



OPERATING MANUAL

for

AC LOAD BANK

type

HAC415-600

issue 1

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INTRODUCTION

The load bank HAC415-600 is designed to provide a load of 600KW on the generators. This is based on the combination of the supplied two load modules. Control is provided from the remote hand held controller.

Cable connection from each load module is made to the generator. Cable connection is made from internal termination bus bars via a panel mounted gland plate. The gland plate needs to be drilled to allow fitting of suitable cable glands. Selection of correct cable type and sizing should be performed by a qualified electrical engineer.

The two load modules require the fitting of an inter-connection control cable. This allows control of the load contactors in the the slave (2nd) load module.

Safety features include internal fuse protection, fan motor overload protection with load auto load shutoff.

The load bank is force cooled by a three phase mains powered fan which is internally connected to the 3 phase load circuit.

The case is designed for outdoor use.

Control of the load bank load channels is performed by a remote hand held controller. The controller displays KW based on pre-defined values stored in a look-up table.

The unit lifted from underneath using a fork lift truck or by suitable strapping under the load bank lifting frame for lifting by crane.

SAFETY CONSIDERATIONS

1. The load bank is designed for outdoor operation.
2. The unit should only be operated by competent electrical engineers who are completely familiar with the operation and specification of the load bank.
3. The equipment is designed for AC operation only and therefore SHOULD NOT be used on DC loads such as batteries.
4. Operators must ensure that interconnecting cables are correctly rated to carry the required load current and adequately insulated to prevent the possibility of electric shock when operating at high voltages.
5. When in use the load bank should be cordoned off using safety barriers.
6. The load bank should only be operated in an area with adequate ventilation.
7. Care should be taken as to the exhaust air outlet will be hot.
8. During operation the load bank should not be covered or positioned to restrict air flow
9. Caution – some metal surfaces will be hot during operation
10. At the end of any test the fans should be kept running for at least 5 minutes on no load to remove the residual heat from the load bank case.

CONNECTION PROCEDURE

- A. Ensure the generator is compatible with the load bank operating voltage.
- B. Ensure the generator is isolated .
- C. Do not attempt to operate the load bank above the maximum operating voltage.
- D. Remove the load bank side panel on each module and make the internal connections via the gland plate. The connections can be made to the terminals labelled L1, L2, L3, N and EARTH.
- E. The interconnection cable terminal blocks are located in both load banks. Cable connections are made between the respective terminal blocks. See circuit diagram.
- F. Ensure the power cables are correctly connected and insulated to prevent any possibility of electric shock.
- G. Replace the side panel of the load bank and fasten securely.
- H. Connect the power cables from each load module to the generator, ensuring the correct phase connections.
- I. Ensure the earth is connected correctly.
- J. Connect the hand held controller into the panel mounted socket on the master load bank.

OPERATING INSTRUCTIONS

Operators should read the

SAFETY CONSIDERATIONS and **CONNECTION PROCEDURE**

before carrying out the following operating instructions

1. Ensure all panels are in place on the load bank.
2. Ensure all panel mounted switches are in the OFF position.
3. Energise the power source from the generator.
4. The load bank fan should rotate via switching the green ON / OFF switch.
5. CHECK THE FAN MOTOR ROTATES IN THE CORRECT DIRECTION
6. If the fan rotates incorrectly the phase connections must be changed as follows ;
 - a) Isolate the power source from the Generator.
 - b) ENSURE THE CABLE AND TERMINATION POINTS DO NOT HAVE LIVE VOLTAGES PRESENT.
 - c) Isolate the Cable from both the load bank and the Generator.
 - d) Change any two line connections. This will align the phases in the required sequence.
 - e) Re-connect the cable to the termination points and continue the operating procedure from 1 above.
7. **OPERATION OF THE REMOTE HAND HELD CONTROLLER**

Select the appropriate load using the hand held controller as follows;

 - a) the hand held controller digits should be flashing. This indicates that it is in setting mode.
 - b) press the X1, X10 and X100 as appropriate to the required KW load setting.
 - c) When the load is at the required value press the green ACCEPT push button
 - d) The display will now remain steady (running mode) and will indicate the actual KW as measured from the load bank in real time. This reading is dependent on the voltage.

- e) During running mode the load can be adjusted by pressing the black push buttons which increases and decreases the load in small steps for each button press. This operates in real time.
 - f) The load can be changed by pressing the X1, X10 or X100 push buttons. This action returns the hand held controller to setting mode.
 - g) When the new load setting has been entered by using the X1, X10 and X100 push button, the change in load is implemented by pressing the green ACCEPT push button.
 - h) The yellow REVERT push button can be used during setting mode, to return the hand held controller to running mode, if required, without changing the load.
 - i) The load can be disconnected from the generator in two ways
 - i) SLOW STOP – orange push button
this feature removes the total load in sequence, in approximately a 5 second period.
 - ii) QUICK STOP – red push button
this feature removes the total load instantaneously
8. Do not exceed the maximum rating of the load bank.
9. Leave the fans running (off load) for five minutes to cool the resistor elements, when the load bank is powered down from the generator.

The red EMERGENCY STOP button can be used as an Emergency Disconnect at any time to disconnect all load circuits and the fan supply.

SPECIFICATION

Type ref	HAC415-600
Max operating voltage	415V three phase 50 Hz
Max current rating	833A per phase
Max power rating	600 KW three phase
Resistor tolerance	+/-5%
Individual case size	
length	1875mm
width	1185mm
height	1275mm
weight	500 kgs each approx

Power consumption of inter-connection load cable: <1A per contactor 240V AC

Fan Noise levels 78dbA

MAINTENANCE PROCEDURES

The load bank should not require any special maintenance, however as with any electrical equipment periodic checks should be carried out to ensure the equipment is in a safe and satisfactory condition.

The following periodic checks are recommended;

- 1) Check the inlet and outlet grills are free from obstruction.
- 2) Check the controls and terminal are undamaged.
- 3) Check the fan rotates freely without obstruction.
- 4) Check internal wiring for loose connections or damage.

FAULT FINDING PROCEDURES

The following fault finding procedure is intended to identify simple operational errors and has been categorised into two possible problem areas as follows;

FAN COOLING NOT OPERATIONAL

- Check the power source is available.
- Check the interconnecting cable connections.
- Check the fan motor operates.
- Check for air blockage.
- Check fan blades are secure to motor shaft.

LOAD BANK DOES NOT PROVIDE SUFFICIENT LOAD CURRENT

- Check the power source is at the required voltage.
- Check the required current channels have been selected.
- Compare the current values with the specification table.
- Identify individual current channels for reduced output.

Any faults not corrected by carrying out the above procedures may require the internal wiring or components of the load bank to be inspected for damage.

Note: Isolate the load bank from any power source before removing any covers.

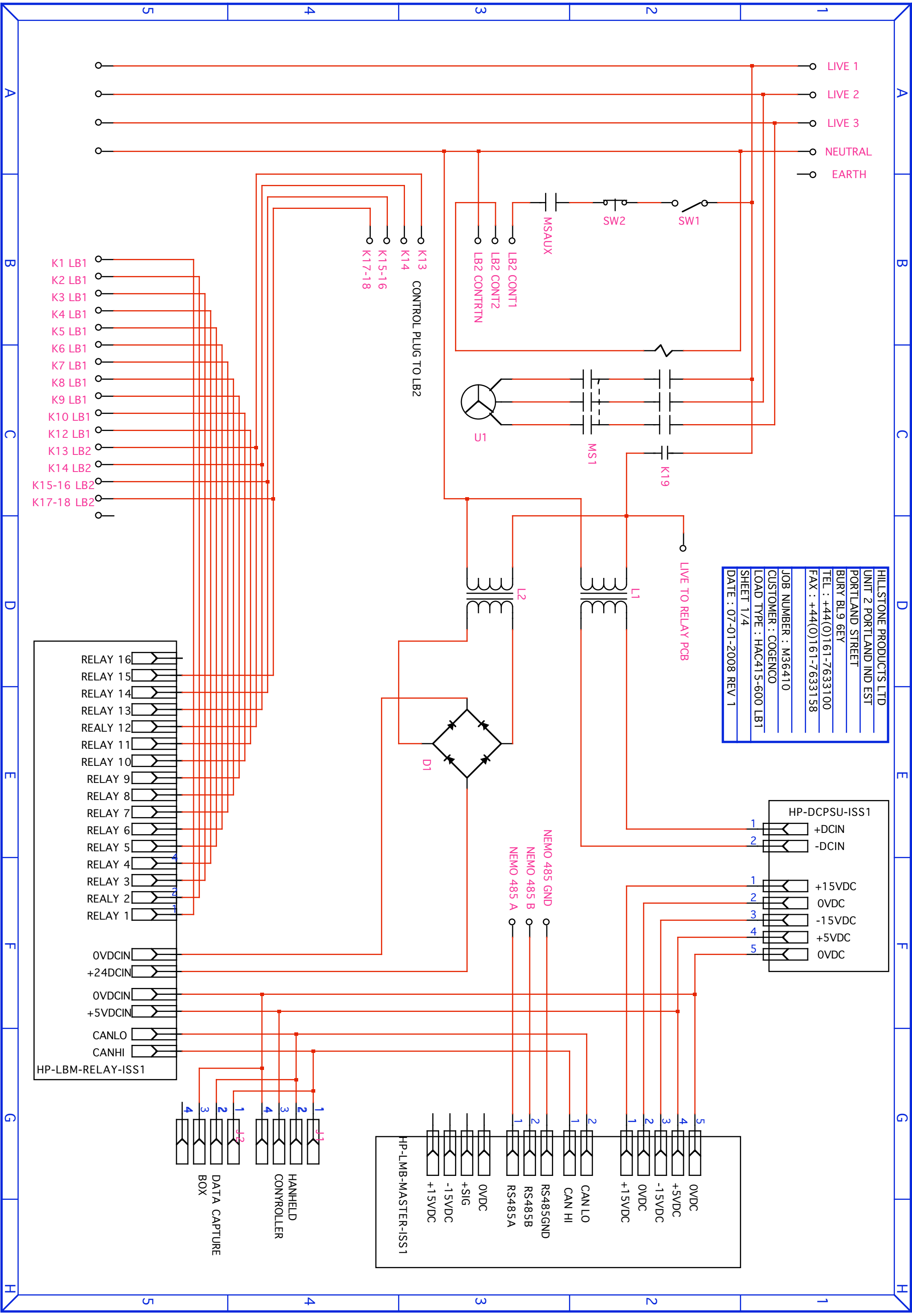
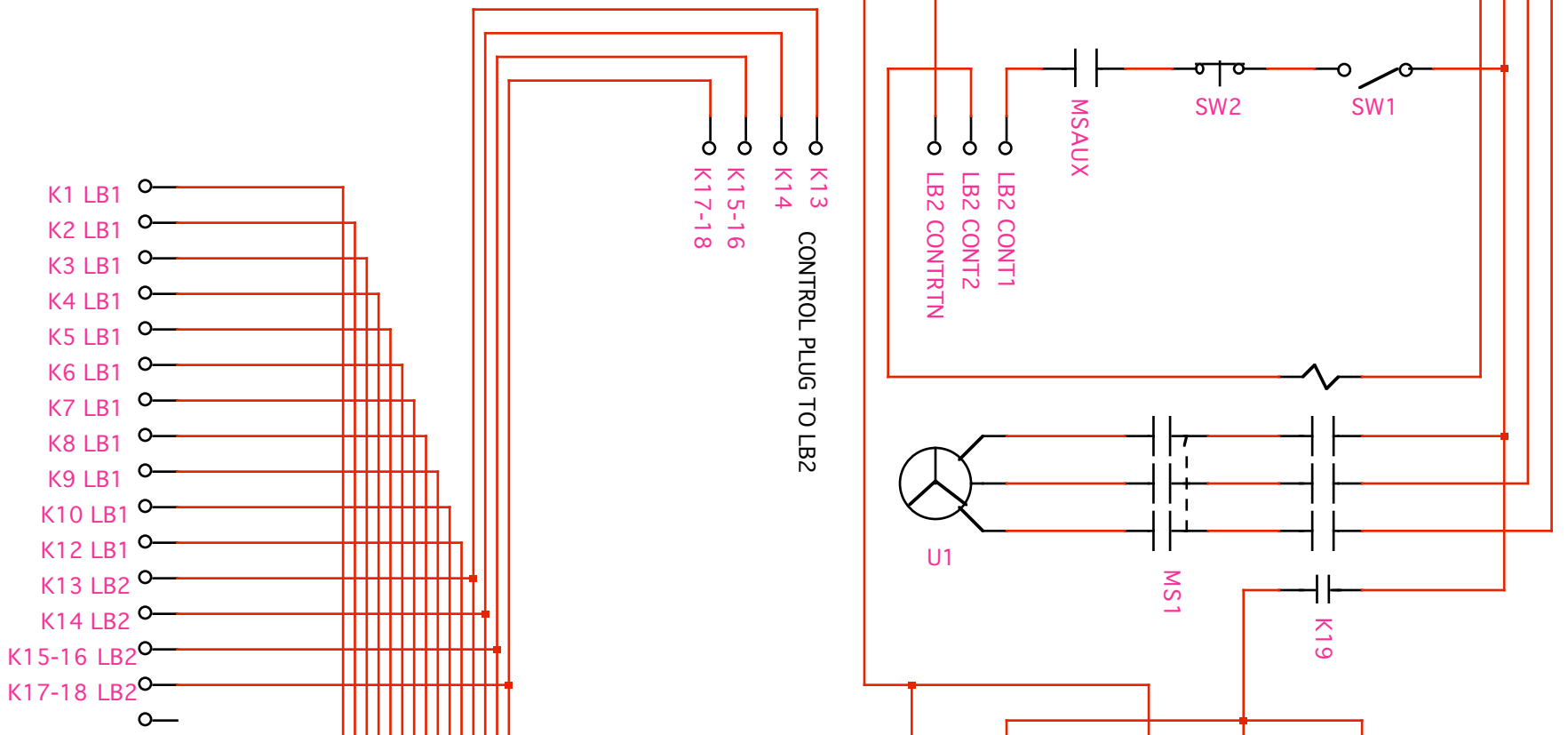
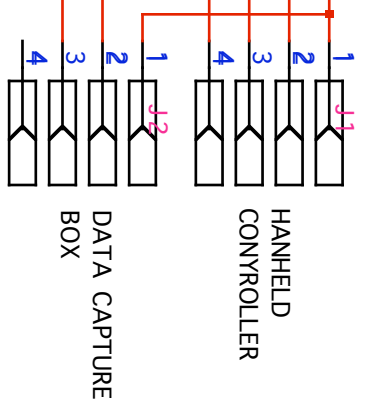
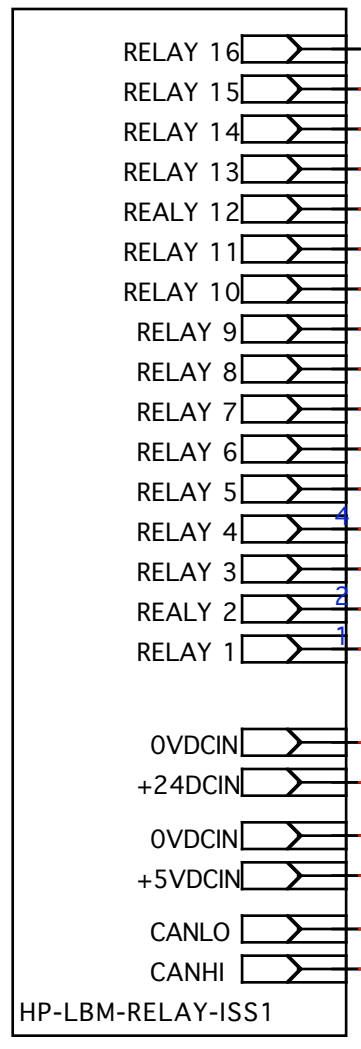
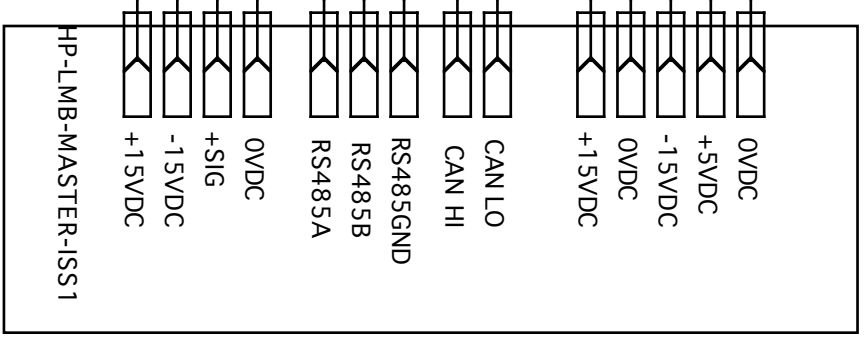
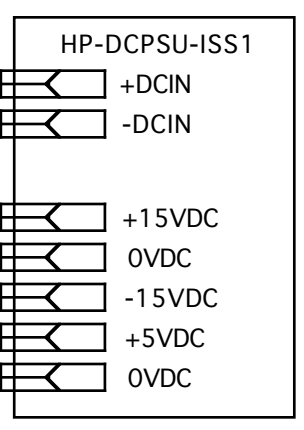
**Testing the load bank with the covers removed is not recommended as high voltages can be present on power resistors or terminals.
Repair or replacement should be carried out by the manufacturer.**

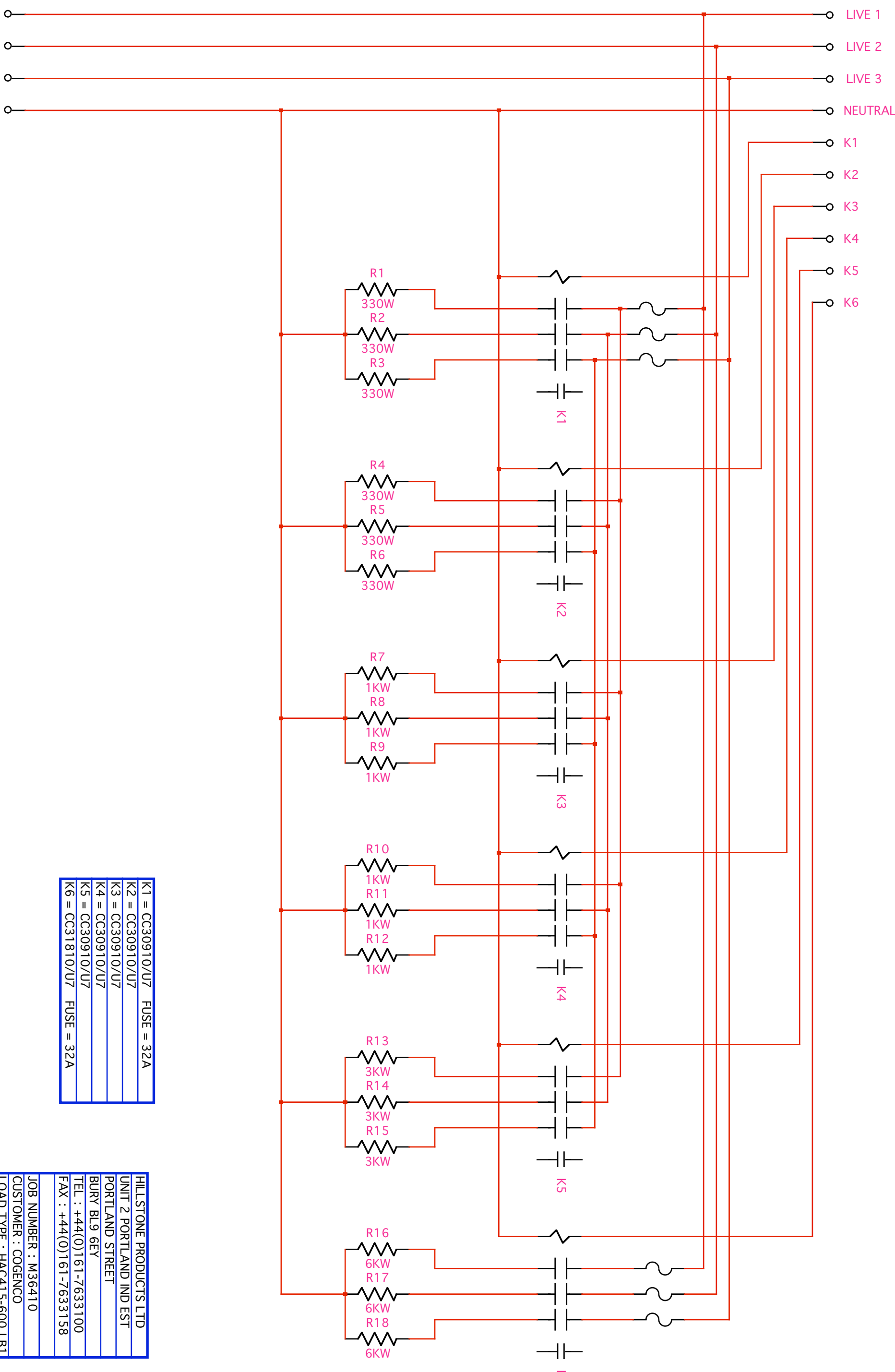
CIRCUIT DIAGRAMS

The following diagram show the schematic arrangement for load bank 1 and load bank 2

LIVE 1
LIVE 2
LIVE 3
NEUTRAL
EARTH

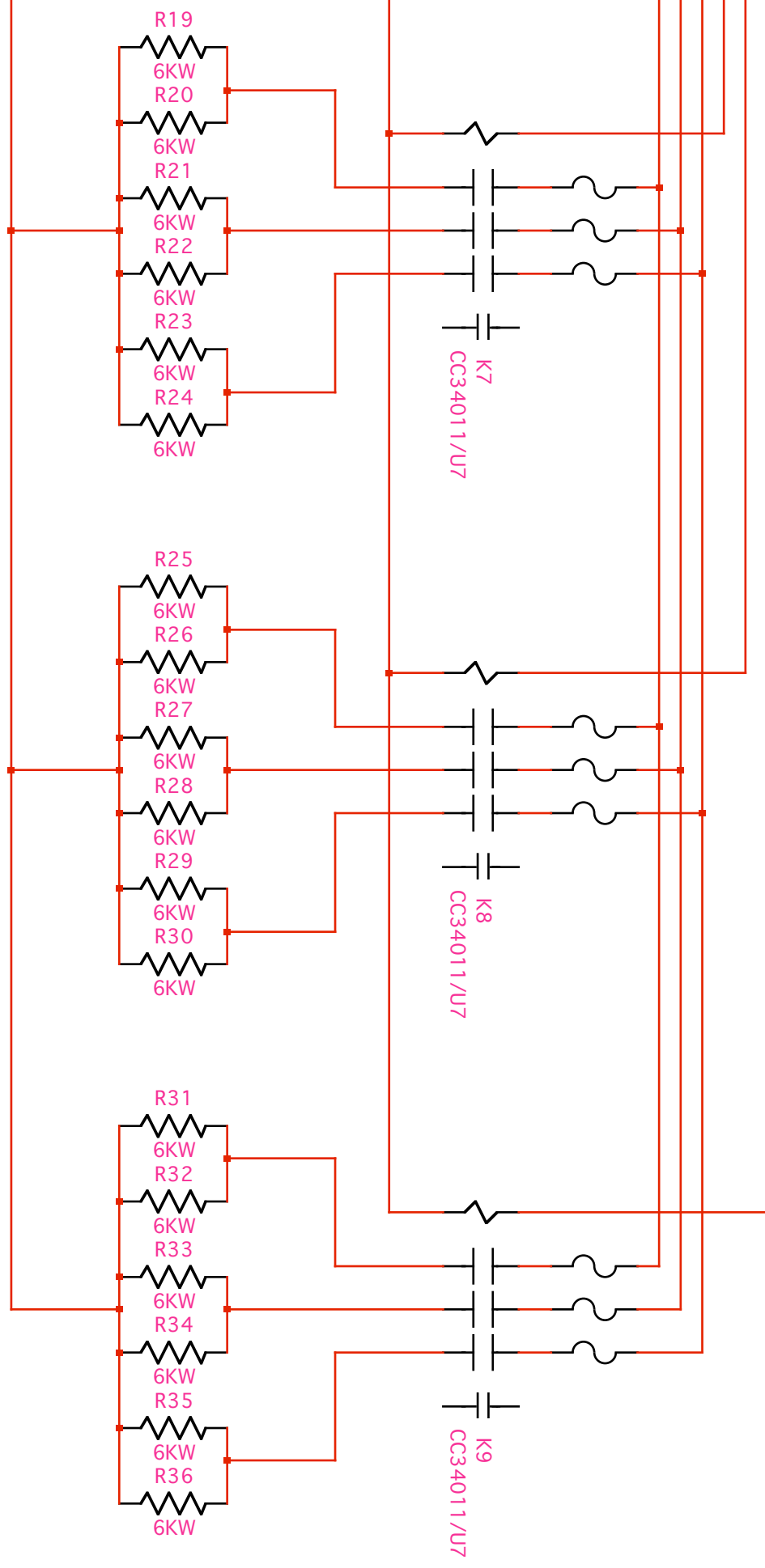
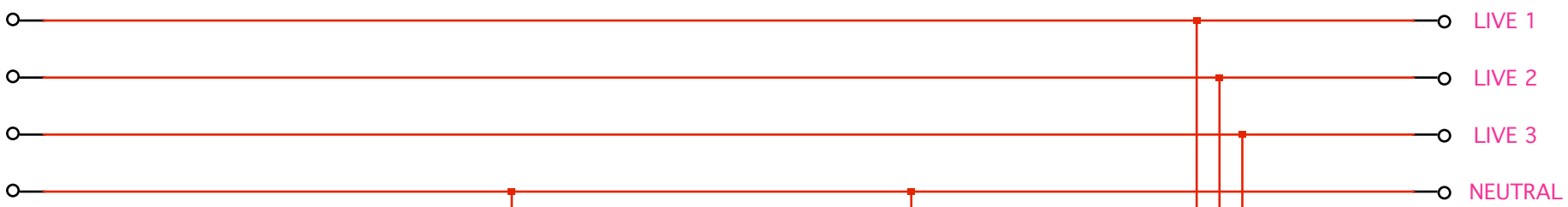
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CUSTOMER : COGENCO
LOAD TYPE : HAC415-600 LB1
SHEET 1/4
DATE : 07-01-2008 REV 1





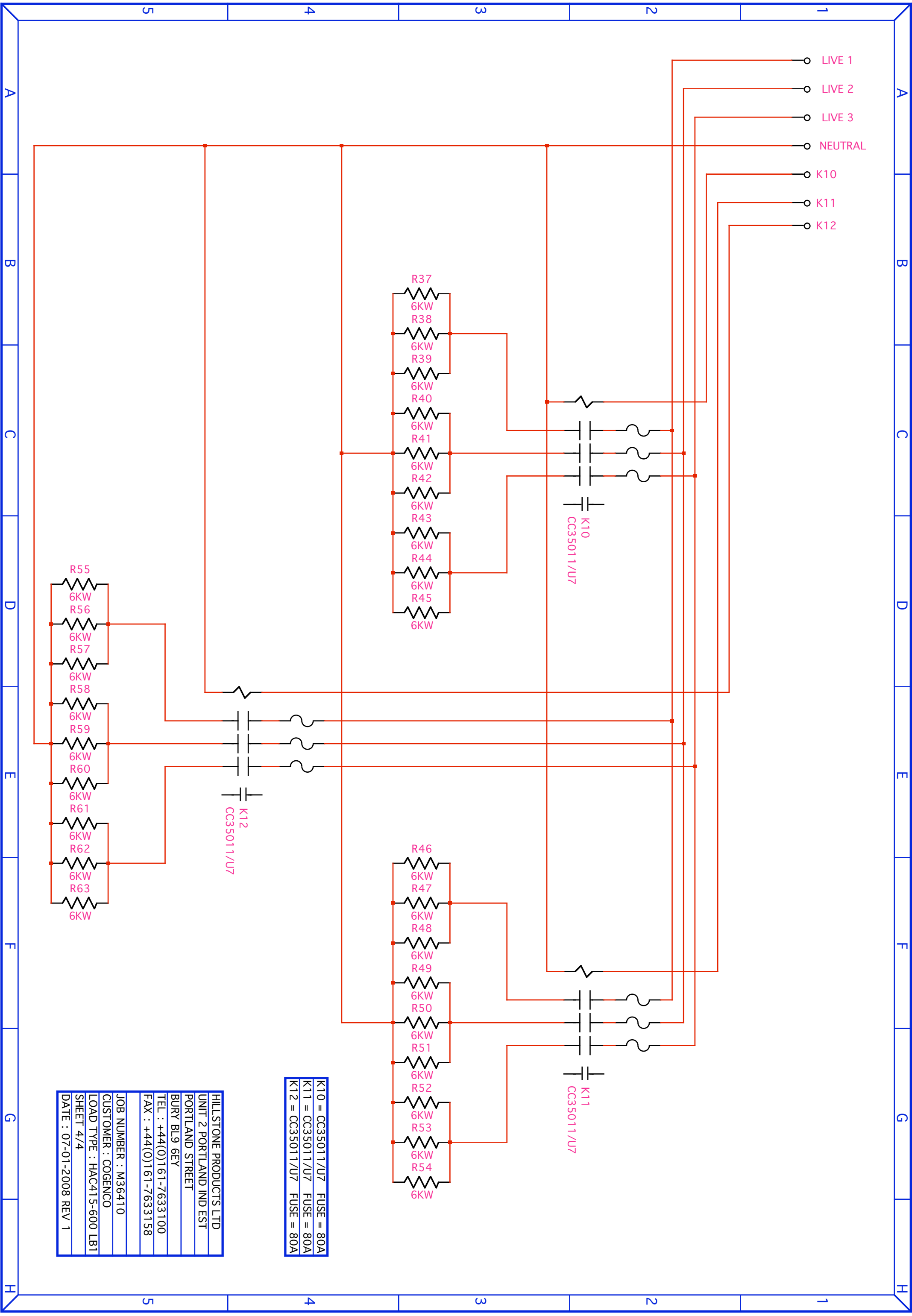
K1 = CC30910/U7	FUSE = 32A
K2 = CC30910/U7	
K3 = CC30910/U7	
K4 = CC30910/U7	
K5 = CC30910/U7	
K6 = CC31810/U7	FUSE = 32A

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CUSTOMER : COGENCO
LOAD TYPE : HAC415-600 LBT
SHEET 2/4
DATE : 07-01-2008 REV 1



K7 = CC34011/U7 FUSE = 63A
 K8 = CC34011/U7 FUSE = 63A
 K9 = CC34011/U7 FUSE = 63A

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 CUSTOMER : COGENCO
 LOAD TYPE : HAC415-600 LBT
 SHEET 3/4
 DATE : 07-01-2008 REV 1



LIVE 1
 LIVE 2
 LIVE 3
 NEUTRAL
 K10
 K11
 K12

R37 6KW
 R38 6KW
 R39 6KW
 R40 6KW
 R41 6KW
 R42 6KW
 R43 6KW
 R44 6KW
 R45 6KW

K10
 CC35011/U7

R55 6KW
 R56 6KW
 R57 6KW
 R58 6KW
 R59 6KW
 R60 6KW
 R61 6KW
 R62 6KW
 R63 6KW

K12
 CC35011/U7

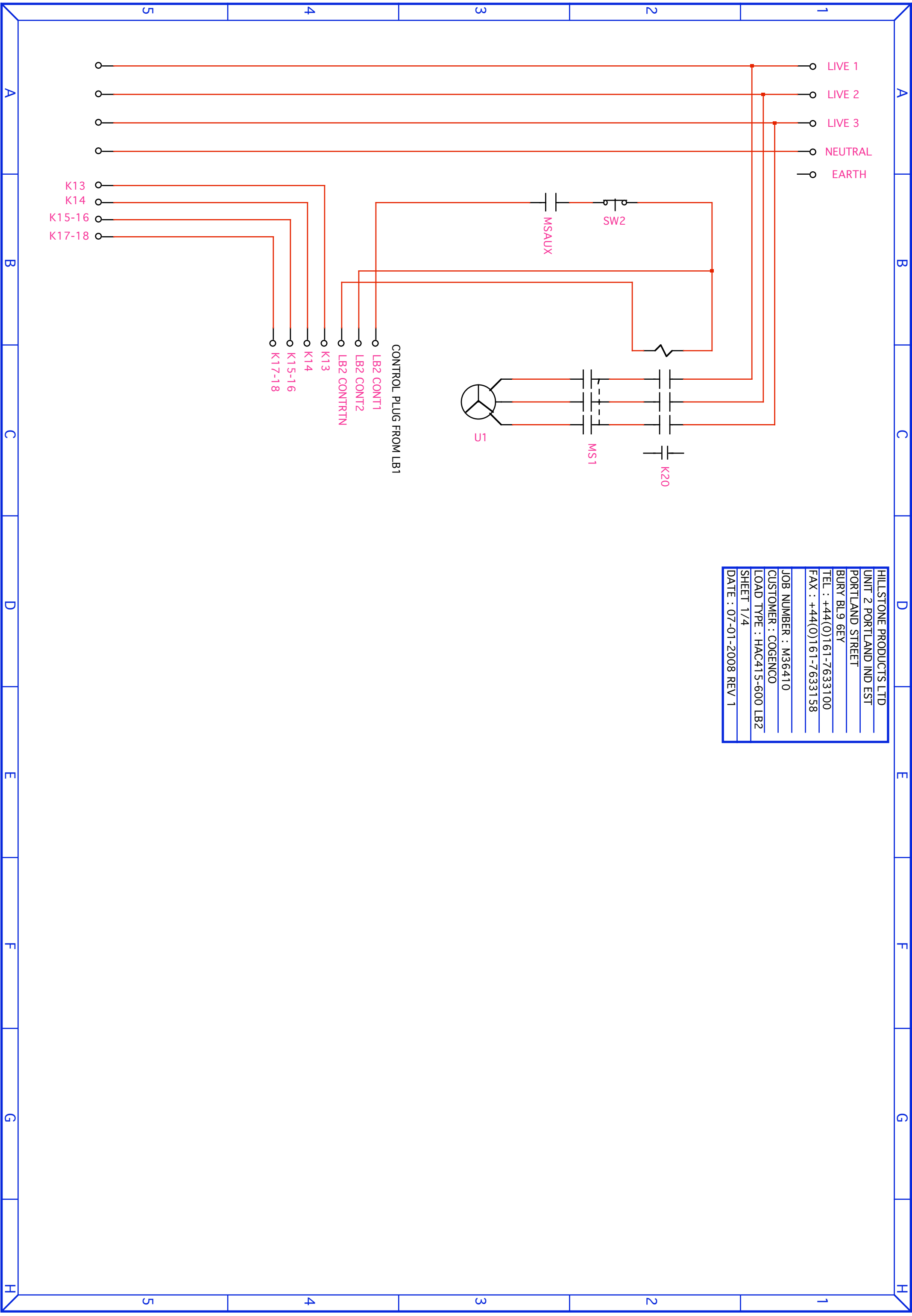
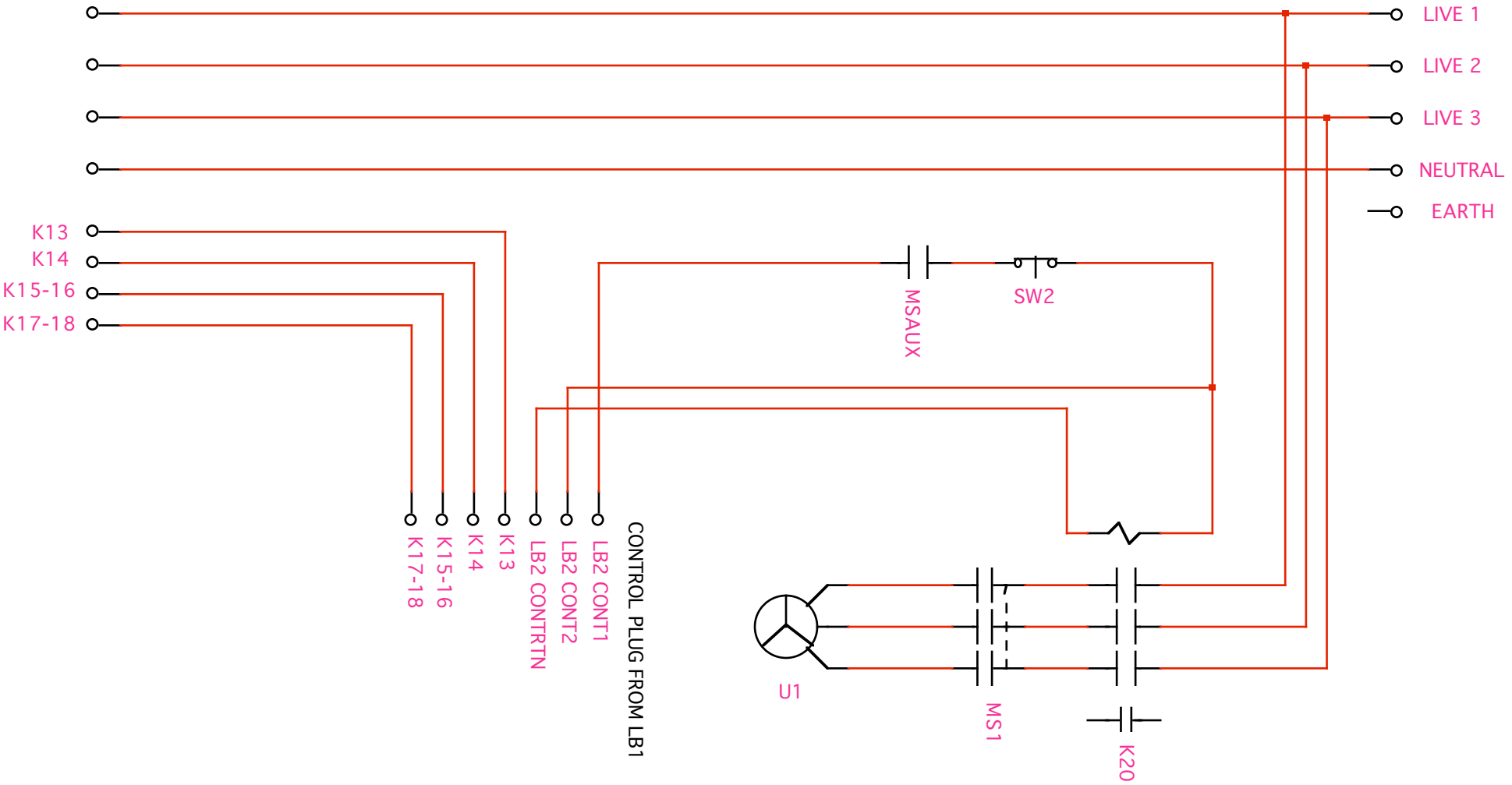
R46 6KW
 R47 6KW
 R48 6KW
 R49 6KW
 R50 6KW
 R51 6KW
 R52 6KW
 R53 6KW
 R54 6KW

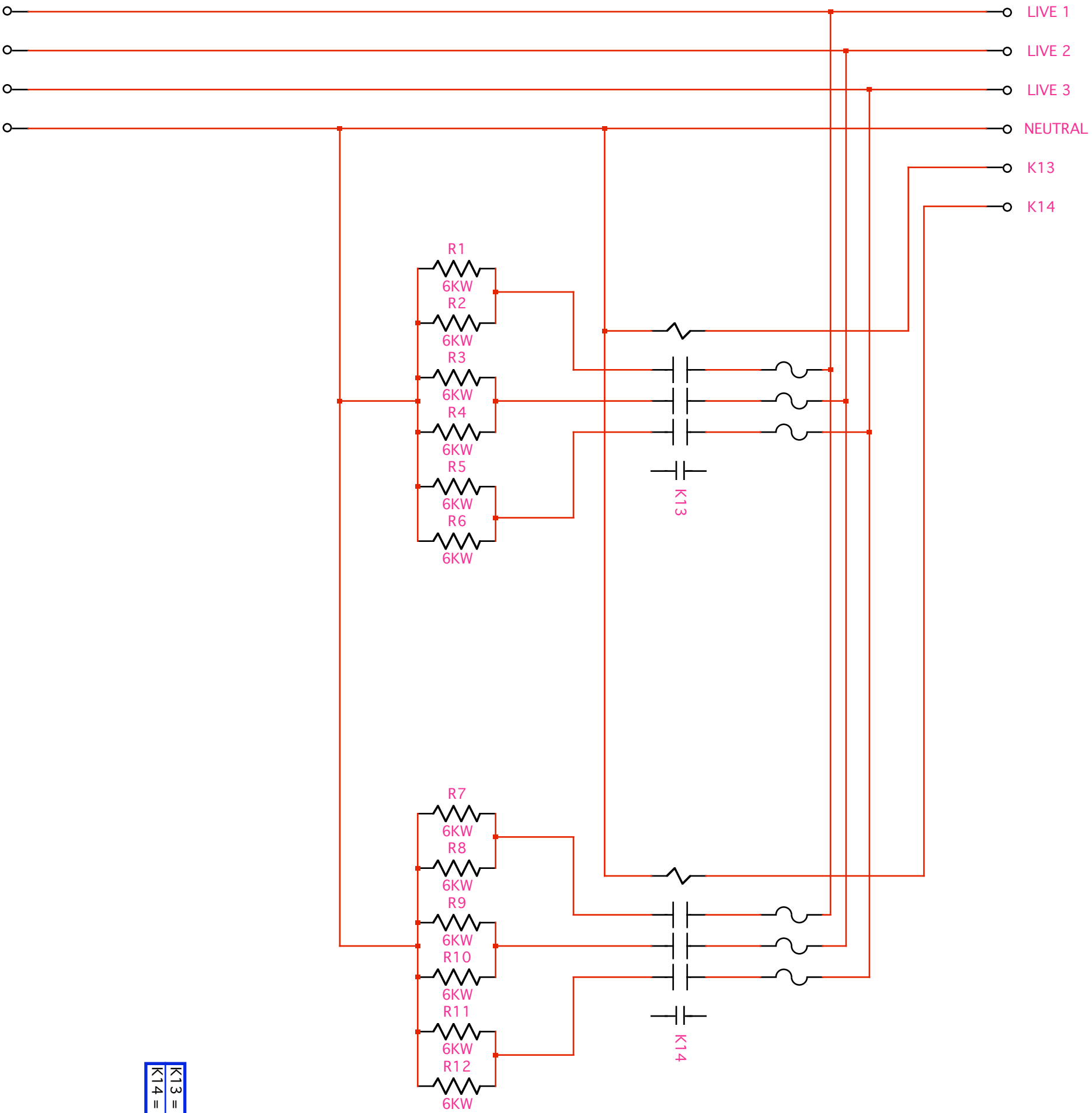
K11
 CC35011/U7

K10 = CC35011/U7 FUSE = 80A
 K11 = CC35011/U7 FUSE = 80A
 K12 = CC35011/U7 FUSE = 80A

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 CUSTOMER : COGENCO
 LOAD TYPE : HAC415-600 LBT
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 DATE : 07-01-2008 REV 1

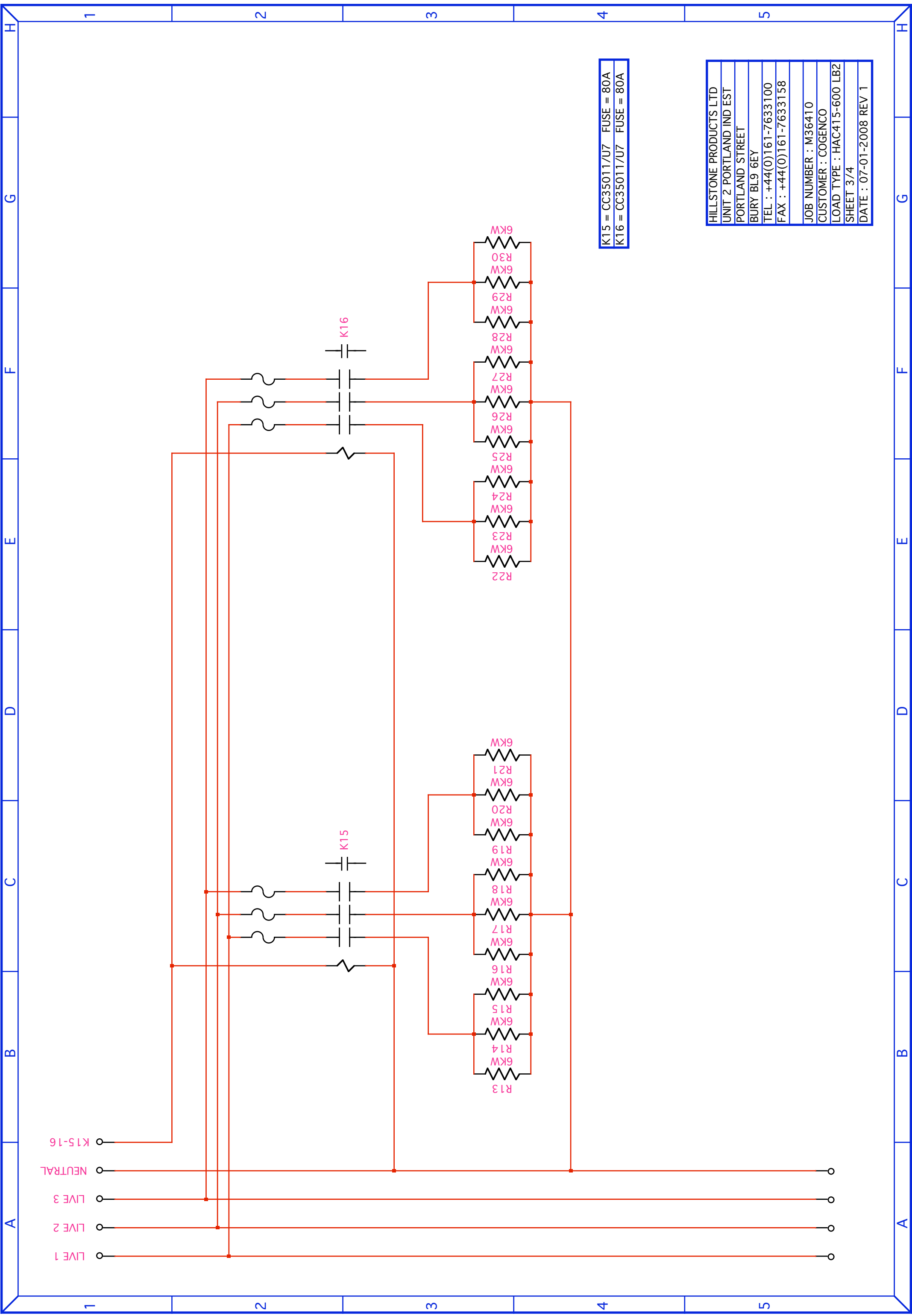
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 JOB NUMBER : M36410
 CUSTOMER : COGENCO
 LOAD TYPE : HAC415-600 LB2
 SHEET 1/4
 DATE : 07-01-2008 REV 1





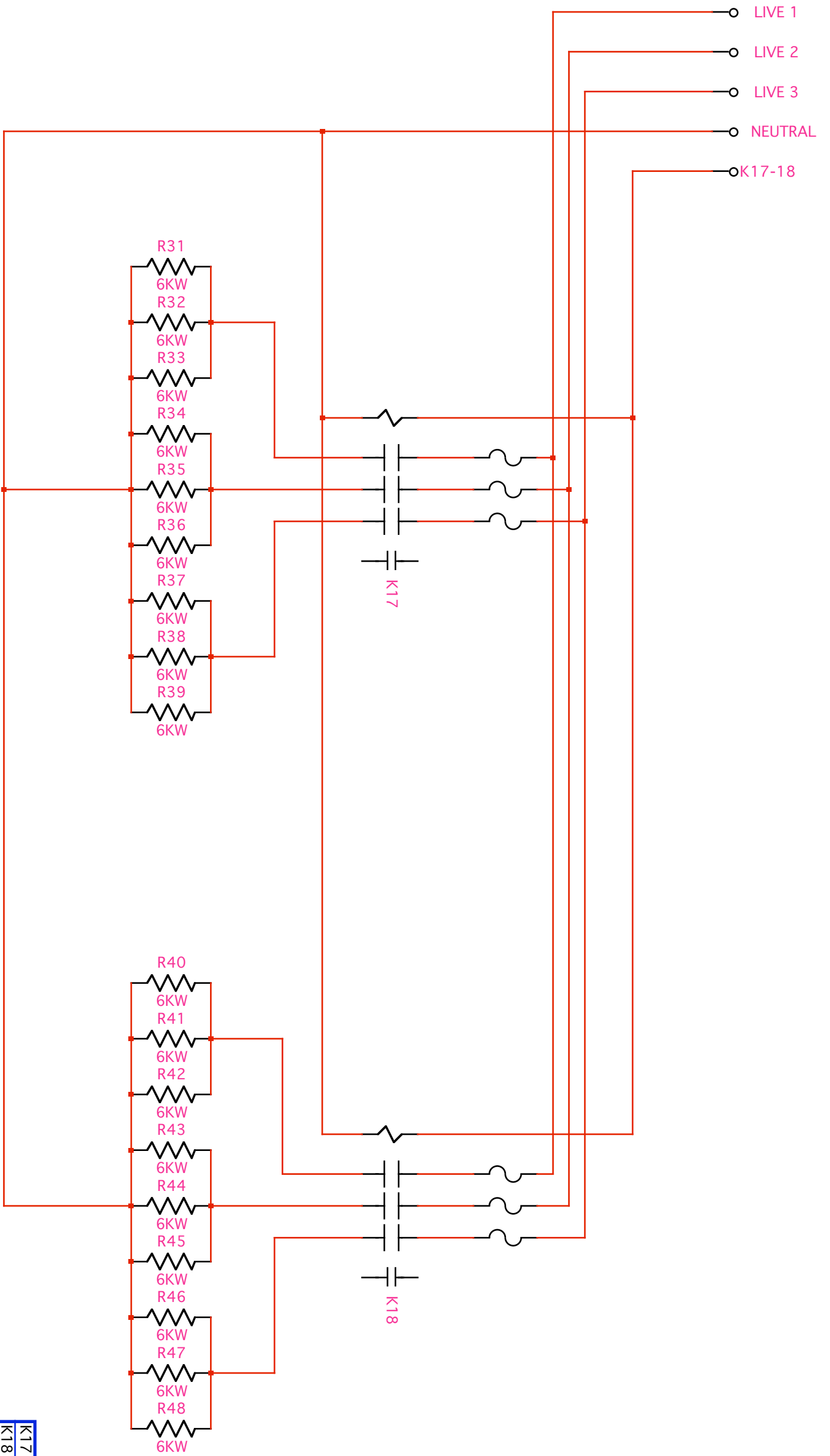
K13 = CC34011/U7 FUSE = 63A
 K14 = CC34011/U7 FUSE = 63A

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 CUSTOMER : COGENCO
 LOAD TYPE : HAC415-600 LBZ
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 DATE : 07-01-2008 REV 1



K15 = CC35011/U7 FUSE = 80A
 K16 = CC35011/U7 FUSE = 80A

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LOAD TYPE : HAC415-600 LB2
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DATE : 07-01-2008 REV 1



K17 = CC35011/U7 FUSE = 80A
 K18 = CC35011/U7 FUSE = 80A

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