

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 Rang	e
Peak Current	40 A (28.3 A _{RMS})
Continuous Current	20 A (20 A _{RMS})
Supply Voltage	100 - 240 VAC





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 ◢

MODES OF OPERATION

- Current
- Position
- Velocity
- Hall Velocity

COMMAND SOURCE

- PWM and Direction
- Encoder Following
- Over the Network
- ±10 V Analog
- 24V Step and Direction
- Sequencing
- Indexing
- Jogging

FEEDBACK SUPPORTED

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

- PID + FF Position Loop
- Compact Size, High Power Density
- 16-bit Analog to Digital Hardware
- Built-in brake/shunt regulator
- On-the-Fly Mode Switching
- On-the-Fly Gain Set Switching
- Dedicated Safe Torque Off (STO) Inputs

INPUTS/OUTPUTS

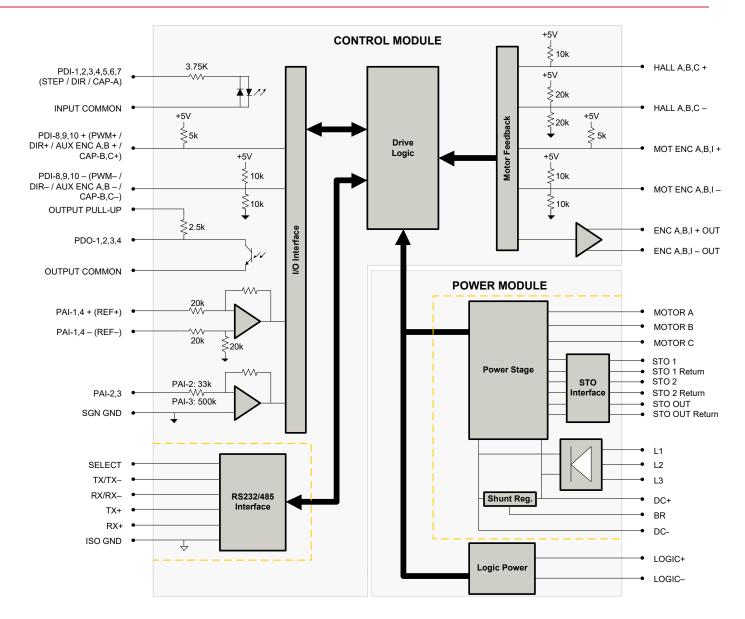
- 3 High Speed Captures
- 4 Programmable Analog Inputs (16-bit/12-bit Resolution)
- 3 Programmable Digital Inputs (Differential)
- 7 Programmable Digital Inputs (Single-Ended)
- 4 Programmable Digital Outputs (Single-Ended)

COMPLIANCES & AGENCY APPROVALS

- UL
- cUL
- CE Class A (LVD)
- CE Class A (EMC)
- RoHS
- TÜV Rheinland® (STO)



BLOCK DIAGRAM



Information on Approvals and Compliances

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c FL [®] us	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.		
CE	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).		
RoHS Compliant	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.		
TÜVRheinland CERTIFIED	Functional Safety STO is TÜV Rheinland® certified and meets requirements of the following standards: • EN ISO 13849-1 Category 4 / PL e • EN IEC 61800-5-2 STO (SIL 3) • EN62061 SIL CL3 • IEC 61508 SIL 3		



SPECIFICATIONS

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Modes of Operation - Current, Hail Velocity, Position, Velocity Motors Supported* - Three Phase (Brushless Servo), Single Phase (Brushed Servo, Voice Coll, Inductive Load), Stepper (2 - or 3 - Phase Closed Loop, Nc Programmable Digital Inputs/Outputs (PDIs/PDOs) Programmable Digital Inputs/Outputs (PDIs/PDOs) - 10/4 Programmable Analog Inputs/Outputs (PAIs/PAOs) - 40 Primary I/O Logic Level - 24 VDC Current Loop Sample Time μs 50 Velocity Loop Sample Time μs 100 Position Loop Sample Time μs 100 Position Loop Sample Time μs 100 Meximum Encoder Frequency MHz 20 (5 pre-quadrature) Internal Shunt Resistor - No Methanical Supportance - No Size (H x W x D) mm (n) 177.5 x 133.5 x 49.2 (6.93 x 5.26 x 1.94) Velogit Loop Sample Time g (oz) 172 (60.7) Heatsink (Base) Temperature Range ⁴ - C (FF) - Size (H x W x D) - E Class A (ENC), CE Class A (LVD), cUL, RoHS, TÜV Rheinland® (STO), UL Size (H x W x D)	Commutation Methods		
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Programmable Analog Inputs/Outputs (PAIs/PAOs)-4/0Primary I/O Logic Level-24 VDCCurrent Loop Sample Timeµs50Velocity Loop Sample Timeµs100Position Loop Sample Timeµs100Maximu Encoder FrequencyMHZ20 (5 pre-quartarue)Internal Shurt Regulator-YesInternal Shurt Regulator-YesInternal Shurt Regulator-CE Class A (EMC), CE Class A (LVD), cUL, RoHS, TÜV Rheinland® (STO), ULSize (H W X D)mm (in)177.5 133.5 x 49.2 (6.99 x 5.26 x 1.94)Weight-CE Class A (EMC), CE Class A (LVD), cUL, RoHS, TÜV Rheinland® (STO), ULHeatsink (Base) Temperature Range ⁶ °C (°F)-75 (32 - 167)Storage Temperature Range°C (°F)-40 - 85 (-40 - 185)Form Factor-Natural ConvectionCooling System-Natural Convection424 LOGIC Connector-2-port, 3.5 mm spaced insert connectorAUX ENCODER Connector-15-pin, high-density, female D-subCOMM Connector-15-pin, high-density, female D-subCOMM Connector-15-pin, high-density, female D-subCD COWER Connector-2-port, 5.0 mm spaced, push-In front spring connection headerMOTOR POWER Connector-5-port, 5.0 mm spaced, push-In front spring connection header	Hardware Protection	-	40+ Configurable Functions, Over Current, Over Temperature (Drive & Motor), Over Voltage, Sho
Primary I/O Logic Level - 24 VDC Current Loop Sample Time µs 50 Velocity Loop Sample Time µs 100 Position Loop Sample Time µs 100 Maximum Encoder Frequency MHz 20 (5 pre-quadrature) Internal Shunt Regulator - Yes Internal Shunt Resistor - No Mechanical Specifications Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, TÜV Rheinland® (STO), UL Size (H x W x D) mm (m) 177.5 x 133 x 49.2 (6.99 x 5.26 x 1.94) Weight g (cz) 1720 (60.7) Heatsink (Base) Temperature Range ⁴ °C (°F) 0.75 (32 - 167) Storage Temperature Range ⁴ °C (°F) 40.45 (40 - 816) Form Factor - Panel Mount Coling System - Natural Convection 424 UCGIC Connector - 15-pin, high-density, male D-sub FEEDBACK Connector - 15-pin, high-density, female D-sub FEEDBACK Connector - 4-port, 5.0 mm spaced, push-in front spring connection header L/O COMRConnector -<	Programmable Digital Inputs/Outputs (PDIs/PDOs)	-	10/4
Current Loop Sample Time μs 50 Velocity Loop Sample Time μs 100 Position Loop Sample Time μs 100 Maximum Encoder Frequency MHz 20 (5 pre-quadrature) Internal Shunt Regulator - Yes Internal Shunt Regulator - No Description Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, TÜV Rheinland® (STO), UL Size (H x W x D) mm (in) 177.5 x 133.5 x 49.2 (6.99 x 5.26 x 1.94) Weight g (co.7) 40-85 (40-185) Heatsink (Base) Temperature Range ⁹ °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) 0 - 80 - 85 (40 - 185) Form Factor - Panel Mount Cooling System - Natural Convection +24V LOGIC Connector - 2-port, 3.5 mm spaced insert connector 420 VLOGIC Connector - 9-pin, female D-sub FEEDBACK Connector - 15-pin, high-density, female D-sub FEEDBACK Connector - 26-pin, hig	Programmable Analog Inputs/Outputs (PAIs/PAOs)	-	4/0
Velocity Loop Sample Time µs 100 Position Loop Sample Time µs 100 Maximu Encoder Frequency MHz 20 (5 pre-quadrature) Internal Shunt Regulator - Yes Internal Shunt Regulator - No Mechanical Specifications Value Obscription Mechanical Specifications Value Agency Approvals Size (H x W x D) Wints Value Medigit g (oz) 1720 (60.7) - Post (32 - 167) Storage Temperature Range ⁰ °C (°F) 0 - 75 (32 - 167) - Panel Mount Cooling System - Panel Mount - Panel Mount Cooling System - - Panel Mount - - - - - - - - - - - - - - - - - - -	Primary I/O Logic Level	-	24 VDC
Position Loop Sample Time jus 100 Maximum Encoder Frequency MHz 20 (5 pre-quadrature) Internal Shunt Regulator - Yes Internal Shunt Resistor No Description Mechanical Specifications Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, TÜV Rheinland® (STO), UL Size (H x W x D) mm (in) 177.5 x 133.5 x 49.2 (6.99 x 5.26 x 1.94) Weight g (oz) 1720 (60.7) Heatsink (Base) Temperature Range ⁹ °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) -40 - 85 (40 - 185) Form Factor - Panel Mount Cooling System - 2-port, 3.5 mm spaced insert connector AUX ENCODER Connector - 9-pin, female D-sub COMM Connector - 9-pin, female D-sub VIO Connector - 2-port, 5.0 mm spaced, push-in front spring connection header VIO Connector - 2-port, 5.0 mm spaced, push-in front spring connection header COVMR Connector - 2-port, 5.0 mm spaced, push-in front spring connection	Current Loop Sample Time	μs	50
Maximum Encoder Frequency MHz 20 (5 pre-quadrature) Internal Shunt Regulator - Yes Internal Shunt Regulator - No Description Mechanical Specifications Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, TÜV Rheinland® (STO), UL Size (H x W x D) mm (in) 177.5 x 133.5 x 49.2 (6.99 x 5.26 x 1.94) Weight g (oz) 1720 (60.7) Heatsink (Base) Temperature Range ⁹ °C (°F) 0.75 (32 - 167) Storage Temperature Range °C (°F) 440 - 85 (40 - 185) Form Factor - Natural Convection Coling System - Natural Convection 424 V LOGIC Connector - 9-pin, figh-density, male D-sub COMM Connector - 9-pin, female D-sub VIO Connector - 15-pin, high-density, female D-sub VIO Connector - 26-pin, high-density, female D-sub COMM Connector - 26-pin, high-density, female D-sub VIO Connector - 26-pin, high-density, female D-sub VIO Connect	Velocity Loop Sample Time	μs	100
Internal Shunt Regulator · Yes Internal Shunt Resistor · No Mechanical Specifications Description Value CE Class A (EMC), CE Class A (LVD), oLL, RoHS, TÜV Rheinland® (STO), UL Agency Approvals - CE Class A (EMC), CE Class A (LVD), oLL, RoHS, TÜV Rheinland® (STO), UL Size (H x W x D) mm (in) 177.5 x 133.5 x 49.2 (6.99 x 5.26 x 1.94) Weight g (oz) 1720 (60.7) Heatsink (Base) Temperature Range ⁹ °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) -40 - 85 (-40 - 185) Form Factor - Panel Mount Cooling System Cooling System - Natural Convection 2-port, 3.5 mm spaced inser	Position Loop Sample Time	μs	100
Internal Shunt Resistor No Description Mechanical Units Specifications Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, TÜV Rheinland® (STO), UL Size (H x W x D) mm (in) 177.5 x 133.5 x 49.2 (6.99 x 5.26 x 1.94) Weight g (oz) 1720 (60.7) Heatsink (Base) Temperature Range ⁹ °C (°F) 0 -75 (32 - 167) Storage Temperature Range °C (°F) 4-0 - 85 (40 - 185) Form Factor - Panel Mount Cooling System - Natural Convection +24V LOGIC Connector - 2-port, 3.5 mm spaced insert connector AUX ENCODER Connector - 9-pin, figh-density, male D-sub COMM Connector - 9-pin, high-density, female D-sub AC POWER Connector - 26-pin, high-density, female D-sub AC POWER Connector - 4-port, 5.0 mm spaced, push-in front spring connection header DC POWER Connector - 4-port, 5.0 mm spaced, push-in front spring connection header	· · ·		20 (5 pre-quadrature)
Internal Shunt Resistor No Mechanical Description Specifications Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, TÜV Rheinland® (STO), UL Size (H x W x D) mm (in) 177.5 x 133.5 x 49.2 (6.99 x 5.26 x 1.94) Weight g (oz) 1720 (60.7) Heatsink (Base) Temperature Range ⁹ °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) -40 - 85 (40 - 185) Form Factor Panel Mount Cooling System - Natural Convection 24V LOGIC Connector - Storage Temperature Connector - AUX ENCODER Connector - 9-pin, figh-density, male D-sub COMM Connector - 9-pin, figh-density, female D-sub AC POWER Connector - 26-pin, high-density, female D-sub AC POWER Connector - 4-port, 5.0 mm spaced, push-in front spring connection header DC POWER Connector - 4-port, 5.0 mm spaced, push-in front spring connection header	· · ·	-	
MechanicalSpecifications UnitsValueAgency Approvals-CE Class A (EMC), CE Class A (LVD), cUL, RoHS, TÜV Rheinland® (STO), ULSize (H x W x D)mm (in)177.5 x 133.5 x 49.2 (6.99 x 5.26 x 1.94)Weightg (oz)1720 (60.7)Heatsink (Base) Temperature Range®°C (°F)0 - 75 (32 - 167)Storage Temperature Range°C (°F)4-0 - 85 (-40 - 185)Form Factor-Panel MountCooling System-Natural Convection+24V LOGIC Connector-2-port, 3.5 mm spaced insert connectorAUX ENCODER Connector-9-pin, female D-subCOMM Connector-15-pin, high-density, female D-subVO Connector-26-pin, high-density, female D-subAC POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection headerDC POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection header	-	-	No
Agency Approvals-CE Class A (EMC), CE Class A (LVD), cUL, RoHS, TÜV Rheinland® (STO), ULSize (H x W x D)mm (in)177.5 x 133.5 x 49.2 (6.99 x 5.26 x 1.94)Weightg (oz)1720 (60.7)Heatsink (Base) Temperature Range®°C (°F)0 - 75 (32 - 167)Storage Temperature Range°C (°F)-40 - 85 (-40 - 185)Form Factor-Panel MountCooling System-Natural Convection+24V LOGIC Connector-2-port, 3.5 mm spaced insert connectorAUX ENCODER Connector-15-pin, high-density, male D-subFEEDBACK Connector-15-pin, high-density, female D-subV/O Connector-26-pin, high-density, female D-subAC POWER Connector-26-pin, high-density, female D-subAC POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection headerMOTOR POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection header			al Specifications
Size (H x W x D)mm (in)177.5 x 133.5 x 49.2 (6.99 x 5.26 x 1.94)Weightg (oz)1720 (60.7)Heatsink (Base) Temperature Range ⁹ °C (°F)0 - 75 (32 - 167)Storage Temperature Range°C (°F)-40 - 85 (-40 - 185)Form Factor-Panel MountCooling System-Natural Convection+24V LOGIC Connector-2-port, 3.5 mm spaced insert connectorAUX ENCODER Connector-9-pin, female D-subCOMM Connector-9-pin, female D-subFEEDBACK Connector-15-pin, high-density, female D-subI/O Connector-26-pin, high-density, female D-subAC POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection headerDC POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection headerMOTOR POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection header	•	Units	
Weightg (oz)1720 (60.7)Heatsink (Base) Temperature Range³°C (°F)0 - 75 (32 - 167)Storage Temperature Range°C (°F)-40 - 85 (-40 - 185)Form Factor-Panel MountCooling System-Natural Convection+24V LOGIC Connector-2-port, 3.5 mm spaced insert connectorAUX ENCODER Connector-9-pin, female D-subCOMM Connector-9-pin, female D-subFEEDBACK Connector-15-pin, high-density, female D-subI/O Connector-26-pin, high-density, female D-subAC POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection headerDC POWER Connector-5-port, 5.0 mm spaced, push-in front spring connection headerMOTOR POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection header		-	
Heatsink (Base) Temperature Range³°C (°F)0 - 75 (32 - 167)Storage Temperature Range°C (°F)-40 - 85 (-40 - 185)Form Factor-Panel MountCooling System-Natural Convection+24V LOGIC Connector-2-port, 3.5 mm spaced insert connectorAUX ENCODER Connector-15-pin, high-density, male D-subCOMM Connector-9-pin, female D-subFEEDBACK Connector-15-pin, high-density, female D-subVO Connector-26-pin, high-density, female D-subAC POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection headerDC POWER Connector-5-port, 5.0 mm spaced, push-in front spring connection headerMOTOR POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection header			
Storage Temperature Range°C (°F)-40 - 85 (-40 - 185)Form Factor-Panel MountCooling System-Natural Convection+24V LOGIC Connector-2-port, 3.5 mm spaced insert connectorAUX ENCODER Connector-15-pin, high-density, male D-subCOMM Connector-9-pin, female D-subCOMM Connector-15-pin, high-density, female D-subVO Connector-26-pin, high-density, female D-subVO Connector-26-pin, high-density, female D-subAC POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection headerDC POWER Connector-5-port, 5.0 mm spaced, push-in front spring connection headerMOTOR POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection header	•		
Form FactorPanel MountCooling System-Natural Convection+24V LOGIC Connector-2-port, 3.5 mm spaced insert connectorAUX ENCODER Connector-15-pin, high-density, male D-subCOMM Connector-9-pin, female D-subCOMM Connector-15-pin, high-density, female D-subVO Connector-26-pin, high-density, female D-subVO Connector-26-pin, high-density, female D-subAC POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection headerDC POWER Connector-5-port, 5.0 mm spaced, push-in front spring connection headerMOTOR POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection header			
Cooling System-Natural Convection+24V LOGIC Connector-2-port, 3.5 mm spaced insert connectorAUX ENCODER Connector-15-pin, high-density, male D-subCOMM Connector-9-pin, female D-subCOMM Connector-15-pin, high-density, female D-subFEEDBACK Connector-26-pin, high-density, female D-subI/O Connector-26-pin, high-density, female D-subAC POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection headerDC POWER Connector-5-port, 5.0 mm spaced, push-in front spring connection headerMOTOR POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection header		°C (°F)	
+24V LOGIC Connector2-port, 3.5 mm spaced insert connectorAUX ENCODER Connector-15-pin, high-density, male D-subCOMM Connector-9-pin, female D-subCOMM Connector-15-pin, high-density, female D-subFEEDBACK Connector-15-pin, high-density, female D-subI/O Connector-26-pin, high-density, female D-subAC POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection headerDC POWER Connector-5-port, 5.0 mm spaced, push-in front spring connection headerMOTOR POWER Connector-4-port, 5.0 mm spaced, push-in front spring connection header	Form Factor	-	
AUX ENCODER Connector15-pin, high-density, male D-subCOMM Connector9-pin, female D-subFEEDBACK Connector-I/O Connector-I/O Connector-AC POWER Connector-DC POWER Connector-Gonnector-DC POWER Connector-DC POWER Connector-Gonnector-DC POWER Connector-DC POWER Connector-Gonnector-CONDER Connector-DC POWER Connector-MOTOR POWER Connector-AC POWER Connector-AC POWER Connector-MOTOR POWER Connector-AC POWER CONNECTOR- <td>Cooling System</td> <td>-</td> <td>Natural Convection</td>	Cooling System	-	Natural Convection
COMM Connector 9-pin, female D-sub FEEDBACK Connector - V/O Connector - V/O Connector - AC POWER Connector - DC POWER Connector - DC POWER Connector - MOTOR POWER Connector - MOTOR POWER Connector - 4-port, 5.0 mm spaced, push-in front spring connection header MOTOR POWER Connector - 4-port, 5.0 mm spaced, push-in front spring connection header	+24V LOGIC Connector	-	
FEEDBACK Connector 15-pin, high-density, female D-sub I/O Connector 26-pin, high-density, female D-sub AC POWER Connector - 26-pin, high-density, female D-sub DC POWER Connector - 4-port, 5.0 mm spaced, push-in front spring connection header DC POWER Connector - 5-port, 5.0 mm spaced, push-in front spring connection header MOTOR POWER Connector - 4-port, 5.0 mm spaced, push-in front spring connection header	AUX ENCODER Connector	-	15-pin, high-density, male D-sub
I/O Connector - 26-pin, high-density, female D-sub AC POWER Connector - 4-port, 5.0 mm spaced, push-in front spring connection header DC POWER Connector - 5-port, 5.0 mm spaced, push-in front spring connection header MOTOR POWER Connector - 4-port, 5.0 mm spaced, push-in front spring connection header	COMM Connector	-	9-pin, female D-sub
AC POWER Connector - 4-port, 5.0 mm spaced, push-in front spring connection header DC POWER Connector - 5-port, 5.0 mm spaced, push-in front spring connection header MOTOR POWER Connector - 4-port, 5.0 mm spaced, push-in front spring connection header	FEEDBACK Connector	-	15-pin, high-density, female D-sub
DC POWER Connector - 5-port, 5.0 mm spaced, push-in front spring connection header MOTOR POWER Connector - 4-port, 5.0 mm spaced, push-in front spring connection header	I/O Connector	-	26-pin, high-density, female D-sub
MOTOR POWER Connector - 4-port, 5.0 mm spaced, push-in front spring connection header	AC POWER Connector	-	4-port, 5.0 mm spaced, push-in front spring connection header
MOTOR POWER Connector - 4-port, 5.0 mm spaced, push-in front spring connection header	DC POWER Connector	-	5-port, 5.0 mm spaced, push-in front spring connection header
	MOTOR POWER Connector	-	
	STO Connector		8-port, 2.0 mm spaced, enclosed, friction lock header

Large inrush current may occur upon initial DC supply connection to DC bus. See installation manual for details. STO features must be disabled for applications not using STO. See page 6 for more information. 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. Continuous Arms value attainable when RMS Charge-Based Limiting is used. P = (DC Rated Voltage) * (Cont. RMS Current) * 0.95.3. 4. 5. 6. 7. 8.

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. Additional cooling and/or heatsink may be required to achieve rated performance.

9.



PIN FUNCTIONS

	+24V LOGIC - Logic Power Connector		
Pin	Name	Description / Notes	I/O
1	LOGIC GND	Logic Supply Ground	GND
2	LOGIC PWR	Logic Supply Input. Turn on the Logic Supply first before turning on the main power supply.	I

AUX ENCODER - Auxiliary Feedback Connector

Pin	Name	Description / Notes	I/O
1	RESERVED	Reserved	-
2	RESERVED	Reserved	-
3	RESERVED	Reserved	-
4	PDI-8 + (PWM+ / AUX ENC A+ / CAP-B+)	Programmable Digital Input or PWM or Auxiliary Encoder or High Speed Capture (For	1
5	PDI-8 - (PWM- / AUX ENC A- / CAP-B-)	Single-Ended Signals Leave Negative Terminal Open)	1
6	PDI-9 + (DIR+ / AUX ENC B+ / CAP-C+)	Programmable Digital Input or Direction Input or Auxiliary Encoder or High Speed Capture	I
7	PDI-9 - (DIR- / AUX ENC B- / CAP-C-)	(For Single-Ended Signals Leave Negative Terminal Open)	1
8	PDI-10 +		I
9	PDI-10 -	Programmable Digital Input (For Single-Ended Signals Leave Negative Terminal Open)	I
10	SGN GND	Signal Ground	SGND
11	SGN GND	Signal Ground	SGND
12	SGN GND	Signal Ground	SGND
13	+5V OUT	+5V Encoder Supply Output (Short Circuit Protected)	0
14	PAI-4 +		I
15	PAI-4 -	Differential Programmable Analog Input (12-bit Resolution)	I

	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)	1
9	RESERVED	Reserved	-

FEEDBACK - Feedback Connector			
Pin	Name	Description / Notes	I/O
1	HALL A+		
2	HALL B+	Commutation Sensor Inputs	1
3	HALL C+		I
4	MOT ENC A+	Differential Encoder A Channel Input (For Single Ended Signals Use Only The Positive	I
5	MOT ENC A-	Input)	1
6	MOT ENC B+	Differential Encoder B Channel Input (For Single Ended Signals Use Only The Positive Input)	1
7	MOT ENC B-		I
8	MOT ENC I+	Differential Encoder Index Input (For Single Ended Signals Use Only The Positive Input)	I
9	MOT ENC I-	Differential Encoder index input (For Single Ended Signals Ose Only The Positive input)	I
10	HALL A-	Commutation Sensor Input (For Differential Signals Only)	1
11	HALL B-	Commutation Sensor Input (For Differential Signals Only)	I
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)	1
15	HALL C-	Commutation Sensor Input (For Differential Signals Only)	1



		I/O - Signal Connector	
Pin	Name	Description / Notes	I/O
1	PDO-1	Isolated Programmable Digital Output	0
2	OUTPUT COMMON	Digital Output Common	OGND
3	PDO-2	Isolated Programmable Digital Output	0
4	PAI-1 + (REF+)	Differential Decementarial Angles Janut es Deference Cimel Janut (40 hit Decelution)	1
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	SGN GND	Signal Ground	SGND
8	OUTPUT PULL-UP	Digital Output Pull-Up For User Outputs	
9	PDI-5	Isolated Programmable Digital Input	1
10	PDO-3	Isolated Programmable Digital Output	0
11	PDI-1	Isolated Programmable Digital Input	1
12	PDI-2	Isolated Programmable Digital Input	1
13	PDI-3	Isolated Programmable Digital Input	
14	PDO-4	Isolated Programmable Digital Output	0
15	INPUT COMMON	Digital Input Common (Can Be Used To Pull-Up Digital Inputs)	IGND
16	SGN GND	Signal Ground	SGND
17	PDI-4 (STEP)	Isolated Programmable Digital Input or Step	1
18	PDI-6 (DIR)	Isolated Programmable Digital Input or Direction	1
19	PDI-7 (CAP-A)	Isolated Programmable Digital Input or High Speed Capture	1
20	ENC A+ OUT	Duffered Freeder Oberend A Octove	0
21	ENC A- OUT	Buffered Encoder Channel A Output	0
22	ENC B+ OUT	Duffered Freeder Obernel D.O. trut	0
23	ENC B- OUT	Buffered Encoder Channel B Output	0
24	ENC I+ OUT		0
25	ENC I- OUT	Buffered Encoder Index Output	0
26	SGN GND	Signal Ground	SGND

	Motor Power Connector			
Pin	Name	Description / Notes	I/O	
1	CHASSIS	Chassis Ground	CGND	
2	MOTOR A	Motor Phase A	0	
3	MOTOR B	Motor Phase B	0	
4	MOTOR C	Motor Phase C	0	

	AC Power Connector			
Pin	Name	Description / Notes	I/O	
1	L1		1	
2	L2	AC Supply Input (Three Phase). External 20 A time delay fuses are recommended in series with the AC input lines.	I	
3	L3		I	
4	CHASSIS	Chassis Ground	CGND	

	DC Power Connector			
Pin	Name	Description / Notes	I/O	
1	DC-	Power Ground	PGND	
2	NC	No Connect	-	
3	DC+	DC Power Input	I	
4	DC+	External Shunt Resistor Connection, Connect resistor between DC+ and BR.	-	
5	BR	External Shunt Resistor Connection. Connect resistor between DC+ and BR.	-	

STO – Safe Torque Off Connector*			
Pin	Name	Description / Notes	I/O
1	STO OUTPUT	Safe Torque Off Output	0
2	RESERVED	Reserved	-
3	STO-1 RETURN	Safe Torque Off 1 Return	STORET1
4	STO-1	Safe Torque Off – Input 1	- I
5	STO-2 RETURN	Safe Torque Off 2 Return	STORET2
6	STO-2	Safe Torque Off – Input 2	I
7	RESERVED	Reserved	-
8	STO OUT RETURN	Safe Torque Off Output Return	STORETO
TO featur	res must be disabled for applications not	using STO. See page 6 for more information	

*STO features must be disabled for applications not using STO. See page 6 for more information.



HARDWARE SETTINGS

Switch Functions

Switch	Description	Setting	
Switch	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

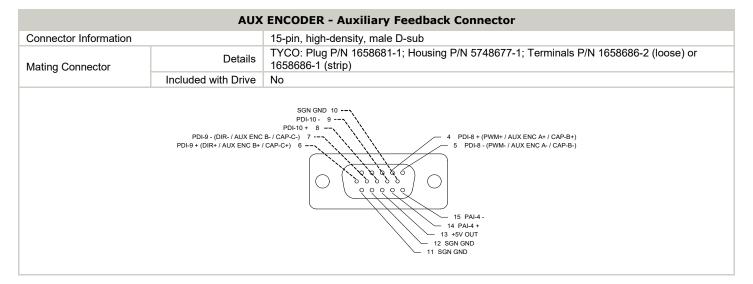
Safe Torque Off (STO) Inputs

The Safe Torque Off (STO) Inputs are dedicated +24VDC max sinking single-ended inputs. For applications not using STO functionality, disabling of the STO feature is required for proper drive operation. STO may be disabled by installing the included mating connector for the STO connector and following the STO Disable wiring instructions as given in the hardware installation manual. Consult the hardware installation manual for more information. Alternatively, a dedicated STO Disable Key connector is available for purchase for applications where STO is not in use. Contact the factory for ordering information.



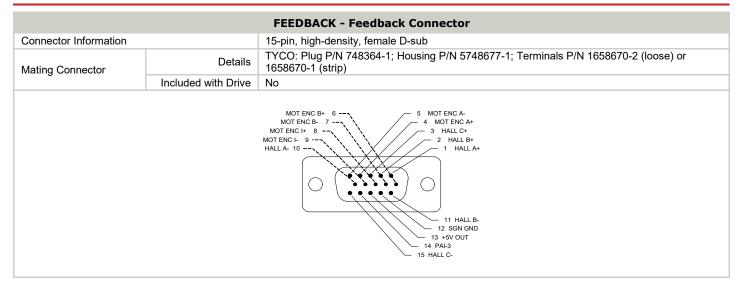
MECHANICAL INFORMATION

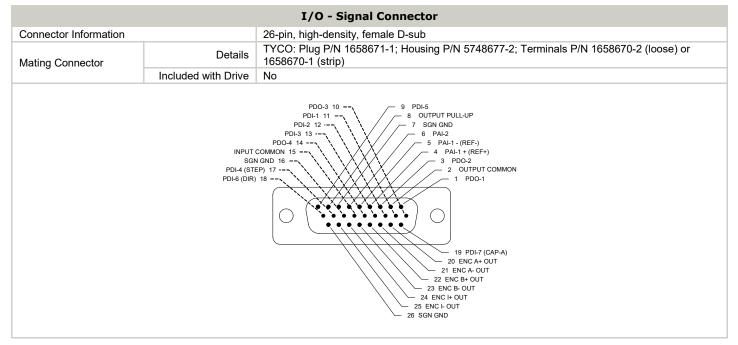
+24V LOGIC - Logic Power Connector		
Connector Information		2-port, 3.5 mm spaced, enclosed, friction lock header
Mating Compositor	Details	Phoenix Contact: P/N 1840366
Mating Connector	Included with Drive	Yes



COMM - RS232/RS485 Communication Connector			
Connector Information 9-pin, female D-sub		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)	
U U	Included with Drive	No	
		3 RS232 RX / RS485 RX- 2 RS232 TX / RS485 TX- 1 SELECT 6 RS485 TX+ 8 RS485 RX+	







Motor Power Connector		
Connector Information 4-port, 5.0 mm spaced, push-in front spring connection header		4-port, 5.0 mm spaced, push-in front spring connection header
Mating Connector	Details	24 to 12 (AWG) / 0.2 to 2.5 (mm ²) (For solid or stranded conductors with or without ferrules)
Mating Connector	Included with Drive	Not Applicable
		MOTOR C 4 1 CHASSIS



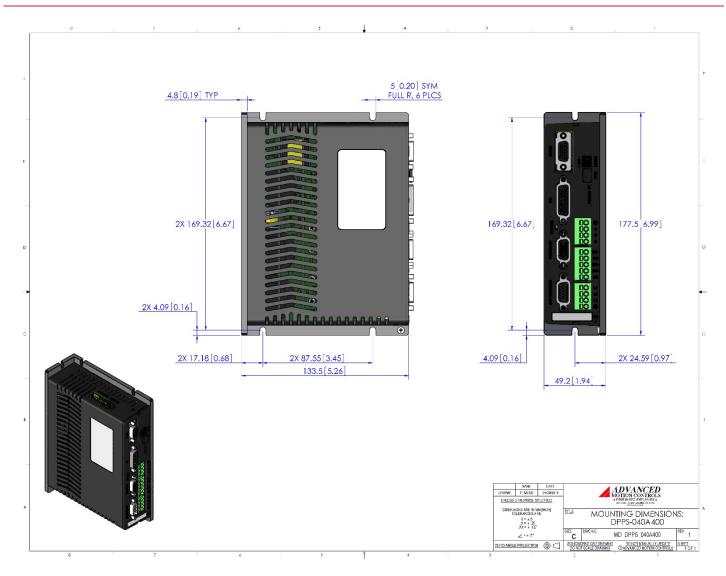
DC Power Connector			
Connector Information		5-port, 5.0 mm spaced, push-in front spring connection header	
Mating Connector	Details	24 to 12 (AWG) / 0.2 to 2.5 (mm ²) (For solid or stranded conductors with or without ferrules)	
Mating Connector	Included with Drive	Not Applicable	
		BR 5 DC+ 4 C- DC+ 4 C- C- C- C- C- C- C- C- C- C-	

AC Power Connector			
Connector Information		4-port, 5.0 mm spaced, push-in front spring connection header	
Mating Connector	Details	24 to 12 (AWG) / 0.2 to 2.5 (mm ²) (For solid or stranded conductors with or without ferrules)	
Mailing Connector	Included with Drive	Not Applicable	
		CHASSIS 4 2 L2 CHASSIS 4 1 L1	

STO – Safe Torque Off Connector		
Connector Information 8-port, 2.00 mm spaced, enclosed, friction lock header		8-port, 2.00 mm spaced, enclosed, friction lock header
Mating Connector	Details	Molex: P/N 51110-0860 (housing); 50394-8051 (pins)
Maing Connector	Included with Drive	Yes
STO-2 RETURN 5 RESERVED 7 STO OUT RETURN 8 STO OUT RETURN 8 STO OUT RETURN 8 STO -2 6 STO -1 RETURN 1 STO OUTPUT 2 RESERVED 4 STO-1		

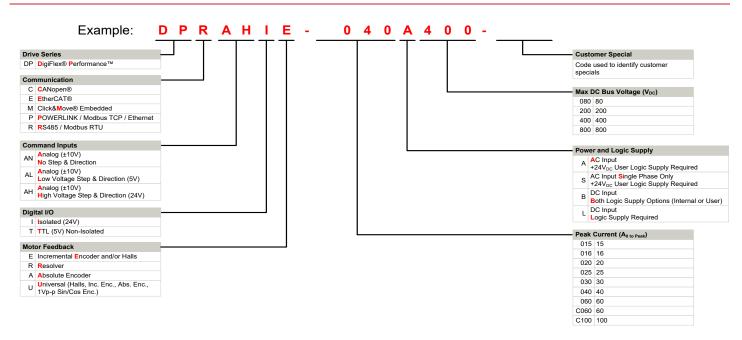


MOUNTING DIMENSIONS





PART NUMBERING INFORMATION



DigiFlex® Performance[™] 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	Tailored Project File		
Private Label Software	Silkscreen Branding		
OEM Specified Connectors	Optimized Base Plate		
No Outer Case	Increased Current Limits		
Increased Current Resolution	Increased Voltage Range		
Increased Temperature Range	Conformal Coating		
Custom Control Interface	Multi-Axis Configurations		
Integrated System I/O	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 <u>www.a-m-c.com</u> 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.

Release Date:Status:6/4/2024Active