Hi Performance Electric Vehicle Systems

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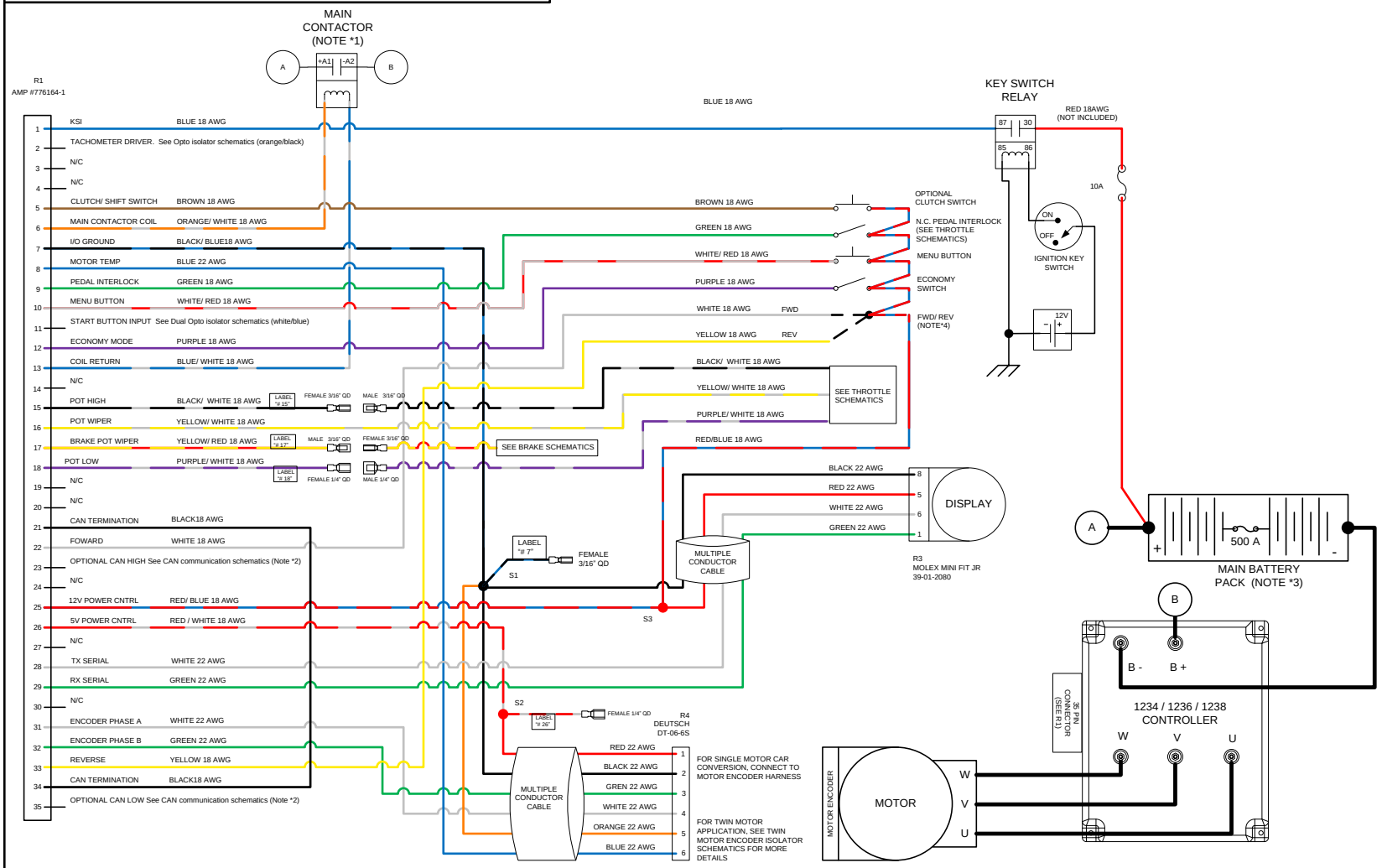
WIRING SCHEMATICS

BASIC AUTOMOTIVE CONVERSION WITH TWIN MOTOR

REVISION: A
Date: 4/25/2013



NOTES:

(*1) USE SUPPLIED CONTACTOR

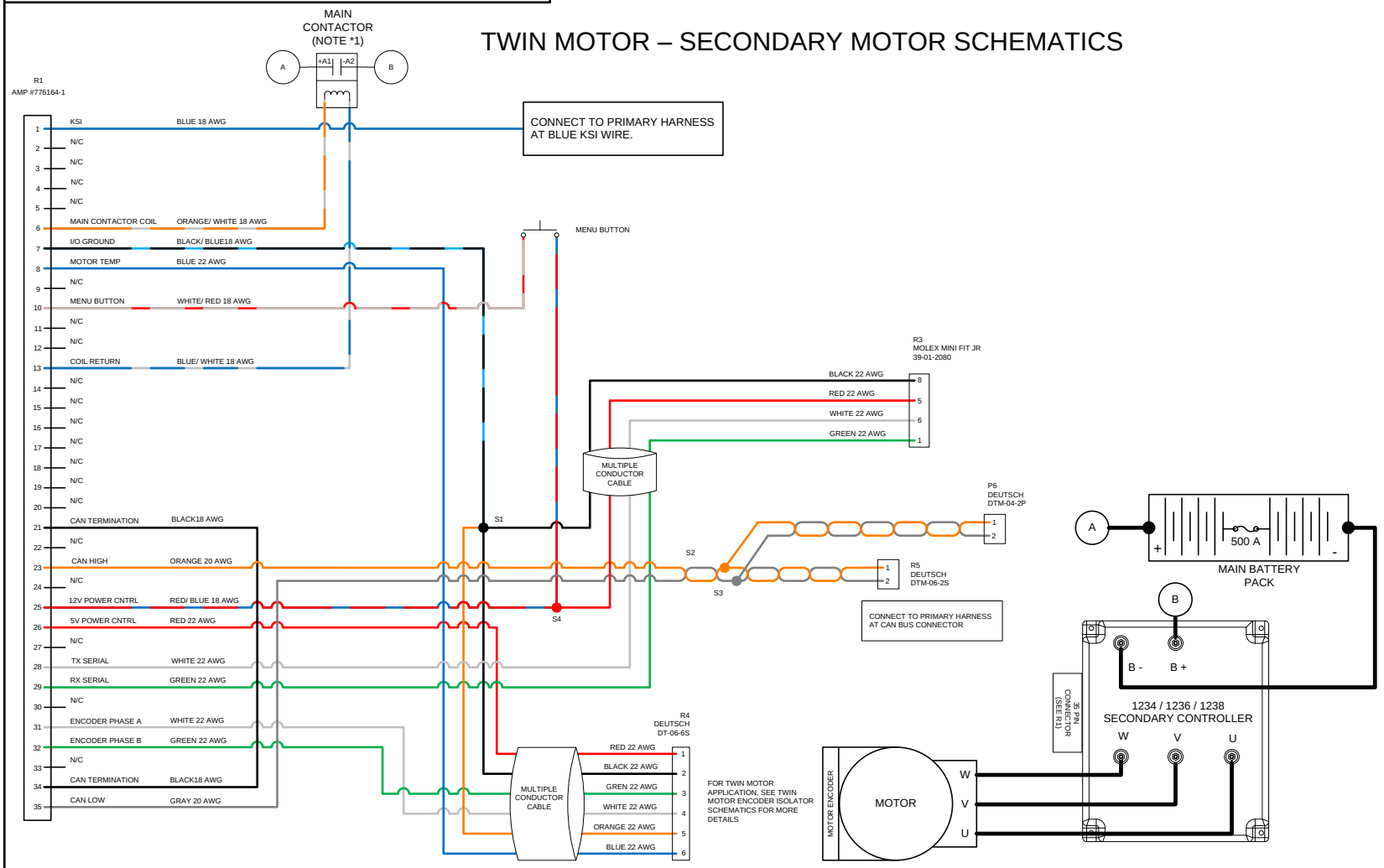
(*2) THE CONTROLLER CAN COMMUNICATION NEEDS TO BE ISOLATED FROM OTHER CAN BASED COMPONENTS. A CAN ISOLATOR MAY BE NEEDED. POSSIBLE SOURCE OF CAN ISOLATOR IS CANOP FROM B&B ELECTRONICS (www.bb-elec.com)

(*3) A BATTERY MANAGEMENT SYSTEM (BMS) IS STRONGLY RECOMMENDED IF LITHIUM ION BATTERIES ARE USED. POSSIBLE SOURCE OF BMS IS EWERT ENERGY SYSTEM'S ORION BMS (www.orionbms.com)

(*4) FORWARD IS CLOCKWISE MOTOR ROTATION FROM ENCODER SIDE VIEW. DEPENDING ON TRANSMISSION CONFIGURATION, USE EITHER WIRE TO OBTAIN DESIRED ROTATION. USE FWD & REV SWITCH IN DIRECT DRIVE APPLICATIONS

CAD TYPE VISIO	APPLICABLE SOFTWARE		
UNIT NONE	DRAWING	1010-AUTO-CONVERSION	
DRW SIZE A	TITTLE	BASIC CAR CONVERSION / PRIMARY TWIN MOTOR SCHEMATICS	
DATE 2/12/13			
SCALE 1:1	SHEET 1 OF 1	REVISION C	**HPEVS**

TWIN MOTOR – SECONDARY MOTOR SCHEMATICS

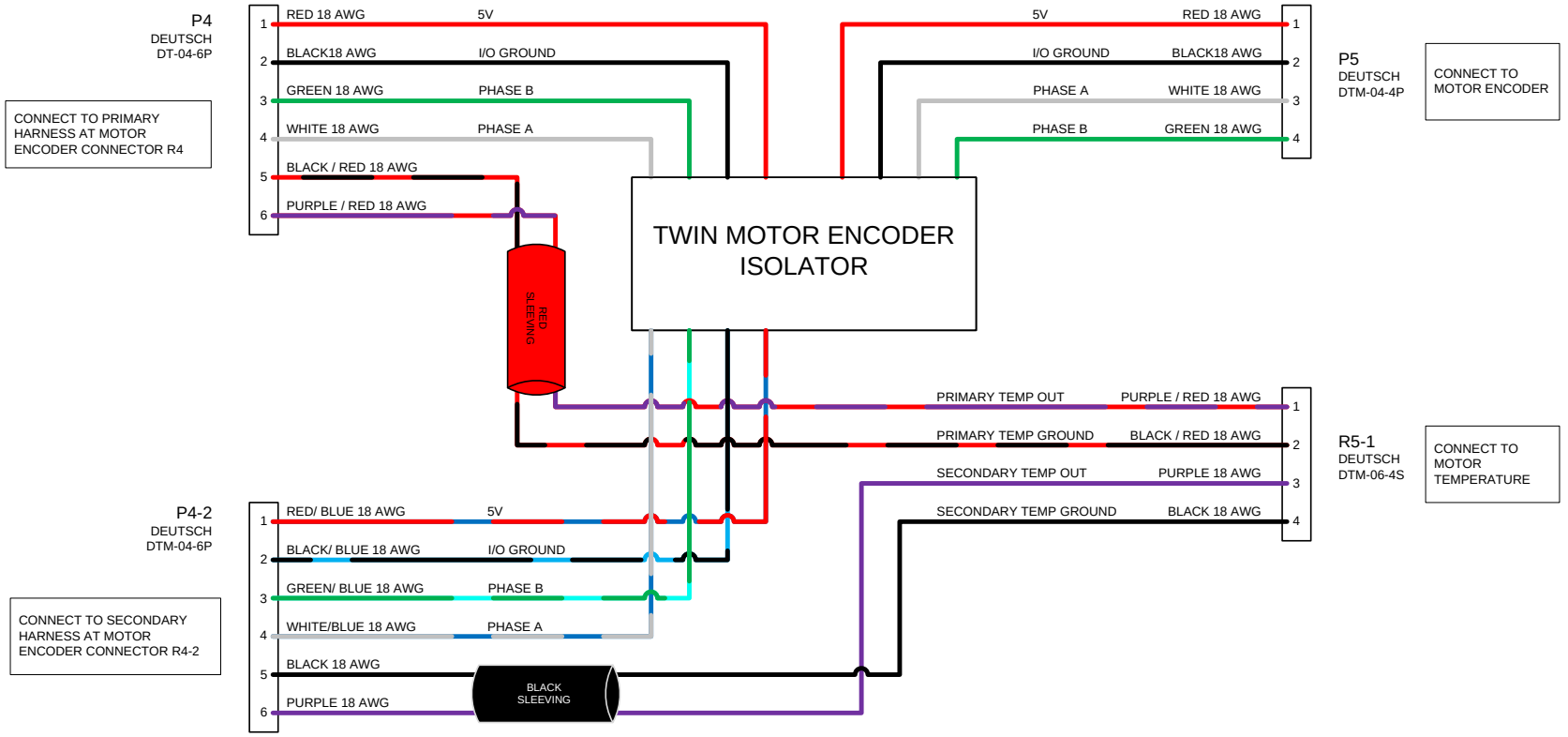


NOTES:

(*1) USE SUPPLIED CONTACTOR

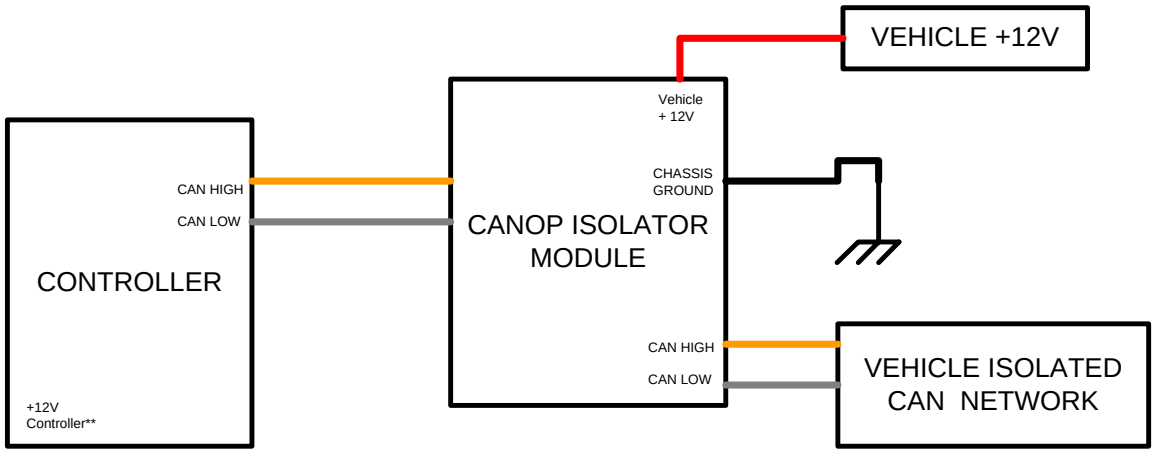
CAD TYPE VISIO	APPLICABLE SOFTWARE		
UNIT NONE	DRAWING 1010-AUTO-CONVERSION-TWIN MOTOR		
DRW SIZE A	TITTLE SECONDARY TWIN MOTOR SCHEMATICS		
DATE 4/2/13			
SCALE 1:1	SHEET 1 OF 1	REVISION A	**HPEVS**

REVISIONS			
REV	ORIGINATOR	DESCRIPTION	APPROVED
A		Initial Release	4/2/2013



CAD TYPE VISIO	CAD LOC.	APPLICABLE SOFTWARE	DRW SIZE B
OPER. NO.	UNIT	DRAWING 1010-TWIN-ENCODER-ISOLATOR	
DESIGN	DETAIL	TITTLE TWIN MOTOR ENCODER ISOLATOR SCHEMATICS	
CHECKED	SAFETY		
SCALE NONE	DATE 4/2/2013	REVISION A SHEET 1 OF 1	HPEVS

REVISIONS		
REV	DESCRIPTION	APPROVED
A	INITIAL RELEASE	3/11/2013



** DO NOT CONNECT THE +12V FROM CONTROLLER TO CAN ISOLATOR

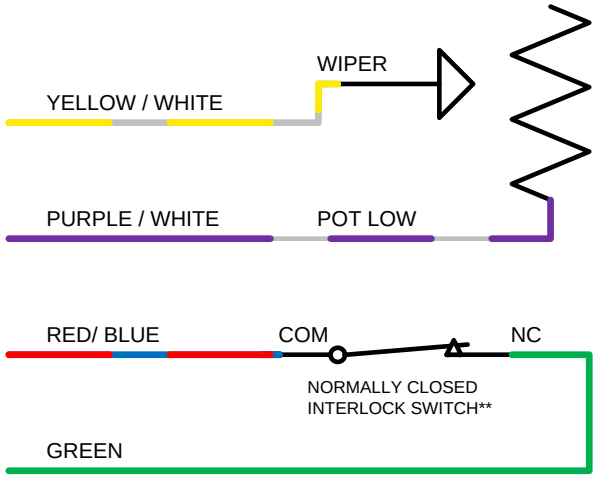
CAD TYPE VISIO	CAD LOC.	CAD FILE	DRW SIZE A
OPER. NO.	UNIT	DRAWING 1010-CAN-OP-ISOLATOR	
DESIGN	DETAIL	TITTLE CAN ISOLATOR	
CHECKED	SAFETY		
SCALE NONE	DATE 4/17/13	REVISION A SHEET 1 OF 1	**HPEVS**

THROTTLE CONFIGURATION

Depending of the type of throttle used for the application, see below table to determine the appropriate connection. Electrical schematics are also included in page 7 through 9.

THROTTLE CONFIGURATION	**TYPE**	**ELECTRICAL CONNECTIONS**
2 WIRE with SWITCH 0-5k Ω	TYPE 2	Connect PURPLE / WHITE wire labeled #18 with PURPLE / WHITE wire. Ending connection at throttle pot low. YELLOW / WHITE wire connected to throttle wiper
3 WIRE with SWITCH 0-5k Ω	TYPE 3	Connect BLACK / WHITE wire labeled #15 with BLACK/ WHITE wire. Ending connection at throttle pot high. Connect PURPLE / WHITE wire labeled #18 WITH PURPLE / WHITE wire. Ending connection at throttle pot low. Connect YELLOW / WHITE wire connected to throttle wiper.
ELECTRONIC without SWITCH	TYPE 1	Disconnect any wire connected to BLACK/WHITE wire labeled #15. Disconnect any wire from PURPLE/ WHITE wire labeled #18. Connect BLACK /BLUE WIRE LABELED #7 with BLACK/ BLUE wire. Ending connection at electronic throttle ground. Connect RED/ WHITE wire labeled #26 with PURPLE / WHITE wire. Ending connection at throttle +5V input. Connect YELLOW / WHITE wire to electronic throttle signal.

REVISIONS		
REV	DESCRIPTION	APPROVED
A	INITIAL RELEASE	1/22/2013

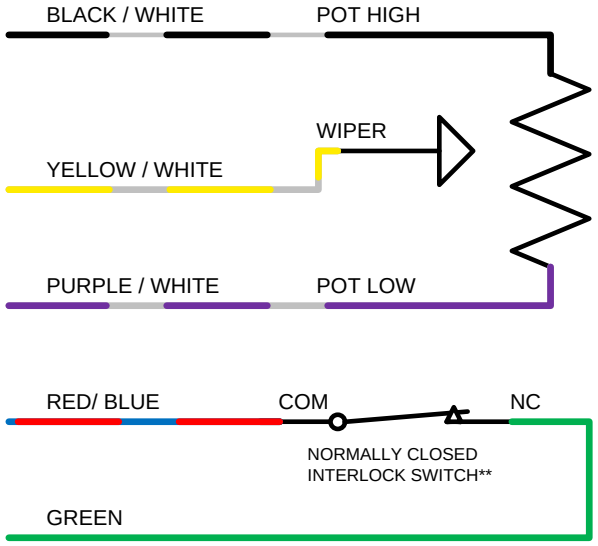


2 WIRE TYPE 2 THROTTLE

** When accelerator pedal IS PRESSED the interlock switch is released to its NORMAL position (switch not activated) thus completing the circuit since its green wire is connected to the normally closed (NC) connection.

CAD TYPE VISIO	CAD LOC.	CAD FILE	DRW SIZE A
OPER. NO.	UNIT	DRAWING 1010-THROTTLE-001	
DESIGN	DETAIL	TITTLE 2 WIRE TYPE 2 THROTTLE	
CHECKED	SAFETY		
SCALE NONE	DATE 1/22/13	REVISION A SHEET 1 OF 3	HPEVS

REVISIONS		
REV	DESCRIPTION	APPROVED
A	INITIAL RELEASE	1/22/2013



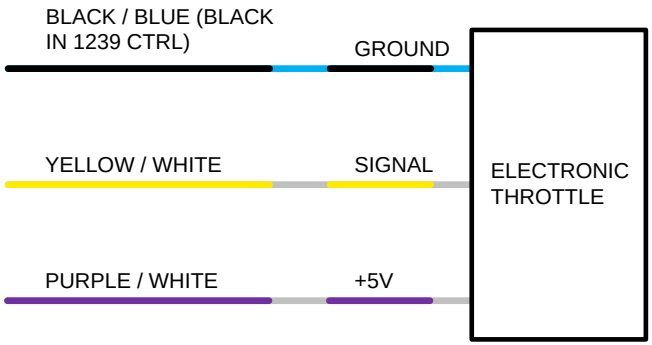
3 WIRE TYPE 3 THROTTLE

** When accelerator pedal IS PRESSED the interlock switch is released to its NORMAL position (switch not activated) thus completing the circuit since its green wire is connected to the normally closed (NC) connection.

CAD TYPE VISIO	CAD LOC.	CAD FILE	DRW SIZE A
OPER. NO.	UNIT	DRAWING 1010-THROTTLE-001	
DESIGN	DETAIL	TITTLE 3 WIRE TYPE 3 THROTTLE	
CHECKED	SAFETY		
SCALE NONE	DATE 1/22/13	REVISION A SHEET 2 OF 3	HPEVS

REVISIONS		
REV	DESCRIPTION	APPROVED
A	INITIAL RELEASE	1/22/2013

ELECTRONIC THROTTLE**



** When Electronic pedal is used, the GREEN wire from pedal interlock does not need to be connected

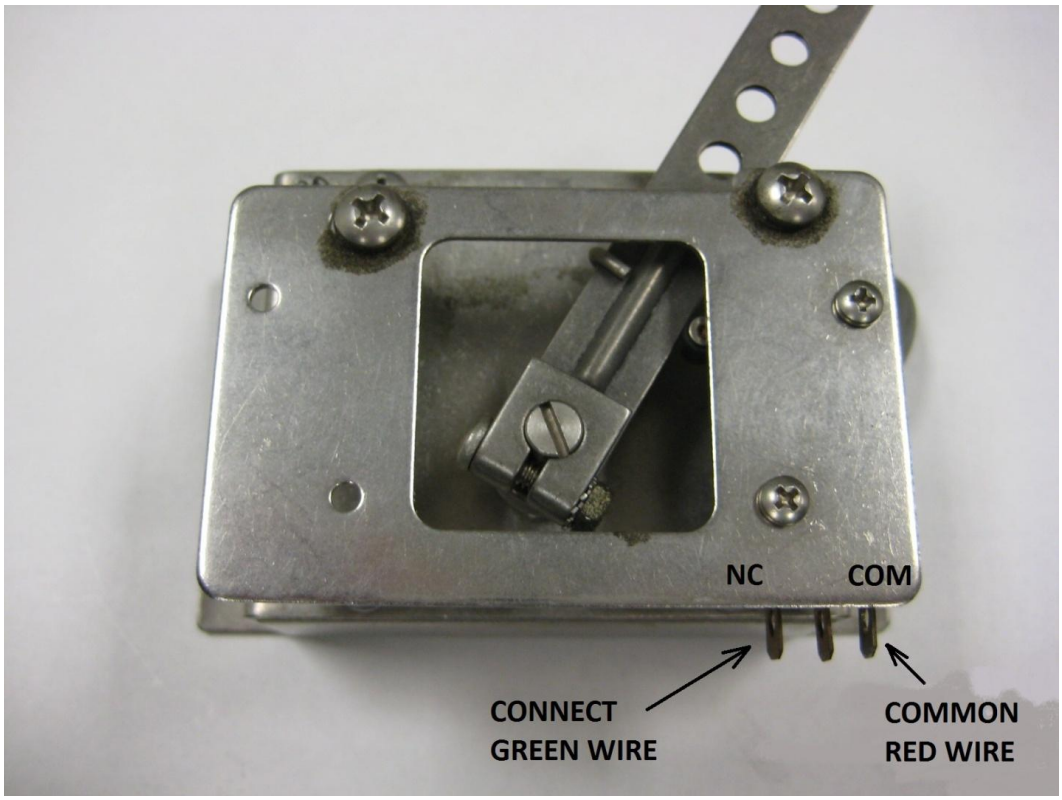
CAD TYPE VISIO	CAD LOC.	CAD FILE	DRW SIZE A
OPER. NO.	UNIT	DRAWING 1010-THROTTLE-001	
DESIGN	DETAIL	TITTLE ELECTRONIC THROTTLE	
CHECKED	SAFETY		
SCALE NONE	DATE 1/22/13	REVISION A SHEET 3 OF 3	HPEVS

PEDAL INTERLOCK CONNECTION

The pedal interlock connection is required for both 2 and 3 wire throttle pot assemblies. The Green wire is connected at Normally Closed tab. Red wire is connected at common tab. See below picture.

NOTE, when accelerator pedal IS PRESSED the interlock switch is released to its NORMAL position (switch not activated) thus completing the circuit since its green wire is connected to the normally closed (NC) connection.

Electronic throttles usually do not have an interlock switches. In this application, the Green and Red wires are connected together.

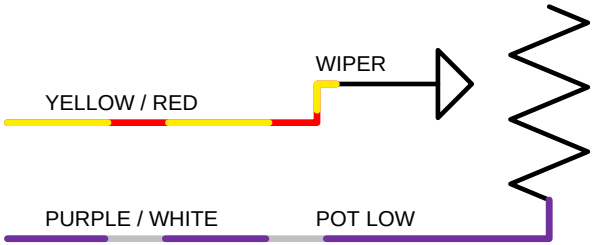


BRAKE POT CONFIGURATION

Depending of the type of brake pot used for the application, see below table to determine the appropriate connection. Electrical schematics are also included in page 12 & 13.

BRAKE POT CONFIGURATION	**TYPE**	**ELECTRICAL CONNECTIONS**
2 WIRE 0-5k Ω	TYPE 2	Connect PURPLE / WHITE wire labeled #18 with PURPLE / WHITE wire. Ending connection at brake pot low. Connect YELLOW / RED wire labeled #17 with wire YELLOW/ RED wire. Ending connection at brake wiper.
BRAKE TRANSDUCER	TYPE 1	Connect RED/ BLUE wire to brake transducer +12V input. Connect BLACK/ BLUE wire labeled #7 with Black/BLUE wire. Ending connection at brake transducer ground. Connect YELLOW / RED wire labeled #17 with wire YELLOW/ RED wire. Ending connection at brake transducer output signal.

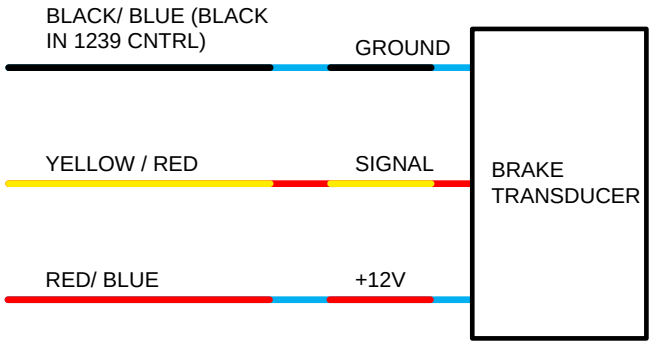
REVISIONS		
REV	DESCRIPTION	APPROVED
A	INITIAL RELEASE	2/19/2013



2 WIRE BRAKE POT

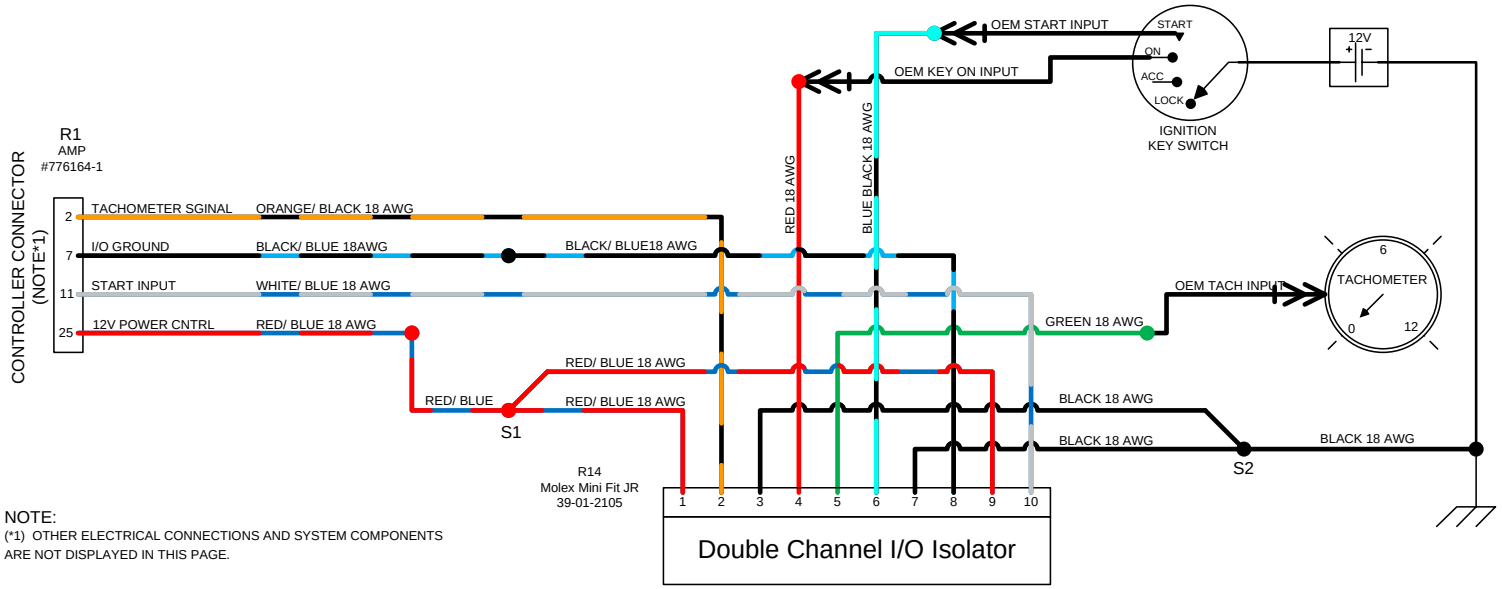
CAD TYPE VISIO	CAD LOC.	CAD FILE	DRW SIZE A
OPER. NO.	UNIT	DRAWING 1010-BRAKE-001	
DESIGN	DETAIL	TITTLE 2 WIRE BRAKE	
CHECKED	SAFETY		
SCALE NONE	DATE 2/19/13	REVISION A SHEET 1 OF 2	HPEVS

REVISIONS		
REV	DESCRIPTION	APPROVED
A	INITIAL RELEASE	2/19/2013



BRAKE TRANSDUCER

CAD TYPE VISIO	CAD LOC.	CAD FILE	DRW SIZE A
OPER. NO.	UNIT	DRAWING 1010-BRAKE-001	
DESIGN	DETAIL	TITTLE BRAKE TRANSDUCER	
CHECKED	SAFETY		
SCALE NONE	DATE 2/19/13	REVISION A SHEET 2 OF 2	HPEVS



NOTE:
(*1) OTHER ELECTRICAL CONNECTIONS AND SYSTEM COMPONENTS ARE NOT DISPLAYED IN THIS PAGE.

I/O ISOLATOR PIN FUNCTION

1 – CHANNEL 1 CONTROLLER 12V
2 – CHANNEL 1 TACHOMETER SIGNAL
3 – CHANNEL 1 GROUND
4 – CHANNEL 1 VEHICLE 12V
5 – CHANNEL 1 OUTPUT TO TACHOMETER
6 – CHANNEL 2 IGNITION KEY INPUT
7 – CHANNEL 2 GROUND
8 – CHANNEL 2 CONTROLLER I/O GROUND
9 – CHANNEL 2 CONTROLLER 12V
10 – CHANNEL 2 CONTROLLER START INPUT

CAD TYPE VISIO	CAD LOC.	CAD FILE	DRW SIZE B
OPER. NO.	UNIT	DRAWING 1010-2CH-ISOLATOR-001	
DESIGN	DETAIL	TITTLE DUAL CHANNEL OPTO-ISOLATOR SYSTEM SCHEMATICS	
CHECKED	SAFETY		
SCALE NONE	DATE 4/19/12	REVISION B SHEET 1 OF 1	HPEVS