CURTIS

Motor Controllers

Permanent Magnet Motor Speed Controller

1212S / 1212P / 1212C

1212S / 1212P / 1212C

The Curtis Model 1212S, 1212P and 1212C Motor Speed Controllers provide efficient, optimal control of permanent magnet drive motors for battery powered industrial vehicles. Optimized for use on lightduty Class III pallet trucks, sweeper scrubber floorcare machines and other similar electric industrial vehicles. Highly flexible programmability allows them to be applied on any low power PM motor application.

FEATURES

Easy Installation and Set-up

▶ Easily programmed with Model 1313 handheld or 1314 PC programming station, or can be supplied pre-programmed.

▶ Compatible with industrial tiller handle wig-wag throttles such as the Curtis Model ET-19XX (1212P) or ET-1XXCAN (1212C only).

▶ Simplified troubleshooting and diagnostics.

▶ Industry standard Molex Mini-fit Jr. logic connectors with convenient 1/4" 6.35mm faston push-fit connectors (1212P,1212C) or heavier duty M4 threaded busbars (1212S) for battery and motor wiring.

▶ Compatible with the Curtis 3140 display.

1212P / 1212C

Smooth and Secure Control

▶ Advanced speed regulation maintains precise speed over varied terrain, obstacles, curbs and ramps.

▶ Linear cutback of current ensures smooth control, with no sudden loss of power during under-voltage or over-temperature.

▶ Proprietary algorithms help prevent gearbox wear while providing smooth starts and reversals.

▶ The vehicle is brought to a complete halt before the electromagnetic brake is applied, ensuring safe and secure stopping under all conditions.

▶ Charger inhibit input prevents driving while charger is connected.

▶ Emergency Stop Decel function ensures a smooth "brake to stop" when the key is turned off or a fault occurs that requires the vehicle to stop.

▶ Emergency reverse with belly button switch input.

▶ Anti-roll back/roll-forward function provides smooth and safe vehicle control on hills and ramps.

▶ Internal main relay provides secure power-off.

▶ Temporary "Boost Current" feature provides greatly improved performance with transient loads such as starting on a hill, crossing thresholds, climbing obstacles, etc.

▶ Input from Curtis 906 battery discharge indicator meter (1212P only).

▶ Output Lift Lockout signal, can drive a relay (1212P) to prevent lift pump operation or directly drive pump contactor (1212S) to protect the vehicle's batteries from damaging level of discharge.

1212S

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Valuable Additional Features

▸ Automatically compensates for changes in motor condition to ensure optimum drive performance at all times.

▸ Multi-mode provides for two distinct and programmable control modes (indoor/outdoor modes).

▸ Power Saver function prevents the controller draining the battery when vehicle is inactive.

▸ Battery Discharge Indicator output.

▸ CANopen compatible CAN bus port for communication with CAN tillers, displays and other CANopen devices (1212C only).

▸ Adjustable brake hold voltage reduces heating of the brake coil.

▸ Reverse Beeper function alerts bystanders (1212P only).

▸ Electronics sealed to IP54 (connectors not sealed).

▸ Output driver for connection of remote status LED.

▸ Integrated LED status indicator (1212S only).

▸ Lift Lockout Output Driver.

Meets or complies with relevant US and International Regulations

EMC: Designed to the requirements of EN 12895:2015+A1:2019.

Safety: Designed to the requirements of EN 1175-1:1998+A1:2010, EN 13849-1:2015.

UL List: UL583.

Electronics sealed to IP54.

Regulatory compliance of the complete vehicle system with the controller installed is the responsibility of the vehicle OEM.

MODEL CHART

Model	Nominal Voltage	Drive Current 2 min, A	Drive Current 20 Sec, A	Peak Boost, A	Max Boost Duration, Sec
1212P-25xx	24	50	90 (10s)	90	N/A
1212C-25xx	24	50	90 (10s)	N/A	N/A
1212S-25xx	24	50	90	100	5
1212S-26xx	24	70	110 (60s)	125	10
1212S-35xx	36	50	90	100	5

FUNCTIONAL SAFETY DATA

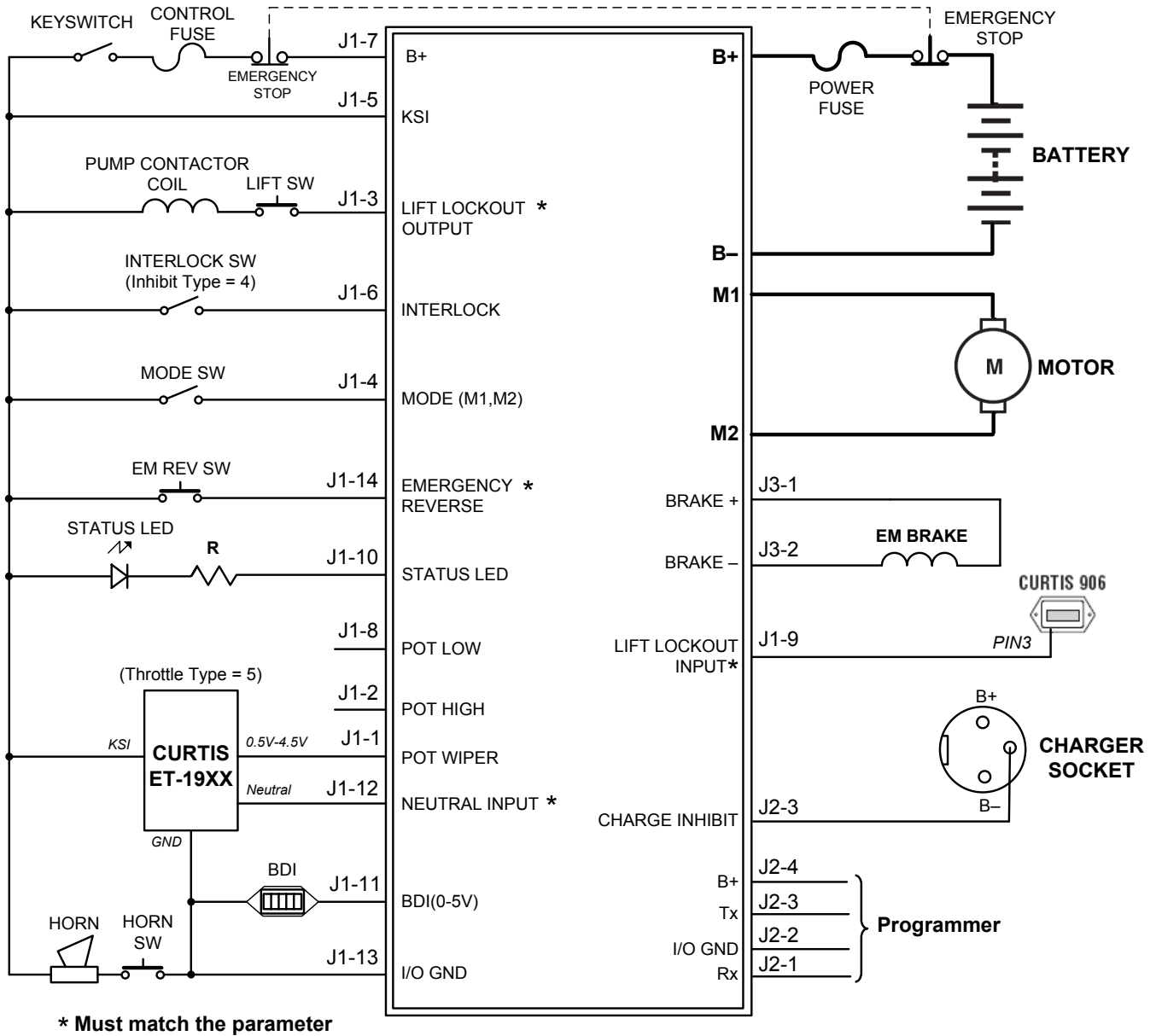| Safety Function	Performance Level (PL)	Designated Architecture	MTTFd	DC	CCF
Uncommanded Powered Movement Motor Braking Torque	b	Category 2	≥ 22 years	≥ 60%	70

1212S / 1212P / 1212C

WIRING DIAGRAM

1212S

1212S / 1212P / 1212C

WIRING DIAGRAM

1212P

KEYSWITCH CONTROL FUSE EMERGENCY STOP

J1-7 B+ B+ POWER FUSE EMERGENCY STOP

J1-5 KSI BATTERY

PUMP CONTACTOR COIL LIFT SW

J1-3 LIFT LOCKOUT * OUTPUT B−

INTERLOCK SW (Inhibit Type = 4) J1-6 INTERLOCK M1

MODE SW J1-4 MODE (M1,M2) M MOTOR

EM REV SW J1-14 EMERGENCY * REVERSE M2

STATUS LED R J1-10 STATUS LED J3-1 BRAKE + EM BRAKE

J3-2 BRAKE −

J1-8 POT LOW LIFT LOCKOUT INPUT* J1-9 CURTIS 906 PIN3

(Throttle Type = 5) J1-2 POT HIGH

CURTIS ET-19XX KSI 0.5V-4.5V J1-1 POT WIPER CHARGER SOCKET

Neutral J1-12 NEUTRAL INPUT * CHARGE INHIBIT J2-3 B−

GND B+

BDI J1-11 BDI(0-5V) J2-4 B+

HORN HORN SW J2-3 Tx

J1-13 I/O GND J2-2 I/O GND Programmer

J2-1 Rx
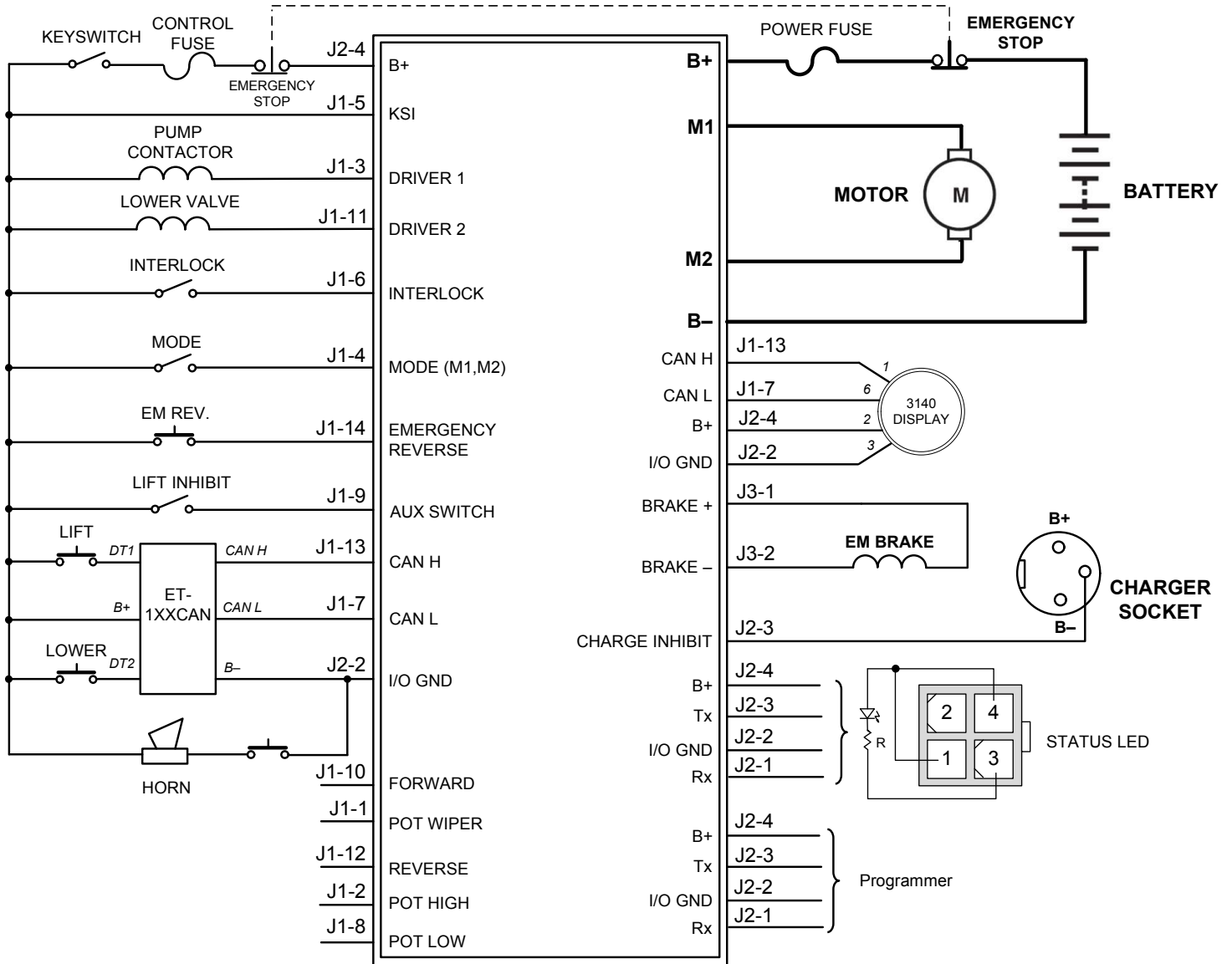
* Must match the parameter

1212S / 1212P / 1212C

WIRING DIAGRAM

1212C

1212S / 1212P / 1212C

DIMENSIONS mm

1212P / 1212C

9.0

18.2

54.0
72±1

M1 M2 B− B+

9.0

113.0

131±1

Ø 5.0 2PL

38.4±1

1212S

141.0

125.0

47.5 ±1.0

25.0

79.0

63.0

CURTIS

STATUS

M1   M2   B−   B+

4-M4 X 0.7 ⌄ 10 Min.

2- Ø5.0
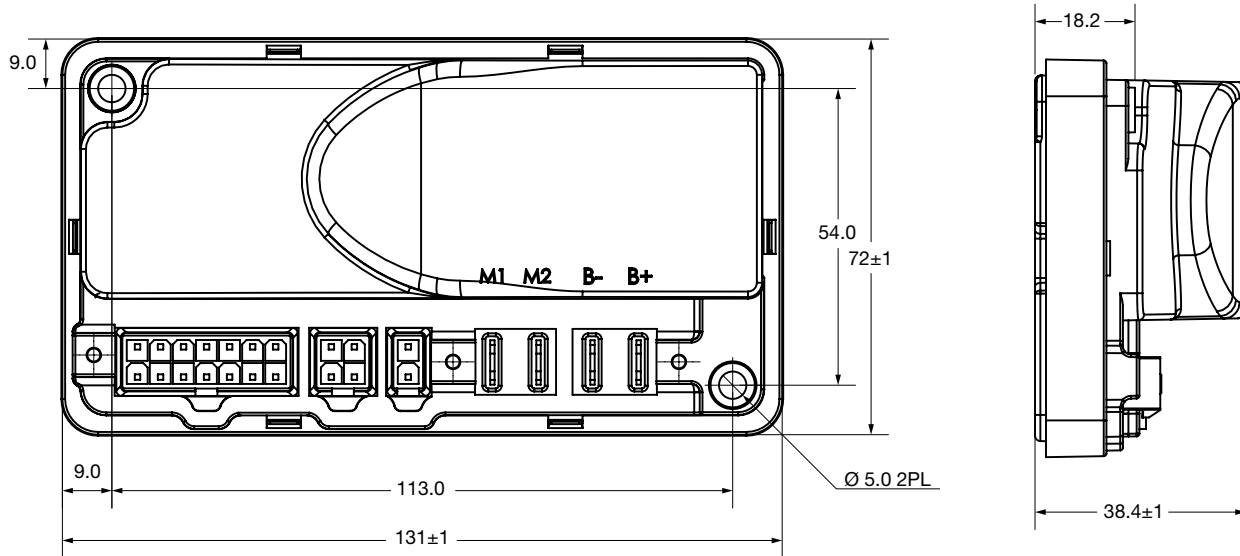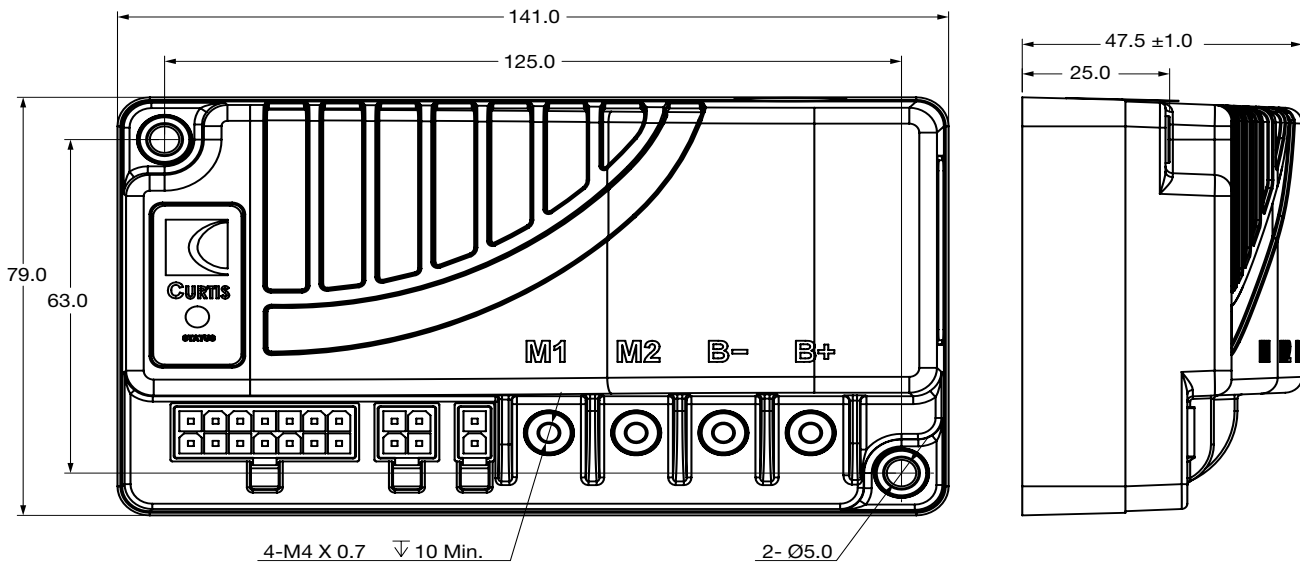
1212S / 1212P / 1212C

CONNECTOR PINOUT CHARTS

J1
1 2 3 4 5 6 7
8 9 10 11 12 13 14

J2
1 2
3 4

J3
1
2
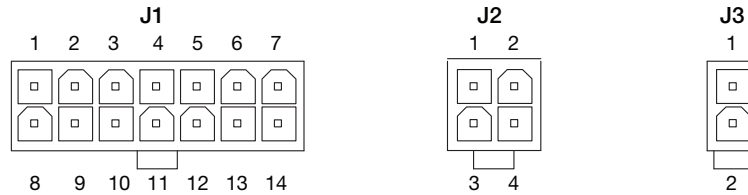
1212S J1

Pin	Description	Pin	Description
1	POT Wiper	8	POT Low
2	POT Hi	9	*Lift Lockout Input/ Pump SRO Input
3	Lift Lockout Output	10	Forward Input
4	Mode Switch (Open= M1, Closed= M2)	11	BDI
5	KSI	12	Reverse Input
6	Interlock Input	13	I/O GND
7	B+	14	Emergency Reverse

* Optional, must match parameter settiing.

1212S J2

Pin	Description
1	Rx
2	I/O GND
3	Tx / Charge Inhibit
4	+15V

1212S J3

Pin	Description
1	Brake +
2	Brake –

1212P J1

Pin	Description	Pin	Description
1	POT Wiper	8	POT Low
2	POT Hi	9	Lift Lockout Input/ Pump SRO Input*
3	Horn/Lift Lockout Output *	10	Status LED
4	Mode Switch (Open= M1, Closed= M2)	11	BDI
5	KSI	12	Reverse / Neutral*
6	Interlock Input	13	I/O GND
7	B+	14	Emergency Reverse *

* Optional, must match parameter setting.

1212P J2

Pin	Description
1	Rx
2	I/O GND
3	Tx / Charge Inhibit
4	Battery +

1212P J3

Pin	Description
1	Brake +
2	Brake –

1212C J1

Pin	Description	Pin	Description
1	POT Wiper	8	POT Low
2	POT Hi	9	AUX Switch
3	Driver 1	10	Forward Input
4	Mode Switch (Open= M1, Closed= M2)	11	Driver 2
5	KSI	12	Reverse
6	Interlock Input	13	CAN H
7	CAN L	14	Emergency Reverse*

* Optional, must match parameter settiing.

1212C J2

Pin	Description
1	Rx
2	I/O GND
3	Tx / Charge Inhibit
4	Battery +

1212C J3

Pin	Description
1	Brake +
2	Brake –

The Curtis Difference
You feel it when you drive it

WARRANTY   Two year limited warranty from time of delivery.