

**ROOF-TOP A.C. UNIT (LOW TON)**

UNIT DESIGNATION	RTU-51,7B1,2 (R24)
MANUFACTURER	CARRIER
MODEL NUMBER	50VL-B 024
VOLTAGE / PHASE	208V-1
<b>EVAPORATOR FAN PERFORMANCE</b>	
TOTAL SUPPLY AIR (CFM)	100
MINIMUM OUTSIDE AIR (CFM)	70
EXTERNAL STATIC PRESSURE (” H <sub>2</sub> O)	35
FAN MOTOR HORSEPOWER	1/2
<b>COOLING PERFORMANCE</b>	
TOTAL CAPACITY (BTUH)	23,000
SENSIBLE CAPACITY (BTUH)	16,750
ENTERING AIR TEMPERATURE DBWB (°F)	80/67
OUTSIDE AMBIENT TEMP (°F)	45
MINIMUM SEER AT ARI CONDITIONS	14.5
<b>HEATING PERFORMANCE</b>	
HEATING INPUT (BTUH)	40,000
HEATING OUTPUT (BTUH)	32,000
AFLUE (% EFFICIENCY)	80
TEMPERATURE RISE (°F)	42
FUEL TYPE	NATURAL GAS
<b>ACCESSORIES</b>	
SLOPED ACCESSORY ROOF CURB	YES

**ROOF-TOP AIR CONDITIONING UNITS**

UNIT DESIGNATION	RTU-L4,15,16/8 (R36)	RTU-L11,14/6 (R44)	RTU-L18,11,17 (R52)	RTU-M2 (R52)	RTU-25-37M4 (R54)	RTU-T3 (R54)	RTU-T11,12 (R54)	RTU-61-64 (R54)
MANUFACTURER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER
MODEL NUMBER	48HC04	48HC05	48HC07	48HC08	48HC12	48HC14	48HC24	48HC28
<b>EVAPORATOR FAN PERFORMANCE</b>								
TOTAL SUPPLY AIR (CFM)	1200	1600	2400	3000	4000	4400	7000	8750
MINIMUM OUTSIDE AIR (CFM)	180	180	360	450	600	650	1050	1325
EXTERNAL STATIC PRESSURE (” H <sub>2</sub> O)	.40 (75-T6)	.50 (A0-T4)	.50 (75-T1)	.50	.75 (50-M4)	.50	.60	.75
FAN MOTOR HORSEPOWER	1/2	1.0	2.0	2.0	2.0	3.1	5.0	7.5
<b>COOLING PERFORMANCE</b>								
TOTAL CAPACITY (BTUH)	31,000	50,000	73,000	89,000	119,500	148,500	244,500	299,500
SENSIBLE CAPACITY (BTUH)	21,200	38,000	53,000	62,000	84,600	102,000	175,200	216,900
ENTERING AIR TEMPERATURE DBWB (°F)	80/67	80/67	80/67	80/67	80/67	80/67	80/67	80/67
OUTSIDE AMBIENT TEMP (°F)	45	45	45	45	45	45	45	45
MINIMUM SEER AT ARI CONDITIONS	(15.0) 12.5	(15.6) 13.0	12.0	12.0	11.5	12.2	12.0	11.2
<b>HEATING PERFORMANCE</b>								
HEATING INPUT (BTUH)	12,000	12,000	125,000	125,000	180,000	180,000	310,000	400,000
HEATING OUTPUT (BTUH)	54,000	54,000	109,000	109,000	148,000	146,000	251,000	325,000
AFLUE (% EFFICIENCY)	82	82	82	82	82	81	81	81
TEMPERATURE RISE (°F)	44	54	45	31	34	28	33	31
FUEL TYPE	NATURAL GAS	NATURAL GAS	NATURAL GAS	NATURAL GAS	NATURAL GAS	NATURAL GAS	NATURAL GAS	NATURAL GAS
<b>ACCESSORIES</b>								
DEHUMIDIFICATION CYCLE	YES	YES	YES	YES	YES	YES	YES	YES
SLOPED ACCESSORY ROOF CURB	YES	YES	YES	YES	YES	YES	YES	YES
VIBRATION ISOLATION CURB	NO	NO	NO	NO	NO	NO	YES	NO

NOTE: PROVIDE BELT DRIVE FAN WITH BELT TENSIONER FOR R50 AND BELOW WHERE DD FAN WILL NOT PROVIDE SCHEDULED EXTERNAL STATIC PRESSURE. NOTE: EXTERNAL STATIC PRESSURE DOES NOT INCLUDE ECONOMIZER LOSS.

**DUCTLESS SPLIT SYSTEM UNITS**

UNIT DESIGNATION	FG/HF-3 (04)	FG/HF-1 (12)	FG/HF-2 (16)	FG/GJ-142 (12)	FG/GJ-3 (30)
MANUFACTURER	MITSUBISHI	MITSUBISHI	MITSUBISHI	MITSUBISHI	MITSUBISHI
FAN-COIL UNIT MODEL NUMBER	MSZ-HM09NA	PLA-A1EAT	PLA-A1EAT	PKA-A126AVL	FLA-A30B44
FAN-COIL UNIT TYPE	WALL MOUNTED	CEILING CASSETTE	CEILING CASSETTE	WALL MOUNTED	WALL MOUNTED
CONDENSING UNIT MODEL NUMBER	—	—	—	FUY-A126HA	FUY-AS08HA4
HEAT PUMP UNIT MODEL NUMBER	MUZ-HM09NA	FUZ-A126KAT	FUZ-A126KAT	—	—
<b>SUPPLY FAN PERFORMANCE</b>					
SUPPLY AIR (CFM)	240	380	710	425	710
EXTERNAL STATIC PRESSURE (” H <sub>2</sub> O)	—	—	—	—	—
<b>COOLING PERFORMANCE</b>					
TOTAL CAPACITY (BTUH)	4,000	12,000	18,000	12,000	30,000
ENTERING AIR TEMPERATURE DBWB (°F)	80/67	80/67	80/67	80/67	80/67
OUTSIDE AMBIENT TEMPERATURE (°F)	45	45	45	45	45
MIN. SEER AT ARI CONDITIONS	18.0	21.0	24.2	19.8	19.8
REFRIGERANT LINE SIZE LIQUID/SUCTION	1/4" / 3/8"	1/4" / 1/2"	3/8" / 5/8"	1/4" / 1/2"	3/8" / 5/8"
<b>HEATING PERFORMANCE</b>					
HEAT PUMP OUTPUT (BTUH)	10,000	18,000	14,500	—	—
ENTERING AIR TEMPERATURE (°F)	70	70	70	—	—
OUTSIDE AMBIENT TEMPERATURE (°F)	47	47	47	—	—
HEATING SEASONAL PERFORMANCE FACTOR	8.5	12.8	11.2	—	—
<b>ACCESSORIES</b>					
HALL-MTD, HARD-WIRED CONTROLLER (PAR-31AA)	YES	YES	YES	YES	YES
MAG-3991 ADAPTER FOR EMS START/STOP	YES	NO	NO	NO	NO
PAC-115AD ADAPTER FOR EMS START/STOP	NO	YES	YES	YES	YES
LOW AMBIENT CONTROL, CRANKCASE HEATER	NO	YES	YES	YES	YES
<b>CONDENSATE PUMP</b>					
GEI, 45 GPH @ 6" H <sub>2</sub> O SAFETY SWITCH	LITTLE GIANT VGMA-20	NO	NO	LITTLE GIANT VGMA-20	LITTLE GIANT VGMA-20

**WATER SOURCE HEAT PUMP UNITS**

UNIT SIZE DESIGNATION	W06	W08	W10	W12	W15	W18	W24	W30
MANUFACTURER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER	CARRIER
MODEL NUMBER	PGH06	PGH08	PGH10	PGH12	PGH15	PGH18	PGH24	PGH30
TYPE	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL	HORIZONTAL
MAX. UNIT DIMENSIONS L x W x H (")	40 x 20 x 12	40 x 20 x 12	40 x 20 x 12	46 x 23 x 18	46 x 23 x 18	54.5 x 25 x 14	54.5 x 25 x 14	58 x 33 x 21
<b>SUPPLY FAN PERFORMANCE</b>								
SUPPLY AIR (CFM)	300	400	600	1000	1200	1400	1900	1900
EXTERNAL STATIC PRESSURE (” H <sub>2</sub> O)	30	30	30	35	35	35	35	35
MAX. FAN MOTOR HORSEPOWER	1/10	1/10	1/4	1/4	1/2	1/2	1/2	3/4
<b>COOLING PERFORMANCE</b>								
TOTAL COOLING CAPACITY (BTUH)	8,000	11,700	14,400	30,500	39,200	42,800	60,900	60,900
SENSIBLE COOLING CAPACITY (BTUH)	6,000	9,000	14,400	22,500	28,500	30,700	44,500	44,500
ENTERING AIR TEMPERATURE DBWB (°F)	80/67	80/67	80/67	80/67	80/67	80/67	80/67	80/67
ENTERING WATER TEMPERATURE (°F)	40	40	40	40	40	40	40	40
MINIMUM SEER AT ARI CONDITIONS	12.5	11.8	13.3	13.1	14.2	12.6	13.2	13.2
HEAT REJECTION	7,500	14,400	24,000	37,000	47,000	51,000	76,000	76,000
<b>HEATING PERFORMANCE</b>								
TOTAL HEATING CAPACITY (BTUH)	7,000	13,800	23,800	36,600	44,900	50,900	67,600	67,600
ENTERING AIR TEMPERATURE (°F)	70	70	70	70	70	70	70	70
ENTERING WATER TEMPERATURE (°F)	60	60	60	60	60	60	60	60
MINIMUM COP AT ARI CONDITIONS	4.5	4.3	4.6	4.3	4.6	4.2	4.2	4.2
HEAT ABSORBED (BTUH)	5,300	10,600	18,600	28,500	35,500	39,000	53,800	53,800
<b>WATER FLOW</b>								
WATER COIL FLOW (GPM)	15	3.0	4.0	7.0	9.0	10.0	15.0	15.0
MAXIMUM COIL PRESSURE DROP (FT)	3.5	8.5	6.6	12.7	14.7	15.9	15.8	15.8
MIN. CONTROL VALVE Cv / MAX. P.D. (FT)	NO VALVE	2.1 / 4.6	2.8 / 4.6	5.0 / 4.6	6.4 / 4.6	7.0 / 4.6	NO VALVE	NO VALVE
FLEXIBLE HOSE & PIPE DIAMETER	1/2"	3/4"	3/4"	3/4"	1"	1"	1-1/4"	1-1/4"

NOTES:  
1. OMIT CONTROL VALVES ON HEHP UNITS TO PROVIDE MINIMUM FLOW THROUGH THE PUMP IN THE FOLLOWING MANNER: FIRST OMIT VALVES ON UNITS AT THE END OF ALL MAINS AND ON UNITS IDENTIFIED AS HAVING 'NO VALVE' IN THE SCHEDULE.  
2. MINIMUM STRAINER SIZE FOR FLEXIBLE HOSE ASSEMBLY IS 1", SEE DETAIL 9/M-21.

**DESIGN CONDITIONS**

SUMMER	- OUTSIDE	45.9F DB, 14.2F MCHB 71.3F WB, 88.5F MCHB
	- INSIDE	78°F DB, 50% RH
WINTER	- OUTSIDE	21.5°F
	- INSIDE	72°F
	- INSIDE	10°F - GYMNASIUMS

OUTSIDE DESIGN CONDITIONS ARE BASED ON ASHRAE GUIDE, HANDBOOK OF FUNDAMENTALS, 2013 EDITION. SUMMER CONDITIONS ARE FROM 1% COLUMN. WINTER CONDITIONS ARE FROM 91.6% COLUMN.

**OUTSIDE AIR REQUIREMENTS**

SYSTEMS ARE DESIGNED TO COMPLY WITH THE 2012 INTERNATIONAL MECHANICAL CODE WITH ALL SUBSEQUENT GEORGIA AMENDMENTS TO THE 2012 INTERNATIONAL ENERGY CONSERVATION CODE WITH ALL SUBSEQUENT GEORGIA AMENDMENTS TO THE 2012 INTERNATIONAL MECHANICAL CODE AND ALL SUBSEQUENT AMENDMENTS TO THE 2012 INTERNATIONAL MECHANICAL CODE. THE DESIGNER HAS REVIEWED THE PROJECT AND HAS DETERMINED THAT THE SYSTEMS ARE DESIGNED TO COMPLY WITH THE 2012 INTERNATIONAL MECHANICAL CODE AND ALL SUBSEQUENT AMENDMENTS TO THE 2012 INTERNATIONAL MECHANICAL CODE. THE DESIGNER HAS REVIEWED THE PROJECT AND HAS DETERMINED THAT THE SYSTEMS ARE DESIGNED TO COMPLY WITH THE 2012 INTERNATIONAL MECHANICAL CODE AND ALL SUBSEQUENT AMENDMENTS TO THE 2012 INTERNATIONAL MECHANICAL CODE. THE DESIGNER HAS REVIEWED THE PROJECT AND HAS DETERMINED THAT THE SYSTEMS ARE DESIGNED TO COMPLY WITH THE 2012 INTERNATIONAL MECHANICAL CODE AND ALL SUBSEQUENT AMENDMENTS TO THE 2012 INTERNATIONAL MECHANICAL CODE.

**IONIZATION UNITS**

- IONIZATION UNITS SHALL BE SIZED TO COMPLY WITH ASHRAE 62.1-2010 AND SHALL MAINTAIN A CONCENTRATION OF NEGATIVE IONS AT A LEVEL OF 500 TO 1800 IONS PER CUBIC CENTIMETER IN THE PRIMARY SPACE SERVED BY THE DEVICE.
- IONIZATION UNITS SHALL BE LISTED OR ETL LISTED FOR INSTALLATION IN A RETURN AIR PLUMB.
- AFTER FILTERS AND BEFORE COIL IN ACCESSIBLE LOCATION.
- CALCULATIONS FOR SIZING THE IONIZATION UNITS SHALL BE BASED ON THE USE OF THE SPACE AND AIR VOLUME. PROVIDE DOUBLE CAPACITY IN LOCKER ROOMS AND STORAGE ROOMS.
- PROVIDE IONIZATION UNITS FOR ALL MSHP'S, DUCTED SPLIT SYSTEM FC'S & FC'S IN LOCKER ROOMS, 6PS-DM4B-AC / 6PS-FC-3-BAS, BAS CONTACT, DUCT OR UNIT MOUNTED, 24V.
- PROVIDE IONIZATION UNITS FOR ALL RTUS AS FOLLOWS: 6PS-IMOD, BAS CONTACT, MOUNTED AFTER THE FILTERS AT THE TOP OF THE COOLING COIL, 24V.
- PROVIDE IONIZATION UNITS FOR DUCTLESS SPLITS AS FOLLOWS (NONE FOR MDF/DF ROOMS): 6PS-FC-2-BAS CONTACT, UNIT MOUNTED, 208V.

**EXHAUST FANS**

FAN DESIG.	TYPE	CFM	EXT. ST. P. (” H <sub>2</sub> O)	MOTOR POWER	DRIVE TYPE	MAX. RPM	MAX. SONES	MANUFACTURER # MODEL NO.	CONTROL SEQUENCE
EF-1	CEILING MOUNTED	100	.125	50 W	DIRECT	1050	1.3	PENN Z65	SH
EF-2	POWER ROOF VENTILATOR	300	.125	1/25 HP	DIRECT	1800	4.0	PENN DX105	EMS
EF-11	POWER ROOF VENTILATOR	570	.25	1/6 HP	DIRECT	1550	7.0	PENN DX18	EMS
EF-12	POWER ROOF VENTILATOR	440	.25	1/6 HP	DIRECT	1800	7.0	PENN DX10R	EMS
EF-13	POWER ROOF VENTILATOR	200	.125	60 W	DIRECT	1550	3.0	PENN DX08R	EMS
EF-14	POWER ROOF VENTILATOR	980	.125	1/6 HP	DIRECT	1550	10.0	PENN DX18	SH/EMS
EF-E1	POWER ROOF VENTILATOR	1480	.125	1/6 HP	DIRECT	1050	8.0	PENN DX16V	EMSTM

NOTE: FANS WITH CFM ABOVE 500 CFM SHALL HAVE MIN 12x12 INSIDE CURB DIMENSION.

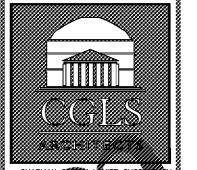
**ELECTRIC UNIT HEATERS**

HEATER DESIG.	TYPE MOUNTING	V / V / PR.	MANUFACTURER # MODEL NUMBER	ACCESSORIES
EH-1	RECESSED CEILING MOUNTED	3.0 / 27V / 10	QMARK GDF	INTEGRAL DISCONNECT, 24V CONTROL TRANSFORMER & RELAY

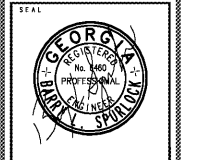
**ENERGY RECOVERY UNITS**

UNIT DESIGNATION	ERU-5
SERVES	LOCKER RMS
TYPE	COOLING & HTG
HEAT TRANSFER METHOD	AIR COOLED
REFRIGERANT	R410A
MANUFACTURER	AACN
MODEL NUMBER	RN-040
<b>OUTSIDE AIR SUPPLY SIDE</b>	
AIR QUANTITY (CFM)	8,000
EXTERNAL STATIC PRESSURE (” H <sub>2</sub> O)	1.0
FAN MOTOR HORSEPOWER	1.0
<b>EXHAUST AIR SIDE</b>	
AIR QUANTITY (CFM)	8,000
EXTERNAL STATIC PRESSURE (” H <sub>2</sub> O)	1.0
FAN MOTOR HORSEPOWER	7.5
<b>DESICCANT WHEEL PERFORMANCE - SUMMER</b>	
EXHAUST ENTERING AIR TEMP. (°F/°RH)	78 / 50%
OUTSIDE ENTERING AIR TEMP. DB / WB (°F) ①	94 / 74
OUTSIDE LEAVING AIR TEMP. DB / WB (°F) ②	83.2 / 68.3
TOTAL HEAT TRANSFERRED (BTUH)	185,230
SENSIBLE EFFECTIVENESS(%) ASHRAE 84-1991	68
LATENT EFFECTIVENESS (%)	65
<b>DX COOLING COIL PERFORMANCE</b>	
ENTERING AIR TEMP. (DB / WB) ③	83.2 / 68.3
LEAVING AIR TEMP. (DB / WB) ④	52.3 / 51.8
TOTAL CAPACITY (BTUH)	427,210
SENSIBLE CAPACITY (BTUH)	284,060
EER @ OPERATING CONDITIONS	12.4
<b>HOT GAS REHEAT PERFORMANCE</b>	
ENTERING AIR TEMP. (DB / WB) ⑤	52.3 / 51.8
LEAVING AIR TEMP. (DB °F / °RH) ⑥	75 / 44%
SENSIBLE HEAT TRANSFERRED (BTUH)	218,000
<b>DESICCANT WHEEL PERFORMANCE - WINTER</b>	
EXHAUST ENTERING AIR TEMP. (DB °F / °RH)	72 / 30%
OUTSIDE ENTERING AIR TEMP. DB / WB (°F)	17 / 14
OUTSIDE LEAVING AIR TEMP. DB / WB (°F)	52.8 / 42.7
SENSIBLE HEAT TRANSFERRED (BTUH)	352,750
<b>GAS HEATING PERFORMANCE</b>	
HEATING INPUT (BTUH)	540,000
HEATING OUTPUT (BTUH)	432,000
THERMAL EFFICIENCY (%)	80%
LEAVING AIR TEMPERATURE (°F)	48
FUEL TYPE	NATURAL GAS
CONTROL	4 STEP

③ DENOTES STATEPOINT FOR OUTSIDE AIR CONDITIONS - SEE SCHEMATIC 1/M4.1



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DATE	NO.	DESCRIPTION
03/27/18		ISSUE PRELIMINARY SCHEDULE, DESIGN DEVELOPMENT DOCUMENTS
06/14/18		ISSUE CONSTRUCTION DOCUMENTS
08/17/18		ISSUE CHECKLIST SET / PERMIT SET
10/10/18		FINAL ISSUE SUBMITTAL / READY FOR PROPOSAL

DOE FACILITY CODE: 660 -3066  
**RIVERWOOD HIGH SCHOOL-PHASE 3-B AUDITORIUM / GYMNASIUM ADDITION**  
5900 RAIDER DRIVE NW SANDY SPRINGS, GA 30328  
FULTON COUNTY SCHOOLS RFP NO. 411-18

SHEET TITLE  
**HVAC SCHEDULES**  
PROJECT NO.  
18015.02  
DATE  
09/17/18  
DRAWN BY  
CPAMMWD  
CHECKED BY  
BLS  
SHEET NO.  
**M-3.1**

Order 1