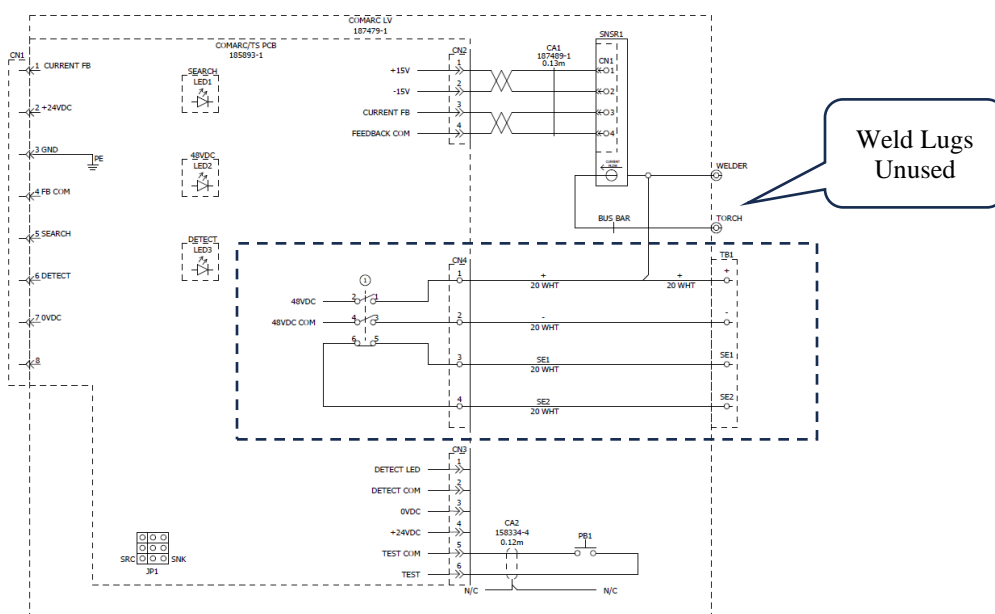**Background:**

Yaskawa America has released a digital interface with the OTC power source. The OTC interface does not support signals for touch sensing function. Therefore, an external source is needed to apply a search voltage and detect when the circuit closes (wire touches). The ComArc LV seamtracking box has a 48vdc circuit for searching voltage and a Hall Effect sensor for current feedback for seamtracking. In this application, the Hall Effect sensor with lugs for the torch lead is not used.

The ComArc LV box has 4 small wire terminals for the external 48 vdc Touch Sense circuit. There is a relay that closes when the SRCH instruction executes and applies 48vdc between the + (torch) and – (work) terminals. There are secondary contacts on a normally closed relay that Open when the search voltage is applied (SE1 and SE2). The wiring back to the YRC1000 controller includes and output which turns on during the SRCH instruction to activate the voltage (via Concurrent IO logic and Simple Connect selection of 48 v Touch Sense option). There is also wiring into Rapid Input 3 (RIN 3) on the Safety IO board. This is standard wiring for the Touch Sense option and should follow system prints, This document covers the external wiring of the ComArc LV box to the OTC welding equipment.
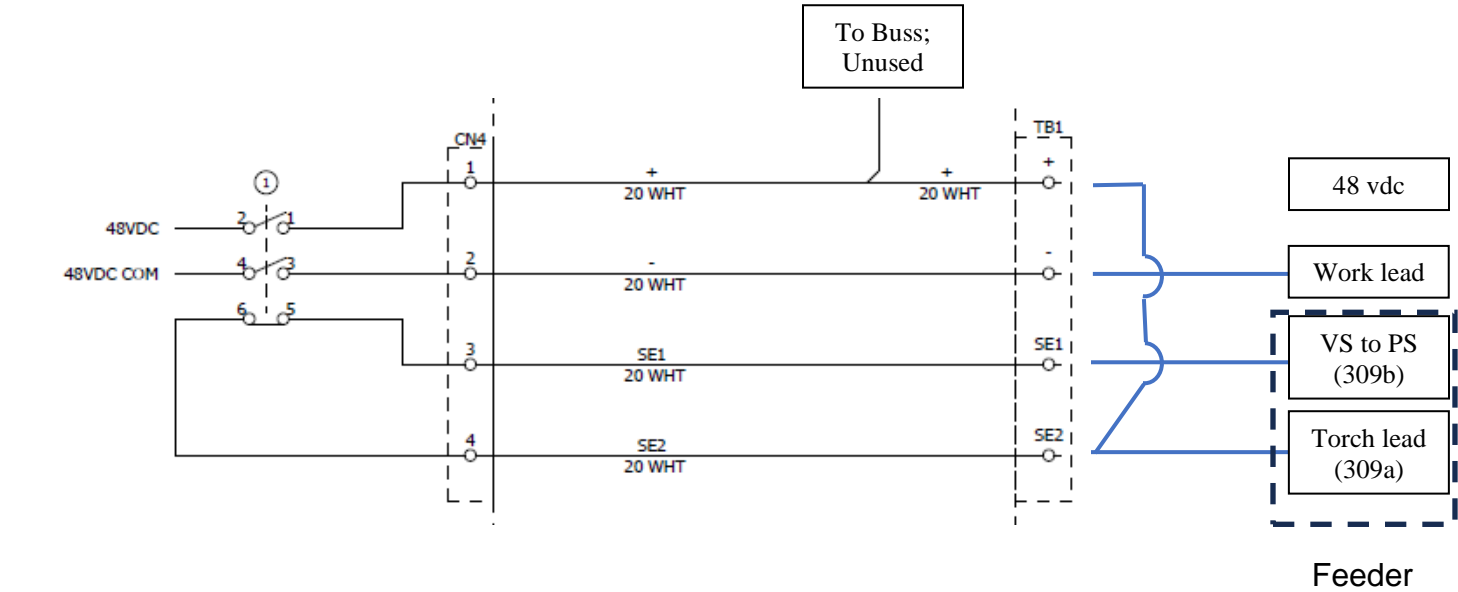
NOTE: The OTC regulates current to keep it constant when stick out changes. This defeats the principle for through-arc-tracking and the OTC is not applicable for COMARC seamtracking. The OTC controls the arc in this manor whether the Penetration Control Function is ON or OFF from the interface.

Wiring – The OTC has a voltage sensing lead in the wire feeder connected to the torch. This connection will short circuit the touch sensing voltage when applied for searching. Therefore, the voltage sensing lead will be connected to the SE1/SE2 contacts to Open when Search Voltage is applied. OTC has screw terminal connections in the wire feeder enclosure for signals from the welder. Yaskawa has wired a secondary cable with a few conductors the length of the wire feeder cable to extend into the feeder enclosure and run back to the ComArc LV box terminals. To save wiring, a jumper is run from the + 48vdc terminal to the SE contact going to the torch to apply SRCH voltage. A smaller gage wire is run from the 48vdc comm (-) terminal to the work lead on the power source.
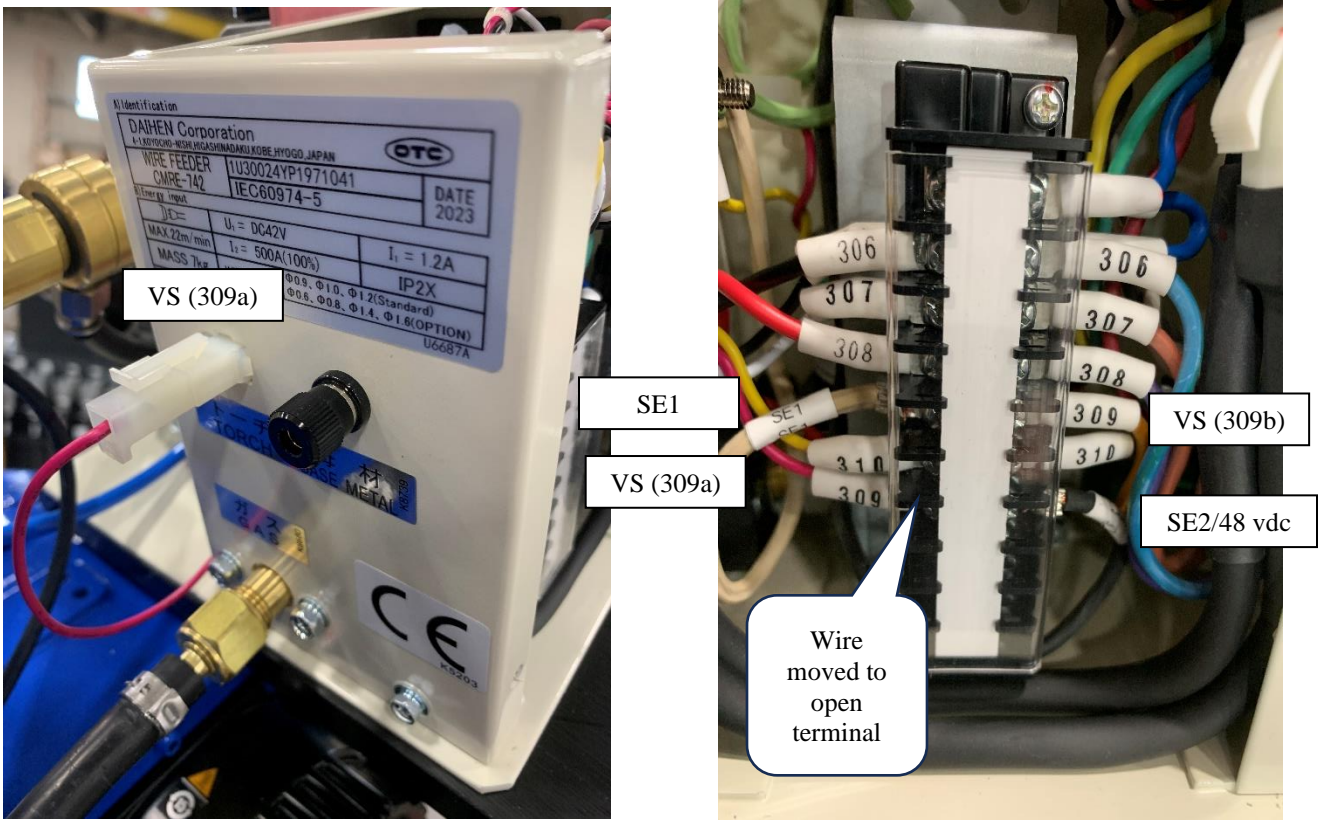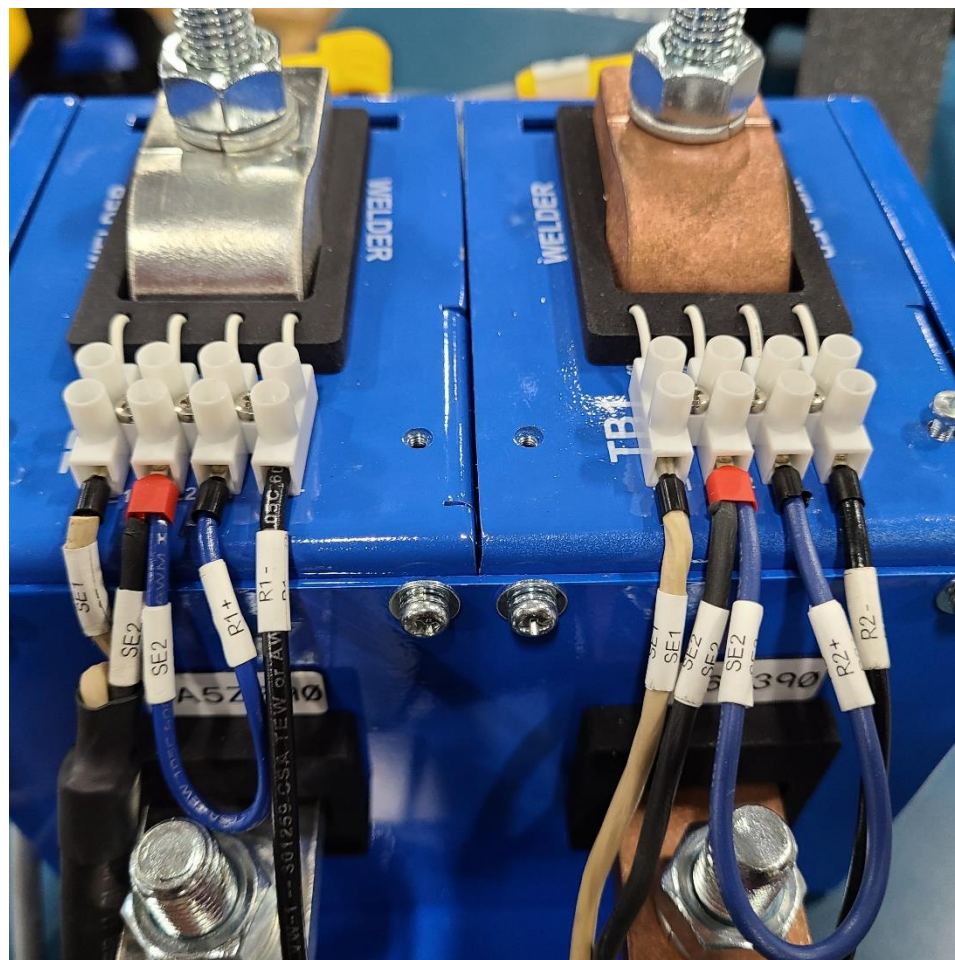

ComArc LV Diagram – 188242-1

LV box terminals to OTC circuit Diagram

LV box terminal wiring – Dual Robot Shown
(Note – use labels printed on box for terminal names. The order of terminals do not match the print shown above)

The above wiring will leave the feeders voltage sensing lead (309) on the normally closed relay SE1/SE2 when welding. When touch sensing, it will open the VS lead back to the power source (309b) and apply the 48 vdc voltage to the VS lead going to the power pin (red wire-309a)

Alternate wiring – *Yaskawa does not like to modify wiring on customer supplied equipment. It was felt that an alternate wiring method would be to intercept the connections inside the power source where the wire feeder cable enters. The voltage sensing lead comes into a connector on a circuit board on the bottom of the power supply. This wire could be cut and connections made similar to the feeder where SE1/SE2 are used to interrupt the VS lead when searching and restore the connection when not searching. A shorter cable could be run through a spare knock out in the back of the welder to the ComArc LV box external from the power source.*

VS wires from feeder on this plug