******VARIABLE SPEED DRIVE SIZING CHECKLIST**

. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .

**CHECK LIST**

BGVSDSC

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **JOB:** | | | | | | | **PART NUMBER:** | | | | | | |
| **CUSTOMER NAME:** | | | | | | |
| **CUSTOMER ADDRESS:** | | | | | | | **DATE:** | | | | | | |
|  | | | | | | | **APPLICATION:** | | | | | | |
|  | | | | | | | **PO #:** | | | | | | |
| **CONTACT NAME:** | | | | | | | **PREPARED BY:** | | | | | | |
| **STANDARD FEATURES / CAPABILITIES** | | | | | | | | | | | | | |
| **ENCLOSURE RATING** | | INDOOR | | | | | | OUTDOOR | | | | | |
|  IP20 CHASSIS | |  TYPE 1 | | |  TYPE 12 | | |  TYPE 3R | | | |  TYPE 4X | |
| **SYSTEM CONTROL** | | | | | | | | | | | | | |
|  Differential Pressure | |  Pressure | | |  Speed | | |  Level | | | |  Flow | |
| **INPUT/OUTPUT OPTIONS - QUANTITY REQUIRED** | | | | | | | | | | | | | |
| ANALOG INPUT |  | DIGITAL INPUT | |  | ANALOG OUTPUT | |  | DIGITAL OUTPUT | | |  | RELAY OUTPUT |  |
| **BMS PROTOCOL** | | | | | | | | | | | | | |
|  MODBUS RTU | |  BACNET MSTP | | |  PROFIBUS | | |  DEVICENET | | | |  OTHER | |
|  NOT REQUIRED | |  | |  |  | |  | Specify Protocol (OTHER): | | | |  | |
| **SITE SPECIFIC DATA:** | | | | | | | | | | | | | |
| **MEASURED LINE TO LINE VOLTAGE** | | | **\*V (Average)** | | | | **\*\*V (IMBALANCE) %** | | **MEASURED LINE TO GROUND VOLTAGE** | | | | |
| L1 - L2 |  | |  | | | |  |  | L1 - Ground | | |  | |
| L2 - L3 |  | |  | |  | |  |  | L2 - Ground | | |  | |
|  | |  | |
| L1 - L3 |  | |  | |  | |  |  | L3 - Ground | | |  | |
|  | |  | |
| **VOLTAGE CALCULATIONS:** | | | | | | | | | | | | | |
|  | | | | |  | | | | | | | | |
| **MOTOR INFORMATION:** | | | | | | | | | | | | | |
| **SPECIFIED INPUT PHASE/VOLTAGE** | | | **NOMINAL MOTOR HP:** | | | | | | | | | | |
| 1PH / 208 - 230 V | | |  < 0.75 | | | 7.5 | | | | 40 | | |  |
| 3PH / 208 - 230 V | | | 1 | | | 10 | | | | 50 | | |  |
| 1PH / 380 - 460 V | | | 1.5 | | | 15 | | | | 60 | | |  |
| 3PH / 380 - 460 V | | | 2 | | | 20 | | | | 75 | | |  |
| 3PH / 575 V | | | 3 | | | 25 | | | | 100 | | |  |
| 1PH / 115 V | | | 5 | | | 30 | | | | 125 | | |  |
| **MOTOR AMPERAGE (SFA / FLA)** | | **/** | | |  | | | **AMBIENT TEMPERATURE** | | | |  | |
| **LOAD WIRE LENGTH** | | | | | | | | | | | | | |
|  < 50 Feet | |  300 Feet Max. | | |  1000 Feet Max. | | |  ≤ 1500 Feet | | | |  > 1500 Feet | |
| **MOTOR PROTECTION - Over 50 feet will require a reactor or filter to protect the motor.** | | | | | | | | | | | | | |
|  No Filter | |  Load Reactor | | |  DV/DT Filter | | |  Sine Wave Filter | | | | | |

For Bell & Gossett Controller Information: [www.bellgossett.com](http://www.bellgossett.com) **CONTROLS TECHNICAL HOTLINE: 866-673-0445**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **The type of transformer and the connection configuration feeding a drive plays an important role in its performance and safety. The following is a brief description of some of the more common configurations and a discussion of their virtues and shortcomings. Always ask what type of power system the site has before sizing the drive.** | | | | | |
| **ELECTRICAL POWER SUPPLY VARIATIONS** | | | | | |
| **Nominal Voltage** | **V Phase to Gnd** | | | **Type of Transformer** | **NOTES** |
| **L1 to Gnd** | **L2 to Gnd** | **L3 to Gnd** |
| 208V | 120V | | | Wye | Most common. Provides rebalancing of unbalanced voltage with a 30° phase shift. |
| 480V | 277V | | |
| 575V | 332V | | |
| 240V | Various | | | Floating Delta | The phases have no true reference to ground |
| 480V |
| 575V |
| 240V | 0V | 240V | 240V | Corner Ground Delta | One phase connected to ground. Other 2 phases = line voltage |
| 480V | 0V | 480V | 480V |
| 240V | 208V | 120V | 120V | Delta with Wild Leg | One phase center tapped to derive a different voltage |
| 480V | 415V | 240V | 240V |
| **ALL 3 PHASE** | **Look for 2 xformer cans on the power pole!** | | | **Open Delta** | **Generating 3 phase power from just 2 phases of a transformer** |
| **DRIVE MODIFICATIONS BASED UPON POWER SUPPLY** | | | | | |
| Wye | Aquavar SPD | Check Line to Ground voltages are within imbalance (3%). | | | |
| Aquavar CPC | Install EMC filter screws EM1/EM3 or F1/F2 depending upon drive frame size. | | | |
| Technologic & IPC | Check Line to Ground voltages are within imbalance (3%). | | | |
| Floating Delta | Aquavar SPD | Follow procedure: Disconnecting EMC Filter and MOV's per IM213. | | | |
| Aquavar CPC | Remove the line to ground EMC filter components by removing EM1 and EM3 or F1 and F2. Refer to “IT systems” in the table below. | | | |
| Technologic & IPC | Set Parameter 14-50 RFI FILTER to [Off]. | | | |
| Corner  Grounded Delta | Aquavar SPD | Follow procedure: Disconnecting EMC Filter and MOV's per IM213. | | | |
| Aquavar CPC | For R4 or N4 frame size, remove EM3. Leave EM1 connected. For R5/N5 and R6/N6 leave the screws in F1/F2 installed (Refer to the “Corner grounded TN systems” column in the table below). | | | |
| Technologic & IPC | Set Parameter 14-50 RFI FILTER to [Off]. | | | |
| Delta with  Wild Leg | Aquavar SPD | Follow procedure: Disconnecting EMC Filter and MOV's per IM213. | | | |
| Aquavar CPC | Refer to the “Corner grounded TN systems” column in the table below. | | | |
| Technologic & IPC | Set Parameter 14-50 RFI FILTER to [Off]. | | | |
| Open Delta | Aquavar SPD | Use a derated (oversized) three phase drive wired for single phase input supply.  Drive output amperage to be derated by 50% to accommodate the single phase input. | | | |
| Aquavar CPC |
| Technologic & IPC | Use dedicated single phase drive wired with the balanced input legs. | | | |
|  | | | | | |
| **Table to be used  for CPC ONLY** | **Frame Sizes** | **Screw** | **Symmetrically Grounded TN Systems (TN-S Systems)** | **Corner Grounded TN Systems** | **IT Systems (ungrounded or high-resistance grounded [> 30 ohm])** |
| **R1…R3** | EM1 | x | x | • |
| EM31 | x | • | • |
| **R4** | EM1 | x | x | — |
| EM31 | x | — | — |
| **R5…R6** | F1 | x | x | — |
| F2 | x | x | — |
| x = Install the screw. (EMC filter will be connected)  • = Replace the screw with the provided polyamide screw. (EMC filter will be connected)  — = Remove the screw. (EMC filter will be connected)  1 = ACS550-U1 drives are shipped with screw EM3 already removed. | | | | |



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