

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 Dukane 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

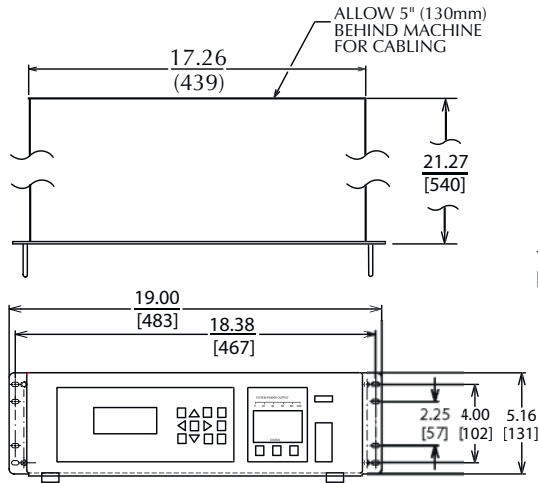
- **Four line by twenty character LCD display** shows cycle data and setup information using terms that are easy to understand
- **Twelve-button keypad** with one touch "Hot Keys" makes programming and parameter entry, selection, or modification fast and easy
- **System power output** indicates normal 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

**DISTANCE MODULE and LINEAR ENCODER**

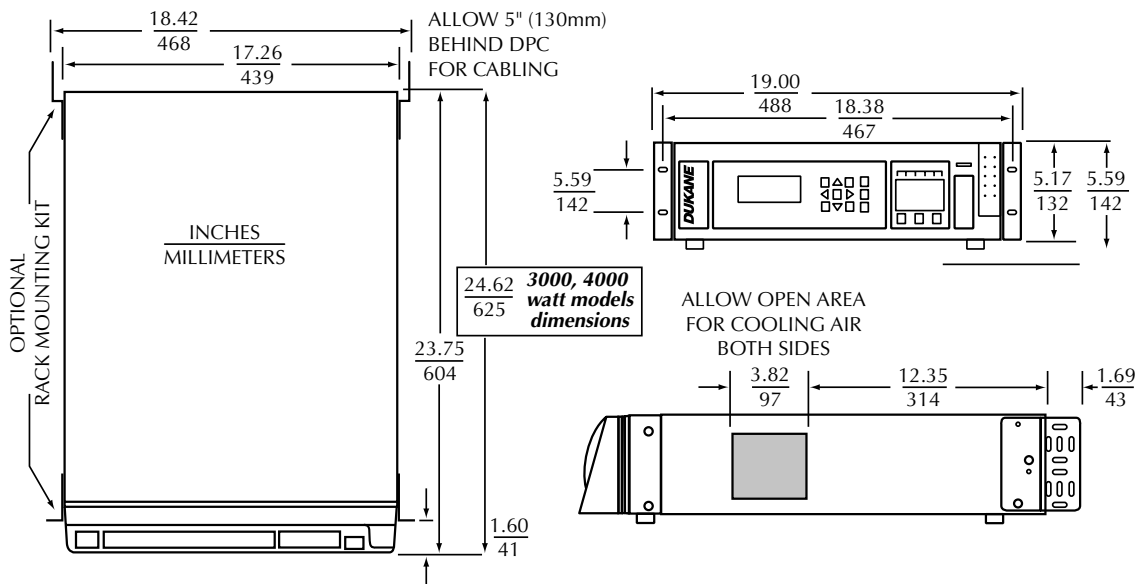
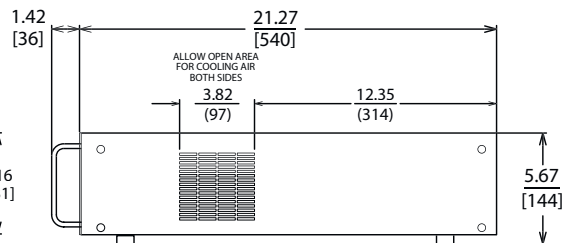
- **Weld by distance mode** controls the melt collapse distance to insure that the same volume of material melts on each part so that the finished joint strength is consistent
- **Weld by absolute distance mode** controls the finished part height to yield uniform assemblies
- **All distance parameters** (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

**Rack Mount**



## DPC IV Plus DYNAMIC PROCESS CONTROLLER™



**Linear Ramp Soft-Start ...**  
**One Touch "HOT KEYS"**  
**AUTO-TRAC tuning**  
**Line Regulation**  
**Load Regulation**  
**Overload Protection**  
**Complete Dukane 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
- **Dukane 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 Dukane Ultrasonics for any updated information.

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