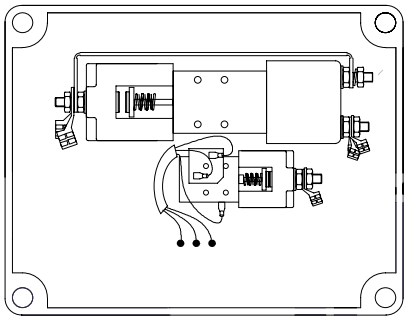

12 / 24 V Battery Coupler

for

Coposite Tunnel Thruster Range

VIP 150, Electric Thrusters

VIP 150 & 250 Hydrualic Thrusters

R 200 Hydraulic Thrusters

INSTALLATION MANUAL

THIS MANUAL MUST BE KEPT ON BOARD AT ALL TIMES

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TABLE OF CONTENTS:

1. WARNINGS:

- Please note that this model of the 12/24V coupler, with **Blue, Black & Brown** control wire inputs, only functions with thrusters, which are **equipped** with an **electronic control box**.
- For 24V thruster units, **not** equipped with an electronic thruster controller, one should use the previous 12/24V coupler model, with **Blue, Red & Brown** control wire inputs.
- A qualified marine electrician should install the coupler.
- Make sure to read and understand the full document and attached drawings before starting the installation of this unit.
- The coupler only functions with a **12 Volt** charging system with a maximum charging current of **100 Ampere**.
- Batteries to be coupled should be of the **same manufacturer** and must be of the **same model and capacity**. Serious damage maybe incurred if different battery types are used.
- The batteries used for the coupler should always be treated as an independent battery bank and should never be directly connected to any other battery banks. The charger should be **protected from reverse currents** in the charging circuit. Most marine type chargers include a reverse current protection diode. This protection can also be obtained by taking the positive of the charging circuit after a diode splitting block, used in most charging circuits on boats.

2. COMPOSITE TUNNEL THRUSTER RANGE:

2.1 POWER CABLING (Refer to Attached Drawing No. BC 01):

- When deciding on the size for the cables of the charging circuit (C1 & C2), the installer should keep voltage drops in the charging circuit to a minimum while ensuring that cables can handle the maximum 100A charging current.

- The cables S+ & S- should be of the same size as those used in the thruster motor circuit (refer to specific thruster model's manual).

- A power fuse and manual battery isolator, as indicated on the attached drawings, should also be installed in the positive power cable of the thruster motor.

2.2 CONTROL CIRCUIT CONNECTIONS (Refer to Attached Drawings No. BC 02 & BC 03):

- When using a standard 24V Composite Tunnel thruster unit (24V thruster motor equipped with 24V relay and electronic controller) with the 12/24V Battery Coupler, one can use either of the following options when wiring up the control circuit:

Option 1:

a) Unplug the negative (black) bridge wire coming from controller where it is plugged to the bottom male spade connectors on the two coils of thruster relay (Refer to Note 1 of Drawing No. BC 02, Page 7).

b) Cut this negative (black) wire and connect it, using proper electrical fittings, to the negative (black) going to the battery coupler relay coils (Refer to Note 2 of Drawing No. BC 02, Page 7).

c) Connect the negative bridge (containing diode), as supplied with 12/24V Coupler, between the negative terminal (A1) on the thruster motor and the bottom male spade connectors on the thruster relay coils (Refer to Note 3 of Drawing No. BC 02, Page 7).

d) Connect the blue and brown wires going to the battery coupler to the unused male spade connectors on thruster relay coils (Refer to Note 4 of Drawing No. BC 02, Page 7).

e) Connect the positive and negative supply wires of the control circuit/ electronic thruster controller at point A & B on the battery bank as used by the 12/24V Battery Coupler (Refer to Note 1 of Drawing No. BC 01, Page 6 and Note 5 of Drawing No. BC 02, Page 7).

f) This will allow you to use the 24V relay, as already mounted on the thruster motor.

Option 2:

a) Change 24V relay as supplied with the 24V thruster unit for a 12V relay (Refer to Note 1 of Drawing No. BC 03, Page 8).

b) Connect the blue, brown & black wires going to battery coupler to the unused male spade connectors on thruster relay coils (Refer to Note 2 of Drawing No. BC 03, Page 8).

c) Take the supply for the control circuit/electronic thruster controller from a 12V battery bank, separate to those coupled by the 12/24V coupler (Refer to Note 3 of Drawing No. BC 03, Page 8).

d) This will allow you to use a separate 12V battery bank to supply your control circuit.

3. VIP 150, ELECTRIC THRUSTERS:

3.1 CONTROL CIRCUIT CONNECTIONS (Refer to Attached Drawing No. BC 04):

- For power cabling of the VIP 150, electric thruster please refer to attached drawing No. BC 01, Page 6.

- Unplug & remove the negative (black) bridge wire, forming part of the thrusters wiring loom, which is plugged to the two bottom male spade connectors of the thruster relay. Then connect the negative bridge, with diode as delivered with 12/24V Coupler, between the negative terminal (A1) on the thruster motor and the two bottom male spade connectors on the thruster relay coils (Refer to Note 1 of Drawing No. BC 04, Page 9).

- Make sure to use a 12 V Electric Battery Isolator in the positive power cable in the thruster motor (Refer to Note 2 of Drawing No. BC 04, Page 9).

- Change 24V up/down motors, as delivered as standard with 24V VIP thruster units, for 12 V models (Refer to Note 3 of Drawing No. BC 04, Page 9).

- Connect the blue and brown, also going to thruster relay coils, as well as a black (neg. common), coming from electronic control card, to the coupler control wiring, as indicated in drawing (Refer to Note 4 of Drawing No. BC 04, Page 9).

- Connect control circuit supply at point A & B of the 12/24 V coupler battery bank, as indicated on drawing no. BC 01 (Refer to Note 1 of Drawing No. BC 01, Page 6 & Note 5 of Drawing No. BC 04, Page 9).

4. VIP 150 & 250 HYDRUALIC THRUSTERS:

4.1 POWER CABLING (Refer to Attached Drawing No. BC 05, Page 10):

- When deciding on the size for the cables of the charging circuit (C1 & C2), the installer should keep voltage drops in the charging circuit to a minimum while ensuring that cables can handle the maximum 100A charging current.

- The cables S+ & S- should be of the same size as those used in the electro hydraulic pump power circuit (refer to specific thruster model's manual).

- A power fuse and manual battery isolator, as indicated on the attached drawings, should also be installed in the positive power cable of the electro hydraulic pump.

4.2 CONTROL CIRCUIT CONNECTIONS (Refer to Attached Drawing No. BC 06):

- Make sure that solenoids for Directional Control Valve (DCV) are in 12 V, if not replace with 12V models (Refer to Note 1 of Drawing No. BC 06, Page 11).

- Make sure to use a 12 V Electric Battery Isolator and Power Relay (Refer to Note 2 & 3 of Drawing No. BC 06, Page 11).

- Change 24V up/down motors, as delivered as standard with VIP hydraulic thruster units, for 12 V models (Refer to Note 4 of Drawing No. BC 06, Page 11).

- Connect blue, brown & black wires, going to DCV, to blue, brown and black control wires at the 12/24V coupler, as indicated in diagram (Refer to Note 5 of Drawing No. BC 06, Page 11).

- The supply should be connected to a separate 12 V battery bank (advised) or to one of the 12 V banks as being used by the 12/24 V Coupler (Refer to Note 6 of Drawing No. BC 06, Page 11).

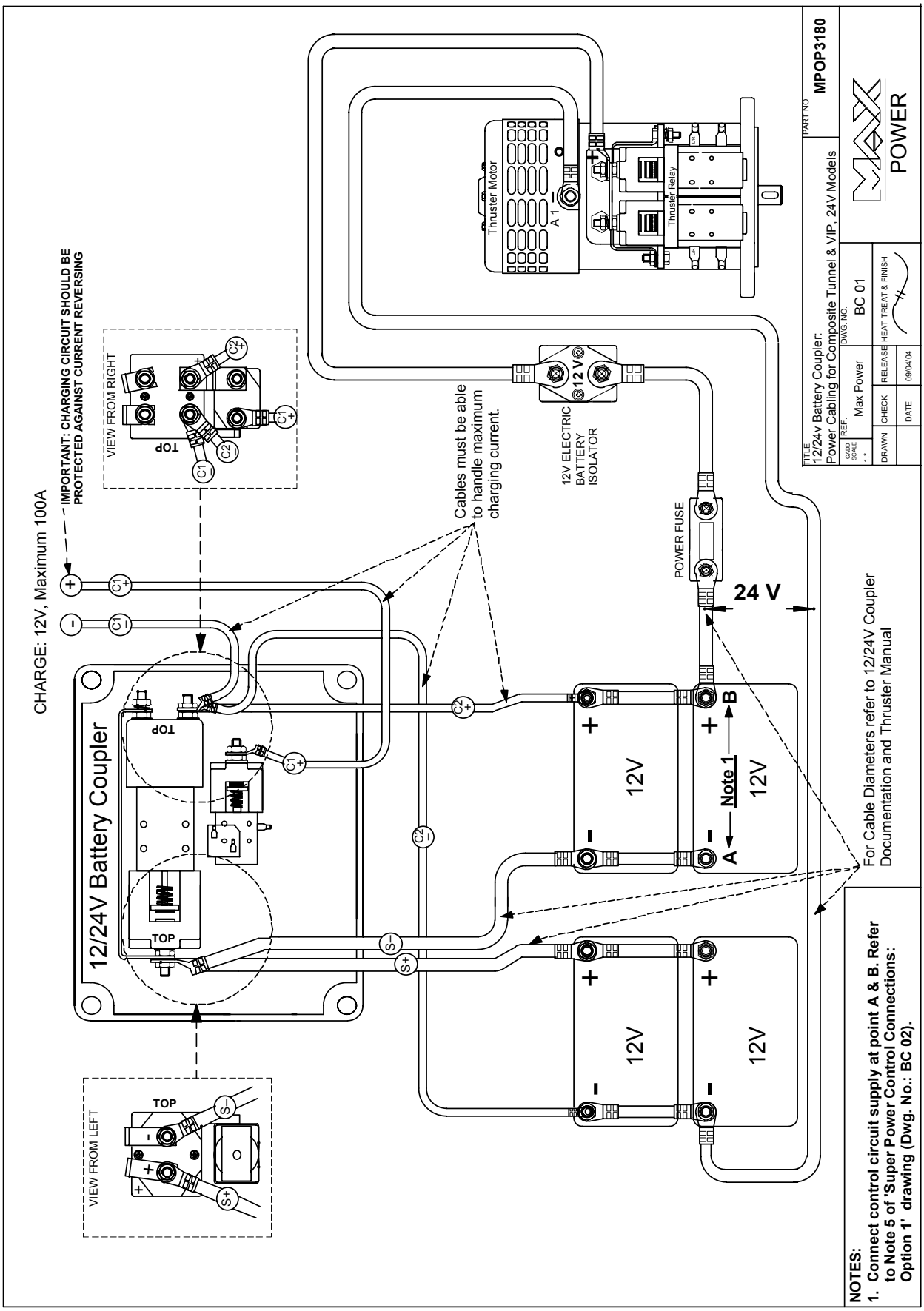
5. R 200 HYDRUALIC THRUSTERS:

5.1 CONTROL CIRCUIT CONNECTIONS (Refer to Attached Drawing No. BC 07):

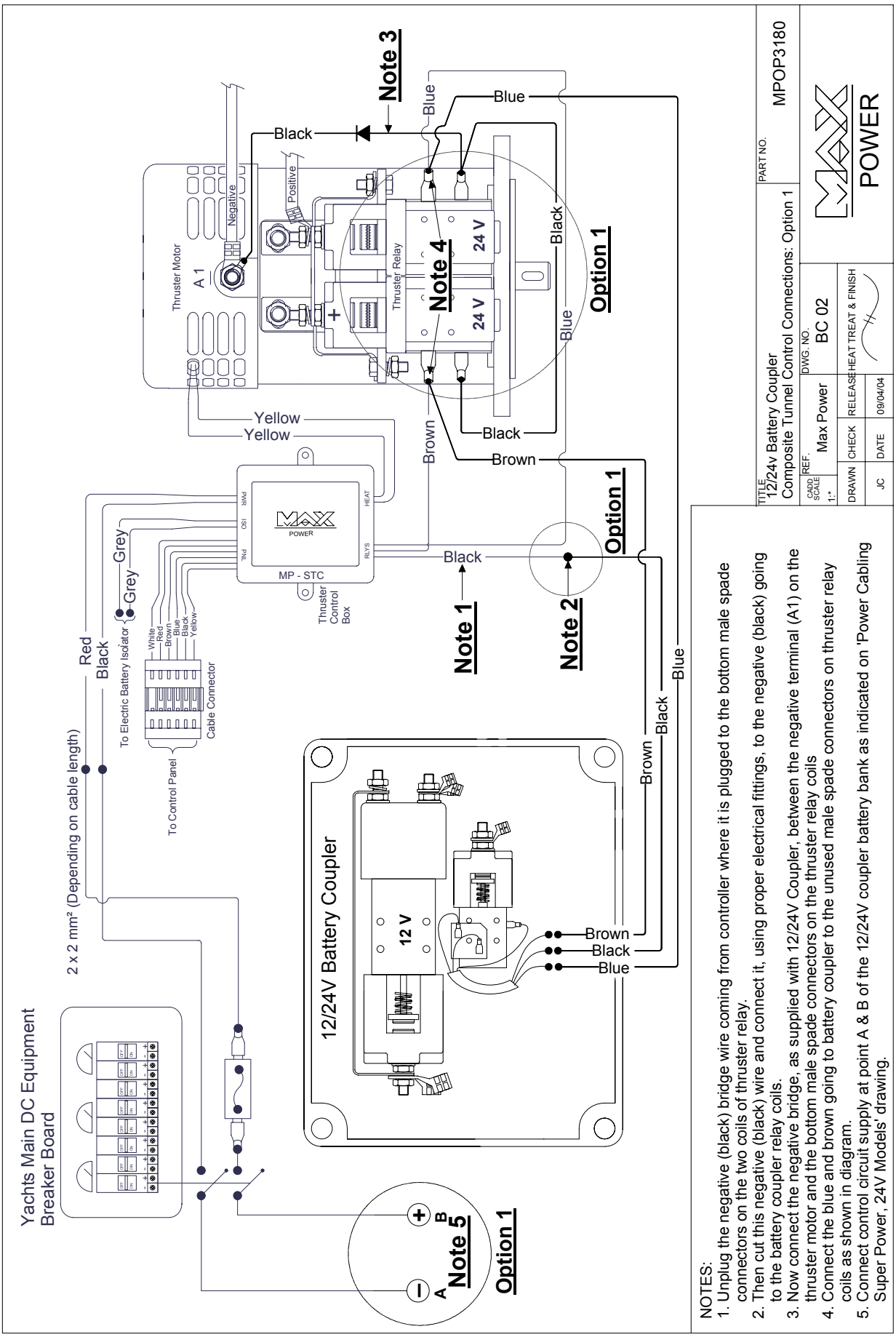
- For power cabling of the R 200 hydraulic thrusters, please refer to attached drawing No. BC 05, Page 10.
- Make sure that solenoids for Directional Control Valve (DCV) are in 12 V, if not replace with 12V models (Refer to Note 1 of Drawing No. BC 07, Page 12).
- Make sure to use a **12 V** Electric Battery Isolator and Power Relay (Refer to Note 2 & 3 of Drawing No. BC 07, Page 12).
- Change 24V motor on the up/down RAM, as delivered as standard with R 200 hydraulic thruster units, for a **12 V** model (Refer to Note 4 of Drawing No. BC 07, Page 12).
- Connect blue, brown & black wires, going to DCV, to blue, brown and black control wires at the 12/24V coupler, as indicated in diagram (Refer to Note 5 of Drawing No. BC 07, Page 12).
- The supply should be connected to a separate 12 V battery bank (advised) or to one of the 12 V banks as being used by the 12/24 V Coupler (Refer to Note 6 of Drawing No. BC 07, Page 12).

6. DRAWINGS:

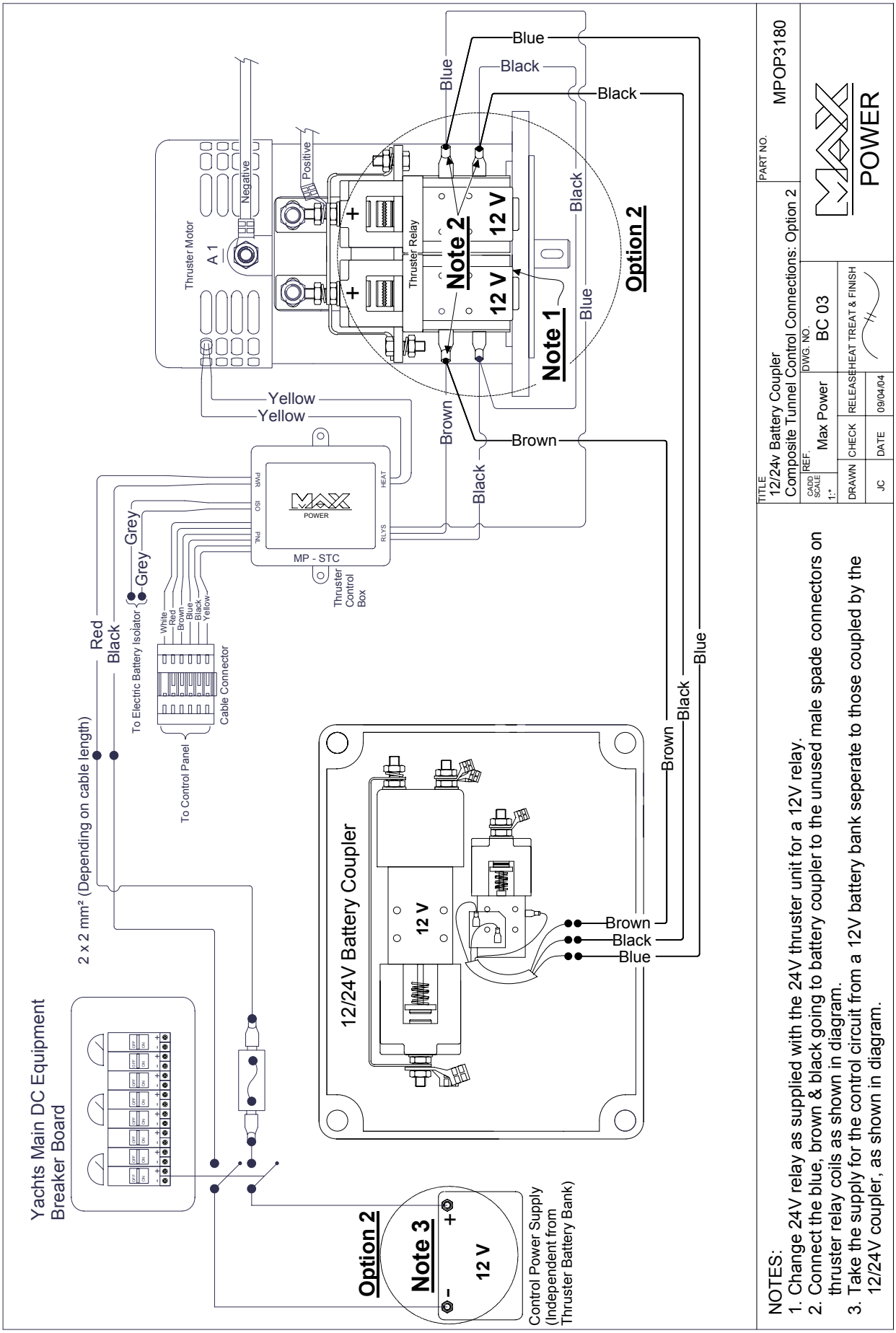
6.1 BC 01: Power Cabling for Composite Tunnel & VIP, 24V Models



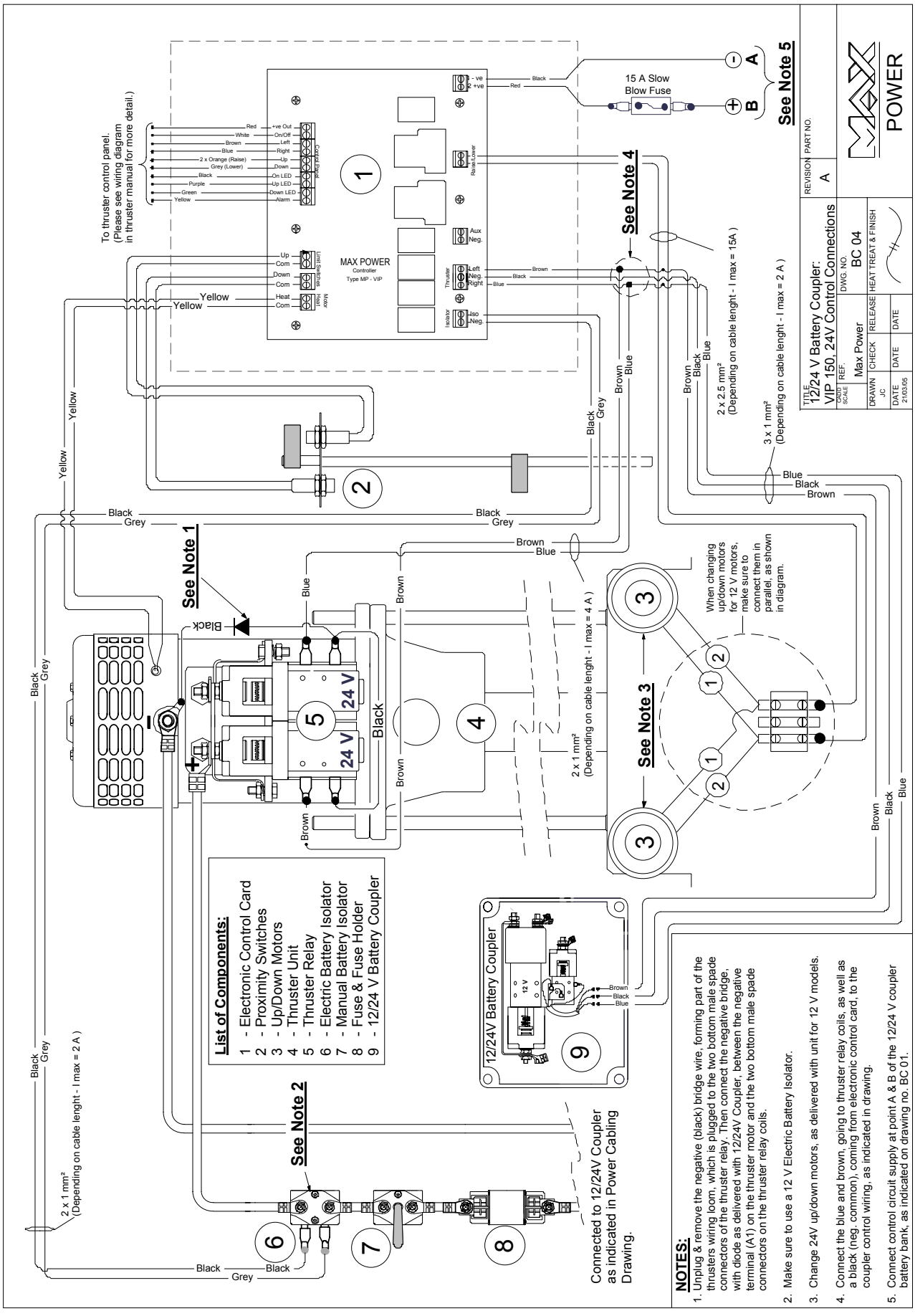
6.2 BC 02: Composite Tunnel Control Connections: Option 1



6.3 BC 03: Composite Tunnel Control Connections: Option 2



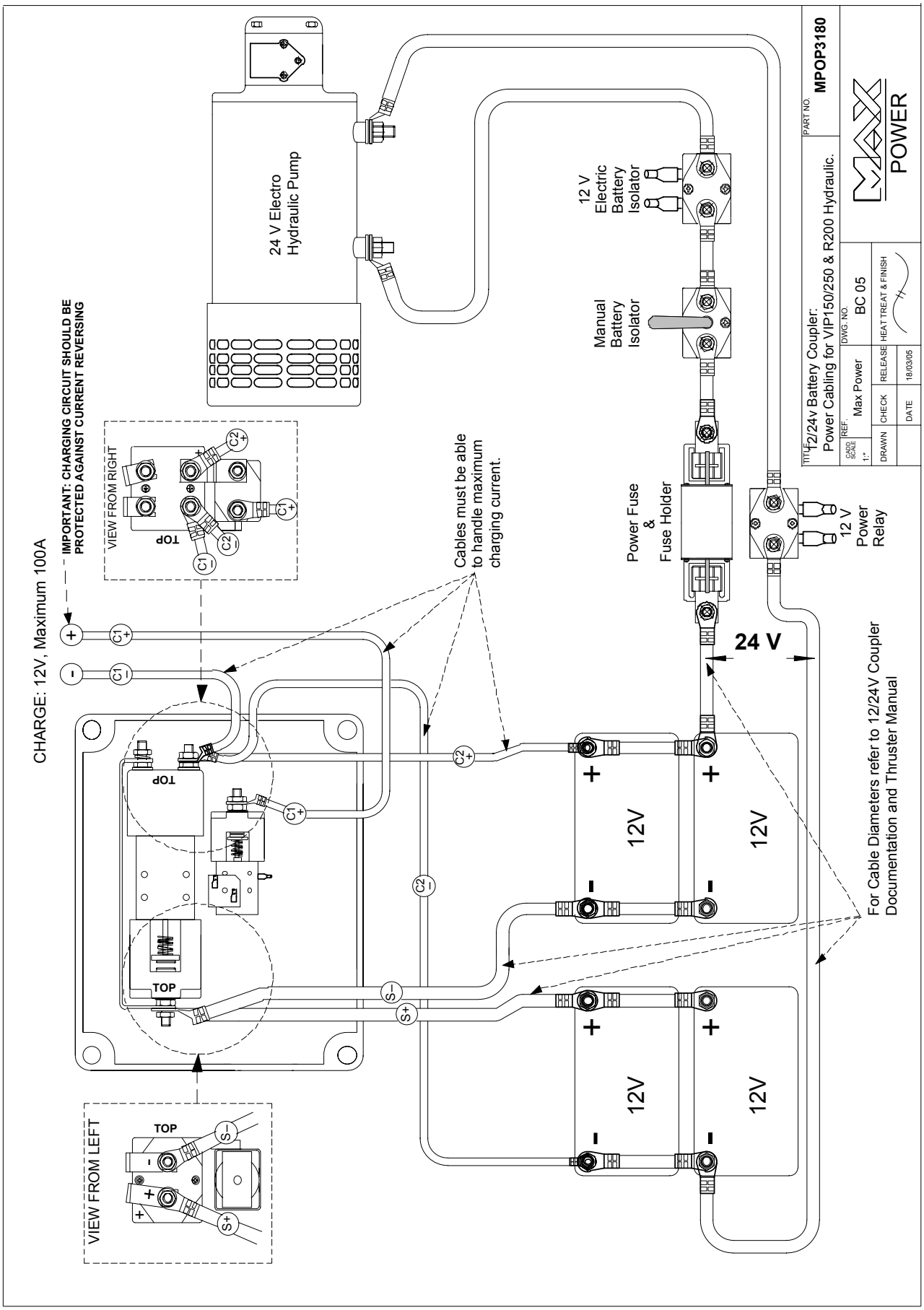
6.4 BC 04: VIP 150, 24V Control Connections



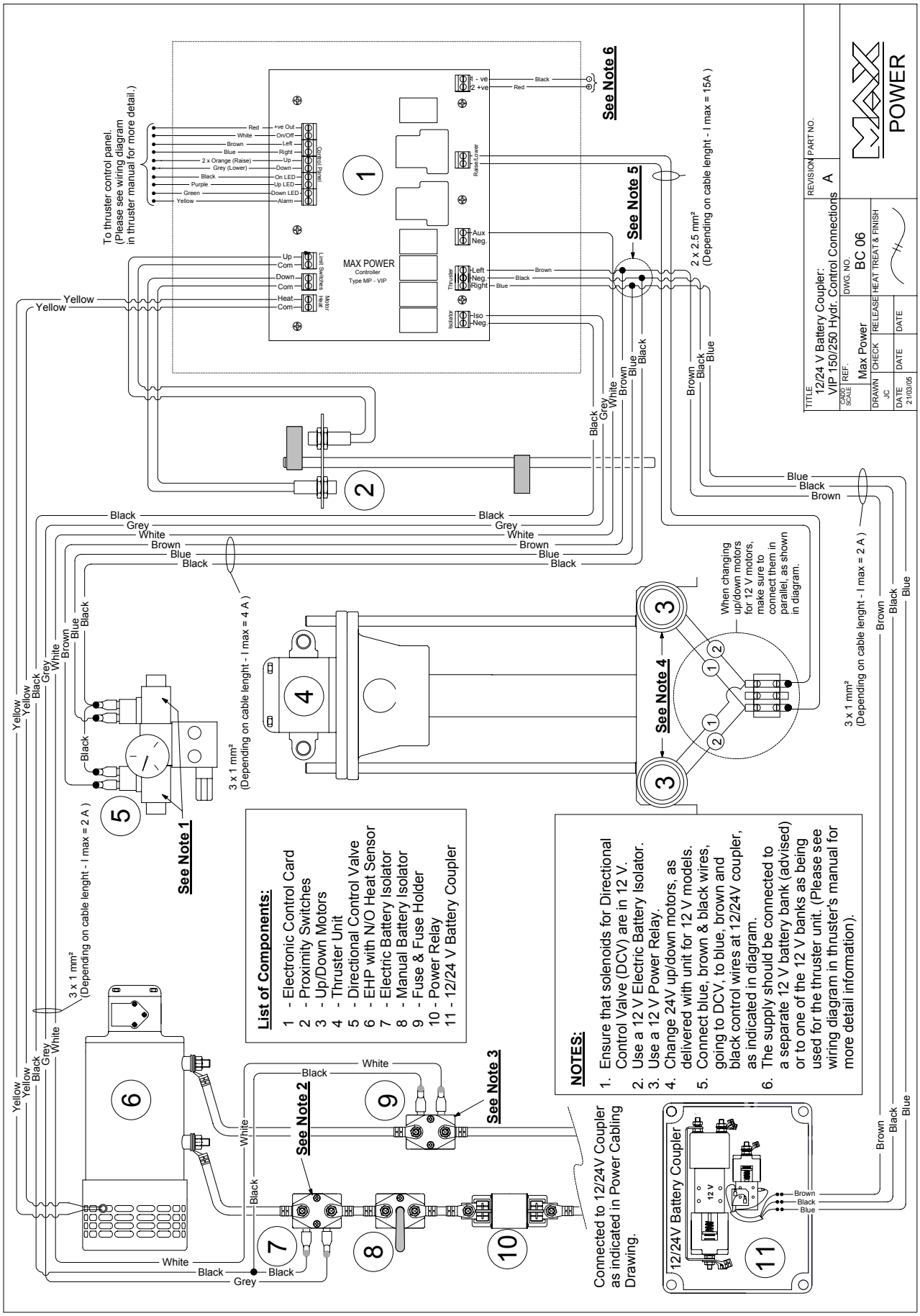
NOTES:

1. Unplug & remove the negative (black) bridge wire, forming part of the thrusters wiring loom, which is plugged to the two bottom male spade connectors of the thruster relay. Then connect the negative bridge, with diode as delivered with 12/24V Coupler, between the negative terminal (A1) on the thruster motor and the two bottom male spade connectors on the thruster relay coils.
2. Make sure to use a 12 V Electric Battery Isolator.
3. Change 24V up/down motors, as delivered with unit for 12 V models.
4. Connect the blue and brown, going to thruster relay coils, as well as a black (neg. common), coming from electronic control card, to the coupler control wiring, as indicated in drawing.
5. Connect control circuit supply at point A & B of the 12/24 V coupler battery bank, as indicated on drawing no. BC 01.

6.5 BC 05: Power Cabling for VIP 150/250 & R 200 Hydraulic



6.6 BC 06: VIP 150/250 Hydraulic Control Connections



6.7 BC 07: R 200 Hydraulic Control Connections