# PAS

## PLASTIC ASSEMBLY SYSTEMS

### DPC IV Plus

# *Dynamic Process Controller ™ (DPC)*

## INTEGRATED PROCESS CONTROL SYSTEM



*The easiest to use,*
*yet most features-rich*
*process controller available!*

## DESIGN

- Integrated power supply and process controller saves space, and simplifies setup and operation

- Modular component design maximizes product flexibility and cost effectiveness by allowing the selection of various power levels and process control features

- System upgradeability allows quick, simple field installation of control and/or user interface features not originally selected

- Retrofittable to existing ultrasonic press systems to bring precise process control and monitoring features to applications already in production

- 19" (48cm) rack mountable version for easy system integration at minimal cost

- Universal IEC 320 power cord receptacle accommodates most worldwide power requirements

- Networking capabilities for multihead and automated systems' setup and monitoring through a single user interface available

- User interface options available for full-screen data entry and parameter viewing

- Compatible with current PAS presses, thrusters, and probes

# DPC IV Plus DYNAMIC PROCESS CONTROLLER™

*The* **DPC IV** Plus *lets you* control *and* monitor *every major parameter of the weld process* faster *and more* accurately *than ever before possible!*

## DYNAMIC PROCESS CONTROL

- Powerful 32-bit RISC microprocessor addresses more data in less time for superior performance

- Real-time, multitasking operating system simultaneously controls and monitors process parameters

- One millisecond sample rate samples cycle parameters one thousand times per second on a cycle-by-cycle basis for greater accuracy, consistency, and control

- Primary *and* secondary control functions offer total flexibility in process control, reducing rejects and increasing part consistency

- Unique Dual Pressure mode increases the clamp force for a better melt during the weld cycle, or a tighter assembly during the hold cycle

- For parts requiring more than one assembly operation and more than one set of process parameters, Sequencing mode automatically changes setups after a user-defined number of process cycles

- Data sampling mode allows user-selectable sample sizes and intervals for downloading or internal storage of up to 10,000 characteristics

- Nonvolatile setup memory stores 25 setups to eliminate repetitive setup procedures and conveniently accommodate multiple projects

- Built-in serial and parallel communications ports for real-time interfacing to external devices such as a printer for permanent documentation, an optional user interface for full-screen display, or another computer for additional data storage or statistical process control (SPC) analysis

- Self-diagnostic error messages simplify troubleshooting and correcting setup and programming mistakes

- Auxiliary outputs provide automation-ready signals, such as ready out, part limit status, in dwell, and part status, for flexible, easy system integration with automated machinery and PLCs

- Programmable bad part limits indicate all parameters outside the tolerance established for an acceptable part

- Programmable suspect part limits indicate parameters in a range that would cause a part to be suspect

- User-activated limit indicators label bad and suspect parts on printouts and an optional user interface showing out-of-tolerance parameters

- Bad part audible and/or electronic alarm alerts the operator to any reject parts without having to look at the user interface

- Separate suspect part audible and/or electronic alarm tells the operator to set the part aside for inspection

- On-screen, real-time power, distance, optional force and pressure, and time graphic output for immediate analysis or documentation of assembly process data (requires an optional user interface)

- Frequency and power displays for checking and monitoring acoustic stack characteristics

- Optional remote setup switching allows setup selection in response to a keyed fixture or a PLC signal, minimizing changeover time and increasing productivity

- Programmable pressure profiling and force by interface with the electronic pressure regulator, pressure transducer, and load cell press options offer increased control, repeatability, and consistency

## FRONT PANEL INTERFACE

- Four line by twenty character LCD display shows cycle data and setup information using terms that are easy to understand

- Twelve-button keypad with one touch "Hot Keys" makes programming and parameter entry, selection, or modification fast and easy

- System power output indicates normal or possible overload operating condition during the weld cycle

- System status panel displays any of six self-diagnostic messages, including Fault, Input Test, Overload, On Line, Overtemperature, or Off Line

# PAS

PLASTIC ASSEMBLY SYSTEMS
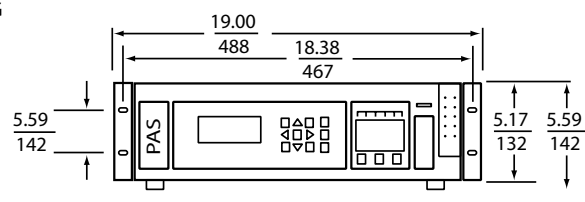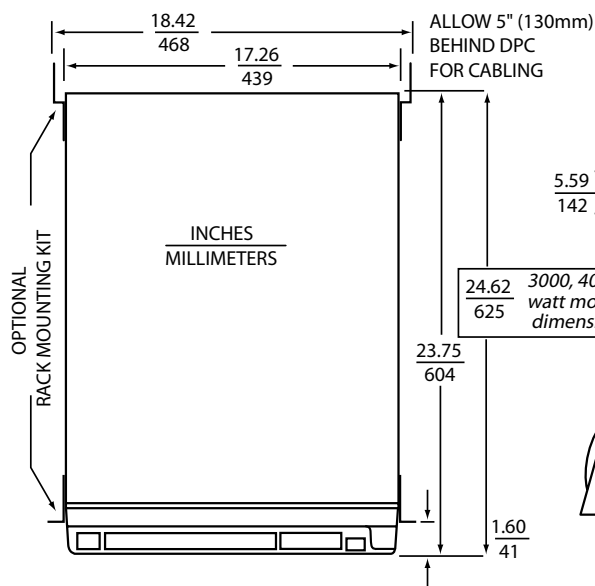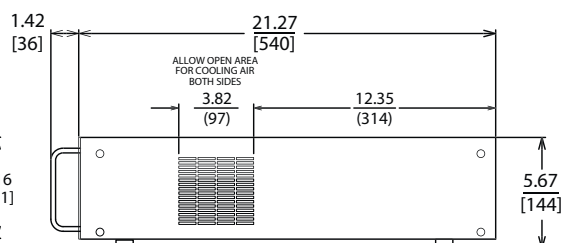
## DISTANCE MODULE and LINEAR ENCODER

- Weld by distance mode controls the melt collapse distance to insure that the same volume of material melts on each part so that the finished joint strength is consistent

- Weld by absolute distance mode controls the finished part height to yield uniform assemblies

- All distance parameters (downstroke, trigger delay, weld, hold, absolute weld, total weld, and total stroke distances) are monitored, with upper and lower limits for bad and suspect parts to verify quality and consistency

- High quality linear optical encoder with a one-micron resolution for excellent precision and repeatability

- Graphing capability for plotting a Distance vs. Time curve on every weld, either on an optional user interface or a serial or parallel printer
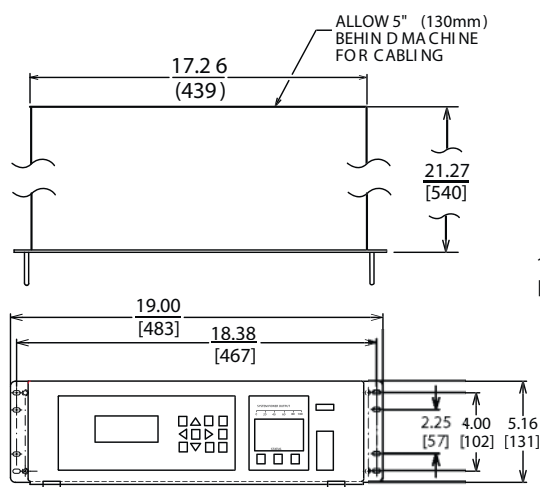
## POWER and ENERGY MODULE

- Weld by peak power mode terminates ultrasound when the available joint material is completely melted, compensating for variations in the molded part

- Weld by energy mode delivers a specific amount of energy to the work to enhance process control

- Monitors all power and energy parameters with upper and lower limits for bad and suspect parts

- System power output indicates normal or possible overload operating condition during the weld cycle

- System status panel displays any of six self-diagnostic messages, including Fault, Input Test, Overload, On Line, Overtemperature, or Off Line

- Graphing capability for plotting a Power vs. Time curve on every weld, either on an optional user interface or a serial or parallel printer

ALLOW 5" (130mm) BEHIND MACHINE FOR CABLING

17.26 (439)

21.27 [540]

19.00 [483]

18.38 [467]

2.25 [57]  4.00 [102]  5.16 [131]

*Rack Mount*

1.42 [36]

21.27 [540]

ALLOW OPEN AREA FOR COOLING AIR BOTH SIDES

3.82 (97)

12.35 (314)

5.67 [144]

18.42 468

17.26 439

ALLOW 5" (130mm) BEHIND DPC FOR CABLING

INCHES MILLIMETERS

OPTIONAL RACK MOUNTING KIT

19.00 488

18.38 467

5.59 142

5.17 132

5.59 142

PAS

24.62 625  *3000, 4000 watt models dimensions*

23.75 604

ALLOW OPEN AREA FOR COOLING AIR BOTH SIDES

3.82 97

12.35 314

1.69 43

1.60 41

## PAS

**PLASTIC ASSEMBLY SYSTEMS**

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# DPC IV Plus DYNAMIC PROCESS CONTROLLER™



*Linear Ramp Soft-Start ...*

*One Touch " HOT KEYS "*

*AUTO-TRAC tuning*

*Line Regulation*

*Load Regulation*

*Overload Protection*

*Complete PAS compatibility*

*... and much more!*

## GENERATOR

• Patented Pulse-Width Modulation design delivers power more efficiently with substantially less stress on the electrical components for superior performance, reliability, and extended service life

• Unique Linear Ramp Soft Start *accelerates* the transducer and tooling up to operating amplitude eliminating mechanical and electrical starting stress

• AUTO-TRAC tuning using phase lock loop technology automatically locks the generator to the resonant frequency of the transducer and tooling even under varying conditions of temperature and loading

• PAS exclusive FLOW-THROUGH COOLING provides on demand thermostatically controlled cooling system that separates electronic components from the cooling air flow chamber

• Electronic overload protection prevents component failure, reducing costly downtime

• Advanced transformer and inductor designs increase efficiency and reliability of electronic components

• Line regulation compensates for line fluctuations assuring consistent amplitude

• Load regulation assures constant amplitude at various loads improving assembly consistency

• Universal Voltage Input automatically compensates for line voltages between 90-130, or 180-260 volts

• Programmable phase adjust, startup frequency, and soft-start time to fine tune the generator to the acoustic tooling, if necessary

## MODELS

| POWER / FREQUENCY | 100 W | 150 W | 350 W | 500 W | 700 W | 1000 W | 1200 W | 1500 W | 1700 W | 2200 W | 3300 W | 4000W |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 kHz | | | | | | | | | | | | 1400 |
| 20 kHz | | | | 2050 | | | 2120 | | 2170 | 2200 | 2330 | |
| 30 kHz | | | | | | | | 3150 | | | | |
| 40 kHz | | | 4035 | | 4070 | 4100 | | | | | | |
| 50 kHz | | 5015 | | | | | | | | | | |
| 70 kHz | 7010 | | | | | | | | | | | |

Note: All specifications are subject to change without notice. Please consult PAS Ultrasonics for any updated information.

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