HIGH PERFORMANCE DOOR DIVISION
DASMA TECHNICAL DATA SHEET
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208V 3-Phase Supply and High Performance Doors

Introduction

*NOTE: The scope of this document includes **230V motors matched with 208V supply, and 3-phase, 60 Hz applications only.** Applications that run on 1-phase are rare for high performance doors, and are only recommended for small, light doors or per the manufacturer's recommendations.*

Technicians and end users of High-Performance Doors (HPDs) should understand the importance of the electrical aspects of these products, such as rated voltage, amp draw, operating range of the motor and controller, and more. Many HPDs demand high levels of electrical energy because the operator is moving the entire weight of the door at accelerated rates of speed. Electrical matters are even more important when the supply voltage is 208V, in which case a 230V motor is often supplied. This Technical Data Sheet provides a basic overview of the relevant concerns for 208V operation of HPDs, and recommends best practices in identifying and addressing the challenges involved.

Qualifications of Installer

HPD systems should be installed by a trained door systems installer in consultation with a licensed electrician.

Issues in the field

The following field symptoms indicate underlying electrical issues. Even if the symptoms are tolerable for a time, they can negatively affect the long-term health of the motor, and should be addressed. The symptoms are typically seen due to insufficient voltage at the motor, and are not unique to 208V power supplies, although 208V systems are more sensitive.

- Door struggles to open
- Door struggles to reverse
- Door moves too slowly
- Door stalls occasionally

- Overcurrent conditions
- Motor hums loudly
- Motor gets too hot to touch
- Brake fails to release

Voltage tolerances

ANSI C84.1 establishes acceptable voltage ranges for manufacturers of electrical equipment. The excerpt from Table 1 of ANSI C84.1 shown below provides NEMA tolerances for Nominal 240V systems. Note: the values shown represent supply requirements during operation.

Excerpt from ANSI C84.1, Table 1
National Steady State Voltage Regulation Standards

Nominal	*Nameplate*	*NEMA*
Standard	**Motor**	**-10%, +10%**
240	230	207 - 253

Based on the 207V lower limit shown in the Table above, any voltage lower than 207V measured during operation is liable to cause adverse symptoms. Consult the motor manufacturer for product-specific tolerances.

Voltage balance

Voltage balance is critical for 208V applications. Consult an electrician if the three phases are not within 6 volts of each other.

Voltage drops

Some applications exhibit line voltage drops or fluctuations. All doors draw higher inrush current at startup versus once the door is moving. Check the voltage when the door is dormant, as the door starts, and while the door is running to ensure the voltage drop is not excessive. Voltage drops can be the result of a number of factors, including:

- Insufficient wire gauge
  Line service conductors that were used for a previous door, if there was one, may not necessarily support a new door, especially if the current demand is higher. Ensure the wire gauge meets the amperage requirements of the application.

- Length of supply conductors
  The voltage drop due to the length of the supply line from the main distribution can result in insufficient voltage at the door. A knowledgeable electrical professional can determine if the conductor size is sufficient if provided with accurate conductor size and reasonable length estimate.

- The number of loads on a single supply
  Dedicated lines are strongly recommended for each HPD. Demand from loads connected to the same service as the door may cause voltage to drop below acceptable levels at the door opening. The cause of the voltage drop may be other doors, or unrelated equipment, which may be dormant at the time of measurement.

Remedies and how to avoid issues

Determining Site Voltage
Site voltage is a measurement at the installation point (the door controller). Measurement at the controller eliminates questions of conductor size and length, temperature of the electrical run from the main supply, and others. If the voltage at the installation point is below tolerance, the electrical run and power loads on the same circuit should be investigated. A new electrical run or isolation from other power loads may be necessary.

Buck-Boost Transformers
Buck-Boost transformers may be a good option to increase the incoming voltage, where necessary. Generally, they are small in physical size and economical. The Buck-Boost transformers needs to be sized correctly for KVA.

Step-Up Transformers
If the remedies described above do not correct the problem, the 208V supply may need to be converted to a 240V supply. This will provide an effective and reliable solution. Depending on your application, an Autotransformer or Isolation Transformer could be used. The Step-Up transformer needs to be sized correctly for KVA.

Conclusion

Where possible, dealers should physically measure the site voltage and order the motor and controller to match. The manufacturer needs to rely on this information from the dealer, and to specify a suitable product, including power requirements. Dealers need to verify that onsite power will meet or exceed manufacturer's requirements to operate the door.

Suboptimal voltage such as 208V can be successfully managed, but it does not generally present ideal conditions for HPD operation. Higher voltages such as 480V or 600V are better for HPD in that they consume less current, generate less heat, and are more resilient to deviations. If a higher voltage is available at the jobsite, it should be used if possible.