Applied Robotics™
Solutions in reach

HIKVA MODULE

SIGMA

95632, Rev 03

May 28, 2019

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REVISION

Revision	Date	Author	Description
00	04/18/2018	DS	Initial Release
01	05/16/2018	DS	Updated Information and added Section 4.1
02	03/14/2019	DS	Updated Information and Removed "HIKVA Module 1"
03	05/28/2019	DS	Added to Informational Documents and fixed text for ROBIFIX connectors.

Robotics Inc. shall not be liable for any errors contained herein or for incidental or consequential damages in connection with the performance or use of this material.

CONTENTS

1 PRECAUTIONS

READ MANUAL
Do not start, operate or service machine until you read and understand operator's manual. Failure to do so could result in serious injury.

HAND CRUSH NOTICE
Indicates the possibility for a crush force between components during coupling of the Robot and Tool Adaptor.

⚠ DANGER — Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING — Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION — Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE — Indicates a situation which, if not avoided, could result in equipment damage and voiding the manufacturer's equipment warranty.

IGNORING INFORMATION ABOUT POTENTIAL HAZARDS CAN LEAD TO SERIOUS HARM TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT, AND MAY RESULT IN THE NULLIFICATION OF THE MANUFACTURER'S EQUIPMENT WARRANTY.

HEED ALL PRECAUTION NOTICES

2 SYSTEM DESCRIPTION

The HIKVA Module is an electrical pass through that mounts directly to the long sides of the APPLIED ROBOTICS Tool Changer. The HIKVA Module provides a reliable pass through of user primary welding current for various types of welding (e.g., spot, stud, and MIG). The HIKVA Module contains two mating halves, one mounted on the Robot Side and one mounted on the Tool Side.

HIKVA Module – The HIKVA Module consists of a Robot Side module and Tool Side module. Both the Robot Side and Tool Side contain three contacts.

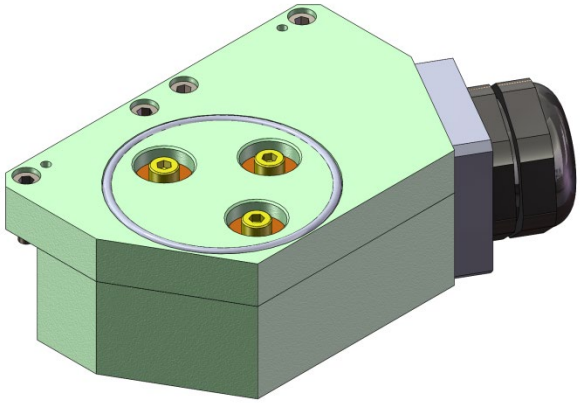


Figure 2-1.
Robot Side HIKVA Module

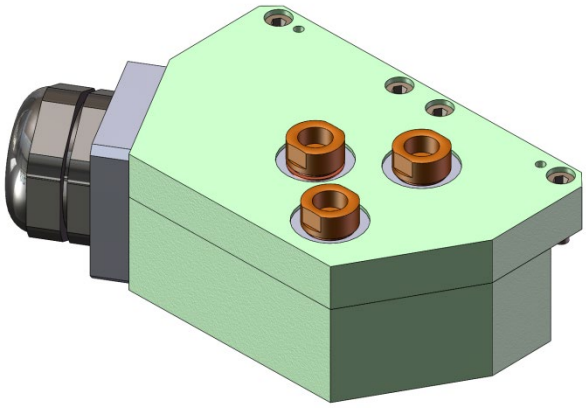
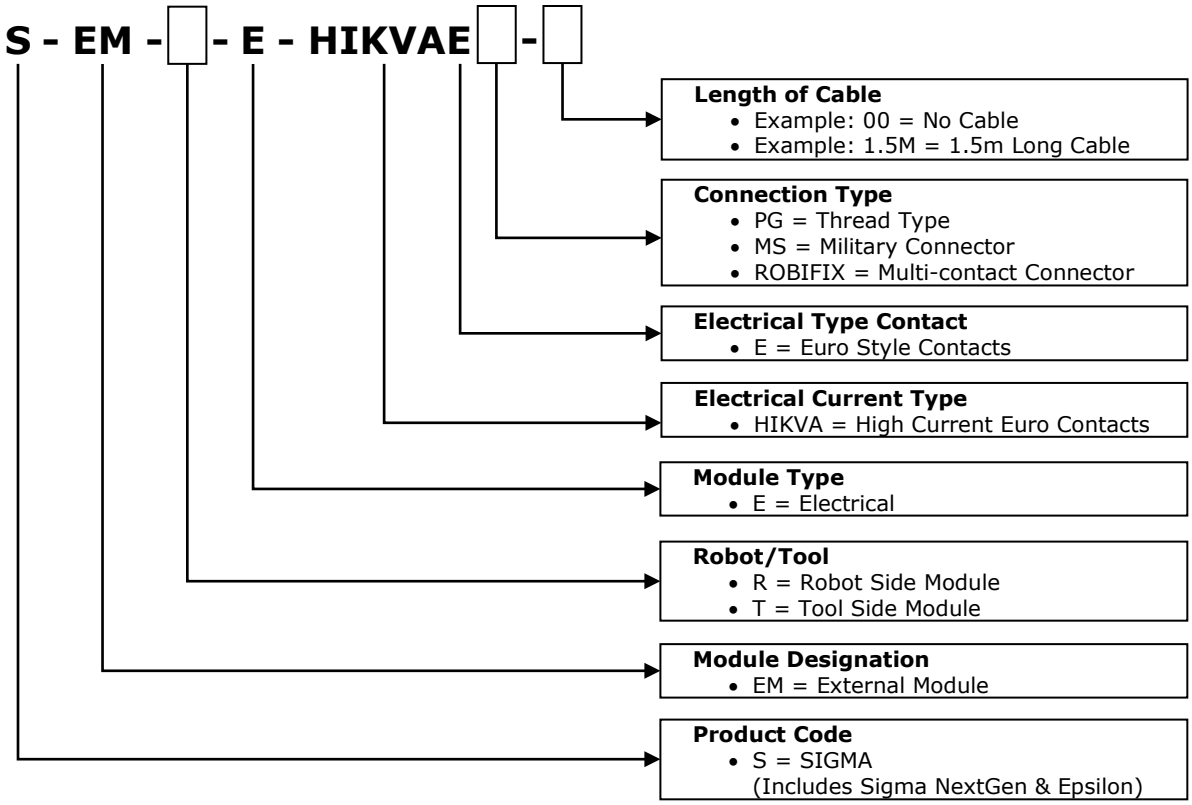


Figure 2-2.
Tool Side HIKVA Module

2.1 HIKVA MODULE – SIGMA



3 TECHNICAL SPECIFICATIONS

Table 3-1. HIKVA Module Technical Specifications

Specification		Metric	English
Number of Contacts		3	
Max Conductor Size		35 mm^2	2 AWG
Mass / Weight *	Robot	1.50 kg	3.30 lb
	Tool	1.63 kg	3.59 lb
Operating Temperature		5 to 60 °C	40 to 140 °F
Transportation & Storage Temperature		5 to 60 °C	40 to 140 °F
Noise Emission		<= 70 dB(A) in any direction	
Current Rating		200A Continuous	
Higher Current Ratings		Contact APPLIED ROBOTICS Technical Support	

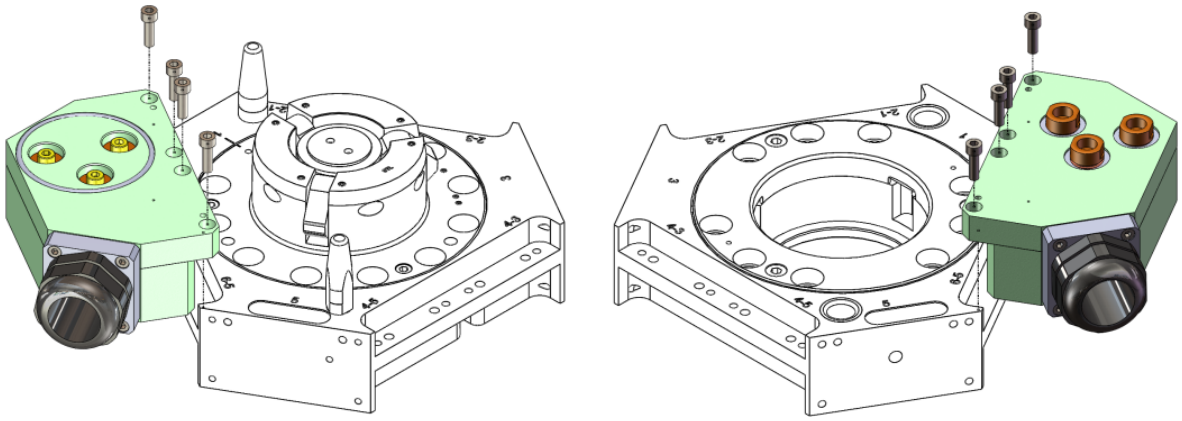
* Module weight may vary depending on specific configuration.

4 INSTALLATION

The HIKVA Module is designed to mount directly to APPLIED ROBOTICS' Sigma, Sigma NextGen, and Epsilon (E125, E160, ES160, & ES200) Tool Change Systems.

The HIKVA Module can be installed on any long side mounting position of the Sigma, Sigma NextGen, or Epsilon Tool Changer. That is, Positions 2, 4, or 6 for the Sigma, Sigma NextGen, and Epsilon E160, ES160, and ES200 Tool Changers, and Positions 2 or 4 for the Epsilon E125 Tool Changer. See applicable Tool Changer manual.

To install the HIKVA Module, locate the module using the two installed M6 dowels and fasten the module to the mounting position using the four M6 socket head cap screws, supplied with the module (See Figure 4-1).



ROBOT SIDE **TOOL SIDE**

Figure 4-1. HIKVA Module Installation

4.1 CABLE INSTALLATION

For cable size specifications, reference applicable equipment drawing. This is not applicable to modules equipped with ROBIFIX connectors.

4.1.1 Robot Side

1. For Cable Preparation, refer to module drawing for cable stripping lengths (See Section 10).
2. Remove strain relief adaptor by using a 4mm Allen wrench to remove four (4) M5 socket head cap screws from tool cover and tool base.

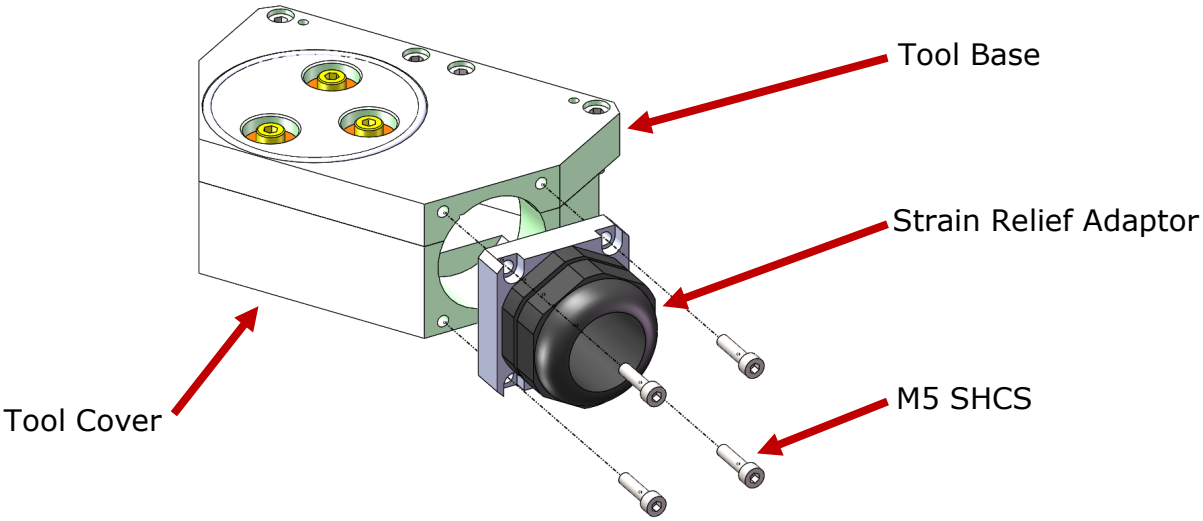


Figure 4.1.1-1. Remove/Install Strain Relief Adaptor

3. Remove tool cover by using a 5mm Allen wrench to remove four (4) M6 socket head cap screws from tool base.

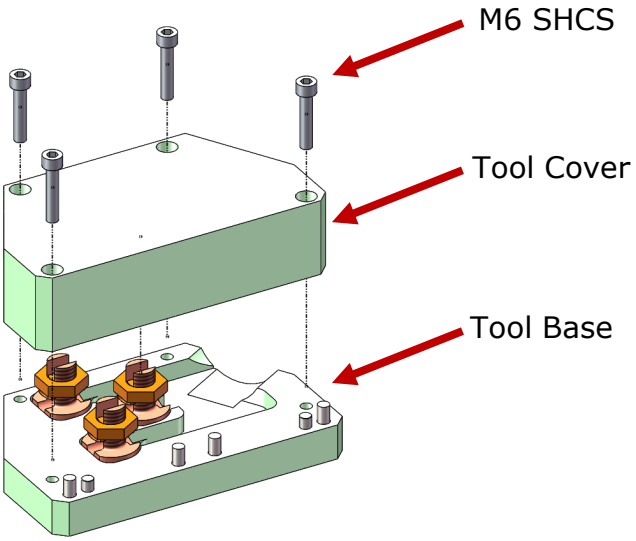


Figure 4.1.1-2. Remove/Install Tool Cover

4. Remove three (3) terminal nuts and three (3) terminal lugs from contacts.

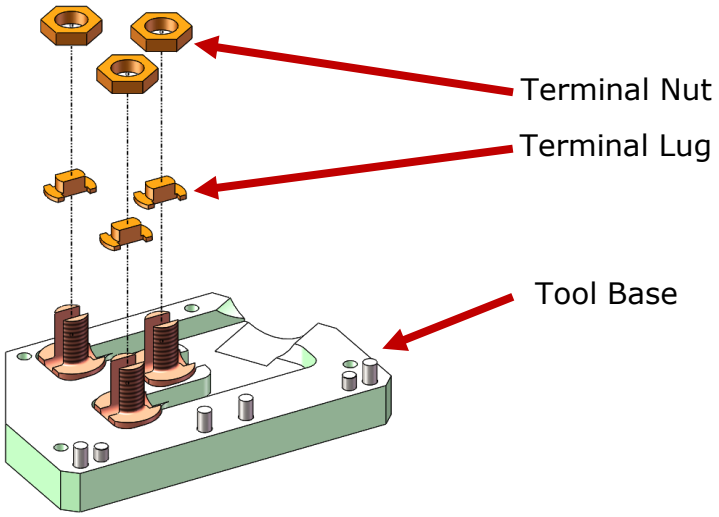


Figure 4.1.1-3. Remove/Install Terminal Nuts and Terminal Lugs

5. Slide cable through strain relief adaptor and install conductors to respective contact terminal. Conductors should be oriented so they are closest to respective contact terminal.
    a. Green conductor goes to PE contact.
    b. Black conductor goes to V contact.
    c. White conductor goes to U contact.

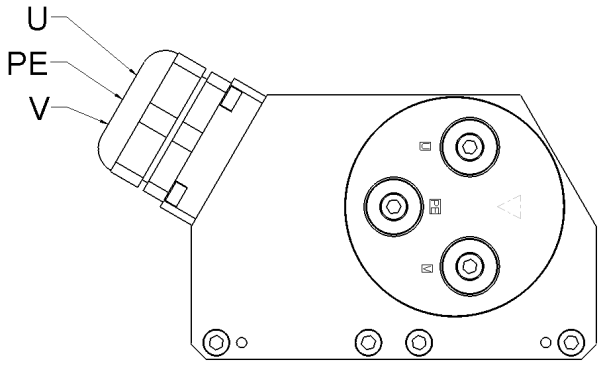


Figure 4.1.1-4. Conductor Orientation

6. Reinstall three (3) terminal nuts and three (3) terminal lugs to contacts (See Figure 4.1.1-3).

NOTICE

TERMINAL NUTS ONLY THREAD ONE WAY; PICK-PUNCHED OR STAMPED LETTER UP.

NOTICE

TERMINAL NUTS HAVE A RECOMMENDED TORQUE OF 12.43 Nm (110.4 IN-LB).

7. Reinstall tool cover onto tool base by using a 5mm Allen wrench to install four (4) M6 socket head cap screws (See Figure 4.1.1-2).

NOTICE

M6 SOCKET HEAD CAP SCREWS HAVE A RECOMMENDED TORQUE OF 1.13 Nm (10 IN-LB).

8. Reinstall strain relief adaptor onto tool cover and tool base by using a 4mm Allen wrench to install four (4) M5 socket head cap screws (See Figure 4.1.1-1).

NOTICE

M5 SOCKET HEAD CAP SCREWS HAVE A RECOMMENDED TORQUE OF 2.85 Nm (25.2 IN-LB).

NOTICE

STRAIN RELIEF SHOULD BE SCREWED SO THAT FLATS ARE PARALLEL TO EDGES OF ADAPTOR. IF NOT, MODULES MAY BE DAMAGED DURING OPERATION.

4.1.2 Tool Side

1. For Cable Preparation, refer to module drawing for cable stripping lengths (See Section 10).
2. Remove strain relief adaptor by using a 4mm Allen wrench to remove four (4) M5 socket head cap screws from tool cover and tool base.

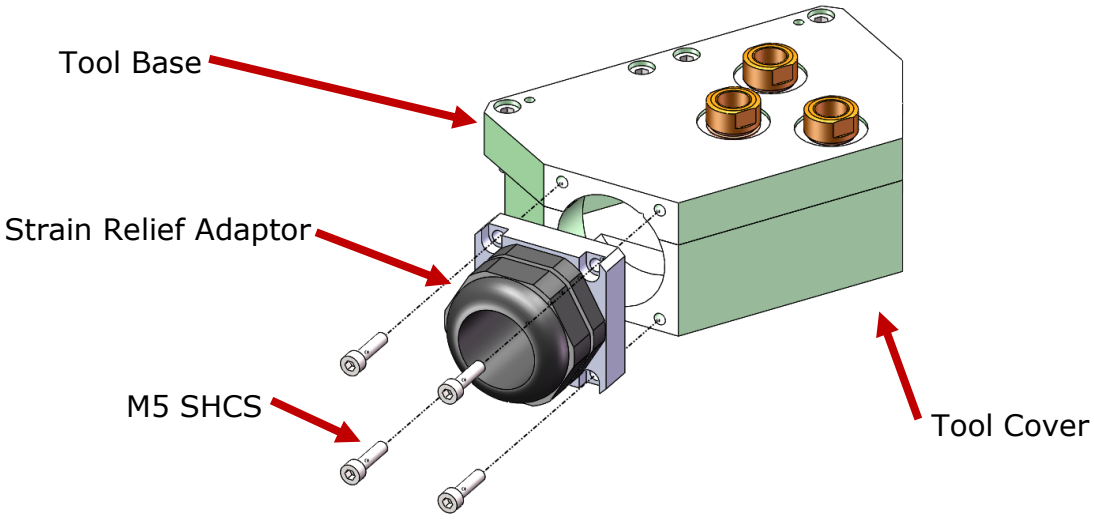


Figure 4.1.2-5. Remove/Install Strain Relief Adaptor

3. Remove tool cover by using a 5mm Allen wrench to remove four (4) M6 socket head cap screws from tool base.

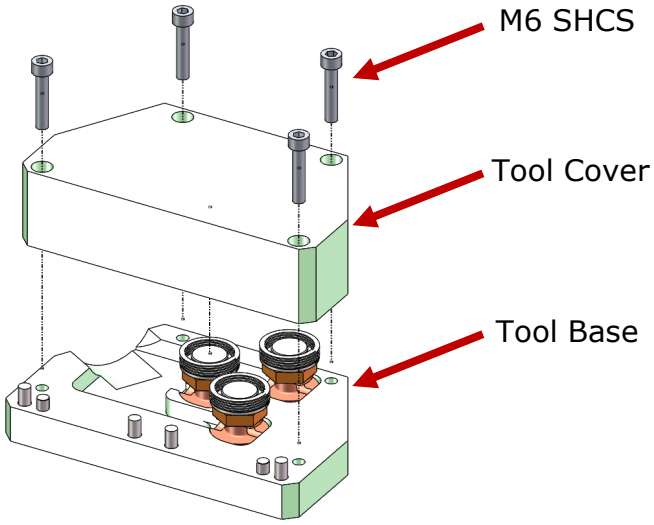


Figure 4.1.2-6. Remove/Install Tool Cover

4. Remove three (3) contact springs, spring retainers, terminal nuts, and terminal lugs from contacts.

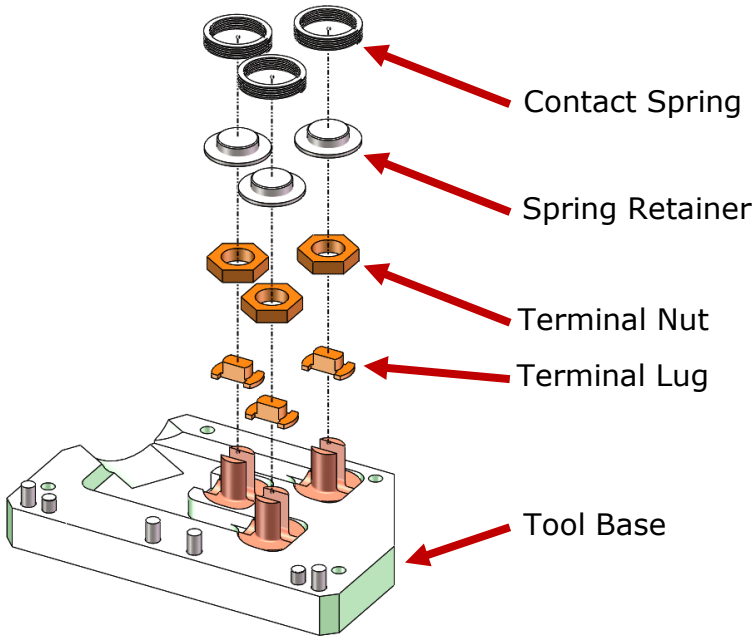


Figure 4.1.2-7. Remove/Install Contact Springs, Spring Retainers, Terminal Nuts, and Terminal Lugs

5. Slide cable through strain relief adaptor and install conductors to respective contact terminal. Conductors should be oriented so they are closest to respective contact terminal.
    a. Green conductor goes to PE contact.
    b. Black conductor goes to V contact.
    c. White conductor goes to U contact.

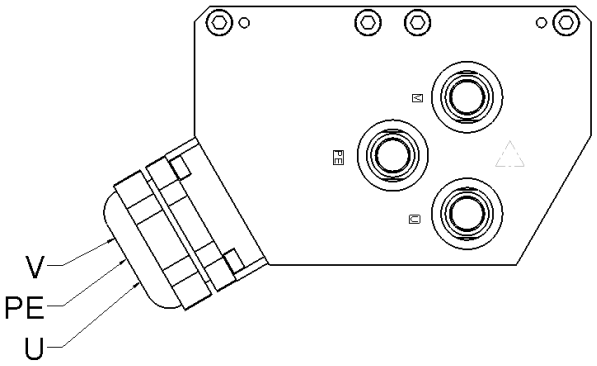


Figure 4.1.2-8. Conductor Orientation

6. Reinstall three (3) contact springs, spring retainers, terminal nuts, and terminal lugs to contacts. (See Figure 4.1.2-7).

NOTICE

TERMINAL NUTS ONLY THREAD ONE WAY; PICK-PUNCHED OR STAMPED LETTER UP.

NOTICE

TERMINAL NUTS HAVE A RECOMMENDED TORQUE OF 12.43 Nm (110.4 IN-LB).

7. Reinstall tool cover onto tool base by using a 5mm Allen wrench to install four (4) M6 socket head cap screws (See Figure 4.1.2-6).

NOTICE

M6 SOCKET HEAD CAP SCREWS HAVE A RECOMMENDED TORQUE OF 1.13 Nm (10 IN-LB).

8. Reinstall strain relief adaptor onto tool cover and tool base by using a 4mm Allen wrench to install four (4) M5 socket head cap screws (See Figure 4.1.2-5).

NOTICE

M5 SOCKET HEAD CAP SCREWS HAVE A RECOMMENDED TORQUE OF 2.85 Nm (25.2 IN-LB).

NOTICE

STRAIN RELIEF SHOULD BE SCREWED SO THAT FLATS ARE PARALLEL TO EDGES OF ADAPTOR. IF NOT, MODULES MAY BE DAMAGED DURING OPERATION.

5 GUIDE TO OPERATION

The two halves of the HIKVA Module mate when the Robot Side of the Tool Changer goes to dock a tool. Power is transmitted via spring loaded pins on the Tool Side when mated. Tool Changer locating pins provide alignment and guidance for interfacing the two halves of the HIKVA Module during docking.

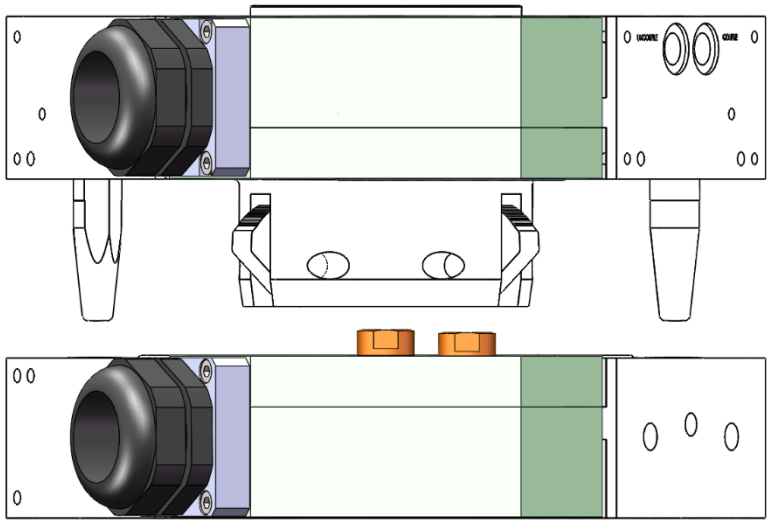


Figure 5-1. Tool Changer Undocked

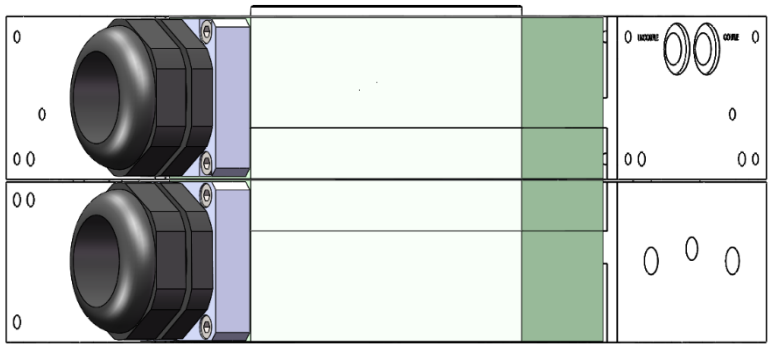


Figure 5-2. Tool Changer Docked

The Robot Side has an O-Ring seal around the three contacts in order to protect the contacts from debris when the Tool Changer is docked.

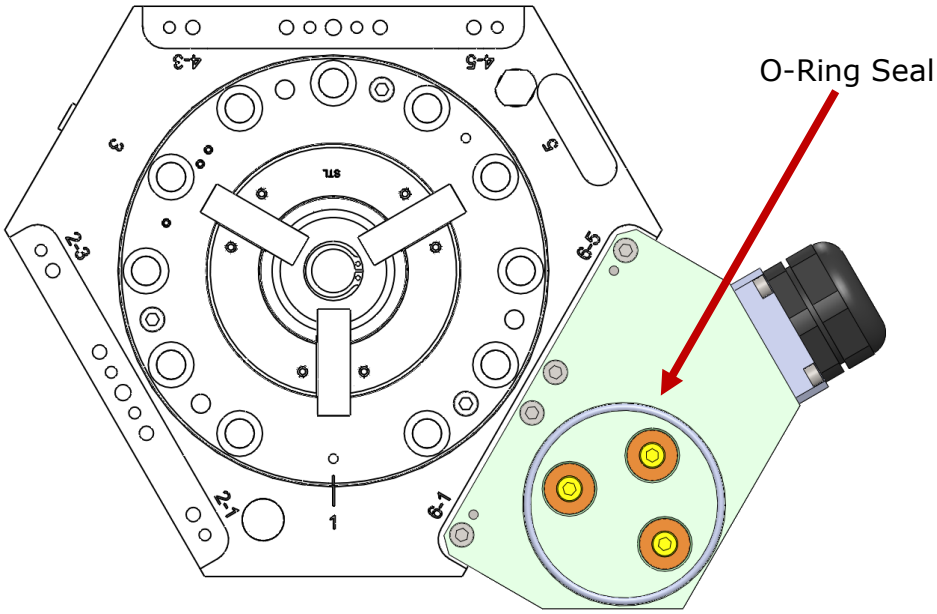


Figure 4.1-3. Robot Side O-Ring Seal

The Tool Side contacts are designed so that the ground (PE) contact is slightly higher than the two power contacts. This ensures the ground contact is First to Mate, where it is the first to make a connection when the Tool Changer is docking and the last to break the connection when the Tool Changer is undocking.

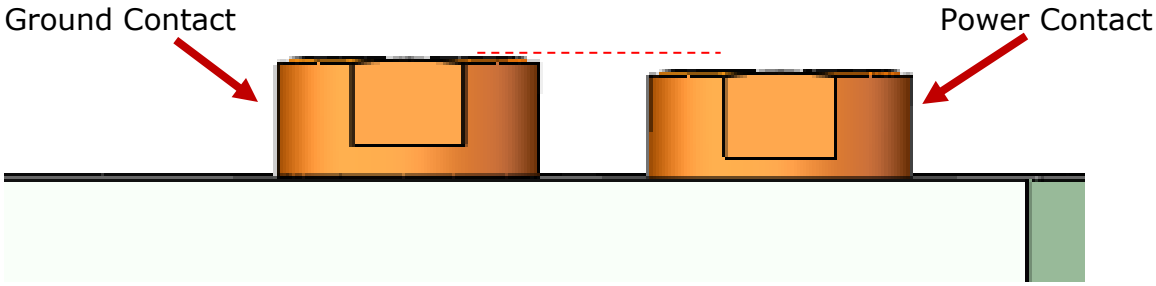


Figure 4.1-4. Tool Side Contacts

⚠ WARNING

TURN OFF POWER DURING CONNECT/DISCONNECT TO AVOID ARCING AND SHORTS.

6 TROUBLESHOOTING

6.1 TROUBLESHOOTING GUIDE

Symptom	Possible Cause	Resolution
Burnt or pitted contacts	Broken Tool Side contact Springs	Replace Tool Side contact springs and all contact tips. (See Sections 9.1, 9.2, and 9.3)
	Contaminants on pins	Replace Tool Side contact springs and all contact tips. (See Sections 9.1, 9.2, and 9.3)
Burnt Housings	Loose conductors	Replace burnt components and make sure conductors are secured.

6.2 TECHNICAL SUPPORT

If you require assistance, contact APPLIED ROBOTICS Technical Support Department at:

Phone: +1 518 384 1000
E-mail: techsupport@appliedrobotics.com

7 MAINTENANCE

NOTICE

FAILURE TO FOLLOW THE MAINTENANCE SCHEDULE DESCRIBED IN THIS SECTION COULD ALTER OR VOID THE WARRANTY PROVIDED BY APPLIED ROBOTICS, INC.

The following table provides a schedule for preventive maintenance to be performed for the HIKVA Module.

Table 7-1. Preventive Maintenance Schedule

Frequency of Maintenance	Preventative Maintenance
Every 2 Weeks	Visual Checks
250,000 Cycles	Visual Checks & Contact Spring Inspection (Tool Side)
500,000 Cycles	
750,000 Cycles	
1,000,000 Cycles	Visual Checks & Contact Spring Inspection (Tool Side) & Replace if Worn or Damaged Parts
1,250,000 Cycles	
1,500,000 Cycles	
1,750,000 Cycles	
2,000,000 Cycles[1]	

7.1 PREVENTIVE MAINTENANCE

1. Inspect contact surfaces for excessive dirt or pitting. Replace contact surfaces if excessive pitting is observed (See Section 9.1 and 9.2).

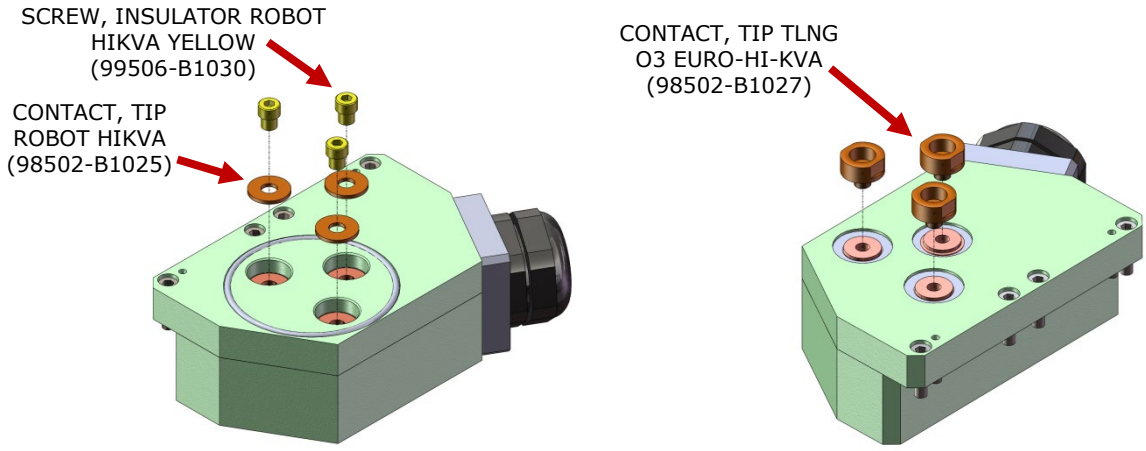


Figure 7.1-1. Contact Tip Robot and Tool HIKVA Module

[1] Continue Visual Checks every 250,000 Cycles. Continue inspecting for wear or damaged components every 500,000 cycles.

8 SPARE PARTS

The spare parts listed below are recommended to be maintained in stock for the life of the HIKVA Module. These quantities are based on a single unit. If higher quantities are purchased, please contact the Technical Support Department at +1 518 384 1000 or techsupport@appliedrobotics.com to determine the quantity of spares recommended for the size of your installation.

HIKVA MODULE (PER MODULE)			
Side	**Description**	**Part Number**	**Quantity**
Robot	CONTACT, TIP ROBOT HIKVA	98502-B1025	3
	SCREW, INSULATOR ROBOT HIKVA YELLOW	99506-B1030	3
Tool	CONTACT, TIP TLNG O3 EURO-HI-KVA	98502-B1027	3
	SPRING, WAVE SMALLEY	96506-P1031	3

9 SPARE PARTS REPLACEMENT

The following procedures explain the correct method for removing and replacing the recommended spare parts listed in Section 8 of this manual. Reference applicable Drawings in Informational Documents for the correct Part Numbers.

⚠ DANGER **TURN OFF AND DISCONNECT ALL POWER BEFORE REPLACING ANY COMPONENTS.**

9.1 CONTACT TIP REPLACEMENT (ROBOT SIDE)

The Contact Tips can be replaced while still on the Robot Adaptor.

1. Remove Insulated Screws (99506-B1030).
2. Remove Contact Tips (98502-B1025).
3. Apply a thin film of Conductive Paste (86005-P1208) Jet Lube Inc. KOPR-SHIELD to one side of the new Contact Tips.
4. Lay the Contact Tip (98502-B1025) so that the side coated with Conductive Paste (86005-P1208) is in contact with the High-Power Contact (96502-B1091).
5. Thread the Insulated Screws (99506-B1030) into the High-Power Contacts (96502-B1091) through the Contact Tips (98502-B1025).

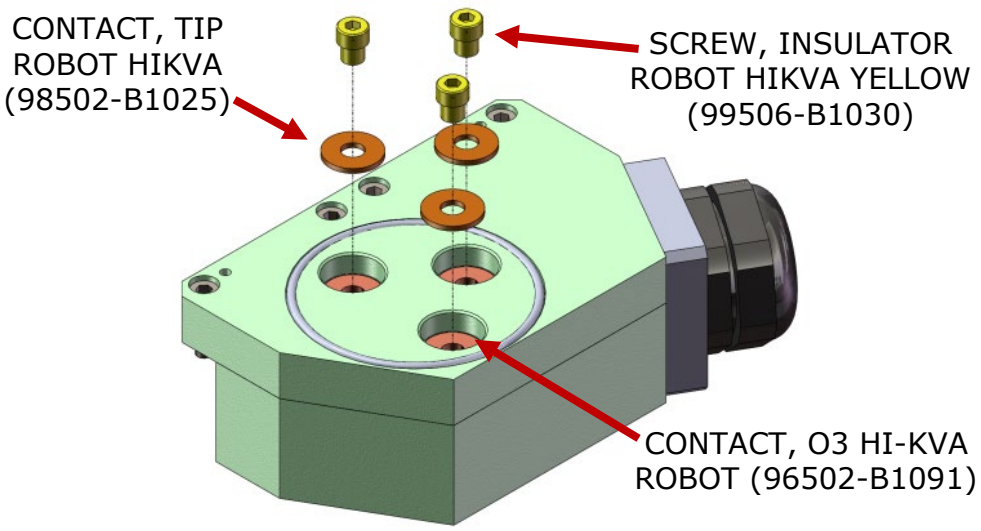


Figure 9.1-1. Contact Tip Replacement (Robot Side)

NOTICE **INSULATED SCREWS HAVE A RECOMMENDED TORQUE OF 1.1 Nm (10 IN-LB).**

9.2 CONTACT TIP REPLACEMENT (TOOL SIDE)

The Contact Tips can be replaced while still on the Tool Adaptor.

1. Remove Contact Tips (98502-B1027).
2. Apply a thin coat of Conductive Paste (86005-P1208) / Jet Lube Inc. KOPR-SHIELD to the exposed surfaces of the High-Power Contact Bodies (98502-C1024).
3. Thread new Contact Tips (98502-B1027) into the High-Power Contact Bodies (98502-C1024).

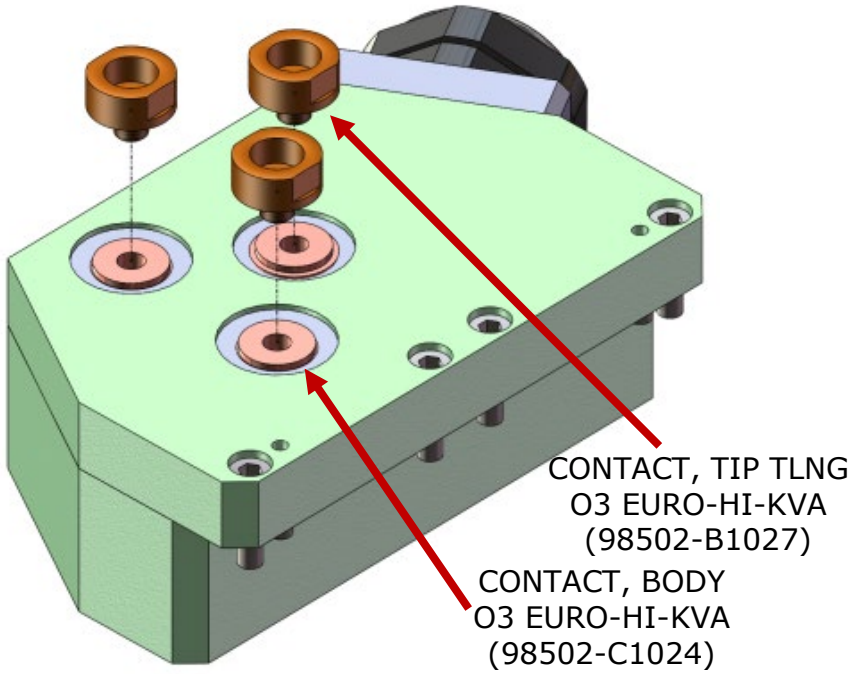


Figure 9.2-1. Contact Tip Replacement (Tool Side)

NOTICE

CONTACT TIPS HAVE A RECOMMENDED TORQUE OF 7.9 Nm (70 IN-LB).

9.3 CONTACT SPRINGS REPLACEMENT (TOOL SIDE)

1. Remove M5 (48029) socket head cap screws from Tool Cover (0202-D82N) as shown in Figure 9.3-1. Contact Spring Replacement (Tool Side).
2. Remove M6 (49185) socket head cap screws. Be aware that the three Spring Retainers (96505-B1002) will be loose when the Tool Cover is removed from the Tool Base (0202-D75N).
3. Remove Spring Retainers (96505-B1002) and Contact Springs (96506-P1031).
4. Place new Contact Springs (96506-P1031) and Spring Retainers (96505-B1002) into the Tool Cover (0202-D82N).

5. Remount the Tool Cover (0202-D82N) by threading the M6 (49185) socket head cap screws into the Tool Base (0202-D75N) through the Tool Cover (0202-D82N).
6. Reinstall the M5 (48029) socket head cap screws in to Strain Relief Adaptor (0204-B70N).

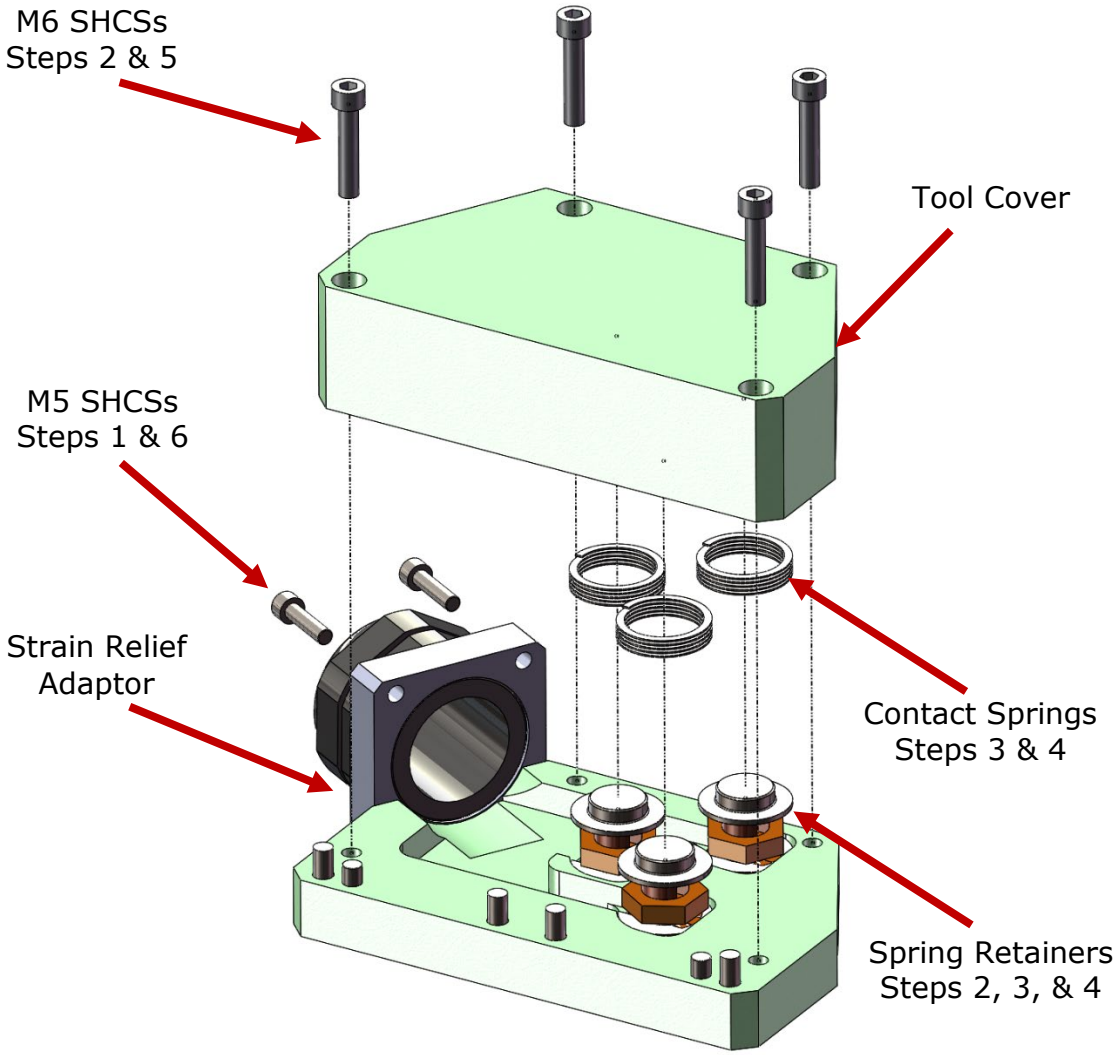


Figure 9.3-1. Contact Spring Replacement (Tool Side)

NOTICE

M5 SCREWS HAVE A RECOMMENDED TORQUE OF 7.6 Nm (67 IN-LB). M6 SCREWS HAVE A RECOMMENDED TORQUE OF 13.1 Nm (116 IN-LB).

10 INFORMATIONAL DOCUMENTS

The documents in this section can assist with installation, use, and identification of replacement parts for the HIKVA Module. Please contact **APPLIED ROBOTICS Technical Support** if you have any questions.

DECLARATIONS
• Declaration of Incorporation for Partly Completed Machinery

DRAWINGS		
SIDE	**DRAWING NUMBER**	**DESCRIPTION**
Robot	1205-D74A	S-EM-R-E-HIKVAE-HU-PG36 3COND XChange EXTERNAL ELECTRICAL MODULE
	1205-D72A	S-EM-R-E-HIKVAE-HU-PG36 XChange EXTERNAL ELECTRICAL MODULE
	1501-D69A	S-EM-R-E-HIKVAEPG3-35MM-00 XChange EXTERNAL ELECTRICAL MODULE
	1313-D38A	S-EM-R-E-HIKVAE-ROBIFIX-TAE1 XChange EXTERNAL ELECTRICAL MODULE
Tool	1205-D75A	S-EM-T-E-HIKVAE-HU-PG36 3COND XChange EXTERNAL ELECTRICAL MODULE
	1205-D73A	S-EM-T-E-HIKVAE-HU-PG36 XChange EXTERNAL ELECTRICAL MODULE
	1501-D70A	S-EM-T-E-HIKVAEPG3-35MM-00 XChange EXTERNAL ELECTRICAL MODULE

Declaration of Incorporation of Partly Completed Machinery (Annex II 1 B of EC Machinery Directive 2006/42/EC)

Description and identification of the partly completed machinery:

XChange – EPSILON Series Tool Changers & Utility Modules

Fulfills the following function:

Allows industrial robots (and other automated equipment) to automatically change their end of arm tooling under programmed control without the need of human intervention. These products are intended to be incorporated into machinery supplied by others.

The following essential requirements of EC Machinery Directive 2006/42/EC (Annex I) have been applied and fulfilled:

Section 1.1.2.	Principles of safety integration
Section 1.1.3.	Materials and products
Section 1.1.5.	Design of machinery to facilitate its handling
Section 1.2.1.	Safety and reliability of control systems
Section 1.2.6.	Failure of the power supply
Section 1.3.2	Risk of break-up during operation
Section 1.3.3.	Risks due to falling or ejected objects
Section 1.3.4.	Risks due to surfaces, edges or angles
Section 1.3.7.	Risks related to moving parts
Section 1.3.9.	Risks of uncontrolled movements
Section 1.5.1.	Risks due to electricity supply
Section 1.5.3.	Risks due to energy supply other than electricity (air pressure)
Section 1.5.8.	Risks due to noise
Section 1.5.10.	Risks due to non-ionizing radiation
Section 1.6.4.	Operator intervention
Section 1.7.1.	Information and warnings on the machinery
Section 1.7.2.	Warning of residual risks
Section 1.7.3.	Marking of machinery
Section 1.7.4.	Instructions.

The partly completed machinery has been designed and manufactured according to the following harmonized standards:

EN ISO 12100-1	Safety of machinery - Basic concepts, general principles for design Part 1: Basic terminology, methodology
EN ISO 12100-2	Safety of machinery - Basic concepts, general principles for design Part 2: technical principles

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EN ISO 10218-2	Robots and robotic devices — Safety requirements for industrial robots — Part 2: Robot systems and integration
EN ISO 60204-1	Safety of machinery. Electrical equipment of machines. General requirements
EN 61000-6-2	Electromagnetic compatibility (EMC) - Generic standards. Immunity for industrial environments
EN 61000-6-4	Electromagnetic compatibility (EMC) - Generic standards. Emission standard for industrial environments
EN 61000-4-2	Electromagnetic compatibility (EMC). Testing and measurement techniques. Electrostatic discharge immunity test
EN 61010-1	Safety requirements for electrical equipment for measurement, control, and laboratory use -- Part 1: General requirements

The relevant technical documentation has been compiled in accordance with Annex VII, Part B of EC Machinery Directive 2006/42/EC. We undertake, in response to a reasoned request, to supply it in electronic form to the market surveillance authorities within a reasonable period.

The party authorized to compile the technical documentation is:

Giovanni Patrini, at Effecto Group SpA

The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the Machinery Directive.

Stefan Casey
Vice President, Engineering

APRIL 20, 2018
Date

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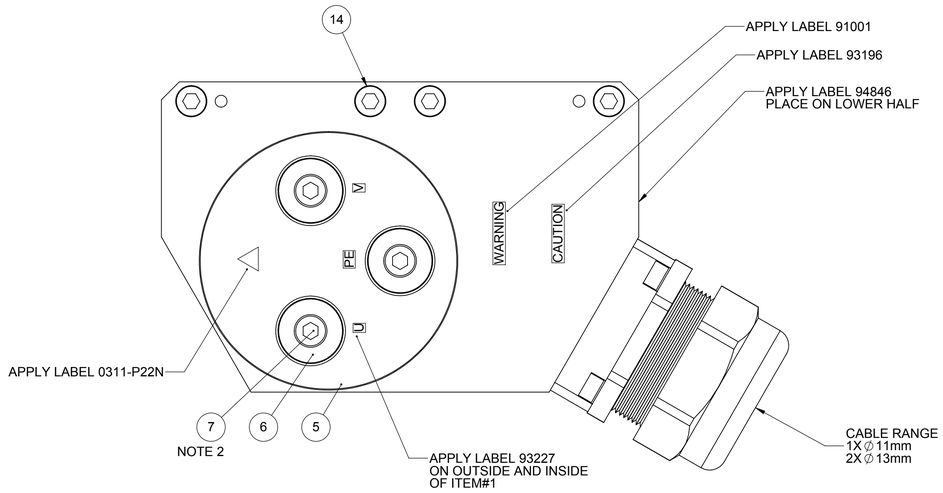
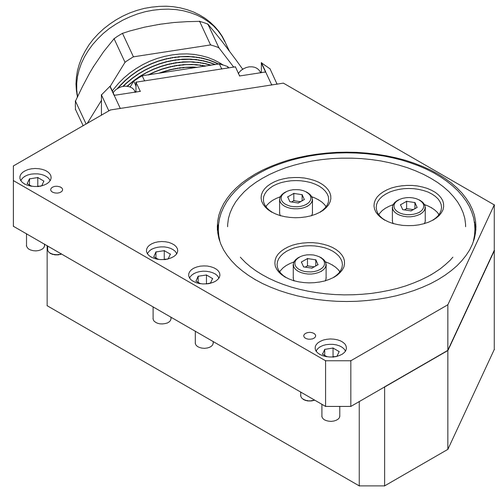
Fax: +39 (0) 32 29 50 686

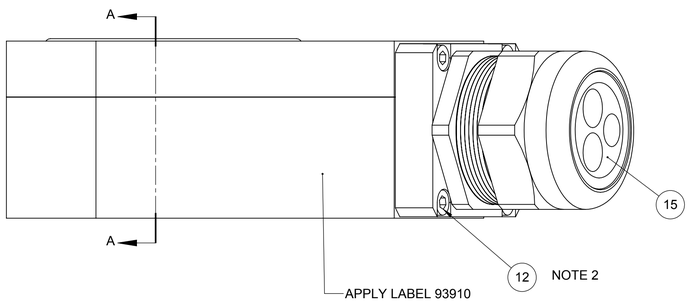
www.appliedrobotics.com

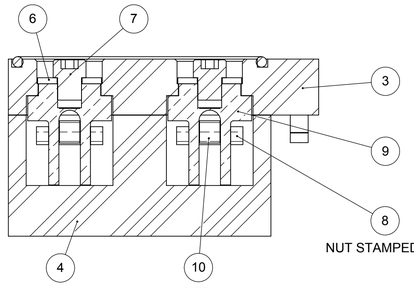
SIZE	DRAWING NUMBER	REV
D	1205-D74A	01

REVISIONS						
ZONE	REV	DESCRIPTION	DR	CHK	DATE	ECR/ESR NO.
	00	RELEASE FOR MANUFACTURING	CR	TM	7-9-12	MMOA-8VHDWY
	01	ITEM #2 1402-B61N WAS 1202-B68N	PS	JV	05/17/2018	GPAI-ASMTAR

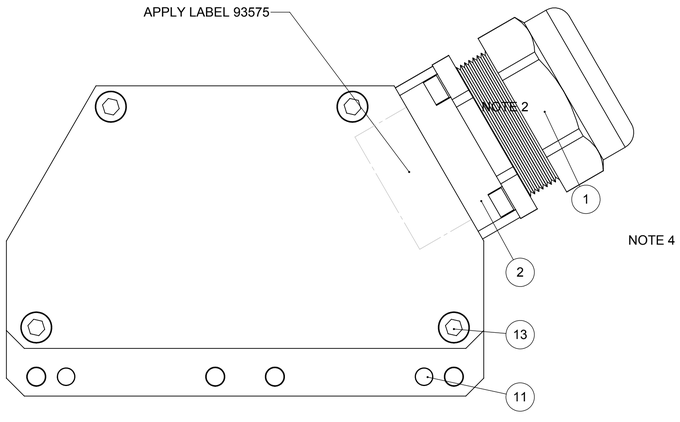








SECTION A-A



ITEM NO.	QTY	PART NO.	DESCRIPTION
15	1	1205-P77N	STRAIN RELIEF, HUMMEL, INSERT 3COND
14	4	48038	SCR, SOC HD CAP M6 X 20 (SS)
13	4	49185	SCR, SOC HD CAP M6 X 30 SS
12	4	48029	SCR, SOC HD CAP M5 X 20 (SS)
11	2	41580	DOWEL, M6 X 12 (HARD STL) m6
10	3	96502-B1093	LUG, CONTACT
9	3	96502-B1091	CONTACT,O3 HI-KVA ROBOT
8	3	96502-B1089	NUT, LOCK BUG TERMINAL
7	3	99506-B1030	SCREW, INSULATOR ROBOT HIKVA
6	3	98502-B1025	CONTACT, TIP ROBOT HIKVA
5	1	0007-P51N	O-RING, 3.109 ID X .139 70 BUNA (P)
4	1	1202-D65N	COVER, ROBOT HIKVA SIGMA
3	1	1202-D64N	BASE, ROBOT HIKVA SIGMA
2	1	1402-B61N	ADAPTER, PG36 SIGMA
1	1	1205-P76N	STRAIN RELIEF, HUMMEL

NOTES:
1. APPLY CONDUCTIVE PAST ARI PART #86005-P1208
2. TORQUE TO 10 IN/LBS
3. INCLUDE ARI DRAWING #0206-D70A IN BAG
4. END USER TO TORQUE TO 44 lbf-in (5Nm)

PRINT DATE
3/14/2019

THIRD ANGLE PROJECTION

DIM. AND TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M-1994

ENGLISH
UNLESS OTHERWISE SPECIFIED:
UNTOLERANCED DIMS ARE BASIC
.25 A B C
∅ .25 M A B C
ALL HOLE DIAMETERS +/- 0.25
INTERNAL RADII & BROKEN EDGES TO BE .13-.38
ALL SURFACE FINISHES 1.6Ra

MAT'L:
Material <not specified>

SURFACE TREATMENT:
-

DR:	C. RITTERSHAUSEN
CHK:	T.MARCELLA
ENG:	C. RITTERSHAUSEN
MFG:	J.SERFILPPI
QC:	J.SERFILPPI

3D MODEL NUMBER:
1205-D74A

SCALE: 1:1
DO NOT SCALE DRAWING

ISO 9001
REGISTERED

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648 Saratoga Rd. Glenville, NY 12302
www.appliedrobotics.com

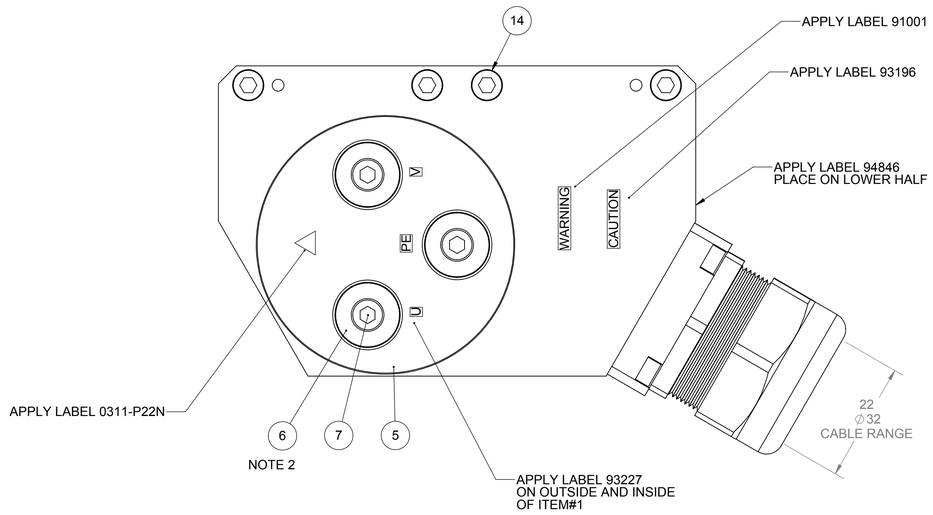
TITLE:
S-EM-R-E-HIKVAE-HU-PG36
3COND
-
-

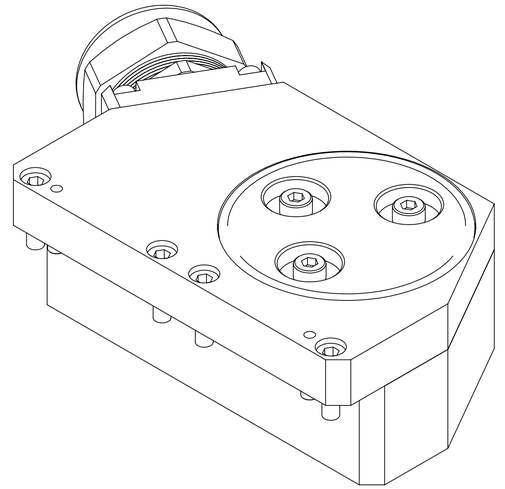
SIZE	DRAWING NUMBER	REV
D	1205-D74A	01

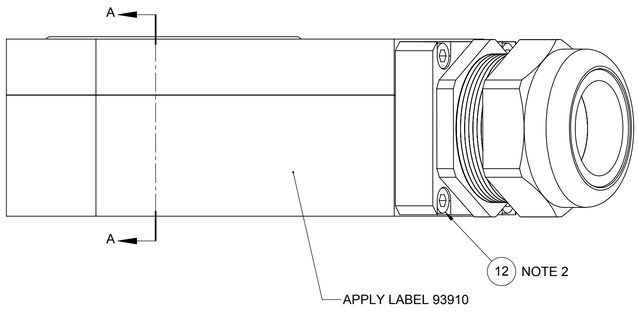
WEIGHT: 1.54 kg | RoHs COMPLIANT: - | SHT. 1 OF 1

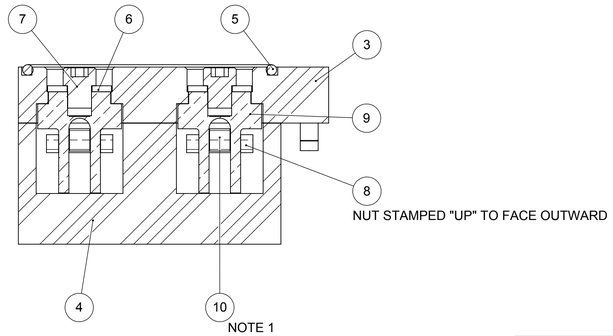
SIZE	DRAWING NUMBER	REV
D	1205-D72A	01

REVISIONS						
ZONE	REV	DESCRIPTION	DR	CHK	DATE	ECR/ESR NO.
	00	RELEASE FOR MANUFACTURING	CR	TM	7-9-12	MMOA-8VHDWY
	01	ITEM #2 1402-B61N WAS 1202-B68N	PS	JV	05/17/2018	GPAI-ASMTAR

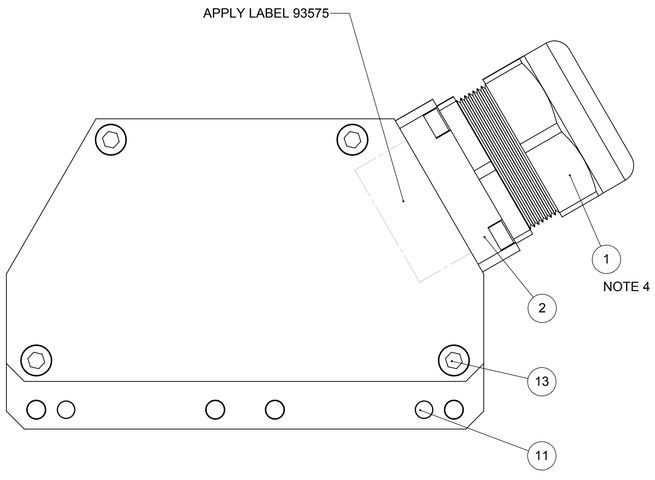








SECTION A-A



NOTES:
1. APPLY CONDUCTIVE PAST ARI PART #86005-P1208
2. TORQUE TO 10 IN/LBS
3. INCLUDE ARI DRAWING #0206-D70A IN BAG
4. END USER TO TORQUE TO 44 lbf-in (5Nm)

PRINT DATE
3/14/2019

ITEM NO.	QTY	PART NO.	DESCRIPTION
14	4	48038	SCR, SOC HD CAP M6 X 20 (SS)
13	4	49185	SCR, SOC HD CAP M6 X 30 SS
12	4	48029	SCR, SOC HD CAP M5 X 20 (SS)
11	2	41580	DOWEL, M6 X 12 (HARD STL) m6
10	3	96502-B1093	LUG, CONTACT
9	3	96502-B1091	CONTACT,O3 HI-KVA ROBOT
8	3	96502-B1089	NUT, LOCK BUG TERMINAL
7	3	99506-B1030	SCREW, INSULATOR ROBOT HIKVA
6	3	98502-B1025	CONTACT, TIP ROBOT HIKVA
5	1	0007-P51N	O-RING, 3.109 ID X .139 70 BUNA (P)
4	1	1202-D65N	COVER, ROBOT HIKVA SIGMA
3	1	1202-D64N	BASE, ROBOT HIKVA SIGMA
2	1	1402-B61N	ADAPTER, PG36 SIGMA
1	1	1205-P76N	STRAIN RELIEF, HUMMEL

THIRD ANGLE PROJECTION

ENGLISH

UNLESS OTHERWISE SPECIFIED:

UNTOLERANCED DIMS ARE BASIC

⌓ .25 A B C

⌖ Ø .25Ⓜ A B C

ALL HOLE DIAMETERS +/- 0.25

INTERNAL RADII & BROKEN EDGES TO BE .13-.38
ALL SURFACE FINISHES 1.6Ra

MAT'L:
Material <not specified>

SURFACE TREATMENT:
-

DIM. AND TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M-1994

ISO 9001 REGISTERED

DR:	C. RITTERSHAUSEN
CHK:	T.MARCELLA
ENG:	C. RITTERSHAUSEN
MFG:	J.SERFILPPI
QC:	J.SERFILPPI

3D MODEL NUMBER:
1205-D72A

SCALE: 1:1
DO NOT SCALE DRAWING

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www.appliedrobotics.com

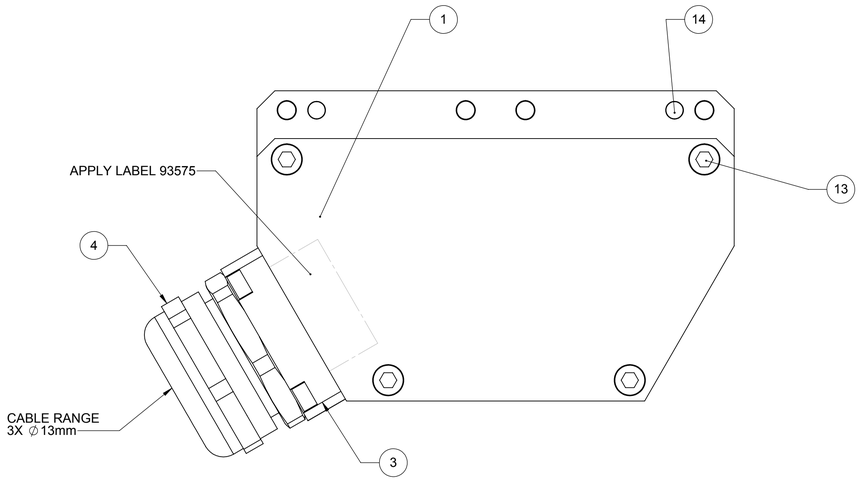
TITLE:
S-EM-R-E-HIKVAE-HU-PG36
-
-

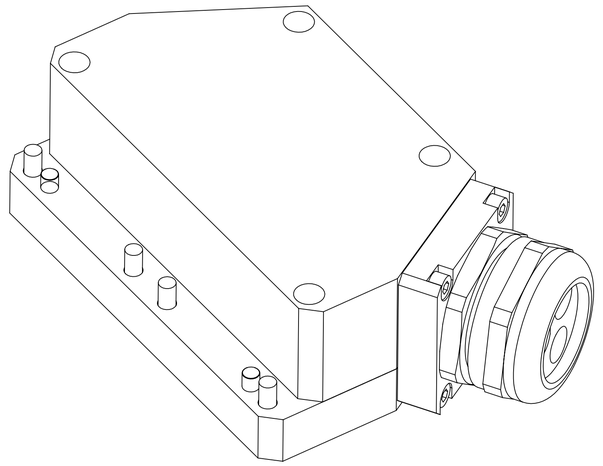
SIZE	DRAWING NUMBER	REV
D	1205-D72A	01

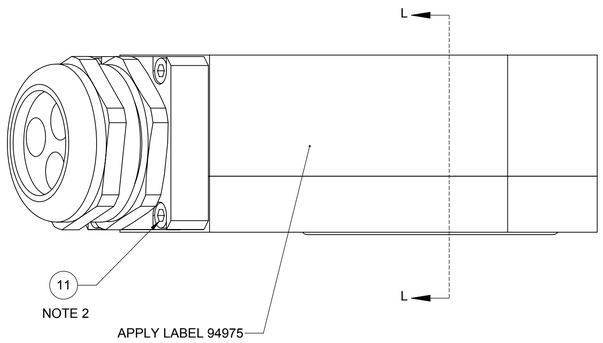
WEIGHT: 1.52 kg | RoHs COMPLIANT: - | SHT. 1 OF 1

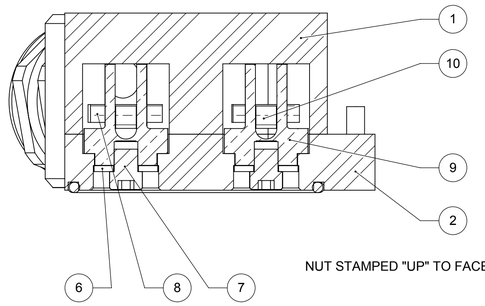
SIZE	DRAWING NUMBER	REV
D	1501-D69A	01

REVISIONS						
ZONE	REV	DESCRIPTION	DR	CHK	DATE	ECR/ESR NO.
	00	RELEASE TO MANUFACTURE	TM	JV	3-20-15	WZEH-9URHUQ
	01	ITEM #3 1402-B61N WAS 1202-B68N	PS	JV	05/17/2018	GPAI-ASMTAR

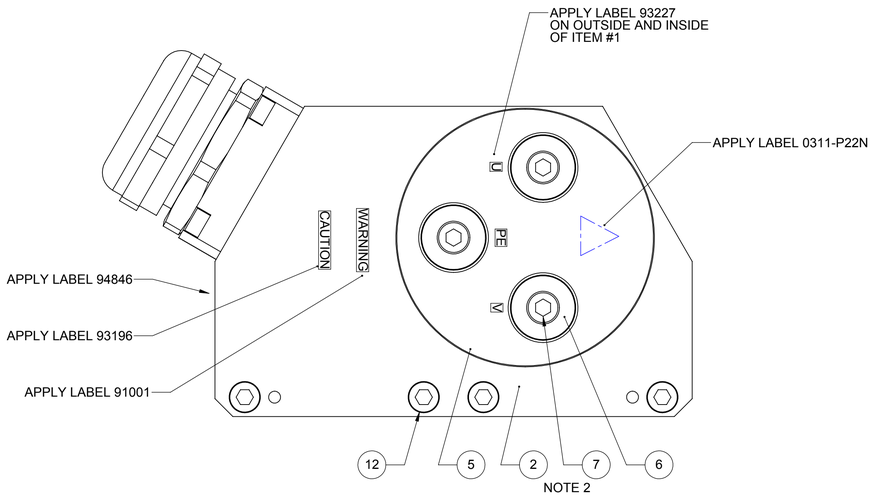








SECTION L-L



NOTES
1. APPLY CONDUCTIVE PASTE ARI PART # 86005-P1208
2. TORQUE TO 10 IN/LBS
3. INCLUDE ARI DRAWING #0206-D70A IN BAG
4. END USER TO TORQUE TO 44lbf-in (5Nm)

PRINT DATE
5/18/2018

ITEM NO.	QTY	PART NO.	DESCRIPTION
14	2	41580	DOWEL, M6 X 12 (HARD STL) m6
13	4	49185	SCR, SOC HD CAP M6 X 30 SS
12	4	48038	SCR, SOC HD CAP M6 X 20 (SS)
11	4	48029	SCR, SOC HD CAP M5 X 20 (SS)
10	3	96502-B1093	LUG, CONTACT
9	3	96502-B1091	CONTACT,O3 HI-KVA ROBOT
8	3	96502-B1089	NUT, LOCK BUG TERMINAL
7	3	99506-B1030	SCREW, INSULATOR ROBOT HIKVA
6	3	98502-B1025	CONTACT, TIP ROBOT HIKVA
5	1	0007-P51N	O-RING, 3.109 ID X .139 70 BUNA (P)
4	1	1501-C71N	STRAIN RELIEF PG36-3 COND.
3	1	1402-B61N	ADAPTER, PG36 SIGMA
2	1	1202-D64N	BASE, ROBOT HIKVA SIGMA
1	1	1202-D65N	COVER, ROBOT HIKVA SIGMA

THIRD ANGLE PROJECTION

DIM. AND TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M-1994

METRIC

UNLESS OTHERWISE SPECIFIED:

UNTOLERANCED DIMS ARE BASIC

⌓ .25 A B C

⌖ ∅ .25 Ⓜ A B C

ALL HOLE DIAMETERS +/- 0.25

INTERNAL RADII & BROKEN EDGES TO BE .13-.38
ALL SURFACE FINISHES 1.6Ra

MAT'L:
-

SURFACE TREATMENT:
-

DR:	T. MARCELLA
CHK:	J. VALLELUNGA
ENG:	T. MARCELLA
MFG:	C. BEST
QC:	M. DUDNATH

3D MODEL NUMBER:
1501-D69A

SCALE: 1:1
DO NOT SCALE DRAWING

ISO 9001
REGISTERED

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www.appliedrobotics.com

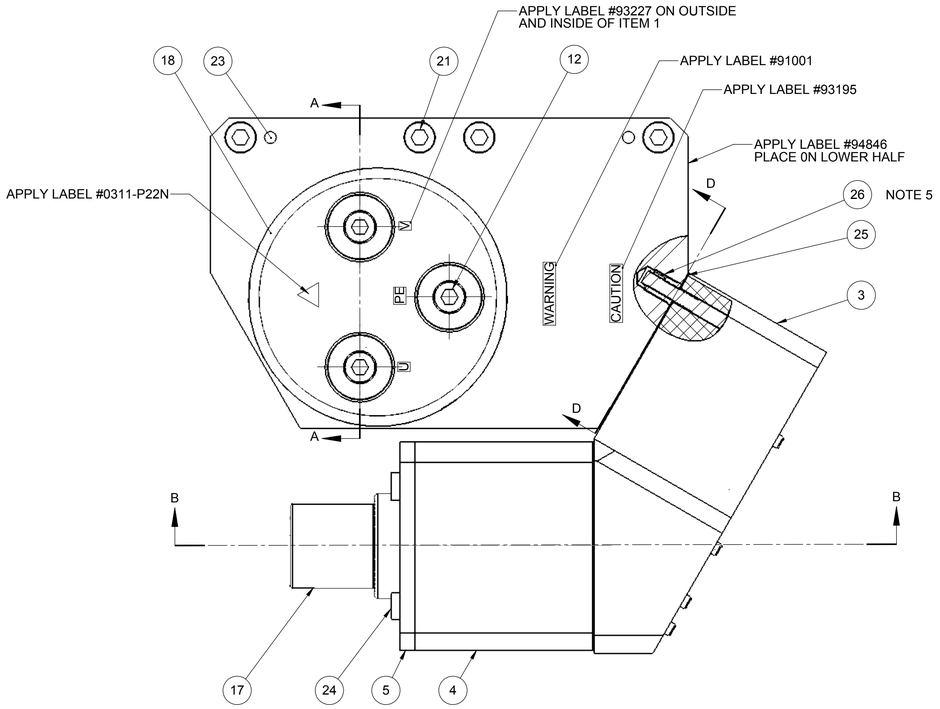
TITLE:
S-EM-R-E-HIKVAEPG3-35MM-00
XChange EXTERNAL
ELECTRICAL MODULE

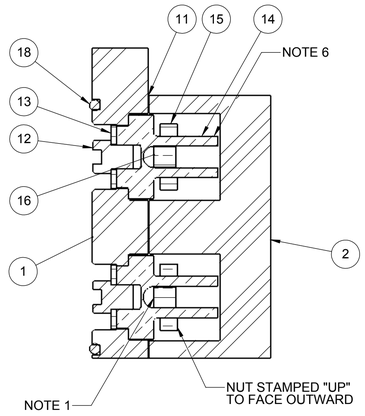
SIZE	DRAWING NUMBER	REV
D	1501-D69A	01

WEIGHT: 1.52 kg | RoHs COMPLIANT: - | SHT. 1 OF 1

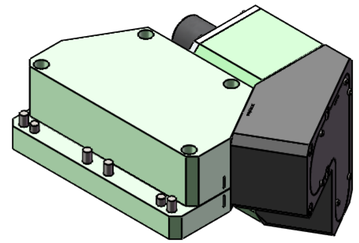
SIZE	DRAWING NUMBER	REV
D	1313-D38A	02

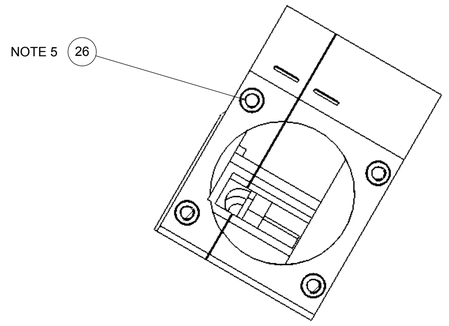
REVISIONS						
ZONE	REV	DESCRIPTION	DR	CHK	DATE	ECR/ESR NO.
	00	RELEASED FOR MANUFACTURING.	JV	SC	01/13/14	GPAI-9EMSZ9
	01	ROTATED 1313-P49N SO "U" IS TOP OF HIKVA	TM	PS	3/10/2014	GPAI-9GGPBH
	02	1800557M WAS 1202-D64N 1800558M WAS 1202-D65N ADDED 1800561P 49458 WAS 49379	TM	JV	9-6-18	GPAI-B3CH8U



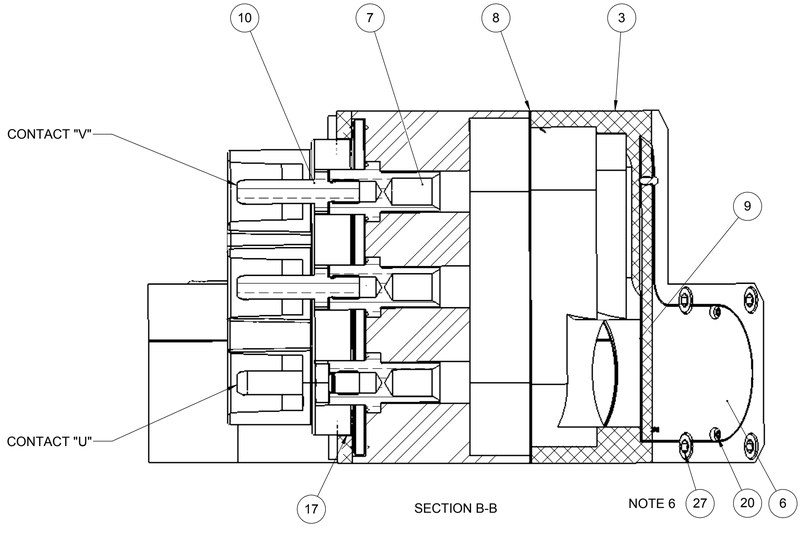


SECTION A-A

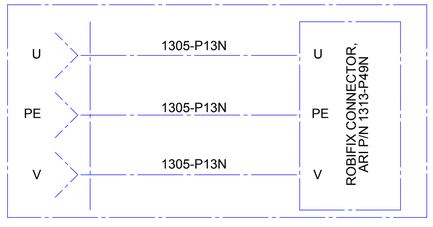




SECTION D-D



SECTION B-B



WIRING SCHEMATIC

NOTES:
1. APPLY CONDUCTIVE PASTE, ARI PART #86005-P1208.
2. USE APPROX 305 mm (12 in) WIRE LENGTH TO START, AND CUT EXCESS TO KEEP A TIGHT RADIUS. STRIP WIRES 22mm FOR APPLIED ROBOTICS HIKVA CONTACTS.
3. REGARDING THE ROBIFIX CONNECTOR PLEASE REFER TO ASSEMBLY INSTRUCTIONS MA301 (FOR SATETY REASONS)
4. BAG & TAG WITH ARI PART NO. & REV NO., AND PURCHASE ORDER NO. (IF APPLICABLE)
5. INSTALL INSERTS FLUSH TO SURFACE IN 1800557M AND 1800558M.
6. APPLY LOCTITE 222 ARI #86005-P1020 TO M5 AND SMALLER SCREWS.

ITEM NO.	QTY	PART NO.	DESCRIPTION
27	4	49458	SCR, SOC HD CAP M5 X 60 (SS)
26	4	1800561P	INSERT, SELF TAPPING M8 OD X M5 ID (SS)
25	1	1307-B86N	GASKET, STRAIN RELIEF,HIKVA
24	4	49971	SCR, SOC HD CAP M5 X 70 (SS)
23	2	41580	DOWEL, M6 X 12 (HARD STL) m6
22	4	49185	SCR, SOC HD CAP M6 X 30 SS
21	4	48038	SCR, SOC HD CAP M6 X 20 (SS)
20	6	49448	SCR, PAN PT TORX HD M2.5 X 8 STL
19	2	48358	DOWEL, M5 X 10 (HARD SS) m6
18	1	0007-P51N	O-RING, 3.109 ID X .139 70 BUNA (P)
17	1	1313-P49N	CONNECTOR. ROBIFIX TAE1-57
16	3	96502-B1093	LUG, CONTACT
15	3	96502-B1089	NUT, LOCK BUG TERMINAL
14	3	96502-B1091	CONTACT,O3 HI-KVA ROBOT
13	3	98502-B1025	CONTACT, TIP ROBOT HIKVA
12	3	99506-B1030	SCREW, INSULATOR ROBOT HIKVA
11	1	1307-C87N	GASKET, COVER, HIKVA
10	3	1313-P77N	CONTACT, PIN HIKVA (S8/M8-41 AG)
9	1	1313-C47N	GASKET, COVER
8	1	1313-C44N	GASKET, SPACER
7	3	1313-C43N	CONTACT, (S-EM-R-E-HIKVAE-ROBIFIX-TAE1)
6	1	1313-C42N	COVER, (S-EM-R-E-HIKVAE-ROBIFIX-TAE1)
5	1	1313-C41N	RETAINER, (S-EM-R-E-HIKVAE-ROBIFIX-TAE1)
4	1	1313-C40N	SPACER, (S-EM-R-E-HIKVAE-ROBIFIX-TAE1)
3	1	1313-D39N	ADAPTER, (S-EM-R-E-HIKVAE-ROBIFIX-TAE1)
2	1	1800558M	COVER, ROBOT HIKVA ROBIFIX
1	1	1800557M	BASE, ROBOT HIKVA ROBIFIX

THIRD ANGLE PROJECTION

METRIC

UNLESS OTHERWISE SPECIFIED:

UNTOLERANCED DIMS ARE BASIC

.25 A B C

⌖ ∅ .25Ⓜ A B C

ALL HOLE DIAMETERS +/- 0.25

INTERNAL RADII & BROKEN EDGES TO BE .13-.38
ALL SURFACE FINISHES 1.6Ra

MAT'L: Material <not specified>

SURFACE TREATMENT: -

DIM. AND TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M-1994

DR:	J. VALLELUNGA
CHK:	S. CASEY
ENG:	T. MARCELLA
MFG:	J. SERFILIPPI
QC:	P. BRAND

3D MODEL NUMBER: 1313-D38A

SCALE: 1:1
DO NOT SCALE DRAWING

ISO 9001 REGISTERED

PRINT DATE 11/12/2018

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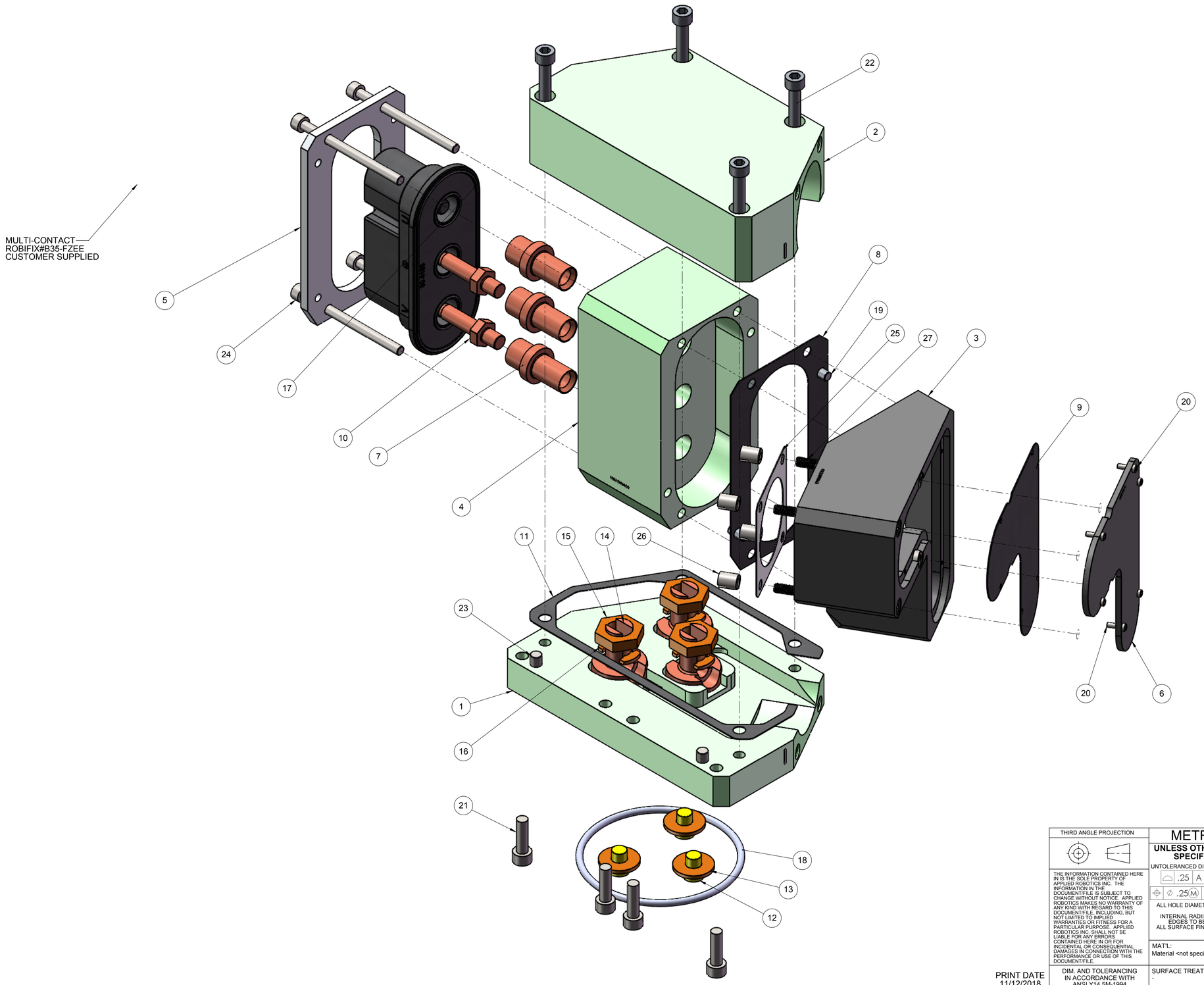
www.appliedrobotics.com

TITLE: S-EM-R-E-HIKVAE-ROBIFIX-TAE1

SIZE	DRAWING NUMBER	REV
D	1313-D38A	02

WEIGHT: 2.70 kg | RoHs COMPLIANT: - | SHT. 1 OF 2

SIZE	DRAWING NUMBER	REV
D	1313-D38A	02



THIRD ANGLE PROJECTION	METRIC	DR: J. VALLELUNGA
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PRINT DATE 11/12/2018	MAT'L: Material <not specified>	SCALE: 1:1 DO NOT SCALE DRAWING
DIM. AND TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M-1994	SURFACE TREATMENT: -	ISO 9001 REGISTERED

Applied Robotics™ Solutions in reach
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www.appliedrobotics.com

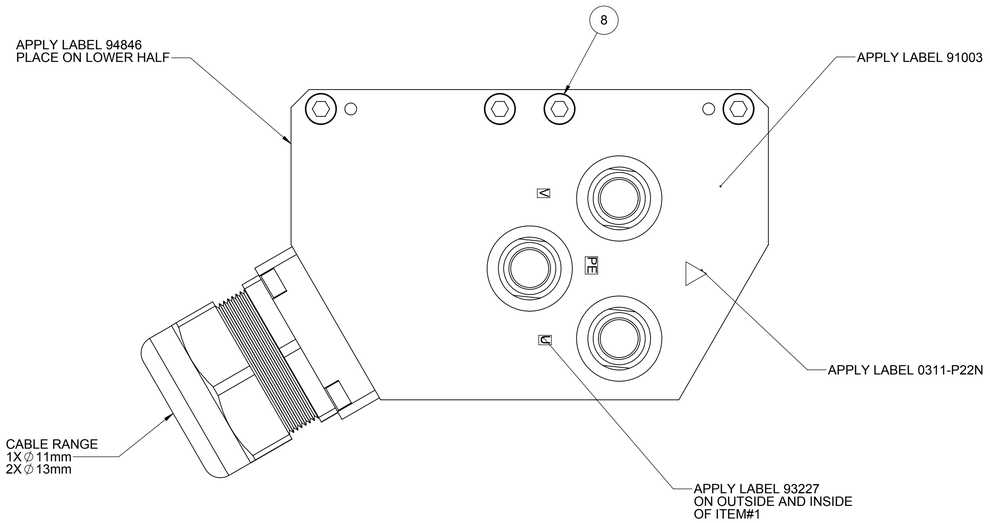
TITLE: S-EM-R-E-HIKVAE-ROBIFIX-TAE1

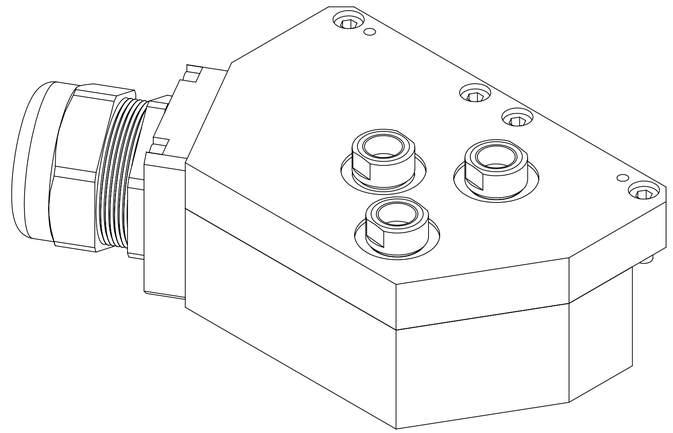
SIZE	DRAWING NUMBER	REV
D	1313-D38A	02

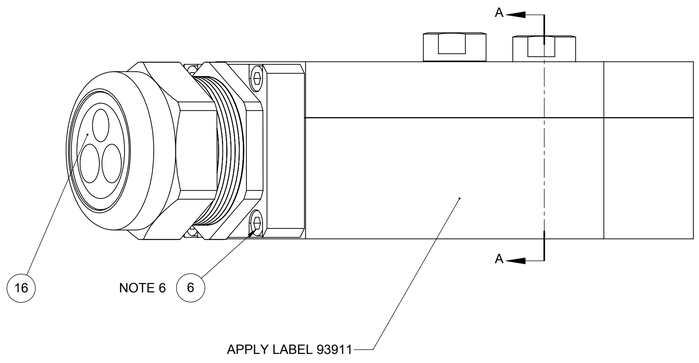
WEIGHT: 2.70 kg	RoHs COMPLIANT: -	SHT. 2 OF 2

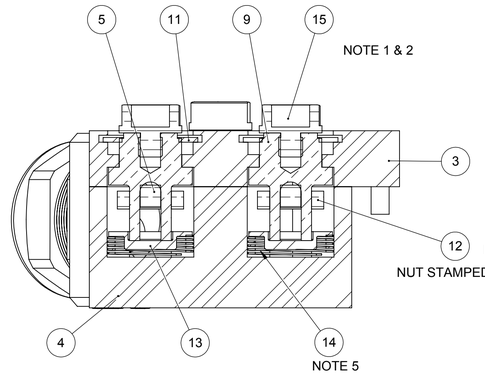
SIZE	DRAWING NUMBER	REV
D	1205-D75A	01

REVISIONS						
ZONE	REV	DESCRIPTION	DR	CHK	DATE	ECR/ESR NO.
	00	RELEASE FOR MANUFACTURING	CR	TM	7-9-12	MMOA-8VHDWY
	01	ITEM #2 1402-B61N WAS 1202-B68N	PS	JV	05/17/2018	GPAI-ASMTAR

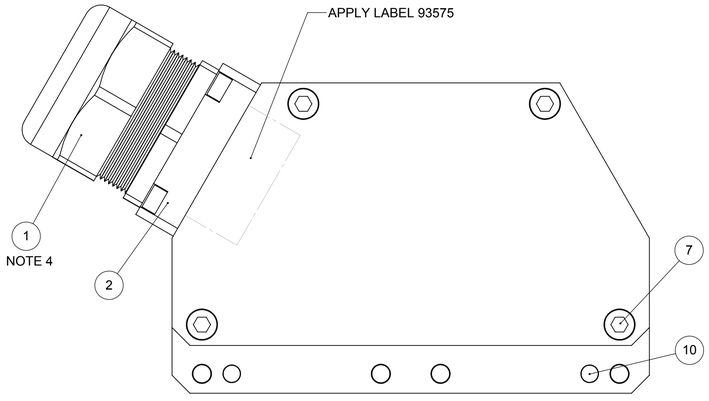








SECTION A-A



NOTES:
1. APPLY CONDUCTIVE PAST ARI PART #86005-P1208
2. TORQUE ITEM #11 ARI PART #98502-B1027 TO 70 IN/LBS
3. INCLUDE ARI DRAWING #0206-D71A IN BAG
4. END USER TO TORQUE TO 44 lbf-in (5Nm)
5. REPLACE CONTACT SPRINGS EVERY 250,000 CYCLES
6. TORQUE TO 10 IN/LBS

PRINT DATE
3/14/2019

ITEM NO.	QTY	PART NO.	DESCRIPTION
16	1	1205-P77N	STRAIN RELIEF, HUMMEL, INSERT 3COND
15	3	98502-B1027	CONTACT, TIP TLNG O3 EURO-HI-KVA
14	3	96506-P1031	SPRING, WAVE SMALLEY
13	3	96505-B1002	RETAINER, SPRING
12	3	96502-B1089	NUT, LOCK BUG TERMINAL
11	3	96502-B1092	SEAL, CONTACT
10	2	41580	DOWEL, M6 X 12 (HARD STL) m6
9	3	98502-C1024	CONTACT, BODY O3 EURO-HI-KVA
8	4	48038	SCR, SOC HD CAP M6 X 20 (SS)
7	4	49185	SCR, SOC HD CAP M6 X 30 SS
6	4	48029	SCR, SOC HD CAP M5 X 20 (SS)
5	3	96502-B1093	LUG, CONTACT
4	1	1202-D67N	COVER, TOOL HIKVA SIGMA
3	1	1202-D66N	BASE, TOOL HIKVA SIGMA
2	1	1402-B61N	ADAPTER, PG36 SIGMA
1	1	1205-P76N	STRAIN RELIEF, HUMMEL

THIRD ANGLE PROJECTION

DIM. AND TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M-1994

ENGLISH

UNLESS OTHERWISE SPECIFIED:

UNTOLERANCED DIMS ARE BASIC

⌓ .25 A B C

⌖ ∅ .25Ⓜ A B C

ALL HOLE DIAMETERS +/- 0.25

INTERNAL RADII & BROKEN EDGES TO BE .13-.38
ALL SURFACE FINISHES 1.6Ra

MAT'L:
Material <not specified>

SURFACE TREATMENT:
-

DR:	C. RITTERSHAUSEN
CHK:	T.MARCELLA
ENG:	C. RITTERSHAUSEN
MFG:	J.SERFILPPI
QC:	J.SERFILPPI

3D MODEL NUMBER:
1205-D75A

SCALE: 1:1
DO NOT SCALE DRAWING

ISO 9001
REGISTERED

Applied Robotics™
Solutions in reach
648 Saratoga Rd. Glenville, NY 12302
www.appliedrobotics.com

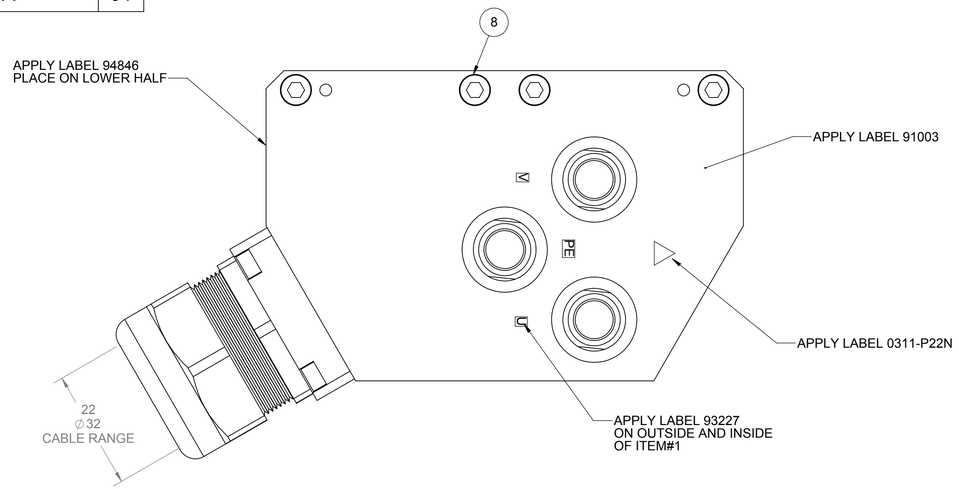
TITLE:
S-EM-T-E-HIKVAE-HU-PG36
3COND
-
-

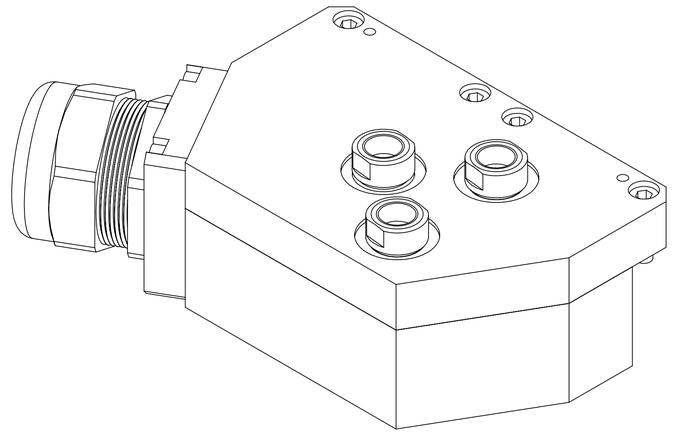
SIZE	DRAWING NUMBER	REV
D	1205-D75A	01

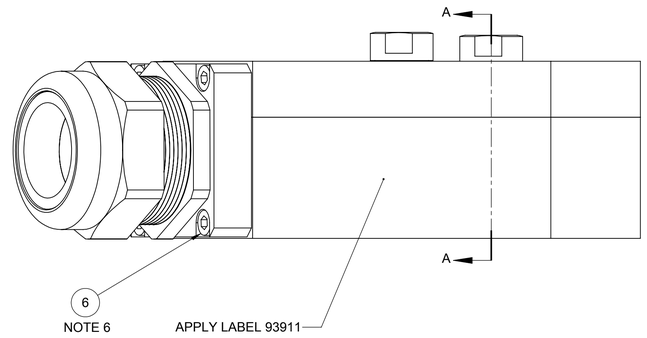
WEIGHT: 1.66 kg | RoHs COMPLIANT: - | SHT. 1 OF 1

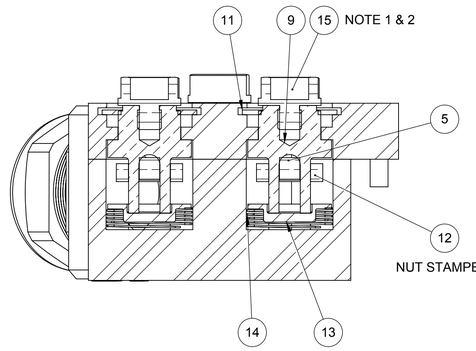
SIZE	DRAWING NUMBER	REV
D	1205-D73A	01

REVISIONS						
ZONE	REV	DESCRIPTION	DR	CHK	DATE	ECR/ESR NO.
	00	RELEASE FOR MANUFACTURING	CR	TM	7-9-12	MMOA-8VHDWY
	01	ITEM #2 1402-B61N WAS 1202-B68N	PS	JV	05/17/2018	GPAI-ASMTAR

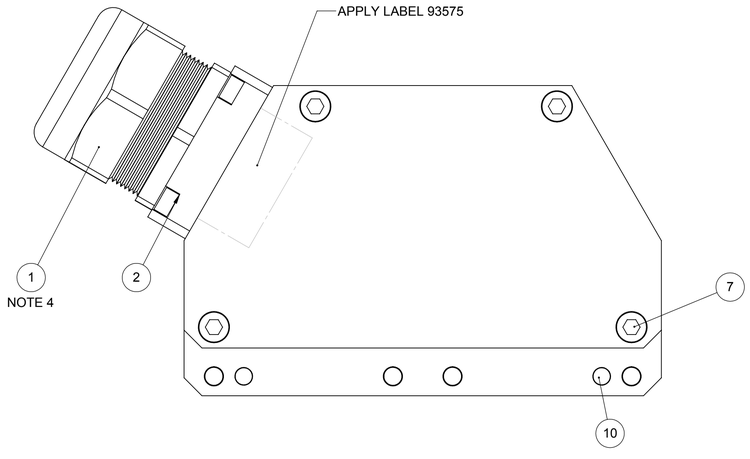








SECTION A-A



NOTES:
1. APPLY CONDUCTIVE PAST ARI PART #86005-P1208
2. TORQUE ITEM #11 ARI PART #98502-B1027 TO 70 IN/LBS
3. INCLUDE ARI DRAWING #0206-D71A IN BAG
4. END USER TO TORQUE TO 44 lbf-in (5Nm)
5. REPLACE CONTACT SPRINGS EVERY 250,000 CYCLES
6. TORQUE TO 10 IN/LBS

PRINT DATE
3/14/2019

ITEM NO.	QTY	PART NO.	DESCRIPTION
15	3	98502-B1027	CONTACT, TIP TLNG O3 EURO-HI-KVA
14	3	96506-P1031	SPRING, WAVE SMALLEY
13	3	96505-B1002	RETAINER, SPRING
12	3	96502-B1089	NUT, LOCK BUG TERMINAL
11	3	96502-B1092	SEAL, CONTACT
10	2	41580	DOWEL, M6 X 12 (HARD STL) m6
9	3	98502-C1024	CONTACT, BODY O3 EURO-HI-KVA
8	4	48038	SCR, SOC HD CAP M6 X 20 (SS)
7	4	49185	SCR, SOC HD CAP M6 X 30 SS
6	4	48029	SCR, SOC HD CAP M5 X 20 (SS)
5	3	96502-B1093	LUG, CONTACT
4	1	1202-D67N	COVER, TOOL HIKVA SIGMA
3	1	1202-D66N	BASE, TOOL HIKVA SIGMA
2	1	1402-B61N	ADAPTER, PG36 SIGMA
1	1	1205-P76N	STRAIN RELIEF, HUMMEL

THIRD ANGLE PROJECTION

DIM. AND TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M-1994

ENGLISH

UNLESS OTHERWISE SPECIFIED:
UNTOLERANCED DIMS ARE BASIC
.25 A B C
∅ .25Ⓜ A B C
ALL HOLE DIAMETERS +/- 0.25
INTERNAL RADII & BROKEN EDGES TO BE .13-.38
ALL SURFACE FINISHES 1.6Ra

MAT'L:
Material <not specified>

SURFACE TREATMENT:
-

DR:	C. RITTERSHAUSEN
CHK:	T.MARCELLA
ENG:	C. RITTERSHAUSEN
MFG:	J.SERFILPPI
QC:	J.SERFILPPI

3D MODEL NUMBER:
1205-D73A

SCALE: 1:1
DO NOT SCALE DRAWING

ISO 9001
REGISTERED

Applied Robotics™
Solutions in reach
648 Saratoga Rd. Glenville, NY 12302
www.appliedrobotics.com

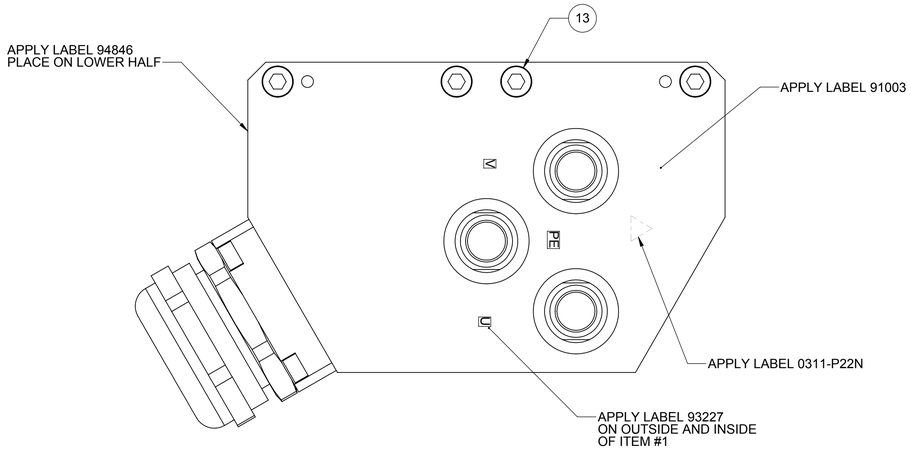
TITLE:
S-EM-T-E-HIKVAE-HU-PG36
-
-

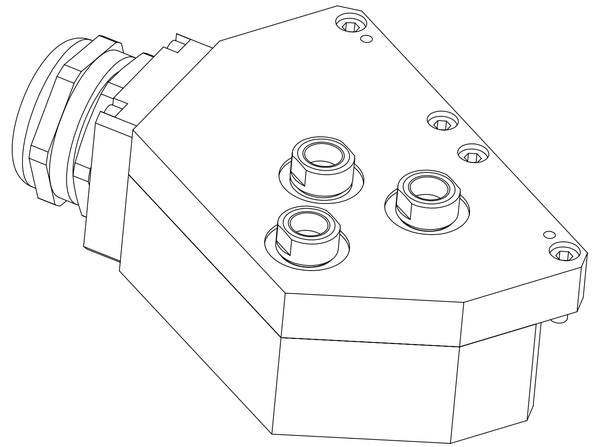
SIZE	DRAWING NUMBER	REV
D	1205-D73A	01

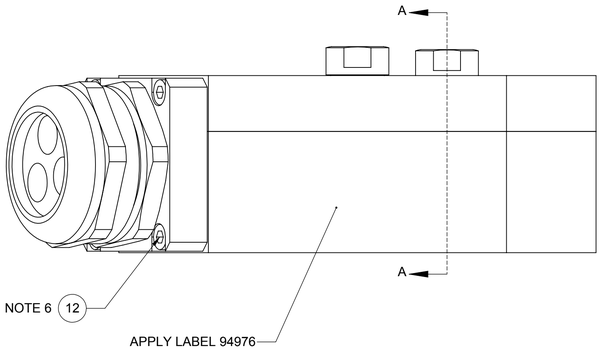
WEIGHT: 1.64 kg | RoHs COMPLIANT: - | SHT. 1 OF 1

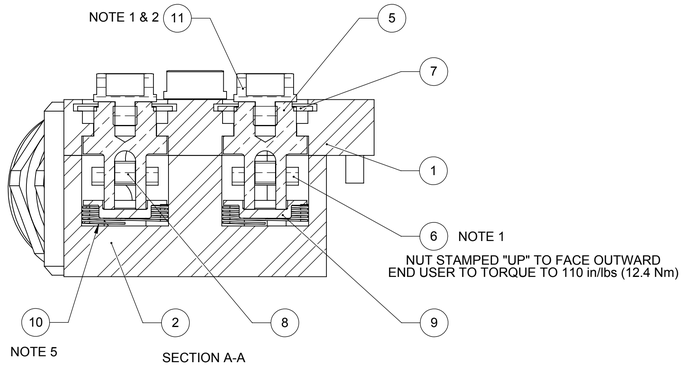
SIZE	DRAWING NUMBER	REV
D	1501-D70A	01

REVISIONS						
ZONE	REV	DESCRIPTION	DR	CHK	DATE	ECR/ESR NO.
	00	RELEASE TO MANUFACTURE	TM	JV	3-20-15	WZEH-9URHUQ
	01	ITEM #3 1402-B61N WAS 1202-B68N	PS	JV	05/17/2018	GPAI-ASMTAR

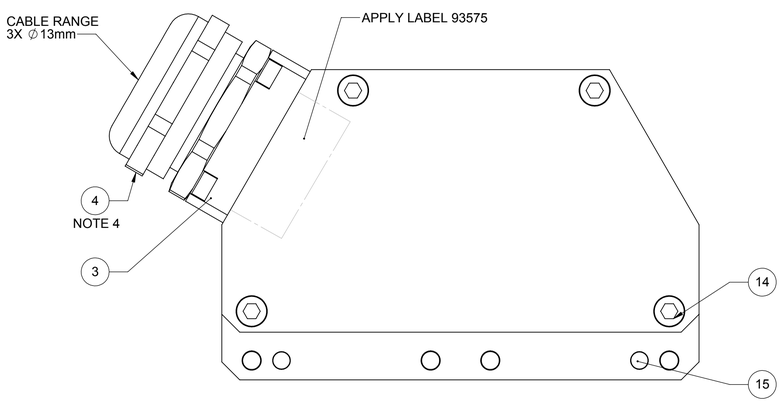








SECTION A-A



NOTES
1. APPLY CONDUCTIVE PASTE ARI PART # 86005-P1208
2. TORQUE ITEM #11 ARI PART #98502-B1027 TO 70 IN/LBS
3. INCLUDE ARI DRAWING #0206-D71A IN BAG
4. END USER TO TORQUE TO 44lbf-in (5Nm)
5. REPLACE CONTACT SPRINGS EVERY 250,000 CYCLES
6. TORQUE TO 10 IN/LBS

PRINT DATE
5/18/2018

ITEM NO.	QTY	PART NO.	DESCRIPTION
15	2	41580	DOWEL, M6 X 12 (HARD STL) m6
14	4	49185	SCR, SOC HD CAP M6 X 30 SS
13	4	48038	SCR, SOC HD CAP M6 X 20 (SS)
12	4	48029	SCR, SOC HD CAP M5 X 20 (SS)
11	3	98502-B1027	CONTACT, TIP TLNG O3 EURO-HI-KVA
10	3	96506-p1031	SPRING, WAVE SMALLEY
9	3	96505-b1002	RETAINER, SPRING
8	3	96502-B1093	LUG, CONTACT
7	3	96502-b1092	SEAL, CONTACT
6	3	96502-B1089	NUT, LOCK BUG TERMINAL
5	3	98502-c1024	CONTACT, BODY O3 EURO-HI-KVA
4	1	1501-C71N	STRAIN RELIEF PG36-3 COND.
3	1	1402-B61N	ADAPTER, PG36 SIGMA
2	1	1202-D67N	COVER, TOOL HIKVA SIGMA
1	1	1202-D66N	BASE, TOOL HIKVA SIGMA

THIRD ANGLE PROJECTION

DIM. AND TOLERANCING IN ACCORDANCE WITH ANSI Y14.5M-1994

METRIC

UNLESS OTHERWISE SPECIFIED:
UNTOLERANCED DIMS ARE BASIC
⌓ .25 A B C
⌖ ∅ .25Ⓜ A B C
ALL HOLE DIAMETERS +/- 0.25
INTERNAL RADII & BROKEN EDGES TO BE .13-.38
ALL SURFACE FINISHES 1.6Ra

MAT'L:
-

SURFACE TREATMENT:
-

DR:	T. MARCELLA
CHK:	J. VALLELUNGA
ENG:	T. MARCELLA
MFG:	C. BEST
QC:	M. DUDNATH

3D MODEL NUMBER:
1501-D70A

SCALE: 1:1
DO NOT SCALE DRAWING

ISO 9001
REGISTERED

Applied Robotics™
Solutions in reach
648 Saratoga Rd. Glenville, NY 12302
www.appliedrobotics.com

TITLE:
S-EM-T-E-HIKVAEPG3-35MM-00
XChange EXTERNAL
ELECTRICAL MODULE

SIZE	DRAWING NUMBER	REV
D	1501-D70A	01

WEIGHT: 1.64 kg | RoHs COMPLIANT: - | SHT. 1 OF 1