

DCX S

General Description

The DCX series power supply provides the highest power density in the smallest package on the market today and offers multiple form factors, providing integrators with a high level of flexibility. Multiple models are available in three frequencies and three form factors (horizontal, vertical, and rack mount): 20 kHz, 30 kHz, and 40 kHz. The power supplies may be combined with an actuator or a converter/booster/horn stack to form an ultrasonic package designed for continuous-duty or production systems.

Simple User Interface

The user interface is engineered to simply but effectively provide users with operating and diagnostic functions at the touch of a button. The front-panel interface includes amplitude setting, power meter, status indicators, and a user-service Ethernet port, which allows the user to communicate with the power supply via the onboard Branson Global User Interface Program.

Ethernet Communication

The Branson Global User Interface Program allows the user to interface with the power supply via a standard Internet browsing program, such as Internet Explorer. The user is capable of remote communication with the power supply, allowing product configurations and system diagnostics, among other functions.



Higher Productivity

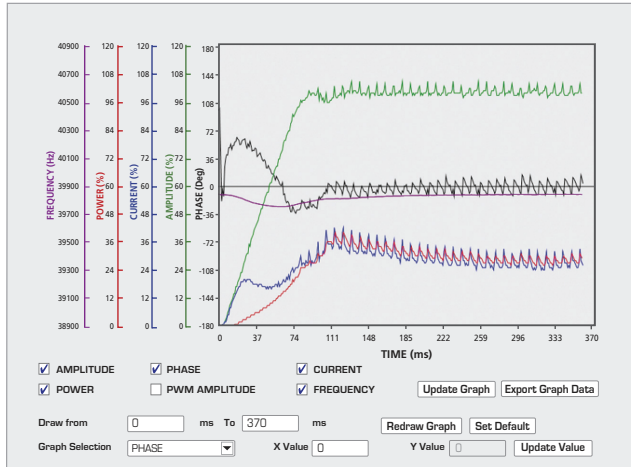
The proven digital communication platform with closed-loop amplitude control provides significant benefits in performance, consistency, and higher productivity, especially in applications requiring a high level of process control, weld quality, and high throughput.

Branson Global User Interface

The user interface eliminates costly software and dedicated computer hardware configuration that often leads to a loss of productivity and time. The connection to this new interface tool is done using a standard RJ45 or Cat 5 cable.

The Branson Global User Interface Program is structured using a standard HTML-based communication interface protocol. This allows the user to employ a commercially available Internet interface program. Once the user is connected, he or she will be allowed to perform product setup, custom I/O configurations, and system diagnostics. The interface offers a tab structure for simple navigation.

Weld Graph



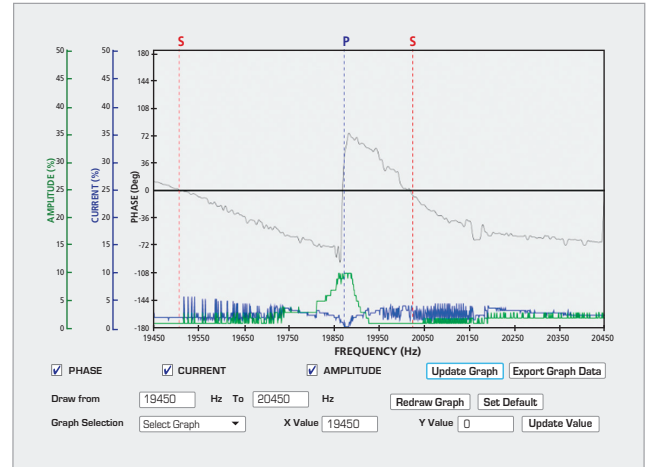
Displays graphing of the weld data in 1-ms increments. The weld graph data includes power, frequency, and amplitude. The weld graph data can also be exported to a spreadsheet.

Weld Setup

The Weld Setup configuration screen is divided into three main sections: WELD, SEEK, and POWER ON. The WELD section includes 'Amplitude' (Weld Amplitude [%] set to 100, with an 'External' checkbox), 'Frequency' (Digital Tune set to 19950, Internal Offset [Hz] set to 0, 'External Offset' checkbox, and 'End of Weld Store' checked), and 'Start Ramp (ms)' set to 80. The SEEK section includes 'Seek Ramp (ms)' set to 80, 'Seek Time (ms)' set to 500, 'Seek Frequency Offset' set to 0, and a 'Timed Seek' checkbox. The POWER ON section includes radio buttons for 'Off', 'Seek', and 'Scan'. At the bottom, there are 'Save', 'Cancel', and 'Restore Defaults' buttons, and the EMERSON logo.

Allow for setup of the weld amplitude, start ramp, alarm latching, and Power On frequency options.

Horn Signature and Diagnostic



Allows for viewing and documenting the horn characteristics after a broadband frequency scan. The scan graphically displays the horn's characteristics and reports the parallel and series-resonant frequencies.

I/O Configuration

The I/O Configuration interface is divided into four sections: DIGITAL INPUTS, DIGITAL OUTPUTS, ANALOG INPUTS, and ANALOG OUTPUTS. The DIGITAL INPUTS section includes: J3-1 (External Start, 0 V@24 V), J3-2 (External Seek, 0 V@24 V), J3-3 (UNASSIGN, 0 V@24 V), J3 (External Reset, External Seek, External Start, External Text, 0 V@24 V), and External Alarm (0 V@24 V). The DIGITAL OUTPUTS section includes: J3-7 (Ready, 0 V@24 V), J3-8 (Sonomics Active, 0 V@24 V), J3-9 (General Alarm, 0 V@24 V), and J3-10 (Seek/Scan Out, 0 V@24 V). The ANALOG INPUTS section includes: J3-17 (Amplitude In) and J3-18 (Frequency Offset). The ANALOG OUTPUTS section includes: J3-24 (Power Out) and J3-25 (Amplitude Out). At the bottom, there are 'Save', 'Cancel', and 'Restore Defaults' buttons, and the EMERSON logo.

Enables configuration of all digital and analog I/O configurations.

Key Features

Electronic Amplitude Control – Amplitude is an important variable in ultrasonic welding. Electronic amplitude control allows repeatable setups and digital accuracy in selecting amplitude and changing the amplitude during a weld cycle. The DCX S features digital amplitude control through the LCD user interface or through the User Interface Program. The amplitude control can also be set from a user-provided external source through the I/O port. The amplitude rate and level can be changed

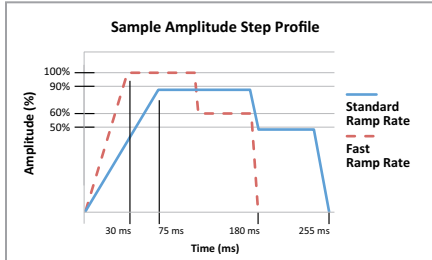


Figure 1

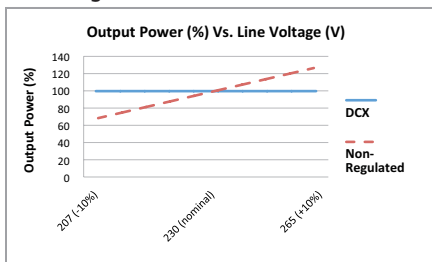


Figure 2

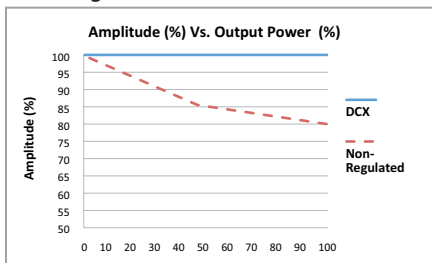


Figure 3

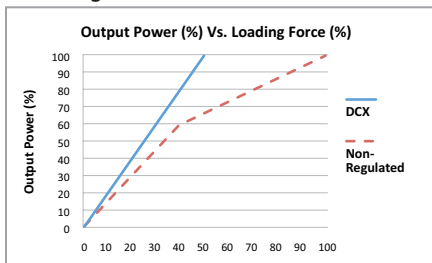


Figure 4

instantaneously during a weld to increase the weld energy, decrease the weld time, and increase product throughput (Figure 1). The amplitude range is programmable between 10 and 100% output.

Regulation – The DCX S converter's output amplitude is maintained independent of load force and line voltage variations. Through a closed-loop amplitude control, the amplitude regulation maintains output amplitude by correcting for disturbances in line voltage (Figure 2) and output power loading (Figure 3). A non-regulated power supply's horn amplitude will fall with increasing output power and horn-loading force. With constant regulated amplitude, less force is required to deliver output power (Figure 4), and a more stable linear relationship is maintained between amplitude and power. Other advantages of regulated amplitude and lower force include greater weld consistency, less flash, and less deflection of thin-walled parts.

Autotune Plus Memory (AT/M) provides fully automatic tuning in a range of ± 500 Hz centered around 19.950 kHz for 20 kHz horns, ± 750 Hz centered around 30.00 kHz for 30 kHz horns, and ± 1000 Hz centered around 39.90 kHz for 40 kHz horns. The AT/M stores the horn frequency in the DCX controller for consistent and reliable horn starting.

Auto Seek tracks the operating frequency of the stack when the DCX is idle. The Auto Seek function automatically finds the horn's frequency by running the horn at a low-level amplitude (10%) and storing the operating frequency in the DCX controller's memory. Auto Seek is a selectable option and can be initiated by Power-up, by depressing the TEST button, by external command, or by one-minute timed Seek.

Scan performs a full-frequency analysis of the horn's operating band and stores the primary operating frequency into memory. This ensures reliable horn starting and allows diagnostics and analysis of the horn's resonant frequencies.

Programmable Starting Ramp Times – The ultrasonic starting rate can be programmed from 1 to 999 milliseconds to accommodate the starting characteristics of a wide range of horns. Selecting the shortest possible ramp time can improve the cycle rate.

Front-Panel Interface – The icon-driven interface allows the user to read and set the weld amplitude, perform horn tests, configure the DCX weld settings, and clear alarms.

I/O Interface allows direct hook-up with programmable controllers. I/O status outputs and command inputs are programmable through the User Interface Program and are available through the 26-pin D-shell port.

Power Measurement – Real output RF power to the horn is measured and displayed in 5% increments through the front-panel LCD bargraph screen. The output power reading is also available through the I/O port in a relative 0 to 10 V analog output signal.

Enclosure Design – The DCX comes in a vertical, horizontal, and rack mount industrial enclosure. The vertical enclosure allows mounting in industrial automation cabinets. The horizontal enclosure allows mounting on bench tops or shelves. The rack mount enclosure is for mounting in a 19" drawer. Thermal management of the internal components in the DCX horizontal and vertical is accomplished through a cooling channel, which separates the electronics from the air flow. The DCX rack mount requires a separate rack mount fan unit for cooling.

System Protection Monitor (SPM) circuitry ensures maximum reliability by necessitating correct operating conditions to protect the power supply, converter, and other system components. The benefit of this circuitry is to avoid equipment failures and downtime.



Branson's acoustic clamp for use in automation maintains converter and booster alignment.

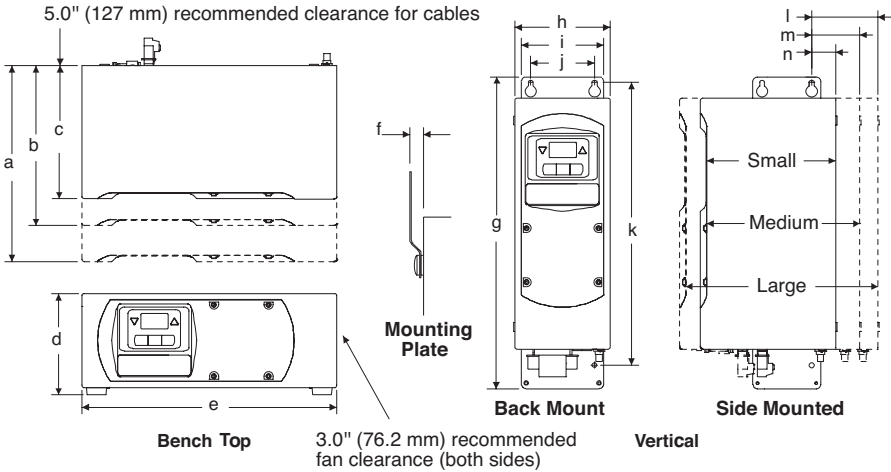
DCX S Series Specifications – Horizontal & Vertical

Three Power Supply Sizes

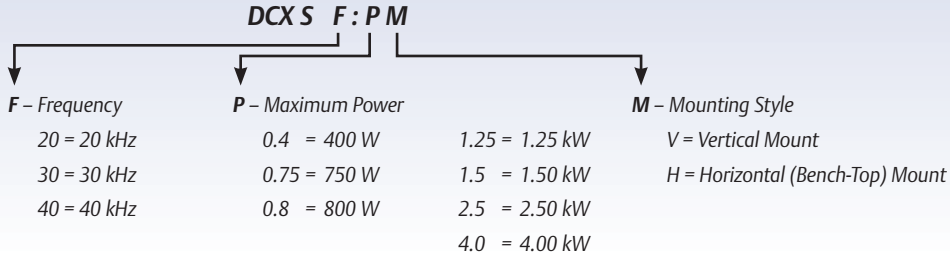
Size	Small			Medium		Large	
DCX S	40:0.4	30:0.75	40:0.8	20:1.25	30:1.5	20:2.5	20:4.0
Frequency	40 kHz	30 kHz	40 kHz	20 kHz	30 kHz	20 kHz	20 kHz
Peak Output Power	400 W	750 W	800 W	1250 W	1500 W	2500 W	4000 W
Max. Continuous Power	200 W	375 W	400 W	625 W	750 W	1250 W	2000 W
Circuit Breaker	10 A	10 A	10 A	15 A	15 A	25 A	25 A
Line Voltage	180-253 VAC, 50/60 Hz, 1 PH			180-253 VAC, 50/60 Hz, 1 PH		180-253 VAC, 50/60 Hz, 1 PH	
Weight	16 lbs. / 7.25 kg			18 lbs. / 8.16 kg		22 lbs. / 10 kg	

Dimensions

Dimension	Inch	mm
a	10.63	270.0
b	8.63	219.2
c	7.13	181.1
d	5.53	140.5
e	14.01	355.9
f	0.37	9.4
g	17.38	441.5
h	5.22	132.6
i	4.50	114.3
j	3.50	88.9
k	15.75	400.0
l	3.37	85.6
m	2.37	60.2
n	1.06	26.9



Ordering Key



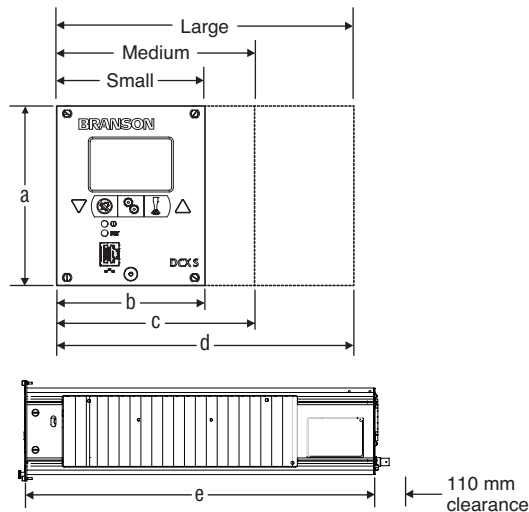
DCX S Series Specifications – Rack Mount

Three Power Supply Sizes

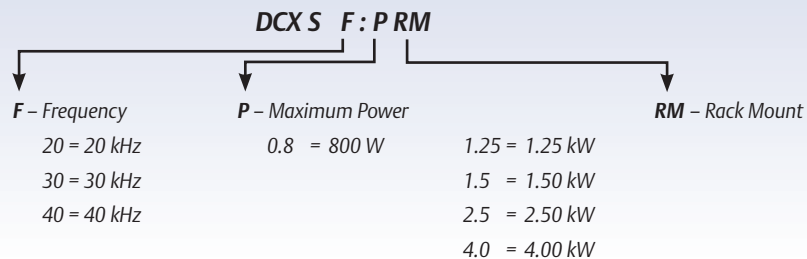
Size	Small		Medium		Large
DCX S	40:0.8	30:1.5	20:1.25	20:2.5	20:4.0
Frequency	40 kHz	30 kHz	20 kHz	20 kHz	20 kHz
Peak Output Power	800 W	1500 W	1250 W	2500 W	4000 W
Max. Continuous Power	400 W	750 W	625 W	1250 W	2000 W
Fuse	16 A	16 A	16 A	16 A	25 A
Line Voltage	180-253 VAC, 50/60 Hz, 1 PH		180-253 VAC, 50/60 Hz, 1 PH		200-253 VAC, 50/60 Hz, 1 PH
Weight	8 lbs. / 3.6 kg		12 lbs. / 5.4 kg		15 lbs. / 6.8 kg

Dimensions

Dimension	Units	mm
a	3 HE	128
b	21 TE	106
c	28 TE	142
d	42 TE	213
e	—	450



Ordering Key



True Global Support & Service

Branson Ultrasonics is the world leader in materials joining, with more than 1,800 employees and 70 sales and support offices. We are committed to leading the industry in products, solutions, service, and support excellence. That means fast delivery, troubleshooting, parts replacement, feasibility studies, cooperative research, preventative maintenance, and repair services. Branson is part of the Industrial Automation division of Emerson, a diversified international manufacturing and technology company committed to developing technological breakthroughs that advance the performance of a wide range of products and processes.

All specifications subject to change without notice. All dimensions are nominal.
All units are CE compliant and comply with FCC rules and regulations governing radio frequency interference.



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