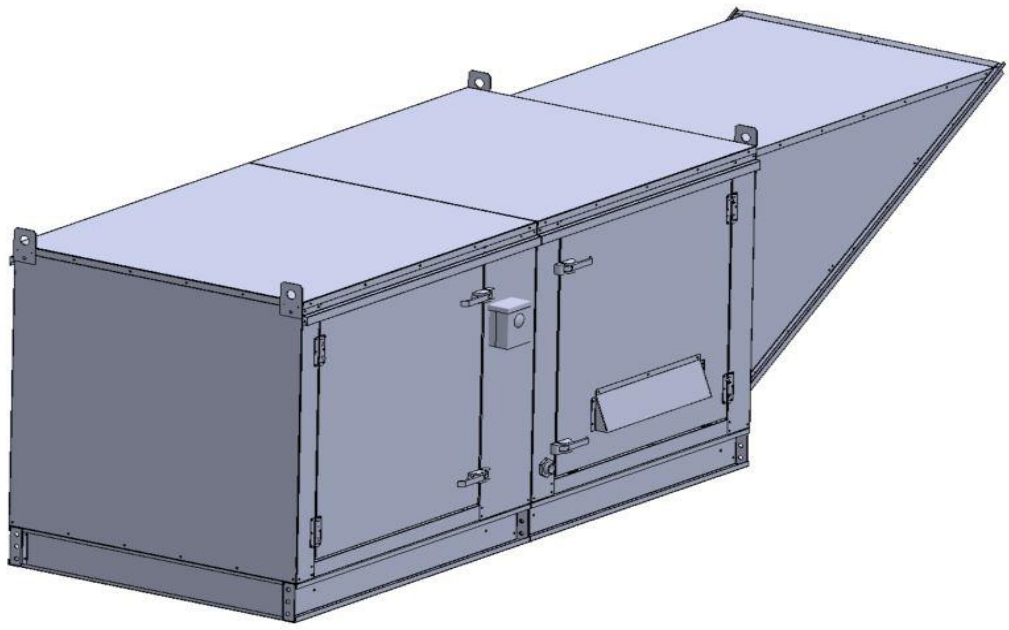
NORTH AMERICAN KITCHEN SOLUTIONS INCORPORATED

Gas-Fired Tempered Make-Up Air Unit

Model:

TK3-1PH-FF

1-Phase, 230V, 3.00 HP, Belt driven with Motorized Damper and 18” Blower. MAX 6200 CFM’s



NAKS Inc
172 Reaser Ct
Elyria, OH 44035

Tel: (440) 365-4567
Fax: (440) 365-2100
www.naksinc.com

TK3-750 Direct Fired (1019 lbs.)

Supply Motor:
Model 00318OT3E56Z-48PP, 3.000 HP, 3 Phase, 230 V, 60Hz, 14.9 FLA, ODP, Premium (E-Plus3) Eff.

Supply Motor Pulleys:

Part Type	Qty	Browning #	Turns Out
Belt	2	BX56	
Blower Pulley	1	2BK80H	
Bushing	1	H-1 3/16	
Motor Pulley	1	2VP42 x 7/8	4.0

Burner:
Min Output BTU: 27,500 BTU/Hr
Max Output BTU: 825,000 BTU/Hr
Size: 18" long
Gas Type: Natural

Supply Performance:
Volume: 6200 cfm Volume Range: 3500-6200 cfm
RPM: 750
TS: 3534 ft/min
SP: 0.639" w.g.
0.500" Ext. + 0.109" Int. + 0.030" Opt.
BHP: 2.745

Heating Schedule:
Altitude: 0'
Winter Entering Air Dry Bulb Temp: 0°F
Temp Rise: 100°F
Output BTU: 669600
Input BTU: 727826
BTUs BASED OFF STANDARD AIR DENSITY

Supply Installation Information:
Gas Inlet Pressure: 7 in. w.c. - 14 in. w.c.
Insurance: No Insurance Requirement (ANSI)
Unit Main Input: 22.5 Amps MCA, 35 Amps MOP, 208 V, 10 AWG Wire Min.
Supply Unit Voltage: 1 phs 230 V 60Hz via VFD

Construction Features
Housing constructed of heavy duty G90 galvanized steel • Forward curved centrifugal blower wheel • Vibration isolation • Adjustable drive assemblies • Adjustable motor mount • Ball bearing motors • Heavy duty, pre-lubricated bearings rated for 200,000 hours of operation • Static resistant belts • Service doors on both sides • Horizontal & down discharge • Large intake area ensures low pressure drop across unit • Spring loaded profile plates automatically adjust for any airflow - no manual setting required! • Weatherproof safety disconnect switch • Modular design provides design flexibility • Fully insulated casing

Blower:
18" forward curved, centrifugal blower. Pillow Block ball bearings. Galvanized finish. 4000-12000 CFM. 1-3/16" x 34" Shaft. 1450 max. RPM. Used in heated and non-heated supply fans.

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

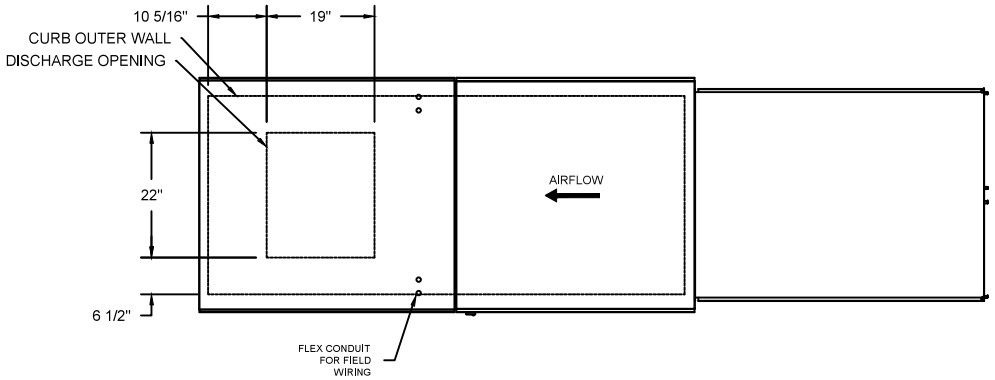
Intake:
Sloped Filtered Intake for Size #3 Modular Heater. 37.25" Wide X 51.625" Long X 35.188" High. Includes 2" MV EZ Kleen Metal Mesh FIlter.

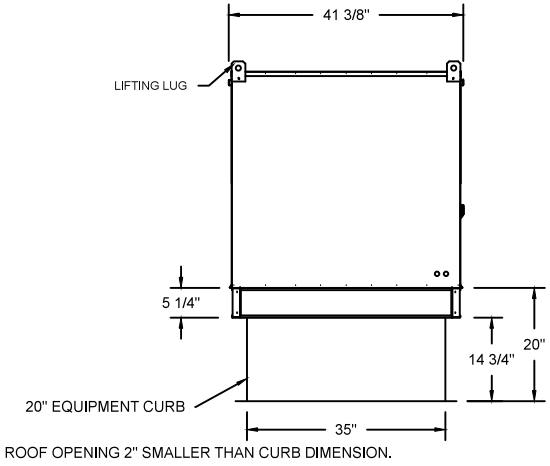
Filters:
6x MV EZ Kleen Metal Mesh Filter. 16"x 20"x 2" Used for heater and supply fan intakes. (3412)

Selected Options:
- Motorized Back Draft Damper 30" X 30" for Size 3 Standard & Modular Heater Units w/Extended Shaft, Standard Galvanized Construction, 3/4" Rear Flange, Low Leakage, NFBUP-S 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
- VAV (Variable-Air-Volume) Wiring Package for Commercial Fans. Manual Speed Control Variable Frequency Drive Included
- Supply Variable Frequency Drive - 3 HP Max., 200/240 V, Single or Three Phase Input, 9.6 A Max., NEMA 1 Enclosure, (Default is Shipped Loose for Field Installation) PART NEEDS PROGRAMMING
- VFD factory mounted and wired on unit control panel.

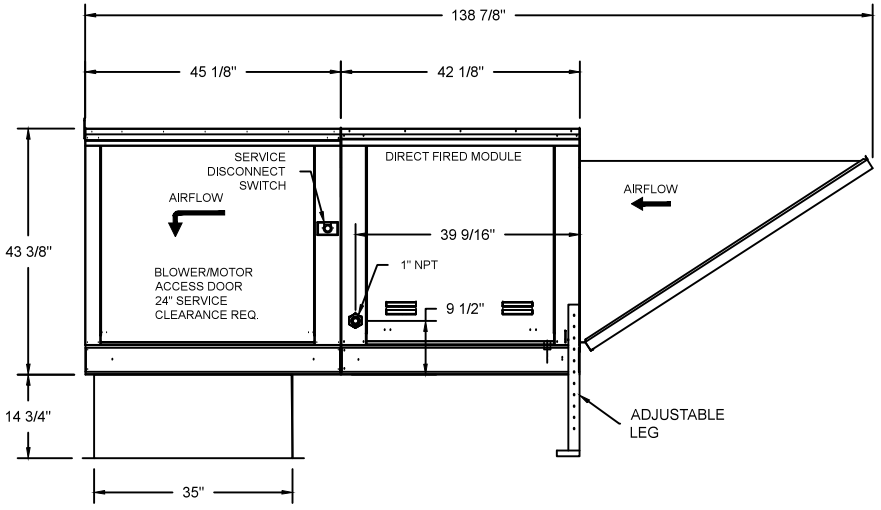
TK3 DIRECT FIRED HEATER
1. DIRECT GAS FIRED HEATED MAKE UP AIR UNIT WITH 18" BLOWER AND 18" BURNER.
2. INTAKE HOOD WITH EZ FILTERS
3. DOWN DISCHARGE - AIR FLOW RIGHT -> LEFT
4. MOTORIZED BACK DRAFT DAMPER W/STANDARD GALVANIZED CONSTRUCTION, LOW LEAKAGE, NFBUP-S ACTUATOR
5. LOW FIRE START. ALLOWS THE BURNER CIRCUIT TO ENERGIZE WHEN THE MODULATION CONTROL IS IN A LOW FIRE POSITION.
6. GAS PRESSURE GAUGE, 0-35"
7. GAS PRESSURE GAUGE, -5 TO +15 INCHES WC.

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.





ROOF OPENING 2" SMALLER THAN CURB DIMENSION.

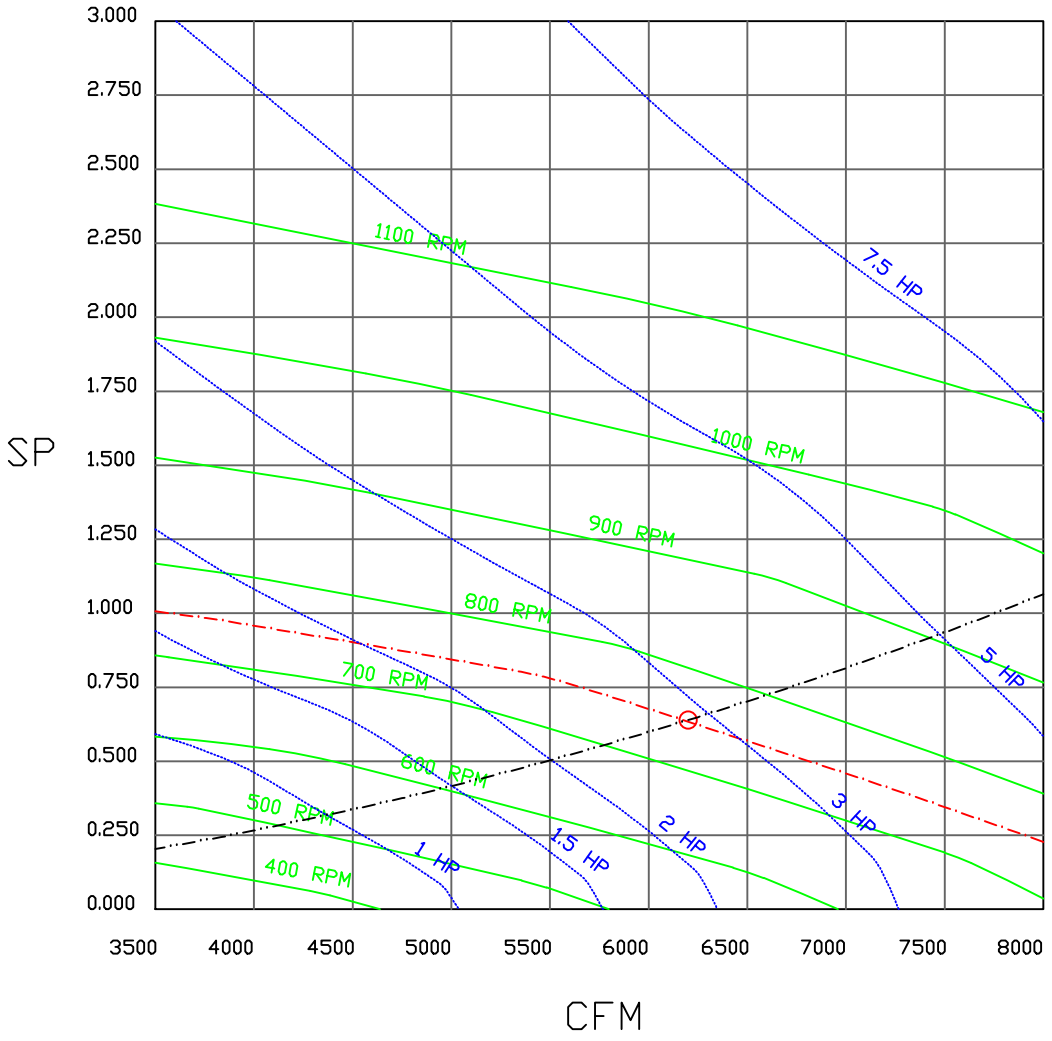


JOB		
LOCATION		
DATE 08/01/2018	JOB #	
DWG # TK3	DRAWN BY	
REV.	SCALE	

(6200 3HP/1PH-230V) - HEATER PERFORMANCE CURVES.

6200 CFM, 0.639 SP @ 750 RPM and 2.745 BHP at 0 feet and 100 deg F

* Please note that these curves were adjusted for job specific temperature and altitude.



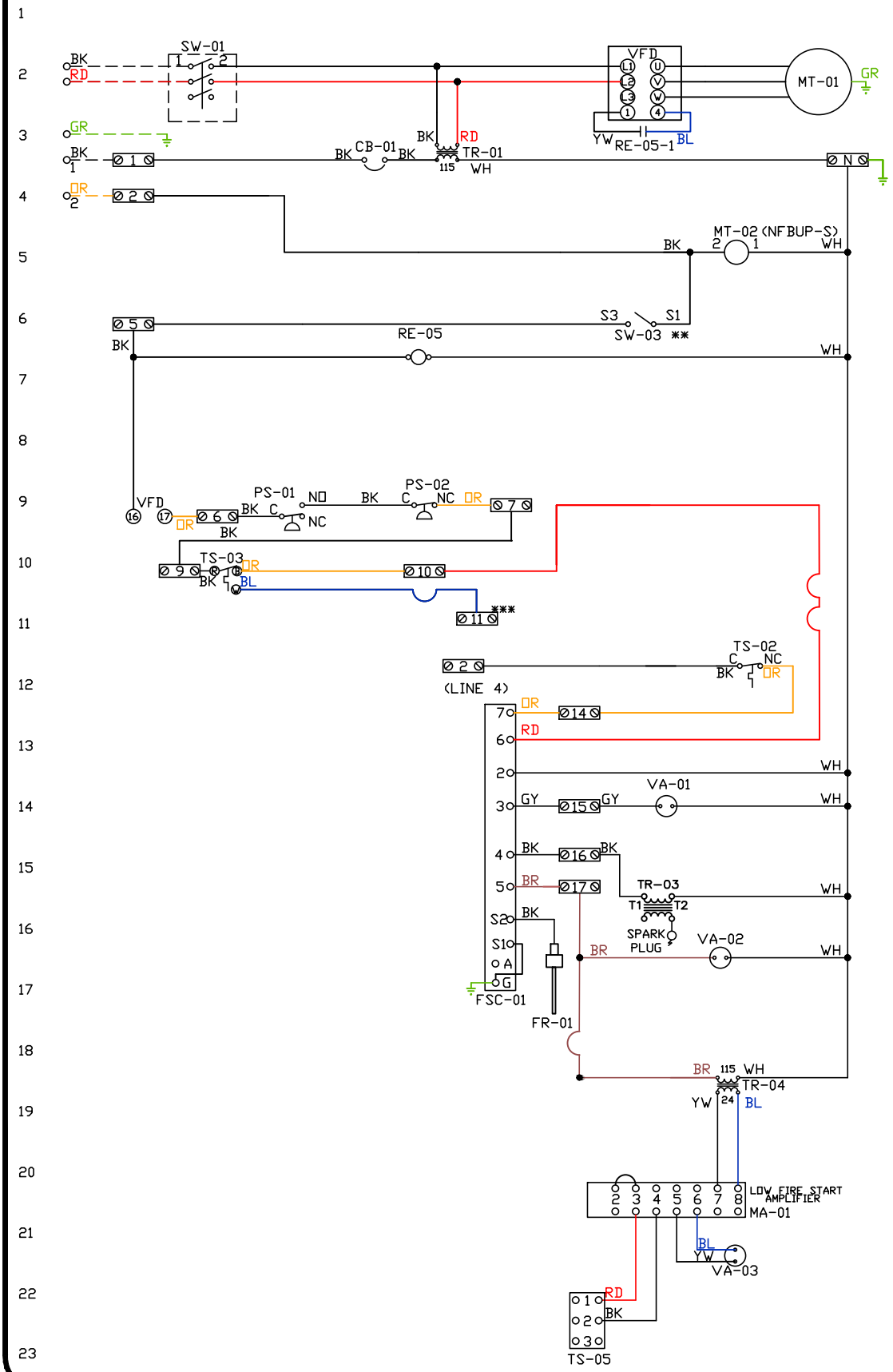
naks NORTH AMERICAN KITCHEN SOLUTIONS INCORPORATED	JOB		
	LOCATION		
	DATE 8/3/2018	JOB #	
	DWG #	DRAWN BY	
	REV.	SCALE 3/8" = 1'-0"	

Direct Fired Heater Wiring

DRAWING NUMBER	SHIP DATE	MODEL **TK 1-5 Series**

JOB *NAKS Direct Fired MUA*

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



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	Fireye 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(200va)	[3]
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 3HP-230V-3P-14.9FLA
VFD PART: ESV222N02YXB

ELECTRICAL INFORMATION

MOTOR/CTRL CIRCUIT MCA: 1.1A
MOTOR/CTRL CIRCUIT MOP: 15A

NOTES

- - - - DENOTES FIELD WIRING
——— DENOTES INTERNAL WIRING

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

WIRE COLOR

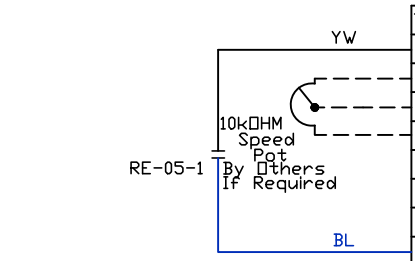
BK-BLACK	YW - YELLOW	RD - RED
BL-BLUE	GR - GREEN	WH - WHITE
BR - BROWN	GY - GRAY	PK - PINK
OR - ORANGE	PR - PURPLE	

SOCKET STYLE "CLION" RELAY

NO	4	3
NC	2	1
COIL	8	7
COM	6	5

VFD Wiring	JOB NAKS Direct Fired MUA	
DRAWING NUMBER	SHIP DATE	MODEL **TK 1-5 Series**

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

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 chasis 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".

SUPPLY DRIVE PARAMETER SETTINGS*

EPM PROGRAM: VAV_MANUSE 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 FOR 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 INIATIATE NEW PARAMETER SETTINGS.

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

GENERAL NOTES

Installed Options

Manual Control

Component Identification

RE-05 VFD Start relay [2]

MOTOR INFO

SUPPLY 3HP-230V-3P-9.3FLA
VFD PART: ESV222N02YXB

ELECTRICAL INFORMATION

MOTOR/CTRL CIRCUIT MCA: 1.1A
MOTOR/CTRL CIRCUIT MOP: 15A

NOTES

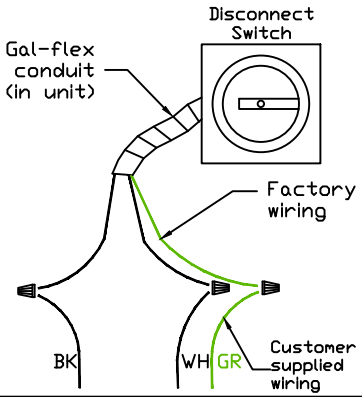
- - - - DENOTES FIELD WIRING
——— DENOTES INTERNAL WIRING

WIRE COLOR

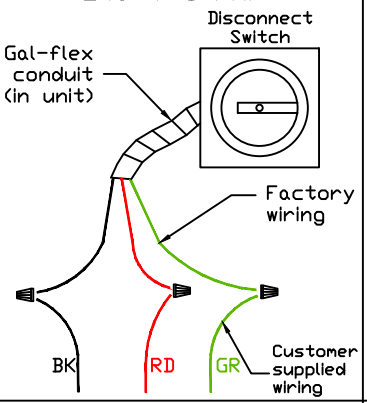
BK - BLACK	YW - YELLOW
BL - BLUE	GR - GREEN
BR - BROWN	GY - GRAY
OR - ORANGE	PR - PURPLE
RD - RED	PK - PINK
WH - WHITE	

Installation Wiring	JOB NAKS Direct Fired MUA	
DRAWING NUMBER	SHIP DATE	MODEL **TK 1-5 Series**

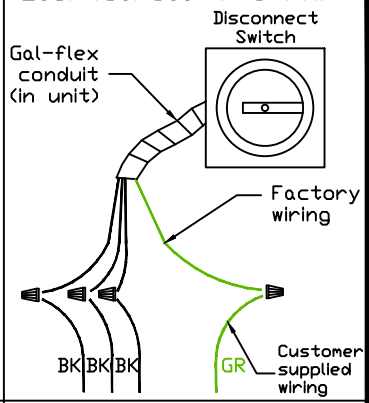
120 V 1 PH.



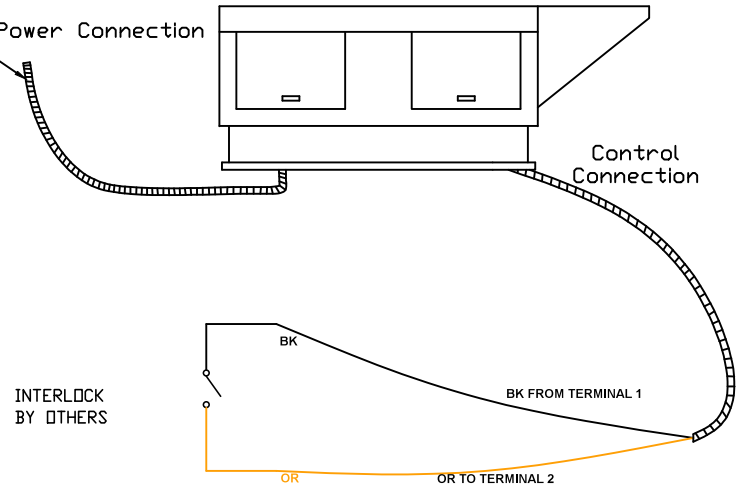
240 V 1 PH.



208/460/600 V 3 PH.



See above details.



Installed Options

Field Wired On/Off Switch

NOTES

WIRE COLOR

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