

85

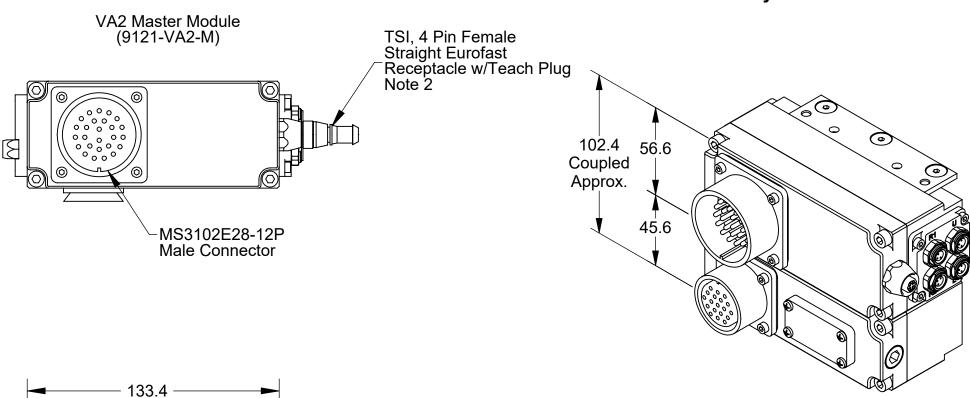
146.1

"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

lev.	Description	Initiator	Date
10	ECO 19187: Sheet 1: Removed "Sheet 6: VA2 Master with SA5 Tool (0-999 Tool ID)" note & renumbered. Removed Sheet 6 & renumbered.	TBC	7/27/2020

VA2 Family Dimensions



Notes:

41.9

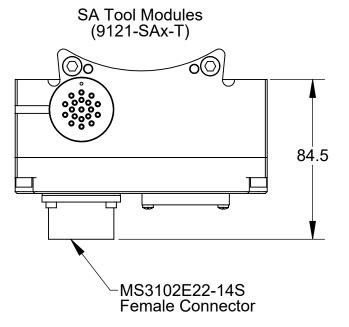
Note 2

<u>Sheet Configurations</u> Sheet 1: VA2 Family Dimensions

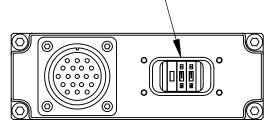
Sheet 2: VA2 Family Serviceable Parts

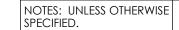
Sheet 3: VA2 Master with SA2 Tool
Sheet 4: VA2 Master with SA3 Tool (0-9 Tool ID)
Sheet 5: VA2 Master with SA4 Tool (0-99 Tool ID)

Sheet 6: VA2 Master with SA3Z1 Tool (0-F Tool ID)
Teach Plug is not connected to the Tool Stand Interlock (TSI) connector. Item is bagged separately.



Tool ID Switches Accessible Through Window (If Applicable) (Window Not Shown for Clarity) (SA3Z1-T Shown)-





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DRAWN BY: **B. Digeso**, 4/14/05 CHECKED BY: R. Heavner, 4/14/05

VA2 Family Module Drawing

DRAWING NUMBER SCALE 1:2

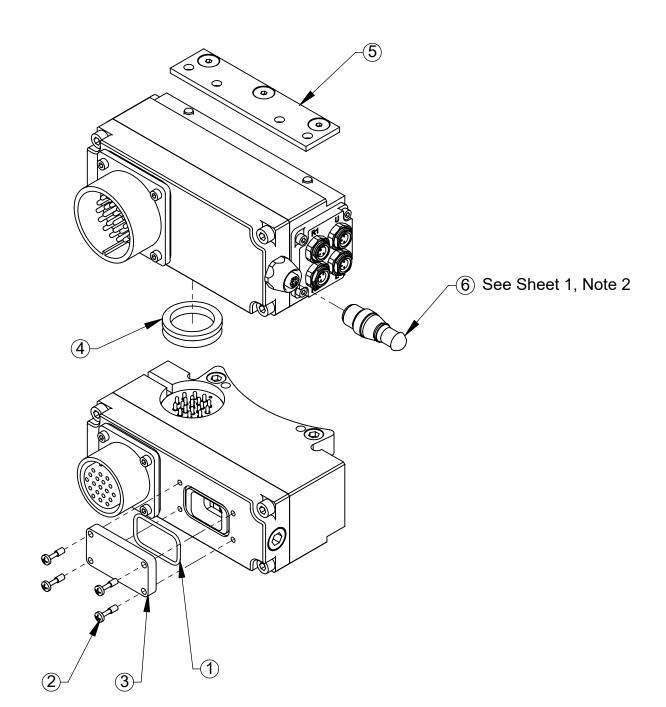
REVISION 10

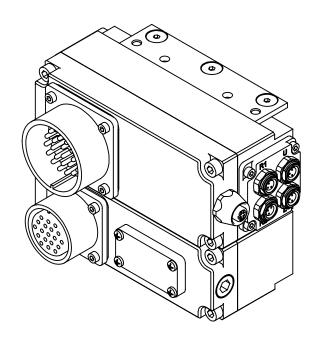
PROJECT # **040611-1** 3rd ANGLE PROJECTION

SHEET 1 OF 6

9630-20-VA2 Family

VA2 Family Serviceable Parts





ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	3410-0001092-01	O-ring AS568-023
2	4	3500-9957012-21	CAPTIVE SCREW M3 X 12 SLOTTED HEAD SS
3	1	3700-20-2696	Thick Window for DP/DE45 Master
4	1	4010-0000030-01	V-Ring Seal
5	1	9005-20-1198	Master Cleat Sub-Assembly
6	1	9120-DE45-PLUG	Yellow Teach Plug w/ Lanyard and Caution Tags

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_	CHECKED BY:
+	

DRAWN BY: B. Digeso, 4/14/05	TITLE
CHECKED BY: R. Heavner, 4/14/05	VA2 Family Module Drawing

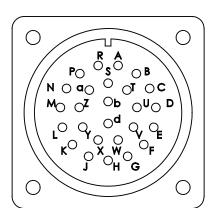
SCALE SIZE DRAWING NUMBER
PROJECT # 040611-1 SHEET 2 OF 6 1:2 B 9630-20-VA2 Family

-20-VA2 Family

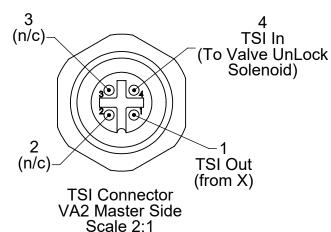
REVISION

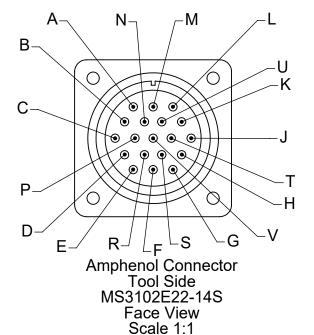
10

VA2 Master with SA2 Tool



Amphenol Connector Master Side MS3102E28-12P **Face View** Scale 1:1





General Notes:

(4-Pin Euro)

VA2-M to SA2-T

VA2 Master Pin Out SA2 Tool MS3102E28-12P MS3102E22-14S Male Connector Female Connector

0 Vdc Reference	A	>>	A	0 Vdc Reference
24 Vdc (I/P)	B	>>	B	24 Vdc (I/P)
available	C	>>	C	available
available	D	>>	D	available
available	E	>>	E	available
available	F	>>	F	available
available	G	>>	G	available
available	H	>>	H	available
available	J	>>	J	available
available	K	>>	K	available
available	L	>>	L	available
available	M	>>	M	available
available	N	>>	N	available
available	P	>>	P	available
available	R	>>	R	available
available	S		S	available
available	T	>>	T	available
available	U	· >> 	U	available
available	V	>>	V	available
Lock O/P	W			
(1) TSI Connection	Χ			
not available	Υ			
RTL #1	Z			

		Controller Outputs
Pin:	Signal:	Description:
Α	0 VDC	Voltage Reference
В	24 VDC	Voltage Supply
W	24 VDC	Lock Solenoid Supply (Double Solenoid)
Χ	24 VDC	Unlock Solenoid Supply
		Controller Inputs
Pin:	Signal:	Description:
Z	RTL #1	Ready-To-Lock Input #1
а	RTL #2	Ready-To-Lock Input #2
b	Lock	Tool Changer Lock Input
d	Unlock	Tool Changer Unlock Input

2. The VA2-M is supplied with a Teach Plug (part # 9120-DE45-PLUG) to make the TSI circuit (Pin 1 to Pin 4 on TSI Connector). It is recommended that the customer integrate a mechanical limit switch to use with this circuit. The limit switch would be mounted to indicate that the robot and tool changer are in the stand, thus making the circuit and only allowing the tool changer to uncouple while in the stand. Contact ATI for further assistance.

> NOTES: UNLESS OTHERWISE SPECIFIED. INDUSTRIAL AUTOMATION DO NOT SCALE DRAWING. ALL DIMENSIONS ARE IN MILLIMETERS. DRAWN BY: **B. Digeso**, 4/14/05

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CHECKED BY: R. Heavner, 4/14/05

VA2 Family Module Drawing

3rd ANGLE PROJECTION

DRAWING NUMBER SCALE PROJECT # **040611-1** SHEET 3 OF 6 1:2 В

9630-20-VA2 Family

REVISION

10

1. Pin A is first mate and last break during a tool change and is specified for use as 0 VDC and/or ground service.

(1)

RTL #2

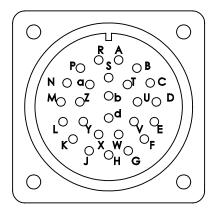
Lock I/P

Unlock I/P

а

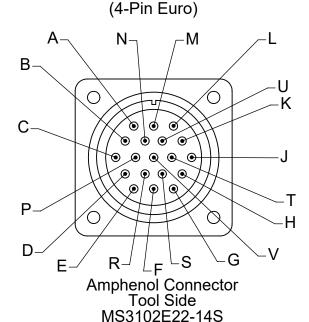
b

VA2 Master with SA3 Tool (0-9 Tool ID)



Amphenol Connector

Master Side MS3102E28-12P Face View Scale 1:1 (n/c)TSİ In (To Valve UnLock Solenoid) න ලේ TSI Out (from X)



Face View

Scale 1:1

1. Pin A is first mate and last break during a tool change and is specified for use as

TSI Connector

VA2 Master Side

Scale 2:1

VA2-M	to	SA3-T
Pir	ı C	ut

VA2 Master	SA3 Tool
MS3102A28-15P	MS3102E22-14S
Male Connector	Female Connector

0 Vdc Reference	A	>>		A	0 Vdc Reference
24 Vdc (I/P & Tool ID)	В	·- >>		B	24 Vdc (I/P & Tool
available	C	·- >>		C	available
available	D	·- >>		D	available
available	E	- >>		E	available
available	F	·- >>		F	available
available	G	>>		G	available
available	H	· - >>		H	available
available	J	·- >>		J	available
available	K	>>		K	available
available	L	>>		L	available
available	M	>>		M	available
available	N	· - >>		N	available
available	P	>>		P	available
available	R	>>		R	available
Tool ID, Bit Value 8	S	>>	ဝ-ဝ	S	not available
Tool ID, Bit Value 4	T	>>		Т	not available
Tool ID, Bit Value 2	U	>>		U	not available
Tool ID, Bit Value 1	V	>>	2	V	not available
Lock O/P	W				
(1) TSI Connection	Χ				
not available	Υ				
RTL #1	Z				
RTL #2	а				

		Controller Outputs
Pin:	Signal:	Description:
Α	0 VDC	Voltage Reference
В	24 VDC	Voltage Supply
W	24 VDC	Lock Solenoid Supply (Double Solenoid)
Χ	24 VDC	UnLock Solenoid Supply
		Controller Inputs
Pin:	Signal:	Description:
S	Tool ID	Bit Value 8 (See Table)
T	Tool ID	Bit Value 4 (See Table)
U	Tool ID	Bit Value 2 (See Table)
V	Tool ID	Bit Value 1 (See Table)
Z	RTL #1	Ready-To-Lock Input #1
а	RTL #2	Ready-To-Lock Input #2
b	Lock	Tool Changer Lock Input
d	Unlock	Tool Changer Unlock Input

Switch 1	Pin	Pin	Pin	Pin
SWILCIT	<u>"</u> S	" <u>†</u> "	<u>"</u>	"V"
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1

3. The VA2-M is supplied with a Teach Plug (part # 9120-DE45-PLUG) to make the TSI circuit (Pin 1 to Pin 4 on TSI Connector). It is recommended that the customer integrate a mechanical limit switch to use with this circuit. The limit switch would be mounted to indicate that the robot and tool changer are in the stand, thus making the circuit and only allowing the tool changer to uncouple while in the stand. Contact ATI for further assistance.

NOTES: UNLESS OTHERWISE SPECIFIED. DO NOT SCALE DRAWING. ALL DIMENSIONS ARE IN MILLIMETERS.



& Tool ID)

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DRAWN BY: B. Digeso, 4/14/05 4/14/05



HECKED BY:	R.	Hea	vne	er,	4

VA2 Family Module Drawing

DRAWING NUMBER SCALE SHEET 4 OF 6 1:2 В 9630-20-VA2 Family

0 VDC and/or ground service. 2. The common for Tool ID is tied into the 24VDC line (Pin B). The Tool ID switches are Rated for service at 50V and 100 mA max. Refer to the Tool ID table for switch setup

information.

General Notes:

b

d

Lock I/P

Unlock I/P

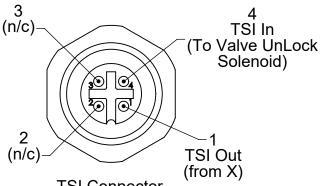
PROJECT # 040611-1

10

REVISION

\bigcirc B o o oc $^{\prime}$ N \odot a \odot Mo oz ob ouo D) X W G \circ^{d} ro ° o_F κ^O

Amphenol Connector Master Side MS3102E28-12P Face View Scale 1:1



SW2 Tool ID,

SW2 Tool ID, SW2 Tool ID, SW2 Tool ID, SW1 Tool ID, SW1 Tool ID, SW1 Tool ID,

SW1 Tool ID,

(1) TSI Connection

not available

RTL #1

RTL #2

Lock I/P

Unlock I/P

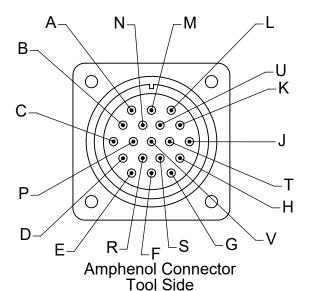
Υ

Z

а

b

TSI Connector VA2 Master Side Scale 2:1 (4-Pin Euro)



MS3102E22-14S

Face View

General Notes:

Scale 1:1 1. Pin A is first mate and last break during a tool change and is specified for use as 0 VDC and/or ground service.

2. The common for Tool ID is tied into the 24VDC line (Pin B). The Tool ID switches are Rated for service at 50V and 100 mA max. Refer to the Tool ID table for switch setup information.

VA2 Master with SA4 Tool (0-99 Tool ID)

VA2-M to SA4-T Pin Out

VA2 Master SA4 Tool MS3102A28-15P MS3102E22-14S Male Connector Female Connector

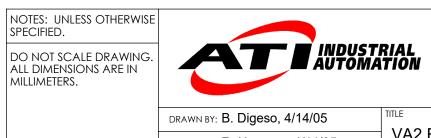
0 Vdc Reference	A >> A	0 Vdc Reference
24 Vdc (I/P & Tool ID)	B >> B	24 Vdc (I/P & Tool
available	C >> C	available
available	D >> D	available
available	E >> E	available
available	F >> F	available
available	G >> G	available
available	H >> H	available
available	J >> J	available
available	K >> K	available
available	L >> L	available
W2 Tool ID, Bit Value 8	M>>	not available
W2 Tool ID, Bit Value 4		not available
W2 Tool ID, Bit Value 2	P	not available
W2 Tool ID, Bit Value 1	R>> ← ⁰ R	not available
W1 Tool ID, Bit Value 8	S	not available
W1 Tool ID, Bit Value 4		not available
W1 Tool ID, Bit Value 2	V>>	not available
W1 Tool ID, Bit Value 1	V >> - 0 0 V	not available
Lock O/P	W	

		Controller Outputs
Pin:	Signal:	Description:
Α	0 VDC	Voltage Reference
В	24 VDC	Voltage Supply
W	24 VDC	Lock Solenoid Supply (Double Solenoid)
Χ	24 VDC	UnLock Solenoid Supply
		Controller Inputs
Pin:	Signal:	Description:
М	Tool ID	SW2 Bit Value 8 (See Table)
N	Tool ID	SW2 Bit Value 4 (See Table)
Р	Tool ID	SW2 Bit Value 2 (See Table)
R	Tool ID	SW2 Bit Value 1 (See Table)
S	Tool ID	SW1 Bit Value 8 (See Table)
Т	Tool ID	SW1 Bit Value 4 (See Table)
U	Tool ID	SW1 Bit Value 2 (See Table)
V	Tool ID	SW1 Bit Value 1 (See Table)
Z	RTL #1	Ready-To-Lock Input #1
а	RTL #2	Ready-To-Lock Input #2
b	Lock	Tool Changer Lock Input
d	Unlock	Tool Changer Unlock Input

The VA2-M is supplied with a Teach Plug (part # 9120-DE45-PLUG) to make the TSI circuit (Pin 1 to Pin 4 on TSI Connector). It is recommended that the customer integrate a mechanical limit switch to use with this circuit. The limit switch would be mounted to indicate that the robot and tool changer are in the stand, thus making the circuit and only allowing the tool changer to uncouple while in the stand. Contact ATI for further assistance.

Switch 1 "S" "T" "U" "V" Switch 2 "M" "N" "P" "R" 0 0 0 0 1 0 0 0 1 2 0 0 1 0 3 0 0 1 1 4 0 1 0 0 5 0 1 0 1 6 0 1 1 0 7 0 1 1 1 8 1 0 0 0 9 1 0 0 1					
0 0 0 0 0 1 0 0 0 1 2 0 0 1 0 3 0 0 1 1 4 0 1 0 0 5 0 1 0 1 6 0 1 1 0 7 0 1 1 1 8 1 0 0 0	Switch 1	"S"	"T"	"U"	"V"
1 0 0 0 1 2 0 0 1 0 3 0 0 1 1 4 0 1 0 0 5 0 1 0 1 6 0 1 1 0 7 0 1 1 1 8 1 0 0 0	Switch 2	"M"	"N"	"P"	"R"
2 0 0 1 0 3 0 0 1 1 4 0 1 0 0 5 0 1 0 1 6 0 1 1 0 7 0 1 1 1 8 1 0 0 0	0	0	0	0	0
3 0 0 1 1 4 0 1 0 0 5 0 1 0 1 6 0 1 1 0 7 0 1 1 1 8 1 0 0 0	1	0	0	0	1
4 0 1 0 0 5 0 1 0 1 6 0 1 1 0 7 0 1 1 1 8 1 0 0 0		0	0	1	0
5 0 1 0 1 6 0 1 1 0 7 0 1 1 1 8 1 0 0 0	3	0	0	1	1
6 0 1 1 0 7 0 1 1 1 8 1 0 0 0	4	0	1	0	0
7 0 1 1 1 8 1 0 0 0	5	0	1	0	1
8 1 0 0 0	6	0	1	1	0
	7	0	1	1	1
9 1 0 0 1	8	1	0	0	0
	9	1	0	0	1

Pin Pin Pin Pin



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VA2 Family Module Drawing CHECKED BY: R. Heavner, 4/14/05

SCALE

1:2

ID)

3rd ANGLE PROJECTION

PROJECT # **040611-1** SHEET 5 OF 6

DRAWING NUMBER В

9630-20-VA2 Family

REVISION 10

VA2 Master with SA3Z1 Tool (0-F Tool ID)

VA2-M to SA3Z1-T Pin Out

VA2 Master SA3Z1 Tool MS3102A28-15P MS3102E22-14S Female Connector Male Connector

0 Vdc Reference ----- >> ------ Δ 0 Vdc Reference ----- >> ----- B 24 Vdc (I/P & Tool ID) 24 Vdc (I/P & Tool ID) C ----- >> ------ C available available D ----- >> ----- D available available ------ >> ------ F available available F ----- >> ------ F available available G ----- >> ------ G available available available H ------ >> ------ H available J ------ >> ------ .l available available K ----- >> ------ K available available available available M ----- >> ----- M available available N ----- >> ----- N available available ----- >> ----- P available available available available Tool ID, Bit Value 8 S ----->> ----not available Tool ID, Bit Value 4 not available U Tool ID, Bit Value 2 not available Tool ID. Bit Value 1 V ----->>-----V not available Lock O/P W

X

Υ

Z

а

(1) TSI Connection

not available RTL #1

RTL #2

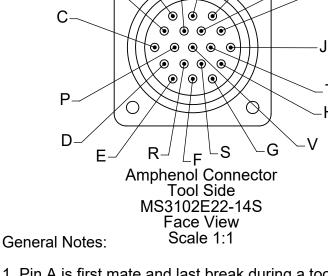
Lock I/P Unlock I/P

	Controller Outputs				
Pin:	Signal:	Description:			
Α	0 VDC	Voltage Reference			
В	24 VDC	Voltage Supply			
W	24 VDC	Lock Solenoid Supply (Double Solenoid)			
Χ	24 VDC	UnLock Solenoid Supply			
Controller Inputs					
Pin:	Signal:	Description:			
S	Tool ID	Bit Value 8 (See Table)			
Т	Tool ID	Bit Value 4 (See Table)			
U	Tool ID	Bit Value 2 (See Table)			
٧	Tool ID	Bit Value 1 (See Table)			
Z	RTL #1	Ready-To-Lock Input #1			
а	RTL #2	Ready-To-Lock Input #2			
b	Lock	Tool Changer Lock Input			
d	Unlock	Tool Changer Unlock Input			

TABLE 1: Tool ID Pinout

Switch				
Position	Pin S	Pin T	Pin U	Pin V
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
Α	1	0	1	0
В	1	0	1	1
С	1	1	0	0
D	1	1	0	1
E	1	1	1	0
F	1	1	1	1

3. The VA2-M is supplied with a Teach Plug (part # 9120-DE45-PLUG) to make the TSI circuit (Pin 1 to Pin 4 on TSI Connector). It is recommended that the customer integrate a mechanical limit switch to use with this circuit. The limit switch would be mounted to indicate that the robot and tool changer are in the stand, thus making the circuit and only allowing the tool changer to uncouple while in the stand. Contact ATI for further assistance.



PO

Mo oz ob ouo D

Amphenol Connector

Master Side

MS3102E28-12P

Face View

Scale 1:1

20 0

TSI Connector

VA2 Master Side

Scale 2:1

(4-Pin Euro)

TSI In

(To Valve UnLock

Solenoid)

TSI Out

(from X)

(n/c)

 \bigcirc B

1. Pin A is first mate and last break during a tool change and is specified for use as 0 VDC and/or ground service.

2. The common for Tool ID is tied into the 24VDC line (Pin B). The Tool ID switches are Rated for service at 50V and 100 mA max. Refer to the Table 1: Tool ID Pinout for switch setup information.



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CHECKED BY: R. Heavner, 4/14/05

VA2 Family Module Drawing

SCALE DRAWING NUMBER 1:2

REVISION

PROJECT # **040611-1** SHEET 6 OF 6 3rd ANGLE PROJECTION

В 9630-20-VA2 Family 10