BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	MANUFACTURER / MODEL	PART NUMBER
1	1	METAL ENCLOSURE,		
2	1	TRANSFORMER / CUSTOMER AGENT - CUSTOM MOLDED CASE: 3D PRINTING URETHANE RESIN - SINGLE BOARD COMPUTER WITH WIRELESS LAN, BLUETOOTH, ETHERNET, PoE, 5V / 2.5 A DC - MEMORY CARD, 16GB	BY SYSTEM INTEGRATOR	Smooth Cast ONYX Raspberry Pi3 Model B+ microSD
3	1	HEMSC - CUSTOM MOLDED CASE: 3D PRINTING URETHANE RESIN - SINGLE BOARD COMPUTER WITH WIRELESS LAN, BLUETOOTH, ETHERNET, PoE, POWER SUPPLY: 5V / 3 A DC	BY SYSTEM INTEGRATOR	Smooth Cast ONYX TINKER BOARD S
4	1	5 PORT 10/100Mbps DESKTOP SWITCH WITH EXTERNAL POWER ADAPTOR, 120VAC/5.0VDC, 0.1A	NETGEAR	FS205
5	1	USB TO ETHERNET ADAPTOR		
6	1	USB TO SERIAL ADAPTOR		
11	1	BATTERY PACK, INPUT: 19.5VAC, 4.62A, OUTPUT: 5VDC USB PORT, 2.1A, 65W	DELL	PW7015M
12	1	POWER ADAPTER, Input:AC100-240V Output: DC 19.5V 4.62A 90W	DELL	6C3W2
14	1	WIRELESS N USB ADAPTER W/ HIGH GAIN ANTENNA, 300Mbps, 802.11n STANDARD	PANDA WIRELESS	PAU06
17	1	5dBi HIGH GAIN Wi-Fi SWIVEL ANTENNA	PROXICAST	ANT-130-002
19	1	REVENUE GRADE METROLOGY UNIT. IEEE 2030.5 OR SUNPEC ALLIANCE COMPLIANT	MEASURELOGIC	DTS310-52-EM-N-2
22	2	SPLIT CORE CURRENT TRANSFORMER, 5A SECONDARY. PART NUMBER PROVIDED FOR INFORMATION. INTEGRATOR TO VALIDATE AMPACITY, BURDEN AND ACCURACY ACCORDING TO THE APPLICATION.	ACCUENERGY CORP.	AcuCT3135R-600:5 INDOOR ONLY
25	1	4 POLE ISOLATION SHORTING SWITCH WITH COVER	STATES TERMINALS	C3-204-C
31	2	DIN RAIL MOUNT OUTLET RECEPTACLE WITH BREAKER, 5A/120VAC	WEIDMULLER	9915480001
33	1	BREAKER, 120/240VAC, 10A, 10KA S.C., DOUBLE POLE, 35 MM DIN RAIL REAR MOUNTING	EATON	QCR2015
40	As Required	TERMINAL BLOCK, 6 mm2, 600V, 50A, AWG 22 TO 8	WEIDMULLER / WDU6	1020200000
41	As Required	TERMINAL BLOCK, END PLATE	WEIDMULLER / WAP 2.5-10, WM, BG	1050000000
42	As Required	TERMINAL BLOCK, END BRACKET	WEIDMULLER / WEW 35/2	1061200000
43	As Required	TERMINAL BLOCK, GROUP MARKER	WEIDMULLER / WAD 8 MC NE WS	1112940000
44	As Required	GROUNDING TERMINAL BLOCK,	WEIDMULLER / WPE 6	1010200000
50	1	FUSE TERMINAL, 30A, 250 V DC/AC FOR 1/4" X 1-1/4" FUSE	WEIDMULLER WSI 4/2/LD 140-250 V AC/DC	1880390000
51	1	END PLATE (FOR FUSE HOLDER WSI 4)	WEIDMULLER WAP WSI4/2	1880450000
52	1	ELECTRONIC GLASS FUSE, FAST ACTING, 1/4' X 1-1/4" , 1.6 A, 250V 200A I.R.	MERSEN	GGC1-6/10
58	As Required	SYMMETRICAL DIN3 MOUNTING RAIL, TS 35 x 7.5, STEEL, GALVANIZED WITH SLOTTED HOLE	WEIDMULLER TS 35X7.5/LL 1M/ST/ZN	0514510000
60	2	2 POLE, FINGER SAFE FUSE HOLDER WITH 15A FUSE REJECTION TYPE CLASS CC, 100kA S.C., 600VAC	MERSEN	USCC2
66	2	2A FUSE REJECTION TYPE CLASS CC, 200kA S.C., 600VAC	MERSEN	ATMR2

NOTE:

1. ALL WORK SHALL BE ACCORDING TO APPLICABLE CODES AND STANDARDS AND SHALL BE SUBJECT TO APPROVAL BY AUTHORITY HAVING JURISDICTION ON THE WORK. ALL MATERIAL SHALL BE APPROVED BY THE APPLICABLE STANDARDS AUTHORITY.
2. PART NUMBER IS AN INDICATION OF THE QUALITY OF THE MATERIAL. EQUIVALENT MATERIAL WILL BE CONSIDERED. CHANGE OF MATERIAL SHALL BE APPROVED BY THE DER PROGRAM MANAGER.
3. THE CONTRACTOR IS RESPONSIBLE TO COMPLETE THE BILL OF MATERIAL FOR ALL SMALL HARDWARE.
4. QUANTITY AND MATERIAL PART NUMBER TO BE VALIDATED BY CONTRACTOR.
5. FOR THE PROTOTYPE PROJECT, THE CA AND THE HEMSC WERE DESIGNED AROUND AN OFF THE SHELF SINGLE BOARD COMPUTER ADAPTED TO THE APPLICATION. IT DID NOT REQUIRE ELECTRICAL AUTHORITY APPROVAL AS IT OPERATED AT OR BELOW 5VDC. TO GET SPECIAL ELECTRICAL SAFETY AUTHORITY APPROVAL, A GROUNDED METAL BARRIER WAS USED TO SEPARATE THE 120/208/240VAC COMPONENTS THAT REQUIRE AUTHORITY APPROVAL FROM THE LOWER VOLTAGE COMPONENTS. IT SHOULD NOT BE ASSUMED THAT THIS WILL BE ACCEPTED FOR SUBSEQUENT SPECIAL APPROVAL.
6. COMMUNICATION TO INVERTER, MANAGED DEVICES, ETC., COULD USE DIFFERENT COMMUNICATION MODE, EX. MODBUS, WiFi, CAT5, ETC.
7. THE INTENT OF THIS DESIGN WAS TO CREATE A BALANCED 3 PHASES SYSTEM WHILE USING SINGLE AND/OR SPLIT PHASE INVERTER & CHARGE CONTROLLER. THE FINAL CONFIGURATION WILL DEPEND ON THE AVAILABLE AND/OR SELECTED COMPONENTS. LOCATION OF THE CURRENT AND VOLTAGE MONITORING DEVICES SHALL BE PLACED TO MONITOR THE INTENDED CIRCUIT BEING MANAGED.

LEGEND AND DEFINITION:

TA	TRANSFORMER AGENT
CA	CUSTOMER AGENT
HEMSC	HOME ENERGY MANAGEMENT SYSTEM CONTROLLER
DG	DISTRIBUTED GENERATION
DP	DISTRIBUTION PANEL
LOP	LOST OF PHASE
MET	METERING RELAY
29	CT ISOLATION SHORTING SWITCH

TRANSFORMER (TX)

CURRENT TRANSFORMER (CT)

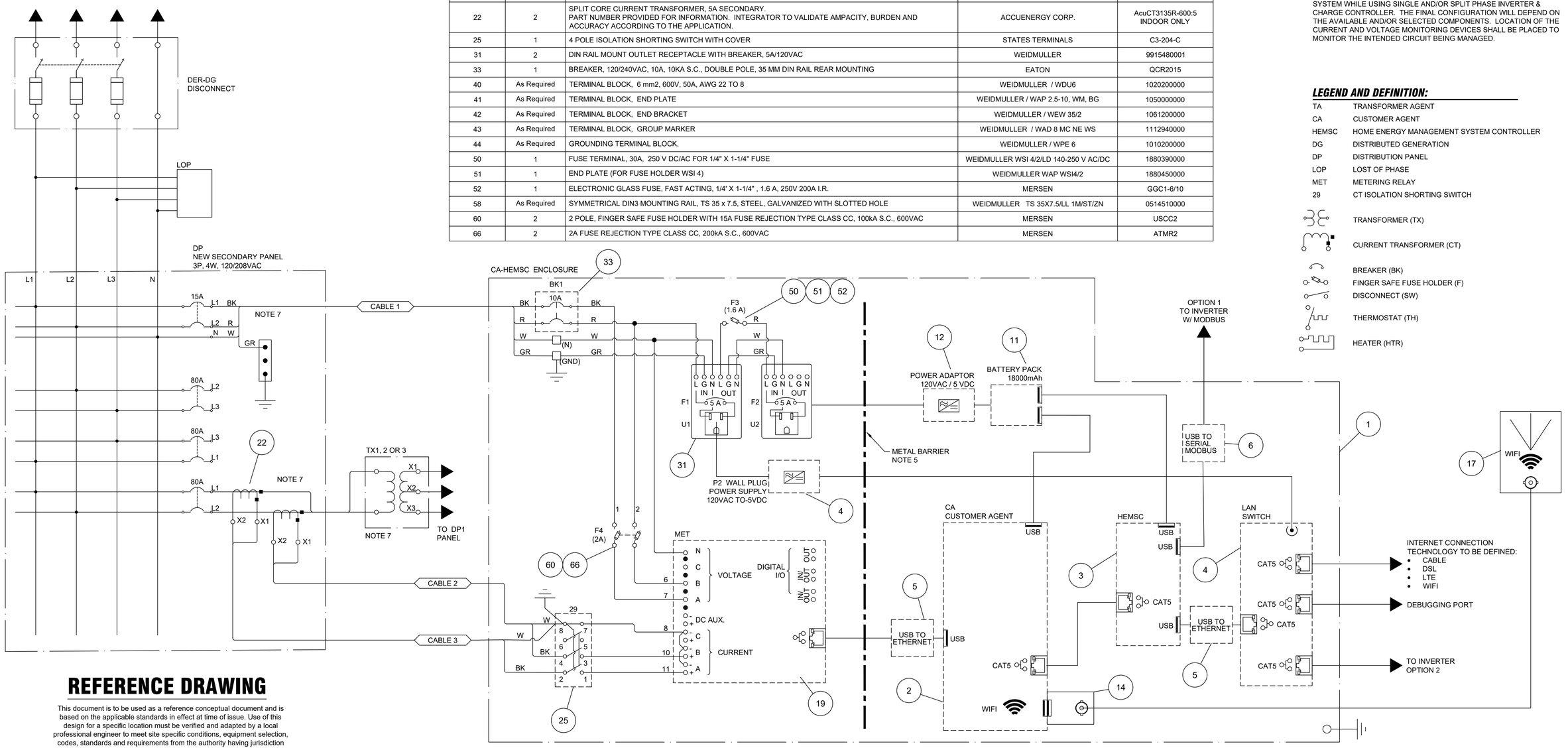
BREAKER (BK)

FINGER SAFE FUSE HOLDER (F)

DISCONNECT (SW)

THERMOSTAT (TH)

HEATER (HTR)



REFERENCE DRAWING

This document is to be used as a reference conceptual document and is based on the applicable standards in effect at time of issue. Use of this design for a specific location must be verified and adapted by a local professional engineer to meet site specific conditions, equipment selection, codes, standards and requirements from the authority having jurisdiction

MiGen Transactive Grid is a smart grid technology field demonstration project led by Hydro Ottawa and partially funded by the Ontario Ministry of Energy, Northern Development and Mines' Smart Grid Fund and the LDC Tomorrow Fund, with great support from the IEEE Standards Association and seven collaborating partners: Carleton University, CIMA+, Panasonic Eco Solutions Canada, Quadra Power, Tantalus (formerly Energate), Thorium Technologies, and University of Ottawa

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Stamp

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0	ISSUE AS REFERENCE DRAWING	12/17/2019	R.L. / A.L.

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Project Manager: E. Cantin, tech.

Client: HYDRO OTTAWA

Project title: MiGen TRANSACTIVE GRID REFERENCE DRAWING

Drawing title: THREE PHASE SYSTEM CA-HEMSC ENCLOSURE CONNECTION WIRING DIAGRAM

Project number: A000597B
Designed by: R.Langlois
Drawn by: A.Langlois
Verified by: E.Cantin
Revision: 0
Drawing N°: REF-ECW-04

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Filename: MiGen_REF-ECW04_CA-HEMS ENCLOSURE THREE PHASE.dwg / Layout: THREE PHASE CA ENCLOSURE CONNECTION WIRING DIAGRAM / Last save: 2020/01/24, 08:04 / Printed: 2020/01/24, 09:25