Description

CPR Series digital servo drives are designed to drive brushed and brushless servo motors, stepper motors and AC induction motors. These all-digital drives operate in torque, speed or position mode and use space vector modulation (SVM) technology. Compared with traditional PWM, it can improve bus voltage utilization and reduce heat dissipation. The drive can be configured to use various external command signals, or the drive's built-in motion engine (internal motion controller for distributed motion applications) can be used to configure commands. In addition to motor control, these drives also have dedicated programmable digital and analog inputs and outputs to enhance the interface with external controllers and devices.

CPR series drives have added a built-in shunt regulator module, which can consume the energy feedback generated during the regeneration process in the system, and maintain the DC bus voltage at a fixed voltage to prevent the drive from overvoltage shutdown.

CPR series drives have the network communication function of RS485/Modbus RTU, and can be connected to DriveWare®7 software through RS232 to complete drive debugging and configuration.

Peak Current	20A(14.1Arms)
Continuos Current	12A(12Arms)
Supply Voltage	10-80 VDC

Features

- Four Quadrant Regenerative Operation
- Space Vector Modulation (SVM) Technology
- Built-in shunt regulator module
- The clamping voltage of the built-in shunt regulator is configurable
- Fully Digital State-of-the-art Design
- Programmable Gain Settings
- Fully Configurable Current, Voltage, Velocity and Position Limits

- 12-bit Analog to Digital Hardware
- On-the-Fly Mode Switching
- On-the-Fly Gain Set Switching
- UL
- cUL
- CE Class A(LVD)
- CE Class A(EMDS)
- RoSH

Note: The certifications and approvals included in the above features are applicable to the internal core drive assembly.

MODES OF OPERATION	COMMAND SOURCE	FEEDBACK SUPPORTED	INPUTS/OUTPUTS
• Current	• ±10 V Analog	• ±10 VDC Position	• 2 High Speed Captures
• Velocity	• PWM and Direction	• Halls	• 1 Programmable Analog Input (12-bit Resolution)
• Position	• Encoder Following	• Incremental Encoder	• 2 Programmable Digital Inputs (Differential)
• Hall Velocity	• 5V Step and Direction	• Auxiliary Incremental Encoder	• 3 Programmable Digital Inputs (Single-Ended)
	• Over the Network	• Tachometer (±10 VDC)	• 3 Programmable Digital Outputs (Single-Ended)
	• Sequencing		
	• Indexing		
	• Jogging		

SPECIFICATIONS

Power Specifications		
Description	**Units**	**Value**
DC Supply Voltage Range	VDC	10-80
DC Bus Over Voltage Limit	VDC	88
DC Bus Under Voltage Limit	VDC	8
Logic Supply Voltage	VDC	20-80
Maximum Peak Output Current[1]	A(Arms)	20（14.1）
Maximum Continuous Output Current[2]	A(Arms)	12（12）
Maximum Continuous Output Power	W	912
Maximum Power Dissipation at Continuous Current	W	48
Internal Bus Capacitance	µF	500
Minimum Load Inductance (Line-To-Line) [3]	µH	250(80 V supply); 150(48 V supply); 75(24 V supply); 40(12 V supply)
Switching Frequency	KHZ	20
Maximum Output PWM Duty Cycle	%	92
Control Specifications		
Description	**Units**	**Value**
Communication Interfaces	-	RS-485/232 / Modbus RTU
Command Sources	-	±10 V Analog, 5V Step and Direction,Encoder Following, Over the Network, PWM and Direction, Sequencing, Indexing, Jogging

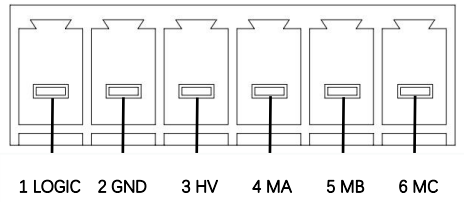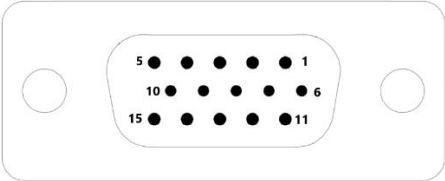|		
Feedback Supported	-	±10 VDC Position, Auxiliary Incremental Encoder, Halls, Incremental Encoder, Tachometer (±10 VDC)
Commutation Methods	-	Sinusoidal, Trapezoidal
Modes of Operation	-	Current, Hall Velocity, Position, Velocity
Motors Supported[4]	-	Three Phase (Brushless Servo), Single Phase (Brushed Servo, Voice Coil, Inductive Load), Stepper (2- or 3-Phase Closed Loop), AC Induction (Closed Loop Vector)
Hardware Protection	-	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)	-	5/3
Programmable Analog Inputs/Outputs (PAIs/PAOs)	-	1/0
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
Maximum Encoder Frequency	MHz	20(5 pre-quadrature)
Mechanical Specifications		
Description	**Units**	**Value**
Size (H x W x D)	mm(in)	158×111×60
Weight	g	900
Temperature Range[5]	℃	0-75
Storage Temperature Range	℃	-40-85
Cooling System	-	Natural Convection

Note：

1．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．Continuous Arms value attainable when RMS Charge-Based Limiting is used.

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

4．Maximum motor speed for stepper motors is 600 RPM. Consult the hardware installation manual for 2-phase stepper wiring configuration.

5．Thermal shutdown when PCB temperature reaches 75°C. The base plate temperature at this point may be between 60°C and 75°C depending on rate of base plate cooling (additional heat sinking), ambient temperature, and output current.

PIN FUNCTIONS

| POWER AND MOTOR POWER - Power Connector		
Pin	**Name**	**Description / Notes**
1	LOGIC	Logic Supply Input
2	GND	Logic Supply Ground (Common With Signal Ground)
3	HV	DC Power Input
4	MA	Motor Phase A
5	MB	Motor Phase B
6	MC	Motor Phase C
Connector Information		6-pin，7.62 mm spaced ，enclosed, friction lock header
Mating Connector	Model	Phoenix Contact：P/N 1804946
	Included with Drive	Yes

1 LOGIC　2 GND　3 HV　4 MA　5 MB　6 MC

Feedback- Feedback Connector		
Pin	**Name**	**Description / Notes**
1	HALL A	Commutation Sensor Inputs（Corresponding to Hall's U+, V+, W+）
2	HALL B	
3	HALL C	
4	MOT ENC A+	Differential Encoder A Channel Input(For Single Ended Signals Use Only The Positive Input)
5	MOT ENC A-	
6	MOT ENC B+	Differential Encoder B Channel Input(For Single Ended Signals Use Only The Positive Input)
7	MOT ENC B-	
8	MOT ENC I+	Differential Encoder Index Input(For Single Ended Signals Use Only The Positive Input)
9	MOT ENC I-	
10	RESERVED	-
11	RESERVED	-
12	SGN GND	Signal Ground
13	+5V OUTPUT	+5V Encoder Supply Output
14	RESERVED	-
15	RESERVED	-

Connector Information		15-pin, high-density, female D-sub
Mating Connector	Model	3-row 15-pin male D-sub plug (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

I/O- Signal Connector		
Pin	**Name**	**Description / Notes**
1	PAI-1 + (REF+)	Differential Programmable Analog Input or Reference Signal Input (12-bit Resolution)
2	PAI-1 - (REF-)	
3	PDO-1	Programmable Digital Output
4	PDO-2	Programmable Digital Output
5	PDO-3	Programmable Digital Output
6	PDI-1	Programmable Digital Input
7	PDI-2	Programmable Digital Input
8	PDI-3	Programmable Digital Input
9	PDI-4 + (PWM+ / AUX ENC A+ / CAP-B+)	Programmable Digital Input or PWM or Auxiliary Encoder or High Speed Capture
10	PDI-4 - (PWM- / AUX ENC A- / CAP-B-)	

11	PDI-5 + (DIR+ / AUX ENC B+ / CAP-C+)	Programmable Digital Input or Direction or Auxiliary Encoder or High Speed Capture
12	PDI-5 - (DIR- / AUX ENC B- / CAP-C-)	
13	GND	
14	GND	Ground
15	GND	

Connector Information		15-pin, high-density, male D-sub
Mating Connector	Model	3-row 15-pin female D-sub plug
	Included with Drive	No
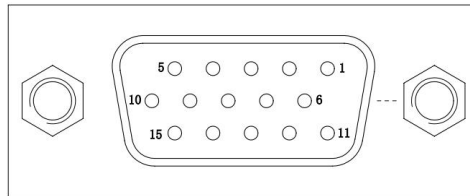
AUX COMM - RS232 Communication Connector	
1	RS232 RX	Receive Line (RS-232)
2	RS232 TX	Transmit Line (RS-232)
3	GND	RS232 GND

Connector Information		3-pin, 2.5 mm spaced, enclosed, friction lock header
Mating Connector	Model	Phoenix Contact:P/N 1881338
	Included with Drive	Yes
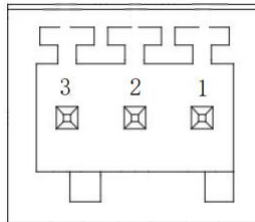
COMM - -RS485/Modbus RTU			
COMM1		COMM2	
1	-	1	-
2	-	2	-
3	-	3	-
4	RS485 RX+	4	RS485 RX+
5	RS232 RX / RS485 RX-	5	RS232 RX / RS485 RX-
6	RS232 RX / RS485 RX-	6	RS232 RX / RS485 RX-
7	RS232 TX / RS485 TX-	7	RS232 TX / RS485 TX-
8	GND	8	GND

Connector Information		Shielded RJ45 socket
Mating Connector	Model	AMP:P/N 5-569552-3
	Included with Drive	No
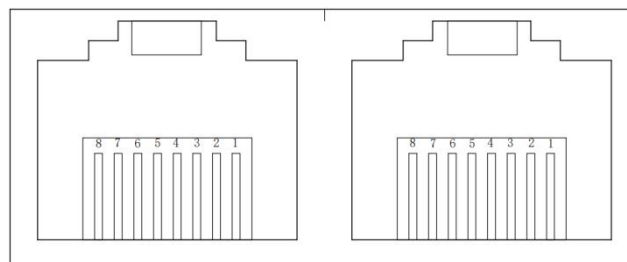
HARDWARE SETTINGS

Clamping Voltage setting				
DIP Switch				Clamping voltage ²
Switch_1	Switch_2	Switch_3	Switch_4	
ON¹	OFF	OFF	OFF	30VDC (at 24 V supply)
OFF	ON	OFF	OFF	42VDC (at 36 V supply)
OFF	OFF	ON	OFF	55VDC((at 48 V supply)
OFF	OFF	OFF	ON	78VDC(at 72 V supply)
8 Switch Functions(ADD/BAUD)				
Switch	Description		ON	OFF
1	RS485 baud rate setting		9.6kbits/sec	Load from non-volatile memory
2	RS485 2-wire and 4-wire system selection		2-wire	4-wire
3	Bit 0 of binary RS-485 drive address³. Does not affect RS-232 settings.		1	0
4	Bit 1 of binary RS-485 drive address. Does not affect RS-232 settings.		1	0
5	Bit 2 of binary RS-485 drive address. Does not affect RS-232 settings.		1	0
6	Bit 3 of binary RS-485 drive address. Does not affect RS-232 settings.		1	0
7	Bit 4 of binary RS-485 drive address. Does not affect RS-232 settings.		1	0
8	Bit 05 of binary RS-485 drive address. Does not affect RS-232 settings.		1	0
9⁴	RS485 communication TX channel 120Ω terminal resistance .		120Ω	None
10	RS485 communication RX channel 120Ω terminal resistance .		120Ω	None
1-Digit DIP switch (J1)				
Switch	Description		ON	OFF
J1⁵	RS232 and RS485 switch		RS485	RS2332

Note：

1. The DIP switch is down to "ON".

2. The DIP switch setting of the clamping voltage is particularly important. Please choose strictly according to the power supply voltage of the system. Setting errors will cause the braking resistor to not release the energy when it is required to release the energy, consume the power supply energy when the energy is not required to release the energy, and cause the internal brake clamp part of the drive to be burned in severe cases. If you need a special clamping voltage, please contact your local dealer for customization.

3. If all bits of the control RS485 ID are OFF, the ID is subject to the setting in the DriveWare software.

4. When you need to set the terminal resistance in the RS485 two-wire communication system, you only need to set Switch-9 to "ON" and keep Switch-10 to "OFF".

5. J1 is "ON" when facing the inside of the drive, and "OFF" when facing outwards. The default is "OFF".

MOUNTING DIMENSIONS
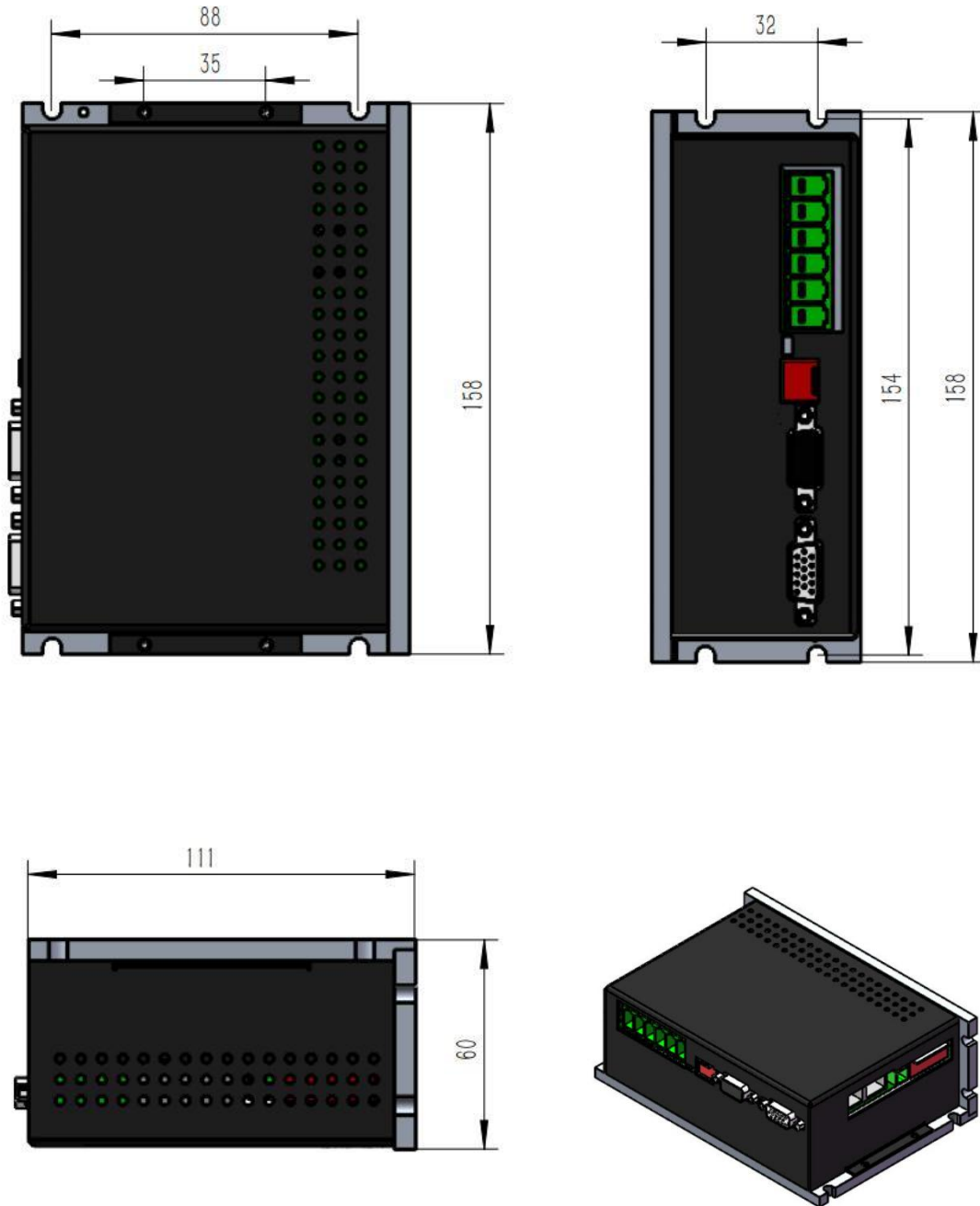
PART NUMBERING INFORMATION

Example：C P R A L T E - 0 2 0 B 0 8 0 -

Drive Series

CP	Built-in shunt regulator module

Customization *

Communication

C	CANopen
E	EtherCAT
S	EtherCAT Sub-node
p	POWERLINK / Modbus
R	RS485 / Modbus RTU

Max DC Bus Voltage

080	80
200	175

Command Inputs

AN	Analog (±10V)
	No Step & Direction (5V)
AL	Analog (±10V)
	Low Voltage Step & Direction (5V)

Power and Logic Supply

B	DC Input
	Both Logic Supply Options (Internal or User)

Digital I/O

I	Isolated (24V)
T	TTL(5V) Non-Isolated

Peak Current（A）

008	8
012	12
015	15
020	20
025	25
040	40
060	60

Motor Feedback

E	Incremental Encoder
R	Resolver
A	Absolute sin/cos (Hiperface & Endat)
S	Sin/cos and/or Halls
U	Universal (Halls, Inc. Enc., Abs. Enc, 1Vp-p Sin/Cos Enc.)

*：AMC China provides customized services for extended environment , please contact local distributors.