

DPCANIR-060A800

Description

The DigiFlex[®] Performance[™] (DP) Series digital servo drives are designed to drive brushed and brushless servomotors. 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.

This DP Series drive features a CANopen interface for networking and a RS-232 interface for drive configuration and setup. Drive commissioning is accomplished using DriveWare[®] 7, available for download at www.a-m-c.com.

All drive and motor parameters are stored in nonvolatile memory.

Power Range	
Peak Current	60 A (42.4 A _{RMS})
Continuous Current	30 A (21.2 A _{RMS})
Supply Voltage	200 - 480 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**

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

MODES OF OPERATION

- **Profile Current**
- . **Profile Velocity**
- . **Profile Position**
- Cyclic Synchronous Current Mode
- Cyclic Synchronous Velocity Mode
- Cyclic Synchronous Position Mode

COMMAND SOURCE

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

FEEDBACK SUPPORTED

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

INPUTS/OUTPUTS

- 3 High Speed Captures
- 4 Programmable Analog Inputs (16-bit/12-bit Resolution)
- 1 Programmable Analog Output (10-bit Resolution)
- 3 Programmable Digital Inputs (Differential)
- 7 Programmable Digital Inputs (Single-Ended)
- 4 Programmable Digital Outputs (Single-Ended)

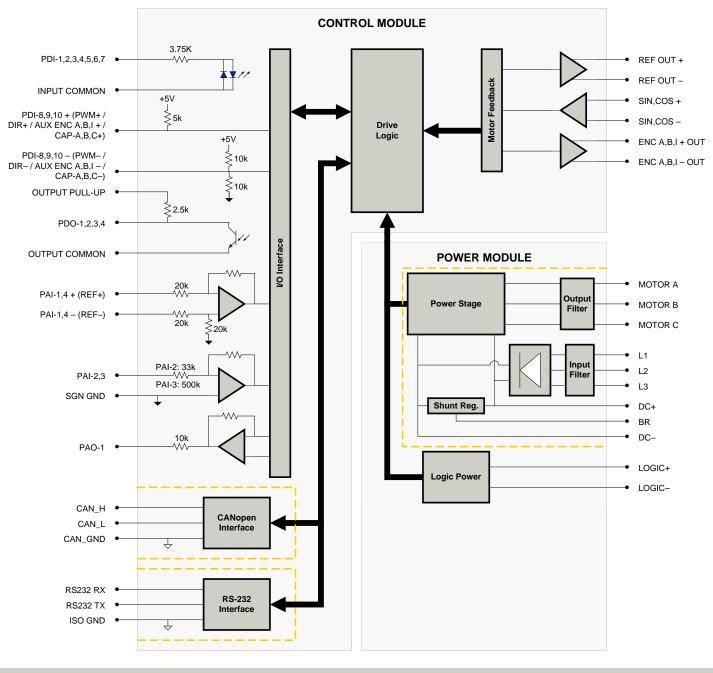
COMPLIANCES & AGENCY APPROVALS

Sold & Serviced By: CE Class A (LVD) C ELECTROMATE CE Class A (EMC)

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BLOCK DIAGRAM



Information on Approvals and Compliances

Compliant with European CE for both the Class A EMC Directive 2004/108/EC on Electromagnetic Compatibility (specifically EN 61000-6-4:2007 and EN 61000-6-2:2005) and LVD requirements of directive 2006/95/EC (specifically EN 60204-1:2006), a low voltage directive to protect users from electrical shock.

ROHS COMPLIANCE

Sold & Serviced By: RoHS (Reduction of Hazardous Substances) is intended to prevent hazardous substances such as lead from being manufactured in electrics and electronic equipment.

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SPECIFICATIONS

Description	Units	Power Specifications Value
Rated Voltage	VAC (VDC)	480 (678)
AC Supply Voltage Range	VAC	200 - 480
AC Supply Minimum	VAC	180
AC Supply Maximum	VAC	528
AC Input Phases	-	3
AC Supply Frequency	Hz	50 - 60
DC Supply Voltage Range ¹	VDC	255 - 747
DC Bus Over Voltage Limit	VDC	850
DC Bus Under Voltage Limit	VDC	230
Logic Supply Voltage	VDC	20 - 30 (@ 850 mA)
Maximum Peak Output Current ²	A (Arms)	60 (42.4)
Maximum Continuous Output Current	A (Arms)	30 (21.2)
Max. Continuous Output Power @ Rated Voltage ³	W	13680
Max. Continuous Power Dissipation @ Rated Voltage	W	720
Internal Bus Capacitance	μF	330
External Shunt Resistor Minimum Resistance ⁴	Ω	40
Minimum Load Inductance (Line-To-Line) ⁵	μH	3000
Switching Frequency	kHz	10
Maximum Output PWM Duty Cycle	%	100
Low Voltage Supply Outputs	-	+5 VDC (250 mA)
		Control Specifications
Description	Units	Value
Communication Interfaces	-	CANopen (RS-232 for configuration)
Command Sources	-	±10 V Analog, Encoder Following, Over the Network, PWM and Direction, Sequencing, Indexing, Jogging
Feedback Supported	-	±10 VDC Position, Auxiliary Incremental Encoder, Resolver, Tachometer (±10 VDC)
Commutation Methods	-	Sinusoidal
Modes of Operation		Profile Current, Profile Velocity, Profile Position, Cyclic Synchronous Current Mode, Cyclic Synchronous Velocity
	-	Mode, Cyclic Synchronous Position Mode
Motors Supported	-	Closed Loop Vector, Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushless)
Hardware Protection	-	40+ Configurable Functions, Over Current, Over Temperature (Drive & Motor), Over Voltage, Short Circuit
Brogrommobile Digital Inpute/Outpute (BDIe/BDOe)	-	(Phase-Phase & Phase-Ground), Under Voltage 10/4
Programmable Digital Inputs/Outputs (PDIs/PDOs)		
Programmable Analog Inputs/Outputs (PAIs/PAOs)	-	4/1
Primary I/O Logic Level	-	24 VDC
Current Loop Sample Time	μs	100
Velocity Loop Sample Time	μs	200
Position Loop Sample Time	μs	200
Resolver Reference/Excitation Signal	Vrms	4 Vrms @ 5 kHz
Expected Resolver Transformation Ratio	Vrms	0.5
Feedback Resolution / Emulated Encoder Resolution ⁶	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
Internal Shunt Regulator	-	Yes
Internal Shunt Resistor	-	No
		Mechanical Specifications
Description	Units	Value
Agency Approvals	-	CE Class A (EMC), CE Class A (LVD), RoHS
Size (H x W x D)	mm (in)	300.5 x 232.1 x 139.3 (11.8 x 9.1 x 5.5)
Weight	g (oz)	6174 (217.8)
Heatsink (Base) Temperature Range ⁷	°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
+24V LOGIC Connector	-	2-port, 5.08 mm spaced, enclosed, friction lock header
AUX COMM Connector	-	3-pin, 2.5 mm spaced, enclosed, friction lock header
AUX ENCODER Connector	-	15-pin, high-density, male D-sub
COMM Connector	-	Shielded, dual RJ-45 socket with LEDs
DC BUS Connector	-	4-port, 7.62 mm spaced, enclosed, friction lock header
FEEDBACK Connector	-	15-pin, high-density, female D-sub
I/O Connector	- Sold	8 Sagin dightensity, female D-sub
MOTOR POWER Connector	- 🦳	
POWER Connector		4-port, 7-62 mm spaced, enclosed, friction lock header 3-port, 7-62 mm spaced, enclosed, friction lock header

Capable of supplying drive rated peak current for 2 seconds with 10-seconds followate continuous value/ tonger times are possible with P = (Dc Ratk Otage) * (Cont. RMS Current) * 0.95. Toll Free Fax (877) SEPW099 ADVANCED Motion Controls recommends using an external fuse in series with the shunt resistor. A 3 amp motor delay fuse is typical. Lower inductance is acceptable for bus voltages well below maximum. Use two provided for bus voltages well below maximum. Use two provided for bus voltages are available. Contact Applications Engine of a control for the second structure of the second structure3. 4. 5. 6. 7.



PIN FUNCTIONS

+24V LOGIC - Logic Power Connector				
Pin	Name	Description / Notes	1/0	
1	LOGIC PWR	Logic Supply Input	1	
2	2 LOGIC GND Logic Supply Ground GND			
	AUX COMM. DS222 Communication Connector			

	AUX CO	DMM - RS232 Communication Connector		
Pin	Name	Description / Notes	1/0	
1	RS232 RX	Receive Line (RS-232)	I	
2	RS232 TX	Transmit Line (RS-232)	0	
3	ISO GND	Isolated Signal Ground	IGND	

	AUX ENCODER - Auxiliary Feedback Connector			
Pin	Name	Description / Notes	1/0	
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	I	
5	PDI-8 - (PWM- / AUX ENC A- / CAP-B-)	Single-Ended Signals Leave Negative Terminal Open)	I	
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)		
8	PDI-10 + (AUX ENC I+ / CAP-A+)	Programmable Digital Input or Auxiliary Encoder or High Speed Capture (For Single-Ended	I	
9	PDI-10 - (AUX ENC I- / CAP-A-)	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 +	Differential Programmable Analog Input (12-bit Resolution)		
15	PAI-4 -			

COMM - CAN Communication Connector			
Pin	Name	Description / Notes	1/0
1	CAN_H	CAN_H Line (Dominant High)	I
2	CAN_L	CAN _L Line (Dominant Low)	I
3	CAN_GND	CAN Ground	CGND
4	RESERVED	Reserved	-
5	RESERVED	Reserved	-
6	RESERVED	Reserved	-
7	CAN_GND	CAN Ground	CGND
8	RESERVED	Reserved	-

	DC BUS - Power Connector		
Pin	Name	Description / Notes	1/0
1	DC-	Internal DC Bus Voltage (Can Be Used To Connect External Shunt Regulator)	I/O
2	2 BR External Brake Resistor Connection -		-
3	DC+	Brake Resistor DC+. Connection for brake resistor.	0
4	DC+	Internal DC Bus Voltage (Can Be Used To Connect External Shunt Regulator)	I/O





FEEDBACK - Feedback Connector			
Pin	Name	Description / Notes	1/0
1	RESERVED	Reserved	-
2	RESERVED	Reserved	-
3	RESERVED	Reserved	-
4	REF OUT +	Baselver Deference (Evertetion Output	0
5	REF OUT -	Resolver Reference/Excitation Output	0
6	SIN+	Resolver Sine Input	1
7	SIN-	Resolver Sille liiput	1
8	COS+	Resolver Cosine Input	1
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)	
15	RESERVED	Reserved	-

		I/O - Signal Connector	
Pin	Name	Description / Notes	1/0
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 Decementation Apple a land the Deference Circul Input (40 bit Decementary)	I
5	PAI-1 - (REF-)	Differential Programmable Analog Input or Reference Signal Input (16-bit Resolution)	I
6	PAI-2	Programmable Analog Input (12-bit Resolution)	I
7	PAO-1	Programmable Analog Output (10-bit Resolution)	0
8	OUTPUT PULL-UP	Digital Output Pull-Up For User Outputs	I
9	PDI-5	Isolated Programmable Digital Input	I
10	PDO-3	Isolated Programmable Digital Output	0
11	PDI-1	Isolated Programmable Digital Input	I
12	PDI-2	Isolated Programmable Digital Input	I
13	PDI-3	Isolated Programmable Digital Input	I
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	Isolated Programmable Digital Input	- I
18	PDI-6	Isolated Programmable Digital Input	I
19	PDI-7	Isolated Programmable Digital Input	1
20	ENC A+ OUT	Emulated Encoder Channel & Output	0
21	ENC A- OUT	Emulated Encoder Channel A Output	0
22	ENC B+ OUT	Emulated Encoder Channel B Output	0
23	ENC B- OUT	Emulated Encoder Channel B Output	0
24	ENC I+ OUT	Emulated Encoder Index Output	0
25	ENC I- OUT		0
26	SGN GND	Signal Ground	SGND

	MOTOR POWER - Power Connector		
Pin	Name	Description / Notes	1/0
1	SHIELD	Motor cable shield. Internally connected to protective earth ground.	-
2	MOTOR C	Motor Phase C	0
3	MOTOR B	Motor Phase B	0
4	MOTOR A	Motor Phase A	0

	POWER - Power Connector			
Pin	Name	Description / Notes	1/0	
1	L3		I	
2	L2	AC Supply Input (Three Phase)	I	
3	L1		I	

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HARDWARE SETTINGS

Switch Functions

Switch	Description	Setting	
Switch	Description	On	Off
1	Bit 0 of binary CANopen node ID. Does not affect RS-232 settings.	1	0
2	Bit 1 of binary CANopen node ID. Does not affect RS-232 settings.	1	0
3	Bit 2 of binary CANopen node ID. Does not affect RS-232 settings.	1	0
4	Bit 3 of binary CANopen node ID. Does not affect RS-232 settings.	1	0
5	Bit 4 of binary CANopen node ID. Does not affect RS-232 settings.	1	0
6	Bit 5 of binary CANopen node ID. Does not affect RS-232 settings.	1	0
7	Bit 0 of drive CANopen bit rate setting. Does not affect RS-232 settings.	1	0
8	Bit 1 of drive CANopen bit 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.

Bit Rate (kbits/sec)	Value For Bit Rate Setting
Load from non-volatile memory	0
500	1
250	2
125	3

Jumper Settings

Jumper	Description	Configuration		
	Header Jumper	Not Installed	Pins 1-2	Pins 2-3
J1	CAN bus termination. Install this jumper (2.54mm) on the last drive in a CAN network. This jumper is located on a 4-pin header adjacent to the RS-232 connector. It consists of the two pins furthest from the connector.	Non- terminating Node	Terminating Node	N/A
J2	Reserved.	-	-	N/A





MECHANICAL INFORMATION

+24V LOGIC - Logic Power Connector		
Connector Information 2-port, 5.08 mm spaced, enclosed, friction lock header		2-port, 5.08 mm spaced, enclosed, friction lock header
Mating Connector	Details	Phoenix Contact: P/N 1757019
Mating Connector	Included with Drive	Yes
2 LOGIC GND 1 LOGIC PWR IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		

AUX COMM - RS232 Communication Connector		
Connector Information 3-pin, 2.5 mm spaced, enclosed, friction lock header		3-pin, 2.5 mm spaced, enclosed, friction lock header
Mating Connector	Details	Phoenix: Plug P/N 1881338
Maing Connector	Mating Connector Included with Drive Yes	
3 ISO GND 2 RS232 TX 1 RS232 RX		

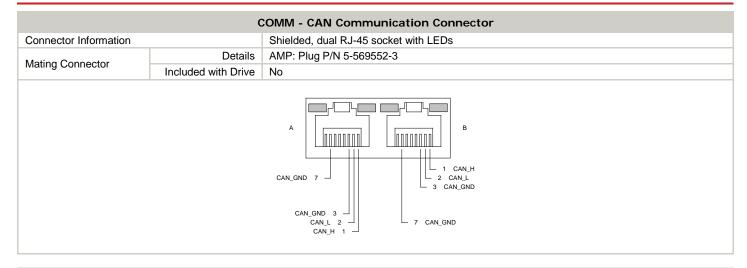
AUX ENCODER - Auxiliary Feedback Connector		
Connector Information 15-pin, high-density, male D-sub		15-pin, high-density, male D-sub
Mating Connector	Details	TYCO: Plug P/N 1658681-1; Housing P/N 5748677-1; Terminals P/N 1658686-2 (loose) or 1658686-1 (strip)
	Included with Drive	No
	SGN GND 10 PDI-10 - (AUX ENC I-/ (CAP-A+) 9 PDI-9 - (DIR - / AUX ENC H-/ (CAP-A+) 8 PDI-9 - (DIR - / AUX ENC B - / CAP-C+) 6 PDI-9 + (DIR + / AUX ENC B - / CAP-C+) 6 PDI-9 + (DIR + / AUX ENC B - / CAP-C+) 6 PDI-9 - (DIR + / AUX ENC B - / CAP-C+) 7 PDI-9 - (DIR + / AUX ENC B - / CAP-C+) 7 PDI-9 - (DIR + / AUX ENC B - / CAP-C+) 7 PDI-9 - (DIR + / AUX ENC B - / CAP-C+) 7 PDI-9 - (DIR + / AUX ENC B - / CAP-C+) 7 PDI-9 - (DIR + / AUX ENC B - / CAP-C+) 7 PDI-9 - (DIR + / AUX ENC B - / CAP-C+) 7 PDI-9 - (DIR + / AUX ENC B - / CAP-C+) 7 PDI-9 - (DIR + / AUX ENC B - / CAP-C+) 7 PDI-9 - (DIR + / AUX ENC B - / CAP-C+) 7 PDI-9 - (DIR + / AUX ENC B - / CAP-C+) 7 PDI-9 - (DIR + / AUX ENC B - / CAP-C+) 7 PDI-9 - (DIR +	





DigiFlex[®] Performance[™] Servo Drive

DPCANIR-060A800



		DC BUS - Power Connector
Connector Information 4-port, 7.62 mm spaced, enclosed, friction lock header		
Details		Phoenix Contact: P/N 1804920
Mating Connector	Included with Drive	Yes

FEEDBACK - Feedback Connector		
Connector Information	Connector Information 15-pin, high-density, female D-sub	
Mating Connector Details		TYCO: Plug P/N 748364-1; Housing P/N 5748677-1; Terminals P/N 1658670-2 (loose) or 1658670-1 (strip)
	Included with Drive	No
	SIN+ 6	

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DigiFlex[®] Performance[™] Servo Drive

I/O - Signal Connector		
Connector Information 26-pin, high-density, female D-sub		
Mating Connector	Details	TYCO: Plug P/N 1658671-1; Housing P/N 5748677-2; Terminals P/N 1658670-2 (loose) or 1658670-1 (strip)
0	Included with Drive	No
	SGN	PDO-3 10 9 PDI-5 PDI-1 11 7 PAO-1 PDI-3 13 6 PAI-2 PDO-4 14 6 PAI-1 (REF-) OMMON 15 4 PAI-1 (REF-) GND 16 2 OUTPUT COMMON 18 1 PDO-1 19 PDI-7 20 ENC A+ OUT 21 ENC A+ OUT 22 ENC B+ OUT 23 ENC B+ OUT 23 ENC B+ OUT 24 ENC I+ OUT 24 ENC I+ OUT 26 SGN GND

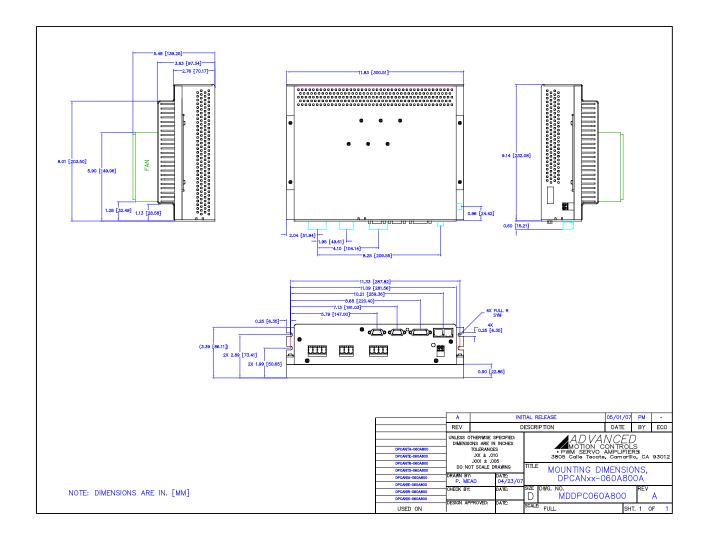
MOTOR POWER - Power Connector		
Connector Information 4-port, 7.62 mm spaced, enclosed, friction lock header		
Mating Connector	Details	Phoenix Contact: P/N 1804920
Mating Connector	Included with Drive	Yes
A MOTORA		

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

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MOUNTING DIMENSIONS

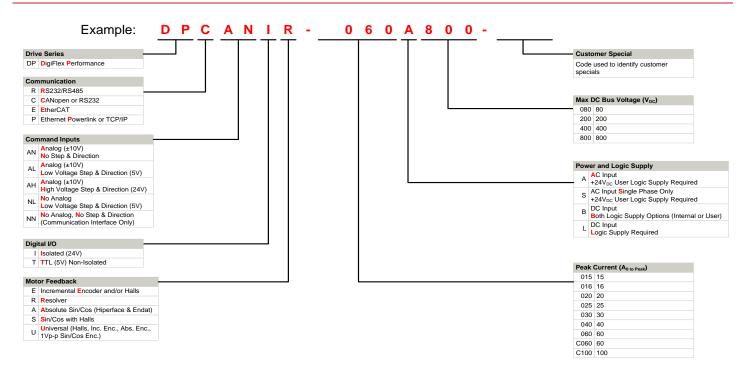




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PART NUMBERING INFORMATION



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 Matters Controls offere a controls of according declaration data facilitate data into matters late a control offere				

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 with our without without with a product may differ from pictures provided in this document.