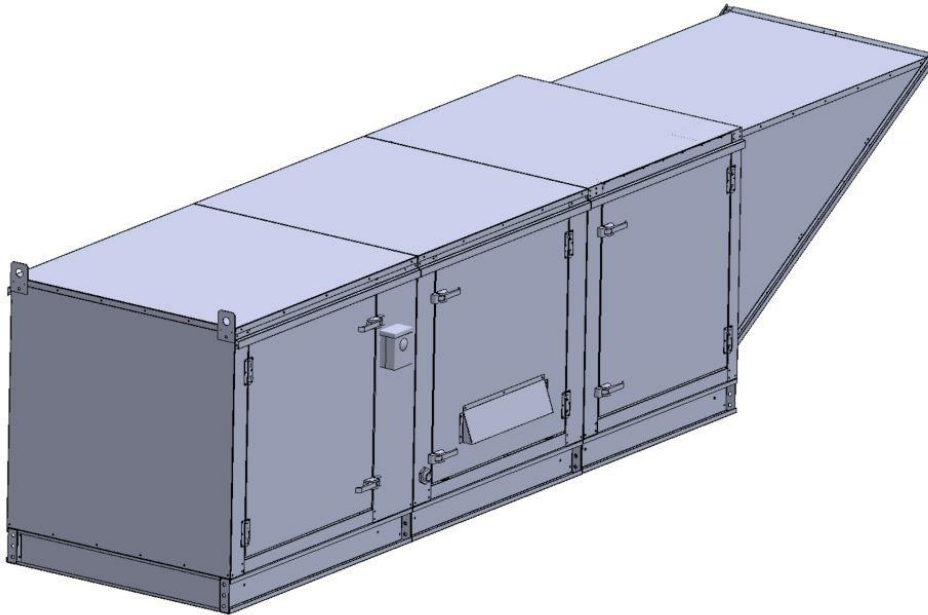


## Gas-Fired Tempered Make-Up Air Unit / EVAP

Model:

TK5-EVAP-1PH-FF

1-Phase, 208V, 10.00 HP, Belt driven with Motorized Damper and 25" Blower. MAX 14000 CFM's





TK5-2000 Direct Fired EVAP (2695 lbs.)

**Supply Motor:**

Model DTP0104, 10.000 HP, 3 Phase, 208 V, 60Hz, 46.7 FLA, ODP, Premium (E-Plus3) Eff.

**Supply Motor Pulleys:**

<u>Part Type</u>	<u>Qty.</u>	<u>Browning #</u>	<u>Turns Out</u>
Belt	2	BX103	
Blower Pulley	1	2B5V136	
Bushing	1	B-2 3/16	
Motor Pulley	1	2VP60 x 1-3/8	2.5

**Burner:**

Min Output BTU: 73,333 BTU/Hr  
Max Output BTU: 2,200,000 BTU/Hr  
Size: 48" long  
Gas Type: Natural

**Supply Performance:**

Volume: 14000 cfm Volume Range: 10000-14000 cfm  
RPM: 682  
TS: 4464 ft/min  
SP: 1.133" w.g.  
0.500" Ext. + 0.597" Int. + 0.036" Opt.  
BHP: 9.258

**Heating Schedule:**

Altitude: 0'  
Winter Entering Air Dry Bulb Temp: 0°F  
Temp Rise: 100°F  
Output BTU: 1512000  
Input BTU: 1643478  
BTUs BASED OFF STANDARD AIR DENSITY

**Cooling Schedule:**

Intake Entering Dry Bulb Temperature: 90°F  
Intake Entering Wet Bulb Temperature: 70°F  
Intake Entering Relative Humidity: 37%  
Intake Leaving Dry Bulb Temperature: 74°F  
Intake Leaving Wet Bulb Temperature: 70°F  
Temperature drop calculations are based on tested data.

**Supply Installation Information:**

Gas Inlet Pressure: 7 in. w.c. - 14 in. w.c.  
Insurance: No Insurance Requirement (ANSI)  
Unit Main Input: 75.0 Amps MCA, 125 Amps MOP, 208 V, 4 AWG Wire Min.  
Supply Unit Voltage: 1 phs 208 V 60Hz via VFD

**Blower:**

25" forward curved, centrifugal blower. Permanently lubricated pillow block ball bearings. Enamel finish. 10000-25000 CFM. 2 3/16" x 54-1/2" Shaft. 1000 maximum RPM. Heavy duty angle iron frame. Used in heated and non-heated supply fans.

**Temp Control:**

RTC Solutions • 40-90°F Discharge Temp Control • Field Wired On/Off Start Command

**Intake:**

Size # 6 Celdek Evaporative Cooler for Size # 5 Modular Heater. 74.822" Wide x 105.238" Long x 58.375" High. Includes intake hood with filters. For outdoor installation. Use with water softener recommended.

**Filters:**

8x MV EZ Kleen Metal Mesh Filter. 20"x 25"x 2" Used for heater and supply fan intakes. (3416)

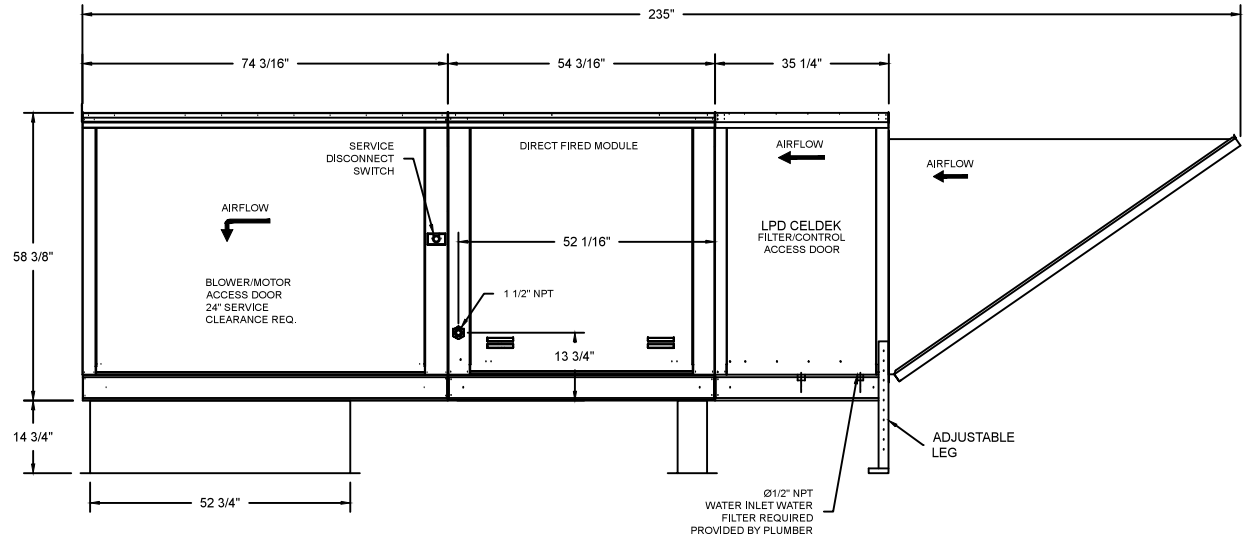
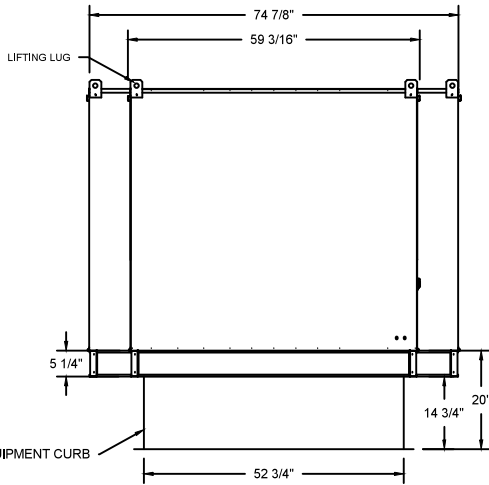
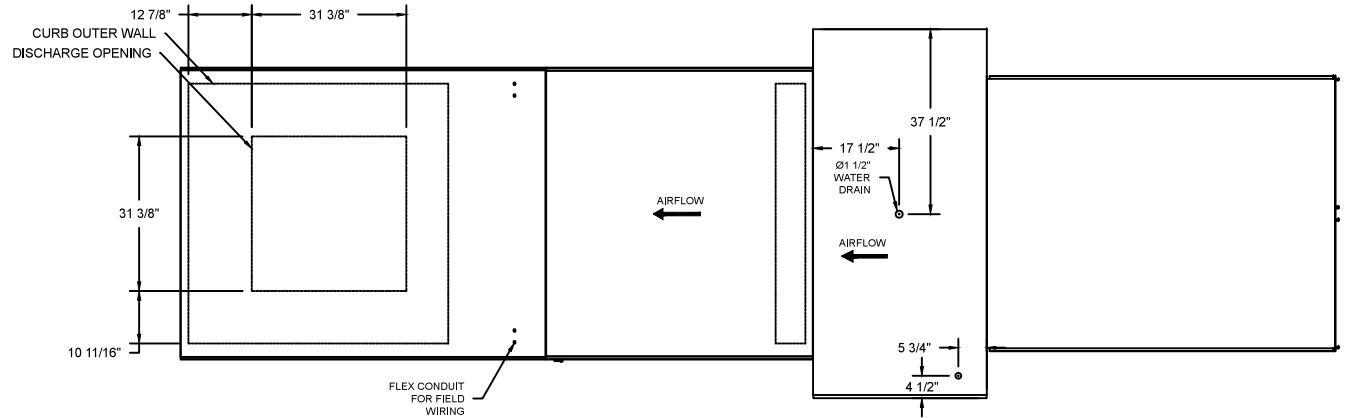
**Selected Options:**

- Motorized Back Draft Damper 43" X 43" for Size 5 Standard & Modular Heater Units w/Extended Shaft, Standard Galvanized Construction, 3/4" Rear Flange, Low Leakage, NFBUPS Actuator Included
- Low Fire Start. Allows the burner circuit to energize when the modulation control is in a low fire position.
- Gas Pressure Gauge, 0-35", 2.5" Diameter, 1/4" Thread Size
- Gas Pressure Gauge, -5 to +15 Inches Wc., 2.5" Diameter, 1/4" Thread Size
- Freeze Protection Drain Control kit for Evaporative Coolers. Includes 3-Way water solenoid valve 8316G064 (shipped loose), Pressure switch installed upstream of 2way solenoid in unit, Brass Tee, 2 NPT half inch nipples, and two stage thermostat T678A1361. Field wiring required by others for 3-way valve. For both Celdek and Standard V-bank type Configurations.
- VAV (Variable-Air-Volume) Wiring Package for Commercial Fans. Manual Speed Control Variable Frequency Drive Included
- Supply Variable Frequency Drive - 20 HP Max., 200/240 V, Three Phase, 54.0 A Max., NEMA 1 Enclosure, (Default is Shipped Loose for Field Installation) PART NEEDS PROGRAMMING
- VFD factory mounted and wired on unit control panel.

**TK5 DIRECT FIRED HEATER WITH EVAP**

1. DIRECT GAS FIRED HEATED MAKE UP AIR UNIT WITH 25" BLOWER AND 48" BURNER
2. EVAP COOLER (LPD CELDEK) – W/INTAKE HOOD W/EZ FILTERS
3. DOWN DISCHARGE - AIR FLOW RIGHT -> LEFT
4. MOTORIZED BACK DRAFT DAMPER 43" X 43" FOR SIZE 5 STANDARD & MODULAR HEATER UNITS W/EXTENDED SHAFT, STANDARD GALVANIZED CONSTRUCTION, 3/4" REAR FLANGE, LOW LEAKAGE, NFBUPS ACTUATOR INCLUDED
5. LOW FIRE START. ALLOWS THE BURNER CIRCUIT TO ENERGIZE WHEN THE MODULATION CONTROL IS IN A LOW FIRE POSITION.
6. GAS PRESSURE GAUGE, 0-35", 2.5" DIAMETER, 1/4" THREAD SIZE
7. GAS PRESSURE GAUGE, -5 TO +15 INCHES WC., 2.5" DIAMETER, 1/4" THREAD SIZE
8. FREEZE PROTECTION DRAIN CONTROL KIT FOR EVAPORATIVE COOLERS. INCLUDES 3-WAY WATER SOLENOID VALVE 8316G064 (SHIPPED LOOSE), PRESSURE SWITCH INSTALLED UPSTREAM OF 2WAY SOLENOID IN UNIT. BRASS TEE, 2 NPT HALF INCH NIPPLES, AND TWO STAGE THERMOSTAT T678A1361. FIELD WIRING REQUIRED BY OTHERS FOR 3-WAY VALVE, FOR BOTH CELDEK AND STANDARD V-BANK TYPE CONFIGURATIONS.

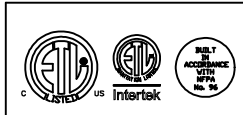
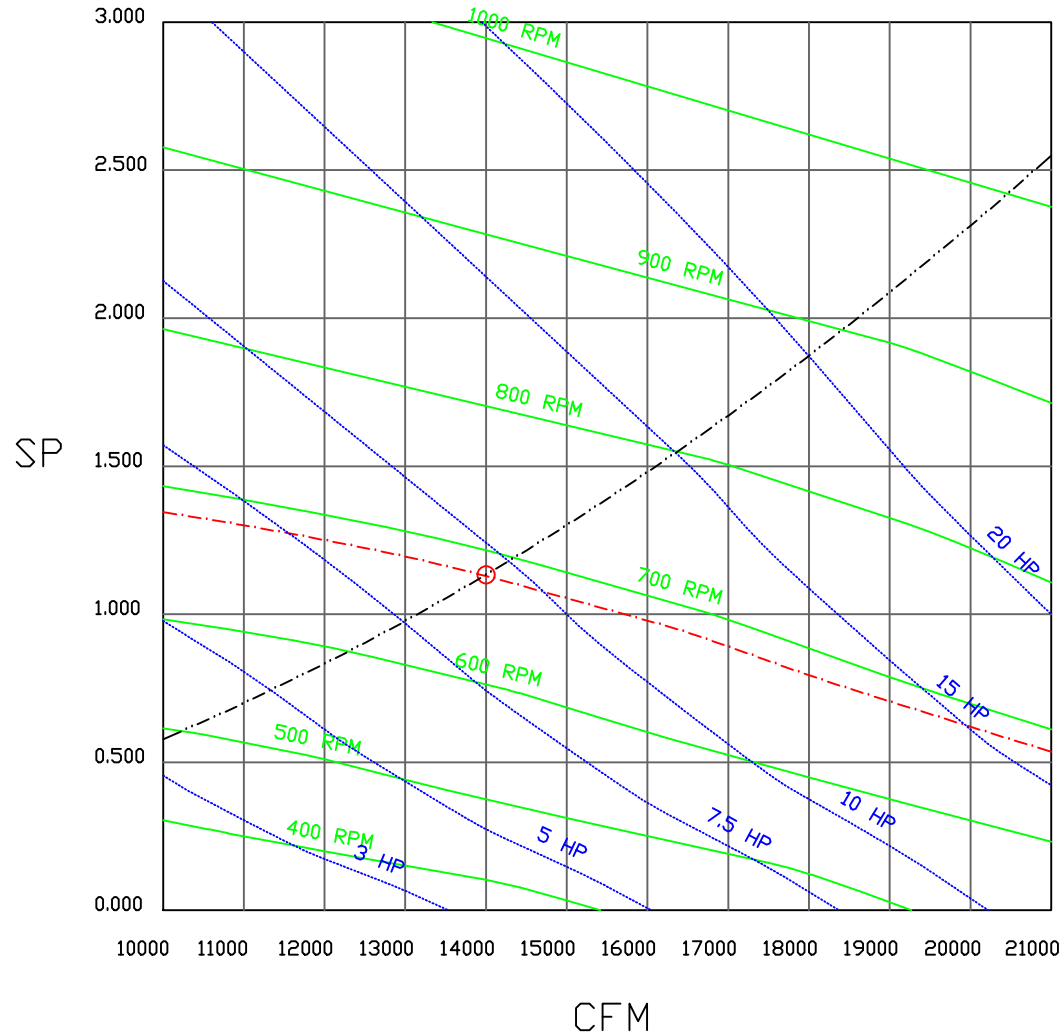
NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE UNLESS OTHERWISE SPECIFIED. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY. FAILURE TO PROPERLY SIZE DUCTWORK MAY CAUSE SYSTEM EFFECTS AND REDUCE PERFORMANCE OF THE EQUIPMENT.



JOB	
LOCATION	
DATE	08/01/2018
DWG #	JOB #
REV.	DRAWN BY
	SCALE

(EVAP 14000 10HP/1PH-208V) - HEATER PERFORMANCE CURVES.

14000 CFM, 1.133 SP @ 682 RPM and 9.258 BHP at 0 feet and 100 deg F  
 \* Please note that these curves were adjusted for job specific temperature and altitude.



JOB	
LOCATION	
DATE 8/3/2018	JOB #
DWG #	DRAWN BY
REV.	SCALE 3/8" = 1'-0"

# Direct Fired Heater Wiring

JOB NAKS Direct Fired MUA EVAP

DRAWING NUMBER

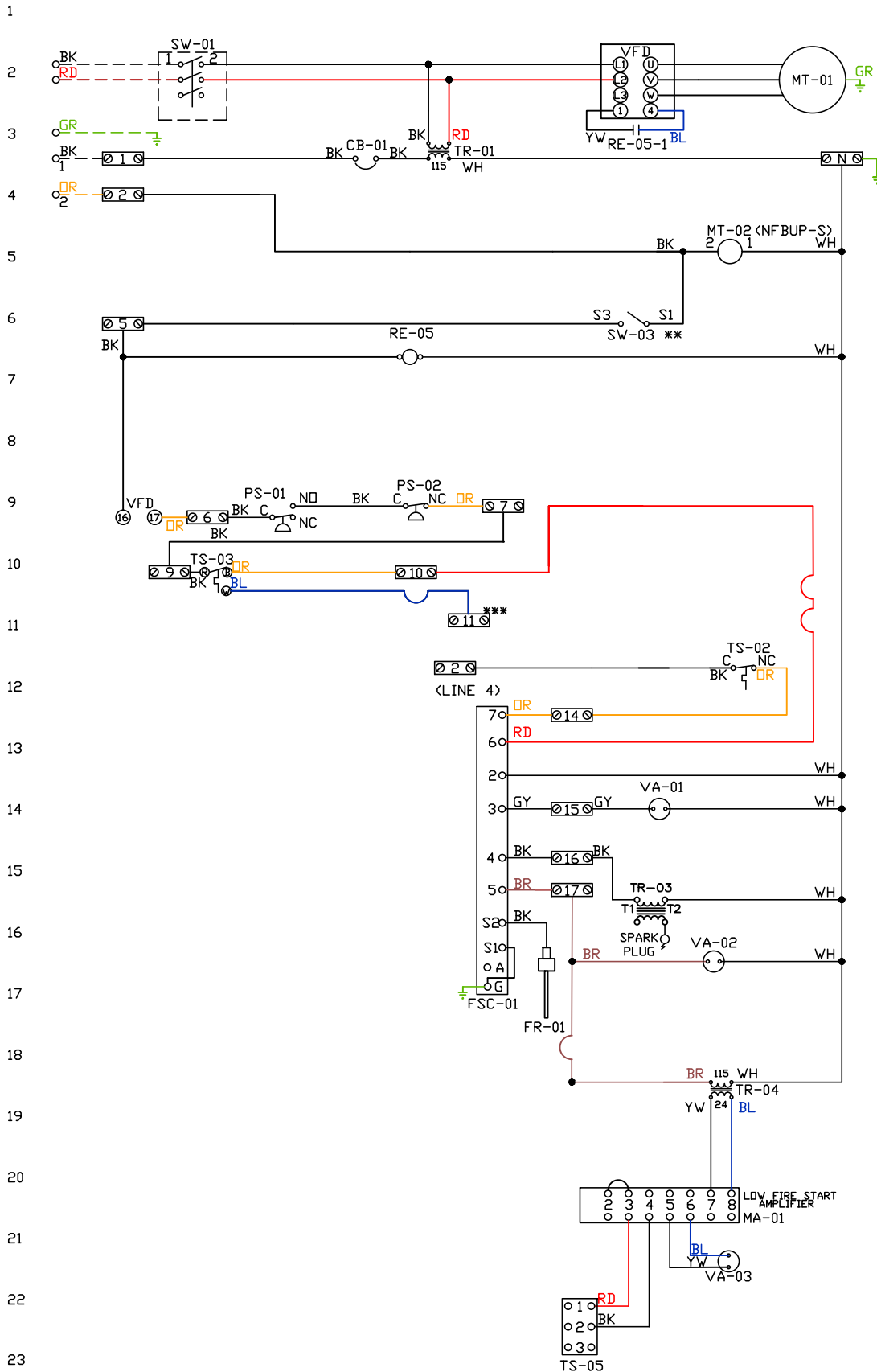
SHIP DATE

MODEL TK 1-5 Series

ATTENTION ELECTRICIAN!  
 DRIP FOR DISCONNECT CONNECTION  
 IS FACTORY SUPPLIED  
 CONNECT POWER TO THE DRIP

Installed Options  
 Field Wired Single Switch Control  
 Motorized Back Draft Damper

Discharge Temp. Control



Component Identification		
Label	Description	Location
CB-01	Circuit breaker (2amp)	[3]
FR-01	Flame rod	[16]
FSC-01	Fireeye FSC	[11-14]
MA-01	Modulating amplifier	[19]
MT-01	Supply motor	[2]
MT-02	Damper motor	[5]
PS-01	Low AirFlow Switch	[9]
PS-02	High AirFlow Switch	[9]
RE-05	VFD Start Relay	[3I6]
SW-01	Main disconnect switch	[2]
SW-03	Damper end limit switch	[4]
TR-01	Power transformer(200v/33)	
TR-03	Ignition transformer	[14]
TR-04	Power transformer(20va)	[17]
TS-02	High temp limit switch	[10]
TS-03	Intake Air Sensor	[10]
TS-05	Discharge Air Sensor	[21]
VA-01	Pilot gas valve	[12]
VA-02	Main gas valve	[15]
VA-03	Modulating gas valve	[20]

**MOTOR INFO**  
 SUPPLY 10HP-208V-3P-46.7FLA  
 VFD PART: ESV752N02TXB

**ELECTRICAL INFORMATION**  
 MOTOR/CTRL CIRCUIT MCA: 75.0A  
 MOTOR/CTRL CIRCUIT MOP: 125A

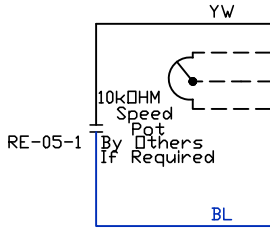
**NOTES**  
 --- DENOTES FIELD WIRING  
 \_\_\_\_\_ DENOTES INTERNAL WIRING

\*\* TERMINALS S4 AND S6 USED ON NF & AF SERIES ACTUATORS  
 \*\*\* TERMINAL 11 PROVIDES COOLING CONNECTION

WIRE COLOR		SOCKET STYLE *CLOW RELAY	
BK-BLACK	YW - YELLOW	RD - RED	ND 4 3
BL-BLUE	GR - GREEN	WH - WHITE	NC 2 1
BR - BROWN	GY - GRAY	PK - PINK	CDL 8 7
DR - ORANGE	PR - PURPLE		CDM 6 5

Installed Options  
Manual Control

SMV SERIES VARIABLE FREQUENCY DRIVE



TERMINAL	FUNCTION
1	Digital Input(Start/Stop)
2	Analog Common
5	Analog Input: 0-10 VDC
6	Internal DC Supply for Speed Pot: +10 VDC
25	Analog Input: 4-20 mA
30	Analog Output
4	Digital Reference/Common
11	Internal DC Supply for External Devices
13A	Digital Input: Configurable with P121
13B	Digital Input: Configurable with P122
13C	Digital Input: Configurable with P123
14	Digital Output: Configurable with P142
30	Analog Output: Configurable with P150...P155
16	Relay Output: Configurable with P140
17	
PE	Ground Terminal
L1	3 Phase Input or Single Phase Input
L2	3 Phase Input or Single Phase Input
L3 (N)	3 Phase input (Neutral for 120v)
U	3 Phase AC Motor
V	3 Phase AC Motor
W	3 Phase AC Motor

BK  
OR BURNER CIRCUIT CONTACT

POWER SUPPLY

MOTOR

Component Identification

RE-05 VFD Start relay [2]

SUPPLY DRIVE PARAMETER SETTINGS\*

All external control wires to motor speed control should be 16-20 AWG shielded multiconductor cables and must not be run in the same conduit or raceway with any high power wiring. Ground Shielded Cable at the drive chassis ONLY.

PG. 11 OF THE DRIVE MANUAL DESCRIBES THE PROPER INSTALLATION PROCEDURE

PG. 19 OF THE DRIVE MANUAL DESCRIBES THE PROGRAMMING PROCEDURE OF THE DRIVE

PG. 23 OF THE DRIVE MANUAL DESCRIBES THE PARAMETER SETTINGS OF THE DRIVE

\*NOTE: THE DEFAULT PASSWORD FROM THE FACTORY REQUIRED TO PROGRAM THE DRIVE IS '225'.

EPM PROGRAM: VAV\_MANKUSE LG\_HP EPM IF >= 15HP)  
 P100 (Start Source) = 01 (Terminal Strip)  
 P102 = \*\*\*Minimum Frequency (Hz)  
 P103 = \*\*\*Maximum Frequency (Hz)  
 (P103 is based on max wheel RPM)  
 P110 (Start Method) = 03 (Auto Re-start)  
 P140 (Form A [NO] Relay) = 01 (Run)  
 P144 (Relay Inversion) = 00 (None)  
 P166 (Carrier Frequency) = 00 (4 kHz)  
 P171 (Current Limit) = 150 (% of Max I)

Adjust manually on all drives  
 P107 = 00 (If 120 or 208 VAC)  
 or 01 (If 230, 480 or 575 VAC)  
 P108 - Motor FLA x 100 / Drive Output Rating  
 P165 (Base Voltage) = Set to Motor Voltage  
 (Preset@230V) P165 FDR STANDARD DRIVE ONLY  
 P167 (Base Frequency) = Calculated Per Fan

When Speed POT is Required the Following Parameters Must be Set:

P101 (Reference Source) = 01 (0-10 VDC)  
 P160 (Speed @ 0 VDC Signal) = Min Frequency  
 P161 (Speed @ 10 VDC Signal) = Max Frequency

IT MAY BE REQUIRED TO FULLY POWER DOWN THE DRIVE AND TURN BACK ON IN ORDER TO INITIATE NEW PARAMETER SETTINGS.

\*\*\*Min. and Max. Frequency Settings override all other Preset speeds/Parameters.

MOTOR INFO  
 SUPPLY 10HP-208V-3P-46.7FLA  
 VFD PART: ESV153N02TXB571

ELECTRICAL INFORMATION  
 MOTOR/CTRL CIRCUIT MCA: 75.0A  
 MOTOR/CTRL CIRCUIT MDP: 125A

NOTES

---- DENOTES FIELD WIRING  
 \_\_\_\_\_ DENOTES INTERNAL WIRING

WIRE COLOR

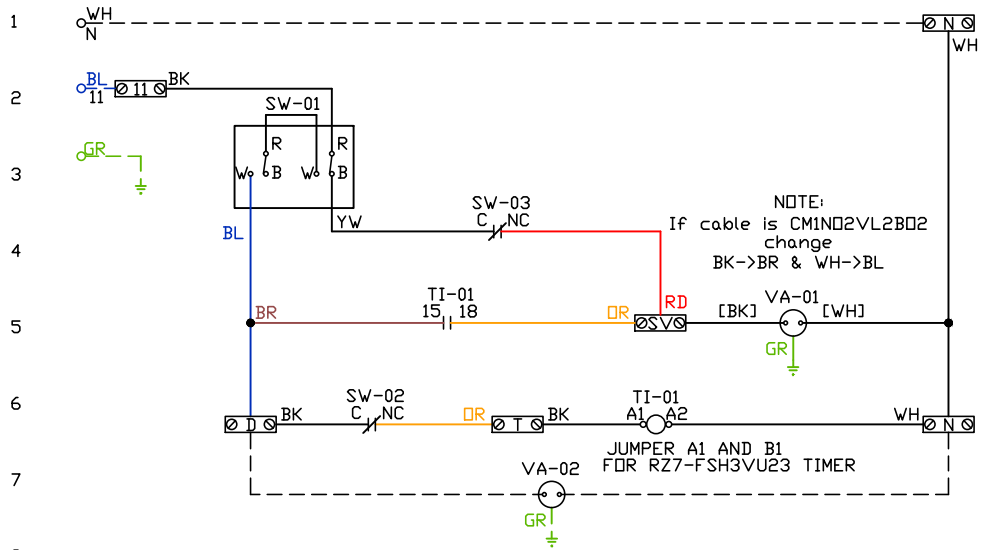
BK - BLACK YW - YELLOW  
 BL - BLUE GR - GREEN  
 BR - BROWN GY - GRAY  
 OR - ORANGE PR - PURPLE  
 RD - RED PK - PINK  
 WH - WHITE

GENERAL NOTES

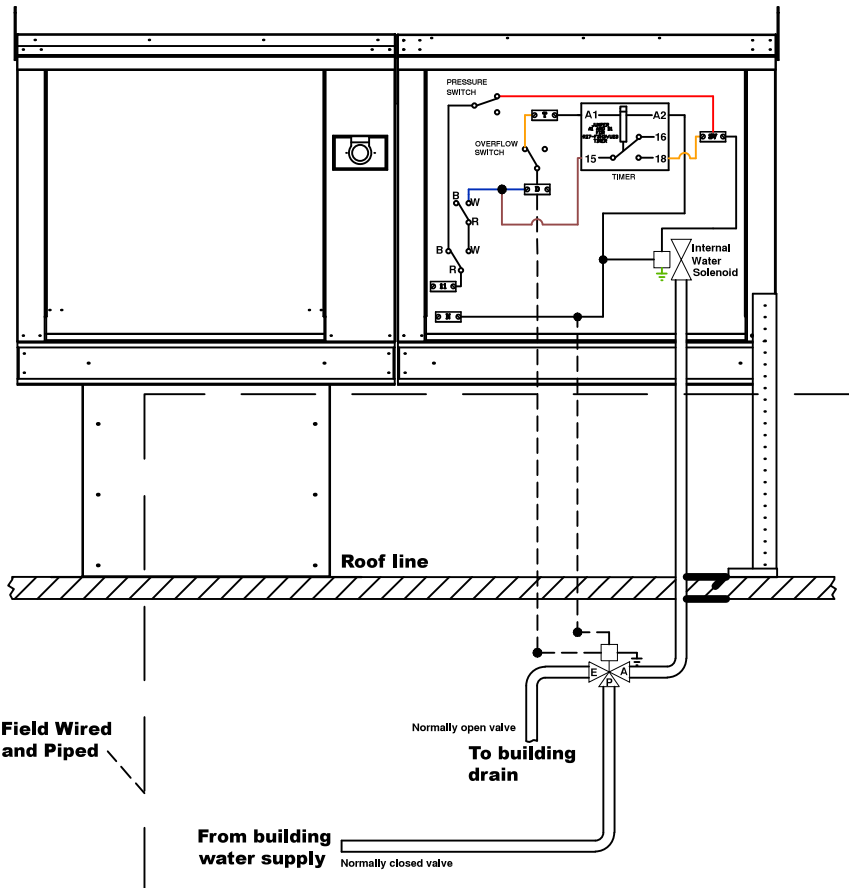
Installed Options

Component Identification

Label	Description	Location
SW-01	Thermostat	[2]
SW-02	Overflow Switch	[6]
SW-03	Pressure Switch	[3]
TI-01	Spray Timer	[5-7]
VA-01	Internal Solenoid Valve	[5]
VA-02	3-Way Solenoid Valve	[7]



POINT-TO-POINT SUMMARY OF DRAIN CONNECTION



NOTES

- DENOTES FIELD WIRING
- DENOTES INTERNAL WIRING

WIRE COLOR

- BK - BLACK
- BL - BLUE
- BR - BROWN
- DR - ORANGE
- RD - RED
- WH - WHITE
- YW - YELLOW
- GR - GREEN
- GY - GRAY
- PR - PURPLE
- PK - PINK

# Installation Wiring

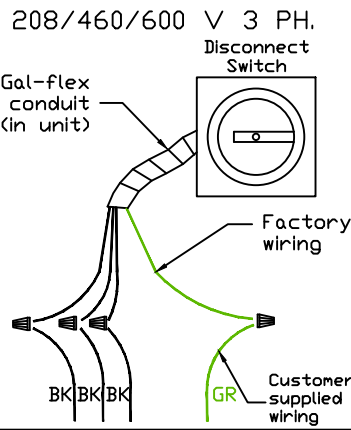
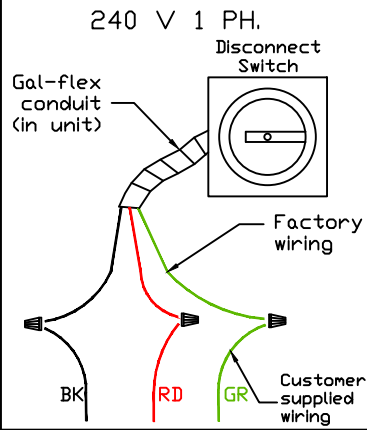
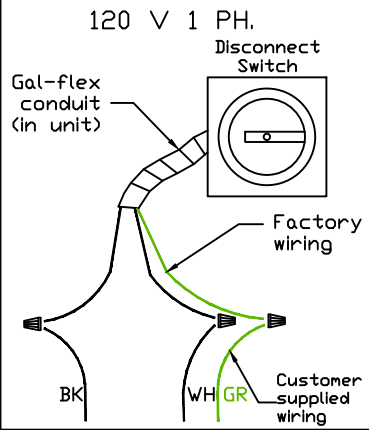
JOB *NAKS Direct Fired MUA*

DRAWING NUMBER

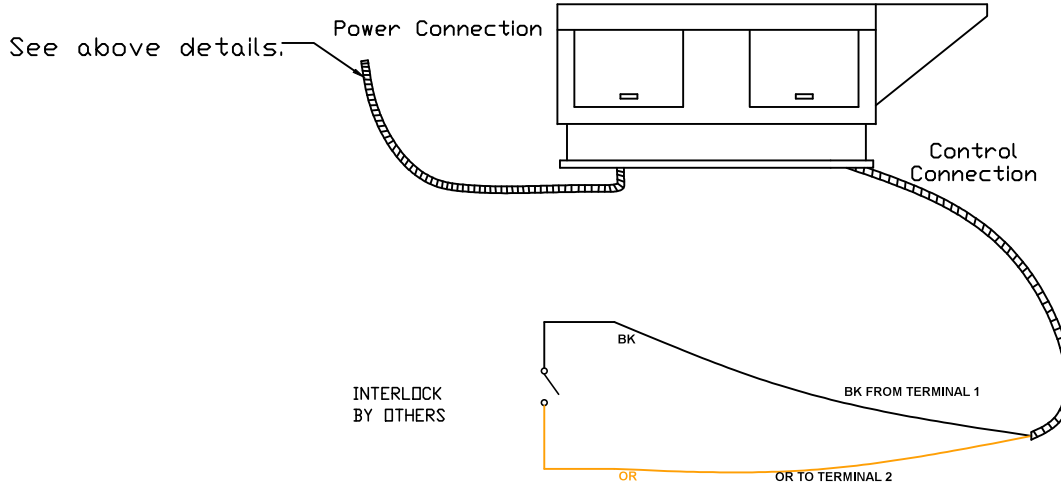
SHIP DATE

MODEL **TK-76**

Installed Options



Field Wired On/Off Switch



NOTES

- WIRE COLOR
- BK - BLACK
  - BL - BLUE
  - BR - BROWN
  - OR - ORANGE
  - RD - RED
  - WH - WHITE
  - YW - YELLOW
  - GR - GREEN
  - GY - GRAY
  - PR - PURPLE
  - PK - PINK