

Description

The DigiFlex® Performance™ (DP) Series digital servo drives are designed to drive brushed and brushless servomotors, stepper motors, and AC induction motors. These fully digital drives operate in torque, velocity, or position mode and employ Space Vector Modulation (SVM), which results in higher bus voltage utilization and reduced heat dissipation compared to traditional PWM. The drive can be configured for a variety of external command signals. Commands can also be configured using the drive's built-in Motion Engine, an internal motion controller used with distributed motion applications. In addition to motor control, these drives feature dedicated and programmable digital and analog inputs and outputs to enhance interfacing with external controllers and devices.

Network communication is accomplished using either RS-485/232 or Modbus RTU. This DP Series drive features a single serial interface used for drive commissioning via DriveWare® 7, available for download at www.a-m-c.com.

The DPR Hardware Installation Manual is available for download from www.a-m-c.com. All drive and motor parameters are stored in non-volatile memory.

Power Range	
Peak Current	25 A (17.7 A _{RMS})
Continuous Current	12.5 A (12.5 A _{RMS})
Supply Voltage	20 - 190 VDC





Features

- ▲ Four Quadrant Regenerative Operation
- ▲ Space Vector Modulation (SVM) Technology
- ✓ Fully Digital State-of-the-art Design
- Programmable Gain Settings
- Fully Configurable Current, Voltage, Velocity and Position Limits

- ▲ PIDF Velocity Loop
- ▲ PID + FF Position Loop
- ▲ Compact Size, High Power Density
- ▲ 16-bit Analog to Digital Hardware
- On-the-Fly Mode Switching
- On-the-Fly Gain Set Switching

MODES OF OPERATION

- Current
- Position
- Velocity

COMMAND SOURCE

- ±10 V Analog
- 5V Step and Direction
- Encoder Following
- Over the Network
- Sequencing
- Indexing
- Jogging

FEEDBACK SUPPORTED

- Resolver
- ±10 VDC Position
- Auxiliary Incremental Encoder
- Tachometer (±10 VDC)

INPUTS/OUTPUTS

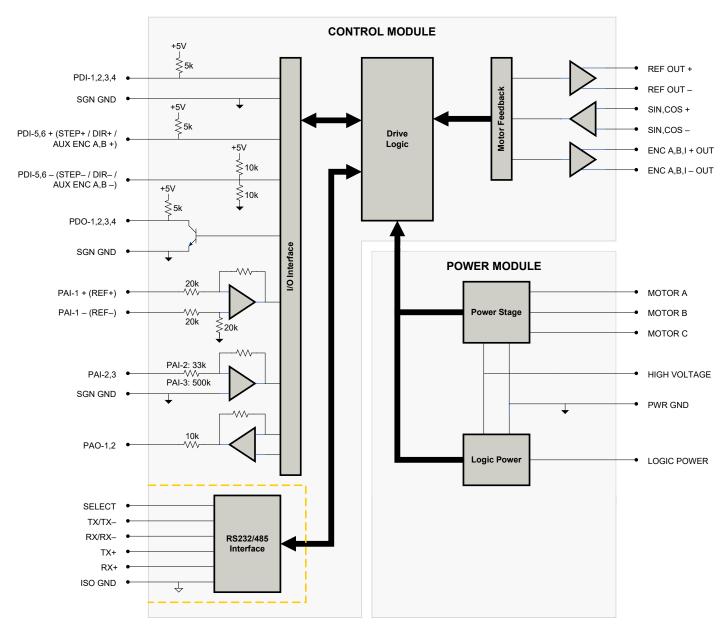
- 3 Programmable Analog Inputs (16-bit/12-bit Resolution)
- 2 Programmable Analog Outputs (10-bit Resolution)
- 2 Programmable Digital Inputs (Differential)
- 4 Programmable Digital Inputs (Single-Ended)
- 4 Programmable Digital Outputs (Single-Ended)

COMPLIANCES & AGENCY APPROVALS

- UL
- cUL
- CE Class A (LVD)
- CE Class A (EMC)
- RoHS



BLOCK DIAGRAM



US and Canadian safety compliance with UL 508c, the industrial standard for power conversion electronics. UL registered under file number E140173. Note that machine components compliant with UL are considered UL registered as opposed to UL listed as would be the case for commercial products. Compliant with European EMC Directive 2014/30/EU on Electromagnetic Compatibility (specifically EN 61000-6-4:2007/A1:2011 for Emissions, Class A and EN 61000-6-2:2005 for Immunity, Performance Criteria A). LVD requirements of Directive 2014/35/EU (specifically, EN 60204-1:2006/A1:2009, a Low Voltage Directive to protect users from electrical shock). The RoHS Directive restricts the use of certain substances including lead, mercury, cadmium, hexavalent chromium and halogenated flame retardants PBB and PBDE in electronic equipment.



SPECIFICATIONS

DC Sus Dev PV Voltage Imit VDC 20 · 190 DC Bus Under Voltage Limit VDC 17 Logic Supply Voltage VDC 17 Logic Supply Voltage VDC 20 · 190 Maximum Peak Output Current¹ A (Arms) 25 (1.7.) Maximum Continuous Output Power V 296 Maximum Continuous Output Dever W 296 Maximum Continuous Output Power W 300 Maximum Output PVM Output µF 300 Voltage Supplied No. 19 100 Setting Frequency MFE 20 Low Voltage Supplied No. 19 100 Commandation Interfaces Power Voltage Supplied No. 19 100 Commandation Interfaces Power Voltage Supplied 100 Voltage Supplied 100 Voltage Supplied Commandation Interfaces Power Voltage Supplied 110 Voltage Supplied 1	Power Specifications			
Communication Interfaces	Description	Units	Value	
DC Bus Under Vottage Limit				
Logic Supply Voltage VDC 20 - 190 Maximum Peak Opting Current ¹ A (Arms) 25 (17.7) Maximum Continuous Outgot Current ¹ A (Arms) 12 5 (12.5) Maximum Peak Dissipation at Continuous Current W 19 Information Subpat Pewer W 19 Maximum Power Dissipation at Continuous Current W 19 Information Subpat Pewer W 19 Maximum Power Dissipation at Continuous Current W 19 Minimum Could Indications (Line To-Line) ³ Jul 3 30 Switching Frequency MHZ 20 Switching Frequency MHZ 20 Commonication Interfaces Commonication Methods Commonication Methods Command Sources RS-485/232 / Modeus RTU Value Commandation Methods Sepecifications Value Commandation Methods Sepecifications Value Modes of Operation Sepecy (2x or 3, 3 manuscolour) Sepecy (2x or 3, 3 manuscolour) Modes of Operation Commonication Methods Sepecy (2x or 3, 3 manuscolour) Sepecy (2x or 3, 3 manuscol	·			
Maximum Peak Output Current* A (Arms) 25 (17.7)	DC Bus Under Voltage Limit		17	
Maximum Continuous Outgat Current* A (Arms) 1.2.5 (12.5) Maximum Power Dissipation at Continuous Current W 226.6 Maximum Power Dissipation at Continuous Current W 119 Internal Bau Capacitance μF 50 Minimum Load Inductione (Line To Line)* μH 300 Switching Frequency 4Mz 20 Assimum Output PWM Duty Cycle 4Mz 20 Low Vollage Supply Outputs Tontrol Specifications Commonimization Interfaces Tontrol Specifications Communication Interfaces 9 RS-485232 / Modibus RTU Commonimization Interfaces Command Sources 9 RS-485232 / Modibus RTU Commonimization Methods Commonimization Methods 9 RS-485232 / Modibus RTU Commonimization Methods Modes Opported 1 110 V Annialog, SV Step and Direction, Encoder Following, Over the Network, Sequencing, Indexing, Outpain Methods Modes Supported 1 110 V Annialog, SV Step and Direction, Encoder Following, Over the Network, Sequencing, Indexing, Jungacing Methods Service, Vision, Annial Methods and Indexing, Outpain Methods Modes Supported 1 10 V Decreation, Auxiliary Incremental	Logic Supply Voltage	VDC	20 - 190	
Maximum Continuous Output Prover W 2258 Maximum Power Dissipation at Continuous Current µF 50 Minimum Load Inductance (Ine-To-Line)³ µF 30 Minimum Load Inductance (Ine-To-Line)³ µF 20 Maximum Output PVM Duty Oycle ½ % 100 100 Control Septing Outputs 5 % VC (250 mA) Description Towards Survey Communication Interfaces 2 % EN 2400 Amanga, 70% Step and Direction, Encoder Following, Over the Network, Sequencing, Indexing, Josephing Communication Interfaces 2 % EN 2400 Amanga, 70% Step and Direction, Encoder Following, Over the Network, Sequencing, Indexing, Josephing Communication Interfaces 2 % EN 2410 Amanga, 70% Step and Direction, Encoder Following, Over the Network, Sequencing, Indexing, Josephing Communication Interfaces 2 % EN 2410 Amanga, 70% Step and Direction, Encoder Following, Over the Network, Sequencing, Indexing, Josephing Communication Interfaces 2 % EN 2410 Amanga, 70% Step and Direction, Encoder, Resolver, Tachometer (±10 VDC) Communication Interfaces 2 % EN 2410 Amanga, Marga, Josephing Communication Interfaces 2 % EN 2410 Amanga, Marga, Josephing Resole (Marga,	Maximum Peak Output Current ¹	A (Arms)	25 (17.7)	
Maximum Power Dissipation at Continuous Current W 19 Internal Bias Capacilance (Ine-To-Line)	Maximum Continuous Output Current ²	A (Arms)	12.5 (12.5)	
Internal Bis Capacitance Image	Maximum Continuous Output Power	W	2256	
Minimum Load Inductance (Line-To-Line)	Maximum Power Dissipation at Continuous Current	W	119	
Switching Frequency IHIZ 20 Maximum Coutput PWM Duty Cycle % 100 Low Voltage Supply Outputs - + 5 VDC (250 mA) Control Segrifications Description Command Sources Value Command Sources - RS-485/232 (Modbus RTU Command Sources - 4 100 V Analogy, 6V Step and Direction, Encoder Following, Over the Network, Sequencing, Indexing, Jogging Feedback Supported - 4 110 V Analogy, 6V Step and Direction, Encoder Following, Over the Network, Sequencing, Indexing, Jogging Feedback Supported - 4 110 V Analogy, 6V Step and Direction, Encoder Following, Over the Network, Sequencing, Indexing, Jogging Modes of Operation - 4 100 V Analogy, 6V Step and Direction, Encoder Following, Over the Network, Sequencing, Indexide Modes, Growth Resolution (Follows) Modes Of Operation - 4 100 V Analogy, 6V Step and Direction, Encoder Following, Over the Network, Sequencing, Index of the Sequencing, Index of Protection Encoder Resolution (Closed Loop) (Act Induction (Closed L	Internal Bus Capacitance	μF	50	
Maximum Output PMM Duty Cycle % 100 Low Voltage Supply Outputs 7	Minimum Load Inductance (Line-To-Line) ³	μH	300	
Communication Interfaces Communication Methods Commun	Switching Frequency	kHz	20	
	Maximum Output PWM Duty Cycle	%	100	
Description Units Value Communication Interfaces - RS-485/232 / Modibus RTU Command Sources - ±10 V Analog, SV Slep and Direction, Encoder Following, Over the Network, Sequencing, Indextory, Joggang Feedback Supported - ±10 V Or Position, Auxiliary Incremental Encoder, Resolver, Tachometer (±10 VDC) Modes of Operation - Sinusodal Motors Supported* - Current, Position, Velocity Hardware Protection - - Three Phase (Brushless Servo), Single Phase (Brushed Servo, Voice Coil, Inductive Load), Sisteper (2- or 3-Phase Slosed Loop), AC Induction (Closed Loop) Vetor) Hardware Protection - - 40+ Configurable Functions, Over Current, Over Temperature (Drive & Motor), Over Voltage, Short Circuit (Phase-Phase & Phase-Ground), Under Voltage Programmable Digital Inputs/Outputs (PDIs/PDOs) - 6/4 Programmable Andog Inputs/Outputs (PAIs/PAOs) - 3/2 Programmable Andog Inputs/Outputs (PAIs/PAOs) - 3/2 Primary I/O Logic Level - ys 100 Current Loop Sample Time ys 100 Expected Resolver Transformation Signal Vms 0.5	Low Voltage Supply Outputs	-	+5 VDC (250 mA)	
Communication Interfaces . RS-485/232 / Modbus RTU Command Sources 2.10 V Analog. SV Step and Direction, Encoder Following, Over the Network, Sequencing, Interesting, Jogging Feedback Supported 2.10 V DC Position, Auxiliary Incremental Encoder, Resolver, Tachemeter (±10 VDC) Modes of Operation 2.0 Current, Position, Velocity Motors Supported* 2.0 Current, Position, Velocity Motors Supported* 3.0 Experience Phase (Brushed Servo, Voice Coil, Inductive Load), Stepper (2 or 3-Phase Closed Loop), AC Induction (Closed Loop Vector) Hardware Protection 3.0 Experience Phase (Protection, Over Current, Over Temperature (Drive & Motor), Over Voltage, Short Circuit (Phase-Phase & Phase-Ground), Under Voltage Programmable Digital Inputs/Outputs (PDIs/PDOs) 6.0 Experience Phase Phase-Ground), Under Voltage Programmable Analog Inputs/Outputs (PAIs/PAOS) 5.0 SVTIL Velocity Loop Sample Time μs 50 Velocity Loop Sample Time μs 100 Resolver Reference/Excitation Signal Vrms 4 Vrms @ SkHz Expected Resolver Transformation Ratio Vrms 4 Vrms @ SkHz Agency Approvals RPM High Res: 5000, Low Res: 2000 Agency Approvals Sc (Experience) C EClass A (LWD), CEI Class A (LWD), C		Control	Specifications	
Command Sources ±10 V Analog. S leap and Direction, Encoder Following, Over the Network, Sequencing, Indexing, Jogging Indexing, Jogging Indexing, Jogging Indexing, Jogging Feedback Supported ±10 VDC Position, Auxiliary Incremental Encoder, Resolver, Tachometer (±10 VDC) Modes of Operation Sinusoidal Motors Supported¹ Three Phase (Brushless Servo), Single Phase (Brushed Servo, Voice Cull, fundurive Load), Sisperper (2- or 3-Phase Closed Loop), ACI funduction (Closed Loop Vector) Hardware Protection 2- 40+ Configurable Functions, Over Current, Over Temperature (Drive & Motor), Over Voltage, Short Circuit (Phase-Phase & Phase-Ground), Under Voltage Programmable Digital Inputs/Outputs (PDIs/PDOs) 4- 64 Programmable Analog Inputs/Outputs (PDIs/PDOs) 4- 64 Programmable Analog Inputs/Outputs (PDIs/PDOs) 5- 644 Programmable Analog Inputs/Outputs (PDIs/PDOs) 5- 5V TTL Current Loop Sample Time μs 100 Velocity Loop Sample Time μs 100 Position Loop Sample Time μs 100 Resolver Reference/Exclation Signal Vrms 4 Vrms @ 5 kHz Resolver Reference/Exclation Signal NRM High Res: 14 (16384 counts/resolver cycle), Low Res: 12 (4096 counts/resolver cycle) Maximum Motor Speed Per Feedback Resolution	Description	Units	Value	
Indeximg, Jogging Feedback Supported	Communication Interfaces	-	RS-485/232 / Modbus RTU	
Commutation Methods - Sinusoidal Modes of Operation - Current, Position, Velocity Motors Supported¹ - Three Phase (Brushless Servo), Single Phase (Brushed Servo, Voice Coil, Inductive Load), Sleeper (2- or 3-Phase Closed Loop), AC Induction (Closed Loop Vector) Hardware Protection - 40 + Configurate Incurions, Over Current, Over Temperature (Drive & Motor), Over Voltage, Short Circuit (Phase-Phase & Phase-Ground), Under Voltage Programmable Digital Inputs/Outputs (PAIs/PAOs) - 3/2 Primary I/O Logic Level - 5 V TTL Current Loop Sample Time μs 100 Velocity Loop Sample Time μs 100 Position Loop Sample Time μs 100 Resolver Reference/Excitation Signal Vrms 4 Vrms @ 5 kHz Expected Resolver Transformation Ratio Vrms 0.5 Feedback Resolution - Emulated Encoder Resolution Bibl High Res: 14 (16384 counts/resolver cycle), Low Res: 12 (4096 counts/resolver cycle) Agency Approvals - C EC Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 19.0 5 x 111.8 x 35.9 (7.5 x 4.4 x 1.4) Weight -	Command Sources	-		
Modes of Operation Gurrent, Position, Velocity Motors Supported¹	Feedback Supported	-	±10 VDC Position, Auxiliary Incremental Encoder, Resolver, Tachometer (±10 VDC)	
Motors Supported¹ Three Phase (Brushless Servo), Single Phase (Brushed Servo, Voice Coil, Inductive Load), Stepper (2- or 3 Phase Closed Loop), AC Induction (Closed Loop Vector) Hardware Protection - Stepper (2- or 3 Phase Closed Loop), AC Induction (Closed Loop Vector) Programmable Digital Inputs/Outputs (PDIs/PDOs) - 6/4 Programmable Analog Inputs/Outputs (PAIs/PAOs) - 6/4 Primary I/O Logic Level - 5 VTTL Current Loop Sample Time µs 50 Velocity Loop Sample Time µs 100 Position Loop Sample Time µs 100 Position Loop Sample Time µs 100 Resolver Reference/Excitation Signal Vrms 4 Vrms @ 5 kHz Expected Resolver Transformation Ratio Vrms 0.5 Feedback Resolution / Emulated Encoder Resolution RPM High Res: 14 (16384 counts/resolver cycle), Low Res: 12 (4096 counts/resolver cycle) Agency Approvals Pescription RPM High Res: 5000, Low Res: 20000 Agency Approvals - C EC Isas A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 190.5 x 111.8 x 35.9 (7.5 x 4.4 x 1.4)	Commutation Methods	-	Sinusoidal	
Stepper (2- or 3-Phase Closed Loop), AC Induction (Closed Loop Vector) Hardware Protection	Modes of Operation	-	Current, Position, Velocity	
Factoware Protection -	Motors Supported ⁴	-	Stepper (2- or 3-Phase Closed Loop), AC Induction (Closed Loop Vector)	
Programmable Analog Inputs/Outputs (PAIs/PAOs) - 3/2 Primary I/O Logic Level - 5V TTL Current Loop Sample Time μs 50 Velocity Loop Sample Time μs 100 Position Loop Sample Time μs 100 Resolver Reference/Excitation Signal Vrms 4 Vrms @ 5 kHz Expected Resolver Transformation Ratio Vrms 0.5 Feedback Resolution / Emulated Encoder Resolution RPM High Res: 5000, Low Res: 20000 Maximum Motor Speed Per Feedback Resolution RPM High Res: 5000, Low Res: 20000 Agency Approvals Specifications Value Size (H x W x D) mm (in) 19.0.5 x 111.8 x 35.9 (7.5 x 4.4 x 1.4) Weight g (oz) 872 (30.8) Heatsink (Base) Temperature Range ⁶ °C ("F) 0 - 75 (32 - 167) Storage Temperature Range °C ("F) -40 - 85 (40 - 185) Form Factor - Panel Mount Coling System - Natural Convection IP Rating - 15-pin, female D-sub FEEDBACK Connector - <td>Hardware Protection</td> <td>-</td> <td></td>	Hardware Protection	-		
Primary I/O Logic Level - 5V TTL Current Loop Sample Time μs 50 Velocity Loop Sample Time μs 100 Position Loop Sample Time μs 100 Resolver Reference/Excitation Signal Vrms 4 Vrms @ 5 kHz Expected Resolver Transformation Ratio Vrms 0.5 Feedback Resolution / Emulated Encoder Resolutions bit High Res: 14 (16384 counts/resolver cycle), Low Res: 12 (4096 counts/resolver cycle) Maximum Motor Speed Per Feedback Resolution RPM High Res: 5000, Low Res: 20000 Maximum Motor Speed Per Feedback Resolution RPM High Res: 5000, Low Res: 20000 Mechanical Specifications Value Obescription Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 190.5 x 111.8 x 35.9 (7.5 x 4.4 x 1.4) Weight g (oz) 872 (30.8) Heatsink (Base) Temperature Range ⁶ °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) -40 - 85 (-40 - 185) Form Factor Panel Mount <th< td=""><td>Programmable Digital Inputs/Outputs (PDIs/PDOs)</td><td>-</td><td>6/4</td></th<>	Programmable Digital Inputs/Outputs (PDIs/PDOs)	-	6/4	
Current Loop Sample Time μs 50 Velocity Loop Sample Time μs 100 Position Loop Sample Time μs 100 Resolver Reference/Excitation Signal Vrms 4 Vrms @ 5 kHz Expected Resolver Transformation Ratio Vrms 0.5 Feedback Resolution / Emulated Encoder Resolution ⁵ bit High Res: 14 (16384 counts/resolver cycle), Low Res: 12 (4096 counts/resolver cycle) Maximum Motor Speed Per Feedback Resolution RPM High Res: 5000, Low Res: 20000 Mechanical Specifications Value Description Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 190.5 x 111.8 x 35.9 (7.5 x 4.4 x 1.4) Weight g (oz) 872 (30.8) Heatsink (Base) Temperature Range ⁶ °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) 40 - 85 (-40 - 185) Form Factor Panel Mount Cooling System - Natural Convection IP Rating - IP 100 COMM Connector	Programmable Analog Inputs/Outputs (PAIs/PAOs)	-	3/2	
Velocity Loop Sample Time μs 100 Position Loop Sample Time μs 100 Resolver Reference/Excitation Signal Vrms 4 Vrms @ 5 kHz Expected Resolver Transformation Ratio Vrms 0.5 Feedback Resolution / Emulated Encoder Resolution5 bit High Res: 14 (16384 counts/resolver cycle), Low Res: 12 (4096 counts/resolver cycle) Maximum Motor Speed Per Feedback Resolution RPM High Res: 5000, Low Res: 20000 Mechanical Specifications Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 190.5 x 111.8 x 35.9 (7.5 x 4.4 x 1.4) Weight g (oz) 872 (30.8) Heatsink (Base) Temperature Range ⁶ °C (°F) 0 -75 (32 - 167) Storage Temperature Range °C (°F) 40 - 85 (-40 - 185) Form Factor Panel Mount Cooling System - Natural Convection IP Rating - Natural Convection IP Rating - IP 10 COMM Connector 9-pin, female D-sub I/O Connecto	Primary I/O Logic Level	-	5V TTL	
Position Loop Sample Time µs 100 Resolver Reference/Excitation Signal Vrms 4 Vrms @ 5 kHz Expected Resolver Transformation Ratio Vrms 0.5 Feedback Resolution / Emulated Encoder Resolutions Sepacifications bit High Res: 14 (16384 counts/resolver cycle), Low Res: 12 (4096 counts/resolver cycle) Mechanical Specifications Mechanical Specifications Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 190.5 x 111.8 x 35:9 (7.5 x 4.4 x 1.4) Weight g (oz) 872 (30.8) Heatsink (Base) Temperature Range ⁶ °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) -40 - 85 (-40 - 185) Form Factor - Panel Mount Cooling System - Natural Convection IP Rating - Natural Convection IP Rating - 9-pin, female D-sub FEEDBACK Connector - 9-pin, high-density, female D-sub I/O Connector - 26-pin, high-dens	Current Loop Sample Time	μs	50	
Resolver Reference/Excitation Signal Vrms 4 Vrms @ 5 kHz Expected Resolver Transformation Ratio Vrms 0.5 Feedback Resolution / Emulated Encoder Resolution 5 bit High Res: 14 (16384 counts/resolver cycle), Low Res: 12 (4096 counts/resolver cycle) Maximum Motor Speed Per Feedback Resolution RPM High Res: 5000, Low Res: 20000 Mechanical Specifications Unite: Support Specifications Unite: Support Specifications Unite: W x D) Mm (in) 190.5 x 111.8 x 35.9 (7.5 x 4.4 x 1.4) UL Size (H x W x D) mm (in) 190.5 x 111.8 x 35.9 (7.5 x 4.4 x 1.4) UL Weight g (oz) 872 (30.8) Resolution Residual (LVD), cUL, RoHS, UL Resolution Resolution Resolution Resolution Resolution Resolution Resolution Resolution Resolution	Velocity Loop Sample Time	μs	100	
Expected Resolver Transformation Ratio Vrms 0.5 Feedback Resolution / Emulated Encoder Resolution5 bit High Res: 14 (16384 counts/resolver cycle), Low Res: 12 (4096 counts/resolver cycle) Maximum Motor Speed Per Feedback Resolution RPM High Res: 5000, Low Res: 20000 Mechanical Specifications Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 190.5 x 111.8 x 35.9 (7.5 x 4.4 x 1.4) Weight g (oz) 872 (30.8) Heatsink (Base) Temperature Range6 °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) -40 - 85 (-40 - 185) Form Factor - Panel Mount Cooling System - Natural Convection IP Rating - Netral Convection IP P10 COMM Connector - 9-pin, female D-sub FEEDBACK Connector - 15-pin, high-density, female D-sub I/O Connector - 26-pin, high-density, female D-sub	Position Loop Sample Time	μs	100	
Feedback Resolution / Emulated Encoder Resolution bit High Res: 14 (16384 counts/resolver cycle), Low Res: 12 (4096 counts/resolver cycle) Maximum Motor Speed Per Feedback Resolution RPM High Res: 5000, Low Res: 20000 Mechanical Specifications	Resolver Reference/Excitation Signal	Vrms	4 Vrms @ 5 kHz	
Maximum Motor Speed Per Feedback Resolution RPM High Res: 5000, Low Res: 20000 Mechanical Specifications Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 190.5 x 111.8 x 35.9 (7.5 x 4.4 x 1.4) Weight g (oz) 872 (30.8) Heatsink (Base) Temperature Range ⁶ °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) 40 - 85 (-40 - 185) Form Factor Panel Mount Cooling System - Natural Convection IP Rating - Natural Convection IP Rating - IP10 COMM Connector - 9-pin, female D-sub FEEDBACK Connector - 15-pin, high-density, female D-sub I/O Connector - 26-pin, high-density, female D-sub	Expected Resolver Transformation Ratio	Vrms	0.5	
Mechanical Specifications Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 190.5 x 111.8 x 35.9 (7.5 x 4.4 x 1.4) Weight g (oz) 872 (30.8) Heatsink (Base) Temperature Range ⁶ °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) -40 - 85 (-40 - 185) Form Factor - Panel Mount Cooling System - Natural Convection IP Rating - IP10 COMM Connector 9-pin, female D-sub FEEDBACK Connector 15-pin, high-density, female D-sub I/O Connector - 26-pin, high-density, female D-sub	Feedback Resolution / Emulated Encoder Resolution ⁵	bit	High Res: 14 (16384 counts/resolver cycle), Low Res: 12 (4096 counts/resolver cycle)	
Description Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 190.5 x 111.8 x 35.9 (7.5 x 4.4 x 1.4) Weight g (oz) 872 (30.8) Heatsink (Base) Temperature Range ⁶ °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) -40 - 85 (-40 - 185) Form Factor - Panel Mount Cooling System - Natural Convection IP Rating - IP10 COMM Connector 9-pin, female D-sub FEEDBACK Connector 15-pin, high-density, female D-sub I/O Connector - 26-pin, high-density, female D-sub	Maximum Motor Speed Per Feedback Resolution	RPM	High Res: 5000, Low Res: 20000	
Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 190.5 x 111.8 x 35.9 (7.5 x 4.4 x 1.4) Weight g (oz) 872 (30.8) Heatsink (Base) Temperature Range ⁶ °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) -40 - 85 (-40 - 185) Form Factor - Panel Mount Cooling System - Natural Convection IP Rating - IP10 COMM Connector 9-pin, female D-sub FEEDBACK Connector 15-pin, high-density, female D-sub I/O Connector 26-pin, high-density, female D-sub				
Size (H x W x D) mm (in) 190.5 x 111.8 x 35.9 (7.5 x 4.4 x 1.4) Weight g (oz) 872 (30.8) Heatsink (Base) Temperature Range ⁶ °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) -40 - 85 (-40 - 185) Form Factor - Panel Mount Cooling System - Natural Convection IP Rating - IP10 COMM Connector 9-pin, female D-sub FEEDBACK Connector 15-pin, high-density, female D-sub I/O Connector 26-pin, high-density, female D-sub	Description	Units	Value	
Weight g (oz) 872 (30.8) Heatsink (Base) Temperature Range ⁶ °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) -40 - 85 (-40 - 185) Form Factor - Panel Mount Cooling System - Natural Convection IP Rating - IP10 COMM Connector - 9-pin, female D-sub FEEDBACK Connector 15-pin, high-density, female D-sub I/O Connector 26-pin, high-density, female D-sub	Agency Approvals	-	CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL	
Heatsink (Base) Temperature Range ⁶ °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) -40 - 85 (-40 - 185) Form Factor - Panel Mount Cooling System - Natural Convection IP Rating - IP10 COMM Connector - 9-pin, female D-sub FEEDBACK Connector 15-pin, high-density, female D-sub I/O Connector 26-pin, high-density, female D-sub	Size (H x W x D)	mm (in)	190.5 x 111.8 x 35.9 (7.5 x 4.4 x 1.4)	
Storage Temperature Range °C (°F) -40 - 85 (-40 - 185) Form Factor - Panel Mount Cooling System - Natural Convection IP Rating - IP10 COMM Connector - 9-pin, female D-sub FEEDBACK Connector - 15-pin, high-density, female D-sub I/O Connector - 26-pin, high-density, female D-sub	Weight	g (oz)	872 (30.8)	
Form Factor - Panel Mount Cooling System - Natural Convection IP Rating - IP10 COMM Connector - 9-pin, female D-sub FEEDBACK Connector - 15-pin, high-density, female D-sub I/O Connector - 26-pin, high-density, female D-sub	Heatsink (Base) Temperature Range ⁶	°C (°F)	0 - 75 (32 - 167)	
Cooling System - Natural Convection IP Rating - IP10 COMM Connector - 9-pin, female D-sub FEEDBACK Connector - 15-pin, high-density, female D-sub I/O Connector - 26-pin, high-density, female D-sub	Storage Temperature Range	°C (°F)	-40 - 85 (-40 - 185)	
IP Rating - IP10 COMM Connector - 9-pin, female D-sub FEEDBACK Connector - 15-pin, high-density, female D-sub I/O Connector - 26-pin, high-density, female D-sub	Form Factor	-	Panel Mount	
COMM Connector - 9-pin, female D-sub FEEDBACK Connector - 15-pin, high-density, female D-sub I/O Connector - 26-pin, high-density, female D-sub	Cooling System	-	Natural Convection	
FEEDBACK Connector - 15-pin, high-density, female D-sub 1/O Connector - 26-pin, high-density, female D-sub	IP Rating	-	IP10	
I/O Connector - 26-pin, high-density, female D-sub	COMM Connector	COMM Connector - 9-pin, female D-sub		
11 7 3	FEEDBACK Connector - 15-pin, high-density, female D-sub		15-pin, high-density, female D-sub	
	I/O Connector	-	26-pin, high-density, female D-sub	
MOTOR POWER Connector - 3-port, 7.62 mm spaced, enclosed, friction lock header	MOTOR POWER Connector	-	3-port, 7.62 mm spaced, enclosed, friction lock header	
POWER Connector - 4-port, 7.62 mm spaced, enclosed, friction lock header	POWER Connector	-	4-port, 7.62 mm spaced, enclosed, friction lock header	

Notes

- Capable of supplying drive rated peak current for 2 seconds with 10 second foldback to continuous value. Longer times are possible with lower current limits.
- 2. 3.
- Continuous A_{rms} value attainable when RMS Charge-Based Limiting is used.

 Lower inductance is acceptable for bus voltages well below maximum. Use external inductance to meet requirements.

 Maximum motor speed for stepper motors is 600 RPM. Consult the hardware installation manual for 2-phase stepper wiring configuration. Higher and lower resolution options are available. Contact Applications Engineering for more information.
- Additional cooling and/or heatsink may be required to achieve rated performance.



PIN FUNCTIONS

	COMM - RS232/RS485 Communication Connector			
Pin	Name	Description / Notes	I/O	
1	SELECT	RS232/485 selection. Pull to ground (CN1-5) for RS485.	I	
2	RS232 TX / RS485 TX-	Transmit Line (RS-232 or RS-485)	0	
3	RS232 RX / RS485 RX-	Receive Line (RS-232 or RS-485)	I	
4	RESERVED	Reserved	-	
5	ISO GND	Isolated Signal Ground	IGND	
6	RS485 TX+	Transmit Line (RS-485)	0	
7	RESERVED	Reserved	-	
8	RS485 RX+	Receive Line (RS-485)	I	
9	RESERVED	Reserved	-	

		FEEDBACK - Feedback Connector	
Pin	Name	Description / Notes	I/O
1	RESERVED	Reserved	-
2	RESERVED	Reserved	-
3	RESERVED	Reserved	-
4	REF OUT +	Resolver Reference/Excitation Output (50 mA maximum)	0
5	REF OUT -	Resolver Reference/Excitation Output (50 IIIA maximum)	0
6	SIN+	Decelver Cine Innut	1
7	SIN-	Resolver Sine Input	I
8	COS+	Resolver Cosine Input	I
9	COS-	Resolver Cosine Input	I
10	RESERVED	Reserved	-
11	RESERVED	Reserved	-
12	SGN GND	Signal Ground	SGND
13	+5V OUT	+5V Encoder Supply Output (Short Circuit Protected)	0
14	PAI-3	Programmable Analog Input (12-bit Resolution)	l l
15	RESERVED	Reserved	-

I/O - Signal Connector				
Pin	Name	Description / Notes	I/O	
1	PDO-1	Programmable Digital Output	0	
2	SGN GND	Signal Ground	SGND	
3	PDO-2	Programmable Digital Output	0	
4	PAI-1 + (REF+)	Differential December Analas Israel an Defended Circultural (40 bit December)	I	
5	PAI-1 - (REF-)	Differential Programmable Analog Input or Reference Signal Input (16-bit Resolution)	1	
6	PAI-2	Programmable Analog Input (12-bit Resolution)	I	
7	PAO-1	Programmable Analog Output (10-bit Resolution)	0	
8	PAO-2	Programmable Analog Output (10-bit Resolution)	0	
9	PDI-6 - (DIR- / AUX ENC B-)	Programmable Digital Input or Direction- or Auxiliary Encoder (For Differential Signals Only)	I	
10	PDO-3	Programmable Digital Output	0	
11	PDI-1	Programmable Digital Input	I	
12	PDI-2	Programmable Digital Input	I	
13	PDI-3	Programmable Digital Input	I	
14	PDO-4	Programmable Digital Output	0	
15	+5V OUT	+5V Encoder Supply Output (Short Circuit Protected)	0	
16	SGN GND	Signal Ground	SGND	
17	PDI-5 + (STEP+ / AUX ENC A+)	Programmable Digital Input or Step+ or Auxiliary Encoder	I	
18	PDI-6 + (DIR+ / AUX ENC B+)	Programmable Digital Input or Direction+ or Auxiliary Encoder	I	
19	PDI-4	Programmable Digital Input	I	
20	ENC A+ OUT	Emulated Encoder Channel A Output	0	
21	ENC A- OUT	Emulated Encoder Chariner A Output	0	
22	ENC B+ OUT	Emulated Encoder Channel B Output	0	
23	ENC B- OUT	Emulated Encoder Chaimer & Output	0	
24	ENC I+ OUT	Emulated Encoder Index Output	0	
25	ENC I- OUT	Emulated Encoder Index Output		
26	PDI-5 - (STEP- / AUX ENC A-)	Programmable Digital Input or Step- or Auxiliary Encoder (For Differential Signals Only)	I	

		MOTOR POWER - Power Connector	
Pin	Name	Description / Notes	I/O
1	MOTOR A	Motor Phase A	0
2	MOTOR B	Motor Phase B	0
3	MOTOR C	Motor Phase C	0



POWER - Power Connector				
Pin	Name	Description / Notes	I/O	
1	PWR GND	Power Ground (Common With Signal Ground)	PGND	
2	HIGH VOLTAGE	DC Power Input	I	
3	LOGIC GND	Logic Supply Ground (Common With Signal Ground)	GND	
4	LOGIC PWR	Logic Supply Input. When using a separate logic power supply, turn on the logic supply first before turning on the main power supply.	I	

HARDWARE SETTINGS

Switch Functions

Switch	Description	Setting	
SWILCII	Description	On	Off
1	Bit 0 of binary RS-485 drive address. Does not affect RS-232 settings.	1	0
2	Bit 1 of binary RS-485 drive address. Does not affect RS-232 settings.	1	0
3	Bit 2 of binary RS-485 drive address. Does not affect RS-232 settings.	1	0
4	Bit 3 of binary RS-485 drive address. Does not affect RS-232 settings.	1	0
5	Bit 4 of binary RS-485 drive address. Does not affect RS-232 settings.	1	0
6	Bit 5 of binary RS-485 drive address. Does not affect RS-232 settings.	1	0
7	Bit 0 of drive RS-485 baud rate setting. Does not affect RS-232 settings.	1	0
8	Bit 1 of drive RS-485 baud rate setting. Does not affect RS-232 settings.	1	0

Additional Details

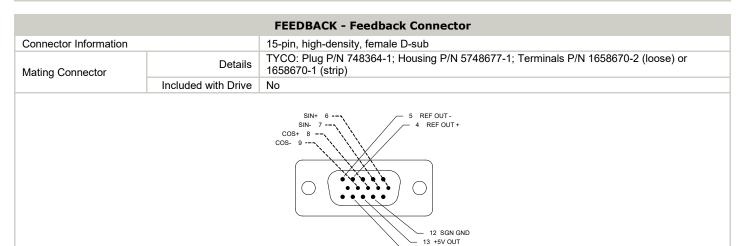
The drive can be configured to use the address and/or bit rate stored in non-volatile memory by setting the address and/or bit rate value to 0. Use the table below to map actual bit rates to a bit rate setting.

Baud Rate (kbps)	Value For Bit Rate Setting
Load from non-volatile memory	0
9.6	1
38.4	2
115.2	3



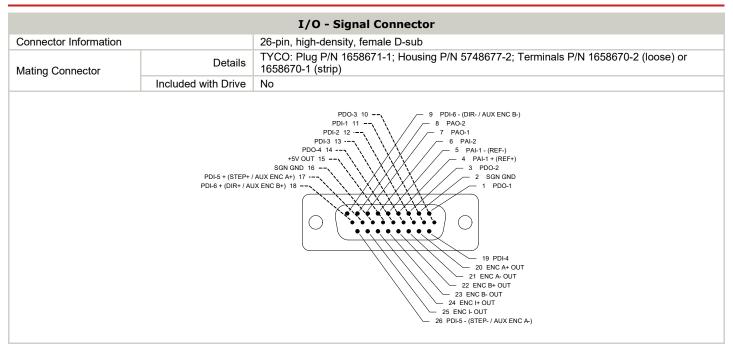
MECHANICAL INFORMATION

COMM - RS232/RS485 Communication Connector		
Connector Information		9-pin, female D-sub
Mating Connector	Details	TYCO: Plug P/N 205204-4; Housing P/N 5748677-1; Terminals P/N 1658540-5 (loose) or 1658540-4 (strip)
	Included with Drive	No
5 ISO GND 3 RS232 RX / RS485 RX- 2 RS232 TX / RS485 TX- 1 SELECT 6 RS485 TX+ 8 RS485 TX+		



14 PAI-3



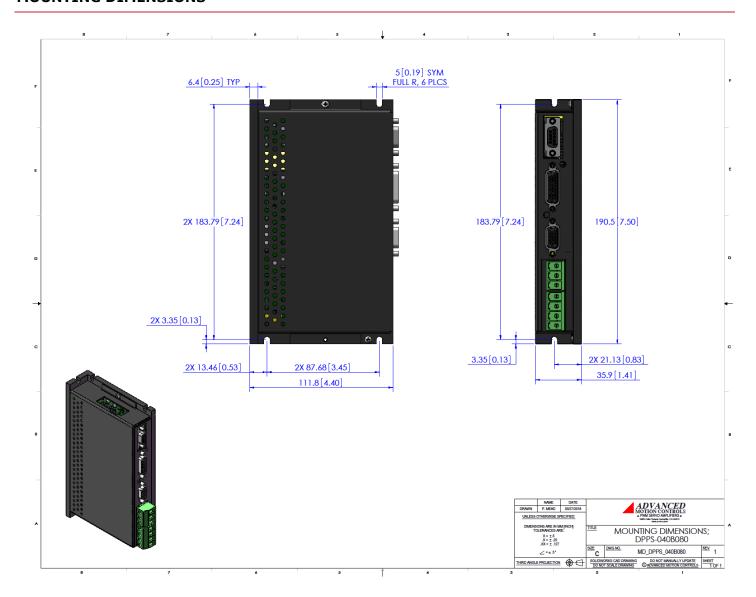


MOTOR POWER - Power Connector		
Connector Information 3-port, 7.62 mm spaced, enclosed, friction lock header		3-port, 7.62 mm spaced, enclosed, friction lock header
Mating Connector	Details	Phoenix Contact: P/N 1804917
Mating Connector	Included with Drive	Yes
	1 MOTOR A 2 MOTOR C	

		POWER - Power Connector
Connector Information 4-port, 7.62 mm spaced, enclosed, friction lock header		4-port, 7.62 mm spaced, enclosed, friction lock header
Mating Connector	Details	Phoenix Contact: P/N 1804920
Mating Connector	Included with Drive	Yes
		1 PWR GND 2 HIGH VOLTAGE 3 LOGIC GND 4 LOGIC PWR

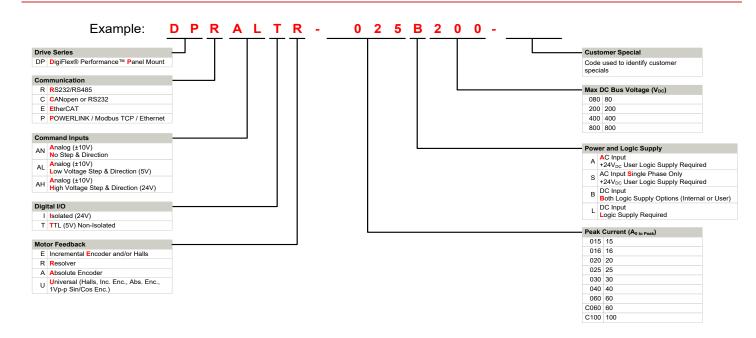


MOUNTING DIMENSIONS





PART NUMBERING INFORMATION



DigiFlex® Performance $^{\text{TM}}$ series of products are available in many configurations. Note that not all possible part number combinations are offered as standard drives. All models listed in the selection tables of the website are readily available, standard product offerings.

ADVANCED Motion Controls also has the capability to promptly develop and deliver specified products for OEMs with volume requests. Our Applications and Engineering Departments will work closely with your design team through all stages of development in order to provide the best servo drive solution for your system. Equipped with on-site manufacturing for quick-turn customs capabilities, ADVANCED Motion Controls utilizes our years of engineering and manufacturing expertise to decrease your costs and time-to-market while increasing system quality and reliability. Feel free to contact Applications Engineering for further information and details.

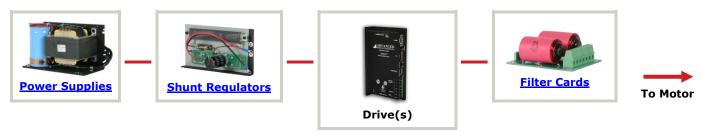
Examples of Customized Products

- Optimized Footprint
- ▲ Private Label Software
- ▲ OEM Specified Connectors
- ▲ No Outer Case
- Increased Current Resolution
- ▲ Increased Temperature Range
- Custom Control Interface
- ▲ Integrated System I/O

- ▲ Tailored Project File
- ▲ Silkscreen Branding
- Optimized Base Plate
- ▲ Increased Current Limits
- ▲ Increased Voltage Range
- Conformal Coating
- Multi-Axis Configurations
- Reduced Profile Size and Weight

Available Accessories

ADVANCED Motion Controls offers a variety of accessories designed to facilitate drive integration into a servo system. Visit www.a-m-c.com to see which accessories will assist with your application design and implementation.



All specifications in this document are subject to change without written notice. Actual product may differ from pictures provided in this document.