Click to verify

Powerflex 400 manual

Options 0 “Ready/Fault” Opto output is active when power is applied. Page 41 Installation/Wiring 1-31 Figure 1.12 Connections and Grounding Shielded Enclosure (1) IP 30/NEMA 1/UL Type 1 Option Kit (Frame C Drives Only) EMI Fittings and Metal Conduit EMI Filter R/L1 U/T1 S/L2 V/T2 T/L3 W/T3 Enclosure Ground Connection Shielded Motor Cable Building Structure Steel (1) Shielded Enclosure required for 200-240V AC 11-22 kW (15-30 HP) PowerFlex 400 drives. Enter a user-selected password to lock the parameters via Option 1. Apply AC power and control voltages to the drive. Failure to do so may result in personal injury and/or equipment damage. Values Default: Read Only Min/Max: 0/FFFF Display: 1 Hex d320 [Control SW Ver] Main Control Board software version. Cancel a change to a parameter value and exit Program Mode. Select drive, enclosure type, and power options. Input Ratings Branch Circuit Protection Voltage 140M/140MT Min Range Motor Enclosure Protectors Volume (2) (3) (in. Page 57 Programming and Parameters Basic Display Group (continued) b006 [Drive Status] Related Parameter(s): A166 Present operating condition of the drive. If any of the conditions exist, as described in Table 1.A, install one of the devices listed under the heading Corrective Action on the line side of the drive. The drive speed command can be obtained from a number of different sources. Listed in Table 1.A are certain input power conditions which may cause component damage or reduction in product life. Page 77 Programming and Parameters 3-25 Terminal Block Group (continued) T084 [Anlg Out1 Setpt] Related Parameter(s): T082, T083 Sets direct parameter control over the analog output. Installation/Wiring General Grounding Requirements The drive Safety Ground - (PE) must be connected to system ground. Application Notes PID Setup PID Control Loop The PowerFlex 400 has a built-in PID (proportional, integral, differential) control loop. Options 0 “Custom V/Hz”... T060 Setting T061 Min/Max 0/320 Hz... Values Default: Min/Max:... Page 157 Application Notes PID Deadband Parameter A158 [PID Deadband] is used to set a range, in percent, of the PID Reference that the drive will ignore. Mounting Considerations 2 Maximum Surrounding Air Temperature 2 General Grounding Requirements 3 Minimum Mounting Clearances 3 Ungrounded Distribution Systems 4 Phase to Ground MOV Removal 4 Specifications, Fuses and Circuit Breakers 5 Power Terminal Block Specifications 8 I/O Wiring Recommendations 9 I/O Terminal Block Specifications 9 Control Terminal Block 10 Control I/O Terminal Designations 11 Relay Terminal Designations and DIP Switches 12 User Installed Auxiliary Relay Card 12 User Installed Relay Board Terminal Designations 12 Prepare for Drive Start-Up 13 Before Applying Power to the Drive 13 Start, Stop, Direction and Speed Control 13 Keypad Hand-Off-Auto Functions 16 Viewing and Editing Parameters 17 Basic Display Group Parameters 18 Smart Start-Up with Basic Program Group 18 Terminal Block Group Parameters 19 Communications Group Parameters 21 Advanced Program Group Parameters 22 Aux Relay Card Group Parameters 23 Advanced Display Group Parameters 24 PowerFlex 400 Packaged Solutions Choose from a variety of standard packaged solutions that are pre-engineered to streamline your acquisition process. Sets the control scheme used to start the drive when in Auto/Remote mode. Page 183 P1 – Floor Level Network (FLN) Table G.2 Point Database for Application 2735 Point Number Subpoint Name Parameter CMD DIR MON b006, bit 2 (Forward) ACCELERATING b006, bit 3 (Accelerating) DECELERATING b006, bit 4 (Decelerating) ALARM – AT SPEED – MAIN FREQ d301 (Digit 0) OPER CMD... Before working on drive, ensure isolation of mains supply from line inputs [R, S, T (L1, L2, L3)]. Page 67 Programming and Parameters 3-15 Terminal Block Group (continued) T056 [Relay Out1 Level] Related Parameter(s): T055, T058, T059, d318 32 bit parameter. Page 182 P1 – Floor Level Network (FLN) Table G.2 Point Database for Application 2735 Point Number Subpoint Name Parameter CTLR ADDRESS C104 APPLICATION – FREQ OUTPUT b001 PCT OUTPUT d322 SPEED d323 CURRENT b003 TORQUE b013 POWER b010 DRIVE TEMP b014 DRIVE MWH b011 RUN TIME... Table of Contents Appendix A Supplemental Drive Information Drive, Fuse & Circuit Breaker Ratings . These objects handle only 15-bit parameter values (0 – 32767). The Param# for Write Param point’s default to commonly accessed parameters and can be changed if desired. The integrity of all ground connections should be periodically checked. Repetitive faults will only be recorded once. Parameter A177 [DC Brake Level] controls the level of braking current used. PowerFlex Drives comply with the EN standards listed below when installed according to the User Manual. Determines the on/off point for the opto output when T065 [Opto Out Sel] is set to option 6, 7, 8, 9, 10 or 12. 1 = Condition True, 0 = Condition False Received Good Message Packet Digit 0 Transmitting Message Digit 1 DSI Peripheral Connected Digit 2 Received Bad Message Packet Digit 3... • If this equipment is used in a manner that is not specified by the manufacturer, the protection that is provided by the equipment may be impaired. Page 2 Important User Information Solid state equipment has operational characteristics differing from those of electromechanical equipment. Enables/disables PID mode and selects the source of the PID reference. Programming and Parameters Basic Display Group b001 [Output Freq] Related Parameter(s): b002, b008, P034, P035, P038 Output frequency present at T1, T2 & T3 (U, V & W). 734 778 1055 1200 Branch Circuit Protection Power Dissipation 140M/140MT Min IP20 Open Motor Enclosure Watts Protectors (4) Volume (2) (3) 3 (in. Overview Catalog Number Explanation Drive Dash Voltage Rating Rating Enclosure Emission Class Comm Slot Code Code Version 22C PowerFlex 400 RS485 Code Rating Not Filtered Code Voltage 240V AC 3 480V AC 3 Code Interface Module Fixed Keypad Code Enclosure Panel Mount - IP20/UL Open-Type Panel Mount - IP30/NEMA 1/UL Type 1 Flange Mount - IP20/UL Open Type... Page 178 Metasys N2 Notes:... Output Value 1 “OutCurr 0-10” 5V for 200% Drive Rated Output Current 11 “OutPowr 0-20”... Download the PDF manual for the PowerFlex400 adjustable frequency ac drive for fan and pump applications. • Auto key toggles frequency control to AUTO in a bumpless transfer. Sets the analog input level that corresponds to P034 [Minimum Freq]. Min/Max wire sizes for Frame F corrected. Programming and Parameters 3-27 Communications Group C101 [Language] Selects the language displayed by the integral LCD display and remote communications option. Page 60 Programming and Parameters Basic Program Group (continued) P036 [Start Source] Related Parameter(s): P037, P042, A166, d301 Stop drive before changing this parameter. Page 190 Index-4... Chapter Troubleshooting Chapter 4 provides information to guide you in troubleshooting the PowerFlex 400 drive. • Flashing fault number • Flashing fault indicator Press the Escape key to regain control of the integral keypad. Aby uzyskać dokumentację produktu przejdź do strony internetowej rok.auto/literature lub skontaktuj się z lokalnym biurem sprzedaży lub przedstawicielstwem firmy Rockwell Automation. Page 148 RJ45 DSI Splitter Cable DSI Cable Accessories RJ45 Splitter Cable – Catalog Number: AK-U0-RJ45-SC1 Slave Port Master Port PIN 1 PIN 8 RJ45 Two-Position Terminal Block Adapter – Catalog Number: AK-U0-RJ45-TB2P (PIN 5) PIN 8 (PIN 4) PIN 1 RJ45 Adapter with Integrated Termination Resistor –... Fault Status Flashing Red Indicates that the drive is faulted. A191 [Skip Freq Band 2] is split applying 1/2 above and 1/2 below the actual skip frequency. Page 142 B-14 Accessories and Dimensions Figure B.7 Bulletin 1321-DC Series Bus Inductors – Dimensions are in millimeters and (inches). Selects drive action when an input signal loss is detected. • Press Stop • Cycle power • Set A197 [Fault Clear] to option 1 “Clear Faults”. Page 72 3-20 Programming and Parameters Terminal Block Group (continued) T070 [Analog In 1 Lo] Related Parameter(s): P034, P038, T069, T071, T072 A152, A153 Stop drive before changing this parameter. Page 105 Programming and Parameters 3-53 Advance Display Group (continued) d303 [Comm Status] Related Parameter(s): C102-C103 Status of the communications ports. Page 164 D-14 Application Notes Notes:... This indicates that the drive is ready for operation. Frame C Mounting Clearances 120 mm (4.7 in.) 120 mm (4.7 in.) Closest object that may restrict airflow through the drive heatsink and chassis 120 mm (4.7 in.) 120 mm (4.7 in.) Mounting Option A No clearance is required between drives. This parameter must match DIP Switch AO1 setting. Page 133 Windows based software package that provides an 9306-4EXP01ENE (CD-ROM) Version 3.01 intuitive means for monitoring or configuring or later Allen-Bradley drives and communication adapters online. Page 42 1-32 Installation/Wiring Notes:... ..P-1 Reference Materials ....P-1 Manual Conventions . Signal loss is defined as an analog signal less than 1V or 2mA. Page 24 1-14 Installation/Wiring Power Terminal Block Frame C, D, and F drives utilize a finger guard over the power wiring terminals. Page 82 3-30 Programming and Parameters Communications Group (continued) C109 [Speed Ref 2] Related Parameter(s): b001, b002, P038, P040, P042, T051-T054, T070, T071, T073, T074, T075, C102, A141, A142, A143-A146, A152, d301 Sets the source of the speed reference to the drive when in Comm Control and the communication network commands the drive to run from Local Control. Verify communications programming for intentional fault. Programming and Parameters Parameter Organization Refer to page 3-58 for an alphabetical listing of parameters. Page 176 Metasys N2 Using Metasys Configurable Objects to Access Parameters Configurable objects are inputs and outputs that let you read and write parameter values. Selected digit will flash. Weights are in kilograms and (pounds). Page 102 3-50 Programming and Parameters Aux Relay Card Group (continued) R243 [Aux 1 Ref Add] R246 [Aux 2 Ref Add] R249 [Aux 3 Ref Add] Sets the amount to add to the PID reference once the next auxiliary motor is turned on to compensate for a drop in the pipe due to the increased flow in a typical pump system. Page 96 3-44 Programming and Parameters Advance Program Group (continued) A191 [Skip Freq Band 2] Related Parameter(s): A190 Determines the bandwidth around A190 [Skip Frequency 2]. This guide summarizes the basic steps and precautions for qualified drive service personnel only. Programming and Parameters 3-31 Advanced Program Group A141 [Purge Frequency] Related Parameter(s): P038, P039, P040, T051-T054 Provides a fixed frequency command value when T051-T054 [Digital Inx Sel] is set to 1 “Purge”. Wiring See the PowerFlex 400 Adjustable Frequency AC Drive for Fan and Pump Applications User Manual, and Frames G and H publication 22C-UM001 for instructions on how to wire the power terminals and control terminals. Not UL Listed for use on 480V or 600V Delta/Delta, corner ground, or high-resistance ground systems. If the drive and line contactor close at the same time, drive damage may result. To simplify drive setup, the most commonly programmed parameters are organized in a single Basic Program Group. Page 4 soc-2 Manual Updates The information below summarizes the changes to the PowerFlex 400 User Manual since the April 2005 release. Page 29 Installation/Wiring 1-19 Table 1.H Relay Terminal Designations and DIP Switches No. Signal Default Description Param. Para conseguir a documentação, visite rok.auto/literature ou entre em contato com seu escritório de vendas regional ou representante da Rockwell Automation. If the PID output is above this level, AutoSwap will be delayed until the PID output drops below this parameter setting. Analog inversion can be accomplished by setting this value larger than T075 [Analog In 2 Hi]. Page 150 RJ45 DSI Splitter Cable Connecting Two Permanent Peripherals NEMA 1 Bezel with DSI Hand Held NEMA 4 Panel Mount Unit DSI Drive Parameter 9 [Device Type] set to "Master" and connected to Master port (M) on RJ45 Splitter Cable Parameter 9 [Device Type] set to "Slave"... Single-phase operation provides 50% rated current. Power Terminal Blocks R/L1 S/L2 T/L3 U/T1 V/T2 W/T3 P2 P1 DC– DC+ BR+ BR– R/L1 S/L2T/L3 P1 P2 DC– R/L1 S/L2 T/L3 P1 P2 DC– U/T1 V/T2 W/T3 Frame F 244 (9.61) R/L1S/L2 T/L3 P1 P2 DC– U/T1 V/T2 W/T3 105.8 138.2 (4.17) (5.44) Frame H Ship (1) Weight 4.33 (9.5) 14.0 (30.9) 51.2 (112.9) (1) Description Terminal 88.0 (194.0) R/L1, S/L2, T/L3 3-phase Input 106 (233.7) U/T1 To Motor U/T1 177 (390.2) V/T2 To Motor V/T2 W/T3 To Motor W/T3 P2, P1 DC Bus Inductor Connection - The C Frame drive is shipped with a jumper between Terminals P2 and P1. b001 [Output Freq] (Hz) Data Source (Param#) Param# IN2 User IN 2 (AI 11) 0/Max Drive Params. Metasys N2 Table F.11 Internal Integer Network Point Type Address (NPT) (NPA) Name Description Min/Max Default Param# IN1 User IN 1 (AI 10) 0/Max Drive Params. A-1 Specifications..... Programming and Parameters 3-57 Advance Display Group (continued) d326 [Fault Bus Volts] Related Parameter(s): b005 Displays the value of b005 [DC Bus Voltage] when the last fault occurred. Examples: T086 Setting T085 Setting T085 Max. UPOZORNĚNÍ: Neprovádějte instalaci, konfiguraci, provoz ani údržbu, pokud jste dosud nepřečetli dokumentaci k produktu a dokumenty obsažené v sekci Doplňující informace pro instalaci, konfiguraci, provoz a údržbu. and output is 0 Hz. correct source. The PID loop is used to maintain a process feedback (such as pressure, flow or tension) at a desired set point. These solutions will help simplify delivery and installation and help ease repeat orders and inventory. Drive Dimensions PowerFlex 400 Frames , Ratings are in kW and HP. • A154 [PID Prop Gain] The proportional gain (unitless) affects how the regulator reacts to the magnitude of the error. Page 31 Installation/Wiring 1-21 Input/Output Connection Example Required Settings Analog Output DIP Switch Unipolar, 4-20 mA Output AO1 = 20MA • 525 Ohm Maximum Parameters T082 [Analog Out1 Sel] = 14 through 20 Common Scaling T083 [Analog Out1 High] T084 [Analog Out1 Setpt] 2 Wire Control DIP Switch Sourcing (SRC),... Exclusive Control is used when A152 [PID Ref Sel] is set to option 1, 2, 3 or 4. Enables/disables the function that allows the direction of motor rotation to be changed. For information on... See page... Who Should Use this Manual? Page 75 Programming and Parameters 3-23 Terminal Block Group (continued) T077 [Sleep-Wake Sel] Related Parameter(s): T078, T079, T080, T081 The drive “sleeps” if the appropriate analog input drops below the set [Sleep Level] for the time set in [Sleep Time] and the drive is running. Important: Read the General Precautions section before proceeding. Select a digit when viewing parameter value. Page 17 Installation/Wiring Input Power Conditioning The drive is suitable for direct connection to input power within the rated voltage of the drive (see Appendix A). Page 13 Installation/Wiring Frame F Drives 1. • Installation, adjustments, putting into service, use, assembly, disassembly, and maintenance shall be carried out by suitably trained personnel in accordance with the applicable code of practice. Page 90 3-38 Programming and Parameters Advance Program Group (continued) A170 [Boost Select] Related Parameter(s): b004, P031, P032, A171, A172, A173 Sets the boost voltage (% of P031 [Motor NP Volts]) and redefines the Volts per Hz curve. Use A170 [Boost Select] to reduce boost level. Start Up Viewing and Editing Parameters The last user-selected Basic Display Group parameter is saved when power is removed and is displayed by default when power is reapplied. Installation must comply with specifications regarding wire types, conductor sizes, branch circuit protection and disconnect devices. Page 116 Troubleshooting Fault Description Action ② F33 Auto Rstrt Tries Drive unsuccessfully attempted Correct the cause of the fault and to reset a fault and resume manually clear. The P1-FLN protocol is a serial communication protocol used by the Siemens ®... Installation/Wiring 1-15 Table 1.D Power Terminal Block Specifications Frame Maximum Wire Size Minimum Wire Size Recommended Torque 8.4 mm (8 AWG) 1.3 mm (16 AWG) 2.9 N-m (26 lb.-in.) 33.6 mm (2 AWG) 8.4 mm (8 AWG) 5.1 N-m (45 lb.-in.) 480V 33.6 mm (2 AWG) Page 26 1-16 Installation/Wiring Important points to remember about I/O wiring: • Always use copper wire. The reverse command may come from a digital or a serial command. RS485 repeaters may need to be used for long cable runs, or if greater than 32 nodes are needed on the network. Modbus RTU Protocol Writing (06) Logic Command Data The PowerFlex 400 drive can be controlled via the network by sending Function Code 06 writes to register address 8192 (Logic Command). The following is an example of basic integral keypad and display functions. Page 33 Installation/Wiring 1-23 Input/Output Connection Example Required Settings Opto Output Parameters T065 [Opto Out Sel] = 0 through 15 • When using Opto Output with T066 [Opto Out Level] an inductive load such as a T068 [Opto Out Logic] relay, install a recovery diode parallel to the relay as shown to prevent damage to the output. After a step change in the PID Feedback: –... Compatibility: Windows 95, 98, ME, NT 4.0 (Service Pack 3 or later), 2000, XP and CE... Frame E Drives 1. Important: I/O Terminal 01 is always a coast to stop input except when P036 [Start Source] is set for... Values Default: Drive Rated Volts Min/Max: 20/Drive Rated Volts Display: 1 VAC A175 [Slip Hertz @ FLA] Related Parameter(s): P033 Compensates for the inherent slip in an induction motor. As an alternative, programming can also be performed using DriveExplorer™ or DriveExecutive™ software, a personal computer and a serial converter module. Important: Power to drive must be cycled before any changes will affect drive operation. Page 73 Programming and Parameters 3-21 Terminal Block Group (continued) T072 [Analog In 1 Loss] Related Parameter(s): T055, T060, T065, T069, T070 T071, A152 Stop drive before changing this parameter. • Auto key stops the drive and the drive switches to Remote mode. Values Default: Read Only Min/Max: 0/3276.7 Display: 0.1 MWh b012 [Elapsed Run Time] Related Parameter(s): A195 Displays the accumulated time that the drive has output power since the last A195 [Reset Meter]. 1. Parameters are programmed (viewed/edited) using the integral keypad. Page 132 Accessories and Dimensions Table B.7 Bulletin 1321 - DC Series Bus Inductors - 380-480V, 60 Hz, Three-Phase Inductance Catalog Number DC Amps Watts Loss IP00 (Open Style) 3.68 1321-DC9-2 1321-DC12-2 3.75 1321-DC18-4 1.75 1321-DC25-4 2.68 1321-DC32-2 1321-DC40-4 Required on 11 and 15 kW (15 and 20 HP) Frame C Flange Mount drive ratings. 3. Manually Clearing Faults Step Key(s) Page 115 Troubleshooting Fault Descriptions Table 4.A Fault Types, Descriptions and Actions Fault Description Action ① Auxiliary Input Auxiliary input interlock is open. In AUTO mode: •... ATTENZIONE: Non installare, configurare, attivare o riparare questo prodotto senza avere prima letto la relativa documentazione nonchè i documenti indicati nella sezione Ulteriori Risore riguardanti l'installazione, la configurazione, l'attivazione o la riparazione dell'apparecchiatura. Enter the same password to unlock the parameters. Figure 1.6 Power Terminal Blocks R/L1 S/L2 T/L3 U/T1 V/T2 W/T3 P2 Frame C DC–... Chapter Installation/Wiring This chapter provides information on mounting and wiring the PowerFlex 400 Drive. Page 134 Accessories and Dimensions Table B.10 Human Interface Module (HIM) Option Kits and Accessories Item Description Catalog Number LCD Display, Remote Panel LCD Display 22-HIM-C2S Mount Digital Speed Control CopyCat Capable IP66 (NEMA Type 4X/12) indoor use only Includes 2.0 meter cable LCD Display, Remote Handheld LCD Display 22-HIM-A3 Digital Speed Control... Refer to the flowchart on page 1-25 for details. Values Default: Read Only Min/Max: 0.0/60.0 Min Display: 0.1 Min d314 [Fault 3 Time-hr] Related Parameter(s): A195, d316 Displays the value of the... Examples Scale Function For a 0-5 volt signal, the following parameter settings are used so that a 0 volt signal = 0% PID Reference and a 5 volt signal = 100% PID Reference. Application Notes D-11 Auxiliary Motor Control Setup The PowerFlex 400 has a built in Auxiliary Motor Control feature. Minimum Mounting Clearances Vertical mounting is shown. Page 110 3-58 Programming and Parameters Parameter Cross-Reference – by Name Parameter Name Number Group Page Parameter Name Number Group Page Compensation A194 Advanced Program 3-45 Accel Time 1 P039 Basic Program 3-10 Contrl In Status d302 Advanced Display 3-52 Accel Time 2 A147 Advanced Program 3-32... Connectivity Guidelines ATTENTION: Risk of injury or equipment damage exists. Drive may add additional voltage unless Option 5 is selected. Tuto dokumentaci můžete získat na rok.auto/literature nebo od obchodního zástupce společnosti Rockwell Automation. Any pending input will be lost. The drive Start command is normally normally determined by determined by P036 [Start Source]. See Motor Protection Circuit Breaker and Motor Circuit Protector Specifications Technical Data, publication (3) Manual Self-protected (Type E) Combination Motor Controller, UL Listed for 208 Wye or Delta, 240 Wye or Delta, 480Y/277, or 600Y/347. All reverse inputs including two-wire Run Reverse will be ignored with reverse disabled. Page 130 Accessories and Dimensions Table B.3 PowerFlex 400 Flange Mount Drives Drive Ratings Output Current Frame Input Voltage 45°C 50°C Catalog Number Size 240V 50/60 Hz 22C-B012F103 3-Phase 17.5A 17.5A 22C-B017F103 22C-B024F103 22C-B033F103 480V 50/60 Hz 6.0A 6.0A 22C-D6P0F103 3-Phase 22C-D010F103 22C-D012F103 22C-D017F103 22C-D022F103... Refer to page 1-9 additional grounding recommendations. Example • [PID Deadband] is set to 5.0 • The PID Reference is 25.0% • The PID Regulator will not act on a PID Error that falls between 20.0 and 30.0% PID Preload The value set in... In Trim mode, the output of the PID loop bypasses the accel/decel ramp as shown. Values Default: Read Only Min/Max: 0.00/P035 [Maximum Freq] Display: 0.01 Hz b002 [Commanded Freq] Related Parameter(s): b001, P034, P035, P038, d302 Value of the active frequency command. Recommended Torque (1) (1) Minimum Wire Size 2.9 N•m (26 lb•in) 2 1.3 mm (16 AWG) 5.1 N•m (45 lb•in) 2 8.4 mm (8 AWG) 2 5.6 N•m (49.5 lb•in) 3.5 mm (12 AWG) 2 19.5 N•m (173 lb•in) 53.5 mm (1/0 AWG) 19.5 N•m (173 lb•in) 2 (300 MCM) 85.0 mm (3/0 AWG) 2 29.4 N•m (260 lb•in) (300 MCM) 107.2 mm (4/0 AWG) 2 40.0 N•m (354 lb•in) (500 MCM) 152.0 mm (300 MCM) Page 1 Adjustable Frequency AC Drive for Fan & Pump Applications FRN 4.xx User Manual www.abpowerflex.com... 1-15 Note added regarding the function of I/O Terminal 18, Analog Common 2. Preface Overview The purpose of this manual is to provide you with the basic information needed to install, start-up and troubleshoot the PowerFlex 400 Adjustable Frequency AC Drive. This function is normally used by Point 79 of a P1-FLN. Set to the motor nameplate rated volts. ATTENTION : Ne pas installer, configurer, exploiter ou maintenir ce produit tant que vous n'avez pas lu sa documentation et les documents de la rubrique Documents connexes pour l'installation, la configuration, l'exploitation et la maintenance de l'équipement. Start Up Integral Keypad Operator Keys Name Description Escape Back one step in programming menu. Page 94 3-42 Programming and Parameters Advance Program Group (continued) A182 [Drive OL Mode] Related Parameter(s): P032, P033 Determines how the drive handles overload conditions that would otherwise cause the drive to fault. DC+, DC- DC Bus Connection (Frame C Drives) P2, DC- DC Bus Connection (Frame D, E, and F Drives) BR+, BR- Not used Safety Ground – PE Power Dissipation (1) Important: Terminal screws may become loose during shipment. Page 158 Application Notes PID Gains The proportional, integral, and differential gains make up the PID regulator. Page 78 3-26 Programming and Parameters Terminal Block Group (continued) T086 [Analog Out2 High] Related Parameter(s): P035, T085, T087 Scales the Maximum Output Value for the A065 [Analog Out Sel] source setting. Grounding as described in Figure 1.11. Page 187 Index Drive Ratings, P-4, A-1 DriveExecutive, 3-1 AC Supply DriveExplorer, 3-1 Ground, 1-8 Source, 1-6 Ungrounded, 1-6 Earthing, see Grounding Armored Cable, 1-11 EMC/RFI Auto Rstrt Tries Fault, 4-4 Grounding, Filter, 1-9 Auxiliary Input Fault, 4-3 Interference, 1-27, 1-29 ESD, Static Discharge, P-3 Before Applying Power, 2-1, 2-2 Bus Capacitors, Discharging, P-3 Faults... Adjust the proportional gain. If mounting horizontally, apply the same clearances plus 50 mm (2.0 in.) clearance from the top and bottom of the enclosure to allow for proper airflow. A-2 Input Power Connections. Page 172 Metasys N2 Table F.1 Description of the Regions of a Virtual Object Region Type Short Description Region 1 Analog Input 32-bit, IEEE-standard floats Region 2 Binary Input 1-bit Region 3 Analog Output 32-bit, IEEE-standard floats Region 4 Binary Output 1-bit Region 5 Internal Float 32-bit, IEEE-standard floats (Analog Data Float) Page 173 Metasys N2 Network Points Table F.7 Binary Inputs Network Point Type Address (NPT) (NPA) Name Description ON (“1”) OFF (“0”) Ready Logic Status bit 00 Ready Not Ready Active Logic Status bit 01 Active Not Active Cmd Dir Logic Status bit 02 Forward Reverse Act Dir... Values Default: 50.0%... • Start command and speed reference come from the integral keypad Start/Hand and Digital Speed Increment and Decrement keys. If A152 [PID Ref Sel] is not set to 0 “PID Disabled”, PID can still be disabled by select programmable digital input options (parameters T051-T054) such as “Local”... Installations with long motor cables may require the addition of external devices to limit voltage reflections at the motor (reflected wave phenomena). Description of New or Updated Information See Page(s) Attention statement clarified. Page 12 Installation/Wiring Frame D Drives 1. The PID loop works by subtracting the PID feedback from a reference and generating an error value. Alternative Accel/Decel rates can be made through digital inputs, RS485 (DSI) communications and/or parameters.) 7.5 10 140M-D8E-C10 100-C09 5098 105 140MT-D9E-C10 100-E09 20 140M-D8E-C16 100-C16 5098 171 140MT-D9E-C16 100-E16 100-C23 5098 200 140MT-D9E-C16 100-E26 100-C23 5098 267 140MT-D9E-C20 100-E26 30 140M-F8E-C32 100-C30 5098 329 100-E30 40 140M-F8E-C32 100-C37 5098 435 100-E38 50 140M-F8E-C45 100-C60 9086 606 100-E65 60 — 100-C60 — 738 100-E65 80 — 100-C85 — 664 100-E80 100 — 100-C85 — 1019 100-E80 125 — 100-E116 — 1245 107 150 — 100-E146 — 1487 100-E190 — 2043 100-E265 — 2617 200 250 — 100-E265 — 3601 235 300 — 100-E305 — 3711 100-E400 — 4208 100-E400 — 4916 100-E580 — 6167 140-TD005 or 140M-TD002. Page 40 1-30 Installation/Wiring Essential Requirements for FCC Compliance Conditions 1-4 listed below must be satisfied for PowerFlex 400 drives to meet the requirements of FCC Part 15 Subpart B. PowerFlex 400 Adjustable Frequency AC Drive FRN 1.xx - 6.xx User Manual Publication 22C-UM001G-EN-P Preface Overview The purpose of this manual is to provide you with the basic ... This Quick Start guide summarizes the basic steps needed to install, start-up and program the PowerFlex 400 Adjustable Frequency AC Drive. Values Default: 0.0% Min/Max: 0.0/100.0% Display: 0.1% T085 [Analog Out2 Sel] Related Parameter(s): P035, T086,... Drive will not reverse motor direction. ATENCIÓN: No instale, configure, opere ni mantenga este producto hasta que haya leído la documentación del producto y los documentos en la sección Recursos adicionales para la instalación, configuración, operación o mantenimiento de equipo. Page 118 Troubleshooting Drive does not Start from Start or Run Inputs wired to the terminal block. Figure 1.5 Typical Grounding R/L1 U/T1... If national or local codes require sizes outside this range, lugs may be used. Page 159 Application Notes Guidelines for Adjusting the PID Gains 1. Options 0 “Disabled” 1 “Electrical” (Default) Some drive/motor combinations have inherent instabilities which are exhibited as non-sinusodial motor currents. T055 Setting T056 Min/Max 0/320 Hz... Para conseguir la documentación, diríjase a contacto con su oficina regional de ventas o representante de Rockwell Automation. Options 1 “1 Aux Mtr” (Default) 1 Auxiliary Motor 2 “2 Aux Mtr” 2 Auxiliary Motors 3 “3 Aux Mtr”... If configurable outputs are programmed to write parameter data to Non-Volatile Storage (NVS) frequently, the NVS will quickly exceed its life cycle and cause the drive to malfunction. Chapter Programming and Parameters Chapter 3 provides a complete listing and description of the PowerFlex 400 parameters. Mounting Considerations • Mount the drive upright on a flat, vertical, and level surface. This setting attempts to correct this condition. Page 181 P1 – Floor Level Network (FLN) Table G.1 Point Database for Application 2735 Factory Engineering Point Point Default Units Slope Intercept Number Type Subpoint Name (SI Units) (SI Units) (SI Units) (SI Units) On Text Off Text PID GAIN 0.01 –... Refer to Start and Speed Reference Control on page 1-24 for details about how other drive settings can override the setting of this parameter. Description of New or Updated Information See Page(s) Important statement regarding differences in parameter defaults for 3-11 packaged drives added to parameter P041 [Reset To Defalts]. These objects handle only 16-bit parameter values. Page 140 B-12 Accessories and Dimensions Figure B.5 PowerFlex 400 Frame C Flange Mount Drive - Dimensions are in millimeters and (inches) 130.3 (5.13) 105.8 138.2 (11.81) (4.17) (5.44) (12.8) 22B-CCC Cutout Dimensions (6.46) (0.21) (0.31) 307.5 (12.11) 230.6 (9.08) 291.5 (11.48) 153.8 (6.06) 76.9... Page 80 3-28 Programming and Parameters Communications Group (continued) C104 [Comm Node Addr] Related Parameter(s): d303 Sets the drive node address for the RS485 (DSI) port if using a network connection. Page 49 Start Up Local/Remote Mode In Local mode: • Start command and speed reference come from the integral keypad Start/Hand and Digital Speed Increment and Decrement keys. ❑ 8. Appendix Application Notes Damper Control Setup The PowerFlex 400 allows damper control logic to be imbedded within the drive reducing cost associated with external control hardware and software. The codes will appear in these parameters in the order they occur (b007 [Fault 1 Code] = the most recent fault). 3-52 Programming and Parameters Advance Display Group d301 [Control Source] Related Parameter(s): P036, P038, T051-T054 Displays the active source of the Start Command and Speed Command which are normally defined by the settings of P036 [Start Source] and P038 [Speed Reference] but may be overridden by digital inputs. The default rate is determined by P039 [Accel Time 1] and P040 [Decel Time 1]. Page 138 B-10 Accessories and Dimensions Figure B.3 PowerFlex 400 Frame E Drive - Dimensions are in millimeters and (inches) 370.0 (14.57) 259.2 (10.21) ∅ 8.5 (0.33) 335.0 (13.19) 605.5 (23.84) 567.4 (22.34) 315.2 (12.41) 240.2 (9.46) 130.2 (5.13) ∅ 62.7 55.2 (2.17) (2.47) ∅... #1 Relay N.O. Ready/Fault Normally open contact for No. 1 output relay. Therefore, the filter must only be used in installations with grounded AC supply systems and be permanently installed and solidly grounded (bonded) to the building power distribution ground. Page 38 Table 1.J PowerFlex 400 – EN61800-3 Compliance PowerFlex 400 Drive First Environment Restricted First Environment Unrestricted kW (HP) Cat. Page 108 3-56 Programming and Parameters Advance Display Group (continued) d319 [Testpoint Data] Related Parameter(s): A196 The present value of the function selected in A196 [Testpoint Sel]. • Parameter numbers and names are shown in this format: P031 [Motor NP Volts] Name Number Group b = Basic Display Group... Page 51 Start Up No Function Mode In No Function mode: • The Auto key has no function • Start command is defined by P036 [Start Source] • Speed Reference command is defined by P038 [Speed Reference] Table 2.D P042 [Auto Mode] = 0 “No Function” T051-T054 [Digital Inx Sel] ≠... Common Symptoms and Corrective Actions Motor does not Start. Page 71 Programming and Parameters 3-19 Terminal Block Group (continued) T066 [Opto Out Level] Related Parameter(s): T065, T068, A163, d318 32 bit parameter. Page 62 3-10 Programming and Parameters Basic Program Group (continued) P038 [Speed Reference] Related Parameter(s): b001, b002, P038, P040, P042, T051-T054, T070, T071, T073, T074, T075, C102, A141, A142, A143-A146, A152, d301 Sets the source of the speed reference to the drive. Page 100 3-48 Programming and Parameters Aux Relay Card Group (continued) R222 [Relay Out3 Level] R225 [Relay Out4 Level] R228 [Relay Out5 Level] R231 [Relay Out6 Level] R234 [Relay Out7 Level] R237 [Relay Out8 Level] Sets the trip point for the digital output relay if the value of [Relay OutX Sel] is 6, 7, 8, 9, 10 or 12. Page 186 P1 – Floor Level Network (FLN) Writing Parameter Values These outputs are written each time the Write Value point is written from the network. Page 63 Programming and Parameters 3-11 Basic Program Group (continued) P040 [Decel Time 1] Related Parameter(s): P038, P039, T051-T054, A141, A143-A146, A148 Sets the rate of deceleration for all speed decreases. Page 70 3-18 Programming and Parameters Terminal Block Group (continued) T065 [Opto Out Sel] Related Parameter(s): P033, T066, T068, T072 T076, A163, d318 Determines the operation of the programmable opto output. - Remove this jumper only when you connect a DC Bus Inductor. Reading Parameter Values The configurable points may show any parameter in the drive by configuring the Param# for INx point. 1 = Condition True, 0 = Condition False Running Bit 1 Forward Bit 2 Accelerating Bit 3 Decelerating Bit 4 Values Default: Read Only Min/Max:... See Table 1.C for recommendations. Page 91 Programming and Parameters 3-39 Advance Program Group (continued) A171 [Start Boost] Related Parameter(s): P031, P032, P034, P035, A170, A172, A173, A174 Sets the boost voltage (% of P031 [Motor NP Volts]) and redefines the Volts per Hz curve when A170 [Boost Select] = 0 “Custom V/Hz”. These devices must be disconnected if the drive is installed on an ungrounded or resistive grounded distribution system. Page 46 Start Up LED Status Indicators LED State Description Program Status Steady Red Indicates parameter value can be changed. Pour obtenir de la documentation, rendez-vous sur le site rok.auto/literature ou contactez votre agence commerciale Rockwell Automation locale ou son représentant. Page 192 *T304* 5011625904-T304 www.rockwellautomation.com Power, Control and Information Solutions Headquarters Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444 Europe/Middle East/Africa: Rockwell Automation, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640 Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846 Publication 22C-UM001E-EN-P –... The information provided Does Not replace ... View and Download Rockwell Automation Allen-Bradley PowerFlex 400 product information online. Page 15 Installation/Wiring Figure 1.2 Frames D, E and F Mounting Clearances Frame D & E Frame F 250 mm (9.8 in.) 150 mm (6.0 in.) 50 mm 50 mm 50 mm 50 mm (2.0 in.) (2.0 in.) (2.0 in.) (2.0 in.) 150 mm 150 mm (6.0 in.) (6.0 in.) Installation/Wiring AC Supply Source Considerations Ungrounded Distribution Systems ATTENTION: PowerFlex 400 drives contain protective MOVs that are referenced to ground. • Solid-state equipment has operational characteristics that differ from those of electromechanical equipment. Page 123 Supplemental Drive Information Category Specification Agency Listed to UL508C and CAN/CSA-22.2 Certification Listed to UL508C for plenums ® Certified to AS/NZS, 1997 Group 1, Class A Marked for all applicable European Directives EMC Directive (89/336) EN 61800-3, EN 50081-1, EN 50082-2 Low Voltage Directive (73/23/EEC) EN 50178, EN 60204 The drive is also designed to meet the appropriate portions of the following specifications:... A setting of 0.0 disables this parameter. Important: If analog inversion is implemented the drive will go to maximum frequency in the event the analog input is lost. Programming and Parameters 3-47 Aux Relay Card Group R221 [Relay Out3 Sel] Related Parameters for the Aux Relay Card Group: Aux Parameters R224 [Relay Out4 Sel] PID Parameters R227 [Relay Out5 Sel] Digital Inputs R230 [Relay Out6 Sel] Relays 1 and 2 R233 [Relay Out7 Sel] R236 [Relay Out8 Sel] Sets the condition that changes the state of the output relay contacts. rok.auto/literature Web : , , rok.auto/literature rok.auto/literature UWAGA: Nie instaluj i nie uruchamiaj tego urządzenia dopóki nie zapoznasz się z instrukcją użytkownika produktu. running for the programmed number of A163 [Auto Rstrt Tries]. Group Parameters Basic Display Output Freq b001 Drive Status b006 Elapsed MWh b011 Commanded Freq b002 Fault 1 Code b007 Elapsed Run Time b012 B a s i c D i s p l Output Current b003... Pull the bottom of the cover out and up to release. Page 131 Accessories and Dimensions Table B.5 Bulletin 1321-3R Series Line Reactors – 380-480V, 60 Hz, Three-Phase Catalog Number Maximum Fundamental Continuous Watts IP00 IP11 Amps Amps Inductance Loss (Open Style) (MENA Type 1) 3% Impedance 25.3 1321-3R8-C 1321-3RA8-C 1321-3R12-B 1321-3RA12-B 1321-3R12-B 1321-3RA12-B 1321-3R18-B 1321-3RA18-B... - The drive cannot power up without a jumper or inductor connected. Start Up Keypad Hand-Off-Auto Functions Parameter P042 [Auto Mode] defines the operation mode of the control keys on the integral keypad. Program with P036 [Start Source]. Page 93 Programming and Parameters 3-41 Advance Program Group (continued) A178 [DC Brk Time@Strt] Related Parameter(s): P037, A177 Sets the length of time that DC brake current is “injected” into the motor after a valid start command is received. Page 107 Programming and Parameters 3-55 Advance Display Group (continued) d313 [Fault 2 Time-min] Related Parameter(s): A195, d317 Displays the value of the d317 [Elapsed Time-min] parameter when the fault occurred. Correctly enter motor nameplate entered. Installation/Wiring 1-27 EMC Instructions CE Conformity Conformity with the Low Voltage (LV) Directive and Electromagnetic Compatibility (EMC) Directive has been demonstrated using harmonized European Norm (EN) standards published in the Official Journal of the European Communities. Figure D.1 Unstable PID Reference PID Feedback Time Figure D.2 Slow Response – Over Damped PID Reference PID Feedback Time Figure D.3 Oscillation –... Cause(s) Indication Corrective Action • Check No value is coming from the The drive “Run” indicator is lit d301 [Control Source] for source of the command. See the chart below for the override priority. Supplemental Drive Information Input Power Connections Figure A.1 Frame C, D, and E Connections Input Protection Input Protection Three Phase Input Single Phase Input Figure A.2 Frame F Connections Input Protection Input Protection Three Phase Input Single Phase Input Note: UL Approval pending for Single-Phase operation. ACHTUNG: Für die Installation, Konfiguration, den Betrieb und die Wartung dieses Produkt lesen Sie sich bitte zunächst die Produktdokumentation sowie die Dokumente im Abschnitt "Weitere Informationen" durch. Page 50 Start Up Auto/Manual Mode In Manual mode: • Start command is defined by P036 [Start Source]. Page 111 Programming and Parameters 3-59 Parameter Name Number Group Page Parameter Name Number Group Page Relay Out7 Sel R234 Relay Card 3-48 Motor OL Current P033 Basic Program Relay Out8 Level R237 Relay Card 3-48 Motor OL Ret P043 Basic Display 3-11 Relay Out8 Sel R236... Changes throughout this revision are marked by change bars, as shown to the left of this paragraph. Page 153 Application Notes Exclusive Control In Exclusive Control, the Speed Reference becomes 0, and the PID Output becomes the entire Freq Command. Frame Screw Size Screw Torque C M5 (#10...24) 2.45...2.94 N•m (22...26 lb•in) D M8 (5/16 in.) 6.0...7.4 N•m (53.2...65.0 lb•in) E M8 (5/16 in.) 8.8...10.8 N•m (78.0...95.3 lb•in) F M10 (3/8 in.) 19.6...23.5 N•m (173.6...208.3 lb•in) G M12 (1/2 in.) 33.5...41.0 N•m (296.5...362.9 lb•in H M12 (1/2 in.) 33.5...41.0 N•m (296.5...362.9 lb•in) • Protect the cooling fan by avoiding dust or metallic particles. Page 114 Troubleshooting Fault Indication Condition Drive is indicating a fault. For information on... See page... For information on... See page... Drive Status Fault Descriptions Faults Common Symptoms and... Appendix Supplemental Drive Information For information on... See page... Drive, Fuse & Circuit Breaker Ratings Specifications Drive, Fuse & Circuit Breaker Ratings The tables on the following pages provide drive ratings and recommended AC line input fuse and circuit breaker information. Our PowerFlex® ... 2. Cause(s) Indication Corrective Action Motor data was incorrectly None 1. Programming and Parameters Basic Program Group P031 [Motor NP Volts] Related Parameter(s): b004, A170, A171, A172, A173 Stop drive before changing this parameter. • Control and signal wires should be separated from power wires by at least 0.3 meters (1 foot). Page 160 D-10 Application Notes The following figures show some typical responses of the PID loop at different points during adjustment of the PID Gains. Turn the latch counterclockwise. Cause(s) Indication Corrective Action... Installation/Wiring 1-29 Figure 1.11 Connections and Grounding Shielded Enclosure (1) IP 30/NEMA 1/UL Type 1 Option Kit (Frame C Drives Only) EMI Fittings and Metal Conduit EMI Filter R/L1 U/T1 S/L2 V/T2 T/L3 W/T3 Enclosure Ground Connection Shielded Motor Cable Building Structure Steel (1) Shielded Enclosure required to meet EN61800-3 First Environment Restricted for 200-240V AC 11-22 kW (15-30 HP) PowerFlex 400 drives and to meet EN61800-3... . IP00 (Open) – IP00 (Open) – 45 Amps (fundamental) and Below 55 Amps (fundamental) and Above Catalog Number Weight 1321-3R8-C... When entering sleep mode the drive will ramp to zero and the run indicator ( ) on the keypad display will flash indicating the drive is in “sleep”... Visit the Technical Documentation Center to find product specifications, installation guides, user manuals, product certifications and more. T053 [Digital In3 Sel] (I/O Terminal 07) T054 [Digital In4 Sel]... Page 143 Accessories and Dimensions B-15 Figure B.8 EMC Line Filters – Dimensions are in millimeters and (inches) Catalog Numbers: 22-RF018-CS, 22-RF018-CL, 22-RF026-CS, 22-RF026-CL, 22-RF026-CL, 22-RF034-CS (2.36) (5.12) (3.54) (1.26) (11.69) (12.17) (11.69) 5.5 (0.22) (0.67) (1.18) Page 144 B-16 Accessories and Dimensions Catalog Numbers: 22-RFD036, 22-RFD050, 22-RFD070, 22-RFD100, 22-RFD150, 22-RFD180 Catalog Number 22-RFD036 74 (2.91) 272 (10.71) 161 (6.34) 60 (2.36) 258 (10.16) 7.5 (0.30) 7 (0.28) 22-RFD050 93 (3.66) 312 (12.28) 190 (7.48) 79 (3.11) 298 (11.73) 13.5 (0.53) 7 (0.28) 22-RFD070 93 (3.66) 312 (12.28) 190 (7.48) 79 (3.11) 298 (11.73) 13.5 (0.53) 7 (0.28) Page 145 Accessories and Dimensions B-17 Figure B.9 Remote (Panel Mount) Small HIM – Dimensions are in millimeters and (inches) Catalog Number: 22-HIM-C2S (0.98) (3.66) (7.09) (2.64) (2.36) (6.06) 19.1 (3.03) (0.75) (0.19) 23.5 (0.93) Page 146 B-18 Accessories and Dimensions Figure B.10 NEMA Type 1 Bezel – Dimensions are in millimeters and (inches) Catalog Number: 22-HIM-B1 11.1 (0.44) (3.66) 25.2 (0.99) (7.09) (2.64) (2.36) (6.06) (0.19) (3.03) 19.1 (0.75) 23.5 (0.93) Page 147 Appendix RJ45 DSI Splitter Cable The PowerFlex 400 drive provides a RJ45 port to allow the connection of a single peripheral device. The source is P038 [Speed Reference]. Page 89 Programming and Parameters 3-37 Advance Program Group (continued) A166 [Reverse Disable] Related Parameter(s): b006, P036, T051-T054 Stop drive before changing this parameter. Table of Contents Preface Overview Who Should Use this Manual? [Relay OutX Select Setting [Relay OutX Level] Min/Max 0/320 Hz... Page 188 Index-2 Parameters Display Group, 3-4 Heatsink OvrTmp Fault, 4-3 Program Group, 3-7 HW OverCurrent Fault, 4-3 PE Ground, 1-8 Phase Short Fault, 4-4 Phase to Ground Fault, 4-4 Wiring, 1-15 point map Wiring Examples, 1-20, 1-23 Metasys N2, F-3, G-2 I/O Board Fail Fault, 4-5 Power Cables/Wiring, 1-11 Input Contactor, 1-15... Options 0 “Disabled”... Values Default: Based on Drive Rating Min/Max: 20/Drive Rated Volts Display: 1 VAC P032 [Motor NP Hertz]... PowerFlex 400 drives can be multi-dropped on an RS485 network using Modbus protocol in RTU mode. Frame Screw Size Screw Torque M5 (#10-24) 2.45-2.94 N-m (22-26 lb.-in.) M8 (5/16 in.) 6.0-7.4 N-m (53.2-65.0 lb.-in.) M8 (5/16 in.) 8.8-10.8 N-m (78.0-95.3 lb.-in.) M10 (3/8 in.) 19.6-23.5 N-m (173.6-208.3 lb.-in.) •... Trim Control is used when A152 [PID Ref Sel] is set to option 5, 6, 7 or 8. Modbus RTU Protocol Reading (03) Drive Error Codes The PowerFlex 400 Error Code data can be read via the network by sending Function Code 03 reads to register address 8449 (Drive Error Codes). T054 Options 15 “Anlg2 InCtrl” Selects Analog Input 2 control for the frequency (Cont.) reference. Replace the finger guard when wiring is complete. Values Default: Read Only... Safety Guidelines for the Application, Installation, and Maintenance of Solid-state Control Installation Instructions, publication SGI-1.1, available from your local Rockwell Automation sales office or online at rok.auto/literature describes some important differences between solid-state equipment and hard-wired electromechanical devices. Page 98 3-46 Programming and Parameters Advance Program Group (continued) A198 [Program Lock] Protects parameters against change by unauthorized personnel. Frames D, E, and F Mounting Clearances Frame D and E 50 mm (2.0 in.) Frames G and H Mounting Clearances or contact your local oder kontaktieren Sie Ihr rok.auto/literature o póngase en Ambient Operating Temperatures Frame Ambient Temperature Minimum C -10 °C (14 °F) -10 °C (14 °F) D, E, F, G, H -10 °C (14 °F) (1) Frame C drives require installation of the PowerFlex® 400 IP30/NEMA 1/UL Type 1 option kit to achieve this rating. Appendix Metasys N2 Appendix F provides information about controlling a PowerFlex 400 drive, setting its Reference, and accessing its parameters through configurable objects when the Metasys N2 network protocol is selected. Enable A194 [Compensation]. 3-12 Programming and Parameters Terminal Block Group T051 [Digital In1 Sel] Related Parameter(s): P036, P038, P039, P040 A141, A142 A143-A146, A147 (I/O Terminal 05) A148, A166, A177, A180, d301, d302 T052 [Digital In2 Sel] (I/O Terminal 06) Stop drive before changing this parameter. Wait three minutes for capacitors to discharge to safe voltage levels. Logic Status Address (Decimal) Value (Decimal) Description No Fault Auxiliary Input Power Loss... Maximum Freq Decel Rate Decel Time Values Default: 20.00 Secs Min/Max: 0.00/600.00 Secs Display: 0.01 Secs... 180...265 6.5 15.5 20 140M-F8E-C16 100-C23 5098 100-E26 21 30 140M-F8E-C25 100-C37 5098 100-E38 180...265 10.9 26.1 35 140M-F8E-C32 100-C37 5098 100-E38 33 180...265 14.4 34.6 45 140M-F8E-C45 100-C43 5098 100-E40 15 49 180...265 21.3 51 70 — 100-C60 — 100-E65 20 65 180...265 28.3 68 90 — 100-C85 — 100-E80 180...265 32.5 78 100 — 100-E96 — 180...265 38.3 92 125 — 100-E116 — 100-E190 — 100-E190 — Fuses and Circuit Breakers – UL 61800-5-1 Applications (Continued) Catalog Output Input Ratings Number Ratings kW HP Voltage Range 50 mm 380...480V AC (±10%) — 3-phase Input, 0...460V 3-phase Output (2.0 in.) 22C-D6P0N103 2.2 3.0 6 340...528 6.3 22C-D010N103 4.0 5.0 10.5 340...528 10.9 13 22C-D012N103 5.5 7.5 12 340...528 11.9 14.2 20 140M-D8E-C16 22C-D017N103 7.5 10 17 340...528 15.3 18.4 25 140M-D8E-C20 22C-D022N103 11 15 22 340...528 19.2 23 22C-D030N103 15 20 27 340...528 25.8 31 22C-D038A103 18.5 25 38 340...528 33.3 40 22C-D045A103 22 30 45.5 340...528 39.1 47 22C-D060A103 30 40 54 340...528 53.3 64 22C-D072A103 37 50 72 340...528 60.7 73 22C-D088A103 45 60 88 340...528 74.9 90 22C-D105A103 55 75 105 340...528 89 22C-D142A103 75 100 128 340...528 124.8 150 200 — 22C-D170A103 90 125 170 340...528 142 170 250 — 22C-D208A103 110 150 208 340...528 167 22C-D260A103 132 200 260 340...528 196 22C-D310A103 160 250 290 340...528 242 290 400 — 22C-D370A103 200 300 370 340...528 304 365 500 — 22C-D460A103 250 350 410 340...528 387 465 600 — (1) Recommended Fuse Type: UL Class J, CC, T, or Type BS88; 600V (550V) or equivalent. Page 154 Application Notes Trim Control In Trim Control, the PID Output is added to the Speed Reference. During this step it may be desirable to disable the integral gain and differential gain by setting them to 0. Manuals and User Guides for Allen-Bradley PowerFlex 400. In addition, the increased impedance of shielded cable may help extend the distance that the motor can be located from the drive without the addition of motor protective devices such as terminator networks. Product Information Original Instructions PowerFlex 400 Adjustable Frequency AC Drive Catalog Number 22C ATTENTION: • Before installing, configuring, operating, or maintaining this product, read this document and the documents that are listed in the Additional Resources section for installing, configuring, or operating equipment. Page 117 Troubleshooting Fault Description Action ② F122 I/O Board Fail Failure has been detected in the 1. Options 1 “English” (Default) 2 “Français” 3 “Español” 4 “Italiano” 5 “Deutsch” 6 “Reserved” 7 “Português” 8 “Reserved” 9 “Reserved” 10 “Nederlands”... Cycle power. These are not recommendations. Page 22 1-12 Installation/Wiring Shielded cable may also help reduce shaft voltage and induced bearing currents for some applications. Page 52 2-10 Start Up Notes:... data into P031, P032 and P033. Page 124 Supplemental Drive Information Category Specification Electrical Voltage Tolerance: 200-240V ±10% 380-480V ±10% Frequency Tolerance: 48-63 Hz Input Phases: Three-phase input provides full rating. Summary of Changes Manual Updates The information below summarizes the changes to the PowerFlex 400 User Manual since the August 2005 release. Summary of Changes This publication contains new or updated information. Page 112 3-60 Programming and Parameters Notes:... Page 103 Programming and Parameters 3-51 Aux Relay Card Group (continued) R254 [Aux AutoSwap Lvl] Sets the maximum level allowable for an AutoSwap to occur. This configuration does not require a master reference, only a desired set point, such as a flow rate for a pump. 1-17 Connection Examples corrected for Analog Input and Analog Output. This example provides basic navigation instructions and illustrates how to program the first Basic Program Group parameter. einen Rockwell Automation-Mitarbeiter. Fuses and Circuit Breakers See the PowerFlex 400 Adjustable Frequency AC Drive for Fan and Pump Applications User Manual, 25 mm publication 22C-UM001 (1.0 in.) Fuses and Circuit Breakers – UL 61800-5-1 Applications 120 mm (4.7 in.) Catalog Output Number Ratings kW HP 120 mm (4.7 in.) 200...240V AC (±10%) — 3-phase Input, 0...230V 3-phase Output 22C-B012N103 2.2 3.0 12 22C-B017N103 3.7 5.0 17.5 180...265 8.8 120 mm 22C-B024N103 5.5 7.5 24 (4.7 in.) 22C-B033N103 7.5 10 120 mm (4.7 in.) 22C-B049A103 11 Mounting Option B 22C-B065A103 15 22C-B075A103 18.5 25 75 22C-B090A103 22 30 81 22C-B120A103 30 40 120 180...265 51.6 124 175 — 22C-B145A103 37 50 130 180...265 62.4 150 200 — Frame F 250 mm (9.8 in.) 150 mm (6.0 in.) 50 mm 50 mm (2.0 in.) (2.0 in.) 150 mm 150 mm (6.0 in.) (6.0 in.) 300 mm (11.8 in.) 300 mm 300 mm (11.8 in.) (11.8 in.) 300 mm (11.8 in.) Enclosure Rating Minimum Mounting Clearances Maximum +45 °C (113 °F) IP20/UL Open Type Use Mounting Option A Use Mounting Option B (1) IP30/NEMA 1/UL Type 1 +50 °C (122 °F) IP20/UL Open Type Use Mounting Option B +45 °C (113 °F) IP30/NEMA 1/UL Type 1 See Frames D, E, and F Mounting Clearances Mounting Clearances Frame Size 200...240V AC Input 400...480V AC Input C C D C D D E E — E — F — G — H Flange Mount for Frame C IP20/66 (NEMA Type 1/4X/12) 300 C (11.81) 325 (12.8) 24.5 (0.96) B C D E 260.0 (10.2) 180.0 (7.1) 116.0 (4.57) 246.0 (9.7) 436.2 (17.7) 206.1 (8.11) 226.0 (8.90) 383.4 (15.09) 605.5 (23.84) 259.2 (10.21) 335.0 (13.19) 567.4 (22.34) 850.0 (33.46) 264.0 (10.39) 381.0 (15.0) 647.5 (25.49) 892.0 (35.12) 264.0 (10.39) 381.0 (15.0) 819.5 (32.26) 1363.8 (53.69) 358.6 (14.12) 480.0 (18.90) 1119.0 (44.06) for fuses and circuit breakers for non-UL applications. Page 69 Programming and Parameters 3-17 Terminal Block Group (continued) T061 [Relay Out2 Level] Related Parameter(s): T060, T063, T064, d318 32 bit parameter. Page 20 1-10 Installation/Wiring Table 1.B Recommended Branch Circuit Protective Devices Voltage Drive Rating Fuse Rating 140M Motor Recommended Rating kW (HP) Amps Protectors MCS Contactors Catalog No. Catalog No. 200-240V AC 2.2 (3.0) 140M-D8E-C16 100-C23 – 3-Phase 3.7 (5.0) 140M-F8E-C25 100-C37 5.5 (7.5) 140M-F8E-C32 100-C37... Per la documentazione sul prodotto visitare il sito rok.auto/literature o contattare l'ufficio vendite o il rappresentate Rockwell Automation di zona. Important statement regarding related parameter added to parameter 3-37 A167 [Flying Start En]. Verify that all terminal screws are tightened to the IP20 Open recommended torque before you apply power to the drive. Page 81 Programming and Parameters 3-29 Communications Group (continued) C108 [Start Source 2] Related Parameter(s): P037, P042, A166, d301 Stop drive before changing this parameter. Page 95 Programming and Parameters 3-43 Advance Program Group (continued) A187 [Bus Reg Mode] Controls the operation of the drive voltage regulation, which is normally operational at decel or when the bus voltage rises. Sets the trip point for the digital output relay if the value of T055 [Relay Out1 Sel] is 6, 7, 8, 9, 10 or 12. Meets or exceeds IEC 61800-9-2 IE2 energy efficiency requirements. • Number of auxiliary motors is set via Parameter R240 [Aux Motor Qty]. Installation/Wiring RFI Filter Grounding Using an external filter with any drive rating, may result in relatively high ground leakage currents. The output is used to provide a signal that is proportional to several drive conditions. 1-24 Installation/Wiring Start and Speed Reference Control The drive speed command can be obtained from a number of different sources. Installation/Wiring Mounting Considerations • Mount the drive upright on a flat, vertical and level surface. Termination resistors need to be applied at each end of the network cable. Users should familiarize themselves with installation and wiring instructions in addition to the requirements of all applicable codes, laws, and standards. ② Power Loss DC bus voltage remained below 1. Page 170 Modbus RTU Protocol Notes:... Select Advance one step in programming menu. Allen-Bradley PowerFlex 400 dc drives pdf manual download. ATENÇÃO: Não instale, configure, opere ou mantenha este produto até que você leia a documentação do produto e os documentos na seção Recursos adicionais para a instalação, configuração, operação ou manutenção do equipamento. ② F38 Phase U to Gnd A phase to ground fault has been 1. The proportional component of the PID regulator outputs a speed command proportional to the PID error. Maximum Freq Accel Rate Accel Time Values Default:... Page 184 P1 – Floor Level Network (FLN) Using Percent (%) for the Reference The Reference (Point 92) for P1 is set as a percentage from 0% to +100%. Page 85 Programming and Parameters 3-33 Advanced Program Group (continued) A149 [S Curve %] Sets the percentage of acceleration or deceleration time that is applied to the ramp as S Curve. Watts (4) Power Terminal Block Specifications 3) Frame Maximum Wire Size C 2 8.4 mm (8 AWG) D 2 33.6 mm (2 AWG) 146 E 2 33.6 mm (2 AWG) (rating 480V, 37...45 kW [50...60 HP]) 207 E 2 107.2 mm (4/0 AWG) (rating 240V, 30...37 kW 266 [40...50 HP] and 480V, 55...75 kW [75...100 HP]) 359 F 2 152.5 mm G 2 152.5 mm 488 H 2 253.0 mm 650 (1) Maximum/Minimum size that the terminal block accepts. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (Publication SGI-1.1 available from your local Rockwell Automation sales office or online at http:// www.rockwellautomation.com/literature) describes some important differences between solid state equipment and hard-wired electromechanical devices. • Wire with an insulation rating of 600V or greater is recommended. drive control and I/O section. Frame C Frame D R/L1 S/L2 T/L3 P1 P2 DC– U/T1 V/T2 W/T3 Frame E: 480V 37...45 kW (50...60 HP) U/T1V/T2 W/T3 Frame E: 240V 480V 30...37 kW 55...75 kW (40...50 HP) (75...100 HP) R/L1 S/L2 T/L3 P1 P2 DC– U/T1 V/T2 W/T3 Frame G R/L1 S/L2 T/L3 DC+ DC– U/T1 V/T2 W/T3 Switch any two motor leads to change = forward direction. Page 149 RJ45 DSI Splitter Cable Connecting One Temporary Peripheral DSI Drive Hand Held Serial Converter Parameter 1 [Adapter Cfg] set to "Auto" (default) or "Master" and connected to Master port (M) on RJ45 Splitter Cable Parameter 9 [Device Type] set to "Auto" (default) or "Master"... Loosen the two captive cover screws. 16 "MOP Up" Increases the value of A142 [Internal Freq] at the current Accel rate if P038... Page 120 Troubleshooting Motor operation is unstable. However, the settings for these parameters can be overridden by a variety of methods. Speed Status Steady Green Indicates that the digital speed control keys are enabled. Loosen the four captive cover screws. If enabled, this sets the percent value of analog output. Page 155 Application Notes PID Reference and Feedback Parameter A152 [PID Ref Sel] is used to enable the PID mode (A152 = 0 "PID Disabled") and to select the source of the PID Reference. Both types of short circuit protection are acceptable for UL and IEC requirements. Model A Model B Catalog Weight Number Model kg (lbs.) 1321-DC9-2 95 (3.75) 83 (3.25) 51 (2.00) – 80 (3.13) 4.7 (0.19) 1321-DC12-1 A... Options 0 "Unlocked" (Default) 1 "Locked"... Table B.8 EMC Line Filters Drive Ratings Input Voltage... Installation/Wiring 1-11 Power Wiring ATTENTION: National Codes and standards (NEC, VDE, BSI, etc.) and local codes outline provisions for safely installing electrical equipment. System output can vary from 0% (auxiliary motors off and drive-controlled motor at zero speed) to 400% (3 auxiliary motors and drive-controlled motor at full speed). Overview Manual Conventions • In this manual we refer to the PowerFlex 400 Adjustable Frequency AC Drive as; drive, PowerFlex 400 or PowerFlex 400 Drive. Reference Materials Manual Conventions Drive Frame Sizes General Precautions... 100% Pr. P035 [Maximum Freq] Value Table G.3 Example Speed Reference and Feedback for a PowerFlex 400 (P035 = 60 Hz) Reference (Point 92) PCT Output (Point 4) Page 185 P1 – Floor Level Network (FLN) Using P1 Configurable Points to Access Parameters Configurable points are inputs and outputs that let you read and write parameter values. Options 0 "Ready/Fault" Relay changes state when power is applied. Page 163 Application Notes D-13 Example 2 One External Motor with AutoSwap Three-Phase Power PowerFlex 400 Reference Feedback Drive Relays Auxiliary Relay Card (1) Mechanically interlocked contactors are recommended to ensure that the drive contactor and the line contactor do not close at the same time. Important: If the drive is running and P036 [Start Source] = 3 or 6 (2-Wire Control), the drive will continue to run at reference defined by P038 [Speed Reference] if a valid start command is present. kW HP 2.2...7.5 3...10 11...15 15...20 18.5...22 25...30 30...37 40...50 45...75 60...100 90...110 125...150 132...160 200...250 200...250 300...350 PowerFlex 400 Frames C...H Dimensions are in mm and (in.). Learn how to install, start-up and program the PowerFlex 400 Adjustable Frequency AC Drive. Page 86 3-34 Programming and Parameters Advanced Program Group (continued) A152 [PID Ref Sel] Related Parameter(s): P038, T070, T071, T072, T074, T075 Stop drive before changing this parameter. For information on... See page For information on... See page Opening the Cover Fuses and Circuit Breakers 1-9 Mounting Considerations Power Wiring 1-11 AC Supply Source Considerations 1-6 I/O Wiring 1-15 Recommendations... page 4-1 for a description of fault types. In addition, some Modbus functions are supported to allow simple networking. Page 88 3-36 Programming and Parameters Advanced Program Group (continued) A163 [Auto Rstrt Tries] Related Parameter(s): T055, T060, T065, T066, A164 Sets the maximum number of times the drive attempts to reset a fault and restart. Cause(s) Indication Corrective Action Drive is Faulted Flashing red status light Clear fault. Page 126 Supplemental Drive Information PowerFlex 400 Watts Loss (Rated Load, Speed & PWM) Panel Mount Watts Flange Mount Watts Voltage kW (HP) Total External Internal Total 200-240V AC 2.2 (3.0) 3.7 (5.0) 5.5 (7.5) 7.5 (10) 11 (15) – – – 15 (20) –... Page 68 3-16 Programming and Parameters Terminal Block Group (continued) T060 [Relay Out2 Sel] Related Parameter(s): P033, T061, T063, T064, T076 A163, d318 Sets the condition that changes the state of the output relay contacts. Important: If a parameter has a decimal point, the value must be properly scaled by the user. A value of "0" in the Param# for Write Param point field disables the writing of data. Time is added, 1/2 at the beginning and 1/2 at the end of the ramp. Values Default: 0.00 (1/Secs) Min/Max: 0.00/99.99 (1/Secs) Display: 0.01 (1/Secs) A157 [PID Setpoint] Provides an internal fixed value for process setpoint when the PID mode is enabled by A152 [PID Ref Sel]. IP20/NEMA/UL Type Open A D E B Frame A C 130.0 (5.1) D 250.0 (9.84) E 370.0 (14.57) F 425.0 (16.73) G 425.0 (16.73) H 529.2 (20.83) (1) Weights include HIM and standard I/O. No. Required Filter Restrict Install Required Filter Restrict Install 22C-... (Allen-Bradley) Motor Drive and Motor Drive and Cable to Filter in Cable to Filter in (Meters) Shielded... Pull on the latch to swing the door open. Familiarize yourself with the integral keypad features (see page 2-3) before setting any Program Group parameters. Modbus RTU Protocol Reading (03) Logic Status Data The PowerFlex 400 Logic Status data can be read via the network by sending Function Code 03 reads to register address 8448 (Logic Status). Application-specific thermal considerations may require a larger enclosure. Do not create a program that frequently uses configurable outputs to write parameter data to NVS. Stop Coast Factory installed jumper or a normally closed input must P036 Function Loss be present for the drive to start. (2) The AIC ratings of the Bulletin 140M/140MT devices can vary. P036 [Start Source] must be set to 5 "RS485 (DSI) Port" in order to accept the commands. Chapter Start Up This chapter describes how to start up the PowerFlex 400 Drive. T055 #1 Relay Common – Common for output relay. Disconnecting MOVs (Drive Frames C, E and F only.) To prevent drive damage, the MOVs connected to ground shall be disconnected if the drive is installed on an ungrounded distribution system where the line-to-ground voltages on any phase could exceed... • Speed Reference command is defined by the Digital Speed Increment and Decrement keys. Accessories and Dimensions Product Dimensions Table B.13 PowerFlex 400 Frames and Weights Drive Weight Packaged Weight Frame kW (HP) kg (lbs.) kg (lbs.) 240V AC – 3-Phase 2.2 (3.0) 2.89 (6.4) 3.41 (7.5) 4.0 (5.0) 2.97 (6.5) 3.49 (7.7) 5.5 (7.5) 3.72 (8.2) 4.27 (9.4) 7.5 (10) Page 136 Accessories and Dimensions Figure B.1 PowerFlex 400 Frame C Drive - Dimensions are in millimeters and (inches) 130.0 (5.1) 180.0 (7.1) 116.0 (4.57) (12.6) (10.2) (9.7) ∅ 28.5 107.0 (4.21) (1.12) 66.0 (2.60) ∅ 22.2 24.0 (0.94) (0.87) 152.2 (5.99) 111.2 (4.38) Page 137 Accessories and Dimensions Figure B.2 PowerFlex 400 Frame D Drive - Dimensions are in millimeters and (inches) ∅ 9.0 250.0 (9.84) 226.0 (8.90) (0.35) 383.4 436.2 (15.09) (17.17) 206.1 (8.11) 192.0 (7.56) 175.5 (6.91) 132.0 (5.20) ∅ 42.0 71.6 (2.82) (1.65) ∅... rok.auto/literature Output Power . Appendix Modbus RTU Protocol PowerFlex 400 drives support the RS485 (DSI) protocol to allow efficient operation with Rockwell Automation peripherals. Refer to Appendix D details. Included is a listing and description of drive faults (with possible solutions, when applicable). Page 58 Programming and Parameters Basic Display Group (continued) b011 [Elapsed MWh] Related Parameter(s): b015, A195 Accumulated output energy of the drive. Refer to the Attention statement on page for important information on bus regulation. Page 23 Installation/Wiring 1-13 Reflected Wave Protection The drive should be installed as close to the motor as possible. Page 44 Start Up Applying Power to the Drive ❑ 7. Page 32 1-22 Installation/Wiring Input/Output Connection Example Required Settings 2 Wire Control DIP Switch Sourcing (SRC), SNK/SRC = SRC Internal Supply, Parameters Run FWD/Run REV P036 [Start Source] = 2, 3, 4 • Input must be active for the Stop-Run P037 [Stop Mode] = 0 through 7 Forward drive to run. We have 5 Allen-Bradley PowerFlex 400 manuals available for free PDF download: Installation Instructions Manual, Technical Data Manual, Quick Start Quide, Installation ... Overview The purpose of this manual is to provide you with the basic information that is needed to install, startup, and troubleshoot the PowerFlex® 400N Adjustable Frequency AC Drive. Page 119 Troubleshooting Drive does not respond to changes in speed command. Metasys N2 Table F.9 Binary Outputs Network Point Values Type Address (NPT) (NPA) Name Description ON ("1") OFF ("0") Run Enable Logic Command bit 00 Enable Stop (Coast) Start/Stop Logic Command bit 00 & 01 Start Stop (Normal) Logic Command bit 02 Not Jog Clear Faults Logic Command bit 03... The integral keypad provides visual notification of a fault condition by displaying the following. Options 0 "DIsabled" 1 "Reduce CLim" 2 "Reduce PWM" 3 "Both-PWM 1st"... Page 177 Metasys N2 Writing Parameter Values ATTENTION: Risk of equipment damage exists. 1-26 Installation/Wiring RS485 Network Wiring Network wiring consists of a shielded 2-conductor cable that is daisy-chained from node to node. Start, Stop, Direction and Speed Control Factory default parameter values allow the drive to be controlled from the integral keypad. (4) When using a Manual Self-protected (Type E) Combination Motor Controller, the drive must be installed in a ventilated or non-ventilated enclosure with the minimum volume specified in this column. Page 189 Index-3 SW OverCurrent Fault, 4-4 System Grounding, 1-8 Terminal Block I/O, 1-16 Power, 1-15 Three Wire Control, 1-20, 1-23 Two Wire Control, 1-20, 1-23 UnderVoltage Fault, 4-3 Ungrounded Supply, 1-6 Unshielded Power Cables, 1-11 Wiring, 1-1 Block Diagram, 1-17, 1-18, 1-19 I/O, 1-15 I/O Examples, 1-20, 1-23 Power, 1-11... Page 55 Programming and Parameters Group Parameters Aux Relay Card Relay Out3 Sel R221 Aux Motor Mode R239 Aux Start Delay R250 Relay Out3 Level R222 Aux Motor Qty R240 Aux Stop Delay R251 A u x R e l a y C a r d Relay Out4 Sel R224... Page 97 Programming and Parameters 3-45 Advance Program Group (continued) A194 [Compensation] Enables/disables correction options that may improve problems with motor instability. Topic Page Understanding Metasys N2 Network Points Using Percent (%) for the Reference Using Metasys Configurable Objects to Access Parameters F-6 Understanding Metasys N2 Metasys nodes are built up by the use of several virtual objects. Replace drive if fault cannot be cleared. Adjustable Frequency AC Drive. Ground impedance must conform to the requirements of national and local industrial safety regulations and/or electrical codes. Appendix Accessories and Dimensions Product Selection Table B.1 Catalog Number Description 22C - Drive Voltage Rating Rating Enclosure Emission Class Comm Slot Table B.2 PowerFlex 400 Drives Drive Ratings Output Current (Amps) Frame Input Voltage 45°C 50°C Catalog Number Size 240V 50/60 Hz 22C-B012N103 3-Phase... Weights are in kg and (lb). Page 139 Accessories and Dimensions B-11 Figure B.4 PowerFlex 400 Frame F Drive - Dimensions are in millimeters and (inches) 425.0 (16.73) 264.0 (10.39) ∅ 13.0 165.8 (6.53) 381.0 (15.00) (0.51) 850.0 (33.46) 678.0 (26.69) 647.5 (25.49) 381.0 (15.00) 280.0 (11.02) 370.0 (14.57) 287.5 (11.32) ∅... Learn about the features, specifications, programming, parameters, troubleshooting and more of this controller. Log In or Create an AccountOpens new dialog The page will refresh upon submission. Analog inversion can be accomplished by setting this value larger than T071 [Analog In 1 Hi]. Page 156 Application Notes Analog PID Reference Signals Parameters T070 [Analog In 1 Lo], T071 [Analog In 1 Hi], T074 [Analog In 2 Lo], and T075 [Analog In 2 Hi] are used to scale or invert an analog PID Reference. Page 74 3-22 Programming and Parameters Terminal Block Group (continued) T074 [Analog In 2 Lo] Related Parameter(s): P034, P038, T072, T073, T075 T076, A152, A153 Stop drive before changing this parameter. Overview General Precautions ATTENTION: The drive contains high voltage capacitors which take time to discharge after removal of mains supply. Page 28 1-18 Installation/Wiring Table 1.G Control I/O Terminal Designations No. Signal Default Description Param. ATTENTION: Driving the 4-20mA analog input from a voltage source could cause component damage. An active purge input will override speed command as shown in the flowchart on page 1-24. Values Default: 0.0 Secs... Page 84 3-32 Programming and Parameters Advanced Program Group (continued) A147 [Accel Time 2] Related Parameter(s): P039, T051-T054, A143-A146 When active, sets the rate of acceleration for all speed increases. Page 65 Programming and Parameters 3-13 T051- 14 "Anlg1 InCtrl" Selects Analog Input 1 control for the frequency reference. A system Run command can be wired directly into one of the drive inputs. Values Default: Read Only Min/Max: 0/820 VDC Display: 1 VDC d327 [Status @ Fault] Related Parameter(s): b006 Displays the value of... Hand-Off-Auto Mode In HAND mode: • Control keys operate as Hand-Off-Auto. Page 141 Accessories and Dimensions B-13 Figure B.6 Bulletin 1321-3R Series Line Reactors – Dimensions are in millimeters and (inches). Page 27 Installation/Wiring 1-17 Figure 1.7 Control Wiring Block Diagram Typical Typical Stop/ (1)(4) SRC Wiring SNK Wiring Function Loss 1 of 7 Digital Input Circuits Start/Run FWD Direction/Run REV Enable Jumper Digital Common Digital Input 1 ENBL Digital Input 2 Digital Input 3 Digital Input 4 Digital Common Opto Common... Die entsprechende Produktdokumentation finden Sie unter rok.auto/literature lokales Vertriebsbüro bzw. Figure 1.9 Network Wiring Diagram PowerFlex 400 PowerFlex 400 PowerFlex 400 Node 1 Node 2 Node "n" FRONT Master TxRxD+ TxRxD+ 120 ohm resistor TxRxD+... Page 35 Installation/Wiring 1-25 Accel/Decel Selection The Accel/Decel rate can be obtained by a variety of methods. The RJ45 DSI Splitter Cable can be used to connect a second DSI peripheral device to the drive. • Protect from moisture and direct sunlight. Page 180 P1 – Floor Level Network (FLN) Network Points Table G.1 Point Database for Application 2735 Factory Engineering Point Point Default Units Slope Intercept Number Type Subpoint Name (SI Units) (SI Units) (SI Units) (SI Units) On Text Off Text CTLR ADDRESS –... Modbus RTU Protocol Standard RS485 wiring practices apply. ATTENTION: Do not install, configure, operate or maintain this product until you have read the product documentation and the documents in the Additional Resources section for installing, configuring, operating or maintaining equipment. Sets the trip point for the digital output relay if the value of T060 [Relay Out2 Sel] is 6, 7, 8, 9, 10 or 12. • Do not expose to a corrosive atmosphere. Page 66 3-14 Programming and Parameters Terminal Block Group (continued) T055 [Relay Out1 Sel] Related Parameter(s): P033, T056, T058, T059, T069 T072, T073, T076, A163, d318 Sets the condition that changes the state of the output relay contacts. To get the product documentation go to rok.auto/literature sales office or Rockwell Automation representative. Page 162 D-12 Application Notes Example 1 One External Motor without AutoSwap Three-Phase Power PowerFlex 400 Reference Feedback Drive Relays Auxiliary Relay Card • Auxiliary Motor Control is enabled via Parameter R239 [Aux Motor Mode]. Page 76 3-24 Programming and Parameters Terminal Block Group (continued) T082 [Analog Out1 Sel] Related Parameter(s): P035, T083, T084 Sets the analog output signal mode (0-20 mA, 4-20 mA, or 0-10V). Sets the control scheme used to start the drive when in Comm Control and the communication network commands the drive to run from Local Control. Error Codes Address (Decimal) Bit(s) Description 1 = Ready, 0 = Not Ready 1 = Active (Running), 0 = Not Active 1 = Cmd Forward, 0 = Cmd Reverse 1 = Rotating Forward, 0 = Rotating Reverse... Page 106 3-54 Programming and Parameters Advance Display Group (continued) d308 [Fault 2 Code] Related Parameter(s): A197 A code that represents the second most recent drive fault. Check remote wiring. Supplemental Drive Information Specifications Drive Ratings Output Ratings Input Ratings Branch Circuit Protection Catalog Number Amps 140M Motor Voltage kW (HP) 45°C 50°C Range Amps Fuses Protectors Contactors 200 - 240V AC – 3-Phase Input, 0 - 230V 3-Phase Output 22C-B012N103 2.2 (3.0) 180-265... Page 101 Programming and Parameters 3-49 Aux Relay Card Group (continued) R240 [Aux Motor Qty] Sets the number of auxiliary motors used while in Auxiliary Motor Control mode. Page 128 Supplemental Drive Information Notes:... ATTENTION: Power must be applied to the drive to perform the following start-up procedures. This feature allows operation of up to three (3) line-started motors in addition to the motor controlled directly by the PowerFlex 400 drive. Displacement Power Factor: 0.98 across entire speed range Efficiency: 97.5% at rated amps, nominal line voltage Maximum Short Circuit Rating: 100,000 Amps Symmetrical (Frame C Drives) 200,000 Amps Symmetrical (Frame D, E, F Drives) Page 125 Supplemental Drive Information Category Specification Control Outputs Relay: Quantity: (2) Programmable Form C Specification Resistive Rating: 3.0A at 30V DC, 3.0A at 125V, 3.0A at 240V AC Inductive Rating: 0.5A at 30V DC, 0.5A at 125V, 0.5A at 240V AC Optional Quantity: (6) Optional Programmable Form A (Drive Frames D, E... Start/Run FWD –... Appendix P1 – Floor Level Network (FLN) Appendix G provides information about controlling a PowerFlex 400 drive, setting its Reference, and accessing its parameters through configurable points when the P1-FLN protocol is selected. Up Arrow Scroll through groups and parameters. Clear a Type 1 fault and restart the drive. Page 61 Programming and Parameters Basic Program Group (continued) P037 [Stop Mode] Related Parameter(s): P036, C105, A176, A177, A178 Active stop mode for all stop sources [e.g. keypad, run forward (I/O Terminal 02), run reverse (I/O Terminal 03), RS485 port] except as noted below. #1 Relay N.C. Ready/Fault Normally closed contact for No. Page 30 1-20 Installation/Wiring I/O Wiring Examples Input/Output Connection Example Required Settings Potentiometer DIP Switch 1-10k Ohm Potentiometer AI1 = 10V Recommended Parameters (2 Watt Minimum) P038 [Speed Reference] = 2 "Analog In1" T069 [Analog In 1 Sel] = 2 "0-10V" Scaling T070 [Analog In 1 Lo] T071 [Analog In 1 Hi] Check Results... Page 87 Programming and Parameters 3-35 Advanced Program Group (continued) A156 [PID Diff Rate] Sets the value for the PID differential component when the PID mode is enabled by A152 [PID Ref Sel]. Page 92 3-40 Programming and Parameters Advance Program Group (continued) A174 [Maximum Voltage] Related Parameter(s): b004, A171, A172, A173 Sets the highest voltage the drive will output.

- http://ylpcl.com/ckfinder/userfiles/files/19341680971.pdf
- http://df-2.de/images/daten/file/41411881858.pdf
- http://plafondchauffant.fr/img/user/file/3056122793.pdf
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