COOLING TOWER UNITS

UNIT NO.	LOCATION	NO. CELLS	EACH CELL	MAX. P.D. FT. WATER	TEMPERATURES AIR WB	TEMPERATURES WATER IN	TEMPERATURES WATER OUT	FAN MOTOR SPEED	FAN MOTOR NOM. HP	FAN MOTOR PHASE/VOLT	REMARKS
1	7D	2	1275	15	79	95	85	1750	(2) 30	3/460	
2	7C	2	1275	15	79	95	85	1750	(2) 30	3/460	
3	7C	1	1500	15	79	95	85	1750	(1) 40	3/460	W/24KW BASIN HTR

WATER COOLED CHILLER UNIT

UNIT NO.	LOCATION	MIN. TONS	MAX. KW PER TON	COMPRESSOR MOTOR KW INPUT	COMPRESSOR MOTOR PHASE VOLT	EVAPORATOR GPM	EVAPORATOR ENT. WATER TEMP. F	EVAPORATOR LVG. WATER TEMP. F	EVAPORATOR MAX. P.D.	CONDENSER GPM	CONDENSER ENT. WATER TEMP. F	CONDENSER LVG. WATER TEMP. F	CONDENSER MAX. P.D.
1-CCU1	7D	850	0.65	553	3Ø/4160	1370	56.9	42.0	15	2550	95.0	85.0	15'
1-CCU2	7D	850	0.65	553	3Ø/4160	1370	56.9	42.0	15	2550	95.0	85.0	15'
1-CCU3	7D	500	0.65	325	3Ø/4160	807	56.9	42.0	15	1500	95.0	85.0	16'

FCO 5V PROVIDE UNIT CAPABLE OF USING R11 OR R123 REFRIGERANT.

PACKAGE AIR COOLED RECIPROCATING CHILLER UNIT (OPERATING ROOM)

UNIT NO.	EQUIPMENT	LOCATION	PERFORMANCE MINIMUM CAPACITY	MOTOR KW INPUT	MOTOR PHASE VOLT.	REMARKS
1-ACRCU2 1-ACRCU3	COMPRESSOR	ROOF	240 TONS (TOTAL OF 2 MACHINES)	161 (EACH)	3Ø/460	COMPRESSOR SHALL BE CAPABLE OF CAPACITY REDUCTION TO 10%
	CHILLER		② 393 GPM 56.7 F WATER IN 42.0 F WATER OUT	--	--	16.8 FT. MAX. WATER P.D. EACH
	AIR COOLED CONDENSER		AIR COOLED CONDENSER SHALL PROVIDE ABOVE PERFORMANCE WITH 95F AMBIENT TEMP.	17 (EACH)	3Ø/460	SHALL PERFORM SATISFACTORILY AT MIN. COMPRESSOR CAPACITY WITH 60 F AMBIENT AIR TEMP.

① PACKAGE AIR COOLED RECIPROCATING CHILLER UNIT SHALL BE PROVIDED WITH HOT GAS BYPASS BY MANUFACTURER TO PROVIDE SATISFACTORY OPERATION DOWN TO 10% CAPACITY WITH A 60 F AMBIENTTEMPERAURE. STARTERS REQUIRED SHALL BE FURNISHED BY MANUFACTURER OR EQUIPMENT. COMPRESSOR STARTER SHALL BE PARTWINDING TYPE WITH A MAXIMUM CURRENT INRUSH OF 60% OF LOCKED ROTOR CURRENT OR MULTIPLE COMPRESSORS SHALL BEFURNISHED.

② CHILLERS SHALL BE PIPED IN SERIES TO PRODUCE SPECIFIED DUTY. MACHINE SHALL BE IDENTICAL.

PACKAGE AIR COOLED RECIPROCATING CHILLER UNIT (ANIMAL ROOM)

UNIT NO.	EQUIPMENT	LOCATION	PERFORMANCE MINIMUM CAPACITY	MOTOR KW INPUT	MOTOR PHASE VOLT.	REMARKS
1-ACRCU1	COMPRESSOR	ROOF	193 TONS	237	3Ø/460	COMPRESSOR SHALL BE CAPABLE OF CAPACITY REDUCTION TO 10%
	CHILLER		272 GPM 59 F WATER IN 42 F WATER OUT	--	--	12 FT. MAX. WATER P.D.
	AIR COOLED CONDENSER		AIR COOLED CONDENSER SHALL PROVIDE ABOVE PERFORMANCE WITH 95F AMBIENT TEMP.	20	3Ø/460	SHALL PERFORM SATISFACTORILY AT MIN. COMPRESSOR CAPACITY WITH 60 F AMBIENT AIR TEMP.

① PACKAGE AIR COOLED RECIPROCATING CHILLER UNIT SHALL BE PROVIDED WITH HOT GAS BYPASS BY MANUFACTURER TO PROVIDE SATISFACTORY OPERATION DOWN TO 10% CAPACITY WITH A 60 F AMBIENTTEMPERAURE. STARTERS REQUIRED SHALL BE FURNISHED BY MANUFACTURER OR EQUIPMENT. COMPRESSOR STARTER SHALL BE PARTWINDING TYPE WITH A MAXIMUM CURRENT INRUSH OF 60% OF LOCKED ROTOR CURRENT OR MULTIPLE COMPRESSORS SHALL BEFURNISHED.

PRESSURE REDUCING VALVES

PRV NO.	LOCATION	STEAM PRESSURE PSIG INLET	STEAM PRESSURE PSIG OUTLET	CAPACITY LBS/HR REQUIRED	CAPACITY LBS/HR MAXIMUM	BYPASS VALVE	PIPE SIZES D_1 ①	PIPE SIZES D_2 ①
1-PRV1A	BOILER ROOM NORTH	65	30	350	510	3/4"	1"	2"
1-PRV2A	BOILER ROOM SOUTH	65	30	3350	4050	2 1/2"	3"	5"
1-PRV2B	BOILER ROOM SOUTH	65	30	6660	7555		4"	6"
1-PRV3A	SERV. BAY A PENTHOUSE	65	30	1400	1950	2 1/2"	2"	4"
1-PRV3B	SERV. BAY A PENTHOUSE	65	30	7900	10275		4"	6"
1-PRV4A	SERV. BAY B PENTHOUSE	65	30	1400	1950	2"	2"	4"
1-PRV4B	SERV. BAY B PENTHOUSE	65	30	4600	6975		3"	5"
1-PRV4C	SERV. BAY B PENTHOUSE	65	30	4600	6975		3"	5"
1-PRV5A	SERV. BAY C PENTHOUSE	65	30	1600	2920	2"	2"	4"
1-PRV5B	SERV. BAY C PENTHOUSE	65	30	4750	6975		3"	5"
1-PRV6A	SERV. BAY D PENTHOUSE	65	30	1400	1950	2"	2"	4"
1-PRV6B	SERV. BAY D PENTHOUSE	65	30	4700	6975		3"	5"

① SIZES REFER TO DETAILS ON DWGS 1-H9, 1-H10

SAFETY VALVES & RELIEF VALVES

VALVE NO.	SERVICE	FLUID	TEMP. F.	MINIMUM CAPACITY	SET PRESSURE PSIG	SIZE & ORIFICE
1-SV1	1-PRV1A	STEAM	312	510	40	3/4 X 1 - E
1-SV2	1-PRV 2A, 2B	STEAM	312	11605	40	4 X 6 - N
1-SV3	1-PRV3A, 3B	STEAM	312	12225	40	4 X 6 - P
1-SV4	1-PRV4A,4B,4C	STEAM	312	15900	40	4 X 6 - P
1-SV5	1-PRV5A, 5B	STEAM	312	9895	40	4 X 6 - N
1-SV6	1-PRV6A, 6B	STEAM	312	8925	40	3 X 4 - M

CIRCULATING PUMPS

PUMP NO.	LOCATION	SYSTEM	CIRCULATING FLUID FLUID	GPM	PUMP HEAD FT. FLUID	TEMP. F.	SPEC. GRAV.	% EFF.	TYPE	MOTOR NOM. HP	MOTOR PHASE VOLT	MOTOR RPM	REMARKS
1-P1	LEVEL 7 NORTH (BOILER ROOM)	CONDENSER WAT	WATER	2550	75	85	1.0	83	HORIZ. SPLIT	75	460V-3Ø	1750	
1-P2	LEVEL 7 NORTH (BOILER ROOM)	CONDENSER WAT	WATER	2550	75	85	1.0	83	HORIZ. SPLIT	75	460V-3Ø	1750	
1-P3	LEVEL 7 NORTH (BOILER ROOM)	CONDENSER WAT	WATER	1500	65	85	1.0	80	HORIZ. SPLIT	40	460V-3Ø	1750	
1-P4	LEVEL 7 NORTH (BOILER ROOM)	CH. WAT PRI	WATER	1370	35	42	1.0	80	HORIZ. SPLIT	20	460V-3Ø	1150	
1-P5	LEVEL 7 NORTH (BOILER ROOM)	CH. WAT PRI	WATER	1370	35	42	1.0	80	HORIZ. SPLIT	20	460V-3Ø	1150	
1-P6	LEVEL 7 NORTH (BOILER ROOM)	CH. WAT PRI	WATER	807	35	42	1.0	80	HORIZ. SPLIT	10	460V-3Ø	1150	
1-P7	LEVEL 7 NORTH (BOILER ROOM)	CH. WAT SEC	WATER	2000	105	42	1.0	81	HORIZ. SPLIT	75	460V-3Ø	1750	VARIABLE SPEED
1-P8	LEVEL 7 NORTH (BOILER ROOM)	CH. WAT SEC	WATER	2000	105	42	1.0	81	HORIZ. SPLIT	75	460V-3Ø	1750	VARIABLE SPEED
1-P9	LEVEL 7 NORTH (BOILER ROOM)	CH. WAT - O.R.	WATER	433	85	42	1.0	72	END SUCT.	20	460V-3Ø	1750	
1-P10	LEVEL 7 NORTH BOILER ROOM	CH. WAT - A.R.	WATER	300	80	42	1.0	74	END SUCT.	10	460V-3Ø	1750	
1-P11	LEVEL 7 NORTH BOILER ROOM	C.H. WAT - A.R.	WATER	300	80	42	1.0	74	END SUCT.	10	460V-3Ø	1750	STANDBY
1-P12	LEVEL 7 - "A" SERVICE BAY	PREHEAT	20% EGW	155	70	180	1.025	65	END SUCT.	7.5	460V-3Ø	1750	
1-P13	LEVEL 7 - "A" SERVICE BAY	PREHEAT	20% EGW	155	70	180	1.025	65	END SUCT.	7.5	460V-3Ø	1750	
1-P14	LEVEL 7 - "B" SERVICE BAY	PREHEAT	20% EGW	210	70	180	1.025	67	END SUCT.	7.5	460V-3Ø	1750	
1-P15	LEVEL 7 - "B" SERVICE BAY	PREHEAT	20% EGW	210	70	180	1.025	67	END SUCT.	7.5	460V-3Ø	1750	
1-P16	LEVEL 7 - "C" SERVICE BAY	HTG - PRI	WATER	175	25	180	1.0	65	END SUCT.	3	460V-3Ø	1750	
1-P17	LEVEL 7 - "C" SERVICE BAY	HTG - PRI	WATER	175	25	180	1.0	65	END SUCT.	3	460V-3Ø	1750	
1-P18	LEVEL 7 - "C" SERVICE BAY	TRU - SEC	WATER	380	80	160	1.0	70	END SUCT.	15	460V-3Ø	1750	
1-P19	LEVEL 7 - "C" SERVICE BAY	TRU - SEC	WATER	380	80	160	1.0	70	END SUCT.	15	460V-3Ø	1750	
1-P20	LEVEL 7 - "C" SERVICE BAY	FTR - SEC	WATER	40	60	180	1.0	47	END SUCT.	1.5	460V-3Ø	1750	
1-P21	LEVEL 7 - "C" SERVICE BAY	FTR - SEC	WATER	40	60	180	1.0	47	END SUCT.	1.5	460V-3Ø	1750	
1-P22	LEVEL 7 - "D" SERVICE BAY	HTG - PRI	WATER	160	25	180	1.0	63	END SUCT.	3	460V-3Ø	1750	
1-P23	LEVEL 7 - "D" SERVICE BAY	HTG - PRI	WATER	160	25	180	1.0	63	END SUCT.	3	460V-3Ø	1750	
1-P24	LEVEL 7 - "D" SERVICE BAY	TRU - SEC	WATER	335	70	160	1.0	74	END SUCT.	10	460V-3Ø	1750	
1-P25	LEVEL 7 - "D" SERVICE BAY	TRU - SEC	WATER	335	70	160	1.0	74	END SUCT.	10	460V-3Ø	1750	
1-P26	LEVEL 7 - "D" SERVICE BAY	FTR - SEC	WATER	45	50	180	1.0	47	END SUCT.	1.5	460V-3Ø	1750	
1-P27	LEVEL 7 - "D" SERVICE BAY	FTR - SEC	WATER	45	50	180	1.0	47	END SUCT.	1.5	460V-3Ø	1750	
1-P28	LEVEL 7 - "A" SERVICE BAY	GLYCOL CIR.	20% EGW	3	116	180	1.025	--	---	1/3	115V-1Ø	1750	
1-P29	LEVEL 7 - "B" SERVICE BAY	GLYCOL CIR.	20% EGW	3	116	180	1.025	--	---	1/3	115V-1Ø	1750	
1-P30	LEVEL 7 NORTH BOILER ROOM	C.H. WAT - O.R.	WATER	433	85	42	1.0	72	END SUCT.	20	460V-3Ø	1750	STANDBY
1-P31	LEVEL 7 - "B" SERVICE BAY	RUN AROUND SYST	20% EGW	175	65	65	1.025	66	END SUCT.	7.5	460V-3Ø	1750	
1-P32	NOT USED												
1-CP33	SEE CONDENSATE PUMP SCHEDULE												
1-CP34	SEE CONDENSATE PUMP SCHEDULE												
1-CP35	SEE CONDENSATE PUMP SCHEDULE												
1-P36	NOT USED												
1-P37	NOT USED												
1-P38	NOT USED												
1-P39	NOT USED												
1-P40	NOT USED												
1-P41	NOT USED												
1-P42	NOT USED												
1-CP43	SEE CONDENSATE PUMP SCHEDULE												

NOTE: PUMPS 1-P44 THROUGH 1-P49 NOT USED.

CONDENSATE PUMPS

PUMP NO.	LOCATION	TYPE UNIT	GPM	DISCHARGE PRESSURE FT. FLUID	MOTOR NOM HP	MOTOR PHASE/ VOLT	MOTOR RPM	REMARKS
1-CP33	1ST LEVEL PARK.	DUPLEX	75	210	(2) 10	3Ø/460	3500	125 GAL. REC.
1-CP34	1ST LEVEL PARK.	DUPLEX	60	210	(2) 10	3Ø/460	3500	80 GAL. REC.
1-CP35	LEVEL 7 SOUTH	DUPLEX	22	30	(2) 3/4	3Ø/460	3500	30 GAL. REC.
1-CP43	LEVEL 7 NORTH	DUPLEX	23	30	(2) 1/2	3Ø/460	3500	15 GAL. REC.

NOTE: PROVIDE FLASH TANK WITH EACH CONDENSATE SET. SEE DETAIL ON 1-H9 FOR METHOD OF SIZING.

CONVERTORS

CONVERTOR NO.	LOCATION	CIRCULATING FLUID (TUBES) FLUID	GPM	TEMP. IN F.	TEMP. OUT F.	MAX. LOSS FT. FLUID	ENTERING CONTROL VALVE	ENTERING CONVERTOR	CONTROL VALVE LBS/HR	TRAP LBS/HR	REMARKS
1-C1	LEVEL 7 - "A" S.B.	20% EGW	140	140	180	5'	30	8	2835	4250	MAX. LENGTH 7'-0"
1-C2	LEVEL 7 - "A" S.B.	20% EGW	140	140	180	5'	30	8	2835	4250	MAX. LENGTH 7'-0"
1-C3	LEVEL 7 - "B" S.B.	20% EGW	194	140	180	5'	30	8	3925	5890	MAX. LENGTH 7'-0"
1-C4	LEVEL 7 - "B" S.B.	20% EGW	194	140	180	5'	30	8	3925	5890	MAX. LENGTH 7'-0"
1-C5	LEVEL 7 - "C" S.B.	WATER	160	153	180	5'	30	8	2185	3280	MAX. LENGTH 7'-0"
1-C6	LEVEL 7 - "C" S.B.	WATER	160	153	180	5'	30	8	2185	3280	MAX. LENGTH 7'-0"
1-C7	LEVEL 7 - "D" S.B.	WATER	145	153	180	5'	30	8	1980	2970	MAX. LENGTH 7'-0"
1-C8	LEVEL 7 - "D" S.B.	WATER	145	153	180	5'	30	8	1980	2970	MAX. LENGTH 7'-0"
1-C9	LEVEL 7 - COND. COOLER/HW ECONOMIZER	WATER	160	60	120	5'	GPM 160	TEMP IN F. 200	TEMP OUT 140	MAX. LOSS FT. FLUID 5'	MAX. LENGTH 8'-0"

NOTE: EACH CONVERTOR IS SIZED FOR 50% CAPACITY.

CONVECTOR SCHEDULE

UNIT SYMBOL	TYPE	EWT	GPM	RUNOUT SUPPLY	RETURN SIZE	APPROX. SIZE W X H X D	MBH	LOCATION
1-CONV 1	RECESSED	160	1/2	3/4"	3/4"	26" X 10" X 4"	1.9	STORAGE KEEPER BB100A
1-CONV 2	RECESSED	160	1/2	3/4"	3/4"	32" X 10" X 4"	2.5	TOILET BB100E
1-CONV 3	RECESSED	160	1/2	3/4"	3/4"	32" X 10" X 4"	2.5	LOUNGE 4D149
1-CONV 4	RECESSED	160	1/2	3/4"	3/4"	32" X 10" X 4"	2.5	CLIN SCIENT OFF 401500

HVAC GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY TO ALL HVAC WORK SHOWN ON H SERIES DRAWINGS.

1. COORDINATE ALL HVAC WORK WITH ELECTRICAL WORK, MECHANICAL, AND ARCHITECTURAL WORK SHOWN ON OTHER DRAWINGS.
2. INSTALL PIPING AND DUCTWORK SO THAT ALL VALVES AND DAMPERS ARE ACCESSIBLE.
3. ALL VALVES ARE NOT INDICATED ON FLOOR PLANS. SEE PIPING DETAILS AND SCHEMATICS FOR ADDITIONAL VALVES NOT INDICATED ON FLOOR PLANS.
4. ELEVATIONS NOTED ARE TO CENTERLINES OF PIPES FOR ALL PRESSURE LINES AND TO INVERT FOR ALL GRAVITY FLOW LINES.
5. IN BUILDING AREAS WITHOUT INTERSTITIAL SPACES, UNLESS OTHERWISE NOTED, ALL PIPING IS OVERHEAD. TIGHT TO UNDERSIDE OF SLAB, WITH SPACE FOR INSULATION IF REQUIRED.
6. MAINTAIN MINIMUM 6'-8" CLEARANCE TO UNDERSIDE OF PIPES, SUSPENDED EQUIPMENT, ETC., THROUGHOUT ACCESS ROUTES IN MECHANICAL AND ELECTRICAL ROOMS. OTHER THAN INTERSTITIAL SPACE.
7. RISER AND EQUIPMENT DRAINS SHALL BE 3/4" VALVE WITH HOSE CONNECTION, EXCEPT WHERE OTHERWISE INDICATED.
8. FOR COMPLETE ROOM NAMES AND NUMBERS, SEE ARCHITECTURAL DRAWINGS.
9. CERTAIN ITEMS SUCH AS CLEANOUTS, ACCESS DOORS, RISES AND DROPS IN PIPING, DUCTWORK, ETC., ARE INDICATED ON THE DRAWINGS FOR CLARITY OR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THOSE ITEMS.
10. PIPING AND DUCTWORK IS TO BE INSTALLED IN THE INTERSTITIAL SPACE IN ZONE AREA INDICATED, EXCEPT AS OTHERWISE NOTED. SEE INTERSTITIAL ZONING AND SUB-ZONING DRAWINGS.
11. SMOKE AND ONE-HOUR RATED PARTITIONS DO NOT EXTEND THROUGH THE INTERSITIAL SPACE. SEE ARCH. DWGS.
12. IN GENERAL, TWO-HOUR RATED PARTITIONS DO NOT EXTEND THROUGH THE INTERSTITIAL SPACE EXCEPT FOR SEPARATION BETWEEN INTERSTITIAL AND NON-INTERSTITIAL SPACE. SEE ARCH. DWGS.
13. ALL PIPING AND DUCTS IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN FURRED CHASES OR SUSPENDED CEILING.
14. FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED.
15. ACCESS PANELS IN SUSPENDED CEILINGS ARE REQUIRED FOR ALL VALVES, TRAPS, DAMPERS, CLEANOUTS, CONTROLS, ETC., AND SHALL BE FURNISHED AND INSTALLED UNDER ARCHITECTURAL SPECIFICATIONS.
16. TOTAL STATIC PRESSURE NOTED IN SCHEDULES INCLUDES DUCT SYSTEM, TERMINAL UNITS, FILTERS, COILS, ETC.
17. FOR TYPICAL STEAM, WATER AND REFRIGERANT PIPING CONNECTIONS TO EQUIPMENT STANDARD DETAILS.
18. CEILING DIFFUSER SIZES SHOWN ON FLOOR PLANS ARE NECK SIZES.
19. WALL-TYPE EXHAUST REGISTERS NOTED AS "B.R." ON DRAWINGS ARE TO BE INSTALLED WITH BOTTOM OF REGISTER SEVEN INCHES ABOVE FINISHED FLOOR.
20. ALL TEMPERATURE AND HUMIDITY SENSORS SHALL BE PROVIDED WITH CONTROLLERS TO PROVIDE PROPER OPERATION OF VALVES.
21. PITCH DOWN ALL STEAM AND CONDENSATE RETURN MAINS ONE INCH IN FORTY FEET IN THE DIRECTION OF FLOW.
22. PITCH UP ALL STEAM AND CONDENSATE RUNOUTS TO RISERS AND EQUIPMENT 1/2 INCH PER FOOT. WHERE THIS PITCH CANNOT BE OBTAINED, RUNOUTS, OVER 8 FEET IN LENGTH SHOULD BE ONE SIZE LARGER THAN NOTED.
23. PROVIDE AND END OF MAIN DRIP AT EACH RISE IN THE STEAM MAIN. PROVIDE CONDENSATE DRIPS AT THE BOTTOMS OF ALL STEAM RISERS AND DOWN FED RUNOUTS TO EQUIPMENT, ETC. AND AHEAD OF ALL CONTROL VALVES.

WATER FILTERS

UNIT NO.	SYSTEM PUMPS	FILTER GPM	AUTOMATIC VALVE PRESSURE RANGE (PSI)	PIPE SIZES
1-BWF1	1-P7, 1-P8	453	4-57	5"
1-BWF2	1-P12,1-P13	30	2-32	1 1/2"
1-BWF3	1-P14, 1-P15	32	2-32	1 1/2"
1-BWF4	1-P16, 1-P17	30	1-14	1 1/2"
1-BWF5	1-P22, 1-P23	30	1-14	1 1/2'
1-BWF6	1-P10, 1-P11	28	2-32	1 1/2"
1-BWF7	1-P9, 1-P30	40	2-32	2"

8-0-1-1241

"AS BUILT" 6-17-94
Revisions Date

RECORD DRAWING
CORRECTED ON BASIS OF DATA
FURNISHED BY THE RESIDENT ENGINEER

Key Plan

STATE OF MARYLAND JOHN F. MILLER No. 10793 REGISTERED PROFESSIONAL ENGINEER
Seal

RTKL/CS&D/HENRY ADAMS (J.V.)
ARCHITECTS AND ENGINEERS
400 E. PRATT STREET
BALTIMORE, MD 21202

Drawing Title: SCHEDULES HVAC
Approved Project Director: Albert Miller
Project Title: 324-BED REPLACEMENT HOSPITAL-PHASE II
Building Number: 1
Location: VAMC-BALTIMORE, MD
Checked
Drawn
Date: 9-1-88
Project No. 511-001D
DRAWING NO. 1-H8
Dwg. 8 of 123

Veterans Administration

VA FORM 08-6231A, MAR 1984
U.S. GOVERNMENT PRINTING OFFICE: 1984-440-467
H.A. JOB NO. VO022AO