



Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
P.O. Box 16620
LittleRock, AR 72231
Phone 501-834-3320
Fax 501-834-5416

Date: 8/4/2026

Return Request: 8/11/2026

Project: Hot Springs National Park – Rehabilitate Bathhouses – Maurice Bathhouse

Supplier: Boone & Boone

Manufacturer: Varies

Submittal: VFDs Re-Submittal

Submittal Number: 230515.001

Spec Section: 230515

Drawing # and Installation Location: MP4.0

ARCHITECT

Strata Architecture
1701 Oak Street, Suite 100
Kansas City, Missouri 64108
(816)474-0900

GENERAL CONTRACTOR

Tepa, LLC
2345 Grand Blvd, Suite 700
Kansas City, Missouri 64108
(816)708-1110

ENGINEER

IMEG Corp.
1600 Baltimore Street, Suite 300
Kansas City, Missouri 64108
(816)842-8437

MECHANICAL SUBCONTRACTOR

Comfort Systems USA (Arkansas), Inc.
9924 Landers Road
North Little Rock, Arkansas 72117
(501)834-3320

Comments:

CSUSA PROJECT NO.

25-7065

joe@comfortar.com

9924 Landers Road
No. LittleRock, AR 72117



Independent field office for
Siemens Building Technologies

PROJECT #25CNEB0017

For information contact:

JOEL DICKINSON, PM
joel.dickinson@powers-hvac.com

MARK PRICE, DESIGN
mark.price@powers-hvac.com

Resubmittal
For Variable Frequency Drives:

REHABILITATE MAURICE BATHHOUSE

HOT SPRINGS, AR

Mechanical Contractor:
COMFORT SYSTEMS USA

August 3, 2026



Submittal Comment Response

**Project: Maurice Bathhouse Controls
Hot Springs, AR**

**Subject: Siemens Building Technologies
HVAC Direct Digital Control System
Response to Variable Frequency Drive Submittal Comments**

Date: 8-03-2026

Powers of Arkansas Contract No. 25CNEB0017

Submitted By: Mark Price

mark.price@powers-hvac.com

➤ See response below to Engineer Submittal Comments for Control Systems:

1. Disapproved - Resubmit

- a. Comment on page 5:
Verify drives meet all specifications requirements.
(Acknowledged / Complies. All Yaskawa HV600 drives provided are sized to meet or exceed the full load amperes (FLA) and voltage requirements listed in the schedule.)
- b. Comment on page 5:
Tag for RF-1M
(Corrected. The tag for RF-1M has been updated on the submittal drawings and schedule to reflect the correct tag name.)
- c. Comment on page 5:
Provide Harmonic Analysis for each drive.
(See attached Harmonic Estimator Report.)
- d. Comment on page 5:
Provide 2 filters of each size.
(Noted. Spare filters will be provided and handed over at job completion per specification requirements.)
- e. Comment on page 5:
Provide 3 fuses of each type and size.
(Noted. Modified selection to have a Circuit Breaker with Drive Input fuses in lieu of a main disconnect. Spare fuses will be provided and handed over at job completion per specification requirements.)
- f. Comment on page 5:

Submittal Comment Response

Drives 3 HP and above are to be Z1000 Series if using Yaskawa.

(Clarification Provided. The Yaskawa standard Z1000 series has been officially phased out and direct-replaced by the Yaskawa HV600 HVAC Drive family. The HV600 series meets or exceeds all physical, electrical, functional, and communications specs of the legacy Z1000. HV600 drives are provided for all 3 HP and larger applications on this project.)

g. Comment on page 5:

Provide with 3% input line reactors or alternate Exceptions listing in the specifications.

*(Complies / Exception Clarified. The Yaskawa HV600 features an **integrated dual-leg 5% DC link choke** as standard internal equipment, which provides equivalent or superior harmonic distortion reduction and transient protection compared to a standard 3% AC input line reactor.)*

h. Comment on page 5:

Drives shall have 5% maximum Voltage Harmonics Distortion and Current Total Demand Distortion.

*(Clarification / Complies. The HV600 drive with standard 5% DC link choke inherently limits drive-level harmonic emissions. Total Harmonic Distortion (**THD_v** and **TDD**) per IEEE 519 is measured at the Point of Common Coupling (PCC) based on total system distribution impedance and building load.)*

i. Comment on page 5:

Provide with 3% output line reactor and additional protection when distances to motors exceed 75 feet.

(Not Required / Complies. All motors are located adjacent to their respective equipment/VFD enclosures, with lead lengths remaining well under the 75-foot threshold. Output reactors are therefore not required per specification guidelines.)

j. Comment on page 6:

Tag for RF-2M

(Corrected. The tag for RF-2M has been updated on the submittal documents and schedule.)

k. Comment on page 8:

The VFD shall incorporate a protective coating on the main control board to conform to IEC60721-3-3 class 3C2 levels.

*(Complies. All standard Yaskawa HV600 printed circuit boards (PCBs) including main control and power boards feature conformal coating compliant with **IEC 60721-3-3 Class 3C2** (chemical gases) and **3S2** (solid particles) for enhanced environmental protection.)*

l. Comments on page 9 and 10:

Submittal Comment Response

Provide per the specifications.

(Complies. The standard HV600 drive protection package inherently satisfies all specified items)

Protection:

1. Input transient protection by means of surge suppressors or equivalent protection.
Integrated MOV transient surge suppressors on the input mains.
2. Snubber networks to protect against malfunctions due to system transients.
Standard internal RC/snubber circuitry protecting IGBTs against switching transients.
3. Under- and overvoltage trips; inverter overtemperature, overload, and overcurrent trips.
Electronic trip protection for DC bus under/over-voltage, inverter over temperature, overload and instantaneous output overcurrent.
4. Power-Interruption Protection: After a power interruption, it prevents the motor from re-energizing until the motor has stopped.
Catch-on-the-fly / speed search capability prevents re-energizing into a rotating motor until speed and phase are locked or safely brings it to a complete stop before restart.
5. Motor thermal overload relay(s) adjustable and capable of NEMA Class 10 motor protection and sized per motor nameplate data. When multiple motors are connected to the VFD output, each motor shall have a manual starter with properly sized overload protection.
Integrated electronic thermal overload protection certified for NEMA Class 10/20 motor protection per NEC (adjustable to motor nameplate FLA). Multi-motor applications utilize individual manual motor starters with overload protection.
6. Notch filter to prevent operation of the controller-motor-load combination at a natural frequency of the combination, Skip frequency feature is acceptable.
Features 3 programmable jump frequency zones with selectable bandwidth settings to avoid mechanical resonance.
7. Loss of phase protection
Instantaneous electronic short circuit protection (line-to-line and line-to-ground) on input and output.
8. short-circuit protection (fuses or circuit breaker).
The HV600 provides high-speed, line-to-line and line-to-ground electronic short-circuit detection on both input and output terminals to trip IGBTs in microseconds before damage occurs. In addition, we have updated the selection to include the Circuit Breaker with Drive Input Fuses Option, providing the specified short-circuit protection.
9. Motor over temperature fault.
Supports direct PTC thermistor input / motor thermal switch monitoring.
10. Loss of load protection.
Programmable under-torque / broken belt detection fault feature.

m. Comment on page 13:

Submittal Comment Response

Complies. The HV600 Hand/Off/Auto High-Resolution LCD Keypad natively displays fault diagnostics, status, and all requested parameters.

Display shall include all protection faults and drive status and the following:

1. Output frequency (Hz).
2. Motor speed (rpm).
3. Motor status (running, stop, fault).
4. Motor current (amperes),
5. Motor torque (percent),
6. Fault or alarming status (code).
7. PID feedback signal (percent).
8. DC-link voltage (VDC).
9. Set-point frequency (Hz).
10. Motor output voltage (V),

- n. Control and Communications Options markup pages 14 and 15.

(Clarification Provided. Option cards noted on pages 14 and 15 are unneeded additions. The Yaskawa HV600 comes factory-equipped with **embedded RS-485 communications** supporting **BACnet MS/TP**, Johnson Controls N2, and Siemens APOGEE FLN (P1) natively on the main terminal board. BACnet MS/TP will be utilized for integration to the Building Automation System.

- o. Which one provided comment on sheet 15.

(Clarification Provided. Updated selection to include the Circuit Breaker with Drive Input Fuses Option PM)

HV600

VARIABLE FREQUENCY DRIVES FOR HVAC BUILDING AUTOMATION

The HV600 builds on decades of experience providing variable frequency drives for HVAC applications. Specifically designed for building automation applications, the HV600 helps minimize energy costs and maximize occupant comfort. The HV600 features a simple, efficient setup with a high contrast display and supports connection to your mobile device while using Yaskawa's free DriveWizard Mobile.

Available in IP20/UL Type 1, IP55/UL Type 12 (with and without switch) and IP20/Protected Chassis versions, the HV600 is the perfect choice for reliable fan and pump control.



RATINGS

208 V Models						
HP	NEMA kW (208 V) IEC kW (220 V)	Output Amps	Frame	Catalog Code HV60U□□□□□□□□		
				IP20/ UL Type 1	IP55/ UL Type 12*	IP20/ Protected Chassis
3	2.2	10.6	1	2011CFA	2011C□A	--
5	3.7	16.7	1	2017CFA	2017C□A	--
7.5	5.5	24.2	2	2024CFA	2024C□A	--
10	7.5	30.8	2	2031CFA	2031C□A	--
15	11	46.2	3	2046CFA	2046C□A	--
20	15	59.4	3	2059CFA	2059C□A	--
25	18.5	74.8	4	2075CFA	2075C□A	--
30	22	88	4	2088CFA	2088C□A	--
40	30	114	4	2114CFA	2114C□A	--
50	37	143	6	2143CFA	2143C□A	--
60	45	169	6	2169CFA	2169C□A	--
75	55	211	9	--	--	2211CBA
100	75	273	9	--	--	2273CBA

* IP55/UL Type 12 models without switch end in CVA.
IP55/UL Type 12 models with switch end in CTA

480 V Models							
HP	NEMA kW (460 V)	IEC kW (400 V)	Output Amps	Frame	Catalog Code HV60U□□□□□□□□		
					IP20/ UL Type 1	IP55/ UL Type 12*	IP20/ Protected Chassis
3	2.2	1.5	4.8	1	4005CFA	4005C□A	--
5	3.7	3	7.6	1	4008CFA	4008C□A	--
7.5	5.6	4	11	1	4011CFA	4011C□A	--
10	7.5	5.5	14	1	4014CFA	4014C□A	--
15	11.2	7.5	21	2	4021CFA	4021C□A	--
20	15	11	27	2	4027CFA	4027C□A	--
25	18.6	15	34	2	4034CFA	4034C□A	--
30	22	18.5	40	3	4040CFA	4040C□A	--
40	30	22	52	3	4052CFA	4052C□A	--
50	37	30	65	3	4065CFA	4065C□A	--
60	45	37	77	4	4077CFA	4077C□A	--
75	56	45	96	4	4096CFA	4096C□A	--
100	75	55	124	4	4124CFA	4124C□A	--
125	93	75	156	6	4156CFA	4156C□A	--
150	112	90	180	9	--	--	4180CBA
200	150	110	240	9	--	--	4240CBA
250	186	160	302	10	--	--	4302CBA

DIMENSIONS inches (mm)

IP20/UL Type 1				IP55/UL Type 12				IP55/UL Type 12 with Switch				IP20/Protected Chassis			
Frame Size	Height	Width	Depth	Frame Size	Height	Width	Depth	Frame Size	Height	Width	Depth	Frame Size	Height	Width	Depth
1	14.1 (357)	4.9 (124)	8.6 (218)	1	14.1 (357)	4.9 (124)	9 (228)	1	20.4 (518)	4.9 (124)	10 (254)	9	27.6 (701)	12.3 (312)	16.5 (419)
2	17.6 (447)	4.9 (124)	9.2 (233)	2	17.6 (447)	4.9 (124)	9.6 (243)	2	24.5 (622)	4.9 (124)	10.5 (267)	10	31.5 (800)	17.3 (439)	18.6 (472)
3	20.1 (510)	7.9 (200)	9.3 (237)	3	20.1 (510)	7.9 (200)	9.7 (247)	3	31.0 (787)	7.9 (200)	10.9 (277)				
4	21.3 (542)	10 (255)	10.4 (263)	4	21.3 (542)	10 (255)	10.7 (273)	4	39.0 (991)	11.4 (290)	12.0 (305)				
6	30.5 (774)	12.3 (312)	15.7 (400)	6	34.9 (886)	14.3 (363)	16.2 (411)	6	44.7 (1135)	14.3 (363)	16.2 (411)				

HV600 SPECIFICATIONS

SPECIFICATIONS

Item	Specification
Input Voltage	Three-phase 200 to 240 VAC, 380 to 480 VAC, +10%/-15%, 50/60 Hz +/-5% For single phase input ratings, Contact Factory
Ambient Operating Temperature	-10°C to +50°C (14°F to 122°F), up to 60°C (140°F) with derating
Ambient Storage Temperature	-20°C to +70°C (-4°F to 158°F)
Overload Capacity	110% for 60 seconds, 140% for 2 seconds, 175% instantaneous
Output Frequency	0 to 400 Hz
Environmental	1,000 meters altitude, up to 4,000 meters with derating
	Class 3C2 and 3S2 operation for IP20/UL Type 1, Class 3C2 and 3S3 for IP55/UL Type 12
	95% humidity, non-condensing
	IP20/UL Type 1 and IP55/Type 12 plenum rated
EMC and Harmonics	EMC filter built in; complies with IEC 61800-3 restricted distribution for first environment
	5% split choke built in both positive and negative DC bus leg as standard
Control Methods	Open Loop V/f
	Open Loop Vector (PM motors only)
Motor Types	Induction
	Permanent Magnet
	Synchronous Reluctance
Protective Design Types	IP20/UL Type 1
	IP55/UL Type 12
	IP20/Protected Chassis
Interface	LCD keypad with Hand-Off-Auto and Status Ring, Bluetooth option
Global Certifications	UL, cUL, CE, RoHS 2, WEEE, TUV SUD
Seismic Certification	CBC, IBC, ASCE7, ICC-ES 156
	HCAI (Special Seismic Certification Pre-approval OSP-0687)
Functional Safety	Safe Torque Off, SIL3 according to IEC 62061, PLe according to ISO 1384
Standard I/O	(7) programmable multi-function digital inputs (24 VDC)
	(2) programmable multi-function analog inputs (0 to +10 VDC, 0-20 mA, 4-20 mA)
	(2) Functional Safety inputs
	(1) fault relay output (Form C)
	(3) programmable multi-function relay outputs (Form A)
	(2) programmable multi-function analog output (0 to +10 VDC, 0-20 mA, 4-20 mA)
24 VDC power	External supply input to maintain communications without main power
	150 mA output for customer use
Network Communications	Built in: BACnet® MSTP, Siemens APOGEE® FLN P1, Johnson Controls Metasys® N2, and Modbus® RTU
	Optional: LonWorks®, EtherNet/IP™ and Modbus® TCP/IP
Software Support Tools	DriveWizard® HVAC
	DriveWizard Mobile
	Programming Simulator
	Energy Savings Predictor
	Harmonics Estimator
	DriveWorksEZ®

IT'S PERSONAL

YASKAWA

Yaskawa America, Inc. 1-800-YASKAWA | Email: info@yaskawa.com | yaskawa.com
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Submittal Schedule Details

Corrected Name

Details, Features and Reference Drawings	H6CPD024PM	H6CPD016PM	H6CPD010PM	H6CPD003PM
TAG(s)	CWP-1,AHU-1M SF1, AHU-1M SF2,AHU-1M SF3, AHU-1M SF4	HWP-1,HWP-2,AHU-3M	AHU-2M SF1,AHU-2M SF2, AHU-2M SF3,AHU-2M SF4	RF-1M
Horsepower (HP)	7.5	5.0	3.0	0.75
Voltage (V)	208	208	208	208
Amperage (A)	24.2	16.7	10.6	3.5
Quantity	5	3	4	1
Enclosure	UL Type 1	UL Type 1	UL Type 1	UL Type 1
Input Impedance (%)	5	5	5	5
Circuit breaker (100k) inc. Input Fusing	✓	✓	✓	✓
Input Fuses	✓	✓	✓	✓
SCCR (kA)	100	100	100	100
Dimensions (H" x W" x D")	36.60 x 6.30 x 13.90	33.00 x 6.30 x 13.90	33.00 x 6.30 x 13.90	33.00 x 6.30 x 13.90
Weight (lbs)	47.0	41.0	41.0	41.0
Specification	SG.H6CPQW.10	SG.H6CPQW.10	SG.H6CPQW.10	SG.H6CPQW.10
Print Size	8.5" x 11.0"	8.5" x 11.0"	8.5" x 11.0"	8.5" x 11.0"
Submittal Page	5	5	5	5
Electrical Schematic	DS.H6CP.01	DS.H6CP.01	DS.H6CP.01	DS.H6CP.01
Print Size	17.0" x 11.0"	17.0" x 11.0"	17.0" x 11.0"	17.0" x 11.0"
Submittal Page	12	12	12	12
Wiring Requirements	UDE00573	UDE00573	UDE00573	UDE00573
Print Size	11.0" x 17.0"	11.0" x 17.0"	11.0" x 17.0"	11.0" x 17.0"
Submittal Page	13	13	13	13
Outline Drawing	DD.HC.1.W2.01	DD.HC.1.W1.01	DD.HC.1.W1.01	DD.HC.1.W1.01
Print Size	8.5" x 11.0"	8.5" x 11.0"	8.5" x 11.0"	8.5" x 11.0"
Submittal Page	14	15	15	15

Submittal Schedule Details

Details, Features and Reference Drawings	H6CPD002PM
TAG(s)	RF-2M
Horsepower (HP)	0.50
Voltage (V)	208
Amperage (A)	2.4
Quantity	1
Enclosure	UL Type 1
Input Impedance (%)	5
Circuit breaker (100k) inc. Input Fusing	✓
Input Fuses	✓
SCCR (kA)	100
Dimensions (H" x W" x D")	33.00 x 6.30 x 13.90
Weight (lbs)	41.0
Specification	SG.H6CPQW.10
Print Size	8.5" x 11.0"
Submittal Page	5
Electrical Schematic	DS.H6CP.01
Print Size	17.0" x 11.0"
Submittal Page	12
Wiring Requirements	UDE00573
Print Size	11.0" x 17.0"
Submittal Page	13
Outline Drawing	DD.HC.1.W1.01
Print Size	8.5" x 11.0"
Submittal Page	15

Corrected Name

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Variable Frequency Drive (VFD)
HV600 Mechanical Specification Submittal
For Narrow Configured UL Type 1 Rated (H6CP) Packages

GENERAL

The HV600 is a high performance PWM (pulse-width-modulated) AC drive. Three-phase input line power is converted to a sine-coded, variable frequency output, which provides optimum speed control of any conventional squirrel cage induction motor. The use of IGBTs (Insulated Gate Bipolar Transistors), with a carrier frequency range of 2 kHz to 12.5 kHz, permits quiet motor operation.

This drive has one control logic board for all horsepower ratings. Printed circuit boards employ surface-mount technology, providing both high reliability, and small physical size of the printed circuit assemblies. The microprocessor delivers the computing power necessary for complete three-phase motor control in building automation systems.

Operating Principle: Input three-phase AC line voltage is first rectified to a fixed DC voltage. Using pulse width modulation (PWM) inverter technology, the DC voltage is processed to produce an output waveform in a series of variable-width pulses. Unique firmware algorithms optimize motor magnetization through control of voltage, current, and frequency applied to generate a nearly sinusoidal output waveform.

STANDARDS

- UL 508A (Industrial Control Panels)
- BTL Listed
- UL, cUL listed
- CBC, IBC, ASCE7, ICC-ES 156
- HCAI (OSHDP)

ENVIRONMENTAL & SERVICE CONDITIONS

Ambient service temperature: Narrow Configured UL Type 1: -10°C to 40°C

Ambient storage temperature: Narrow Configured UL Type 1: -20°C to 70°C

Humidity: 0% to 95%, non-condensing

Altitude: to 1,000 meters (3,300 feet); higher by derating

Service factor: 1.0

RoHS 2 Compliant

QUALITY ASSURANCE

In-circuit testing of all printed circuit boards is conducted to ensure proper manufacturing.

Final printed circuit board assemblies are functionally tested via computerized test equipment.

All fully assembled controls are computer tested with induction motor loads to assure unit specifications are met.

The average MTBF (Mean Time Between Failure) is 28 years.

CONSTRUCTION

VFD power input stage converts three-phase AC line power into a fixed DC voltage via a solid-state full-wave diode rectifier with MOV (Metal Oxide Varistor) surge protection. An internal 5% split choke built in both positive and negative DC bus reduces harmonics for cleaner power.

Intermediate Section of the VFD - DC bus maintains a fixed DC voltage with filtering and short circuit protection as a DC supply to the VFD output section. It is interfaced with the VFD diagnostic logic circuit to continuously monitor and protect the power components.

Output Section of the VFD - Insulated Gate Bipolar Transistors (IGBTs) convert DC bus voltage to a variable frequency and voltage, utilizing a PWM sine-coded output to the motor. Motor noise at 60 Hz is less than 2 dB above the motor noise from across-the-line operation when measured at a distance of one meter.

POWER AND CONTROL ELECTRONIC HOUSINGS

UL Type 1 Narrow Configured enclosure: 208 V, 0.5 thru 40 HP; 480 V, 0.75 thru 75 HP

Microprocessor-based control circuit

Non-volatile memory (EEPROM); all programming memory is saved when the VFD is disconnected from power.

Digital operator keypad and display provide local control and readout capability:

- Hand/Off/Auto commands
- Speed Reference command
- Reset command

Easy to remove heat sink cooling fan with programmable on/off control

USB mini-B port for quick and easy PC connection

PROTECTION

Output current overload rating of 110% for 60 seconds, 140% for 2 seconds, 175% instantaneous

Output short circuit protection

Current limited stall prevention (overload trip prevention) during acceleration, deceleration, and run conditions

Optically isolated operator controls

Fault display

"Hunting" prevention logic

Electronic ground fault protection

Electronic motor overload relay protects the motor while in operation

Motor current display as well as verification that the motor is running

Proof of flow/loss of flow detection

DC bus charge indication

Heatsink overtemperature protection

Cooling fan operating hours recorded

Input/output phase loss protection

Line voltage sensors to monitor for brownout and blackout conditions with adjustable fault levels to ensure the proper settings pursuant to each application.

Reverse prohibit selectability

Short circuit withstand rating of 100 kA RMS with customer provided branch circuit protection.

Two emergency override modes (across-the-line or speed selectable via the drive)

OPERATION

Output frequency and speed display can be programmed for other speed-related and control indications, including: RPM, CFM, GPM, PSI, in WC, % of maximum RPM, or custom.

Power loss ride-through (2 seconds capable)

Time delay on start; peak avoidance for smooth generator switchover

VFD accepts either a direct acting or a reverse acting speed command signal.

Bi-directional "Speed Search" capability to start into a rotating load. Two types: current detection and residual voltage detection

DC injection braking, to prevent fan "windmilling"

Remote Run/Stop command input

Eight programmable HVAC specific application presets

Over 100 programmable functions, resettable to factory HVAC presets

User parameter initialization to re-establish project specific parameters

Ramp-to-stop or coast-to-stop selection

Auto restart capability: 0 to 10 attempts with adjustable delay time between attempts

One custom selectable Volts/Hertz pattern and multiple preset Volts/Hertz patterns

Auto speed reference input signal, adjustable for bias and gain

While the VFD is running, operational changes in control and display functions are possible, including:

- Acceleration time (0 to 6000 seconds)

- Deceleration time (0 to 6000 seconds)

- Frequency reference command

- Hand/Off/Auto commands

- Monitor display

- Removable digital operator

Automatic energy saving, reduced voltage operation

PRODUCT FEATURES

Displacement power factor of .98 throughout the motor speed range

Internal EMI/RFI filter complies with EN 61800-3

Built-In real time clock for time and date stamping events along with timer functions for starting, stopping and speed changes without the need for external controls

Voltmeter, ammeter, kilowatt meter, elapsed run time meter, and heatsink temperature monitoring functions

Two internal (PI) controls

Drive internal PI closed-loop control with selectable engineering units

Independent PI control for use with external device

Differential PID feedback feature

Sleep function in both closed loop and open loop control

Feedback signal low pass filter

Feedback signal loss detection and selectable response strategy

Feedback signal inverse and square root capability

24 VDC, 150 mA transmitter power supply

Seven programmable multi-function input terminals (24 VDC) providing 60+ programmable features, including:

- Customer Safeties

- BAS / Damper Interlock

- Emergency Override – BAS interlock mode, min/max speed setting, 16 preset speeds, and more

- Preset Speed

- PI control enable / disable

One Dedicated Fault Form C relay (30 VDC/250 VAC, 2 Amp), and 3 programmable Form A relays for: “Motor Run,” “Damper Actuator,” “Auto Transfer,” “Drive Run,” “Hand Mode,” “Auto Mode,” “System Fault,” “Serial Com Run,” and numerous other options.

Two programmable 0 to 10 VDC or 4-20 ma analog outputs, proportional to drive monitor functions including output frequency, output current, output power, PI feedback, output voltage and others

Remote speed reference (speed command) signal:

- 0 to 10 VDC (20 k Ω)

- 4 to 20 mA DC (250 Ω)

Nine preset speeds

Input and output terminal status indication

Diagnostic fault indication

VFD efficiency: 96% at half-speed; 98% at full-speed

“S-curve” soft start / soft stop capability

Run/Fault output contacts

Serial communication loss detection and selectable response strategy

“Up/Down” floating point control capability

Output Frequency 0 to 400 Hz

Controlled speed range of 40:1

Critical frequency rejection capability: three selectable, adjustable bandwidths

140% starting torque capability, available from 3 Hz to 60 Hz

Adjustable carrier frequency, from 2 kHz to 12.5 kHz

Analog/Digital Virtual I/O – internally sends an output to an input (no wiring needed)

Dynamic noise control for quiet motor operation

Programmable security code

Cloud service (Yaskawa Drive Cloud) for product registration and parameter storage

Store up to four additional parameter sets in keypad

Integrated PLC (DriveWorks EZ)

Rotational as well as Stationary motor auto-tuning

“Kinetic Energy Braking” (KEB) function stops the motor in up to half the time it would take without this function.

Control Methods Include:

- V/F Control

- Enhanced PM Motor control

- SynRM Motor Control

Motor Types:

- Induction

- Permanent Magnet

- Synchronous Reluctance

Temperature controlled fan

LCD keypad with Hand/Off/Auto and Copy keypad functions.

Motor preheat function

Self-regulating lead/lag control for multiple drives (up to 4)

Drive/motor alternation control (share motor run time for lead drive/motor)

Up to four PID setpoints

Draw down level selection for PID setpoint

Anti-no-flow control for deadhead protection

Pre-charge pump functionality

Low city alarm digital input

State/de-state control – add/remove drive based on feedback or output frequency

Single phase foldback

Flash upgradeable firmware

Heatsink overtemperature speed fold-back feature

“Bumpless” transfer between Hand and Auto modes

Emergency override can be used as “smoke purge” function

Fan failure detection and selectable drive action

Programming and firmware upgrade without three-phase main power DriveWizard Mobile

Programming Application

LED Status Ring

Conformal coating (IEC 60721-3-3, UL TYPE 1: 3C2, 3S2)

Complete narrow configured package is factory assembled.

Input disconnect switch with a lockable, through-the-door operating mechanism

BACnet, Siemens APOGEE FLN, Metasys N2, and Modbus RTU communication protocols as standard, with the ability to configure controller parameters, view controller monitors, control I/O, clear faults, and view controller status. EtherNet/IP, Modbus TCP/IP and LonWorks are optionally available.

BACnet Health monitors including Net Health, Tokens Received/Transmitted, Messages Received/Transmitted, Next/Previous Node Address, Max/Min Master Found, number of Nodes on Network, COV, MSTP Loop Time, CRC Errors, MSTP Tokens Lost/Retry, Deadtime Average.

Door mounted control keypad with LCD display for “Control Power,” “Drive Ready,” “Drive Run,” “Drive Selected,” “Drive Fault,” “Drive Test,” “Motor OL,” “Safety Open” “BAS Interlock,” “Auto Run”, Auto Transfer,” “Emergency Override,” “Hand Mode,” “Off Mode”, and “Auto Mode.”

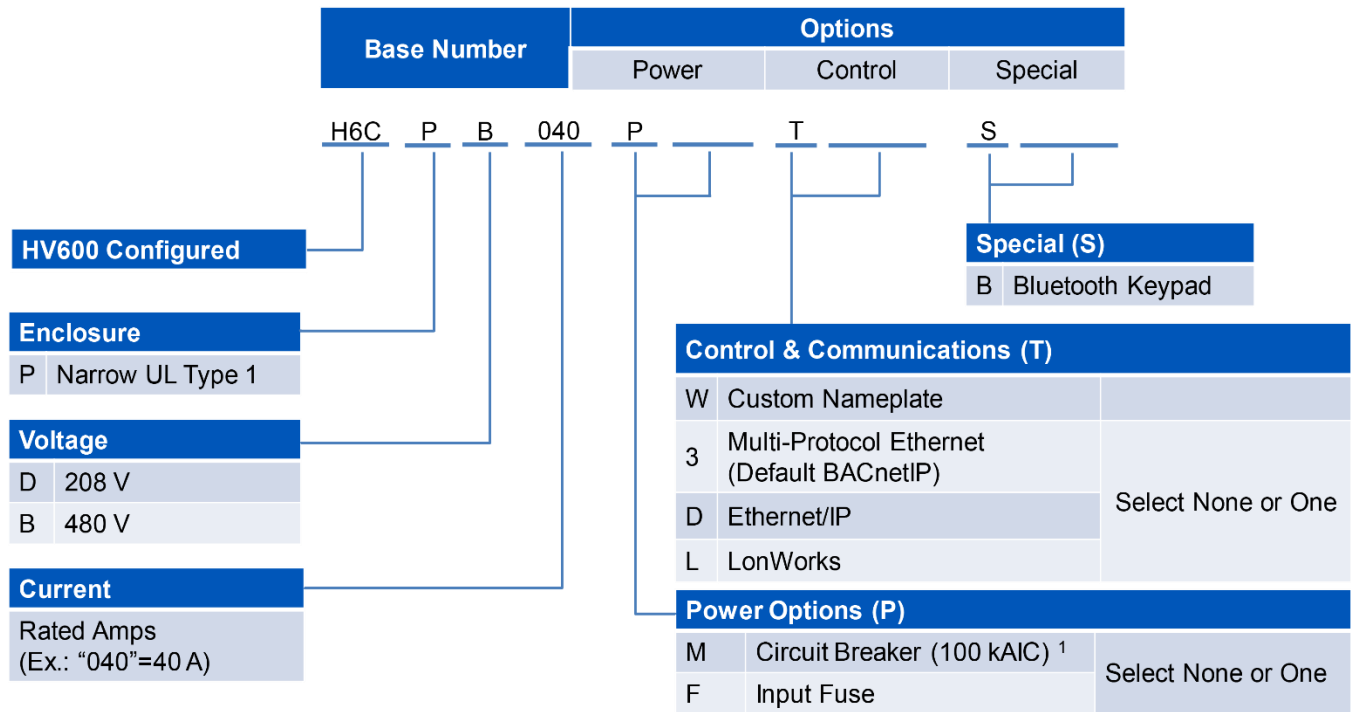
Damper control circuit with end-of-travel feedback capability including two adjustable wait time functions. One is a run delay time, where the drive will operate at a preset speed before the damper opens to pressurize the system. The other time function is an interlock wait time, so if the damper has not fully opened within the specified time, a fault will be declared.

Selectable energy savings and harmonic reduction mode.

Model Number Configuration (H6CP)

Step 1. Complete the Base Number for the voltage and current rating.

Step 2. Add the Option Code letter for each required option. If an option is not wanted, no character is inserted in that position.



ENCLOSURE TYPE

[P] UL Type 1 Narrow Configured Enclosure

VOLTAGE

[D] 208 volt model for nominal, 200 or 208 VAC (+10/-15%); 60 or 50 Hz (+/-5%) systems

[B] 480 volt model for nominal, 380, 400, 415, 440, 460 or 480 VAC (+10/-15 %); 60 or 50 Hz (+/-5%) systems

[P] POWER OPTIONS

MAIN INPUT DISCONNECT (Default)

Input disconnect switch with a lockable, through-the-door operating mechanism, no branch short circuit protection.

[P] POWER OPTIONS (Continued)

[M] Circuit Breaker Option is a 100 kAIC rated circuit breaker with fuses. When

option (M) is specified, the configured drive package will be rated at 100 kAIC. *(Replaces default input disconnect)*

[F] Drive Input fusing is available as a selection when the Circuit Breaker option is not already being used. Use this selection when drive input fusing is desired with the default input disconnect switch.

[T] CONTROL & COMMUNICATION OPTIONS

[W] Engraved nameplate

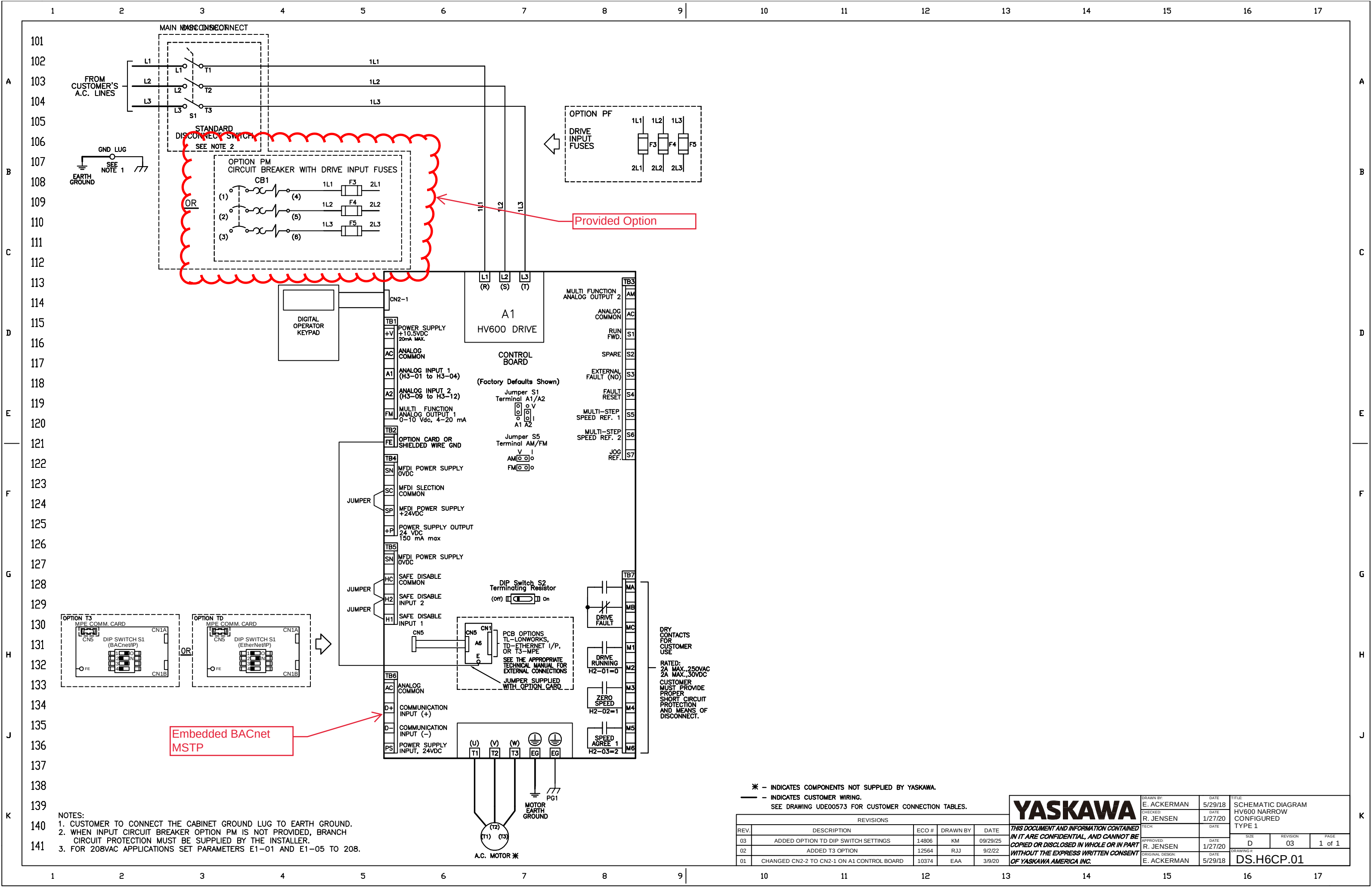
[3] Multi-Protocol Ethernet (Default BACnetIP)

[D] Ethernet/IP

[L] LonWorks

[S] Special

[B] Bluetooth Keypad



- NOTES:
1. CUSTOMER TO CONNECT THE CABINET GROUND LUG TO EARTH GROUND.
 2. WHEN INPUT CIRCUIT BREAKER OPTION PM IS NOT PROVIDED, BRANCH CIRCUIT PROTECTION MUST BE SUPPLIED BY THE INSTALLER.
 3. FOR 208VAC APPLICATIONS SET PARAMETERS E1-01 AND E1-05 TO 208.

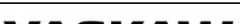
* - INDICATES COMPONENTS NOT SUPPLIED BY YASKAWA.
- - INDICATES CUSTOMER WIRING.
SEE DRAWING UDE00573 FOR CUSTOMER CONNECTION TABLES.

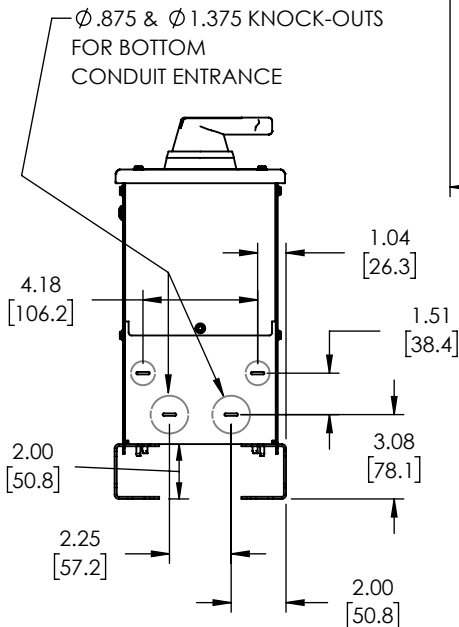
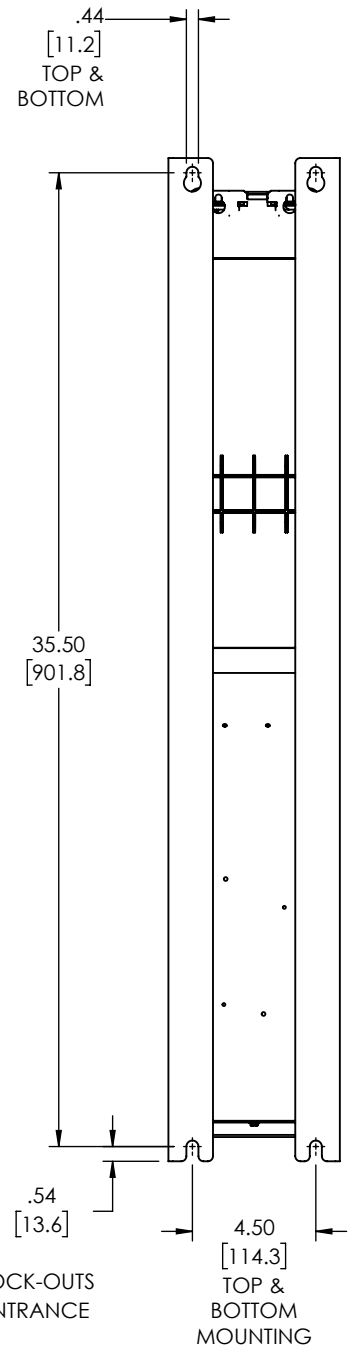
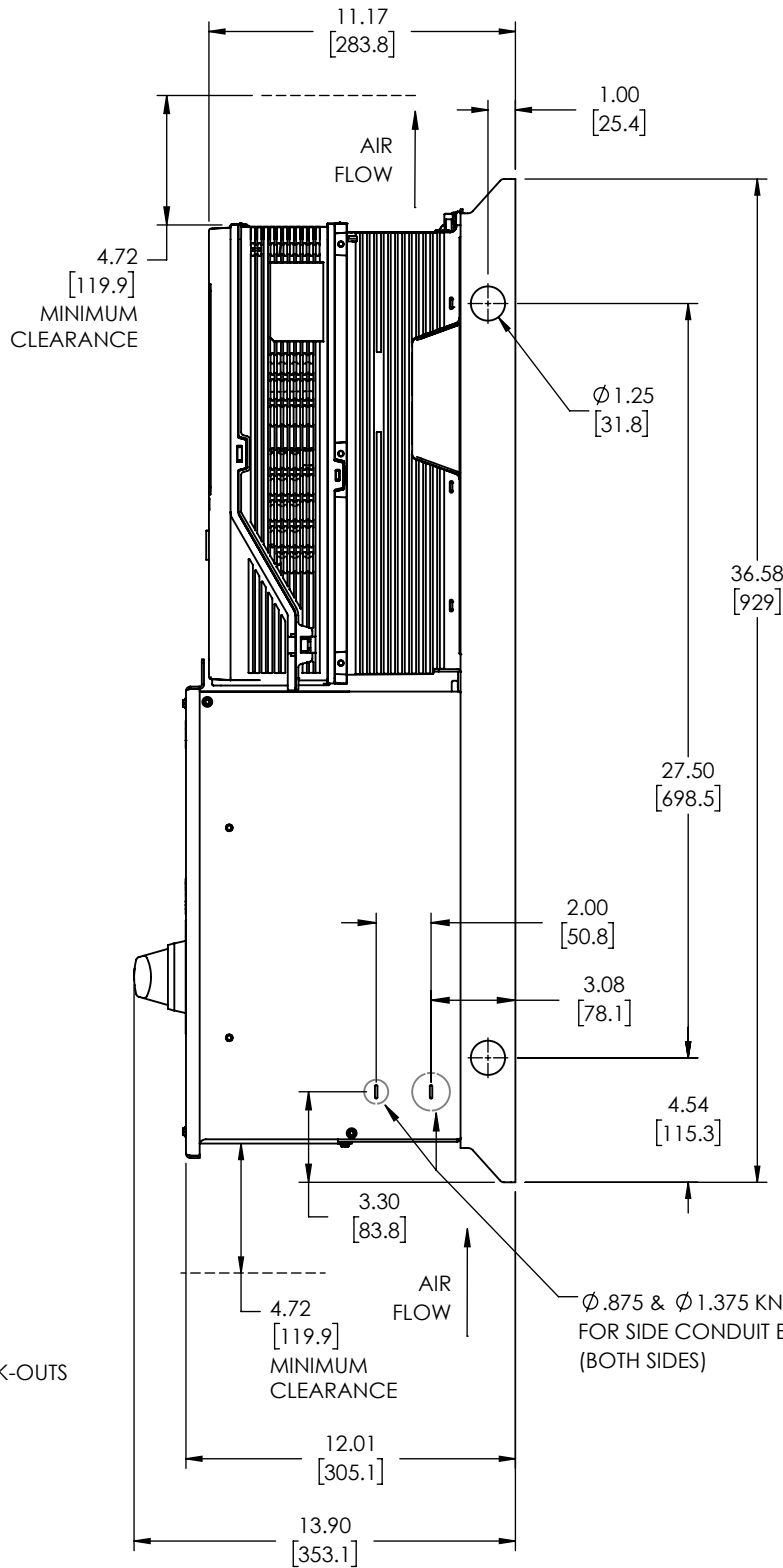
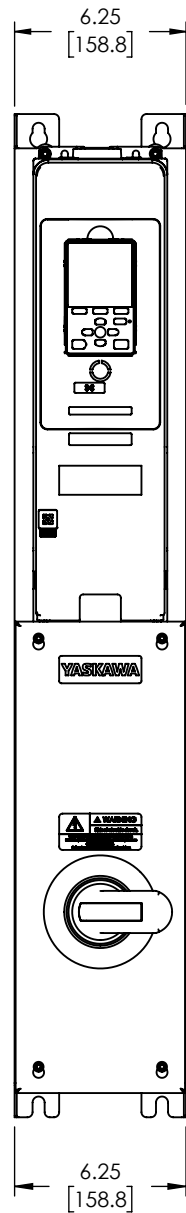
REVISIONS				
REV.	DESCRIPTION	ECO #	DRAWN BY	DATE
03	ADDED OPTION TD DIP SWITCH SETTINGS	14806	KM	09/29/25
02	ADDED T3 OPTION	12564	RJJ	9/2/22
01	CHANGED CN2-2 TO CN2-1 ON A1 CONTROL BOARD	10374	EAA	3/9/20

YASKAWA		DRAWN BY: E. ACKERMAN	DATE: 5/29/18	TITLE: SCHEMATIC DIAGRAM HV600 NARROW CONFIGURED TYPE 1		
		CHECKED: R. JENSEN	DATE: 1/27/20			
THIS DOCUMENT AND INFORMATION CONTAINED HEREIN ARE CONFIDENTIAL AND NOT BE COPIED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN CONSENT OF YASKAWA AMERICA INC.		APPROVED: R. JENSEN	DATE: 1/27/20	SIZE: D	REVISION: 03	PAGE: 1 of 1
		ORIGINAL DESIGN: E. ACKERMAN	DATE: 5/29/18	DRAWING #: DS.H6CP.01		

- FOR 0 TO 100 AMPS, USE A MINIMUM OF 60 °C - 75 °C COPPER WIRE. (USE COPPER CONDUCTORS ONLY)
- FOR ABOVE 100 AMPS, USE A MINIMUM OF 75 °C COPPER WIRE. (USE COPPER CONDUCTORS ONLY)

Date	Time	Location	Observations

	DRAWN BY: E. ACKERMAN	DATE: 5/13/18	TITLE: CUSTOMER CONNECTION HV600 CONFIGURED NARROW TYPE 1		
	CHECKED: R. JENSEN	DATE: 2/3/20			
	TECH:	DATE:			
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	ORIGINAL DESIGN: E. ACKERMAN	DATE: 5/13/18	DRAWING #: UDE00573		



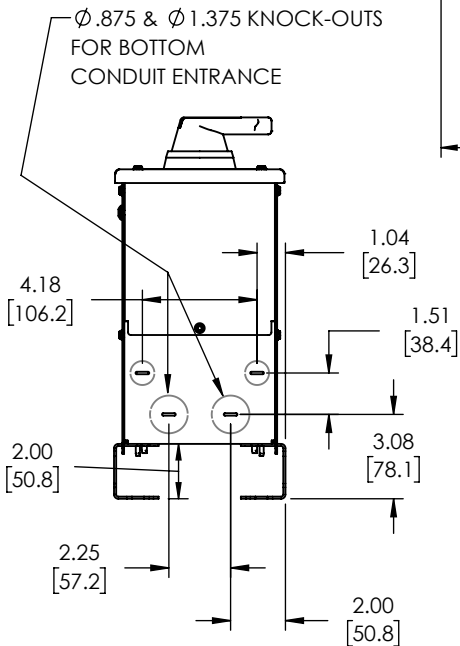
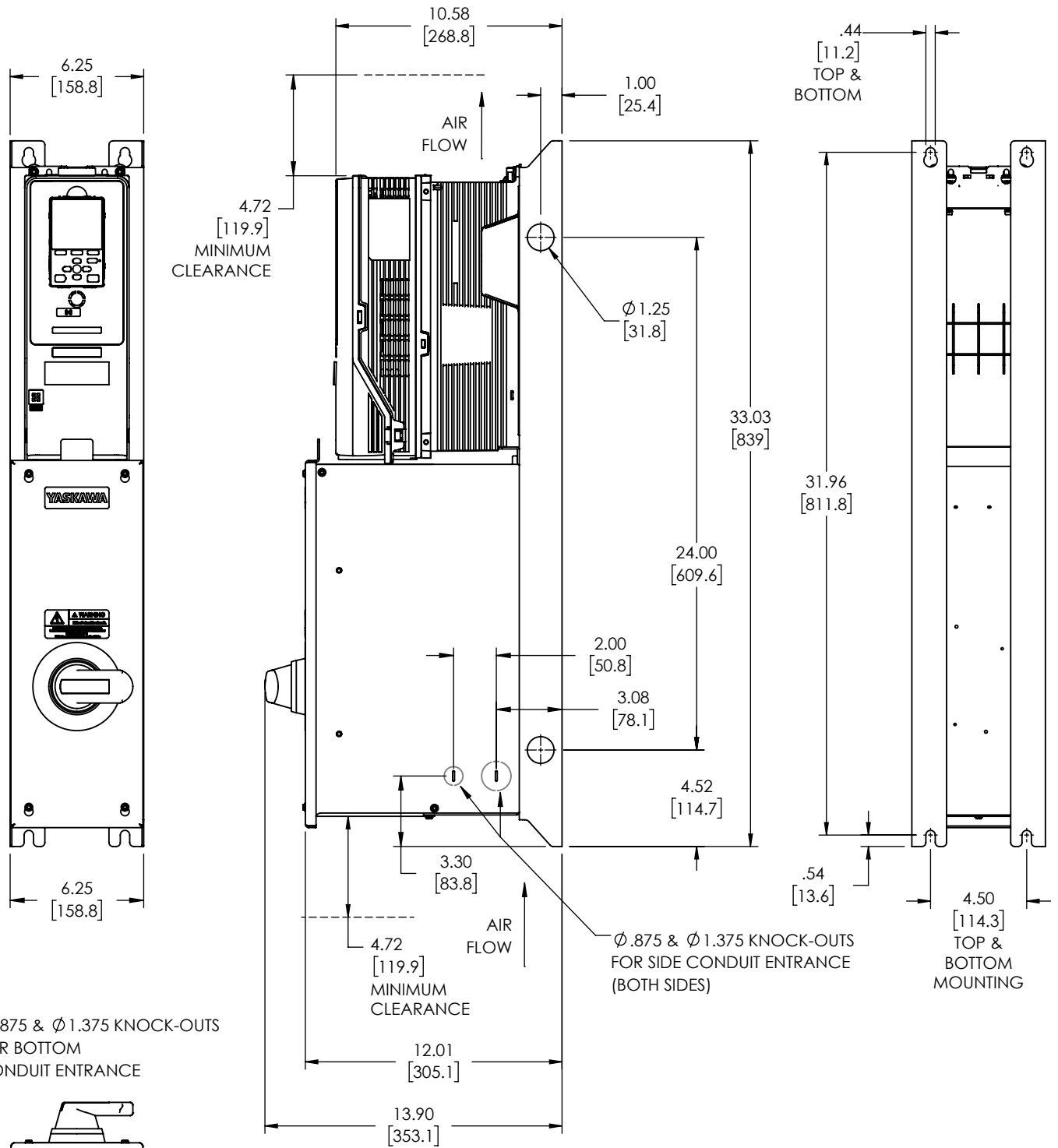
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- USE APPROPRIATE TYPE RATED HUBS OR FITTINGS TO MAINTAIN ENCLOSURE RATING.

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YASKAWA		ORIGINAL DESIGN: D. Dahlman	DATE: 08/21/2018	TITLE: DIMENSION DRAWING, HV600, O/U, CONFIG, W2		
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		CHECKED: D. Guckenberger	DATE: 01/23/2020	SIZE: A	REVISION: 00	PAGE: 1 OF 1
UNITS: INCHES	SCALE: NONE	APPROVED: K. Flierl	DATE: 01/30/2020	DRAWING #: DD HC 1 W2 01		



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		DRAWN: D. Dahlman	DATE: 01/22/2020			
		CHECKED: D. Guckenberger	DATE: 01/23/2020	SIZE: A	REVISION: 00	PAGE: 1 OF 1
		APPROVED: K. Flierl	DATE: 01/30/2020	DRAWING #: DD HC 1 W1 01		
		UNITS: INCHES	SCALE: NONE			

POWERS OF ARKANSAS

Date: 8/3/2026

To: POWERS OF ARKANSAS

Prepared by:

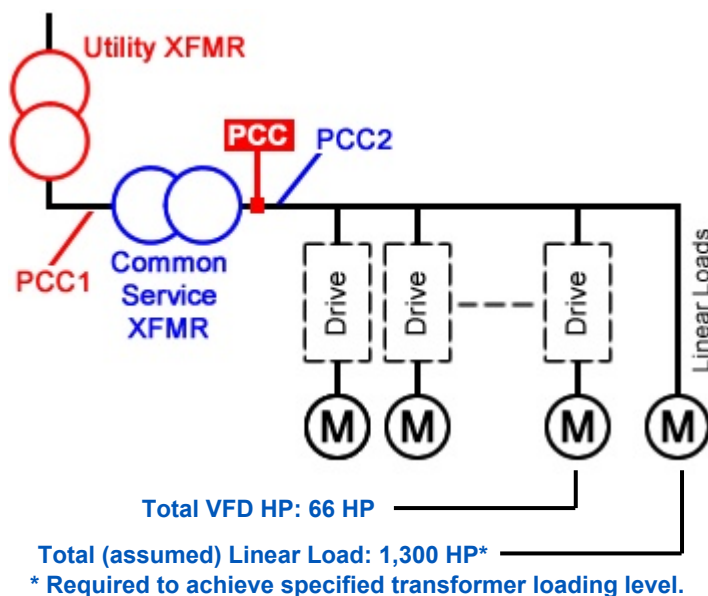
Project: REHABILITATE BATHHOUSESE MAURICE
Utility:

Harmonics Summary				
MEASURES			STANDARDS	
ISC/LOAD	21.8	PROJECT	CUSTOM	IEEE 519
Current TDD (%)		1.6 %	-	8.0%
Voltage THD (%)		0.8 %	-	8.0%
Compliance (PCC)				PASS

Estimation Assumptions	
VFD systems loading level	100.0 %
PCC2 Transformer rating of	1,500 KVA
PCC2 Transformer loaded at	80.0 %
All systems on the same PCC2	✓

Standard: IEEE 519 - 2022

Source Data	PCC1	PCC2
Source	Utility XFMR	Service XFMR
Frequency (Hz)	60	60
Rating (KVA)	50,000	1,500
Sec. Voltage (V)	13,800	208
Impedance Z (%)	8.00	5.75
Isc (A)	26,148	72,410
Rated Amps, rms (A)	2,092	4,164
Amps Fundamental (A)	50.1	3,324.2
Amps Harmonics (A)	0.8	53.7
Total Amps (A)	50.1	3,324.6
Transformer Load (%)	2.4	80.0



	Rating	Load
Service Transformer	1,500 KVA	80.0 %
Connected VFD Systems:	Quantity	Power
6-Pulse w/5% DC	14	66 HP
Total Non-Linear Load:	14	66 HP
Total Linear Load:		1,300 HP
Total Connected Load:		1,366 HP

The results of this estimation may not represent the actual installed system due to insufficient system data and / or limits of the estimating software. Yaskawa America, Inc. assumes no responsibility for the accuracy of the supplied data or of this report.