MECHANICAL LEGEND

- SUPPLY AIR DIFFUSER
- RETURN AIR GRILLE
- EXHAUST AIR GRILLE
- PERFORATED RETURN AIR PANEL
- OR — DIRECTIONAL AIR FLOW
- MANUAL VOLUME DAMPER
- SUPPLY OR OUTSIDE AIR DUCT UP & DOWN
- RETURN AIR DUCT UP & DOWN
- EXHAUST AIR DUCT UP & DOWN
- SUPPLY OR OUTSIDE AIR DUCT UP & DOWN
- RETURN AIR DUCT UP & DOWN
- EXHAUST AIR DUCT UP & DOWN
- VAV TERMINAL UNIT
- VVT TERMINAL UNIT
- (E) EXISTING
- CONNECT TO EXISTING
- AC-4 — THERMOSTAT OR TEMP. SENSOR
- ? — NOTE
- XX ? — EQUIPMENT DESIGNATOR
- BALL VALVE
- GATE VALVE
- CHECK VALVE
- BALANCING VALVE
- THERMOMETER
- DIRECTION OF FLOW
- PUMP
- STRAINER
- PRESSURE GAUGE
- PETE'S PLUG
- DOUBLE CHECK ASSEMBLY
- PRESSURE REDUCING VALVE
- UNION
- 2-WAY CONTROL VALVE
- 3-WAY CONTROL VALVE
- CAP
- S — SMOKE DETECTOR
- MOTORIZED DAMPER

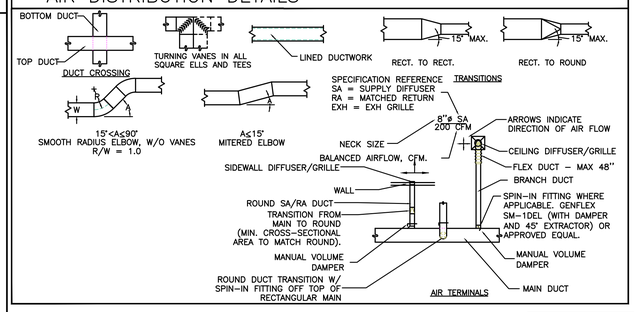
AFF	ABOVE FINISH FLOOR
AHU	AIR HANDLING UNIT
B.D.	BOTTOM OF DUCT
BHP	BRAKE HORSEPOWER
BTU	BRITISH THERMAL UNITS
CFM	CUBIC FEET PER MINUTE
CONN.	CONNECTION
CONT.	CONTINUATION
CW	DOMESTIC COLD WATER
DB	DRY BULB
DIA.	DIAMETER
DIST.	DISTRIBUTION
EA	EXHAUST AIR
EDB	ENTERING DRY BULB TEMPERATURE
EWB	ENTERING WET BULB TEMPERATURE
EWT	ENTERING WATER TEMPERATURE
FF	FINISH FLOOR
FIXT.	FIXTURE
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT.	FEET / FOOT
GA.	GAUGE
GPM	GALLONS PER MINUTE
H	HEIGHT
HP	HORSEPOWER
I.D.	INSIDE DIAMETER
IN.	INCHES
L	LENGTH
LBS.	POUNDS
LDB	LEAVING DRY BULB
LWB	LEAVING WET BULB
LWT	LEAVING WATER TEMPERATURE
MAX.	MAXIMUM
MBH	THOUSANDS OF BTUs PER HOUR
MIN.	MINIMUM
NC	NOISE CRITERIA
N.C.	NORMALLY CLOSED
N.I.M.	NOT IN MECHANICAL
NO.	NUMBER
N.O.	NORMALLY OPEN
O.A.	OUTSIDE AIR
P	PERSON
PSI	POUNDS PER SQUARE INCH
P/T	PRESSURE / TEMPERATURE
R.A.	RETURN AIR
RECT.	RECTANGULAR
REQ'D	REQUIRED
S.A.	SUPPLY AIR
S.P.	STATIC PRESSURE
SQ.	SQUARE
TEMP.	TEMPERATURE
TYP.	TYPICAL
VAV	VARIABLE AIR VOLUME
W	WIDTH
WB	WET BULB
WPD	WATER PRESSURE DROP
ø	DIAMETER

- (E) EXISTING
- (D) DEMOLISH
- NEW WORK
- HWS — (HWS) HEATING WATER SUPPLY
- HWR — (HWR) HEATING WATER RETURN
- FIRE DAMPER
- FIRE / SMOKE DAMPER
- SMOKE DAMPER

SEISMIC BRACING

- LATERAL BRACING
- LONGITUDINAL BRACING
- LONGITUDINAL & LATERAL BRACING

AIR DISTRIBUTION DETAILS



EXHAUST FANS

MARK NUMBER	EF 1	EF 2	EF 3
TYPE	CEILING CABINET	CEILING CABINET	ROOF DIRECT DRIVE
SYSTEM	RESTROOM	BIKE 137	TRASH
CFM	100	200	600
TOTAL SP. (IN H20)	0.125	0.125	0.5
RPM	1250	740	1533
TIP SPEED (FPM)	–	--	4365
MOTOR WATTS OR HP	100 W	127 W	1/6 HP
CONTROLLED BY	LIGHTS	HUMIDISTAT	CONTINUOUS
INTERLOCK WITH	NONE	NONE	NONE
FAN SPEED CONTROLLER	NO	YES	YES
WHEEL TYPE	FC	BI	BI
BACK DRAFT DAMPER	GRAVITY	GRAVITY	NONE
ISOLATION	RUBBER	RUBBER	RUBBER
DESIGN WEIGHT (LBS)	25	23	45
MAX. SONES	1.5	1.7	9.1
MAX AMPS – ***	1.3	1.8	2.2
POWER (VOLTS/PHASE/HZ) – ***	120/60/1	120/60/1	120/60/1
BASIS OF DESIGN:	BROAN L100	BROAN L200	GREENHECK G-095-VG

*** – ELECTRICAL DATA LISTED FOR REFERENCE ONLY, COORDINATE WITH ELECTRICAL DESIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS

INDOOR UNITS – *

MARK NUMBER	FC-1 24 MBH	FC-2 24 MBH	FC-3 48 MBH	FC-4 24 MBH	FC-5 24 MBH	FC-6 24 MBH	FC-7 24 MBH	FC-8 24 MBH
SYSTEM	ELEC 122	MGMT SUITE 123	HALL/MAIL 127	CASE MNGR 124 & 125	LAUNDRY 129	FAMILY RM 132	MEETING 133	SERVER 140
TYPE	WALL MOUNTED	WALL MOUNTED	DUCTED	DUCTED	WALL MOUNTED	DUCTED	DUCTED	WALL MOUNTED
EFFICIENCY	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT
NOMINAL COOLING CAPACITY	24,000 BTUH	24,000 BTUH	48,000 BTUH	24,000 BTUH	24,000 BTUH	24,000 BTUH	24,000 BTUH	24,000 BTUH
HEATING CAPACITY	24,000 BTUH	24,000 BTUH	50,000 BTUH	24,000 BTUH	24,000 BTUH	24,000 BTUH	24,000 BTUH	24,000 BTUH
TOTAL SUPPLY CFM	635	635	1400	1130	635	1130	1130	635
OSA CFM	--	--	--	247	--	247	247	--
EXTERNAL SP. ("H20)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
VOLTS/PHASE	208/1	208/1	208/1	208/1	208/1	208/1	208/1	208/1
MCA/MOP	0.6/15	SEE OUTDOOR UNIT	3.4/15	2.9/15	0.6/15	2.9/15	2.9/15	0.6/15
WEIGHT	31	31	120 LBS	110	31	110	110	31
BASIS OF DESIGN	DAIKIN FTX24NMVJU	DAIKIN FTX24NMVJU	DAIKIN FBQ48PVJU	DAIKIN FBQ24PVJU	DAIKIN FTX24NMVJU	DAIKIN FBQ24PVJU	DAIKIN FBQ24PVJU	DAIKIN FTX24NMVJU
OUTDOOR UNIT	HP-1 2 TON	HP-2 2 TON	HP-3 4 TON	HP-4 2 TON	HP-5 2 TON	HP-6 2 TON	HP-7 2 TON	HP-8 2 TON

* – PROVIDE ALL UNITS THAT CANNOT BE DRAINED BY GRAVITY WITH CONDENSATE PUMP, ROUTE ALL CONDENSATE LINES HIDDEN WITHIN STRUCTURE TO AN APPROVED LOCATION PROVIDED BY THE PLUMBER.

OUTDOOR UNITS – SPLIT SYSTEM HEAT PUMP

MARK NUMBER	HP-1 2 TON	HP-2 2 TON	HP-3 4 TON	HP-4 2 TON	HP-5 2 TON	HP-6 2 TON	HP-7 2 TON	HP-8 2 TON
SYSTEM	ELEC 122	MGMT SUITE 123	HALL/MAIL 127	CASE MNGR 124 & 125	LAUNDRY 129	FAMILY RM 132	MEETING 133	SERVER 140
TYPE	1-PORT HEAT PUMP	1-PORT HEAT PUMP	1-PORT HEAT PUMP	1-PORT HEAT PUMP	1-PORT HEAT PUMP	1-PORT HEAT PUMP	1-PORT HEAT PUMP	1-PORT HEAT PUMP
NORMAL COOLING CAPACITY	24,000 BTUH	24,000 BTUH	48,000 BTUH	24,000 BTUH	24,000 BTUH	24,000 BTUH	24,000 BTUH	24,000 BTUH
NORMAL HEATING CAPACITY	24,000 BTUH	24,000 BTUH	50,000 BTUH	24,000 BTUH	24,000 BTUH	24,000 BTUH	24,000 BTUH	24,000 BTUH
EFFICIENCY SEER/EER	17.6/10.2	17.6/10.2	14.0/8.6	17.6/10.2	17.6/10.2	17.6/10.2	17.6/10.2	17.6/10.2
EFFICIENCY HSPF/COP	8.4/--	8.4/--	8.4/--	8.4/--	8.4/--	8.4/--	8.4/--	8.4/--
REFRIGERANT	410 A	410 A	410 A	410 A	410 A	410 A	410 A	410 A
REFRIGERANT CHARGE	X LBS	X LBS	X LBS	X LBS	X LBS	X LBS	X LBS	X LBS
MAX OPERATING TEMPS	115/5	115/5	115/5	115/5	115/5	115/5	115/5	115/5
MAX PIPING LENGTH	98 FT	98 FT	230 FT	98 FT	98 FT	98 FT	98 FT	98 FT
MAX PIPING HEIGHT	65 FT	65 FT	98 FT	65 FT	65 FT	65 FT	65 FT	65 FT
VOLTS-PHASE – **	208/230-1 PHASE	208/230-1 PHASE	208/230-1 PHASE	208/230-1 PHASE	208/230-1 PHASE	208/230-1 PHASE	208/230-1 PHASE	208/230-1 PHASE
MCA/MOP – **	16.5/20.0 AMPS	16.5/20.0 AMPS	29.1/35	16.5/20.0 AMPS	16.5/20.0 AMPS	16.5/20.0 AMPS	16.5/20.0 AMPS	16.5/20.0 AMPS
COMPRESSOR	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED
WEIGHT	172 LBS	172 LBS	200	172 LBS	172 LBS	172 LBS	172 LBS	172 LBS
BASIS OF DESIGN	DAIKIN RX24NMVJU	DAIKIN RX24NMVJU	DAIKIN RZQ48TAVJUA	DAIKIN RX24NMVJU	DAIKIN RX24NMVJU	DAIKIN RX24NMVJU	DAIKIN RX24NMVJU	DAIKIN RX24NMVJU

** – ELECTRICAL DATA LISTED FOR REFERENCE ONLY, COORDINATE WITH ELECTRICAL DESIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS

Commercial Ceiling Heater KDS Series

Model Code:

KDS	A	24	20
A	B	C	D

A: Series
B: A=Surface B=Recessed mount
C: 20 - 208V 24 - 240V
27 - 277V 48 - 480V
D: Watts (20=2000 - 100=10000)
E: -1 single phase -3 three phase

4 heaters per floor

- Totally enclosed fan and lifetime-lubricated ball bearing motor
- Three stainless steel tubular hating elements with aluminum fins
- High-limit temperature control with automatic reset
- Fan delay purges heater of residual heat
- Installation recessed into a T-bar ceiling for KDSR units
- Installation surface mounted for KDSA or KDSB units
- Recommended installation height: 8-12 ft. (2.4-3.6m)
- Standard color: white (-BW) (Almond optional)
- Built-in contactor for: all units at 347V, 480V, 600V, all units from 5-10 kW, and all units at 3-Phase
- Continuous circulation controlled by a built in switch (with power-on indicator light (-CV))
- 208V, 240V, 277V, 347V, 480V, 600V, 1 or 3-Phase
- Standard finish: epoxy/polyester powder paint
- Outlet grill made of flat ribbon wire
- 1-year warranty against defects, 10-year on element

The KDS Series Ceiling Heater

Designed for ceiling mount, this unit heater provides a high level of comfort. Driven by a powerful motor, the fan creates circulation by blowing downward warm air accumulation near ceilings.

Engineering Specifications

Contractor shall supply and install KDS Series electric heaters of the wattage and voltage as indicated on the plans.

Color: Standard: white Optional: Almond, metallic silver, bronze, metallic charcoal, aluminum, semi-gloss black. Custom colors available upon request.
Finish: Standard: epoxy/polyester powder paint.
Voltage: 208V, 240V, 277V, 347V, 480V, 600V, 1 or -3 phase.
Construction: Grill made of flat ribbon wire. High-limit temperature control with automatic reset.
Fan: Totally enclosed and lifetime-lubricated ball bearing motor. Fan delay purges heater of residual heat.
Heating element: Three stainless steel tubular heating elements with aluminum fins.
Warranty: 1-year warranty against defects. 10-year warranty on the heating elements.

CH 1

Control: Line voltage control standard. Built-in 240V contactor for: all units from 5 to 10kW, all units at 347V, 480V, 600V, all units at 3-phase. 24V and 120V control circuit available. Built-in tamperproof thermostat available. 24V relay (with or without transformer) available. Continuous circulation controlled by a built-in switch with power-on indicator light available (-CV). Any remote thermostat or relay must be connected to the heater control terminal block. 4
Installation: Recommended height: between 8 ft. (2.4 m) and 12 ft. (3.6 m). Recessed into insulated or T-bar ceiling (KDSR). Surface mounting (KDSA and KDSB).
Application: Apartment building, commercial building, drop ceiling, stairwell, garage.

King Electrical Manufacturing Company / 9131 10th Avenue South, Seattle, WA 98108 / phone 206.762.0400 / fax 206.763.7738 / www.king-electric.com

Commercial Ceiling Heater KDS Series

Ordering Information

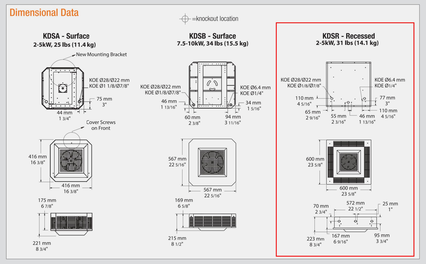
*Add suffix -X for optional almond color

	SURFACE MODEL KDSA	UPC	RECESS MODEL KDSR	UPC	SURFACE MODEL KDSB	UPC	VOLTS 1ph	WATTS
240V	KDSAU2420-1	30850	KDSRU2420-1	30906			240	2000
	KDSAU2430-1	30852	KDSRU2430-1	30908			240	3000
	KDSAU2440-1	30854	KDSRU2440-1	30910			240	4000
	KDSAU2450-1	30856	KDSRU2450-1	30912			240	5000
					KDSBU2475-1	30962	240	7500
					KDSBU24100-1	30964	240	10000
208V	KDSAU2020-1	30858	KDSRU2020-1	30914			208	2000
	KDSAU2030-1	30860	KDSRU2030-1	30916			208	3000
	KDSAU2040-1	30862	KDSRU2040-1	30918			208	4000
	KDSAU2050-1	30864	KDSRU2050-1	30920			208	5000
					KDSBU2075-1	30966	208	7500
					KDSBU20990-1	30968	208	9900
277V	KDSAU2720-1	30866	KDSRU2720-1	30922			277	2000
	KDSAU2730-1	30868	KDSRU2730-1	30924			277	3000
	KDSAU2740-1	30870	KDSRU2740-1	30926			277	4000
	KDSAU2750-1	30872	KDSRU2750-1	30928			277	5000
					KDSBU2775-1	30970	277	7500
					KDSBU27100-1	30972	277	10000
480V	KDSAU4820-1	30874	KDSRU4820-1	30930			480	2000
	KDSAU4830-1	30876	KDSRU4830-1	30932			480	3000
	KDSAU4840-1	30878	KDSRU4840-1	30934			480	4000
	KDSAU4850-1	30880	KDSRU4850-1	30936			480	5000
					KDSBU4875-1	30974	480	7500
					KDSBU48100-1	30976	480	10000

	SURFACE MODEL KDSA	UPC	RECESS MODEL KDSR	UPC	SURFACE MODEL KDSB	UPC	VOLTS 3ph	WATTS
240V	KDSAU2420-3	30882	KDSRU2420-3	30938			240	2000
	KDSAU2430-3	30884	KDSRU2430-3	30940			240	3000
	KDSAU2440-3	30886	KDSRU2440-3	30942			240	4000
	KDSAU2450-3	30888	KDSRU2450-3	30944			240	5000
					KDSBU2475-3	30978	240	7500
					KDSBU24100-3	30980	240	10000
208V	KDSAU2020-3	30890	KDSRU2020-3	30946			208	2000
	KDSAU2030-3	30892	KDSRU2030-3	30948			208	3000
	KDSAU2040-3	30894	KDSRU2040-3	30950			208	4000
	KDSAU2050-3	30896	KDSRU2050-3	30952			208	5000
					KDSBU2075-3	30982	208	7500
					KDSBU20990-3	30984	208	9900
480V	KDSAU4820-3	30898	KDSRU4820-3	30954			480	2000
	KDSAU4830-3	30900	KDSRU4830-3	30956			480	3000
	KDSAU4840-3	30902	KDSRU4840-3	30958			480	4000
	KDSAU4850-3	30904	KDSRU4850-3	30960			480	5000
					KDSBU4875-3	30986	480	7500
					KDSBU48100-3	30988	480	10000

Commercial Ceiling Heater KDS Series

Dimensional Data



Control Options

MODEL	DESCRIPTION
Product no-RT	Factory installed (Only) 24V relay with transformer
Product no-R	Factory installed 24V relay without transformer
Product no-120	Factory installed 120V control circuit
Product no -RCV24	Factory installed summer fan 24V remote control + pilot light (switch not included)
Product no -RCV240	Factory installed summer fan 240V remote control + pilot light (switch not included)
KDSA-T-BAR KDSB-T-BAR	Adapter for T-bar ceiling (KDSA/KDSB kits)
Product no-CV	Factory installed summer fan switch + pilot light
Product no -DIS20	Factory installed disconnect switch 277V and less, double pole, 20 Amp
Product no -DIS40	Factory installed disconnect switch 600V max, three pole, 40 Amp
Product no -DIS80	Factory installed disconnect switch 600V, three pole, 80 Amp
KDS-T-AV	Built-in tamper-proof thermostat kit
Product #-T-AV	Factory installed built-in tamper-proof thermostat

Options

ADD SUFFIX	DESCRIPTION
-A	Almond color
-AE	Metallic Silver color (10% up-charge applies)
-BZ	Bronze color (10% up-charge applies)
-CM	Metallic Charcoal color (10% up-charge applies)
-AL	Aluminum color (10% up-charge applies)
-NL	Semi-Gloss Black (10% up-charge applies)
-BW	White

King Electrical Manufacturing Company / 9131 10th Avenue South, Seattle, WA 98108 / phone 206.762.0400 / fax 206.763.7738 / www.king-electric.com

ARCHITECTS
HACKER
555 SE MLK Jr. Blvd. Suite 501, Portland, OR 97214

homeforward

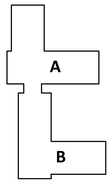
ANDERSEN MECHANICAL, Inc.

MFA INC.
Consulting Engineers
2007 S.E. Ash St.
Portland, OR 97214
PH: (503) 234-0548
FAX: (503) 234-0677
WWW.MFIA-ENG.COM
CONTACT: MARK DENYER

STAMP 3-15-22

REGISTERED PROFESSIONAL ENGINEER 54,607 OREGON JULY 11, 2003 MARK R. DENYER
EXPIRES: 31DEC23

REVISION NO. DATE



KEY PLAN - (NTS)

TRUE NORTH PLAN NORTH

HOME FORWARD
5600 NE 42ND
PORTLAND, OR 97218

ISSUANCE
PERMIT SET

PROJECT NUMBER
2003

DATE
MARCH 18, 2022

SCALE
As indicated

DRAWING TITLE
MECHANICAL SCHEDULES

SHEET NUMBER
M6.00