL. RUPTURE DISCS), ORIFICES (NOT METERING ORIFICES)</td></tr> <tr><td>BQ</td><td>HANGERS, SUPPORTS, FRAMES, RACKS, PIPE PENETRATIONS</td></tr> <tr><td>BR</td><td>PIPING, DUCTWORK, CHUTES</td></tr> <tr><td>BS</td><td>SILENCERS</td></tr> <tr><td>BT</td><td>CATALYTIC CONVERTER MODULES</td></tr> <tr><td>BU</td><td>INSULATION, SHEETING</td></tr> <tr><td>BY</td><td>MECHANICALLY OPERATED CONTROLLERS (CONTROL UNITS)</td></tr> <tr><td>BZ</td><td>SPECIAL EQUIPMENT UNITS</td></tr> <tr><td>C</td><td>DIRECT MEASURING CIRCUITS</td></tr> <tr><td>CD</td><td>DENSITY</td></tr> <tr><td>CE</td><td>ELECTRICAL VARIABLES</td></tr> <tr><td>CF</td><td>FLOW RATE</td></tr> <tr><td>CG</td><td>DISTANCE, LENGTH, POSITION</td></tr> <tr><td>CK</td><td>TIME</td></tr> <tr><td>CL</td><td>LEVEL</td></tr> <tr><td>CM</td><td>MOISTURE, HUMIDITY</td></tr> <tr><td>CP</td><td>PRESSURE</td></tr> <tr><td>CQ</td><td>QUALITY VARIABLES (ANALYSIS, MATERIAL PROPERTIES)</td></tr> <tr><td>CR</td><td>RADIATION VARIABLES</td></tr> <tr><td>CS</td><td>VELOCITY, SPEED, FREQUENCY</td></tr> <tr><td>CT</td><td>TEMPERATURE</td></tr> <tr><td>CU</td><td>COMBINED VARIABLES</td></tr> <tr><td>CV</td><td>VISCOOSITY</td></tr> <tr><td>CW</td><td>WEIGHT, MASS</td></tr> <tr><td>CX</td><td>NEUTRON FLUX (REACTOR POWER)</td></tr> <tr><td>CY</td><td>VIBRATION, EXPANSION</td></tr> <tr><td>D</td><td>CLOSED LOOP CONTROL CIRCUITS</td></tr> <tr><td>DD</td><td>DENSITY</td></tr> <tr><td>DE</td><td>ELECTRICAL VARIABLES</td></tr> <tr><td>DF</td><td>FLOW RATE</td></tr> <tr><td>DG</td><td>DISTANCE, LENGTH, POSITION</td></tr> <tr><td>DK</td><td>TIME</td></tr> <tr><td>DL</td><td>LEVEL</td></tr> <tr><td>DM</td><td>MOISTURE, HUMIDITY</td></tr> <tr><td>DP</td><td>PRESSURE</td></tr> <tr><td>DQ</td><td>QUALITY VARIABLES (ANALYSIS, MATERIAL PROPERTIES)</td></tr> <tr><td>DR</td><td>RADIATION VARIABLES</td></tr> <tr><td>DS</td><td>VELOCITY, SPEED, FREQUENCY</td></tr> <tr><td>DT</td><td>TEMPERATURE</td></tr> <tr><td>DU</td><td>COMBINED VARIABLES</td></tr> <tr><td>DV</td><td>VISCOOSITY</td></tr> <tr><td>DW</td><td>WEIGHT, MASS</td></tr> <tr><td>DX</td><td>NEUTRON FLUX (REACTOR POWER)</td></tr> <tr><td>DY</td><td>VIBRATION, EXPANSION</td></tr> <tr><td>E</td><td>ANALOG AND BINARY SIGNAL CONDITIONING</td></tr> <tr><td>EA</td><td>OPEN-LOOP CONTROL</td></tr> <tr><td>EB</td><td>SUBDIVISION</td></tr> <tr><td>EC</td><td>POSSIBLE</td></tr> <tr><td>ED</td><td>AS REQUIRED</td></tr> <tr><td>EE</td><td></td></tr> <tr><td>EG</td><td>ALARM, ANNUNCIATION</td></tr> <tr><td>EH</td><td>SUBDIVISION</td></tr> <tr><td>EJ</td><td>POSSIBLE</td></tr> <tr><td>EK</td><td>AS REQUIRED</td></tr> <tr><td>EM</td><td>PROCESS COMPUTER</td></tr> <tr><td>EN</td><td>SUBDIVISION</td></tr> <tr><td>EP</td><td>POSSIBLE</td></tr> <tr><td>EQ</td><td>AS REQUIRED</td></tr> <tr><td>ER</td><td>REACTOR PROTECTION</td></tr> <tr><td>EU</td><td>COMBINED ANALOG AND BINARY SIGNAL CONDITIONING</td></tr> <tr><td>EW</td><td>PROTECTION</td></tr> <tr><td>EX</td><td>SUBDIVISION</td></tr> <tr><td>EY</td><td>POSSIBLE</td></tr> <tr><td>EZ</td><td>AS REQUIRED</td></tr> <tr><td>F</td><td>INDIRECT MEASURING CIRCUITS</td></tr> <tr><td>FD</td><td>DENSITY</td></tr> <tr><td>FE</td><td>ELECTRICAL VARIABLES</td></tr> <tr><td>FF</td><td>FLOW, RATE</td></tr> <tr><td>FG</td><td>DISTANCE, LENGTH, POSITION</td></tr> <tr><td>FK</td><td>TIME</td></tr> <tr><td>FL</td><td>LEVEL</td></tr> <tr><td>FM</td><td>MOISTURE, HUMIDITY</td></tr> <tr><td>FP</td><td>PRESSURE</td></tr> <tr><td>FQ</td><td>QUALITY VARIABLES (ANALYSIS, MATERIAL, PROPERTIES)</td></tr> <tr><td>FR</td><td>RADIATION VARIABLES</td></tr> <tr><td>FS</td><td>VELOCITY, SPEED, FREQUENCY</td></tr> <tr><td>FT</td><td>TEMPERATURE</td></tr> <tr><td>FU</td><td>COMBINED VARIABLES</td></tr> <tr><td>FV</td><td>VISCOOSITY</td></tr> <tr><td>FW</td><td>WEIGHT, MASS</td></tr> <tr><td>FX</td><td>NEUTRON FLUX (REACTOR POWER)</td></tr> <tr><td>FY</td><td>VIBRATION, EXPANSION</td></tr> </tbody> </table> <b>EQUIPMENT UNIT CLASSIFICATION (A<sub>1</sub> A<sub>2</sub> A<sub>3</sub> A<sub>4</sub>)</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr><td>G</td><td>ELECTRICAL EQUIPMENT</td></tr> <tr><td>GA</td><td>JUNCTION BOXES FOR ANALOG MEASURED DATA</td></tr> <tr><td>GB</td><td>JUNCTION BOXES FOR BINARY SIGNALS</td></tr> <tr><td>GC</td><td>JUNCTION BOXES FOR ANALOG SAFETY I&amp;C (SIL) MEASURED DATA</td></tr> <tr><td>GD</td><td>JUNCTION BOXES FOR POWER CABLES &gt; 1 KV</td></tr> <tr><td>GE</td><td>JUNCTION BOXES FOR POWER CABLES &lt; 1 KV</td></tr> <tr><td>GF</td><td>JUNCTION BOXES FOR OPERATIONAL I&amp;C (BELT) MEASURED DATA</td></tr> <tr><td>GG</td><td>JUNCTION BOXES FOR THERMOCOUPLES</td></tr> <tr><td>GH</td><td>ELECTRICAL AND INSTRUMENTATION AND CONTROL INSTALLATION UNITS (E.G. CUBICLES, BOXES)</td></tr> <tr><td>GK</td><td>INFORMATION DISPLAY AND OPERATOR CONTROL EQUIPMENT FOR PROCESS COMPUTERS AND AUTOMATION SYSTEMS (KEYBOARDS, MONITORS, PRINTERS)</td></tr> <tr><td>GM</td><td>JUNCTION BOXES FOR LIGHT CURRENT SYSTEMS OF NATIONAL TELECOMMUNICATIONS SERVICES</td></tr> <tr><td>GN</td><td>NETWORKING EQUIPMENT (BUS COUPLERS AND OPTIC TRANSCIVERS, ETC.)</td></tr> <tr><td>GP</td><td>SUBDISTRIBUTION/JUNCTION BOXES FOR LIGHTING</td></tr> <tr><td>GQ</td><td>SUBDISTRIBUTION/JUNCTION BOXES FOR POWER SOCKETS</td></tr> <tr><td>GR</td><td>DC GENERATING EQUIPMENT (BATTERIES)</td></tr> <tr><td>GS</td><td>SWITCHGEAR EQUIPMENT (IF NOT IDENTIFIED UNDER PROCESS EQUIPMENT)</td></tr> <tr><td>GT</td><td>TRANSFORMER EQUIPMENT</td></tr> <tr><td>GU</td><td>CONVERTOR EQUIPMENT</td></tr> <tr><td>GV</td><td>STRUCTURE-RELATED EARTHING AND LIGHTNING PROTECTION EQUIPMENT, SURGE ARRESTORS</td></tr> <tr><td>GW</td><td>CABINET POWER SUPPLY EQUIPMENT</td></tr> <tr><td>GX</td><td>ACTUATING EQUIPMENT FOR ELECTRICAL VARIABLES</td></tr> <tr><td>GY</td><td>JUNCTION BOXES FOR LIGHT CURRENT SYSTEMS (NOT OF NATIONAL TELECOMMUNICATIONS SERVICES)</td></tr> <tr><td>GZ</td><td>HANGERS, SUPPORTS AND RACKS FOR ELECTRICAL AND JUNCTION BOXES FOR LIGHT CURRENT SYSTEMS INSTRUMENTATION AND CONTROL EQUIPMENT</td></tr> </tbody> </table> <b>1.3.2 EQUIPMENT UNIT NUMBERING</b> FOR THE A. NUMBERING OF VALVES (AA....), PIPING (BR....) AN MEASURING CIRCUITS (C....) THE FOLLOWING NUMBERING LOGIC WILL BE USED. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NUMBER RANGE</th> <th>VALVES (AA...)</th> <th>PIPES (BR...)</th> <th>MEASURING CIRCUITS (C...)</th> </tr> </thead> <tbody> <tr><td>001-050</td><td>MOTOR OPERATED VALVES</td><td>MAIN PIPES</td><td>001-079 : ANALOG MEASUREMENT</td></tr> <tr><td>051-080</td><td>CHECK VALVES</td><td></td><td></td></tr> <tr><td>081-100</td><td>CONTROL VALVES</td><td>NOT USED</td><td></td></tr> <tr><td>101-190</td><td>VALVES IN MAIN PIPES</td><td></td><td></td></tr> <tr><td>191-199</td><td>SAFETY VALVES</td><td>UPSTREAM AND DOWNSTREAM LINES OF SAFETY AND PRESSURE RELIEF VALVES</td><td>080-099 : BINARY MEASUREMENT</td></tr> <tr><td>201-249</td><td>CHECK VALVES</td><td>NOT USED</td><td></td></tr> <tr><td>251-299</td><td>NOT USED</td><td></td><td>FOR TESTING EQUIPMENT</td></tr> <tr><td>301-399</td><td>ISOLATING EQUIPMENT FOR MEASURING</td><td>PRESSURE LINES FOR MEASUREMENT</td><td>NOT USED</td></tr> <tr><td>401-499</td><td>VALVES IN DRAINS AND FLUSHING PIPES</td><td>DRAINS, FLUSHING PIPES, PRESSURE SUPPRESSION PIPES</td><td>ACCEPTANCE TESTS</td></tr> <tr><td>501-599</td><td>VALVES FOR VENTING</td><td>VENTING</td><td>LOCAL MEASURING CIRCUITS</td></tr> <tr><td>601-699</td><td>VALVES IN SAMPLING AND PROPORTIONING</td><td>SAMPLING AND PROPORTIONING PIPES</td><td>ELEMENT (SENSORS)</td></tr> <tr><td>701-799</td><td>VALVES FOR INTERNAL CONTROLS</td><td>INTERNAL CONTROL PIPES</td><td>BLOCKED</td></tr> <tr><td>801-899</td><td>NOT USED</td><td>NOT USED</td><td>BLOCKED</td></tr> <tr><td>901-999</td><td>NOT USED</td><td>NOT USED</td><td>GROUPED MEASURING CIRCUITS (e.g. MULTIPONT SELECTOR SWITCHED, MULTI CHANNEL RECORDERS)</td></tr> </tbody> </table> <b>PIPING IDENTIFICATION</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2"></th> <th>EXAMPLE</th> </tr> </thead> <tbody> <tr> <td>DIRECTION OF FLOW</td> <td>DIRECTION OF FLOW</td> <td>PLANT CODE 22LAB50 SYSTEM CODE BR001 LINE NUMBER DNXXX-HBD1 PIPE DESIGNATION NOMINAL DIAMETER(DN) PIPE</td> </tr> <tr> <td>FLOW FOR BOTH DIRECTION</td> <td></td> <td></td> </tr> </tbody> </table> <b>REFERENCE DOCUMENTS/DRAWINGS</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DOC/DWG NO.</th> <th>TITLE</th> </tr> </thead> <tbody> <tr><td>JCP2-DA01-00ZEN-020001</td><td>DOCUMENT IDENTIFICATION</td></tr> <tr><td>JCP2-DA01-00ZEN-020002</td><td>EQUIPMENT AND SYSTEM IDENTIFICATION</td></tr> </tbody> </table> <b>FOR APPROVAL</b> <p>THIS DRAWING IS THE PROPERTY OF DOOSAN ENERBILITY CO., LTD. IT IS NOT TO BE COPIED OR USED IN ANY WAY DEDIMENTAL TO THE COMPANY.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>B</td> <td>30.May.2025</td> <td>ISSUED FOR APPROVAL</td> <td>Y.J.KIM</td> <td>C.K.HONG</td> </tr> <tr> <td>A</td> <td>25.Apr.2025</td> <td>ISSUED FOR APPROVAL</td> <td>Y.J.KIM</td> <td>C.K.HONG</td> </tr> <tr> <td>REV. NO.</td> <td>DATE</td> <td>DESCRIPTION</td> <td>DRAWN</td> <td>CHKD.</td> </tr> </table> <p>Project: <b>JAFURAH COGENERATION PROJECT - PHASE II EXPANSION</b></p> <p>Owner: <b>KEPCO POWER COMPANY</b></p> <p>Owner's Engineer: <b>WSP</b></p> <p>Contractor: <b>DOOSAN DOOSAN ENERBILITY</b></p> <p>Sub-Supplier: <b>HYUNDAI POWER SYSTEMS</b></p> <p>DRAWING TITLE: <b>AUX BOILER PIPING &amp; INSTRUMENT DIAGRAM</b></p> <p>SYMBOL AND LEGEND (4/4)</p> <p>GRAPHIC SCALE: 0 5 10 25 50 100 200m</p> <p>SCALE: 1:1</p> <p>DRAWING NUMBER: JCP2-XG02-22ZEN-121101</p> <p>HEET NO.: 4/4</p> <p>REV. NO.: A</p>										PLANT SECTION	ENTRY	PLANT COMMON	02	STG & AUXILIARY SYSTEM	20	GT/HSG UNIT	21	RESERVE BOILER #1	22	RESERVE BOILER #2	23	RESERVE BOILER #3	24	CODE	IDENTIFICATION	A	GRID AND DISTRIBUTION SYSTEMS	B	POWER TRANSMISSION AND AUXILIARY POWER SUPPLY	C	INSTRUMENTATION AND CONTROL EQUIPMENT (IDENTIFICATION ON A PRIORITY BASIS ACCORDING TO MAIN, INSTRUMENTATION AND CONTROL FUNCTION ALSO ACCEPTABLE IN COMPOSITE STRUCTURE HARDWARE PACKAGING SYSTEMS.)	D	INSTRUMENTATION AND CONTROL EQUIPMENT (FOR USE ONLY WHEN THE FUNCTION KEYS CM TO CT ARE INSUFFICIENT FOR THE IDENTIFICATION)	E	CONVENTIONAL FUEL SUPPLY AND RESIDUES DISPOSAL	F	WATER SUPPLY AND DISPOSAL	G	CONVENTIONAL HEAT GENERATION	H	STEAM, WATER, GAS CYCLES	I	MAIN MACHINE SETS	J	PROCESS ENERGY SUPPLIED FOR EXTERNAL USERS (e.g. DISTRICT HEATING)	K	COOLING WATER SYSTEMS	L	AUXILIARY SYSTEMS	M	ANCILLARY SYSTEMS	N	STRUCTURES	O	RENEWABLE ENERGY PLANTS	P	HEAVY MACHINERY (NOT MAIN MACHINES SETS)	Q	WORKSHOP AND OFFICE EQUIPMENT	A	MECHANICAL EQUIPMENT	AA	VALVES, DAMPER, ETC. (INCL. ACTUATORS, ALSO MANUAL, RUPURE DISK, EQUIPMENT)	AB	ISOLATING ELEMENTS, AIR LOCKS	AC	HEAT EXCHANGERS	AE	TURNING, DRIVING, LIFTING AND SLEWING GEAR (INCL. MANIPULATORS)	AF	CONTINUOUS CONVEYOR, FEEDERS (ESCALATORS)	AG	GENERATOR UNITS	AH	HEATING, COOLING UNITS	AJ	SIZE REDUCTION EQUIPMENT	AK	COMPACTING, PACKAGING EQUIPMENT	AM	MIXERS, AGITATORS	AN	COMPRESSOR UNITS, FANS, BLOWERS	AP	PUMP UNITS	AS	ADJUSTING AND TENSIONING EQUIPMENT	AT	CLEANING, DRYING, FILTERING, SEPARATING EQUIPMENT	AU	CONVERTORS (NON ELECTRICAL), E.G. SERVOMOTOR	AV	COMBUSTION EQUIPMENT, E.G. GRATES	AW	STATIONARY TOOLING, TREATMENT EQUIPMENT	AX	TEST AND MONITORING EQUIPMENT	AZ	SPECIAL EQUIPMENT UNITS	B	MECHANICAL EQUIPMENT	BB	VESSELS, STORAGE TANKS	BE	SHAFTS (FOR ERECTION AND MAINTENANCE ONLY)	BF	FOUNDATIONS	BG	BOILER HEATING SURFACES	BN	JET PUMPS, EJECTORS, INJECTORS	BP	FLOW RESTRICTORS AND LIMITERS (INCL. RUPTURE DISCS), ORIFICES (NOT METERING ORIFICES)	BQ	HANGERS, SUPPORTS, FRAMES, RACKS, PIPE PENETRATIONS	BR	PIPING, DUCTWORK, CHUTES	BS	SILENCERS	BT	CATALYTIC CONVERTER MODULES	BU	INSULATION, SHEETING	BY	MECHANICALLY OPERATED CONTROLLERS (CONTROL UNITS)	BZ	SPECIAL EQUIPMENT UNITS	C	DIRECT MEASURING CIRCUITS	CD	DENSITY	CE	ELECTRICAL VARIABLES	CF	FLOW RATE	CG	DISTANCE, LENGTH, POSITION	CK	TIME	CL	LEVEL	CM	MOISTURE, HUMIDITY	CP	PRESSURE	CQ	QUALITY VARIABLES (ANALYSIS, MATERIAL PROPERTIES)	CR	RADIATION VARIABLES	CS	VELOCITY, SPEED, FREQUENCY	CT	TEMPERATURE	CU	COMBINED VARIABLES	CV	VISCOOSITY	CW	WEIGHT, MASS	CX	NEUTRON FLUX (REACTOR POWER)	CY	VIBRATION, EXPANSION	D	CLOSED LOOP CONTROL CIRCUITS	DD	DENSITY	DE	ELECTRICAL VARIABLES	DF	FLOW RATE	DG	DISTANCE, LENGTH, POSITION	DK	TIME	DL	LEVEL	DM	MOISTURE, HUMIDITY	DP	PRESSURE	DQ	QUALITY VARIABLES (ANALYSIS, MATERIAL PROPERTIES)	DR	RADIATION VARIABLES	DS	VELOCITY, SPEED, FREQUENCY	DT	TEMPERATURE	DU	COMBINED VARIABLES	DV	VISCOOSITY	DW	WEIGHT, MASS	DX	NEUTRON FLUX (REACTOR POWER)	DY	VIBRATION, EXPANSION	E	ANALOG AND BINARY SIGNAL CONDITIONING	EA	OPEN-LOOP CONTROL	EB	SUBDIVISION	EC	POSSIBLE	ED	AS REQUIRED	EE		EG	ALARM, ANNUNCIATION	EH	SUBDIVISION	EJ	POSSIBLE	EK	AS REQUIRED	EM	PROCESS COMPUTER	EN	SUBDIVISION	EP	POSSIBLE	EQ	AS REQUIRED	ER	REACTOR PROTECTION	EU	COMBINED ANALOG AND BINARY SIGNAL CONDITIONING	EW	PROTECTION	EX	SUBDIVISION	EY	POSSIBLE	EZ	AS REQUIRED	F	INDIRECT MEASURING CIRCUITS	FD	DENSITY	FE	ELECTRICAL VARIABLES	FF	FLOW, RATE	FG	DISTANCE, LENGTH, POSITION	FK	TIME	FL	LEVEL	FM	MOISTURE, HUMIDITY	FP	PRESSURE	FQ	QUALITY VARIABLES (ANALYSIS, MATERIAL, PROPERTIES)	FR	RADIATION VARIABLES	FS	VELOCITY, SPEED, FREQUENCY	FT	TEMPERATURE	FU	COMBINED VARIABLES	FV	VISCOOSITY	FW	WEIGHT, MASS	FX	NEUTRON FLUX (REACTOR POWER)	FY	VIBRATION, EXPANSION	G	ELECTRICAL EQUIPMENT	GA	JUNCTION BOXES FOR ANALOG MEASURED DATA	GB	JUNCTION BOXES FOR BINARY SIGNALS	GC	JUNCTION BOXES FOR ANALOG SAFETY I&C (SIL) MEASURED DATA	GD	JUNCTION BOXES FOR POWER CABLES > 1 KV	GE	JUNCTION BOXES FOR POWER CABLES < 1 KV	GF	JUNCTION BOXES FOR OPERATIONAL I&C (BELT) MEASURED DATA	GG	JUNCTION BOXES FOR THERMOCOUPLES	GH	ELECTRICAL AND INSTRUMENTATION AND CONTROL INSTALLATION UNITS (E.G. CUBICLES, BOXES)	GK	INFORMATION DISPLAY AND OPERATOR CONTROL EQUIPMENT FOR PROCESS COMPUTERS AND AUTOMATION SYSTEMS (KEYBOARDS, MONITORS, PRINTERS)	GM	JUNCTION BOXES FOR LIGHT CURRENT SYSTEMS OF NATIONAL TELECOMMUNICATIONS SERVICES	GN	NETWORKING EQUIPMENT (BUS COUPLERS AND OPTIC TRANSCIVERS, ETC.)	GP	SUBDISTRIBUTION/JUNCTION BOXES FOR LIGHTING	GQ	SUBDISTRIBUTION/JUNCTION BOXES FOR POWER SOCKETS	GR	DC GENERATING EQUIPMENT (BATTERIES)	GS	SWITCHGEAR EQUIPMENT (IF NOT IDENTIFIED UNDER PROCESS EQUIPMENT)	GT	TRANSFORMER EQUIPMENT	GU	CONVERTOR EQUIPMENT	GV	STRUCTURE-RELATED EARTHING AND LIGHTNING PROTECTION EQUIPMENT, SURGE ARRESTORS	GW	CABINET POWER SUPPLY EQUIPMENT	GX	ACTUATING EQUIPMENT FOR ELECTRICAL VARIABLES	GY	JUNCTION BOXES FOR LIGHT CURRENT SYSTEMS (NOT OF NATIONAL TELECOMMUNICATIONS SERVICES)	GZ	HANGERS, SUPPORTS AND RACKS FOR ELECTRICAL AND JUNCTION BOXES FOR LIGHT CURRENT SYSTEMS INSTRUMENTATION AND CONTROL EQUIPMENT	NUMBER RANGE	VALVES (AA...)	PIPES (BR...)	MEASURING CIRCUITS (C...)	001-050	MOTOR OPERATED VALVES	MAIN PIPES	001-079 : ANALOG MEASUREMENT	051-080	CHECK VALVES			081-100	CONTROL VALVES	NOT USED		101-190	VALVES IN MAIN PIPES			191-199	SAFETY VALVES	UPSTREAM AND DOWNSTREAM LINES OF SAFETY AND PRESSURE RELIEF VALVES	080-099 : BINARY MEASUREMENT	201-249	CHECK VALVES	NOT USED		251-299	NOT USED		FOR TESTING EQUIPMENT	301-399	ISOLATING EQUIPMENT FOR MEASURING	PRESSURE LINES FOR MEASUREMENT	NOT USED	401-499	VALVES IN DRAINS AND FLUSHING PIPES	DRAINS, FLUSHING PIPES, PRESSURE SUPPRESSION PIPES	ACCEPTANCE TESTS	501-599	VALVES FOR VENTING	VENTING	LOCAL MEASURING CIRCUITS	601-699	VALVES IN SAMPLING AND PROPORTIONING	SAMPLING AND PROPORTIONING PIPES	ELEMENT (SENSORS)	701-799	VALVES FOR INTERNAL CONTROLS	INTERNAL CONTROL PIPES	BLOCKED	801-899	NOT USED	NOT USED	BLOCKED	901-999	NOT USED	NOT USED	GROUPED MEASURING CIRCUITS (e.g. MULTIPONT SELECTOR SWITCHED, MULTI CHANNEL RECORDERS)			EXAMPLE	DIRECTION OF FLOW	DIRECTION OF FLOW	PLANT CODE 22LAB50 SYSTEM CODE BR001 LINE NUMBER DNXXX-HBD1 PIPE DESIGNATION NOMINAL DIAMETER(DN) PIPE	FLOW FOR BOTH DIRECTION			DOC/DWG NO.	TITLE	JCP2-DA01-00ZEN-020001	DOCUMENT IDENTIFICATION	JCP2-DA01-00ZEN-020002	EQUIPMENT AND SYSTEM IDENTIFICATION	B	30.May.2025	ISSUED FOR APPROVAL	Y.J.KIM	C.K.HONG	A	25.Apr.2025	ISSUED FOR APPROVAL	Y.J.KIM	C.K.HONG	REV. NO.	DATE	DESCRIPTION	DRAWN	CHKD.
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GC	JUNCTION BOXES FOR ANALOG SAFETY I&C (SIL) MEASURED DATA																																																																																																																																																																																																																																																																																																																																																																																																																										
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GF	JUNCTION BOXES FOR OPERATIONAL I&C (BELT) MEASURED DATA																																																																																																																																																																																																																																																																																																																																																																																																																										
GG	JUNCTION BOXES FOR THERMOCOUPLES																																																																																																																																																																																																																																																																																																																																																																																																																										
GH	ELECTRICAL AND INSTRUMENTATION AND CONTROL INSTALLATION UNITS (E.G. CUBICLES, BOXES)																																																																																																																																																																																																																																																																																																																																																																																																																										
GK	INFORMATION DISPLAY AND OPERATOR CONTROL EQUIPMENT FOR PROCESS COMPUTERS AND AUTOMATION SYSTEMS (KEYBOARDS, MONITORS, PRINTERS)																																																																																																																																																																																																																																																																																																																																																																																																																										
GM	JUNCTION BOXES FOR LIGHT CURRENT SYSTEMS OF NATIONAL TELECOMMUNICATIONS SERVICES																																																																																																																																																																																																																																																																																																																																																																																																																										
GN	NETWORKING EQUIPMENT (BUS COUPLERS AND OPTIC TRANSCIVERS, ETC.)																																																																																																																																																																																																																																																																																																																																																																																																																										
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GR	DC GENERATING EQUIPMENT (BATTERIES)																																																																																																																																																																																																																																																																																																																																																																																																																										
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GZ	HANGERS, SUPPORTS AND RACKS FOR ELECTRICAL AND JUNCTION BOXES FOR LIGHT CURRENT SYSTEMS INSTRUMENTATION AND CONTROL EQUIPMENT																																																																																																																																																																																																																																																																																																																																																																																																																										
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001-050	MOTOR OPERATED VALVES	MAIN PIPES	001-079 : ANALOG MEASUREMENT																																																																																																																																																																																																																																																																																																																																																																																																																								
051-080	CHECK VALVES																																																																																																																																																																																																																																																																																																																																																																																																																										
081-100	CONTROL VALVES	NOT USED																																																																																																																																																																																																																																																																																																																																																																																																																									
101-190	VALVES IN MAIN PIPES																																																																																																																																																																																																																																																																																																																																																																																																																										
191-199	SAFETY VALVES	UPSTREAM AND DOWNSTREAM LINES OF SAFETY AND PRESSURE RELIEF VALVES	080-099 : BINARY MEASUREMENT																																																																																																																																																																																																																																																																																																																																																																																																																								
201-249	CHECK VALVES	NOT USED																																																																																																																																																																																																																																																																																																																																																																																																																									
251-299	NOT USED		FOR TESTING EQUIPMENT																																																																																																																																																																																																																																																																																																																																																																																																																								
301-399	ISOLATING EQUIPMENT FOR MEASURING	PRESSURE LINES FOR MEASUREMENT	NOT USED																																																																																																																																																																																																																																																																																																																																																																																																																								
401-499	VALVES IN DRAINS AND FLUSHING PIPES	DRAINS, FLUSHING PIPES, PRESSURE SUPPRESSION PIPES	ACCEPTANCE TESTS																																																																																																																																																																																																																																																																																																																																																																																																																								
501-599	VALVES FOR VENTING	VENTING	LOCAL MEASURING CIRCUITS																																																																																																																																																																																																																																																																																																																																																																																																																								
601-699	VALVES IN SAMPLING AND PROPORTIONING	SAMPLING AND PROPORTIONING PIPES	ELEMENT (SENSORS)																																																																																																																																																																																																																																																																																																																																																																																																																								
701-799	VALVES FOR INTERNAL CONTROLS	INTERNAL CONTROL PIPES	BLOCKED																																																																																																																																																																																																																																																																																																																																																																																																																								
801-899	NOT USED	NOT USED	BLOCKED																																																																																																																																																																																																																																																																																																																																																																																																																								
901-999	NOT USED	NOT USED	GROUPED MEASURING CIRCUITS (e.g. MULTIPONT SELECTOR SWITCHED, MULTI CHANNEL RECORDERS)																																																																																																																																																																																																																																																																																																																																																																																																																								
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DIRECTION OF FLOW	DIRECTION OF FLOW	PLANT CODE 22LAB50 SYSTEM CODE BR001 LINE NUMBER DNXXX-HBD1 PIPE DESIGNATION NOMINAL DIAMETER(DN) PIPE																																																																																																																																																																																																																																																																																																																																																																																																																									
FLOW FOR BOTH DIRECTION																																																																																																																																																																																																																																																																																																																																																																																																																											
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JCP2-DA01-00ZEN-020001	DOCUMENT IDENTIFICATION																																																																																																																																																																																																																																																																																																																																																																																																																										
JCP2-DA01-00ZEN-020002	EQUIPMENT AND SYSTEM IDENTIFICATION																																																																																																																																																																																																																																																																																																																																																																																																																										
B	30.May.2025	ISSUED FOR APPROVAL	Y.J.KIM	C.K.HONG																																																																																																																																																																																																																																																																																																																																																																																																																							
A	25.Apr.2025	ISSUED FOR APPROVAL	Y.J.KIM	C.K.HONG																																																																																																																																																																																																																																																																																																																																																																																																																							
REV. NO.	DATE	DESCRIPTION	DRAWN	CHKD.																																																																																																																																																																																																																																																																																																																																																																																																																							







NOTE

1. THIS P&ID IS IDENTICAL FOR UNIT 22(BOILER #1), UNIT 23(BOILER #2) AND  
UNIT 24(BOILER #3). Example of STEAM DRUM,  
Boiler #1 : 22HAD10BB001  
Boiler #2 : 23HAD10BB001  
Boiler #3 : 24HAD10BB001

## LEGEND

NO.	DESCRIPTION	REMARK
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## REFERENCE DOCUMENTS/DRAWINGS

DOC/DWG NO.	TITLE
JCP2-XG02-22ZEN-121101	AUX BOILER SYMBOL & LEGEND P&ID
JCP2-XG02-22ZEN-121103	AUX BOILER STEAM SYSTEM P&ID
JCP2-XG02-22ZEN-121104	AUX BOILER AIR & GAS SYSTEM P&ID
JCP2-XG05-22ZEN-121002	AUX BOILER - HEAT AND MATERIAL BALANCE DIAGRAM

## FOR APPROVAL

THIS DRAWING IS THE PROPERTY OF DOOSAN ENERBILITY CO., LTD.  
IT IS NOT TO BE COPIED OR USED IN ANY WAY DEDIMENTAL TO THE COMPANY.

B	Jun.2025	ISSUED FOR APPROVAL	Y.J.KIM	C.K.HONG
A	25-Apr-2025	ISSUED FOR APPROVAL	Y.J.KIM	C.K.HONG
REV. NO.	DATE	DESCRIPTION	DRAWN	CHKD. APPD.

## Project

JAFURAH COGENERATION PROJECT - PHASE II EXPANSION

Owner Owner's Engineer 

Contractor DOOSAN ENERBILITY

Sub-Supplier HYUNDAI POWER SYSTEMS

## DRAWING TITLE

AUX BOILER

PIPING &amp; INSTRUMENT DIAGRAM

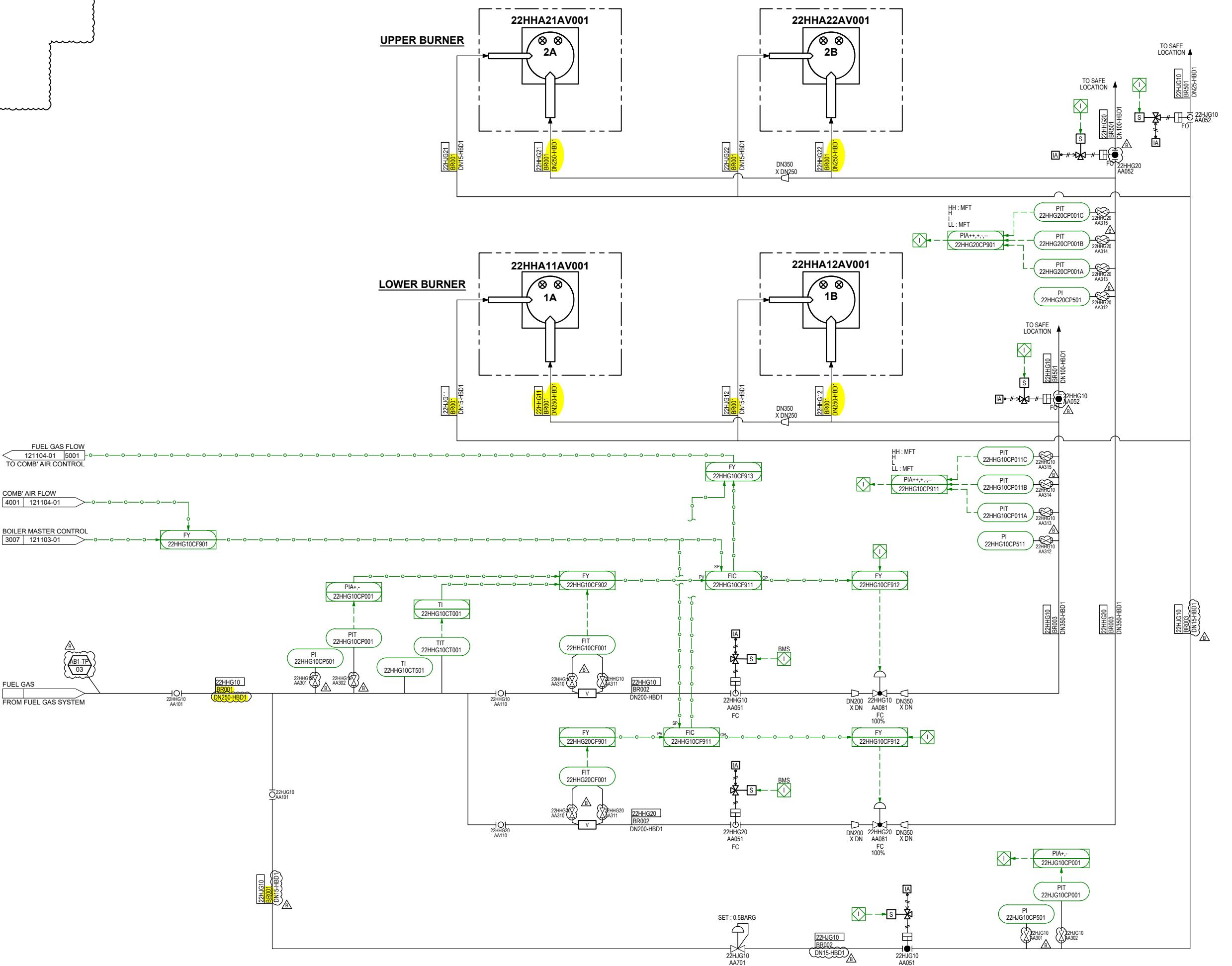
BURNER SYSTEM (1/2)

SCALE 1:1

DRAWING NUMBER JCP2-XG02-22ZEN-121105

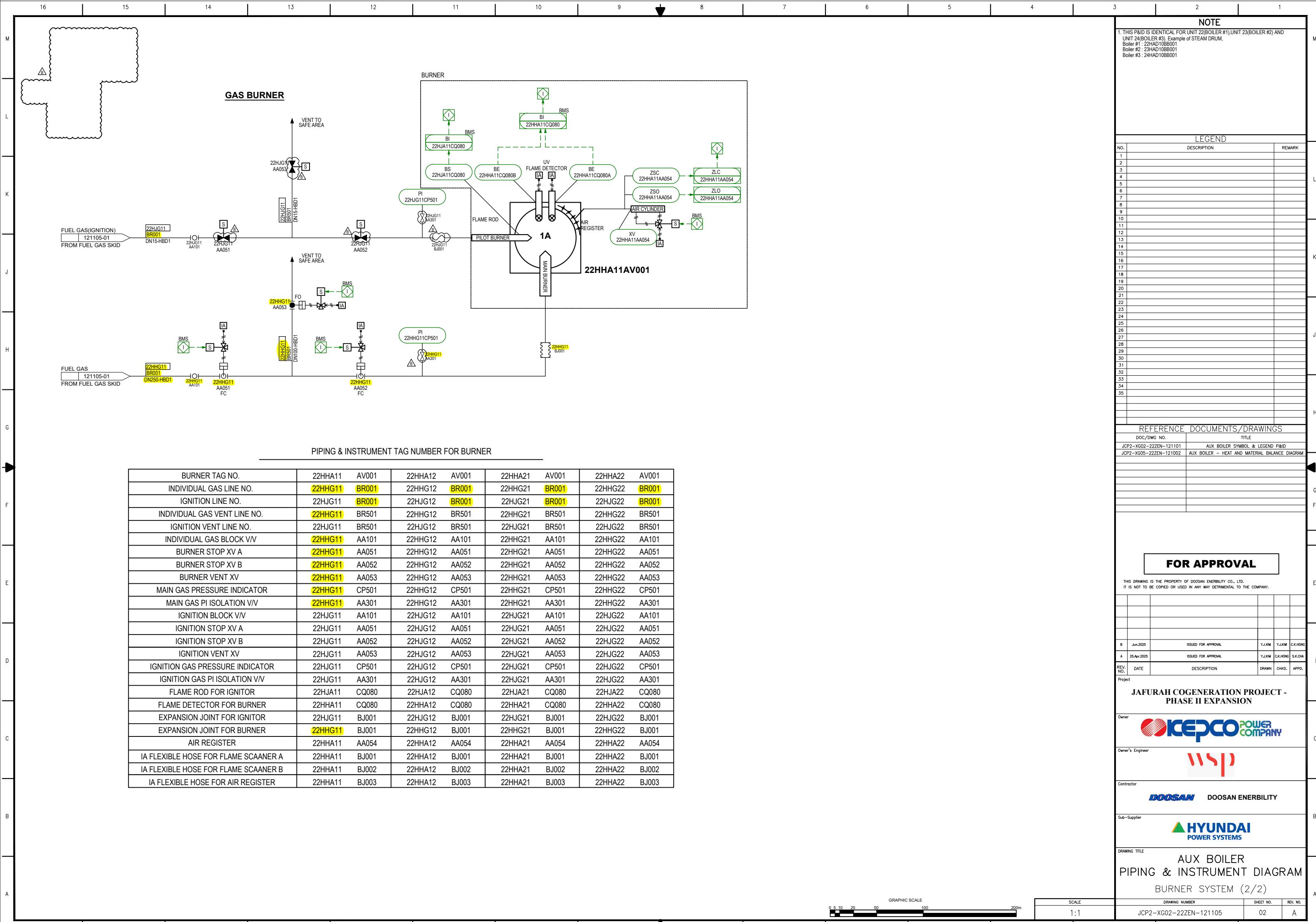
SHEET NO. 01

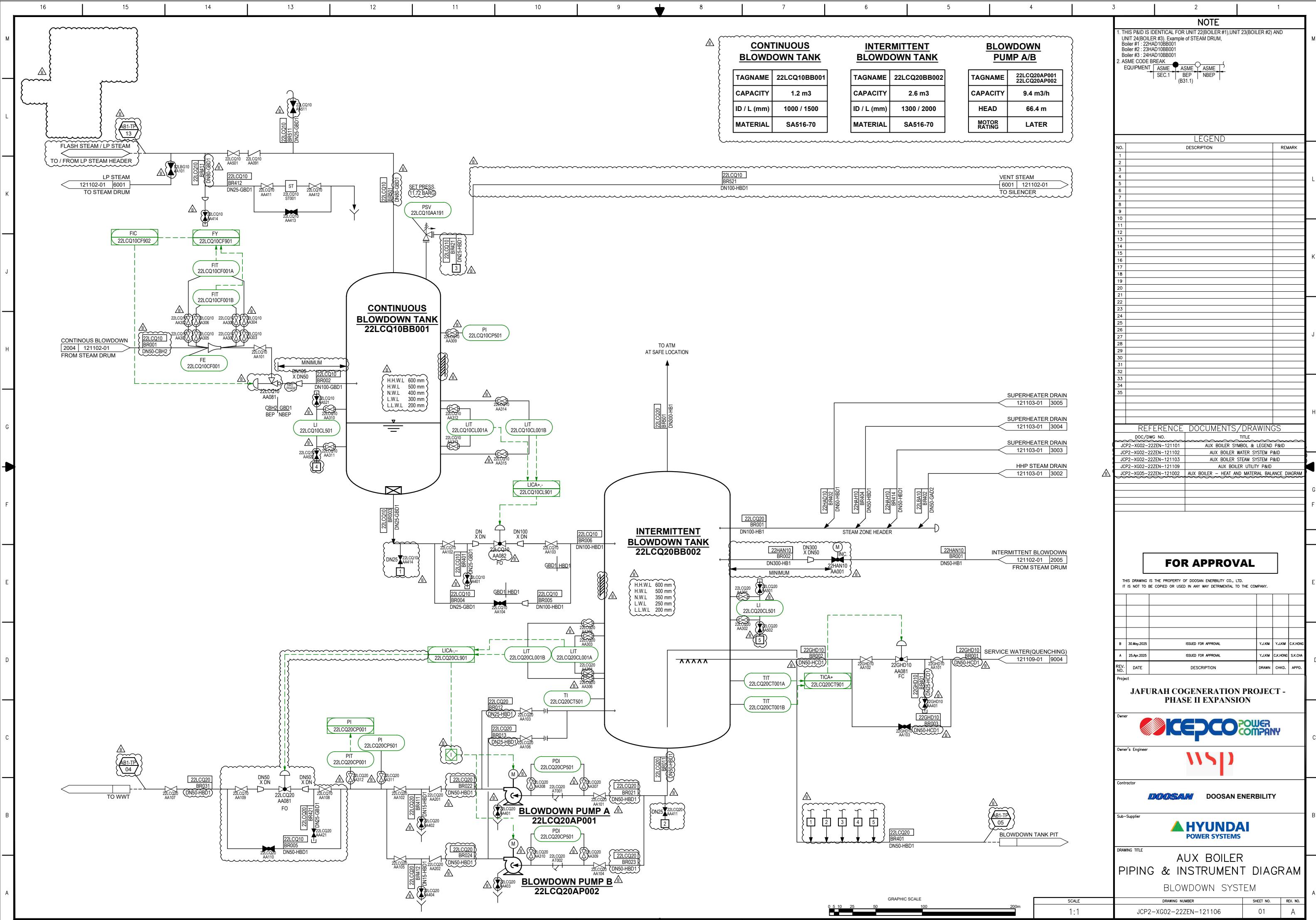
REV. NO. A

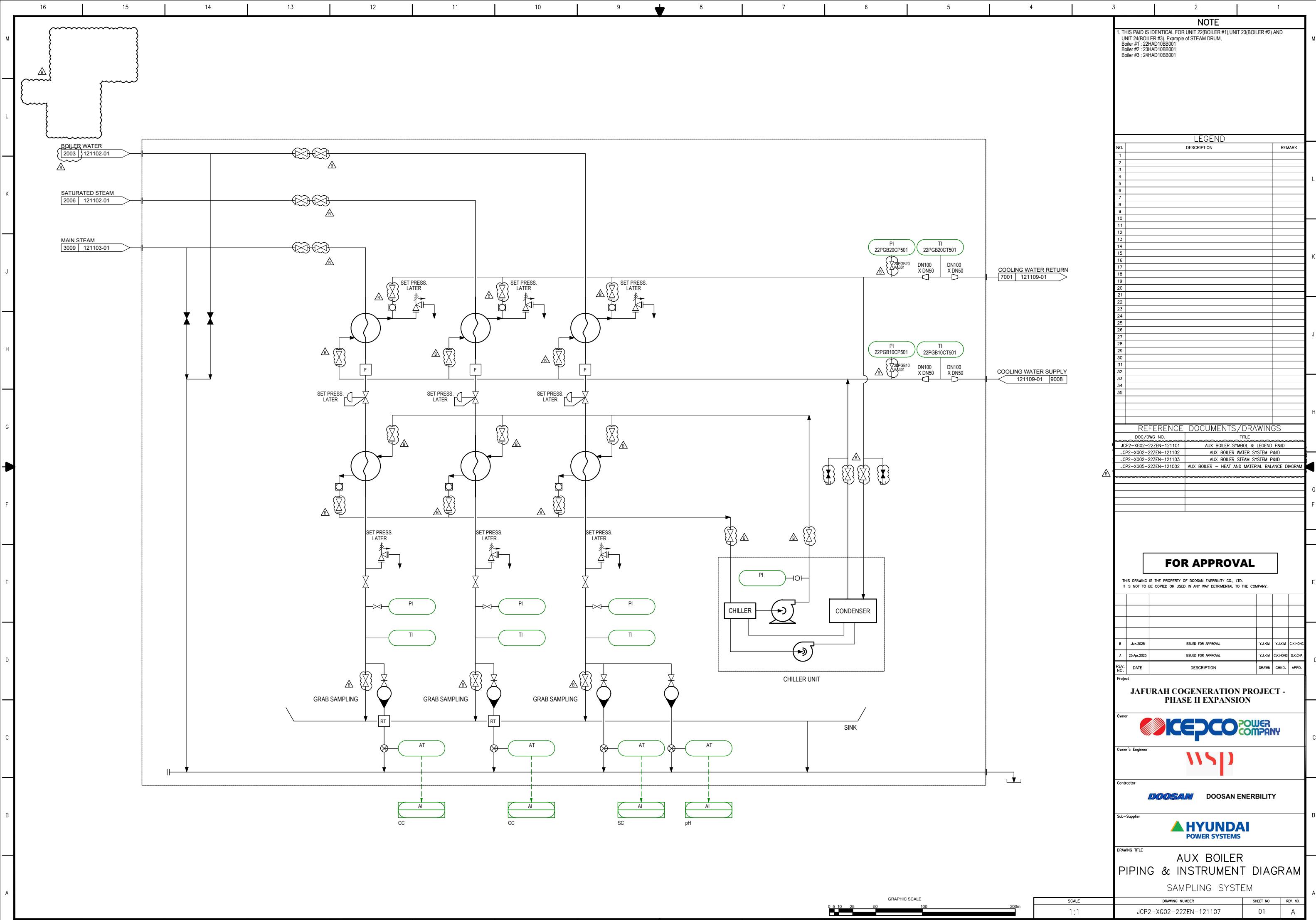


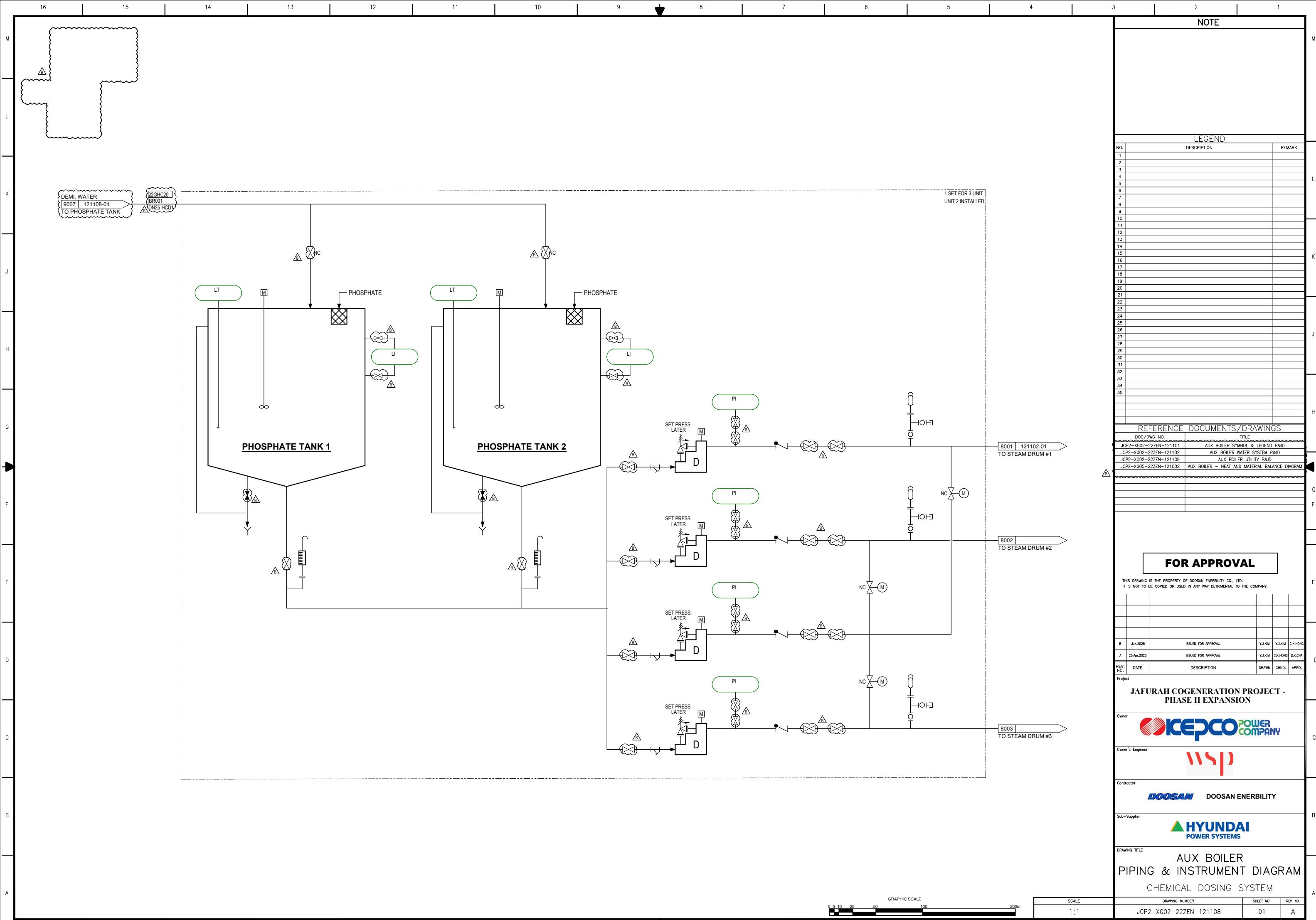
GRAPHIC SCALE  
0 5 10 25 50 100 200m

SCALE 1:1  
DRAWING NUMBER JCP2-XG02-22ZEN-121105  
SHEET NO. 01  
REV. NO. A

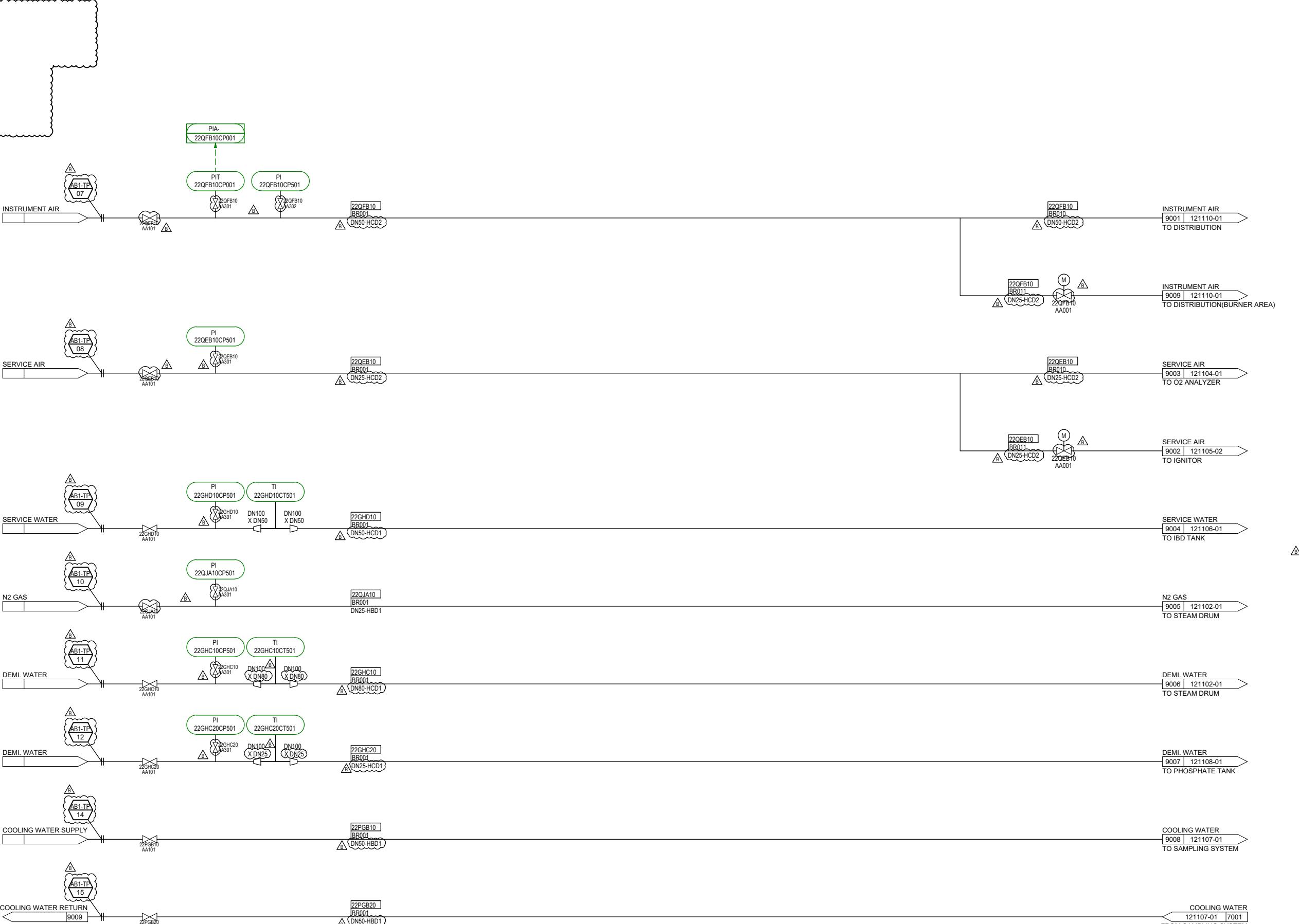








1. THIS P&ID IS IDENTICAL FOR UNIT 22(BOILER #1),UNIT 23(BOILER #2) AND  
UNIT 24(BOILER #3). Example of STEAM DRUM,  
Boiler #1 : 24HAD10BB001  
Boiler #2 : 24HAD10BB001  
Boiler #3 : 24HAD10BB001



1. THIS P&ID IS IDENTICAL FOR UNIT 22(BOILER #1), UNIT 23(BOILER #2) AND  
UNIT 24(BOILER #3). Example of STEAM DRUM,  
Boiler #1 : 24HAD10BB001  
Boiler #2 : 24HAD10BB001  
Boiler #3 : 24HAD10BB001

## LEGEND

NO.	DESCRIPTION	REMARK
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## REFERENCE DOCUMENTS/DRAWINGS

DOC/DWG NO.	TITLE
JCP2-XG02-22ZEN-121101	AUX BOILER SYMBOL & LEGEND P&ID
JCP2-XG02-22ZEN-121102	AUX BOILER WATER SYSTEM P&ID
JCP2-XG02-22ZEN-121103	AUX BOILER STEAM SYSTEM P&ID
JCP2-XG02-22ZEN-121104	AUX BOILER AIR & GAS SYSTEM P&ID
JCP2-XG02-22ZEN-121105	AUX BOILER BURNER SYSTEM P&ID
JCP2-XG02-22ZEN-121106	AUX BOILER BLOWDOWN SYSTEM P&ID
JCP2-XG05-22ZEN-121002	AUX BOILER - HEAT AND MATERIAL BALANCE DIAGRAM

## FOR APPROVAL

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B	30-May-2025	ISSUED FOR APPROVAL	Y.J.KIM	Y.J.KIM	C.K.HONG
A	25-Apr-2025	ISSUED FOR APPROVAL	Y.J.KIM	C.K.HONG	S.K.CHIA
REV. NO.:	DATE	DESCRIPTION	DRAWN	CHKD.	APPD.

Project  
**JAFURAH COGENERATION PROJECT - PHASE II EXPANSION**

Owner  
**ICEPCO POWER COMPANY**

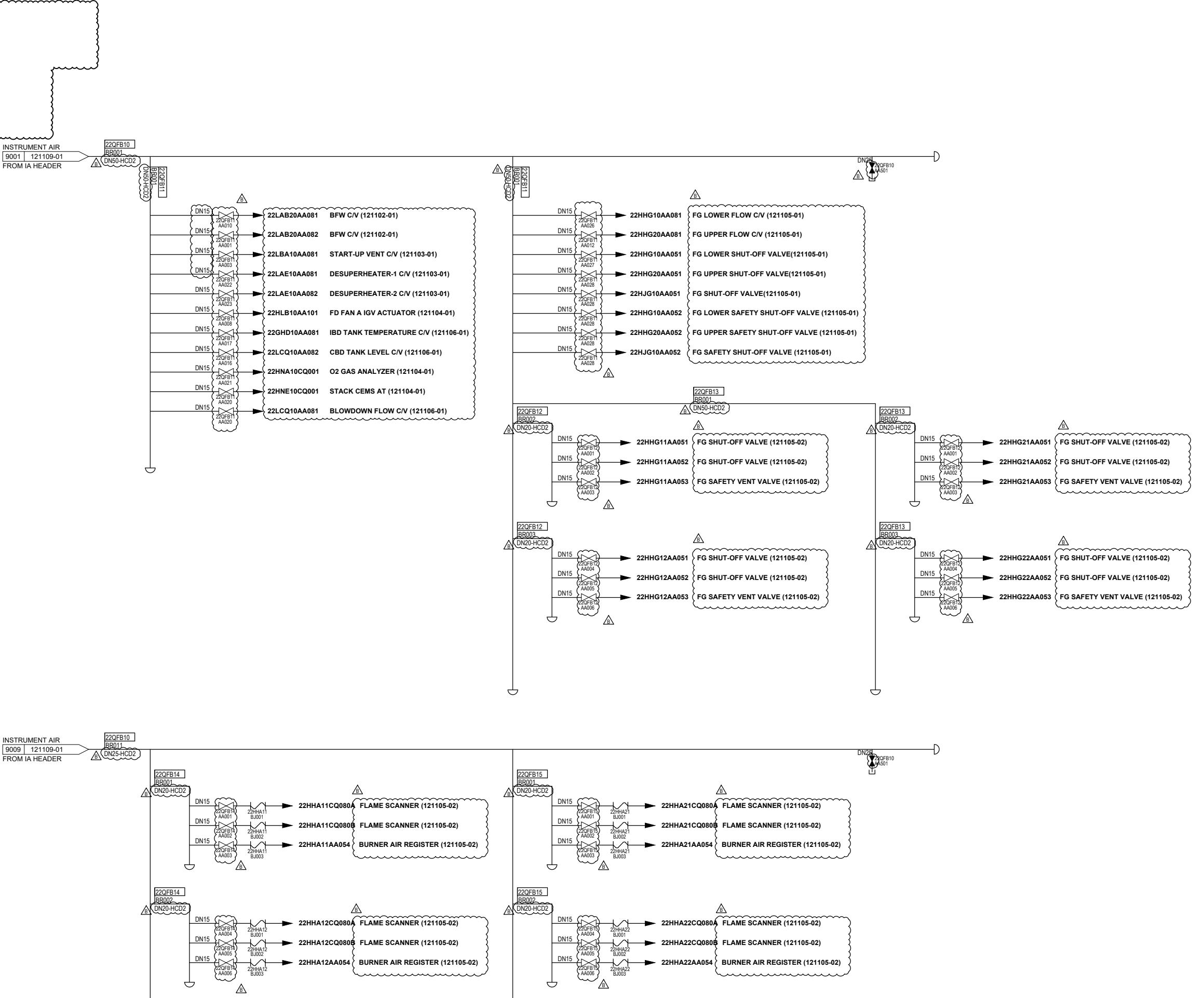
**WSP**

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**DOOSAN** DOOSAN ENERBILITY

Sub-Supplier  
**HYUNDAI** HYUNDAI POWER SYSTEMS

DRAWING TITLE  
**AUX BOILER  
PIPING & INSTRUMENT DIAGRAM  
INSTRUMENT AIR**

SCALE 1:1 DRAWING NUMBER JCP2-XG02-22ZEN-121110 SHEET NO. 01 REV. NO. A



GRAPHIC SCALE  
0 5 10 25 50 100 200m

