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Field Installation Manual

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IMPORTANT INSTRUCTIONS

ATTENTION: After completing the installation and testing, it is essential that this booklet is drawn to the attention of the person responsible for its future operation and maintenance and is available for ready reference all the time.

FAILURE TO READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY BEFORE INSTALLATION & OPERATION WILL VOID WARRANTY OF ES-1 AND COULD CAUSE SERIOUS PERSONAL INJURY, FIRE HAZARD & ELECTRIC SHOCK MAY LEAD TO DEATH.

CAUTION:

To prevent electric shock, disconnect electric power to system at main fuse or circuit breaker box until installation or rework is complete.

PRECAUTION:

Do not use on circuits exceeding specified voltage.

Do not short main terminals to test.

Electrical Installation and all components of the installation must be UL listed / UL approved and as per NEC code.

WARNING

Celec manufacture components & parts that can be used in a wide variety of industrial & commercial applications. The selection and application of Celec products remains the responsibility of the equipment designer or end user. Celec accepts no responsibility for how its products may be incorporated into final design. Under no circumstances should any Celec product be incorporated into any product or design as the exclusive or sole safety control, all controls should be designed to dynamically fault defect and fail safety under all circumstances. Any warning provided by Celec must be passed through to the end user. Celec offers a warranty only as to the quality of its product to confirm to the catalog specifications. No other warranty is offered. Celec assumes no liability for any personal injury, property damage, losses or claims arising out of the misapplication and Non performance of its products.

PRODUCT SPECIFICATIONS

Model: …… ES-1, ES-1 (E)

Rated Voltage…… 240V AC

Phases…… Single Phase 120/240V AC

Rated Frequency…… 60Hz

Maximum Current…… 14 Amp per phase

Maximum kVar…… 3.3

Maximum Ambient Temperature …… 40^0C

Enclosure…… Type 1

Connection Terminal	Connection Type	Size	Wire Type & Temperature	Torque N-m (Lb-in)
T1	Power Circuit	12 AWG, Str.	CU, 60/75°C	1.2(14)
T2	CT Circuit*	10 AWG, Str./Sol.*	CU, 60/75°C	0.5(7)
Earthing Terminals	Bonding Circuit	14 AWG, Str./Sol.	CU, 60/75°C	8.5(75)

*** Specified as per UL. Nominal Current in CT Circuit is less then 100 mA. May use 18-22 AWG Str./Sol.**

UNPACKING

1. Un Pack the ES-1 from box using Plastic Strip Cutter.
2. Collect the Accessories as per the Packing Slip.
3. Remove any cardboard or thermocol packing inside the ES-1 given for support during transportation.
4. Do not use ES-1 in case of any Breakage or loose connections or Oil Spill inside.

MOUNTING

CAUTION: - Indoor Use Only, Type-1 Enclosure.

1. Choose the dry and Clean Wall to Install the ES-1 taking care conduit connections from Bottom side Enclosure Size is 300 x 200 x 120 mm and weight 6kg (13 Pounds).
2. Premark the Mounting holes on wall or structure.
3. Make a Drill for the wall plugs.
4. Fix the Enclosure on wall with fasteners

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Connection Type # 1

Use this instruction

If 20 Amp circuit breaker is available in customer Main Breaker Panel.

ES-1 is designed for use with Main Breaker Panel Single Phase 120/240V AC up to 200 Ampere.

ES-1 unit should be mounted with four appropriate sized fasteners before connect to Main Breaker Panel.

1.1 Power Connections

1.11 Remove the Panel cover of ES-1 exposing internal connections.

1.12 Locate Earth Terminal in ES-1, connect the earth wire to ES-1 Earth Terminal. Connect the other side of earth wire to main breaker panel ground rod. Ensure all mechanical connections are secure and making full contact.

1.13 Locate existing 2 Pole 20 Amp Circuit Breaker in the Main Breaker Panel.

(a) Connect the wire L1 to Phase 1 of 20 Amp circuit breaker.

(b) Connect the wire L2 to Phase 2 of 20 Amp circuit breaker.

1.14 Qualified Representative must inspect size of cable 12 AWG.

1.15 Connect power cables to T1 Terminal Block of ES-1.

1.2 Current Sensor Connections

1.21 Open one side of split CT (Current Sensor). Clip the CT on the wire L1 before main Circuit Breaker as shown in the (fig-1) Page-6.

1.22 Locate terminal block T2 (S1-S2) in ES-1.

1.23 Qualified Representative line side of Main Panel should connect the wires from external CT to T2 (S1-S2), preferably twisted.

1.24 Firmly secure current sensor to line side (L1) of main circuit breaker.

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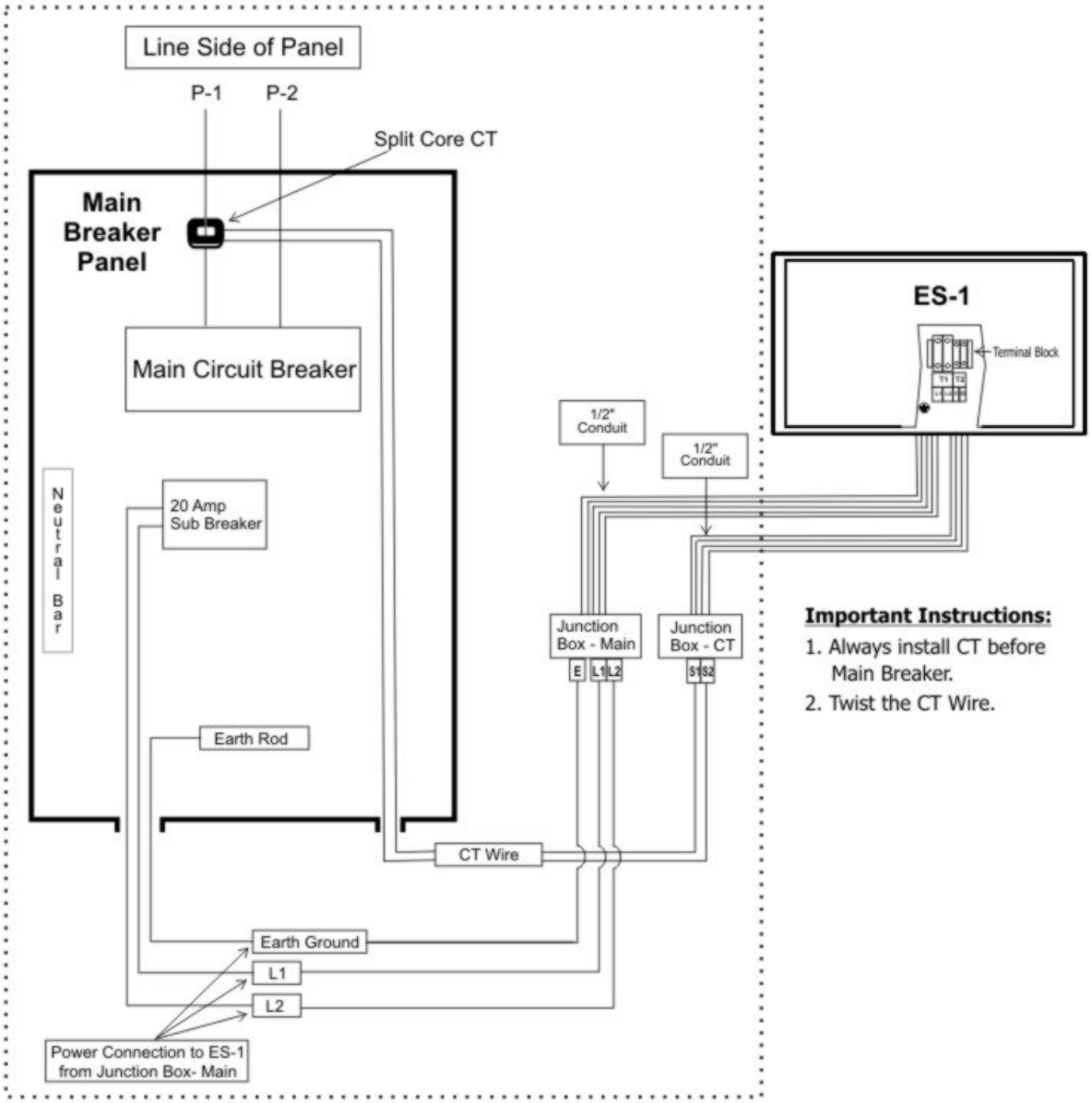
Connection Diagram



Important Instructions:

1. Always install CT before Main Breaker.
2. Twist the CT Wire.

Note:

- All Components used for installation must be UL listed or UL recognized.
- Earth Terminal in ES-1 must be connected to Panel earth rod.
- All external connections and additional work must be performed by qualified representative in accordance with NEC.
- Failure to comply will void warranty.

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Connection Type#2

Use these instructions

If 20 Amp circuit breaker is unavailable, existing blanks are available.

ES-1 unit is designed for use with Customer Main Breaker Panel Single Phase 120/240V AC up to 200 Amp.

ES-1 units should be mounted with four appropriate sized fasteners before connect to Main Breaker Panel.

1. Remove Main Panel covers exposing internal wiring and breakers.
2. Remove existing 2 Pole breaker blanks and install new 2 Pole 20 Amp circuit Breakers.
3. For rest of connection follow the Connection type#1 on page 5.

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Connection Type#3

Use this instruction

If 20 Amp circuit breaker is unavailable and require a new disconnect switch or other approved device.

ES-1 unit is designed for use with Customer Main Breaker Panel Single Phase 120/240V AC up to 200 Amp.

Representative must purchase 20 Amp Blade-Fused Disconnect Switch or 20 Amp Circuit Breaker for connection of ES-1 to Customer Main Breaker Panel.

1. Install new 20 Amp Blade-Fused disconnect or External Circuit Breaker switch to wall or existing backboard. Qualified Representative should note if codes allow for direct connection to bus bars in main breaker panel or requires installation of an additional sub panel.
2. Wire in rigid conduit between customer main breaker panel & external disconnect switch. Connect to ES-1 using 1/2''conduit.
3. Locate earth ground connection in ES-1 and connect to grounding bar or to earth ground rod in main breaker panel.
4. For rest of connection follow the Connection type#1 on page 5.

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Electrical Data Sheet

Model	ES-1, ES-1 (E)
Phase Configuration	Single Phase 120/240V AC
Maximum Line Voltage	240V AC
Maximum Power	3.3 kVar
Monitoring	PF-Volt, Current, KW,KVA,KVAR- ON Status Of Capacitors
Accuracy	0.1 kVar
Frequency	60Hz
Protection	Capacitor Inbuilt Protection P2
Equipment Protection	Internal design has adequate clearance and creepage distance against line transients. MOVs not required.
Circuit breaker Required	20 Amp 2 pole
Low Losses	0.5 Watt each step
Human Protection	All High voltage shielded from contact.
Operating temperature range	40^{o}C Ambient
Dimensions(L X H X D)	12” X 8” X 5” (300 x 200 x 120 mm) Metal Enclosure Type 1
Operating Life	Switching tested up to 25,000 times, 6,000 as per UL
Wire Gauge & Rating	12 AWG Str for Power, 22 AWG Str for CT
Unit Weight	6 kg (13 Pounds)

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Recommended Parts List

Item	Make	Part No.	Qnty.
Main Wire 12 AWG Str. 600v	Any *	UL1015	As required
CT Wire 22 AWG Str. 600v	Any *	UL1015	As required
Bonding Wire 14 AWG Str. 600v	Any *	UL 1015	As required
CT (Current Sensor)	Megnelab	SCT-0750-050	1
Dowel Plug Size M8	Any	---	4
Screw 50 mm Size M8	Any	---	4
1/2" Conduit Connector	Any *	---	8
1/2" Tube/Conduit	Any *	---	As required

***All the Parts used in installation must be UL recognized or UL listed.**

NOTE

Installation of material and workmanship at the customer's Main Breaker Panel shall be the responsibility of the qualified Electrician in accordance with NEC. Any and all connections exterior to the ES-1 unit shall be the responsibility of the qualified Electrician.