DEEP SEA ELECTRONICS

DSEP960, DSEP962 & DSEP915 Installation Instructions

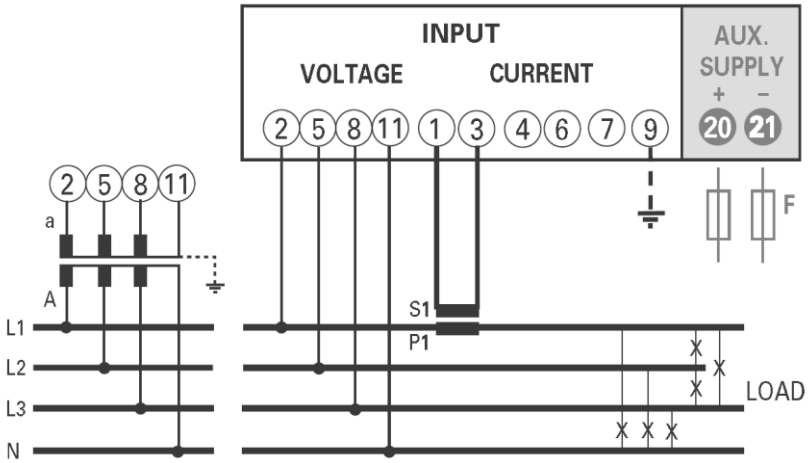
These instructions are intended as a quick guide only. For complete instructions and specifications, refer to DSE publication *057-302 DSEP960 Operator Manual* available from www.deepseaelectronics.com .

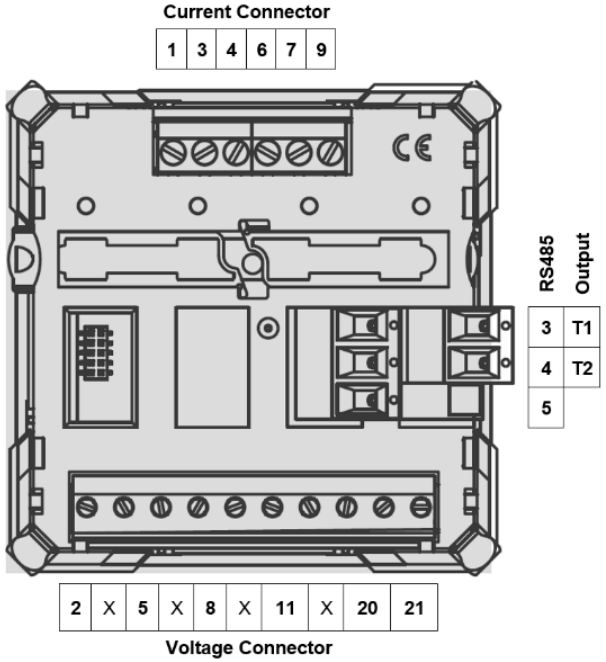
TYPICAL CONNECTIONS

NOTE: This diagram shows connection to a 3 phase, 4 wire topology. For details of other wiring topologies, refer to DSE Publication: *057-302 DSEP960 Operator Manual* available from www.deepseaelectronics.com.

NOTE: Cables / wires must be installed as indicated to prevent liquid (water) entering the device. Part number of suitable connectors / blanking plugs are detailed in DSE publication *057-302 DSEP960 Operator Manual* available from www.deepseaelectronics.com.

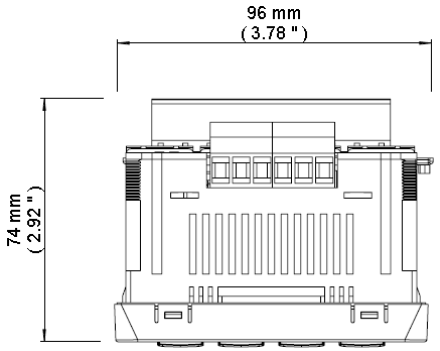
NOTE: Screened 120 Ω impedance cable specified for use with RS485 must be used for the RS485 connection. DSE stock and supply Belden cable 9841 which is a high quality 120 Ω impedance cable suitable for RS485 use (DSE part number 016-030).

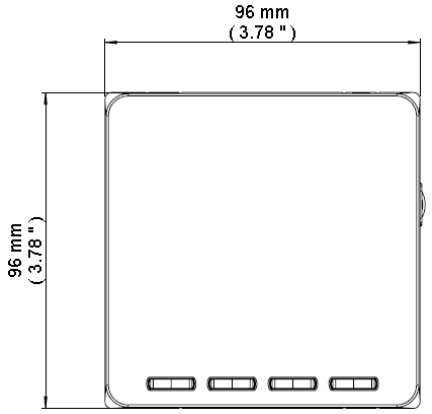


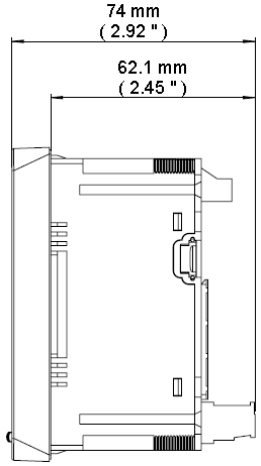


DIMENSIONS, MOUNTING AND HOUSING

Item	Specification
Mounting Type	Fascia Mount
Panel Cutout	92 mm X 92 mm (3.6 " X 3.6 ")
Dimensions (width X height X depth) (without DSEP915)	96 mm X 96 mm X 74 mm (3.8 " X 3.8 " X 2.9 ")
Dimension (width X height X depth) (with DSEP915)	96 mm X 96 mm X 93 mm (3.8 " X 3.8 " X 3.7 ")
Connections	Screw Terminals
Overall Weight	<1 kg (2.2 lb.)
Case Material	Self Extinguishing Polycarbonate
IP Protection (EN60529)	IP54 Fascia when mounted IP20 Rear
NEMA Protection	12 Fascia when mounted 1 Rear
Weight	285 grams (10 oz)







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VIEWING THE INSTRUMENTS

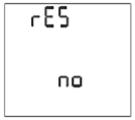
The Display is divided into four menus. Press the relevant function key to cycle the items within the menu:

V	A	P-Q-S	E-PF-F
Voltage Phase and Linked	**Current** Phase and Neutral	**Three Phase Power** Active, Reactive, Apparent, Distorting	**Power Factor** Phase and Three Phase
Minimum Voltage Phase	**Current Demand** Phase	**Phase Power** Active, Reactive, Apparent	**Frequency**
Maximum Voltage Phase	**Maximum Current Demand** Phase	**Power Demand** Active, Reactive, Apparent	**Run Hour**
Voltage Harmonic Distortion	**Average Current** (I1+I2+I3)/3	**Maximum Power Demand** Active, Reactive, Apparent	**Positive Active Energy** Partial and Total
	Current Harmonic Distortion		**Positive Reactive Energy** Partial and Total
			Negative Active Energy
			Negative Reactive Energy

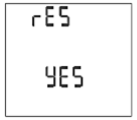
RESETTABLE VALUES

The *Accumulated* values listed below are reset by following the button path shown below.

- Press  and  at the same time.



- Press  to select YES:



- Then press  to reset the instrument.

Applicable to:

- Minimum and Maximum Voltage.
- Current Demand and Current Maximum Demand.
- Active, Reactive, Apparent Power Maximum Demand.
- Run Hour.
- Partial Active and Reactive Energy.

CURRENT TRANSFORMERS

Item	Specification
Applicable Terminals	1, 3, 4, 6, 7, 9
CT Secondary Rating	1 A / 5 A
CT Ratio	1 to 9999
Maximum CT Primary	50 kA with 5 A secondary 10 kA with 1 A secondary
Working Frequency (Automatically Detected)	45 Hz to 65 Hz 360 Hz to 440 Hz
Measurement Type	True RMS
Harmonics	Up to 50th Harmonic
Peak Factor	2
Start Time (energy count)	<5 s
CT Burden	1 VA per phase, to max 6 A

Item	Specification
Rigid Cable	0.05 mm^2 to 6. 0mm^2 30 AWG to 10 AWG
Flexible Cable	0.05 mm^2 to 4.0 mm^2 30 AWG to 12 AWG
Tightening Torque	1.0 Nm (8.9 lbf.in)

VOLTAGE TRANSFORMERS

NOTE: Where the supply to be measured is above the maximum voltage specified above (and below 1200 V), VTs are used to transform the voltage to a level within the specification.

Item	Specification
Applicable Terminals	2, 5, 8, 11
VT Ratio	1 to 10
Maximum VT Primary	1200 V
VT Burden	0.1 VA ph-N

Item	Specification
Rigid Cable	0.05 mm^2 to 4.5 mm^2 30 AWG to 12 AWG
Flexible Cable	0.05 mm^2 to 2.5 mm^2 30 AWG to 13 AWG
Tightening Torque	0.6 Nm (5.3 lbf.in)

VOLTAGE SENSING

Item	Specification
Applicable Terminals	2, 5, 8, 11
Type	Single Phase and Three Phase networks, with or without Neutral.
Single Phase Voltage Range	50 V ph-N to 290 V ph-N
Single Phase Voltage Nominal	230 V ph-N
Three-Phase Voltage Range	80 V ph-hp to 500 V ph-ph
Three-Phase Voltage Nominal	400V pn-N.
Working Frequency (Automatically Detected)	45 Hz to 65 Hz 360 Hz to 440 Hz

DSEP961 AUXILLARY SUPPLY

NOTE: Aux Supply must be connected to Terminals 20 and 21. For DSEP961 Aux Supply is 80 V AC to 265 V AC, 100 V DC to 300 V DC. For DSEP962 Aux Supply is 11 V DC to 60 V DC.

NOTE: 50 Hz and 60 Hz nominal supply is automatically detected and selects the *Low Frequency* measurement, range 45 Hz to 65 Hz.

Item	Specification
Applicable Terminals	20, 21
Aux Suppy Rating	80 V AC to 265 V AC 110 V DC to 300 V DC
Working Frequency (Automatically Detected)	45 Hz to 65 Hz 360 Hz to 440 Hz
Burden	2.5 VA at 230 V AC supply without DSEP915. 3.5 W at 110 V DC supply without DSEP915.
Protection	Protected against incorrect polarity.

DSEP962 AUXILLARY SUPPLY

Item	Specification
Aux Suppy Rating	11 V DC to 60 V DC

RS485

Item	Specification
Applicable Terminals	RS485 3, RS485 4, RS485 5
Type	Galvanically isolated from AC inputs and Auxiliary Supply.
Standard	3 Wire RS485. Half Duplex, Autogating.
Protocol	Modbus RTU / Modbus TCP
Slave Address	1 to 255
Number of Data Bits	8
Number of Stop Bits	1
Parity Bit	None, Even, Odd
Query Response Time	< 100 ms
Transmission Speed (baud rate)	4800 bit/s, 9600 bit/s, 19200 bit/s, 38400 bit/s
Modbus Message Format for 32-bit Values	Big Endian, Little Endian, Swap
Max Devices	32
Max Distance to Master	1200 m (1600 yds)

ETHERNET (DSEP915)

Item	Specification
Applicable Terminals	RJ45 Connector
Type	Galvanically isolated from AC inputs and Auxiliary Supply.
Standard	Auto Detection
Protocol	Modbus TCP
Slave Address	1 to 255
Network Settings	IP Address Subnet Gateway Speed Mode TCP Port TCP Timeout
Query Response Time	< 100 ms
Transmission Speed	Max 10 Mb/s
Modbus Message Format for 32-bit Values	Big Endian, Little Endian, Swap

ENVIRONMENTAL CONDITIONS

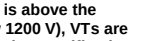
Item	Specification
Nominal Temperature	23 ºC ± 2 ºC (73.4 ºF ± 3 º F)
Temperature Range	5 ºC to 55 ºC (41 ºF to 131 ºF)
Storage and Transport Temperature	-25 ºC to 70 ºC (-13 ºF to 158 ºF)
Max Power Dissipation (For Thermal Calculations of Control Panel)	5 W

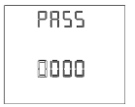
CONFIGURATION

NOTE: This document is intended as a guide only, for full details of module configuration, refer to DSE Publication: *057-302 DSEP960 Operator Manual* available from www.deepseaelectronics.com.

ACCESSING THE CONFIGURATION MENUS

The *Configuration Menu* is accessed by following the button path shown below.

- Simultaneously press  and  to enter the Configuration Menu.



- Press  and  to adjust the digit to the desired value for the menu you wish to access, then press  to move to adjust the next digit.

- Adjust all digits as required, press  to confirm completed entry of the Access Code.

The *Configuration Menu* is divided into subsections, accessed using different *Access Codes*.

Item	Level1	Level 2	Level 3
	PASS 1000	PASS 2001	PASS 3002
1	Customised Display Page	CT Ratio	Communications Protocol
2	Connection	VT Ratio	
3	Current and Power Delay		
4	Display Contrast		
5	Backlit Display		
6	Rated Frequency		
7	CT Secondary Rating		
8	Run Hour Meter Count Start		
9	RS485 Communications		
10	Pulse Output		
11	Harmonic Analysis		