

PAS PLASTIC ASSEMBLY SYSTEMS

PAS iQ Series LE ultrasonic welding systems are an entry level machine designed for applications that require significantly less process documentation, yet are built on the robust precision mechanical platform as our full featured machines. Available in either 20 kHz or 15 kHz in power ranges from 1200 – 4800 watts. Two main models offer either Time and Energy or Time Energy and Distance. While the LE is an entry level machine advance features like Process Limits, 0.5 millisecond sample rate, separate Weld and Hold pressures and multiple setup recipe storage with front panel lock out come standard on all LE models.

FEATURES

- **100% digital control** of all power supply functions and parameters allows for unique configurations and future upgrades or requirements. Includes digital frequency synthesis.
- Industry leading data **acquisition rate speed of 0.5 ms** due to advanced **multi-core architecture**. Increased weld accuracy and repeatability.
- **Amplitude adjustment** in 1% increments from 20% to 100% through front panel or remote (4-20) mA.
- **Linear Ramp Soft-start** algorithm allows the acoustic stack to be brought to operating amplitude smoothly, minimizing start-up surges and abnormal stress to the stack and power supply.
- **Digi-Trac** tuning automatically tracks the resonant frequency digitally. No need to manually tune the generator during every weld cycle. The output frequency adjusts itself to match the acoustic stack (sonotrode booster and transducer).
- **Line and Load Regulation amplitude** is maintained independent of load force and incoming line voltage variations. Through a closed-loop amplitude control, the amplitude regulation maintains output amplitude be correcting for fluctuations in line voltage and output power loading. Maintained within 1% to provide weld process consistency and shorter cycle times.
- **Programmable softstart** and **softstop** amplitude can be used to reduce stress on acoustic stacks, or for high-speed application to achieve full amplitude in as short as 0.010 seconds. Factory configurable settings also available.

iQ Series

ULTRASONIC PRESS SYSTEM



AUTOMATED



HAND PROBE



PRESS

LE



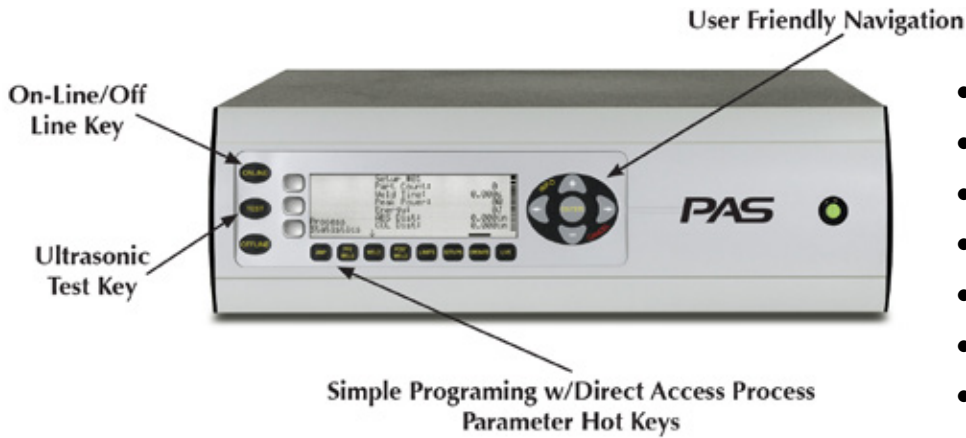
Power and Frequencies

1200 W | 2400 W | 3600 W - 20 kHz
3600 W | 4800 W - 15 or 20 kHz

Easy Fault is exclusive to iQ power supplies. System faults and alarms prompt a fault code, (i.e. U501). Enter the code at www.dukane.com/easyalarm and the Easy Alarm search will provide additional tips and process improvement information. Thus expediting fault /alarm solutions and reducing down time.



IQ GENERATOR/POWER SUPPLY FEATURES



- **100% digitally controlled**
- **Linear Ramp Soft-Start**
- **DIGI-TRAC tuning**
- **Line Regulation**
- **Load Regulation**
- **Overload Protection**
- **Complete PAS compatibility**
- **... and much more!**

Trigger by Power (U.S. Patent 7,475,801)

Provides more consistent welds by providing a sufficient and repeatable amount of pressure/force to be applied to the part before the weld cycle starts. Trigger by Power is a cost effective alternative to Trigger by Force. However, unlike Trigger by Force, Trigger by Power does not require additional, expensive components such as a load cell, amplifier board and cabling. In effect, the system uses the ultrasonic stack as a load cell. When the ultrasound is activated, the amplitude is ramped up to the Trigger Amplitude setting and held there until enough force is applied to the part to reach the Trigger Power setting. At that point the weld cycle begins and will continue until the weld control parameter (Time, Energy or Power) is reached.

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 Position** 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.

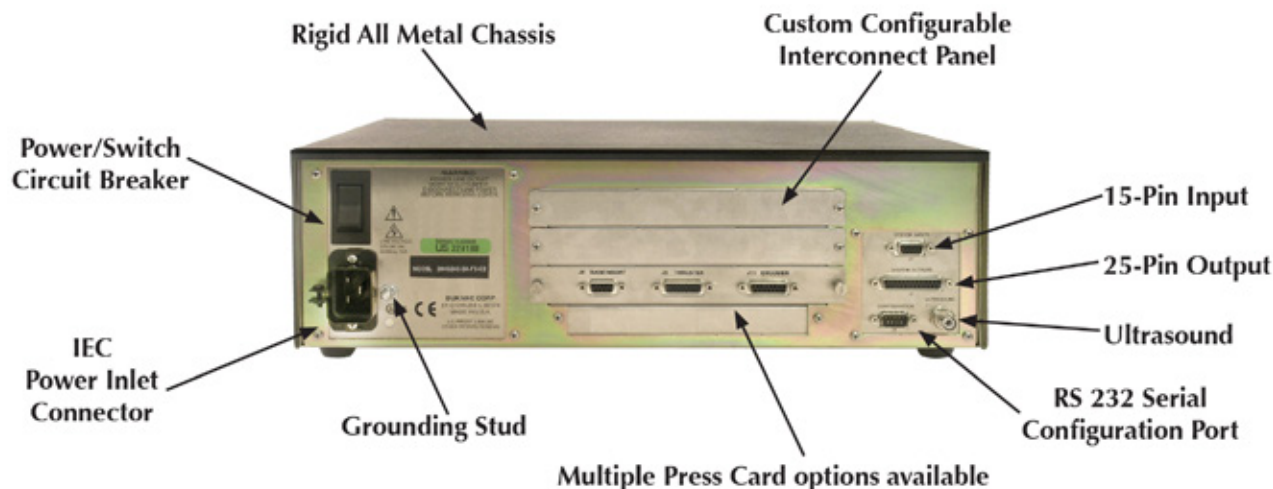
Power and Energy Module

- **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.

- **User-accessible, programmable advanced hardware** settings allow N.D.S. changes to Phase Shift, Free Run Frequency, Frequency Lock/Hold and Frequency Limits – providing advance settings for difficult acoustic stacks.
- Selectable **frequency lock and hold** feature system ignores digi-trac automatic tuning feature and locks to startup stack frequency – helps in difficult applications where the stack couples with a product.
- **Afterburst** includes delay and duration time settings.
- **Advanced I/O is standard** with 25-pin output, and 15-pin input, user configurable from the utility menu. Visit: www.dukane.com/us go to **downloads/application notes**.
- **Patented modular hardware design** incorporates motherboard/interconnect of internal components. Reduces internal cabling while increasing reliability and performance.
- **Unique Dual Pressure mode** increases the hold clamp force for a tighter assembly during the hold cycle.
- **Power display** for checking and monitoring acoustic stack characteristics.
- **Eight Unique Setup Storage** includes Amplitude, Process Parameters and Limits.
- **Flow Through Cooling.**



IQ GENERATOR/POWER SUPPLY FEATURES



iQ Press Features

- **Rugged construction** using the highest quality components provides superior performance, precision, and reliability.
- **Compact, single-rail linear ball slide assembly** system offers accurate positioning, stable movement, and friction-free travel.
- **7" (178 mm) stroke** with mechanical bottom stop adjustable in 0.001" (.025 mm) increments.
- **Top-of-stroke limit switch** for automation application.
- **All controls are accessible from the front** for convenient set-up and operation.
- **Easy-to-use front panel position indicators** with universal icons instantly show settings of position and bottom stop, and optional slow speed, pre-trigger, and end-of-weld switches.
- **Chrome-plated column and titanium booster** are standard.
- **Internally mounted optional linear encoder** saves space in multi head and automated installations.
- **Remote pneumatics availability** offers increased flexibility in system integration.
- **OSHA-required lockout for air supply** is standard.
- **Ergonomic base and cycle activation switches** reduce operator fatigue.
- **Status indicators in base** for Power, In Cycle, and Abort clearly communicate system conditions.
- **Twist-release emergency stop switch** meets international safety standards.
- **Press/thruster design provides system flexibility and upgrade ability**, reducing equipment investment.

Options

- **Hydraulic speed control** offers precision hydraulic control of the melt velocity. This is critical to achieve maximum weld strength in staking, inserting and shear joint applications.
- **Patented resonant mount booster.**
- **Longer press columns** to increase part load area height.
- Custom air cylinder 1.50" (38 mm), or 2.00" (51 mm) and 3.00" (76 mm) diameters.
- **Ultra Series Press system compatibility** card allows for seamless connection to legacy Dukane Ultra Series welders.

Automation Interfacing

PAS's iQ LE modular welders can be interfaced with external devices and controls (e.g., PLCs). This will require both a 15 pin input cable and 25 pin output cable (optional).

Inputs include, 8 Remote Setup Switching, Front Panel Security Lock Out, Reset Latch Input and Cycle Activation.

Outputs include 22 VDC to power users automation controls, Multiple Programmable status, Numerous fault status, including Good, Bad and Suspect Part, Power Monitor Out and Amplitude Monitor output.

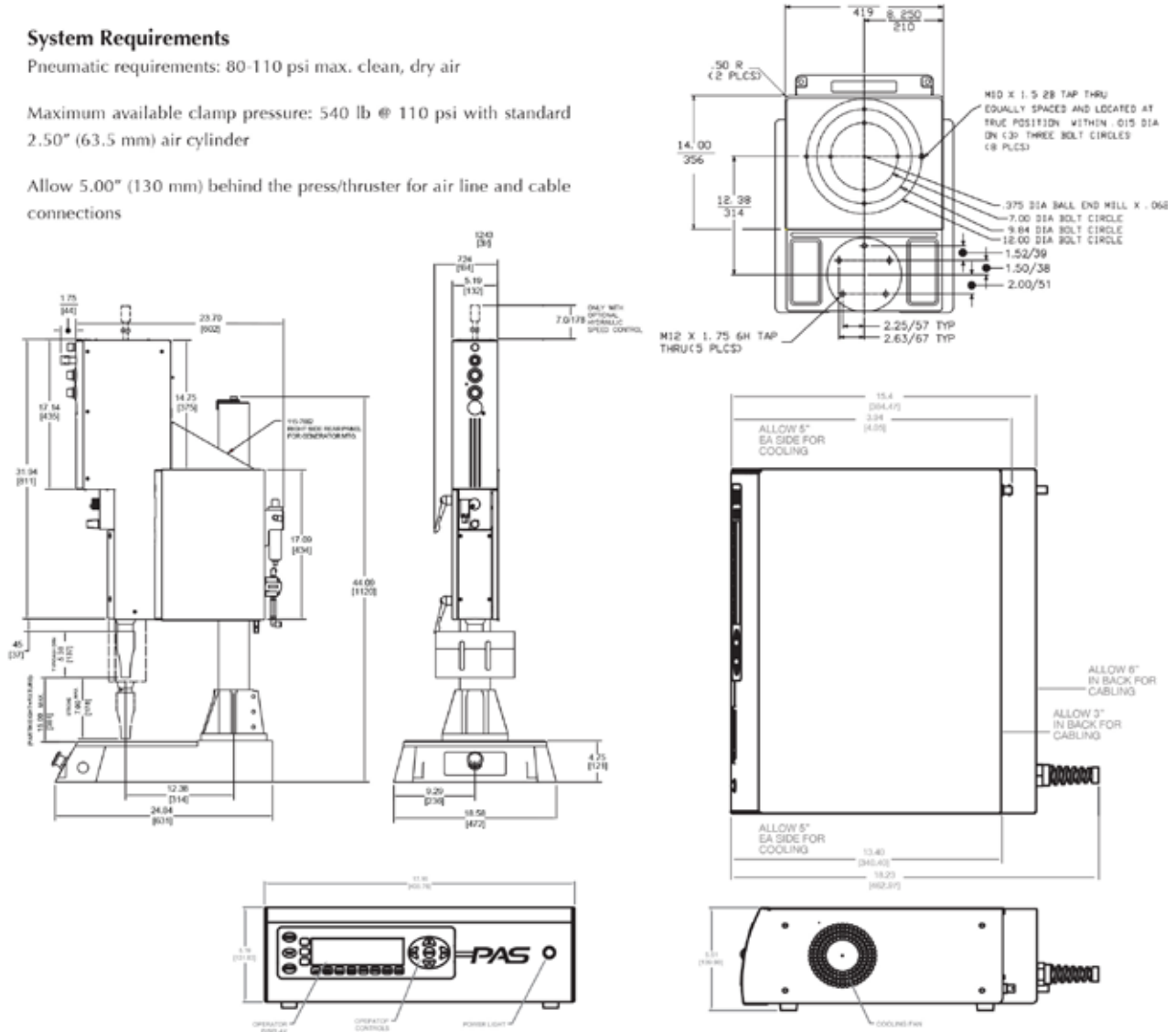
DIMENSIONS

System Requirements

Pneumatic requirements: 80-110 psi max. clean, dry air

Maximum available clamp pressure: 540 lb @ 110 psi with standard 2.50" (63.5 mm) air cylinder

Allow 5.00" (130 mm) behind the press/thruster for air line and cable connections



DIMENSIONS

Press Dimensions	Standard	Press Dimensions	Standard	Thruster Dimensions	
Base Width	18.58" (472 mm)	Column CL to Horn CL	12.38" (314 mm)	Housing Height	31.90" (810 mm)
Base Depth	24.83" (631 mm)	Usable Throat	8.00" (200 mm)	Housing Width	5.19" (132 mm)
Column Height	39.00" (991 mm)	Stroke	7.00" (178 mm)	Housing Depth	11.00" (280 mm) Max.
Column Diameter	3.50" (89 mm)	Weight	170.00 lbs (77 kg)	Weight	40.00 lbs. (18 kg)
Maximum Height	57.00" (1450 mm)	Housing Width	5.19" (132 mm)		

MODELS

Power / Frequency / Profile	1200 W	1800 W	2400 W	3600 W	4800 W
15 kHz				X	X
20 kHz	X		X	X	
Max. current:	15 amps	15 amps	15 amps	30 amps	30 amps
1200 W fixed cord 100-120 VAC	1200 W model also available in 200-240 VAC				

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

