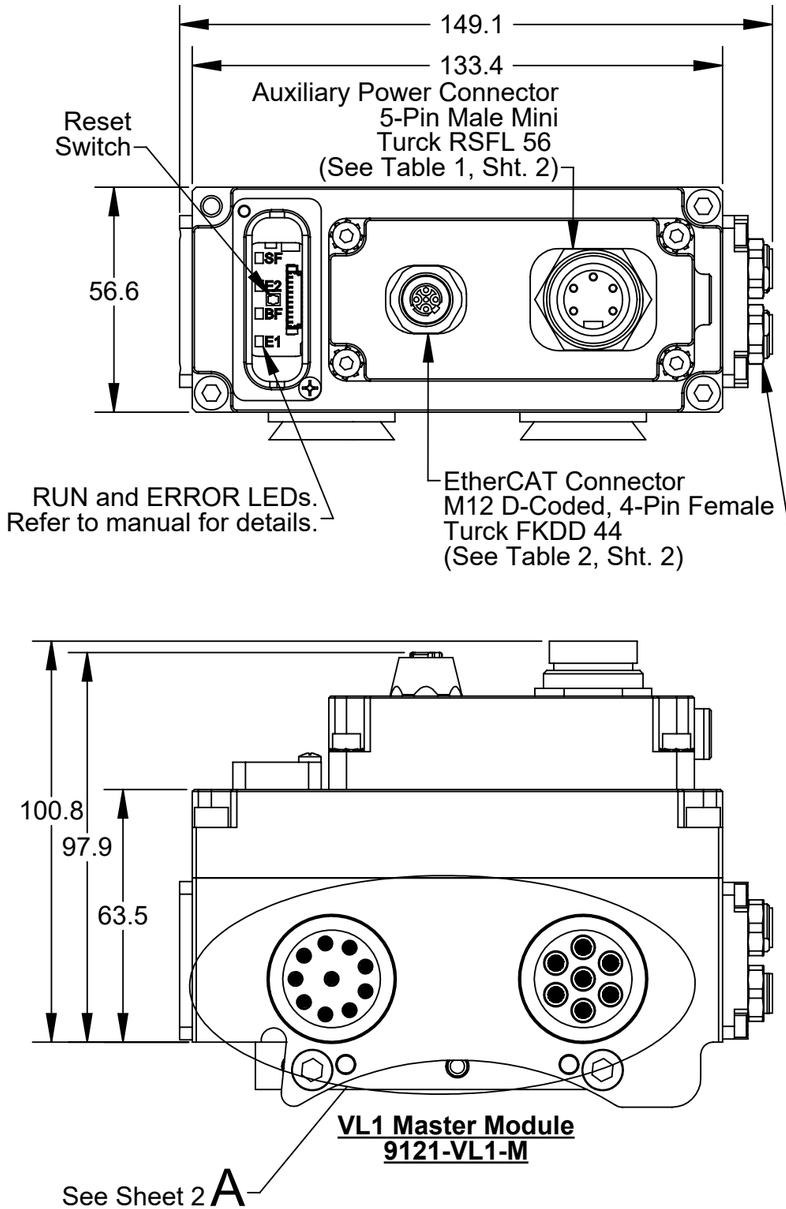
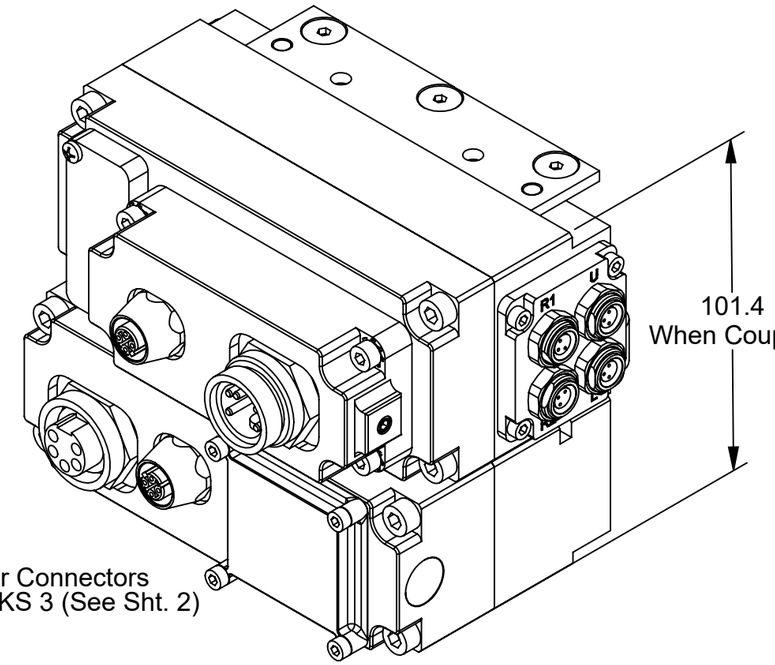
REV.	DESCRIPTION	INITIATOR	DATE
05	ECO 21749: Updated to show new Tool side window	BAW	2/27/2026

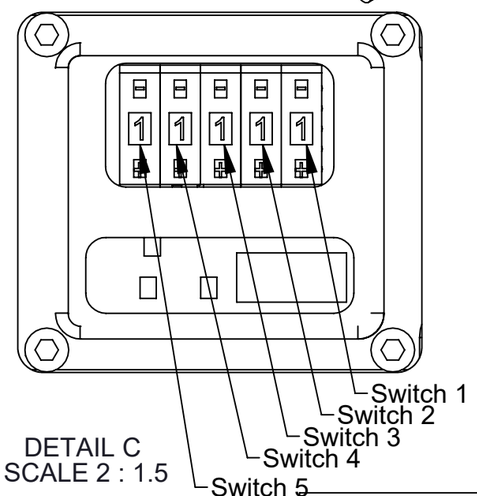
" DANGER!" - Electrical Shock Hazard

This module has a Voltage of 50V or greater, NO contact should be attempted before removing power. This especially includes separation or insertion of the mating connectors or any contact with the tool changer or its components."

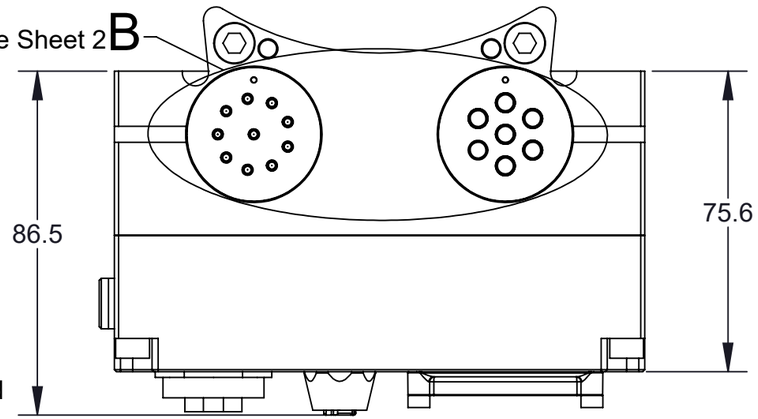


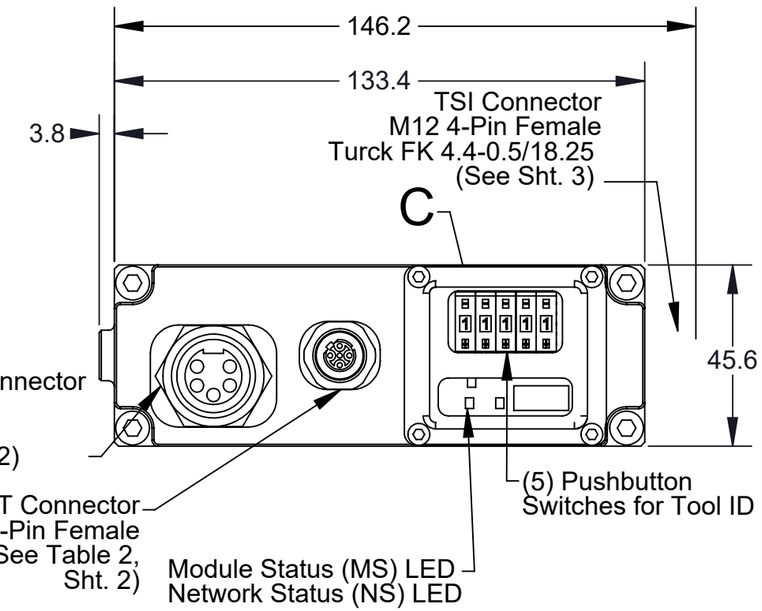
VL1 Master Module
9121-VL1-M





DETAIL C
SCALE 2 : 1.5





LV1 Tool Module
9121-VL1-T

Notes:
1. The modules are shown at sheet scale. All connector face views are shown at a 3:2 scale, except as noted.
2. Serviceable parts for the VL1 are shown on Sheet 4. The electrical schematic is shown on Sheet 5.
3. The Auxiliary Power and Ethernet connectors are oriented as shown on the Modules.
4. Valve adapters integrated with the VL1 Master module can be single or double solenoid.

NOTES: UNLESS OTHERWISE SPECIFIED.

DO NOT SCALE DRAWING. ALL DIMENSIONS ARE IN MILLIMETERS.

3rd ANGLE PROJECTION

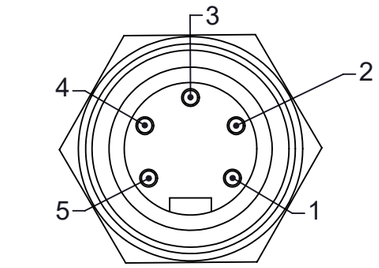
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CHECKED BY: W. Berrocal, 09/05/14
A. Strotzer, 09/09/14
PROJECT # 140728-5 SHEET 1 OF 5

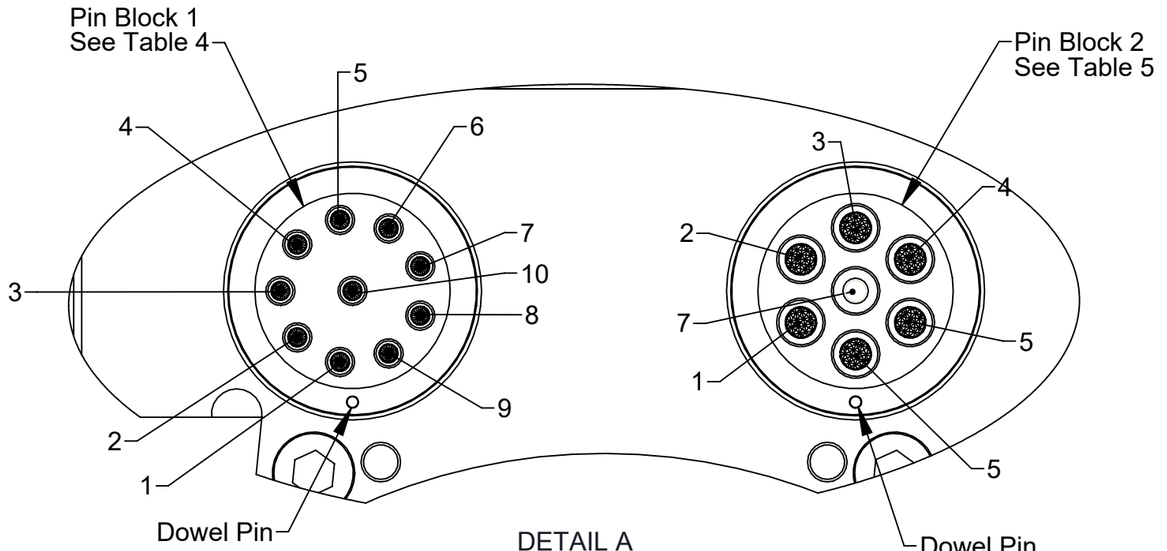
TITLE: VL1 EtherCAT Control Module Customer Drawing

SCALE	SIZE	DRAWING NUMBER	REVISION
2:3	B	9630-20-VL1	05



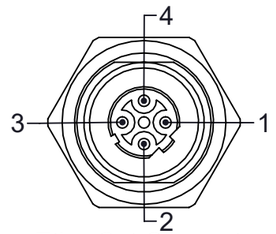
Auxiliary Power Male Connector
(Master Side)
See Table 1
Scale 2:1

Table 1	
1	US2 GND (Switched)
2	US1 GND (Unswitched)
3	FE
4	US1 (Unswitched)
5	US2 (Switched)



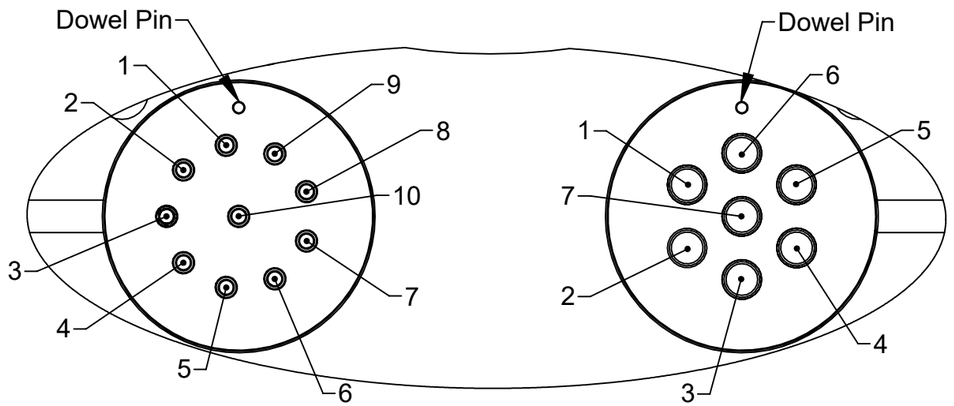
DETAIL A
SCALE 2 : 1.5
Master Pin Blocks
See Table 4 & 5

Table 4	
Pin Block 1	
1	RX1+
2	RX1-
3	RS485+
4	RS485-
5	TSI IN
6	TSRV
7	TX1+
8	TX1-
9	TSI OUT
10	TSIV



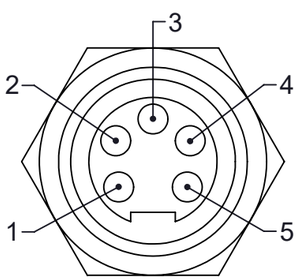
EtherCat Connector
(Master and Tool Sides)
See Table 2
Scale 3:2

Table 2		
	Master	Tool
1	Tx+	Tx+
2	Rx+	Rx+
3	Tx-	Tx-
4	Rx-	Rx-



DETAIL B
SCALE 2 : 1.5
Tool Pin Blocks
See Table 4 & 5

Table 5	
Pin Block 2	
1	US1+
2	TOOL_PRESENT
3	US1-
4	US2-
5	FE
6	US2+
7	24V_TH



Auxiliary Power Female Connector
(Tool Side)
See Table 3
Scale 3:2

Table 3	
1	US2 GND (Switched)
2	US1 GND (Unswitched)
3	FE
4	US1 (Unswitched)
5	US2 (Switched)

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3rd ANGLE PROJECTION

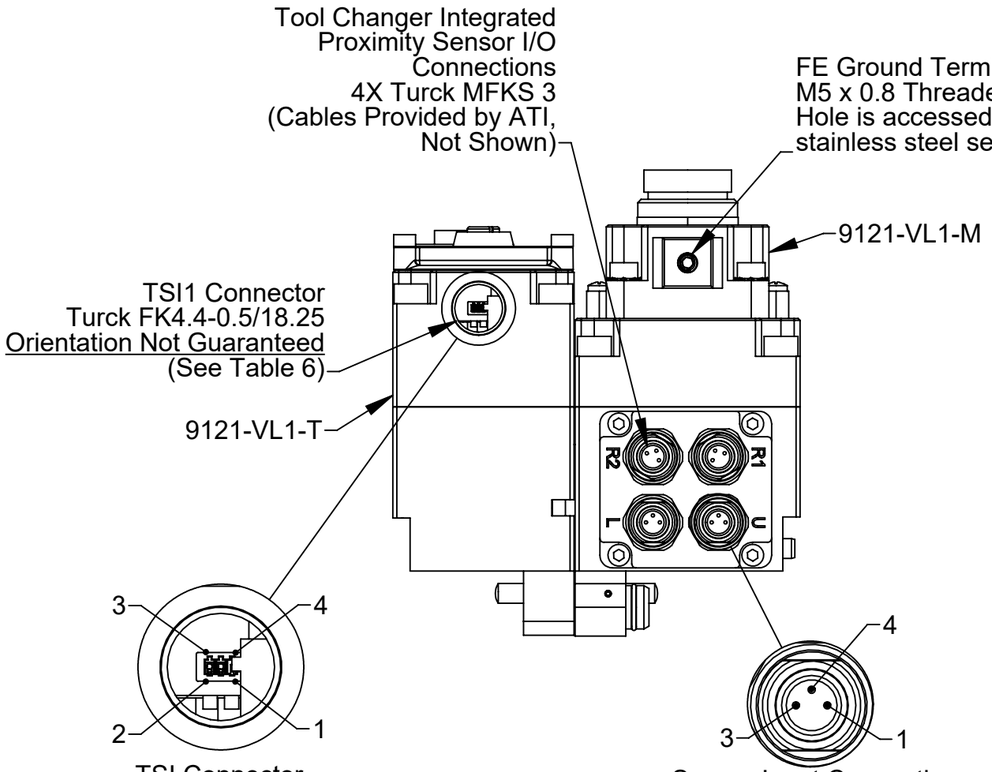
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A. Strotzer, 09/09/14
PROJECT # 140728-5 SHEET 2 OF 5

TITLE: VL1 EtherCAT Control Module Customer Drawing

SCALE	SIZE	DRAWING NUMBER	REVISION
1:1	B	9630-20-VL1	05

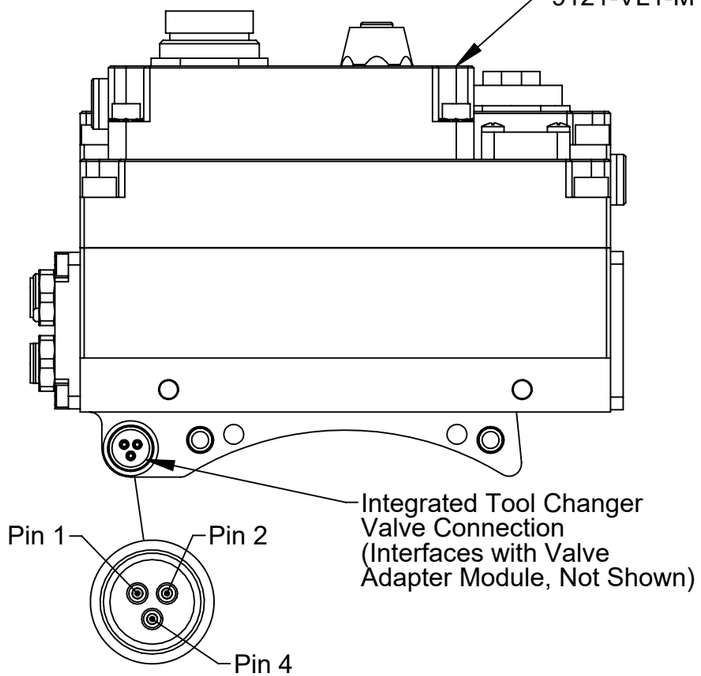


TSI Connector
M12 4-Pin Female
Turch FK4.4-0.5/18.25
Scale 3:2

Table 6	
1	24V_TH
2	24V_TH
3	TSI Relay Control
4	TSIV Input

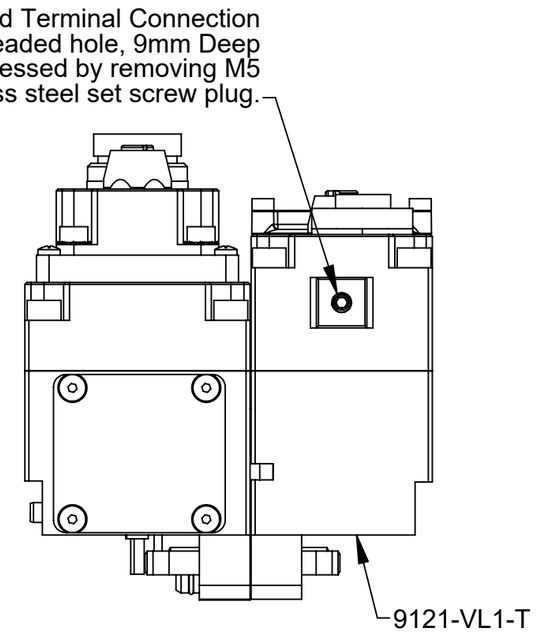
Sensor Input Connection
Typical
Turck MFKS 3
Scale 3:2

Table 7	
1	V+
3	V-
4	Input



DETAIL K
SCALE 1.5 : 1

Table 8	
1	V+ (Unlatch)
3	V- (Common)
4	V+ (Latch)



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3rd ANGLE PROJECTION

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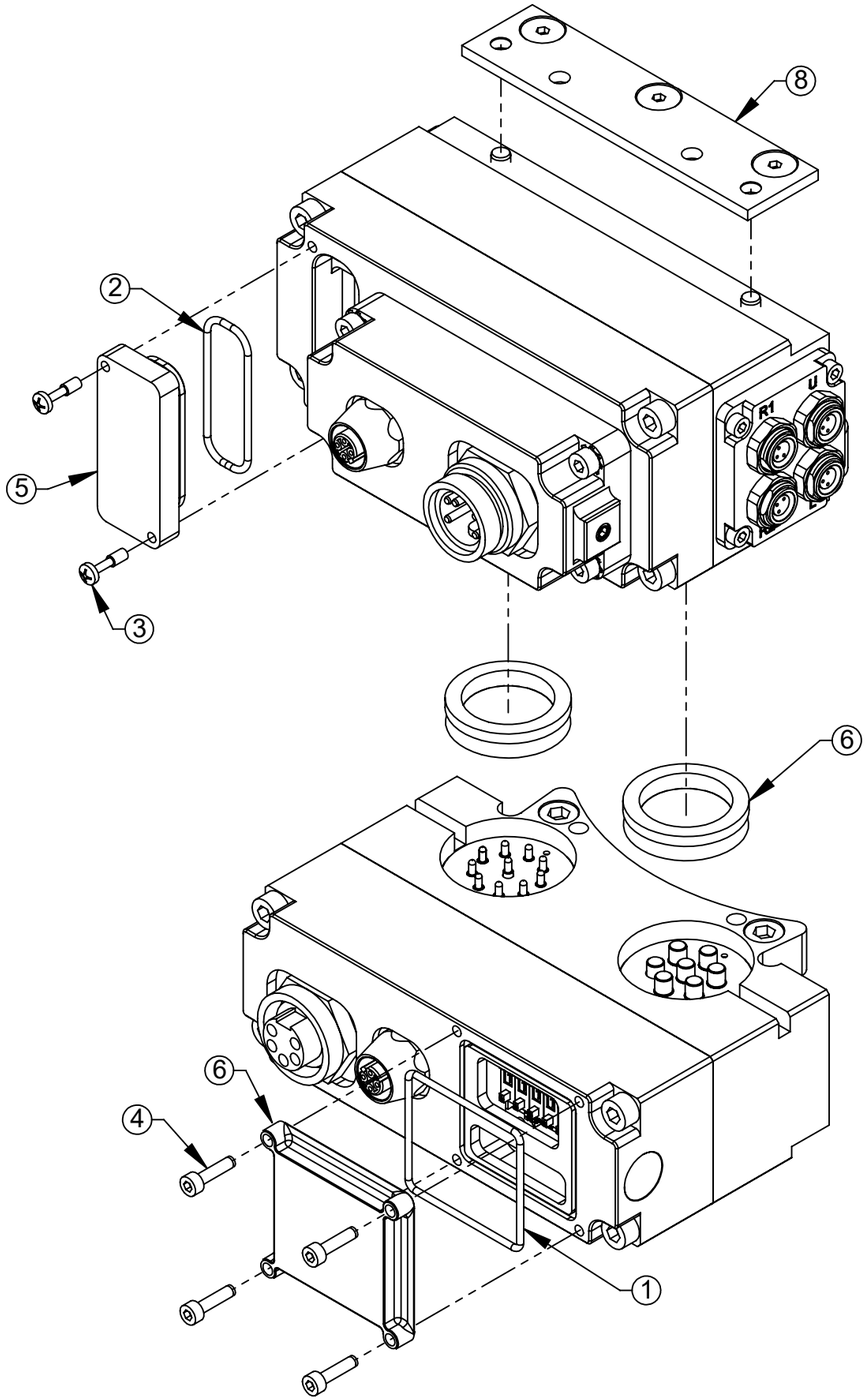
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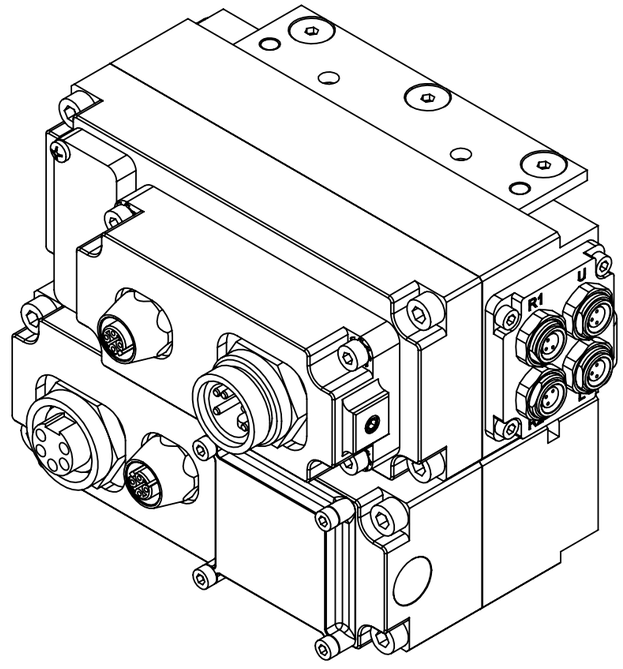
DRAWN BY: M. Hallmark, 09/03/14
CHECKED BY: W. Berrocal, 09/05/14
A. Strotzer, 09/09/14
PROJECT # 140728-5 SHEET 3 OF 5

TITLE: VL1 EtherCAT Control Module Customer Drawing

SCALE	SIZE	DRAWING NUMBER	REVISION
1:1	B	9630-20-VL1	05

VL1 Master and Tool Seviceable Parts





ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	3410-0001021-01	O-ring, AS568-031
2	1	3410-0001201-01	O-ring, AS568-024
3	2	3500-9957012-21	Captive Screw M3 x 12 Slotted Head SS
4	4	3500-1058012-15	Captive M3 x 21 Slotted Head Corrosion Protection
5	1	3700-20-4820	Window, Master, DJ Module, Annular Seal
6	1	3700-20-11880	Window, Tool, Injection Molded
7	2	4010-0000030-01	V-Ring Seal
8	1	9005-20-1198	Master Cleat Assembly

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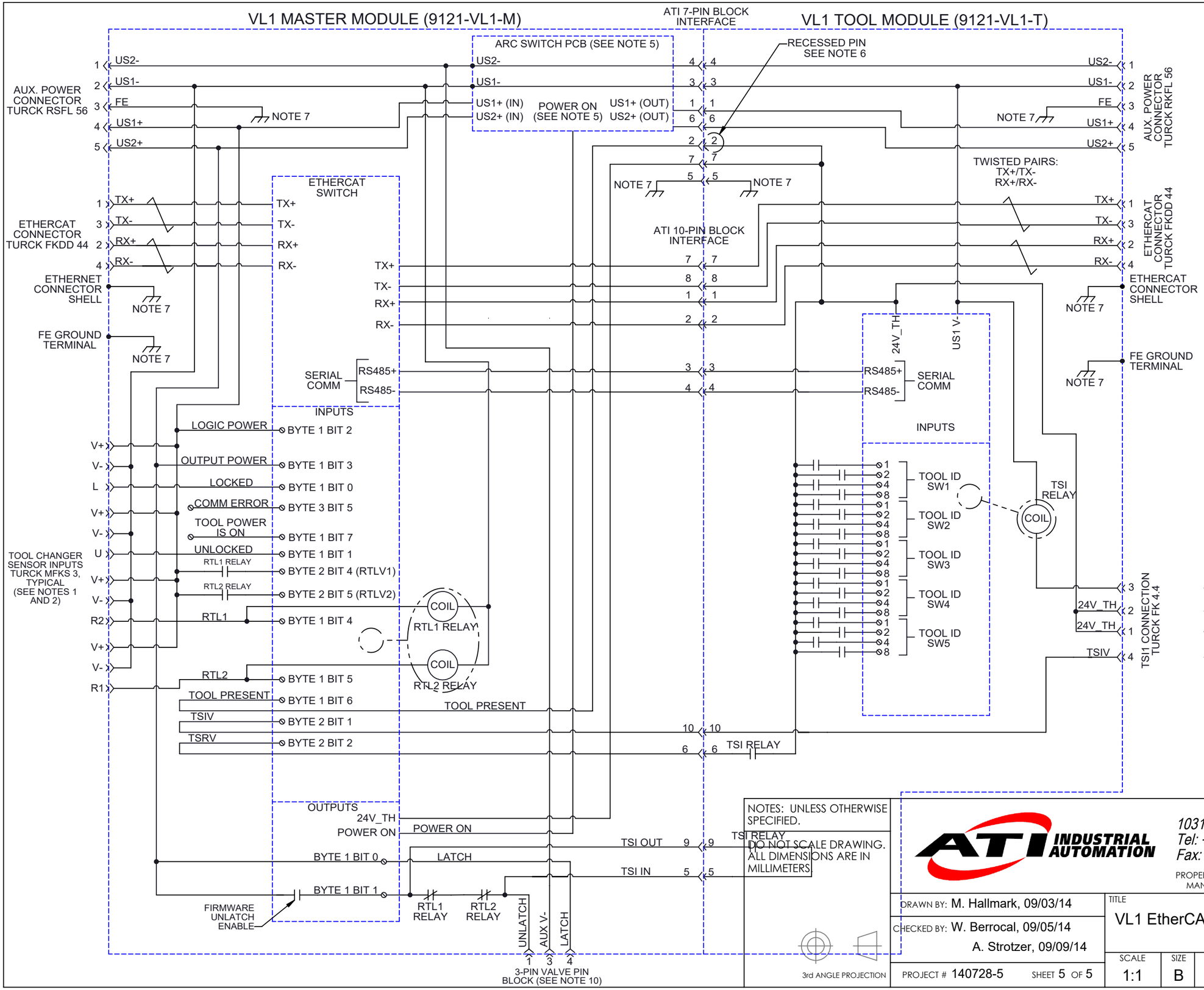
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PROJECT # 140728-5 SHEET 4 OF 5

TITLE: VL1 EtherCAT Control Module Customer Drawing

SCALE	SIZE	DRAWING NUMBER	REVISION
2:3	B	9630-20-VL1	05



Schematic Notes:

1. Note that the sensors are powered by US1 Unswitched power (US1+).
2. The complete tool changer package comes equipped with external cables that are connected to the sensors.
3. Cables for EtherCAT and Auxiliary Power to the VL1 Modules are supplied by the user.
4. The Tool ID I/O is reported in the VL1 Master Bitmap. Refer to the product manual for more information.
5. The Arc Prevention Circuits turn off US1+ and US2+ during coupling and uncoupling of the Master and Tool. The switching function is controlled by the "POWER ON" signal from the main PC Board.
6. The "TOOL PRESENT" signal is transmitted through a recessed pin in the Tool side Pin Block. This ensures that all of the spring probes and contact pins are touching when power is turned on. Refer to the product manual for additional information.
7. The EtherCAT connector shell, FE, and FE Ground Terminals are connected to the module housing (i.e. Chassis Ground).
8. The current rating of spring probes on the 7-Pin Block is 15A maximum. The spring probes on the 10-Pin Block are rated to 3A maximum.
9. The 9121-VL1-T module supports the use of a mechanical limit switch for integration with TSI. The limit switch connected to the TSI connector must have two sets of N.O. contacts (double-pole, single-throw). A limit switch is available from ATI (p/n 9005-20-1165) but is not included with the VL1 modules. Contact ATI for specific switch requirements.
10. An internal pin block is used to connect the Latch/Unlatch signal to the Valve Adapter, as shown in the schematic.

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PROJECT # 140728-5 SHEET 5 OF 5

TITLE: VL1 EtherCAT Control Module Customer Drawing

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