

E80/100 & E125LP COOLANT MODULE

95654, Rev 00

December 3, 2019

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REVISION

Revision	Date	Author	Description
00	12/03/2019	DS	Initial Release

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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 DESCRIPTIONS

The E80/100 & E125LP Coolant Module provides a reliable pass through of user supplied fluid connections. It consists of a Robot Side module and a Tool Side module. Both the Robot Side and Tool Side contain extended valved/checked fittings that are self-closing and leak free, and seal when the Tool Changer is disconnected, eliminating the need for an additional shut-off valve and preventing water from leaking.

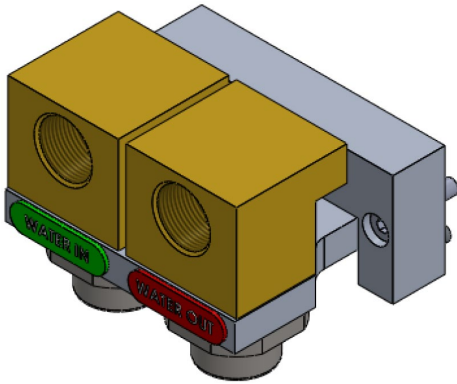


Figure 2-1.
Robot Side Coolant Module

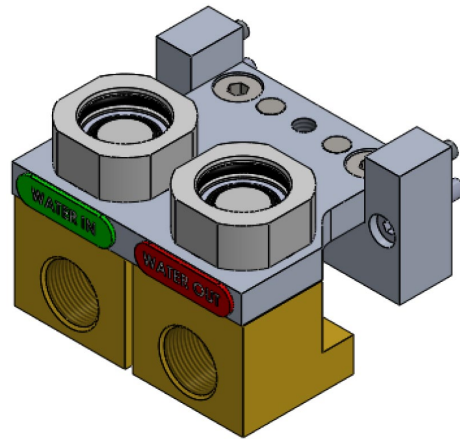
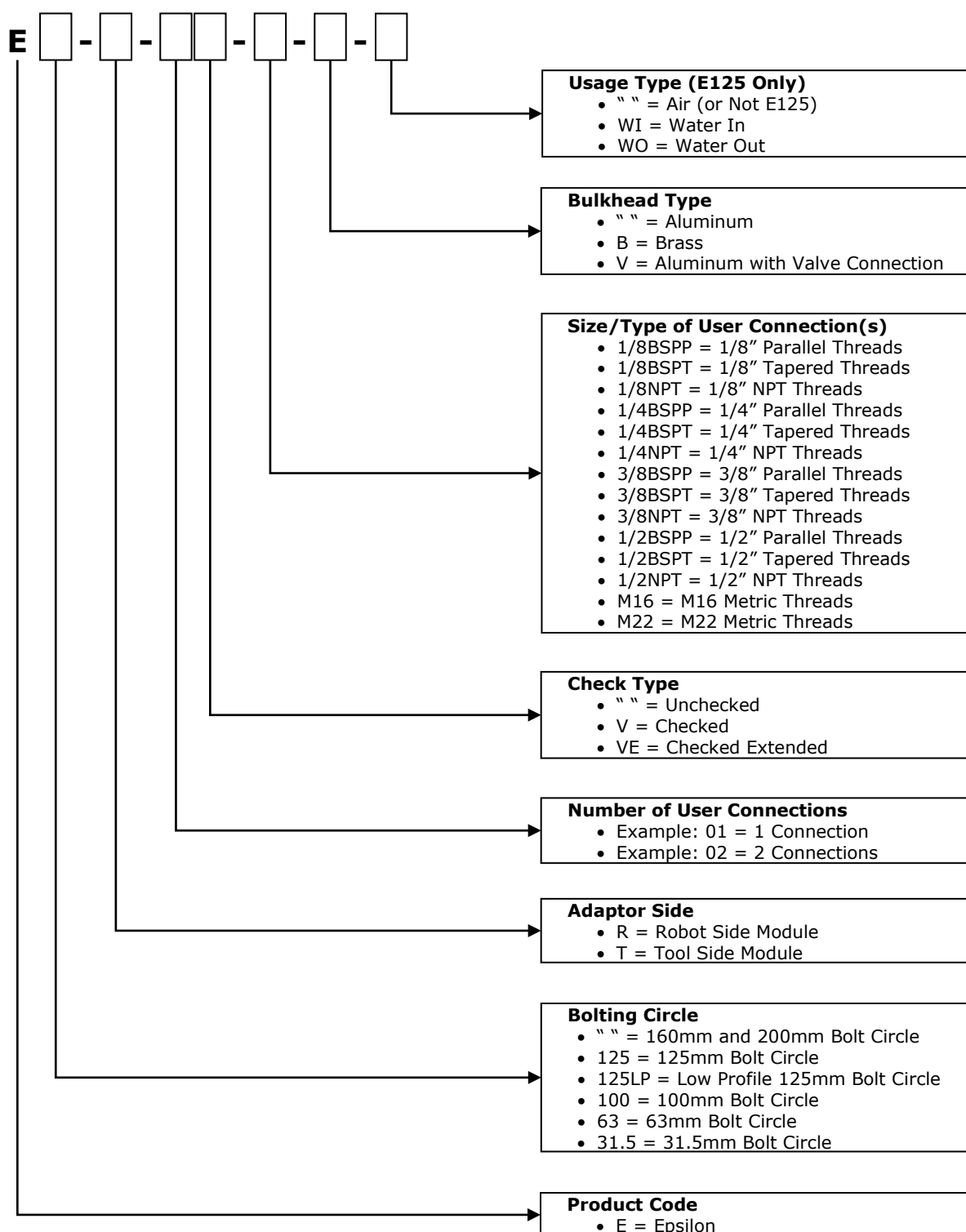


Figure 2-2.
Tool Side Coolant Module

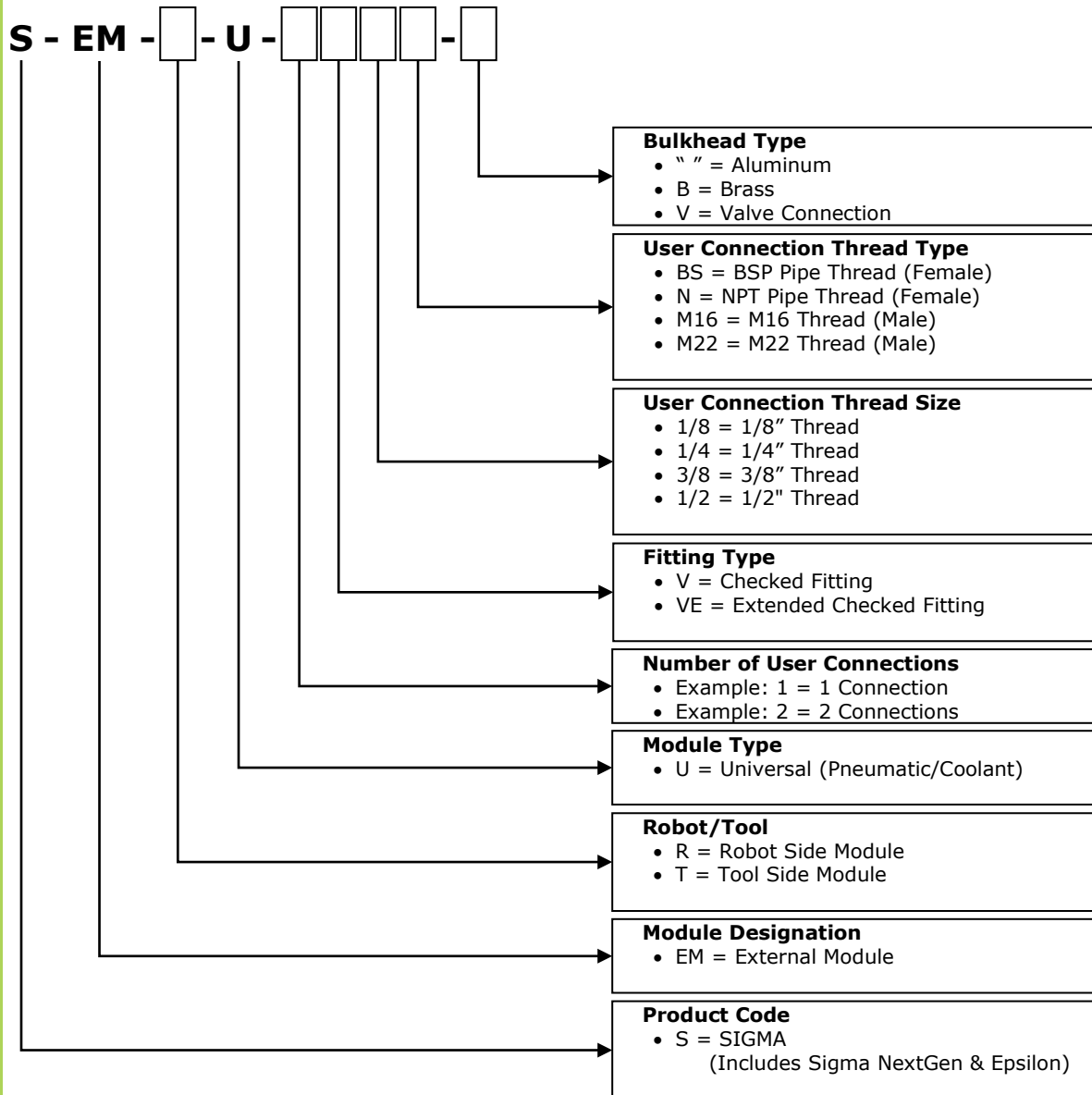
2.1 PNEUMATIC/COOLANT MODULE 1



Custom/Special: E- - - - - S# # # #

Note: If " " (blank) is chosen, remove "-"
(dash) if that is the only
input between dashes.

2.2 PNEUMATIC/COOLANT MODULE 2



3 TECHNICAL SPECIFICATIONS

Table 3-1. Coolant Module Technical Specifications

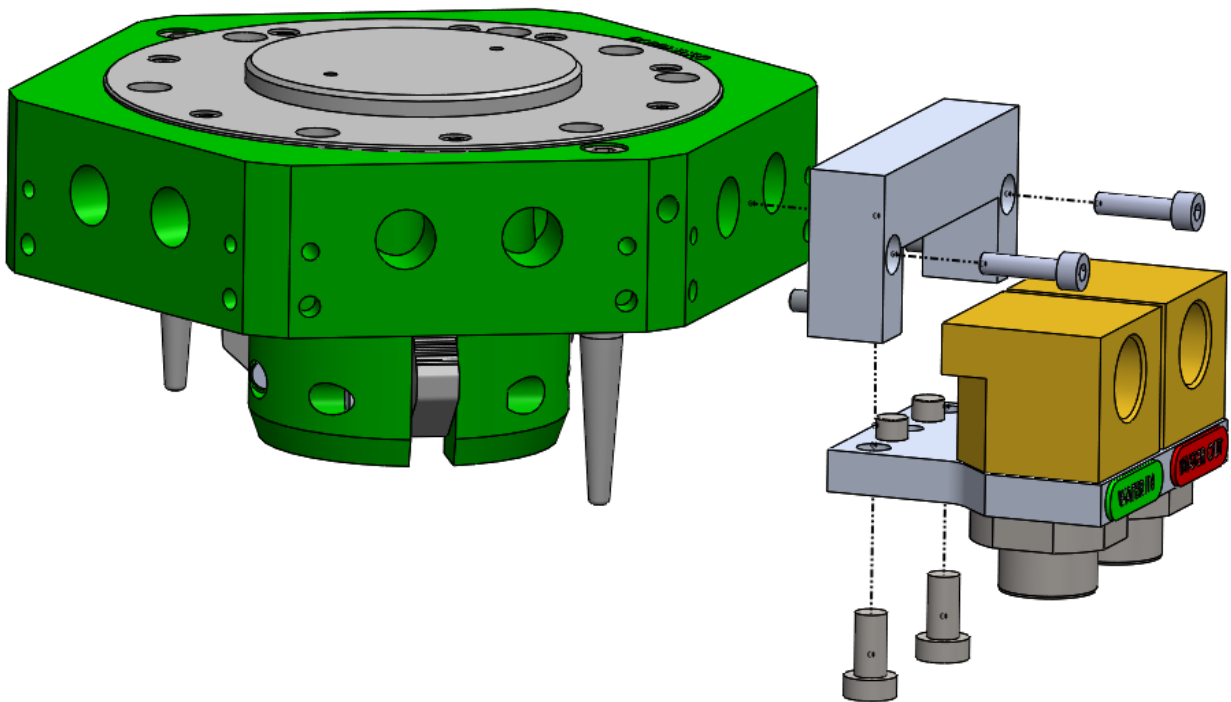
Specification		Metric	English
Height (Robot and Tool Coupled)		89.9 mm	3.54 in
Mass / Weight *	Robot	0.55 kg	1.21 lb
	Tool	0.55 kg	1.21 lb
Operating Temperature		5 °C to 60 °C	40 °F to 140 °F
User Pressure Range		0 to 7 bar	0 to 101 psi
Flow (CFM)		**Contact Applications Engineering**	

* 2 User Connections, which is standard.

4 INSTALLATION

The E80/100 & E125LP Coolant Module is designed to mount directly to APPLIED ROBOTICS' Epsilon E80, E100, and E125LP Tool Change Systems on any mounting position. That includes: Positions 2, 3, 4, 5, or 6. See applicable Tool Changer manual.

To install the E80/100 & E125LP Coolant Module, locate the Adaptor Plate of the module using the two (2) installed M4 dowels and fasten the Adaptor Plate to the mounting position using the M4 socket head cap screws, supplied with the module. Mount the Carrier Plate assembly to the adaptor plate using the two (2) installed M6 dowels and fasten the Carrier Plate assembly to the Adaptor Plate using the M6 socket head cap screws, supplied with the module (See Figure 4-1).



**Figure 4-1. E80/100 & E125LP Coolant Module Installation
(E80/100 & E125LP Robot Side Coolant Module Shown)**

5 GUIDE TO OPERATION

The two halves of the E80/100 & E125LP Coolant Module mate when the Robot Side of the Tool Changer goes to dock a tool. The two halves work together via spring return self-closing ports. The ports open when the Tool Changer docks and self-close when the Tool Changer undocks.

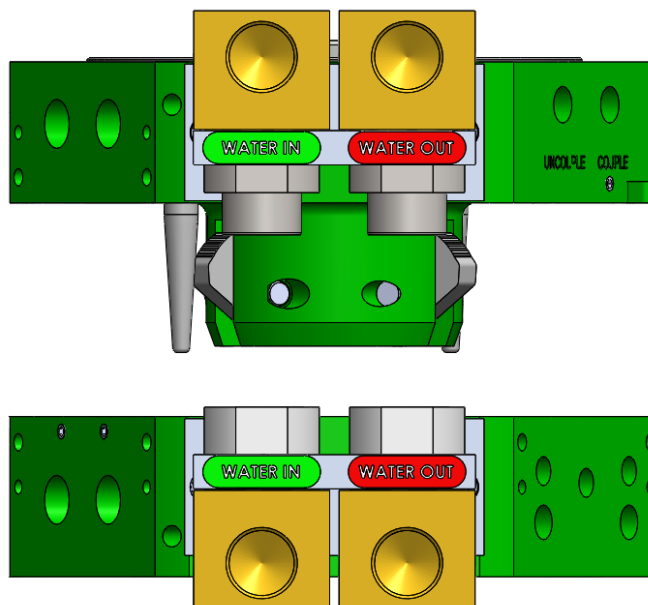


Figure 5-1. Tool Changer Undocked

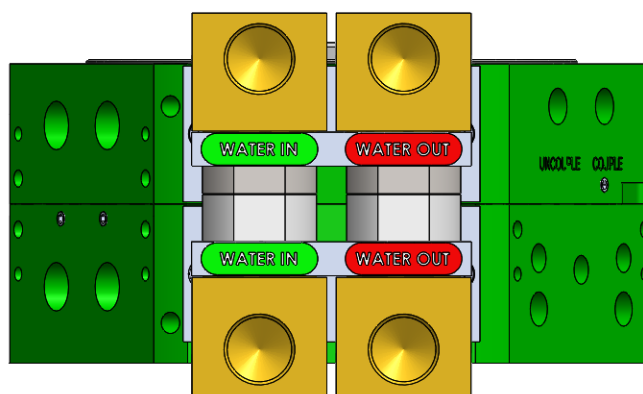


Figure 5-2. Tool Changer Docked

5.1 MODULE CONNECTORS

The shape of module connectors can affect the pressure drop of the system and should be considered. For example, a 90-degree connector will increase the pressure drop of the system compared to a straight connector due to the total loss coefficient. Therefore, if using a 90-degree connector, select one with a low loss coefficient to minimize the overall pressure drop.

6 TROUBLESHOOTING

6.1 TROUBLESHOOTING GUIDE

Fitting		
Symptom	Possible Cause	Resolution
Fluid leaking from Fittings	Fitting dry	Lubrication (See Section 7.1.1)
	O-Rings worn or sheared	Fitting Replacement (See Section 9.1)

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 E80/100 & E125LP Coolant Module.

Table 7-1. Preventive Maintenance Schedule

Frequency of Maintenance	Preventative Maintenance
Every 2 Weeks	Visual Checks
250,000 Cycles	Visual Checks & Lubrication (Section 7.1.1)
500,000 Cycles	
750,000 Cycles	
1,000,000 Cycles	
1,250,000 Cycles	Lubrication (Section 7.1.1) & Visual Checks & Replace if worn or damaged parts (Section 9.1)
1,500,000 Cycles	
1,750,000 Cycles	
2,000,000 Cycles ¹	

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

7.1 PREVENTIVE MAINTENANCE

7.1.1 Lubrication

Proper lubrication of O-rings and sealing surfaces is essential to maintaining the performance and prolonging the operational life of the E80/100 & E125LP Coolant Module. A generous amount of lube placed on the female fitting will lubricate both fittings after the first engagement (See Figure 7.1.1-1 Lube Female Fitting).

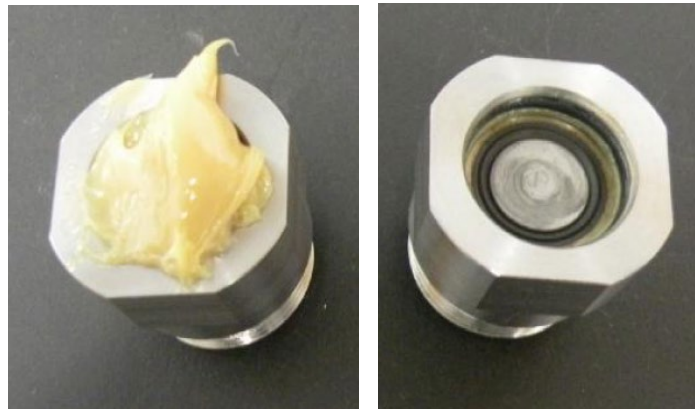


Figure 7.1.1-1 Lube Female Fitting

7.1.2 Lubricant Specifications

Lubricant	ARI Part #	Manufacturer	Manufacturer's Part #
Staburags NBU 30 Grease or White EP Bearing Grease	0903-P11N or 96503-P1018	Kluber or Dow Corning	NBU 30 or White EP Bearing Grease

8 SPARE PARTS

The spare parts listed below are recommended to be maintained in stock for the life of the E80/100 & E125LP Coolant 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.

COOLANT MODULE (PER MODULE)			
Side	Description	Part Number	Model Number
Robot	LOW PROFILE EXTENDED FITTING, MALE	0509-C39A	LPF-08M-SS-EXTENDED
Tool	LOW PROFILE EXTENDED FITTING, FEMALE	0509-C38A	LPF-08F-SS-EXTENDED

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.

9.1 FITTING REPLACEMENT

1. Remove Carrier Plate assembly from Adaptor Plate by removing the M6 socket head cap screws using a 5mm Allen wrench.
2. Remove hoses and fittings connected to Bulkhead Adaptors.
3. Unthread and remove fittings from Bulkhead Adaptors.
4. Install new fittings by threading them into the Bulkhead Adaptors through the Carrier Plate. Tighten fitting until snug. Ensure O-ring on fitting seals to Bulkhead Adaptors.
5. Apply Loctite 242, or equivalent, to the threads of the socket head cap screws before installing.
6. Mount Carrier Plate to Adaptor Plate by threading the M6 socket head cap screws through the Carrier Plate into the Adaptor Plate.

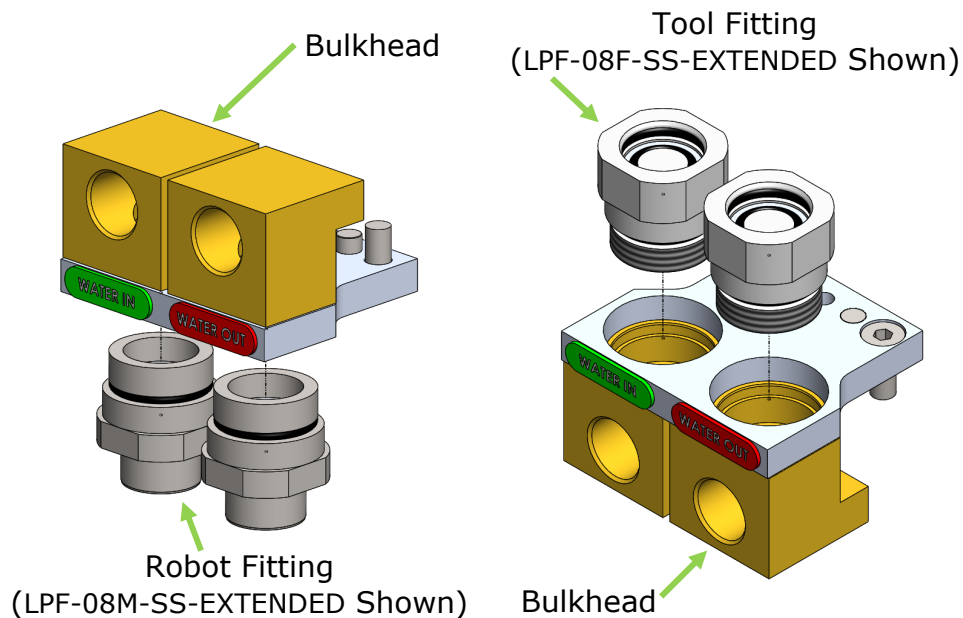


Figure 9.1-1. Robot Side Fitting Replacement

Figure 9.1-2. Tool Side Fitting Replacement

NOTICE

**M6 SOCKET HEAD CAP 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 E80/100 & E125LP Coolant Module. Please contact **APPLIED ROBOTICS Technical Support** if you have any questions.

DECLARATIONS	
Declaration of Incorporation for Partly Completed Machinery	

DRAWINGS		
MODULE	DRAWING NUMBER	DESCRIPTION
Robot Side	1900756A	E100-R-02VE-3/8BSPP-B
Tool Side	1900757A	E100-T-02VE-3/8BSPP-B

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

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

8 7 6 5 4 3 2 1

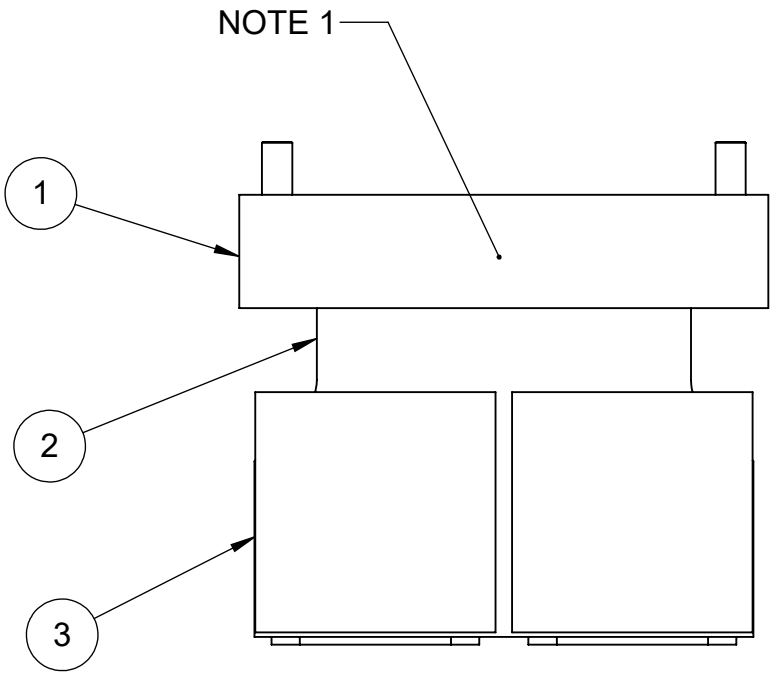
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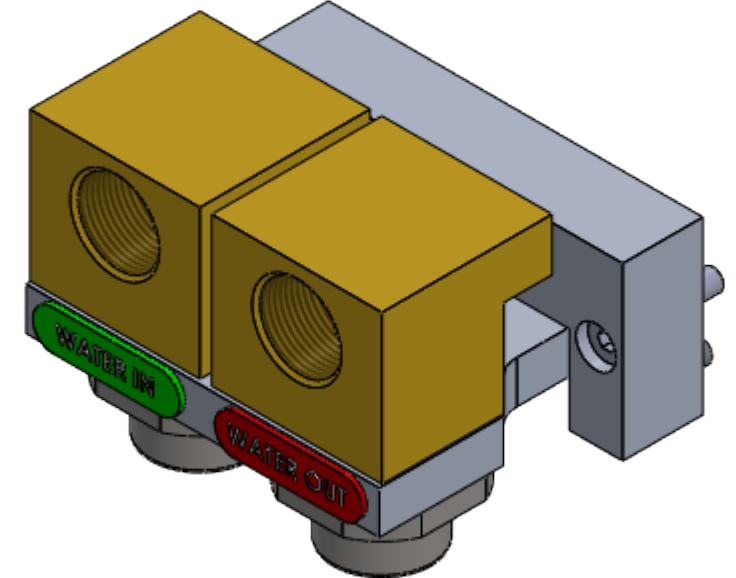
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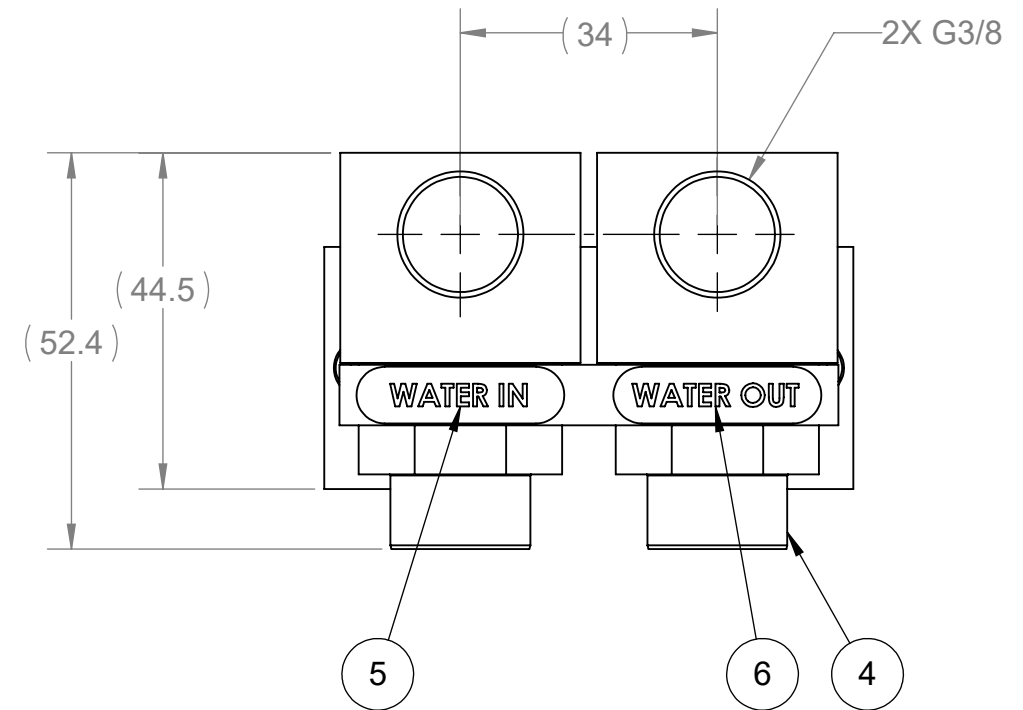
REV
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REVISIONS						
ZONE	REV	DESCRIPTION	DR	CHK	DATE	ECR/ESR NO.
	00	RELEASE FOR MANUFACTURE	JV	TM	11/13/19	DSCZ-BG5QAJ

NOTE 1







2X G3/8

NOTES

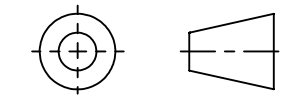
- APPLY LABEL ARI #90107L.
- ALL MOUNTING HARDWARE TO BE SHIPPED IN A 4X4 BAG LABELED "MOUNTING HARDWARE".
- ALL ITEMS TO RECEIVE LOCTITE ARE TO BE THOROUGHLY CLEANED FROM GREASE AND OIL.
- ALL DOWELS ARE INSERTED TO 50% OF OVERALL LENGTH (+/- .5mm) UNLESS OTHERWISE NOTED.
- APPLY LOCTITE 222 ARI #86005-P1020 TO M5 AND SMALLER SCREWS.

10	2	48347	DOWEL, M4 X 10
9	2	41580	DOWEL, M6 X 12 (HARD STL) m6
8	2	48019	SCR, SOC HD CAP M4 X 16 (SS)
7	2	49491	SCR, SOC LOW HD CAP M6 X 12 (SS)
6	1	1800481P	LABEL, WATER OUT NAMEPLATE
5	1	1800480P	LABEL, WATER IN NAMEPLATE
4	2	0509-C39A	LPF-08M-SS-EXTENDED
3	2	1900932M	ADAPTER, BULKHEAD 3/8 BSP BRASS ROTATABLE
2	1	1900931M	PLATE MOUNT, BULKHEAD ERT100-U-EXT
1	1	1900930M	ADAPTER PLATE, BULKHEAD ER/T100

ITEM NO.	PART NO.	DESCRIPTION
10		DOWEL, M4 X 10
9		DOWEL, M6 X 12 (HARD STL) m6
8		SCR, SOC HD CAP M4 X 16 (SS)
7		SCR, SOC LOW HD CAP M6 X 12 (SS)
6		LABEL, WATER OUT NAMEPLATE
5		LABEL, WATER IN NAMEPLATE
4		LPF-08M-SS-EXTENDED
3		ADAPTER, BULKHEAD 3/8 BSP BRASS ROTATABLE
2		PLATE MOUNT, BULKHEAD ERT100-U-EXT
1		ADAPTER PLATE, BULKHEAD ER/T100

ITEM NO.	PART NO.	DESCRIPTION
10		DOWEL, M4 X 10
9		DOWEL, M6 X 12 (HARD STL) m6
8		SCR, SOC HD CAP M4 X 16 (SS)
7		SCR, SOC LOW HD CAP M6 X 12 (SS)
6		LABEL, WATER OUT NAMEPLATE
5		LABEL, WATER IN NAMEPLATE
4		LPF-08M-SS-EXTENDED
3		ADAPTER, BULKHEAD 3/8 BSP BRASS ROTATABLE
2		PLATE MOUNT, BULKHEAD ERT100-U-EXT
1		ADAPTER PLATE, BULKHEAD ER/T100

THIRD ANGLE PROJECTION



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DIM. AND TOLERANCING IN ACCORDANCE WITH ASMEY 14.5-2009

METRIC

UNLESS OTHERWISE SPECIFIED:

UNTOLERANCED DIMS ARE BASIC

	.25	A	B	C
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	Ø .25(M)	A	B	C
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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: J. VALLELUNGA

CHK: T. MARCELLA

ENG: J. VALLELUNGA

MFG: M. DUDNATH

QC: M. DUDNATH

3D MODEL NUMBER:
1900756A

SCALE: 1:1
DO NOT SCALE DRAWING

ISO 9001
REGISTERED

AppliedRobotics™

Solutions in reach

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www.appliedrobotics.com

TITLE:
E100-R-02VE-3/8BSPP-B

SIZE	DRAWING NUMBER	REV
C	1900756A	00

Weight: 0.554 kg RoHs COMPLIANT: SHT. 1 OF 1

SCREW TORQUE CHART ARI:
FOR ALUMINUM AND STEEL
UNLESS OTHERWISE NOTED

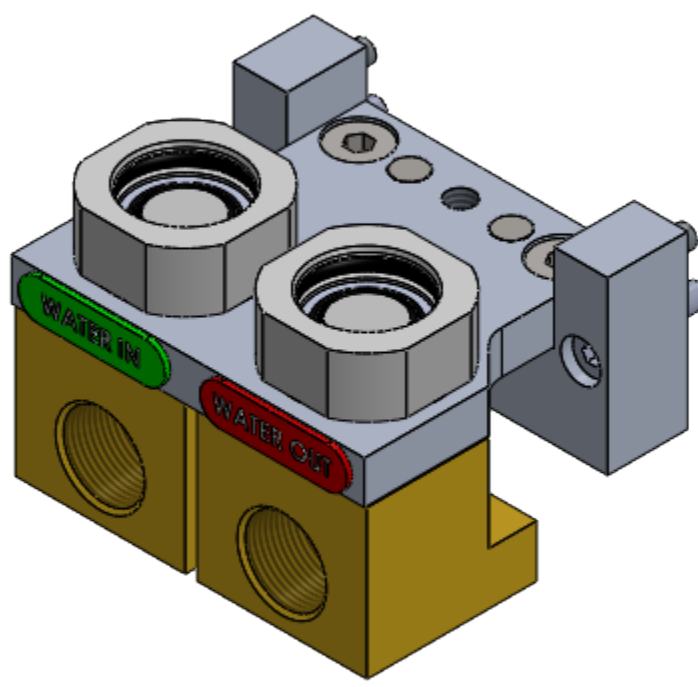
BOLT SIZE	TORQUE
M5	4.5 FT-LBS
M6	7.7 FT-LBS
M8	19.0 FT-LBS
M10	37.0 FT-LBS
M12	65.0 FT-LBS

PRINT DATE
11/14/2019

8 7 6 5 4 3 2 1

UNLESS OTHERWISE NOTED	
<u>BOLT SIZE</u>	<u>TORQUE</u>
M5	4.5 FT-LBS
M6	7.7 FT-LBS
M8	19.0 FT-LBS
M10	37.0 FT-LBS
M12	65.0 FT-LBS

SURFACE FINISHES 1.6Ra MATERIAL: Material <not specified> SURFACE TREATMENT:	SCALE: 1:1 DO NOT SCALE DRAWING ISO 9001 REGISTERED	SIZE C Weight: 0.554 kg	DRAWING NUMBER 1900757A RoHs COMPLIANT:	REV 00 SHT. 1 OF 1
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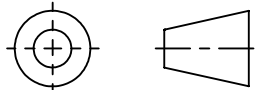
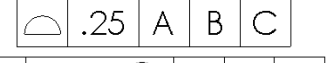
- ## NOTES
1. APPLY LABEL ARI #90107L.
 2. ALL MOUNTING HARDWARE TO BE SHIPPED IN A 4X4 BAG LABELED "MOUNTING HARDWARE".
 3. ALL ITEMS TO RECEIVE LOCTITE ARE TO BE THOROUGHLY CLEANED FROM GREASE AND OIL.
 4. ALL DOWELS ARE INSERTED TO 50% OF OVERALL LENGTH (+/- .5mm) UNLESS OTHERWISE NOTED.
 5. APPLY LOCTITE 222 ARI #86005-P1020 TO M5 AND SMALLER SCREWS.

METRIC UNLESS OTHERWISE SPECIFIED: UNTOLERANCE 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		DR: J. VALLELUNGA CHK: T. MARCELLA ENG: J. VALLELUNGA MFG: M. DUDNATH QC: M. DUDNATH 3D MODEL NUMBER: 1900757A		 648 Saratoga Rd. Glenville, NY 12302 www.appliedrobotics.com	
MAT'L: Material <not specified>		SCALE: 1:1 DO NOT SCALE DRAWING		TITLE: E100-T-02VE-3/8BSPP-B	
SURFACE TREATMENT:		ISO 9001 REGISTERED		SIZE C	DRAWING NUMBER 1900757A
				Weight: 0.554 kg	RoHs COMPLIANT: SHT. 1 OF 1

SCREW TORQUE CHART ARI:
FOR ALUMINUM AND STEEL
UNLESS OTHERWISE NOTED

<u>BOLT SIZE</u>	<u>TORQUE</u>
M5	4.5 FT-LBS
M6	7.7 FT-LBS
M8	19.0 FT-LBS
M10	37.0 FT-LBS
M12	65.0 FT-LBS

PRINT DATE
11/14/2019

THIRD ANGLE PROJECTION		METRIC UNLESS OTHERWISE SPECIFIED: UNTOLERANCED DIMS ARE BASIC		DR: J. VALLELUNGA CHK: T. MARCELLA ENG: J. VALLELUNGA MFG: M. DUDNATH QC: M. DUDNATH	 648 Saratoga Rd. Glenville, NY 12302 www.appliedrobotics.com		
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		DIM. AND TOLERANCING IN ACCORDANCE WITH ASMEY 14.5-2009		SURFACE TREATMENT:		ISO 9001 REGISTERED	
					SIZE C	DRAWING NUMBER 1900757A	REV 00
					Weight: 0.554 kg	RoHs COMPLIANT:	SHT. 1 OF 1