



Drives • Servos • HMI
Product Release
First Quarter 2006

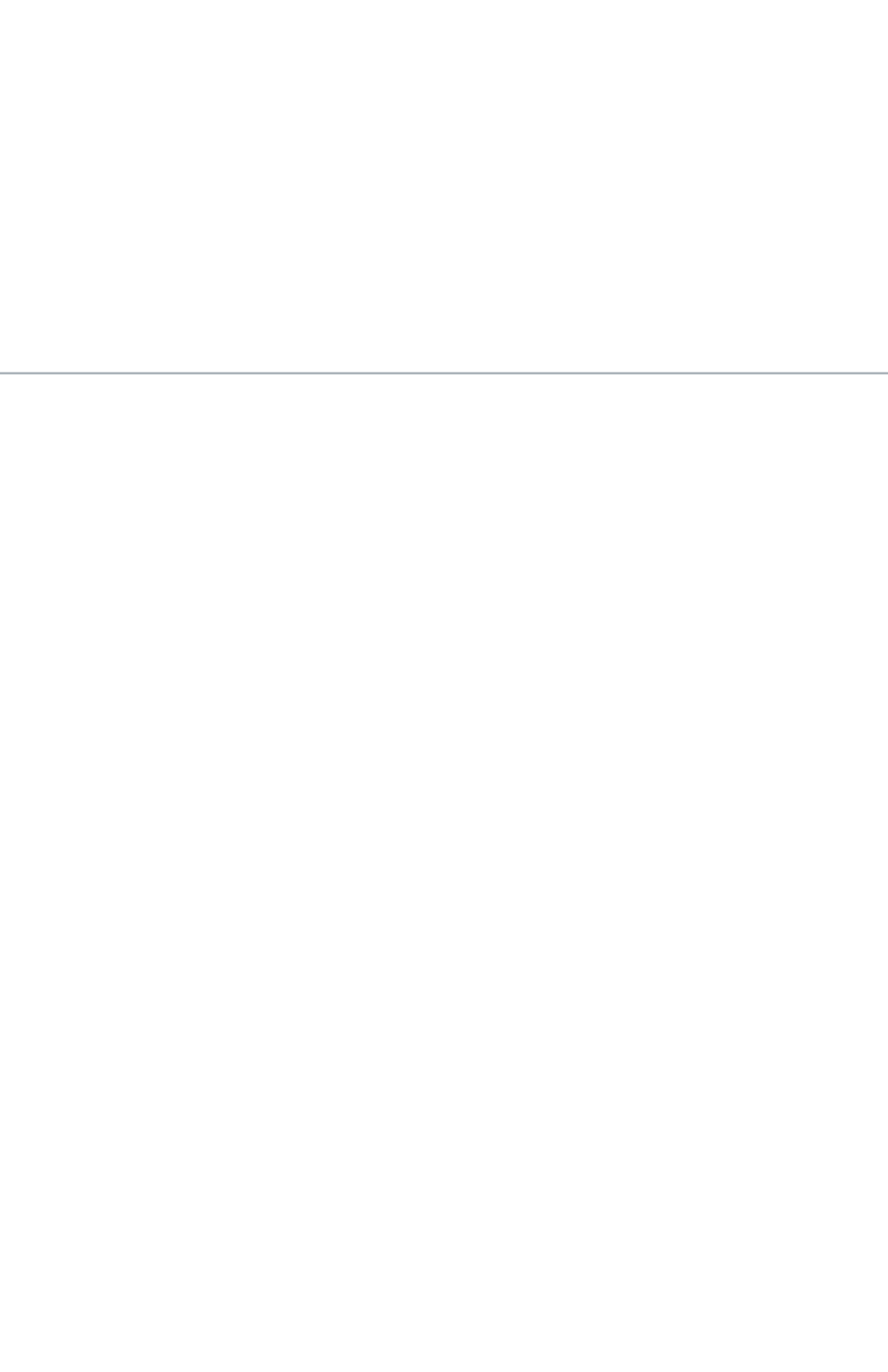


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Product Overview

One Company...One Complete Solution



The ACR family is one of the highest-performing motion controller families on the market today. All ACR products use the same system software and programming language; this assures users complete flexibility in upgrading their hardware while maintaining their investment in program development.



ACR 9000: high performance
and real-time speed

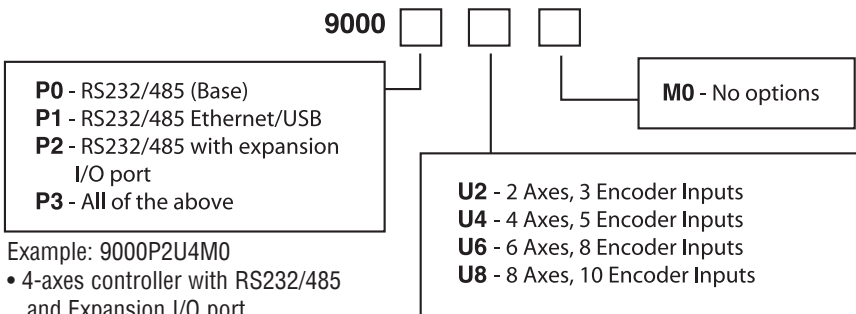
The ACR9000 is Parker's premier standalone motion controller. The ACR9000 is capable of controlling up to 8 axes of motion and is software configurable for servo or stepper control per axis. Ethernet and USB connectivity options provide the ideal solution for connecting to PCs in applications requiring high-speed data transfer. The ACR9000 also has an expansion I/O port option for connecting to the Parker I/O family of remote I/O products. All Parker ACR controllers use the same system software and programming language; this assures users complete flexibility in upgrading their hardware while maintaining their investment in program development.

The ACR9000 is the solution for standalone applications requiring industry-leading performance in an affordable and easy-to-use package.

Features

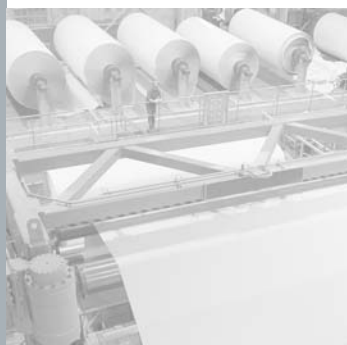
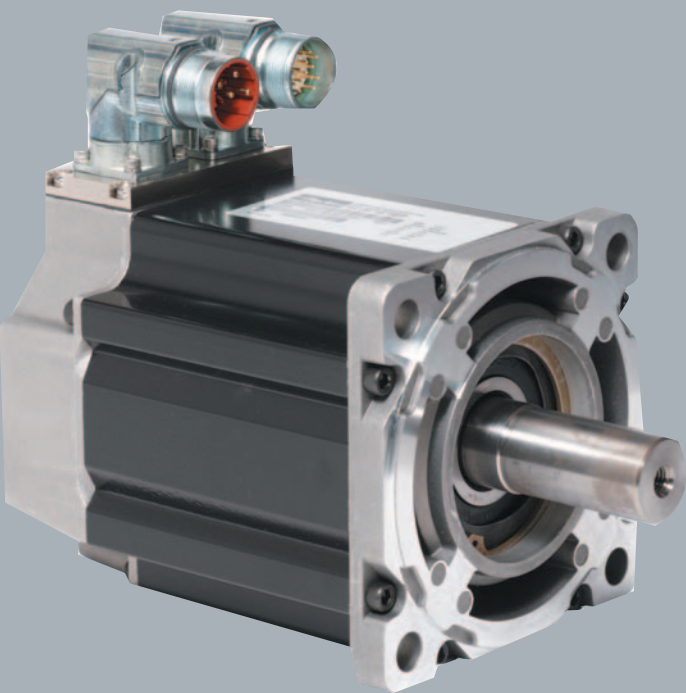
- Up to 8 axes of servo or stepper control
- 150 MFLOPS, 32-bit floating-point DSP
- Up to 10 encoder inputs at 20 MHz
- 10/100 Ethernet & USB 2.0 full-speed communication option
- RS-232/RS-485 communication
- Expansion I/O port option for connection to Parker I/O family
 - Up to 512 discrete inputs
 - Up to 512 discrete outputs
 - Up to 32 analog inputs
 - Up to 32 analog outputs
- 24 VDC optically isolated onboard inputs
 - 20 on 2 – 4-axes configurations
 - 40 on 6 – 8-axes configurations
- 24 VDC optically isolated onboard outputs
 - 4 on 2 – 4-axes configurations
 - 8 on 6 – 8-axes configurations
- 120/240 VAC power input
- CE (EMC & LVD), UL, cUL approval

How to Order





Hardware	Value
Axes/controller	2-8 axes
PC-Bus interface	NA (Standalone only)
Standalone option	Yes
Processor	32-bit floating-point DSP @ 150 MFLOPS / 75 MHz
Trajectory calculation	64-bit precision
User memory	1 MB
System memory	1 MB
Firmware	Flash-based
Flash memory	8 MB
Size	3.58" W x 10.5" H x 5.3" D (2-4 axes), 5.0" W x 10.5" H x 5.3" D (6-8 axes)
Operating system	Multi-tasking RTOS
Performance	
Multi-tasking	8 coordinated systems, motion/PLC programs
Trajectory update	Every 100-500 usec
Servo update	25 usec/axis
Ladder Logic PLC	100-500 usec scan time
Interpolation	Linear, circular, sinusoidal, helical and elliptical, splines, NURBS, 3D arcs
Servo loop	PID, velocity feedforward, acceleration feedforward notch, LoPass filtering
Position regulation	Hardware, < 1usec
Communications	
PC bus	NA
Standard interface	1 serial port (RS232 and/or RS422)
Optional interface	10/100baseT Ethernet, USB 2.0 full speed, expansion I/O port
Inputs	
Encoder input	Up to 10 at 20 MHz post-quadrature maximum
Optional onboard analog input	Up to 8 (12- or 16-bit resolution)
Command Signal	
Analog outputs	Up to 8 (16-bit precision)
Stepper outputs	Up to 8 @ 1 MHz maximum
Digital Onboard I/O	
	20, 24 VDC optically isolated onboard inputs for 2 to 4 axes
	40, 24 VDC optically isolated onboard inputs for 6 to 8 axes
	4, 24 VDC optically isolated onboard outputs for 2 to 4 axes
	8, 24 VDC optically isolated onboard outputs for 6 to 8 axes
Software Support	
Language interface	Visual Basic, Visual C++, C++
Program tools	ACR-VIEW Motion/PLC Program
Operating system	Windows® NT, 98, 2000, XP
Additional firmware highlights	Triggered floating point electronic GEARING Triggered segmented electronic CAM On-the-fly position and velocity matching Ladder Logic PLC Interruptible moves Either analog or digital feedback for position or velocity loops Dual-encoder feedback Data teach and learn functions Parameter-based with over 15,000 addressable pre-defined hardware registers Sinusoidal commutation NURBS and splines 3D arcs Automatic tangential tool operation



Designed for the demanding applications found in today's high-performance servo systems, MPP motors offer lower inertia and higher power all in a smaller package than conventional motors.



MaxPlusPlus: low inertia, high power

The “MaxPlusPlus” (MPP) series of brushless servo motors from Parker features a new design that offers lower inertia and higher power, all in a smaller motor package. These brushless servo motors are designed for the demanding applications found in today’s high-performance servo systems. The MPP motors feature segmented core technology, which can yield up to 40% higher torque per unit size than conventionally wound servo motors. “Potted” stators improve heat transfer for better thermal efficiency, resulting in increased torque at the motor shaft. High-energy neodymium magnets are employed for higher rates of acceleration. Parker will customize any MPP motor to meet your specific system requirements.

Common customizations include:

- Shafts (longer, shorter, diameter change, hollow shafts)
- Front flange (bolt circle, pilot, NEMA dimensions)
- Motors coatings (white, PTFE, steel-it grey)
- Non-standard feedback devices
- Special Connectors
- Special stator windings

Features

- Segmented core technology - 40% higher torque
- Potted stator design - improved thermal efficiency
- Size 92, 100, 115, 142, 190, 230, and 270
- Continuous torque: 1.3 Nm (12 lb-in) to 146 Nm (1295 lb-in)
- Continuous stall torque: 1.5 Nm (14 lb-in) to 162 Nm (1434 lb-in)
- Peak torque: 5 Nm (44 lb-in) to 513 Nm (4540 lb-in)
- Brushless construction
- High-performance neodymium magnets
- Thermistor protection
- Resolver, incremental encoder, or absolute encoder (single or multi-turn)
- 24 volt failsafe brake (optional)
- “Rotatable” right angle PS-style connectors
- Optional IP65 shaft seal
- Two-year warranty

Specifications



Model	Rated Speed RPM	Rated Output kW	Rated Output HP	Continuous Rotor Inertia Kg-m2 (lb-in-sec2)	Stall Torque Nm (lb-ins)	Continuous Peak torque Nm (lb-ins)	Stall Current Amps -rms	Peak Current Amps -rms	Voltage
MPP0921B	3800	0.5	0.7	.0000441 (.00039)	1.5 (14)	5.0 (50)	1.8	7	230
MPP0921C	5000	0.6	0.8	.0000441 (.00039)	1.6 (14)	5.0 (45)	2.9	10	230
MPP0921R	5000	0.6	0.8	.0000441 (.00039)	1.6 (14)	5.0 (45)	1.4	5	460
MPP0922C	4200	1.1	1.4	.0000780 (.00069)	2.9 (26)	9.3 (83)	3.7	14	230
MPP0922D	5000	1.2	1.6	.0000780 (.00069)	3.1 (28)	10.0 (88)	5.6	20	230
MPP0922R	5000	1.2	1.6	.0000780 (.00069)	3.1 (28)	9.8 (88)	2.8	10	460
MPP0923D	5000	1.6	2.1	.0001130 (.0010)	4.0 (36)	12.8 (113)	7.2	26	230
MPP0923R	5000	1.6	2.1	.0001130 (.0010)	4.0 (36)	12.8 (113)	3.6	13	460
MPP1002D	4900	1.6	2.1	.0002599 (.0023)	4.6 (41)	14.5 (129)	7.9	29	230
MPP1002R	4900	1.5	2.0	.0002599 (.0023)	4.6 (41)	14.5 (129)	3.9	14	460
MPP1003C	4200	1.8	2.4	.0003729 (.0033)	6.1 (54)	19.1 (170)	7.2	26	230
MPP1003D	4200	1.8	2.4	.0003729 (.0033)	6.1 (54)	19.1 (170)	10.3	38	230
MPP1003Q	4200	1.9	2.5	.0003729 (.0033)	6.3 (56)	19.9 (176)	3.9	14	460
MPP1003R	4200	1.9	2.5	.0003729 (.0033)	6.3 (56)	20.1 (178)	5.4	20	460
MPP1152C	4000	1.6	2.1	.0002712 (.0024)	5.7 (51)	18.1 (160)	8.5	31	230
MPP1152D	4000	1.7	2.2	.0002712 (.0024)	5.8 (52)	18.5 (163)	10.4	38	230
MPP1152R	4000	1.6	2.1	.0002712 (.0024)	5.5 (49)	17.4 (154)	4.9	18	460
MPP1153B	3400	2.2	2.9	.0004068 (.0036)	7.9 (70)	25.1 (222)	7.7	28	230
MPP1153C	4000	2.3	3.0	.0004068 (.0036)	8.1 (71)	25.5 (226)	12.1	44	230
MPP1153P	3100	2.2	2.9	.0004068 (.0036)	8.4 (74)	26.6 (235)	4.1	15	460
MPP1153R	4000	2.3	3.0	.0004068 (.0036)	8.1 (72)	25.5 (226)	6.0	22	460
MPP1154A	1900	1.8	2.4	.0005198 (.0046)	9.8 (87)	31.2 (277)	5.4	20	230
MPP1154B	3800	2.7	3.5	.0005198 (.0046)	9.8 (87)	31.3 (277)	10.7	39	230
MPP1154P	3700	2.7	3.5	.0005198 (.0046)	9.8 (87)	31.2 (277)	5.4	20	460
MPP1422C	4000	3.4	4.5	.0007796 (.0069)	11.1 (98)	35.1 (311)	14.6	53	230
MPP1422R	4400	3.4	4.5	.0007796 (.0069)	11.1 (98)	26.8 (238)	29.3	107	460
MPP1424B	3100	5.0	6.6	.001469 (.013)	19.4 (172)	61.5 (544)	19.4	71	230
MPP1424C	3800	5.2	6.8	.001469 (.013)	19.5 (173)	56.8 (503)	24.3	89	230
MPP1424R	3700	5.2	6.8	.001469 (.013)	19.5 (173)	61.6 (546)	12.1	44	460
MPP1426B	3000	6.2	8.1	.002147 (.019)	26.0 (230)	70.2 (623)	26.2	96	230
MPP1426P	3000	6.2	8.1	.002147 (.019)	26.0 (230)	82.1 (726)	13.1	48	460
MPP1428P	2900	7.0	9.2	.002599 (.023)	33.2 (294)	105.0 (931)	16.8	61	460
MPP1428Q	2900	7.0	9.2	.002599 (.023)	33.4 (295)	106.0 (935)	21.0	77	460
MPP1904P	3000	8.3	10.9	.00452 (.040)	35.5 (315)	113.0 (996)	18.0	66	460
MPP1906B	2500	9.7	12.7	.00627 (.055)	47.3 (419)	150.0 (1326)	36.2	132	230
MPP1906P	3000	9.9	13.0	.00627 (.055)	45.9 (407)	146.0 (1288)	23.5	87	460
MPP1908N	2100	11.1	14.5	.00774 (.068)	62.4 (553)	198.0 (1750)	20.6	75	460
MPP1908P	2800	11.8	15.5	.00774 (.068)	60.1 (532)	190.0 (1684)	30.3	111	460
MPP2306N	2000	11.6	15.2	.00169 (.150)	80.3 (712)	255.0 (2252)	28.5	104	460
MPP2308N	1600	13.6	17.8	.02237 (.198)	106.5 (943)	337.0 (2985)	28.1	103	460
MPP2308P	1900	14.1	18.5	.02237 (.198)	105.7 (936)	335.0 (2964)	35.7	130	460
MPP2706M	1000	12.0	15.7	.02734 (.242)	124.8 (1105)	395.0 (3497)	24.7	91	460
MPP2706N	1400	14.4	18.9	.02734 (.242)	120.1 (1064)	380.3 (3366)	32.4	118	460
MPP2706P	1600	16.5	21.6	.02734 (.242)	120.9 (1071)	382.7 (3388)	40.5	148	460
MPP2708L	900	13.8	18.1	.0353 (.313)	161.9 (1433)	512.7 (4538)	26.4	97	460
MPP2708M	1300	17.8	23.3	.0353 (.313)	155.8 (1379)	493.1 (4364)	38.9	142	460
MPP2708N	1600	20.3	26.6	.0353 (.313)	153.0 (1354)	484.0 (4287)	50.1	182	460

The new higher-power Aries drives contain all the same features and benefits as their lower-powered siblings. These time and cost saving features include Smart Encoder feedback to automatically set up the drive, support for Endat multi-turn absolute encoders to dispense with limit switches and homing routines and an innovative DriveTalk feature to communicate with the Aries drive without a serial connection.

Aries Series: high-power, compact digital servo drives

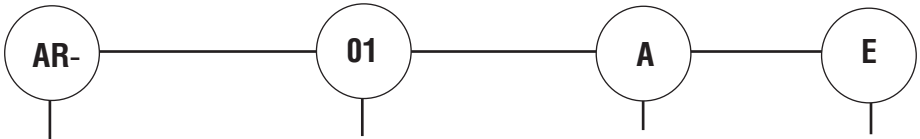
With its “plug and spin” design, the Aries family of compact digital servo drives requires no setup. Users simply attach any Parker “smart encoder” motor and the drive automatically configures. Available in seven versions (100, 200, 400, 750, 1300, 2000 and 3000 Watts), the Aries family gives users a robust and cost-effective digital servo product – users only pay for the level of performance they need. Unlike the competition, the Aries family is designed with open architecture in mind. This allows the Aries to be configured for use with any manufacturer’s motion controller and servo motor.

The Aries comes standard as a torque-only amplifier but is software selectable to run in velocity mode. An optional step-and-direction version is also available for users replacing stepper systems or not wanting to change their current step-and-direction command interface.

Features

- Plug and spin – no set up required; drive auto-configures when used with Parker’s “smart encoder” motor
- Drive Talk – ACR9000 controller can access all drive parameters
- Auto-tuning available
- Optimized for Parker’s brushless rotary and linear servo motors
- Standard quadrature encoder compatible
- 7 versions available: 100, 200, 400, 750, 1300, 2000 and 3000 Watts
- Standard high-density D-sub connectors for easy connectivity to any system
- 120/240 VAC input with required 120/240 VAC keep alive circuitry
- CE (EMC & LVD), UL compliant
- Compact design
- Brake relay
- Optional velocity and step-and-direction signal inputs

How to Order



Aries Digital Drive Series
Example AR-01AE

Maximum Shaft Power
01 - 100 Watts 13 - 1300 Watts
02 - 200 Watts 20 - 2000 Watts
04 - 400 Watts 30 - 3000 Watts
08 - 750 Watts

Command Interface
A - Analog +/- 10V
S - Step and direction

Motor Feedback
E - Encoder



Specifications	AR-01_E	AR-02_E	AR-04_E	AR-08_E
Motor Output Power				
Shaft Power @ Continuous Current	100 Watts*	200 Watts*	400 Watts*	750 Watts*
Shaft Power @ Peak Current	300 Watts*	600 Watts*	1200 Watts*	2250 Watts*
Drive Output Power				
Continuous Current (RMS)	1 Amp	1.75 Amps	3 Amps	4.5 Amps
Peak Current (RMS)	3 Amps	5.25 Amps	9 Amps	13.5 Amps
Bus Voltage	170/340 VDC			
PWM	16 or 32 kHz, motor dependent			
Drive Input Voltage	120/240 VAC, 1ø, 50/60 Hz			
Specifications	AR-13_E	AR-20_E	AR-30_E	
Motor Output Power				
Shaft Power @ Continuous Current	1300 Watts*	2000 Watts*	3000 Watts*	
Shaft Power @ Peak Current	3900 Watts*	6000 Watts*	9000 Watts*	
Drive Output Power				
Continuous Current (RMS)	6.3 Amp	10 Amps	16 Amps	
Peak Current (RMS)	14.2 Amps	30 Amps	48 Amps	
Bus Voltage	170/340 VDC	340 VDC	340 VDC	
PWM	16 or 32 kHz, motor dep.	16 kHz	16 kHz	
Drive Input Voltage	20/240 VAC, 1 or 3 ph	240 VAC, 1 or 3 ph	240 VAC, 3 phase,	
		50/60 Hz		
Performance				
Servo Update	62.5 μ secondsm			
Accuracy	\pm 1 encoder count; encoder dependentm			
Commutation	Sinusoidal			
Inputs				
Command	14-bit resolution ADC, \pm 10 V (torque/velocity control) Step and direction, 2 MHz max (position control)			
Enable/Reset	5-24 VDC			
Encoder	5 MHz (pre-quadrature); RS-422 compatible differential input			
Outputs				
Fault	5-24 VDC			
Brake	Solid state, normally open; 1 Amp @ 24 VDC max			
Encoder Out	RS-422 compatible differential driver; 5 MHz max. output frequency (pre-quadrature)			
Communications				
Type	RS-232 (3-wire)/RS-485 (2-wire) ASCII			
Baud Rate	Fixed at 9600			
Multi-drop	Up to 99 units (RS485 only)			
Drive talk	RS-485 (2 wire)			
Standards	UL, cUL, CE(LVD), CE(EMC)			
Environmental				
Temperature	0-45½ C (32-113½ F) except AR-13_E 0-40½ C (32-104½ F)			
Humidity	0-95% non-condensing			
Shock/Vibration	15g, 11 msec half sine / 10-2000 Hz @ 2g			
Weight - lbs (kg)				
AR-01_E	1.68 (0.76)			
AR-02_E	1.90 (0.86)			
AR-04_E	2.54 (1.15)			
AR-08_E	2.82 (1.28)			
AR-13_E	3.60 (1.63)			
AR-20_E	7.35 (3.33)			
AR-30_E	7.40 (3.36)			
* @ 240 VAC				



Parker's new HPC PowerStations are available in 10", 15" and 17" panel-mount touchscreen systems, as well as a non-display version. Each has been designed and tested to perform under extreme conditions, and they run in Windows® on CompactFlash for even greater reliability.



HPC/HPX Power Stations

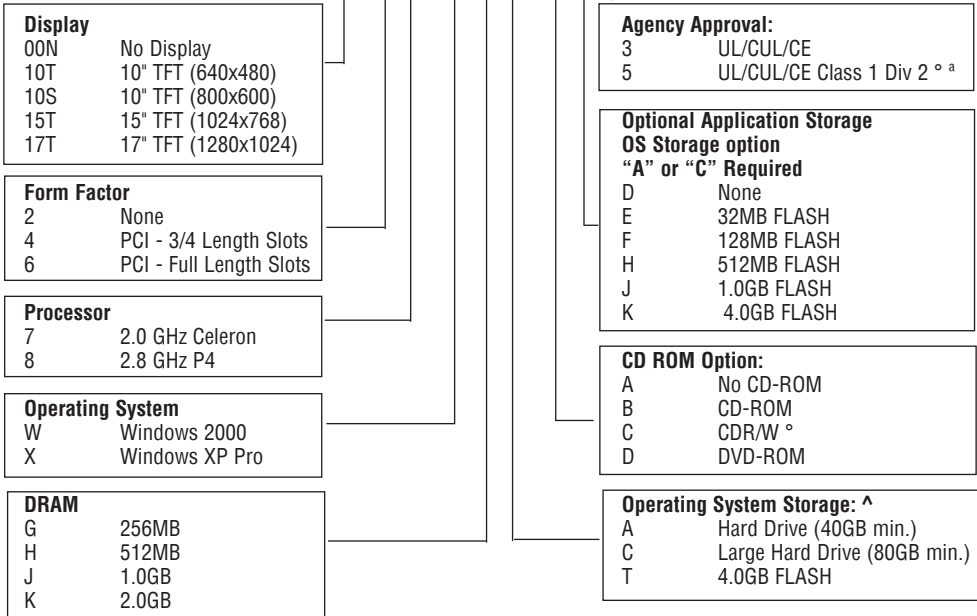
With 10", 15", and 17" panel mount touchscreen systems and a non-display system, the new HPC PowerStation line of Industrial PCs is designed and tested to extremes. HPC PowerStations are NEMA-rated, robust units that are tougher than "light duty" Industrial workstations with more processor, media and connectivity performance for your money.

CTC's award winning InteractX Windows HMI software can be purchased, installed and licensed with HPX PowerStation versions of this workstation line. This reliable, high-performance PC platform will serve your factory automation needs for years to come!

Features

- Panel Mount Touchscreen and Split System PCs
- High performance PC tested to the extremes
- UL rated for NEMA Type 4/4X hosedown
- Built for "out of box success" with a 24-month warranty
- Designed and manufactured in the USA

HPC10T - 2 7 - X G A - B D 3



Note:

All systems include 0-50 °C operation, 110VAC power and agency approvals for CE, UL & CUL. Display based systems include an analog resistive touchscreen, NEMA 4/4X rated package.

Notes and Exceptions

- ^ Actual storage volumes may be higher.
- o Class 1 Div 2 option not available with CDR/W option.
- a C1D2 systems ship with USB and PS/2 ports covered.



Display Options	10" TFT (640x480) 10" TFT (800x600)	15" TFT (1024x768) 17" TFT (1280x1024)	00" Remote (1280x1024)
Processor Support	2.0GHz Celeron or 2.8 GHz Pentium 4 Socket 478		
CPU	2.0GHz Celeron or 2.8 GHz Pentium 4 Socket 478		
Chipset	Intel 845GV/ICH4 • 400/533MHZ FSB • Intel Extreme Graphics • Hyper-Threading Technology Support		
Memory	256MB Shared DDR 200/266 (2) 184-Pin Slots, 2.0GB Max.		
System	256MB Shared DDR 200/266 (2) 184-Pin Slots, 2.0GB Max.		
Video	64MB+ Shared System Memory		
Operating System	Windows 2000 or XP Professional		
Storage Options	(1) 3.5" 40GB, Enhanced IDE		
Hard Drive	(1) 3.5" 40GB, Enhanced IDE		
CompactFlash	(1) External Type II slot (IDE Bootable)		
Floppy	N/A		
CD ROM	CDR, CDRW, or DVD-ROM or None (Bootable)		
User Interface	Analog Resistive		
Touchscreen	Analog Resistive		
Keyboard	(1) PS/2, with over current protection		
Mouse	(1) PS/2, with over current protection		
Ports	(4) USB 2.0/1.1 ports Type-A, with over current protection		
USB	(4) USB 2.0/1.1 ports Type-A, with over current protection		
Serial	(1) RS232 9-Pin D-sub (second port available on 00" units)		
Ethernet	(1) 10/100Base-T w/ RJ45		
Parallel	(1) 25-Pin D-sub		
External Video	(1) Analog 15-Pin D-sub connector (max. resolution 2048x1536)		
Audio	(1) Amplified Output, (1) Line Input, (1) Microphone, AC97		
Expansion	Slots None Standard Optional PCI Slots: (2) ¾ Length or (2) Full Length		
BIOS Options	Plug-n-Play Configurable USB Compatibility Modes Configurable Boot Devices: • Hard Drive • CD/ROM • CompactFlash • LAN • USB		
Package	0-50°C		
Temperature Range	0-50°C		
Rel. Humidity	5-95% (non-cond.)		
Vibration	5-500 Hz .5grms (Random-operational-HD) 5-500 Hz 1grms (Random-operational-CompactFlash)		
Shock	10G, 11 msec (operating) 30G, 11 msec (non-operating)		
Power Requirements	90-250 VAC; 50/60 Hz		
Agency Approval	UL/CUL; CE; Optional Class 1 Division 2 (pending)		

About Parker Hannifin Corporation

Parker Hannifin is a leading global motion-control company dedicated to delivering premier customer service. A Fortune 500 corporation listed on the New York Stock Exchange (PH), our components and systems comprise over 1,400 product lines that control motion in some 1,000 industrial and aerospace markets. Parker is the only manufacturer to offer its customers a choice of hydraulic, pneumatic, and electromechanical motion-control solutions. Our Company has the largest distribution network in its field, with over 7,500 distributors serving nearly 400,000 customers worldwide.

The Aerospace Group

is a leader in the development, design, manufacture and servicing of control systems and components for aerospace and related high-technology markets, while achieving growth through premier customer service.



The Fluid Connectors Group

designs, manufactures and markets rigid and flexible connectors, and associated products used in pneumatic and fluid systems.



The Hydraulics Group

designs, produces and markets a full spectrum of hydraulic components and systems to builders and users of industrial and mobile machinery and equipment.



The Automation Group

is a leading supplier of pneumatic and electromechanical components and systems to automation customers worldwide.



Parker's Charter

To be a leading worldwide manufacturer of components and systems for the builders and users of durable goods. More specifically, we will design, market and manufacture products controlling motion, flow and pressure. We will achieve profitable growth through premier customer service.



The Climate & Industrial Controls Group

designs, manufactures and markets system-control and fluid-handling components and systems to refrigeration, air-conditioning and industrial customers worldwide.



The Seal Group

designs, manufactures and distributes industrial and commercial sealing devices and related products by providing superior quality and total customer satisfaction.



The Filtration Group

designs, manufactures and markets quality filtration and clarification products, providing customers with the best value, quality, technical support, and global availability.



The Instrumentation Group

is a global leader in the design, manufacture and distribution of high-quality critical flow components for worldwide process instrumentation, ultra-high-purity, medical and analytical applications.

Contacts

Servo and Stepper Motion Control Systems Compumotor Division

P: 707.584.7558 or 800.358.9070

F: 707.584.2446

Applications: 800.358.9070

Human-Machine Interface and Integrated Machine Control CTC Unit of Compumotor Division

P: 513.831.2340 or 800.233.3329

F: 513.831.5042

Electromechanical Positioning Systems Daedal Division

P: 724.861.8200 or 800.245.6903

F: 724.861.3330

Automation Actuator Division

P: 330.336.3511

F: 330.334.3335

Gearheads and Linear Systems Parker Bayside

P: 516.484.5353 or 800.305.4555

F: 516.629.8000

Rotary and Linear Servo Motors Custom Servo Motor

P: 507.354.1616 or 866.506.3573

F: 507.354.1611

Linear Servo Motors and Positioning Systems Trilogy

P: 281.226.7750

F: 281.226.7760

CD Contents: Competitive Data, Power Point Presentations, Fliers, Pricing, Images, Press Releases, Sales Bulletins, Software and User Guides (if applicable).



Parker Hannifin Corporation
Electromechanical North America Division
parkermotion.com