



# PARTS MANUAL FOR HALE SAM



BY

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FSG-MNL-00212 REVISION HISTORY		
CHANGE	DATE	AFFECTED PAGES
Revision C	09 AUG 2022	Added Revision History Table. Updated for new can network module system. Table 1 updated on starting on page 10. Updated SAM Drawing Package on pages 24-93.





## Abbreviations And Acronyms

The abbreviations used in this manual are limited to standard (commonly used and accepted) scientific units of measure and therefore are NOT defined or listed. The acronyms used in this manual are defined in this listing (in numerical-alphabetical order) and are NOT defined within the text.

CAFS	Compressed Air Foam System
CAN	Controller Area Network
ESP	Environmentally Safe Priming
ID	Identification
ITL	Indicator Tank Level (ITL-40 a Hale product)
MIV	Master Intake Valve (A Hale Product)
NFPA	National Fire Protection Association
OEM	Original Equipment Manufacturer
OIM	Operation Installation Maintenance
P/N	Part Number
WI-FI	Local Area Wireless Technology

## 1. SAFETY

This section provides definitions for DANGERS, WARNINGS, CAUTIONS and NOTES contained herein, precautions to be taken for pump repair as well as an alphabetical summary listing of the WARNINGS and CAUTIONS used in this manual.

### 1.1 Safety Headings

DANGERS, WARNINGS, CAUTIONS, or NOTICES that immediately precede a step apply directly to that step and all sub steps. DANGERS, WARNINGS, CAUTIONS, or NOTICES that precede an entire procedure apply to the entire procedure. DANGERS, WARNINGS, CAUTIONS, and NOTICES consist of two parts: A heading (that identifies possible result if disregarded) and a statement of the hazard (that provides the minimum precautions). NOTES are used to highlight operating or maintenance procedures, practices, conditions or statements that are not essential to protection of personnel or equipment. NOTES may precede or follow the step or procedure, depending upon the information and how it pertains to the procedure/step. The headings used and their definitions are.

**ATTENTION ▲ DANGER**

INDICATES A HAZARDOUS SITUATION, WHICH IF NOT AVOIDED WILL RESULT IN SERIOUS INJURY OR DEATH.

**ATTENTION ▲ WARNING**

INDICATES A HAZARDOUS SITUATION, WHICH IF NOT AVOIDED COULD RESULT IN SERIOUS INJURY OR DEATH.

**ATTENTION ▲ CAUTION**

INDICATES A POTENTIALLY HAZARDOUS SITUATION, WHICH IF NOT AVOIDED MAY RESULT IN MINOR OR MODERATE INJURY.

**IMPORTANT ▲ NOTICE**

ADDRESSES PRACTICES NOT RELATED TO PERSONAL INJURY.

#### NOTE

Highlights an essential aspect of an operating or maintenance procedure, condition, or statement and/or provides pertinent ancillary information.

### 1.2 Safety Summary

The following warnings and cautions are used throughout the Hale SAM manuals (and/or the items they reference) and are provided here as a safety summary.

**ATTENTION ▲ DANGER**

ALL ELECTRICAL SYSTEMS HAVE THE POTENTIAL TO CAUSE SPARKS DURING SERVICE. TAKE CARE TO ELIMINATE EXPLOSIVE OR HAZARDOUS ENVIRONMENTS DURING SERVICE AND/OR REPAIR.

**ATTENTION ▲ DANGER**

CHECK THE BILL OF LADING FOR THE WEIGHT BEFORE LIFTING. ONLY USE APPROPRIATE LIFT METHODS AND EQUIPMENT TO MOVE OR HANDLE SAM PUMP KIT OR MODULE. (TYPICAL PUMP KIT WEIGHT IS APPROXIMATELY 1200 LBS. (545 KG) TYPICAL MODULE WEIGHT IS 2800 LBS. (1270 KG)

**ATTENTION ▲ DANGER**

ELECTRICAL POWER TO THE VALVE MOTOR SHOULD BE DISCONNECTED BEFORE OPERATING THE VALVE PHYSICALLY USING THE MANUAL OVERRIDE HANDWHEEL.

**ATTENTION ▲ DANGER**

ELECTRICAL POWER TO THE VALVE MOTOR SHOULD BE DISCONNECTED BEFORE PHYSICALLY OVERRIDING ANY VALVE.

**ATTENTION ▲ DANGER**

OPERATORS SHOULD FIRST BE TRAINED TO OPERATE THE FIRE PUMP MANUALLY (USING PUSH BUTTONS, CONTROL RODS, AND MANUAL [NOT ELECTRICAL] VALVE OVERRIDES.)

- AUTOMATION ONLY MITIGATES PROBLEMS AROUND THE PUMP AND VALVES
  - OPERATORS NEED TO UNDERSTAND HOW TO DIAGNOSE PROBLEMS
  - SAM MANAGES PROBLEMS BY HELPING TO KEEP THE PUMP SAFE BUT IF AN INADEQUATE WATER SUPPLY OR PUMP CAVITATION OCCURS THE OPERATOR MUST UNDERSTAND WHAT IS HAPPENING AND CORRECT THE PROBLEM
- SAM DOES NOT ADJUST FOR FRICTION LOSS ON HOSE LINES OR PUMPING AT ELEVATION
  - SAM MAINTAINS PRESSURE SETTINGS BASED ON SENSORS MEASURING PRESSURE NEAR THE DISCHARGE VALVE
  - THE SYSTEM CAN NOT ALLEVIATE STATIC PRESSURES
    - RESIDUAL PRESSURE IN THE SYSTEM MAY BUILD IN THE DISCHARGE LINES WHEN THAT PARTICULAR LINE IS NOT FLOWING WATER OR NOT FLOWING ENOUGH WATER TO BE GATED
    - THE OPERATOR MUST BE AWARE THAT THIS PRESSURE MAY PRESENT A DANGER TO LARGER DISCHARGES. (THEREFORE, SETTING A SMALLER DISCHARGE LINE AT A PRESSURE HIGHER THAN YOU WOULD EXPOSE A LARGER HOSE [OR LARGER DISCHARGE] TO IS NOT RECOMMENDED)

**ATTENTION ▲ WARNING**

A PRESSURE HAZARD MAY EXIST EVEN WHEN THE PUMP IS NOT RUNNING. PRIOR TO REMOVING HOSES OR CAPS FROM PUMP CONNECTIONS, RELIEVE PRESSURE BY OPENING DRAINS. BLEEDER VALVES SHOULD ALSO BE USED WHEN CONNECTING TO AN INTAKE FROM A PRESSURIZED SOURCE.

**ATTENTION ▲ WARNING**

ALWAYS FOLLOW LOCAL GUIDELINES FROM THE AHJ AND THE APPARATUS MANUFACTURER.

**ATTENTION ▲ WARNING**

ALWAYS FOLLOW PROPER OPERATING PROCEDURES. THE PUMP OPERATOR MUST BE FAMILIAR WITH THE PUMP AND SAM OPERATING INSTRUCTIONS AS WELL AS OTHER OPERATING GUIDELINES FOR THE APPARATUS AND ACCESSORIES.

**ATTENTION ▲ WARNING**

ALWAYS STOP THE ENGINE, SET THE PARKING BRAKE, AND CHOCK THE WHEELS BEFORE GOING UNDER THE TRUCK FOR ANY REASON.

**ATTENTION ▲ WARNING**

AVOID CONTACT WITH HOT SURFACES. THE PACKING GLAND AND PUMP BODY MAY PRESENT A TEMPERATURE HAZARD. OVERHEATING MAY RESULT IN A SCALDING WATER HAZARD.

**ATTENTION ▲ WARNING**

DO NOT EXCEED OPERATING PRESSURE LIMITS OF PUMP, INSTALLED PLUMBING, HOSE(S), OR EQUIPMENT IN USE.

HOSE FAILURE CAN RESULT IF A HOSE IS EXPOSED TO EXCESSIVE PRESSURE.

**ATTENTION ▲ WARNING**

OPERATORS, INSTALLERS, AND MAINTENANCE PERSONNEL MUST BE TRAINED AND QUALIFIED FOR ALL THE ACTIVITIES THEY PERFORM.

**ATTENTION ▲ WARNING**

NOT ALL GLOVES ALLOW THE SAM TOUCHSCREENS TO FUNCTION. TEST GLOVES ON ALL OF THE SAM TOUCHSCREENS PRIOR TO OPERATING SAM. DO NOT WEAR GLOVES THAT PREVENT THE TOUCHSCREENS FROM OPERATING.

**ATTENTION ▲ WARNING**

SAM TOUCHSCREENS DO NOT FUNCTION IF COMPLETELY COVERED AND/OR IMMERSSED IN WATER. DO NOT ALLOW THE TOUCHSCREENS TO BE COMPLETELY COVERED/IMMERSSED WITH WATER (OR ANY LIQUID). DRY THE SCREEN TO RESTORE FUNCTIONALITY.

**ATTENTION ▲ WARNING**

THE PROCEDURES IN THIS SECTION PROVIDE ONLY GENERAL AND MINIMAL INSTRUCTION. DO NOT REPLACE LOCAL PROCEDURES OR POLICIES OR RECOMMENDATIONS AND PROCEDURES PROVIDED IN THE APPARATUS/TRUCK/UNIT MANUAL WITH THESE PROCEDURES.

THE PROCEDURES IN THIS SECTION ARE GENERAL OPERATING PROCEDURES BASED ONLY ON HALE EQUIPMENT. NOT ALL PROCEDURES IN THIS SECTION MAY APPLY TO YOUR SPECIFIC OPERATIONAL REQUIREMENTS OR APPARATUS CONFIGURATION. REFER TO ONLY THE INFORMATION/PROCEDURES WHICH APPLY TO YOUR OPERATIONAL REQUIREMENTS AND ONLY WHEN LOCAL PROCEDURES, POLICIES, OR GUIDELINES ESTABLISHED BY THE AHJ DO NOT EXIST.

ALWAYS REFER TO THE PROCEDURES PROVIDED BY THE AHJ FOR SETTING WHEEL CHOCKS AS WELL AS LAYOUT AND CONNECTION OF HOSES, VALVES AND DRAINS.

**ATTENTION ▲ WARNING**

THE TABLET COMMUNICATES THROUGH THE SAM CONTROL CENTER LOCATED IN THE OPERATORS PANEL, IF THAT SCREEN FAILS, THE TABLET WILL NOT CONTROL THE APPARATUS.

**ATTENTION ▲ CAUTION**

SHIPPING CONTAINERS WEIGHS VARY WIDELY FOR SAM COMPONENTS. ALWAYS CHECK THE SHIPPING INFORMATION FOR EACH CONTAINERS WEIGHT AND USE THE APPROPRIATE LIFTING METHOD AND/OR WEIGHT RATED EQUIPMENT.

**ATTENTION ▲ CAUTION**

REMOVE SYSTEM PRESSURE BEFORE PERFORMING CALIBRATION. OPEN ALL DRAINS AND AIR BLEED VALVES TO ENSURE THE SYSTEM IS NOT PRESSURIZED AND THE VALVE(S) CAN BE OPENED AND CLOSED SAFELY BEFORE PROCEEDING WITH VALVE CALIBRATION.

**ATTENTION ▲ CAUTION**

VALVES OPERATE AUTOMATICALLY. REMOVE POWER BEFORE OVERRIDE

**IMPORTANT ▲ NOTICE**

ACTIVATING FOAM OFF FROM THE SAM CONTROL CENTER TURNS OFF THE SMART-FOAM SYSTEM, TURNING OFF FOAM TO ALL FOAM CAPABLE DISCHARGES, HOWEVER, THE DISCHARGE(S) ARE NOT CLOSED AND CONTINUE TO FLOW WATER ONLY.

**IMPORTANT ▲ NOTICE**

AHJ MUST INSURE PROPER TRAINING IS IN PLACE FOR ALL OPERATORS. THIS QUICK START GUIDE DOES NOT REPLACE OR SUPERSEDE THE OPERATION INSTALLATION MAINTENANCE MANUAL OR PROPER TRAINING.

**IMPORTANT ▲ NOTICE**

AKRON BRASS SWING-OUT™ VALVES FROM A DISCHARGE PORT WILL NOT FUNCTION IN THE PLACE OF ANY SPECIAL PURPOSE VALVE (TF, T2P, PONY) IN A HALE SAM SYSTEM. DO NOT USE ONE FOR SUBSTITUTION OR REPLACEMENT PURPOSES.

**IMPORTANT ▲ NOTICE**

ALL SAM TOUCHSCREENS ARE WATER RESISTANT.

**IMPORTANT ▲ NOTICE**

ALL SAM TOUCHSCREENS FUNCTION BETTER IF TOUCHED USING THE PAD PORTION OF THE FINGER WHILE WEARING GLOVES. THE TOUCHSCREENS OFTEN DO NOT FUNCTION WHEN TOUCHED USING THE SEAM PORTION OF A GLOVE.

**IMPORTANT ▲ NOTICE**

ALTHOUGH SMARTFOAM AND SMARTCAFS BOTH UTILIZE THE FOAM LABEL, A FOAM LABELED DISCHARGE BUTTON DOES NOT OPERATE THE SAME WAY ON SAM FOR BOTH SYSTEMS.

**IMPORTANT ▲ NOTICE**

ALWAYS DISCONNECT THE POWER CABLE, GROUND STRAPS, ELECTRICAL WIRES AND CABLES FROM THE CONTROL UNIT OR OTHER HALE SAM EQUIPMENT BEFORE ELECTRIC ARC WELDING AT ANY POINT ON THE APPARATUS.

**IMPORTANT ▲ NOTICE**

ALWAYS TURN OFF CAFS FROM THE SMARTCAFS CONTROL DISPLAY.

**IMPORTANT ▲ NOTICE**

AN ACCURATE FLOW MEASURING DEVICE MUST BE USED TO MEASURE THE WATER FLOW WHEN CALIBRATING THE FLOW SENSOR. USE A SUITABLE SIZE, SMOOTH BORE NOZZLE AND AN ACCURATE AND CALIBRATED PITOT GAUGE INSTRUMENT OR MASTER FLOW METER. HAND HELD PITOT GAUGES ARE USUALLY NOT VERY ACCURATE. MAKE SURE THE SYSTEM IS CALIBRATED WITH AN ACCURATE FLOW MEASURING DEVICE.

**IMPORTANT ▲ NOTICE**

AN OFF-THE-SHELF AKRON BRASS SWING-OUT™ VALVE WILL NOT FUNCTION IN A HALE SAM SYSTEM. DO NOT USE ONE FOR SUBSTITUTION OR REPLACEMENT PURPOSES.

**IMPORTANT ▲ NOTICE**

DISCONNECT ELECTRICAL POWER TO THE VALVE MOTOR WHEN USING THE OVERRIDE TO OPERATE THE VALVE DIRECTLY.

**IMPORTANT ▲ NOTICE**

DO NOT ALTER THE CAN NETWORK COMMUNICATIONS (SAE J1939 CAN BUS) OR CONNECT OTHER DEVICES TO ANY OF THE CAFS, CAPTIUM, FOAM, OR SAM CAN BUS BACKBONE(S).

**IMPORTANT ▲ NOTICE**

DO NOT HARD SHUTDOWN THE TABLET (POWER OFF BY HOLDING THE POWER BUTTON FOR LONGER THAN 5 SECONDS). A HARD SHUTDOWN MAY CORRUPT THE OPERATING SYSTEM, MAKING THE TABLET UNUSABLE.

**IMPORTANT ▲ NOTICE**

DO NOT RUN THE PRIMER FOR MORE THAN 45 SECONDS. IF PRIME IS NOT ACHIEVED IN 30 - 45 SECONDS, STOP AND LOOK FOR AIR LEAKS OR BLOCKED SUCTION HOSE.

**IMPORTANT ▲ NOTICE**

EXCESSIVE PRESSURE LOSS MAY OCCUR IF THE DRIP RATE IS GREATER THAN AN INDIVIDUAL DRIP (A STEADY STREAM OF WATER) OR DRIP RATE EXCEEDS ONE DRIP EVERY 0.6 SECOND. THIS CONDITION DEGRADES PUMP PERFORMANCE.

**IMPORTANT ▲ NOTICE**

HALE MIDSHIP PUMPS ARE SHIPPED WITHOUT GEAR OIL. FILL THE GEARBOX WITH GEAR OIL SPECIFIED IN PARAGRAPH 7.4.2, RECOMMENDED GEARBOX LUBRICANTS, OF FSG-MNL-00199, OIM MANUAL FOR HALE MIDSHIP PUMPS, BEFORE OPERATING.

**IMPORTANT ▲ NOTICE**

IF THE DISCHARGE DOES NOT ACTIVATE VERIFY THE CAFS SYSTEM PRESETS (PRESET 1 FOR CAFS, PRESET 7 FOR FOAM ONLY ON THE SMARTCAFS DISPLAY) CONFIGURATION MATCHES THE SAM CONFIGURATION. (SAM WILL ONLY ACTIVATE MATCHING CONFIGURATIONS—WET, MED, OR DRY.) IF THE CONFIGURATIONS DO NOT MATCH, OPERATE SAM MANUALLY TO OPEN THE VALVE USING THE SAM CONTROL CENTER. THEN OPERATE THE CAFS SYSTEM FROM THE SMARTCAFS DISPLAY.

**IMPORTANT ▲ NOTICE**

IF THE TABLET-TO-SAM WI-FI CONNECTION IS LOST, RETURN TO A SAM CONTROL CENTER ON THE APPARATUS TO RESUME CONTROL FROM A SAM CONTROL CENTER ON THE APPARATUS.



**IMPORTANT ▲ NOTICE**

KEEP ALL I/O PORT COVERS IN PLACE DURING USE TO PREVENT WATER DAMAGE.

**IMPORTANT ▲ NOTICE**

OTHER ELECTRICAL COMPONENTS MUST NOT BE SUPPLIED FROM THE SAM SYSTEM SUPPLY. DO NOT CONNECT THE PRIMER AND HALE SAM TO THE SAME POWER WIRE.

**IMPORTANT ▲ NOTICE**

ONLY TOUCH THE SCREEN IN ONE PLACE AT A TIME. THE TOUCHSCREENS DO NOT SUPPORT MULTI-TOUCH.

**IMPORTANT ▲ NOTICE**

PERFORMING THIS PROCEDURE CAUSES SAM TO EXIT AUTO MODE.

**IMPORTANT ▲ NOTICE**

PUMP SEAL/PUMP SHAFT DAMAGE MAY OCCUR IF DRIP RATE IS LESS THAN ONCE EVERY 6 SECONDS. THIS CONDITION DEGRADES PUMP PERFORMANCE.

**IMPORTANT ▲ NOTICE**

SOME WATER ONLY OPERATIONS MAY DAMAGE THE CAFS SYSTEM IF THE CLUTCH IS ENGAGED. REFERENCE CAFS QUICKSTART GUIDE, DISENGAGING THE COMPRESSOR CLUTCH (PAGE 10 OF FSG-MNL-00176) TO ENSURE PROPER CAFS TURN OFF WHEN SAM INCLUDES A CAFS SYSTEM.

**IMPORTANT ▲ NOTICE**

THE CONTROLLER UNIT DEUTSCH CONNECTORS ARE KEYED TO PREVENT INTERCHANGE OR REVERSE DIRECTION INSERTION. DO NOT FORCE A CONNECTOR WITHOUT FIRST VERIFYING THE CONNECTORS ORIENTATION AND PLACEMENT.

**IMPORTANT ▲ NOTICE**

THE SAM CONTROL CENTER WILL NOT FUNCTION PROPERLY WITHOUT ONE OF THE DISPLAYS CONFIGURED AS THE MASTER.

**IMPORTANT ▲ NOTICE**

THE STYLE 9327 NAVIGATOR MINI VALVE CONTROLLER DOES NOT SUPPORT PRESSURE INDICATION. DO NOT USE A STYLE 9327 NAVIGATOR MINI VALVE CONTROLLER FOR DISCHARGE VALVE PURPOSES OR CALIBRATIONS.

**IMPORTANT ▲ NOTICE**

TOUCH ONLY THE SPECIFIED BUTTON(S). FAILURE TO PERFORM THIS PROCEDURE CORRECTLY MAY CAUSE SAM TO BECOME INOPERATIVE.

**IMPORTANT ▲ NOTICE**

WHEN CLOSING AN INTAKE IN MANUAL MODE, ENSURE THE PUMP HAS AN ADEQUATE WATER SUPPLY TO PREVENT OVERHEATING.

**IMPORTANT ▲ NOTICE**

WHILE SAM CAN REDUCE PUMP OPERATOR WORKLOAD, IT DOES NOT TAKE THE PLACE OF THE PUMP OPERATOR. THE PUMP OPERATOR STILL NEEDS TO CALCULATE THE REQUIRED LINE PRESSURE TO SUPPORT THE HOSE LAY AND NOZZLE IN USE. SAM WILL MAINTAIN THE SET PRESSURE IN AUTO MODE.

## 2. SAM ILLUSTRATED BREAKDOWNS

All Hale SAM system and associated pump drawings are available on the memory stick (flash drive) provided with the pump and on the Hale Products website (<https://www.haleproducts.com>).

The Hale SAM system and associated pump drawings provide the information required to install, maintain, and repair SAM and the associated Hale pump. Additionally, the drawings provide information about the available Hale options for the associated pump. The following paragraphs organize SAM and each associated pumps data into sections applicable to that pump.

To locate a part number from a referenced drawing, match the items name in the DESCRIPTION column and then note/record the associated part number from the adjacent PART NUMBER column. On some drawings the PART NUMBER column references a lookup table. A lookup table is used when multiple part numbers apply for the same item. (Typically due to multiple valve sizes being available for the Customer to choose from, i.e. tank fill, tank-to-pump, or auxiliary intake valves.)

Reference the SAM OIM (FSG-MNL-00210) when local procedures do NOT exist. The OIM provides basics of SAM and SAM operation, installation verification, preventive maintenance, and operator-based troubleshooting. Refer to the SAM Technical Manual (FSG-MNL-00211) for additional installation information, preventive maintenance instruction, remove and replace instructions, and system troubleshooting.

In addition to the SAM manuals, the manuals for the associated Hale pump will be required to operate and maintain the entire system. Additional information such as Q Series midship pump specifications, ratings, and Hale Bulletin 650, Hale Foam Proportioning System Foam Concentrate Compatibility, can be found on the Hale website ([www.haleproducts.com](http://www.haleproducts.com)) or on the flash drive provided with the system.

When SAM includes an optional SmartFOAM or SmartCAFS, the manuals for the applicable foam system will also be required to operate and maintain the entire system.

### 2.1 SAM Numbering and Specifications References

SAM system only comes as part of a Hale pump kit or a Hale module and is therefore identified by the associated pump ID plate. Figure 1 shows the typical ID plate used on the Hale SAM.



Figure 1. Hale ID Tag With Sample Markings





The ID plate is stamped with the appropriate model, capacity (NFPA rated) code, drive unit code, and serial number at the factory during manufacturing/testing. (Refer to the Pump Identification paragraph in the OIM Manual for the applicable Hale pump information.) The pump ID plate is permanently attached to the associated Hale built pump module if the pump was ordered as part of a Hale built module, otherwise it is shipped loose with the SAM pump kit.

#### NOTE

**Using your pumps serial number and the Hale website (or calling Customer Service) is the best way to ensure you receive/utilize the correct replacement parts for your pump and SAM system.**

## 2.2 SAM Pump Kits And Modules

Hale provides SAM systems in three forms: As a pump kit with loose valves, as a pump kit with installed valves, and as a Hale built module. Refer to FSG-MNL-00210, Operation Installation Maintenance Manual For Hale SAM, Section 5, INSTALLATION paragraph, for a detailed description of each form of SAM. Each of the forms content is very similar and therefore, are NOT addressed separately herein. (Modules, additionally, contain plumbing and ancillary systems that are NOT part of SAM and are NOT covered herein.)

### 2.2.1 Discharge/Intake To Port Cross Reference (Valve Positions)

Refer to the QMAX PORT DIAGRAM (FSG-PL-01509) or QMAX-XS PUMP ASSEMBLY (FSG-PL-01510) for port diagram information to cross reference the intake and/or discharge (Friendly Name) being replaced. The drawings can be found on the flash drive provided with the system or on the Hale website ([www.haleproducts.com](http://www.haleproducts.com)).

### 2.2.2 General Information For SAM Akron Brass Swing-Out™ Valves

The primary pump mounted SAM components are Akron Brass Swing-Out™ valves, Hale Products modules, and Hale Products master intake valves. The Akron Brass Swing-Out™ valves are used for both intake (auxiliary [Pony] and special purpose vales [tank fill and tank-to-pump]) and discharge purposes.

The special purpose/intake valves are NOT interchangeable with each other or with discharge locations. Replacement special purpose vales can ONLY be used for their designed function.

Refer to FSG-MNL-00211, Technical Manual For Hale SAM, for troubleshooting information.

#### IMPORTANT ▲ NOTICE

**AN OFF-THE-SHELF AKRON BRASS SWING-OUT™ VALVE WILL NOT FUNCTION IN A HALE SAM SYSTEM. DO NOT USE ONE FOR SUBSTITUTION OR REPLACEMENT PURPOSES.**

#### IMPORTANT ▲ NOTICE

**AKRON BRASS SWING-OUT™ VALVES FROM A DISCHARGE PORT WILL NOT FUNCTION IN THE PLACE OF ANY SPECIAL PURPOSE VALVE (TF, T2P, PONY) IN A HALE SAM SYSTEM. DO NOT USE ONE FOR SUBSTITUTION OR REPLACEMENT PURPOSES.**

It is important to note that the valve stores the user specific Friendly Name, discharge Color assignment, calibration information (pressure/flow), and additional configuration information. Refer to the Technical Manual For Hale SAM (FSG-MNL-00211), for detailed removal and replacement information and procedures for configuring a specific Akron Brass Swing-Out™ valve. This makes providing the Hale ID tag information extremely important when ordering a replacement valve for a SAM system.



### **2.2.2.1 Installation**

Refer to the following Akron Brass documents for general installation information and especially if valve assembly clocking is required.

- 109896, Akron Swing-Out™ Valve Installation And Operating Instructions (Gen 1)
- 117113, 8600 Series Electric Actuator Installation Instructions (Gen 1)
- 123248, Style 8600 Electric Actuator With Motor Driver Installation Instructions (Gen 1)

Refer to FSG-MNL-00211, Technical Manual For Hale SAM, for references to removal and replacement information and procedures for configuring a specific Akron Brass Swing-Out™ valve (Gen 1 or Gen 2).

### **2.2.2.2 Repair Part Kits**

To repair/rebuild the physical valve portion of a Gen 1 Akron Brass Swing-Out™ valve, refer to 109896, Akron Swing-Out™ Valve Installation And Operating Instructions, Field Service Kits paragraph. To repair/rebuild the physical valve portion of a Gen 2 Akron Brass Swing-Out™ valve, refer to the following Akron Brass documents:

- 109905, Style 8620-8635 And 8920-8935 Generation II Swing Out Valve With Electric Actuator
- 118883, Style 8804 Field Service Kit with Metal Ball for: 8815 Swing-Out™ Valve Conversion Kit for: 7615 and 7815 Swing-Out Valve
- 127890, Style 8600 Electric Actuator Installation Instructions
- 127891, Technical Service Parts
- 127903, Technical Service Parts

A composite ball kit is NOT recommended; however, they may be used to rebuild an Akron Brass Swing-Out™ valve on a SAM system.

Refer to FSG-MNL-00211, Technical Manual For Hale SAM, for references to torque specifications, removal and replacement information and procedures for configuring a specific Akron Brass Swing-Out™ valve (Gen 1 or Gen 2).

### **2.2.2.3 Replacement Valves**

Refer to FSG-PL-01508, REPLACEMENT SAM VALVE for the replacement Akron Brass Swing-Out™ valve part numbers for a SAM system.

Be sure to complete the REQUIRED REPLACEMENT VALVE INFORMATION table and provide a completed table for each replacement valve required.



## 2.3 Component To Drawing Cross-Reference

### NOTE

Drawing revision is critical to obtaining correct/current data as superseded drawings are obsoleted when the newest revision is released.

Table 1 provides an alphabetically ordered list of all major SAM components (column 1). When a SAM component is used for multiple functions within the SAM system, an indentured (right-hand justified text in column 1) follows the common component name. For each SAM component/functional name there are three associated columns: Plate/Drawings (column 2) which provides a drawing number (or numbers), Sheet (column 3) which provides the sheet number (or numbers) (from the column 2 drawing), and Content (column 4) which provides that drawing/sheet content as one (or as many as applies) of the following category.

- Connection
- Identification
- Location
- Part Numbers

**Table 1. Component To Drawing Cross-Reference**

Component/Item	Plate/Drawing	Sheet	Content
4-Way Air Valve (Part of Priming Feature Block Assy.)	FSG-PL-01501	1 and 5	Location (General)
	FSG-PL-01502	1 and 5	Location (General)
	FSG-PL-01513	1 and 5	Location (General)
	538-00099-001	1	Location (Detail) Identification Part Numbers
2		Connection	
Anode	FSG-PL-01501	1 and 8	Location Identification Connection Part Numbers
	FSG-PL-01502	1 and 8	Location Identification Connection Part Numbers
	FSG-PL-01513	1 and 8	Location Identification Connection Part Numbers
Barometer Sensor	FSG-PL-01501	1 and 7	Location Identification Connection Part Numbers
	FSG-PL-01502	1 and 7	Location Identification Connection Part Numbers



Table 1. Component To Drawing Cross-Reference – CONTINUED

Component/Item	Plate/Drawing	Sheet	Content
Barometer Sensor - CONTINUED	FSG-PL-01513	1 and 7	Location Identification Connection Part Numbers
Bus Termination Resister (Female) (Male)	FSG-PL-01504 (See NOTE 3 for part numbers.)	1	Location Identification Connection
Buzzer	FSG-PL-01501	2	Location (General)
	FSG-PL-01502	2	Location (General)
	FSG-PL-01513	2	Location (General)
	FSG-PL-01503	17	Connector Part Numbers
	FSG-PL-01505	2	Identification Connection Part Numbers
Check Valve (Air Bleed Solenoid)	FSG-PL-01501	6 and 7	Location Identification Connection Part Numbers
	FSG-PL-01502	6 and 7	Location Identification Connection Part Numbers
	FSG-PL-01513	6 and 7	Location Identification Connection Part Numbers
Check Valve (Tank Fill)	FSG-PL-01501	8	Location Identification Connection Part Numbers
	FSG-PL-01502	8	Location Identification Connection Part Numbers
	FSG-PL-01513	9	Location Identification Connection Part Numbers
Check Valve (Quick Prime Solenoid)	FSG-PL-01501	5	Location Identification Connection Part Numbers
	FSG-PL-01502	5	Location Identification Connection Part Numbers



Table 1. Component To Drawing Cross-Reference – CONTINUED

Component/Item	Plate/Drawing	Sheet	Content
Check Valve (Quick Prime Solenoid) - CONTINUED	FSG-PL-01513	5	Location Identification Connection Part Numbers
Discharge CAN Module	FSG-PL-01501	1, 6 and 7	Location Identification Connection Part Numbers
	FSG-PL-01502	1, 6 and 7	Location Identification Connection Part Numbers
	FSG-PL-01513	1 and 5	Location Identification Connection Part Numbers
AFS CAN Module	FSG-PL-01501	1, 6 and 7	Location Identification Connection Part Numbers
	FSG-PL-01502	1, 6 and 7	Location Identification Connection Part Numbers
	FSG-PL-01513	1 and 5	Location Identification Connection Part Numbers
Discharge (1 thru 12) (Akron Brass Swing-Out™ valve)	FSG-PL-01508	1	Part Numbers
	FSG-PL-01506	1 and 2	Location Identification Connection
	FSG-PL-01504	1	Connection
Ship Loose Valves ONLY (Location)	FSG-PL-01501	1	Location (General)
	FSG-PL-01502	1	Location (General)
	FSG-PL-01513	1	Location (General)
Dual Action Air Cylinder (Part of SAM Drain Manifold Assembly)	FSG-PL-01501	4	Location
	FSG-PL-01502	4	Location
	FSG-PL-01513	4	Location
	538-00100-000	1	Location Connection
	538-00097-00X	2	Part Numbers
Dual Action Air Cylinder (Part of SAM Priming Feature Block Assembly)	FSG-PL-01501	5	Location
	FSG-PL-01502	5	Location
	FSG-PL-01513	5	Location



**Table 1. Component To Drawing Cross-Reference – CONTINUED**

Component/Item	Plate/Drawing	Sheet	Content	
Dual Action Air Cylinder - CONTINUED (Part of SAM Priming Feature Block Assembly)	538-00099-000	1 and 2	Location Connection	
	538-00097-00X	1	Part Numbers	
Flowmeter (Discharge 1 thru 12)	FSG-PL-01506	1 and 2	Identification Connection Part Numbers	
Ground Loop Isolator	FSG-PL-01503	17	Connector Part Numbers	
	FSG-PL-01505	1	Connection Part Numbers	
ITL-40 (For Water)	FSG-PL-01501	2	Location	
	FSG-PL-01502	2	Location	
	FSG-PL-01513	2	Location	
	FSG-PL-01505	1	Identification Connection Part Numbers	
Level Sensor (Gearbox)	FSG-PL-01501	1	Location (General)	
		4	Identification Connection Part Numbers	
	FSG-PL-01502	1	Location(General)	
		4	Identification Connection Part Numbers	
	FSG-PL-01513	1	Location(General)	
		4	Identification Connection Part Numbers	
	LH MIV 2.0	FSG-PL-01501	1	Location (General)
			6	Identification Connection
FSG-PL-01503		16	Deutsch Part Nos.	
FSG-PL-01502		1	Location(General)	
		6	Identification Connection	
FSG-PL-01513		1	Location(General)	
		6	Identification Connection	
FSG-PL-01491		2 thru 5	Part Numbers	
	2	Repair Kits		
MIV Control Module	FSG-PL-01491	4	Location	
		2	Part Numbers	

Table 1. Component To Drawing Cross-Reference – CONTINUED

Component/Item	Plate/Drawing	Sheet	Content
MIV Control Module - CONTINUED	610-00050	1	Connector P/N Info
MIV-A Control Module	FSG-PL-01501	1	Location (General)
		5	Identification Connection Part Numbers
	FSG-PL-01502	1	Location (General)
		5	Identification Connection Part Numbers
	FSG-PL-01513	1	Location (General)
		3	Identification Connection Part Numbers
	FSG-PL-01503	6	Connector Part Numbers
	FSG-PL-01504	1	Identification Connection
Matrix Governor Module	FSG-PL-01501	1	Location (General)
		2	Identification Connection Part Numbers
	FSG-PL-01502	1	Location (General)
		2	Identification Connection Part Numbers
	FSG-PL-01513	1	Location (General)
		3	Identification Connection Part Numbers
	FSG-PL-01503	4	Connector Part Numbers
	FSG-PL-01504	1	Identification Connection
Pressure Sensor (Discharge 1 thru 12) (Pump Panel Master Pressure Sensors; use the same part.)	FSG-PL-01506 (Transducer, 300 PSI)	1 and 2	Location Identification Connection Part Numbers
Pressure Transducer (ITL-40) (Water Tank, Foam Tank A, or Foam Tank B)	118253 (Operation Manual)	4	Part Numbers
		18	Location Identification Part Numbers
		19 and 21	Connection

Table 1. Component To Drawing Cross-Reference – CONTINUED

Component/Item	Plate/Drawing	Sheet	Content	
Pressure Transducer (Priming/Air Bleed AKA Water Column Sensor)	FSG-PL-01501	1	Location (General)	
		4	Location Identification Connection	
	FSG-PL-01502	1	Location (General)	
		4	Location Identification Connection	
	FSG-PL-01513	1	Location (General)	
		4	Location Identification Connection	
	538-00100-000	1	Location Identification Connection Part Numbers	
	RH Bottom MIV 2.0	FSG-PL-01501	1	Location (General)
			7	Identification Connection
		FSG-PL-01503	16	Deutsch Part Nos.
FSG-PL-01502		1	Location(General)	
		7	Identification Connection	
FSG-PL-01491		2 thru 5	Part Numbers	
		2	Repair Kits	
RH MIV 2.0	FSG-PL-01501	1	Location (General)	
		6	Identification Connection	
	FSG-PL-01503	16	Deutsch Part Nos.	
	FSG-PL-01502	1	Location(General)	
		6	Identification Connection	
	FSG-PL-01513	1	Location(General)	
		7	Identification Connection	
	FSG-PL-01491	2 thru 5	Part Numbers	
		2	Repair Kits	
	SAM Control Center	FSG-PL-01501	2	Location (General)
FSG-PL-01502		2	Location (General)	
FSG-PL-01513		2	Location (General)	
FSG-PL-01503		2 and 17	Connector Part Numbers	
FSG-PL-01504		1	Identification Connection	





Table 1. Component To Drawing Cross-Reference – CONTINUED

Component/Item	Plate/Drawing	Sheet	Content		
SAM Control Center - CONTINUED	FSG-PL-01505	1	Connection Part Numbers		
SAM Pump Controller	FSG-PL-01501	2	Location (General)		
	FSG-PL-01502	2	Location (General)		
	FSG-PL-01513	2	Location (General)		
	FSG-PL-01503	2 and 17	Connector Part Numbers		
	FSG-PL-01504	1	Identification Connection		
	FSG-PL-01505	1	Connection Part Numbers		
Sensor Module	FSG-PL-01501	1	Location (General)		
		5	Location Identification Connection Part Numbers		
	FSG-PL-01502	1	Location(General)		
		5	Location Identification Connection Part Numbers		
	FSG-PL-01513	1	Location(General)		
		5	Location Identification Connection Part Numbers		
	FSG-PL-01503	5	Connector Part Numbers		
	FSG-PL-01504	1	Identification Connection		
	Solenoid	(All)	FSG-PL-01501	1	Location (General)
			FSG-PL-01502	1	Location(General)
FSG-PL-01513			1	Location(General)	
(Air Bleed)		FSG-PL-01501	6 and 7	Location Identification Connection Part Numbers	
		FSG-PL-01502	6 and 7	Location Identification Connection Part Numbers	
		FSG-PL-01513	6 and 7	Location Identification Connection Part Numbers	



Table 1. Component To Drawing Cross-Reference – CONTINUED

Component/Item	Plate/Drawing	Sheet	Content
Solenoid – CONTINUED (Air Bleed) - CONTINUED  (Auxiliary Pump Cooling)     (Quick Prime)	FSG-PL-01503	15	Connector Part Numbers
	FSG-PL-01501	8	Location Identification Connection Part Numbers
	FSG-PL-01502	8	Location Identification Connection Part Numbers
	FSG-PL-01513	9	Location Identification Connection Part Numbers
	FSG-PL-01503	15	Connector Part Numbers
	FSG-PL-01501	5	Location Identification Connection Part Numbers
	FSG-PL-01502	5	Location Identification Connection Part Numbers
	FSG-PL-01513	5	Location Identification Connection Part Numbers
	FSG-PL-01503	15	Connector Part Numbers
Tank Fill (Akron Brass Swing-Out™ valve)	FSG-PL-01501	1	Location (General)
		8	Location Identification Connection
	FSG-PL-01502	1	Location(General)
		8	Location Identification Connection
	FSG-PL-01513	1	Location(General)
		9	Location Identification Connection
	FSG-PL-01503	7	Connector Part Numbers
	FSG-PL-01506	4	Part Numbers
FSG-PL-01508	1	Part Numbers	
Tank-To-Pump (Akron Brass Swing-Out™ valve)	FSG-PL-01501	1	Location (General)

**Table 1. Component To Drawing Cross-Reference – CONTINUED**

<b>Component/Item</b>	<b>Plate/Drawing</b>	<b>Sheet</b>	<b>Content</b>
Tank-To-Pump (Akron Brass Swing-Out™ valve) - CONTINUED	FSG-PL-01501	5	Location Identification Connection
	FSG-PL-01502	1	Location(General)
		5	Location Identification Connection
	FSG-PL-01513	1	Location(General)
		5	Location Identification Connection
	FSG-PL-01503	7	Connector Part Numbers
	FSG-PL-01506	4	Part Numbers
FSG-PL-01508	1	Part Numbers	
Temperature Sensor (Gearbox)	FSG-PL-01501	1	Location (General)
		4	Location Identification Connection Part Numbers
	FSG-PL-01502	1	Location(General)
		4	Location Identification Connection Part Numbers
	FSG-PL-01513	1	Location(General)
		4	Location Identification Connection Part Numbers
	FSG-PL-01503	15	Connector Part Numbers



Table 1. Component To Drawing Cross-Reference – CONTINUED

Component/Item	Plate/Drawing	Sheet	Content
Temperature Sensor (Pump Body)	FSG-PL-01501	1	Location (General)
		3	Location Identification Connection Part Numbers
	FSG-PL-01502	1	Location(General)
		3	Location Identification Connection Part Numbers
	FSG-PL-01513	1	Location(General)
		8	Location Identification Connection Part Numbers
FSG-PL-01503	15	Connector Part Numbers	
T-Port MIV 2.0	FSG-PL-01501	1	Location (General)
		5	Identification Connection
	FSG-PL-01503	16	Deutsch Part Nos.
	FSG-PL-01502	1	Location(General)
		5	Identification Connection
	FSG-PL-01491	2 thru 5	Part Numbers
2		Repair Kits	
Twister	FSG-PL-01501	2	Location (General)
	FSG-PL-01502	2	Location(General)
	FSG-PL-01503	2	Location(General)
	FSG-PL-01503	3	Connector Part Numbers
	FSG-PL-01504	1	Connection
	FSG-PL-01505	1	Connection Part Numbers
Water Detector  (Autolube)	FSG-PL-01501	1	Location (General)
	FSG-PL-01502	1	Location(General)
	FSG-PL-01513	1	Location(General)
	FSG-PL-01501	3	Location Identification Connection Part Numbers





**Table 1. Component To Drawing Cross-Reference – CONTINUED**

Component/Item	Plate/Drawing	Sheet	Content
Auxiliary SAM Control Center (1 and/or 2) – CONTINUED	FSG-PL-01503	2 and 17	Connector Part Numbers
	FSG-PL-01504	1	Connection
	FSG-PL-01505	1	Connection Part Numbers
DC-DC Converter (12 V–24 V)	FSG-PL-01503	10	Connector Part Numbers
	FSG-PL-01505	4	Connection Part Numbers
Docking Station (Tablet Mounting) (Location selected by OEM/End User)	FSG-PL-01505	4	Identification Connection Part Numbers
ITL-40 (Foam Tank A or Foam Tank B)	FSG-PL-01501	2	Location
	FSG-PL-01502	2	Location
	FSG-PL-01513	2	Location
	FSG-PL-01505	1	Identification Connection Part Numbers
Navigator (9323)	FSG-PL-01503	7 and 8	Connector Part Numbers
	FSG-PL-01504	1	Connection
	FSG-PL-01505	5	Connection Part Numbers
Navigator (9335)	FSG-PL-01503	7 and 8	Connector Part Numbers
	FSG-PL-01504	1	Connection
	FSG-PL-01505	5	Connection Part Numbers
Pressure Transducer (ITL-40) (Foam Tank A)	118253 (Operation Manual)	4	Part Numbers
		18	Location Identification Part Numbers
		19 and 21	Connection
Pressure Transducer (ITL-40) (Foam Tank B)	118253 (Operation Manual)	4	Part Numbers
		18	Location Identification Part Numbers
		19 and 21	Connection
Tablet (Ruggedized)	FSG-PL-01504	1	Location Identification Connection Part Numbers



Table 1. Component To Drawing Cross-Reference – CONTINUED

Component/Item	Plate/Drawing	Sheet	Content
Wi-Fi Router	FSG-PL-01503	10	Connector Part Numbers
	FSG-PL-01505	4	Connection Part Numbers



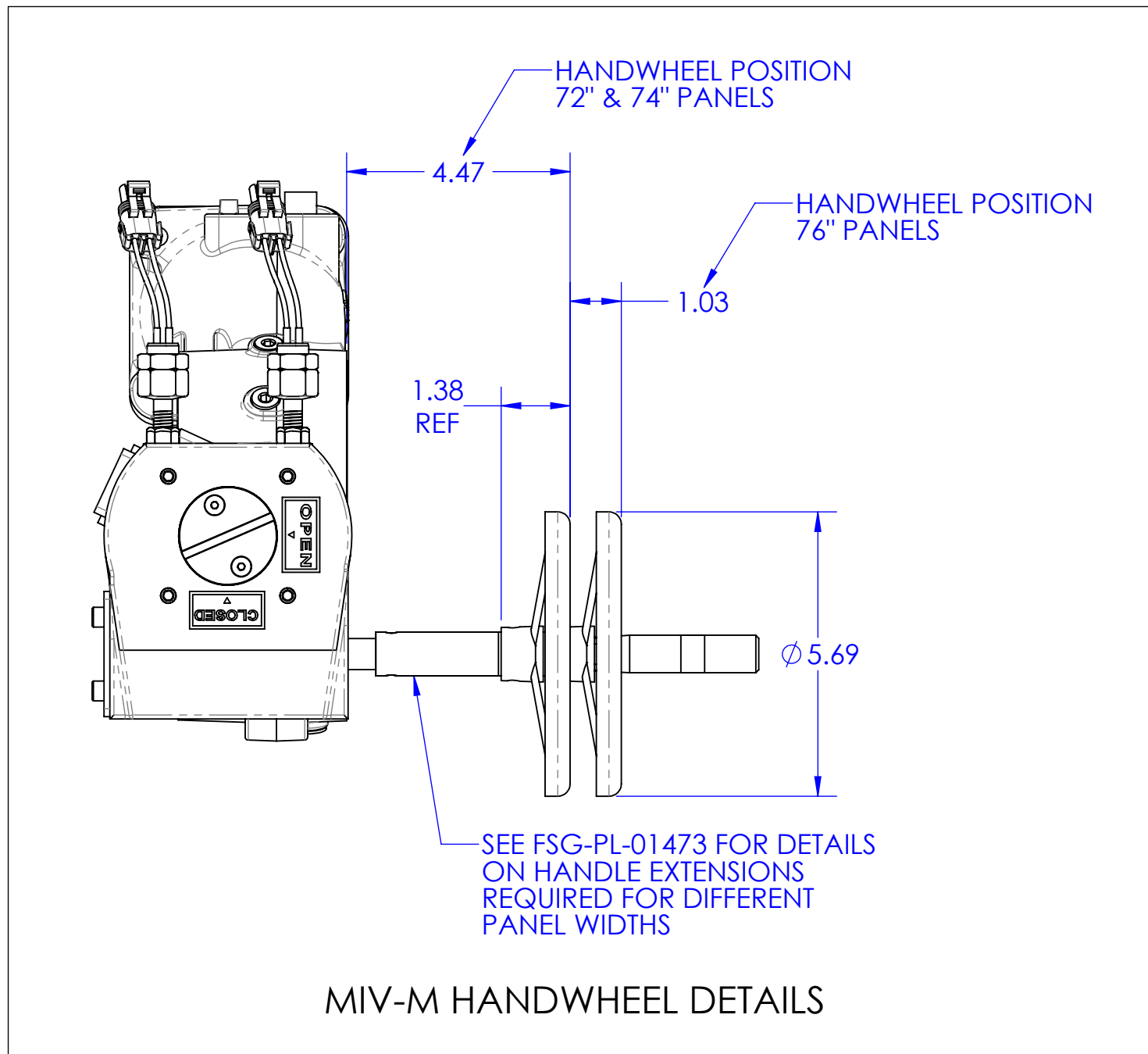
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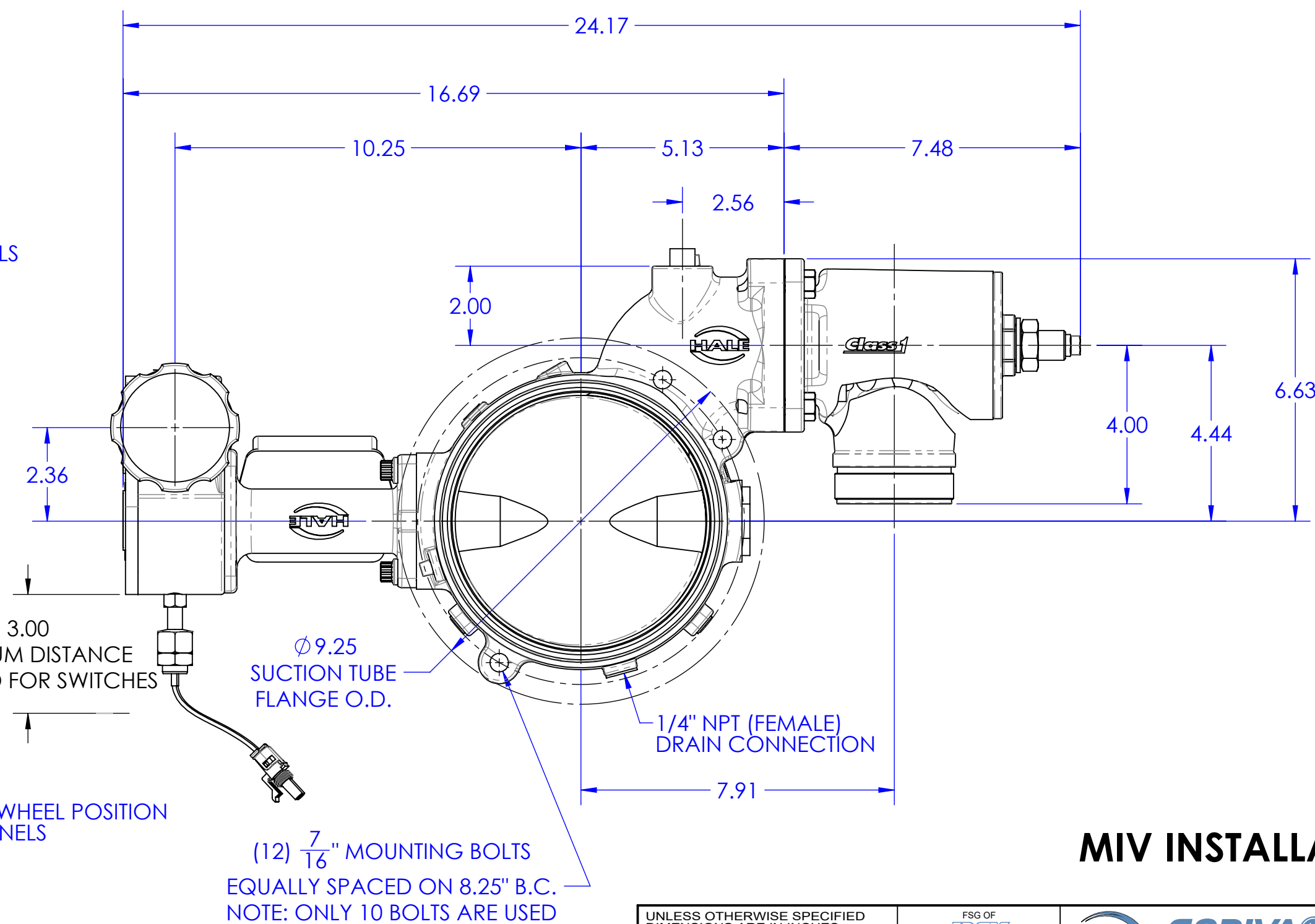
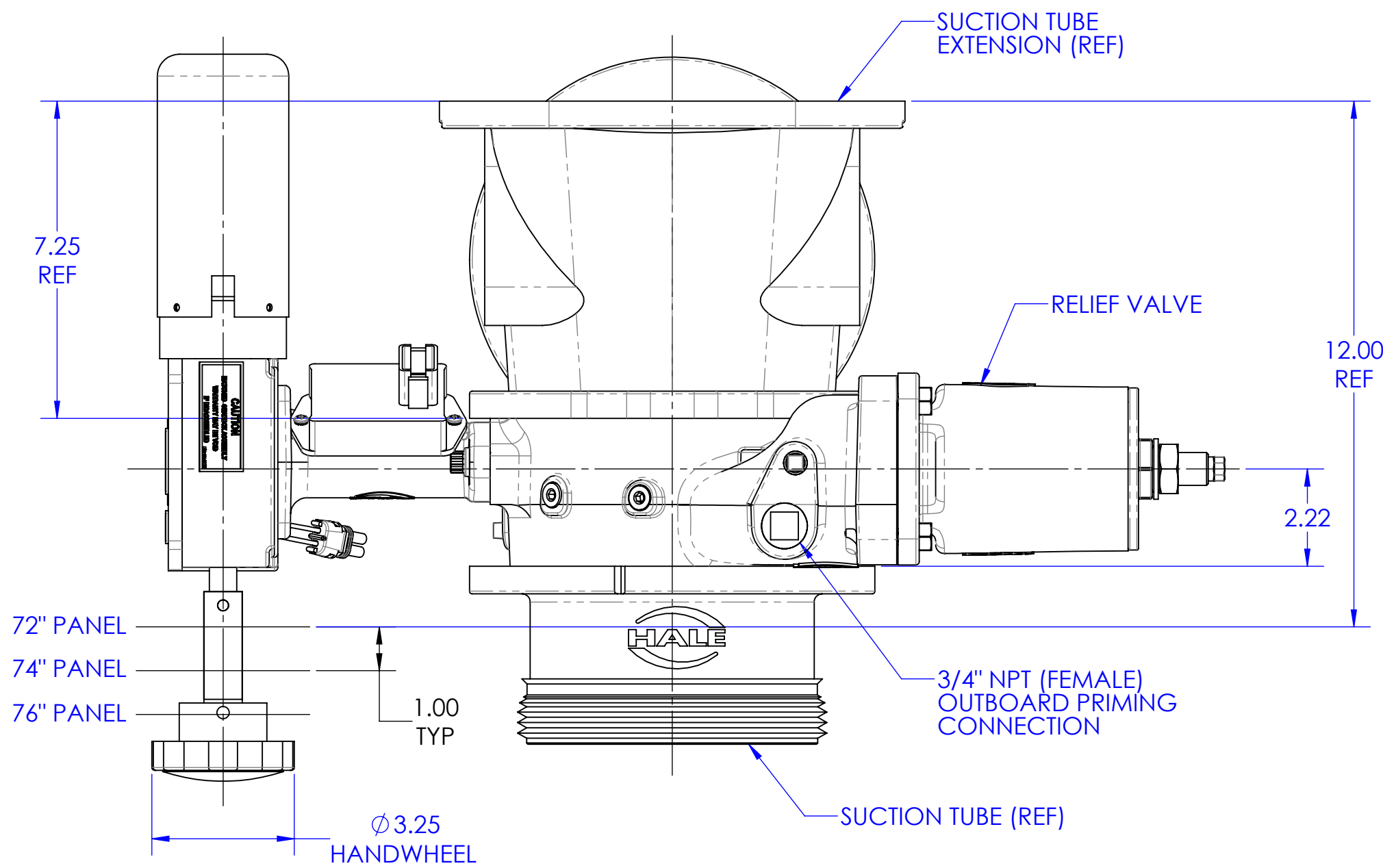
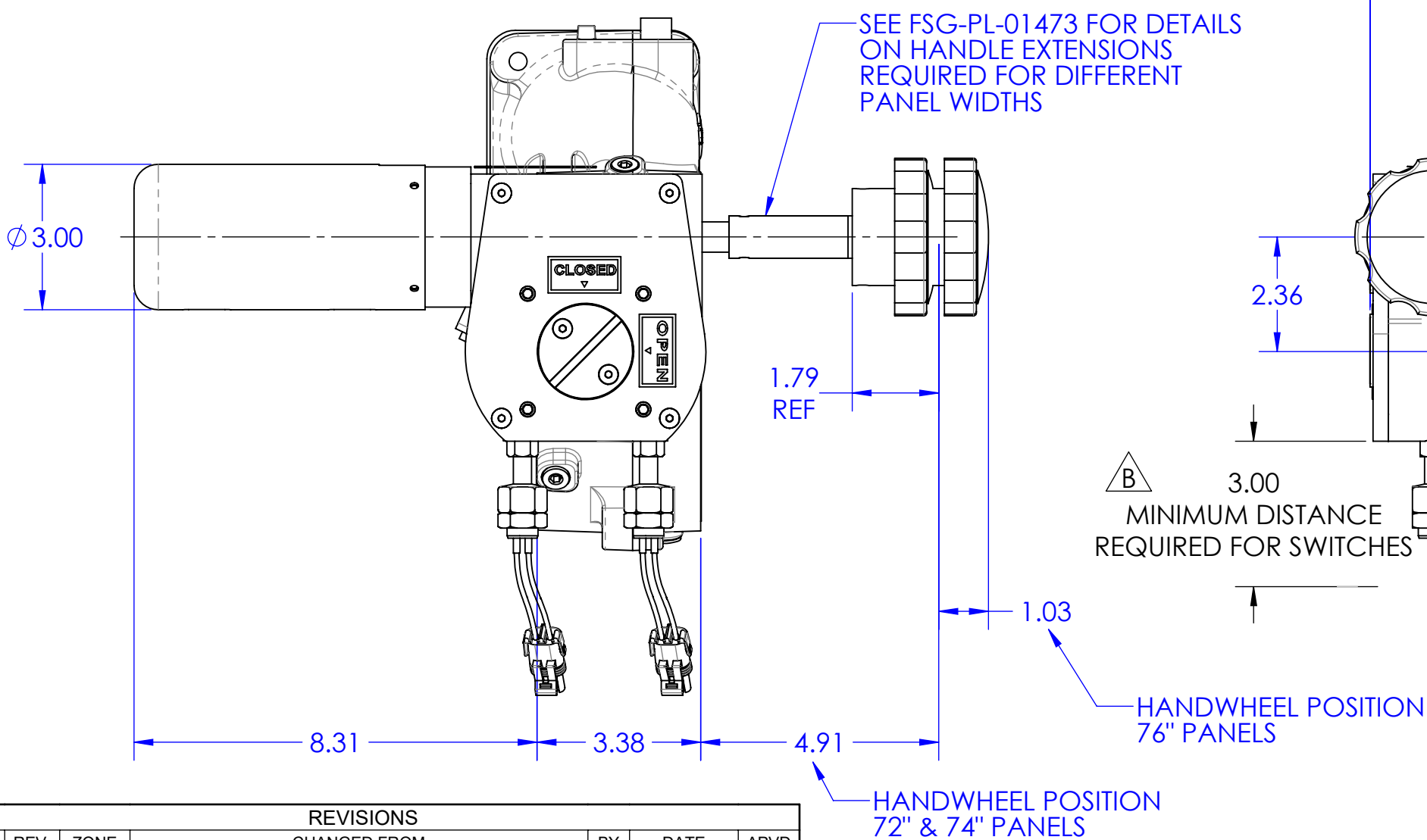
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NOTE: FOR MIV REVERSE DETAILS, SEE DRAWING FSG-PL-01520.



**MIV INSTALLATION**

REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
	A		ORIGINAL RELEASE	TAM	17JAN2020	MAL
5492	B	E1, F5, 5-E7, 5-F12, 5-G10, 5-G11, 5-G6, 6-B1	ADDED NOTE TO REFER TO DRAWING FOR MIV REVERSE DETAILS ON SHEET 1, UPDATED PANEL CUTOUTS FOR MANUAL OVERRIDE KNOB ON SHEET 5 AND ADDED SHEET 6 FOR AB VALVE PANEL DETAILS	TAM	14JUL2021	JLS
5762	C	6-G2	UPDATED PANEL DETAILS FOR AB VALVE ON SHEET 6	TAM	20APR2022	KTN

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP EDGES, 0.1MAX

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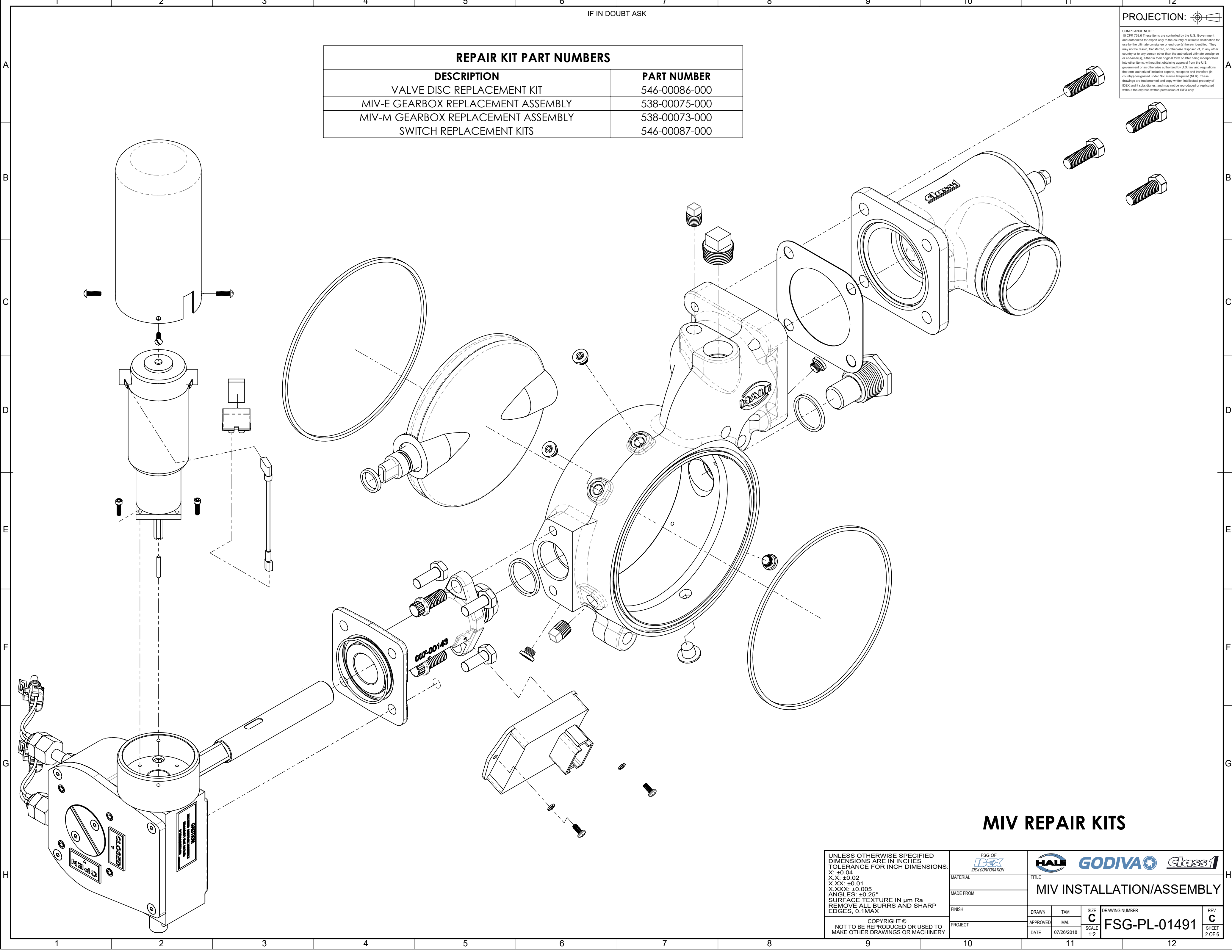
FSG OF IDEX CORPORATION		HALE GODIVA class1	
MATERIAL	TITLE MIV INSTALLATION/ASSEMBLY		
MADE FROM	DRAWN	TAM	SIZE C
FINISH	APPROVED	MAL	DRAWING NUMBER FSG-PL-01491
PROJECT	DATE	07/28/2018	SCALE 1:3
			REV C
			SHEET 1 OF 6

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REPAIR KIT PART NUMBERS	
DESCRIPTION	PART NUMBER
VALVE DISC REPLACEMENT KIT	546-00086-000
MIV-E GEARBOX REPLACEMENT ASSEMBLY	538-00075-000
MIV-M GEARBOX REPLACEMENT ASSEMBLY	538-00073-000
SWITCH REPLACEMENT KITS	546-00087-000



**MIV REPAIR KITS**

<small>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS: X: ±0.04 X.X: ±0.02 X.XX: ±0.01 X.XXX: ±0.005 ANGLES: ±0.25° SURFACE TEXTURE IN µm Ra REMOVE ALL BURRS AND SHARP EDGES, 0.1MAX</small>	<small>FSG OF</small> 			
	<small>MATERIAL</small> <small>MADE FROM</small>		<small>TITLE</small> <b>MIV INSTALLATION/ASSEMBLY</b>	
<small>FINISH</small>		<small>DRAWN</small> TAM	<small>TAM</small>	<small>SIZE</small> C
<small>PROJECT</small>		<small>APPROVED</small> MAL	<small>DATE</small> 07/28/2018	<small>SCALE</small> 1:2
<small>COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY</small>			<small>DRAWING NUMBER</small> <b>FSG-PL-01491</b>	<small>REV</small> C SHEET 2 OF 6



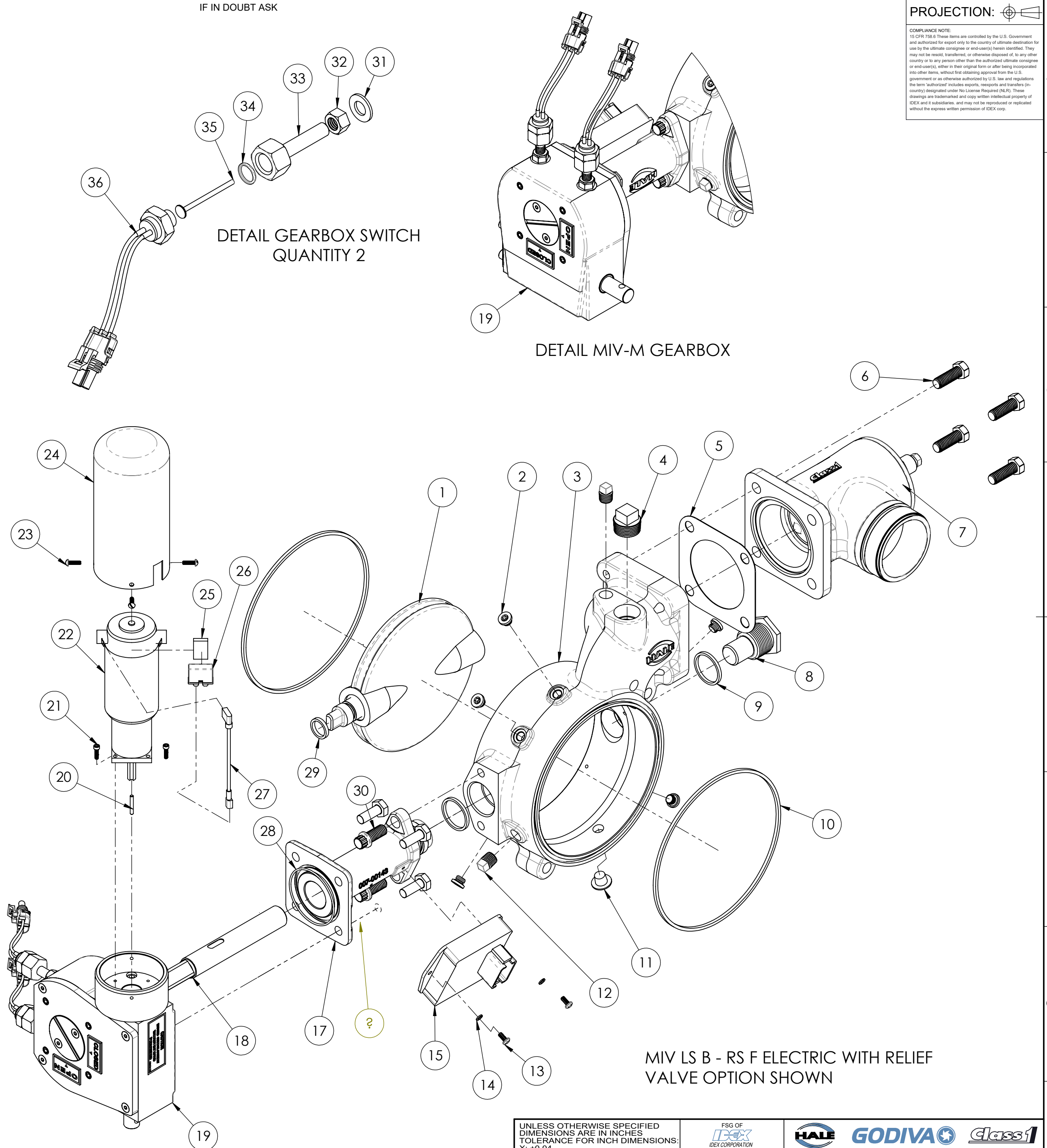
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	505-0230-00-0	MIV DISC	1
2	082-30100-611	PLUG, 1/8 BSPP, PLTD BRASS	5
3	038-1741-00-0	MIV VALVE BODY	1
4	217-0501-00-0	PLUG-3/4 NPT M.I.	1
5	046-0050-00-0	GASKET, 115 FLANGE	1
6	018-1812-02-0	SCREW, 7/16-14 X 1-1/4L	4
7	SEE TABLE 'A'	VALVE, ASSEM., RELIEF	1
8	041-0520-00-0	MIV TRUNNION	1
9	040-9160-00-0	SQUARE SEAL RING 1.40" O.D.	2
10	142-0110-00-0	SQUARE SEAL RING	2
11	217-4003-05-0	1/4" CAR PLUG	1
12	217-0201-00-0	1/4 NPT SQUARE HEAD STEEL PLUG	2
13	102521	SCREW, PAN PH 8-32X.38 SS	2
14	097-0620-00-0	WASHER 1/4 LOCK STEEL + ZINC	2
15	610-00050	MIV CONTROL MODULE	1
16	018-1610-02-0	CSW HH 3/8-16 X 1.00 Z	4
17	007-00143-000	MIV ADAPTER ASSEMBLY	1
18	037-2110-01-0	SHAFT, MIV ELECTRIC	1
19	SEE TABLE 'B'	MIV GEARBOX	1
20	064-6350-00-0	PIN 1/8X7/8 MIV-E VLV DRIVE	1
21	018-0604-08-0	CSW SH 6-32 X 0.50 ZINC	4
22	200-1250-01-1	MOTOR MIV-E	1
23	018-0604-45-0	SCREW, RD SL 6-32 X 0.50 ZINC	4
24	044-1480-00-0	MIV-E VLV GEARMOTOR COVER	1
25	048-1080-01-0	MOUNTING PAD	1
26	200-1240-00-0	CIRCUIT BREAKER	1
27	013-1360-00-0	SR4-14LR WHITE WIRE	1
28	040-00036-000	O-RING, 2-036 BUNA-N	1
29	040-1159-00-0	SQUARE SEAL RING .870" O.D.	1
30	018-1810-22-0	SCREW 7/16-14 X 1.00 12-PT ZINC PL	2
31	097-5730-01-0	WASHER, FLAT M10 SS	2
32	105218	NUT, FINISHED 3/8-16 SS	2
33	008-0791-00-0	SWITCH CAP	2
34	040-8210-00-0	SEAL RING	2
35	064-6600-00-0	SWITCH PIN	2
36	200-2450-00-0	SWITCH	2
37	513-0270-05-0	HARN, MIV POWER CABLE WIRINGL (NOT SHOWN)	1

**TABLE 'A' - ITEM 7 - VALVE, ASSEM, RELIEF**

PART NUMBER	DESCRIPTION	QTY.
538-1920-00-0	VALVE, RELIEF, 2.5 SUCTION, VIC	1
538-1920-10-0	VALVE, RELIEF, 2.5 SUCTION, NPT	1
538-1920-20-0	VALVE, RELIEF, 2.5 SUCTION, NST	1

**TABLE 'B' - ITEM 19 - MIV GEARBOX**

PART NUMBER	DESCRIPTION	QTY.
538-00074-000	MIV-E GEARBOX ASSEMBLY	1
538-00072-000	MIV-M GEARBOX ASSEMBLY	1



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 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra REMOVE ALL BURRS AND SHARP EDGES, 0.1MAX

**FSG OF IDEX CORPORATION**

**HALE GODIVA class1**

**MIV INSTALLATION/ASSEMBLY**

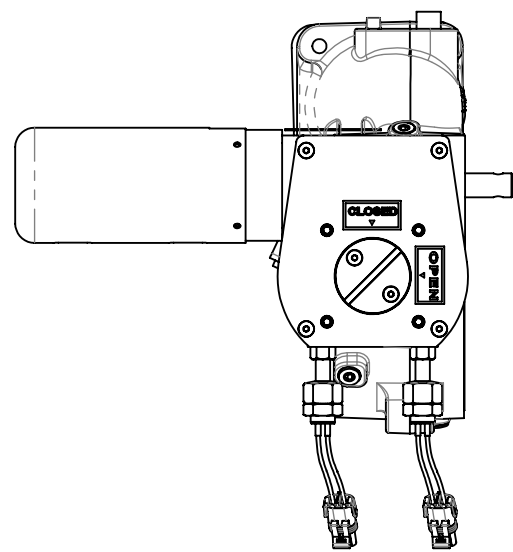
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 REV: C SHEET 3 OF 6

IF IN DOUBT ASK

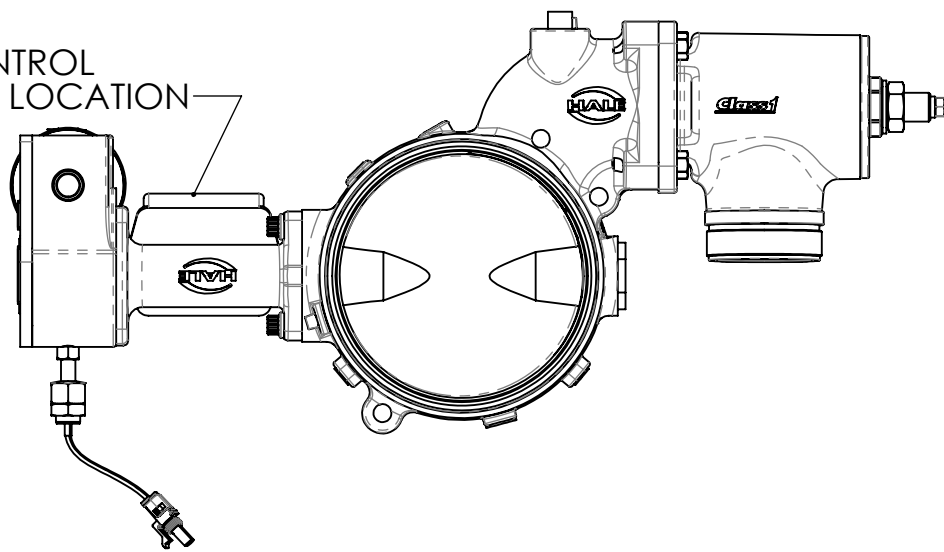
PROJECTION: 

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MIV-E SIDE

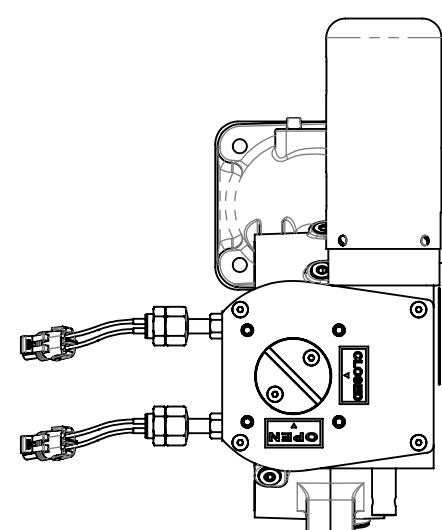


MIV CONTROL MODULE LOCATION

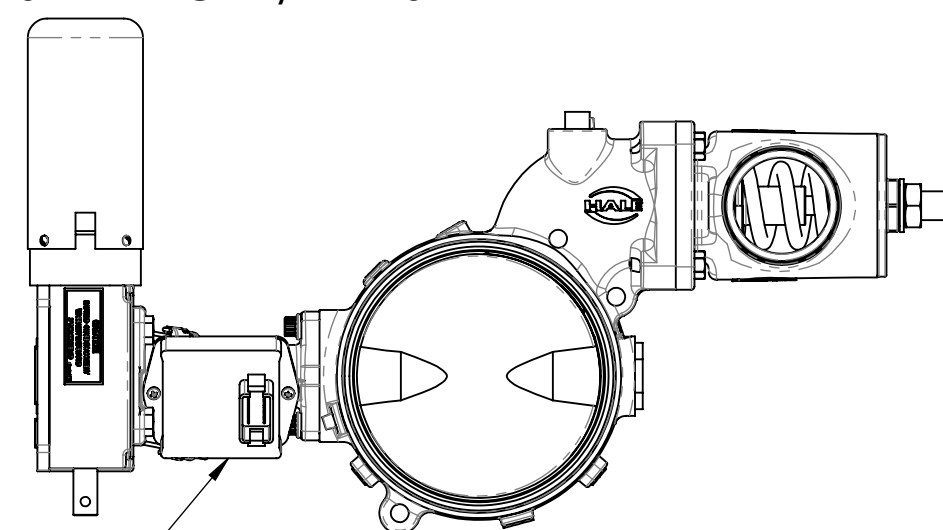


PART NUMBER	DESCRIPTION
538-1561-12-0	MIV-E SIDE W/ NO RELIEF VALVE
538-1561-33-0	MIV-E SIDE W/ NO RELIEF VALVE (PUMP MOUNTED)
538-1561-31-0	MIV-E SIDE W/ 2.5 SST R.V.-VIC
538-1561-21-0	MIV-E SIDE W/ 2.5 SST R.V.-NPT
538-1561-19-0	MIV-E SIDE W/ 2.5 SST R.V.-NH/NST

MIV-E BOTTOM SUCTION  
RIGHT SIDE FRONT/LEFT SIDE REAR

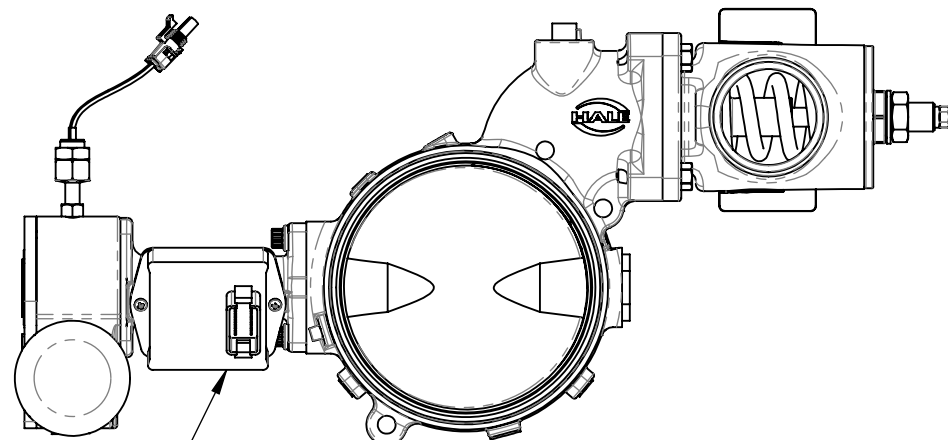
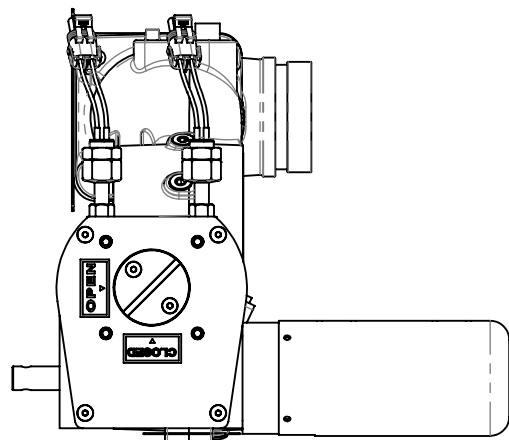


MIV CONTROL MODULE LOCATION



PART NUMBER	DESCRIPTION
538-1561-52-0	MIV-E BOTTOM LS-FR RS-RE W/ NO RELIEF VALVE
538-1561-43-0	MIV-E BOTTOM RS-FR LS-RE W/ 2.5 SST R.V.-VIC
538-1561-32-0	MIV-E BOTTOM RS-FR LS-RE W/ 2.5 SST R.V.-NPT
538-1561-35-0	MIV-E BOTTOM RS-FR LS-RE W/ 2.5 SST R.V.-NH/NST
538-1561-26-0	MIV-E, B.S. L.S

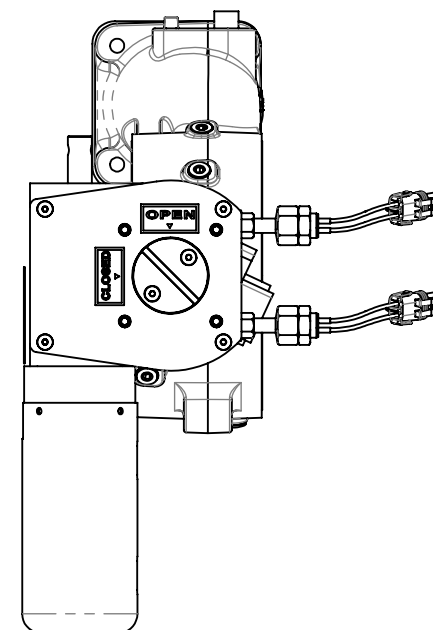
MIV-E T-PORT



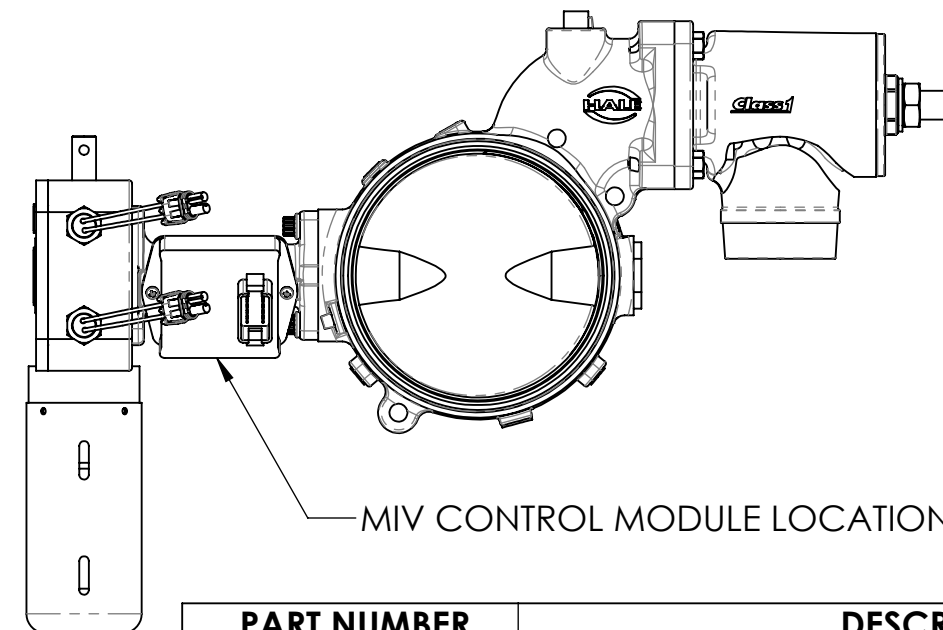
MIV CONTROL MODULE LOCATION

PART NUMBER	DESCRIPTION
538-1561-61-0	MIV-E T-PORT
538-1561-62-0	MIV-E T-PORT PUMP MOUNTED

MIV-E BOTTOM SUCTION  
LEFT SIDE FRONT/RIGHT SIDE REAR

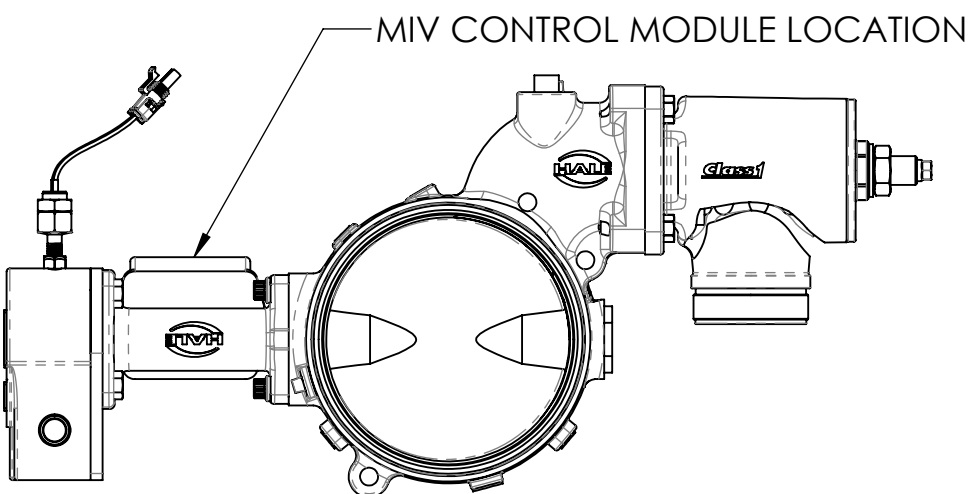
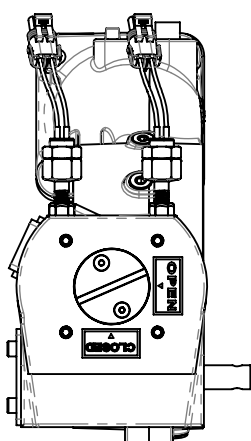


MIV CONTROL MODULE LOCATION



PART NUMBER	DESCRIPTION
538-1561-51-0	MIV-E BOTTOM LS-FR RS-RE W/ NO RELIEF VALVE
538-1561-29-0	MIV-E BOTTOM LS-FR RS-RE W/ 2.5 SST R.V.-VIC
538-1561-30-0	MIV-E BOTTOM LS-FR RS-RE W/ 2.5 SST R.V.-NPT
538-1561-28-0	MIV-E, B.S. R.S

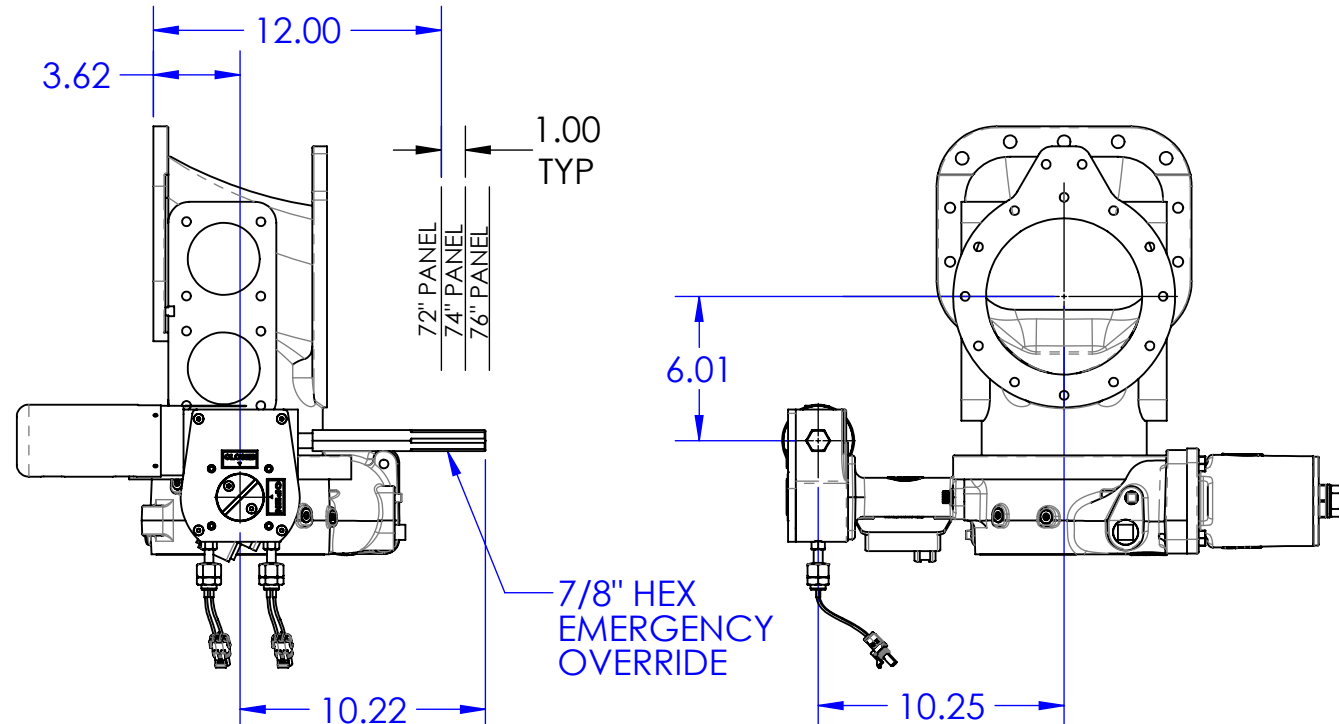
MIV-M SIDE



MIV CONTROL MODULE LOCATION

PART NUMBER	DESCRIPTION
538-00070-001	MIV-M MANUAL FOR STOCK
538-00070-000	MIV-M MANUAL VALVE
538-1561-01-0	MIV-M SIDE MANUAL
538-1561-07-0	MIV-M INLET VALVE W/ 2.5 SST R.V.-VIC
538-1561-06-0	MIV-M INLET VALVE W/ 2.5 SST R.V.-NPT
538-1561-05-0	MIV-M INLET VALVE W/ 2.5 SST R.V.-NH/NST

MIV BOTTOM MOUNTED OVERRIDE POSITION



VERRIDE POSITION  
72", 74" & 76" PANELS

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.1MAX

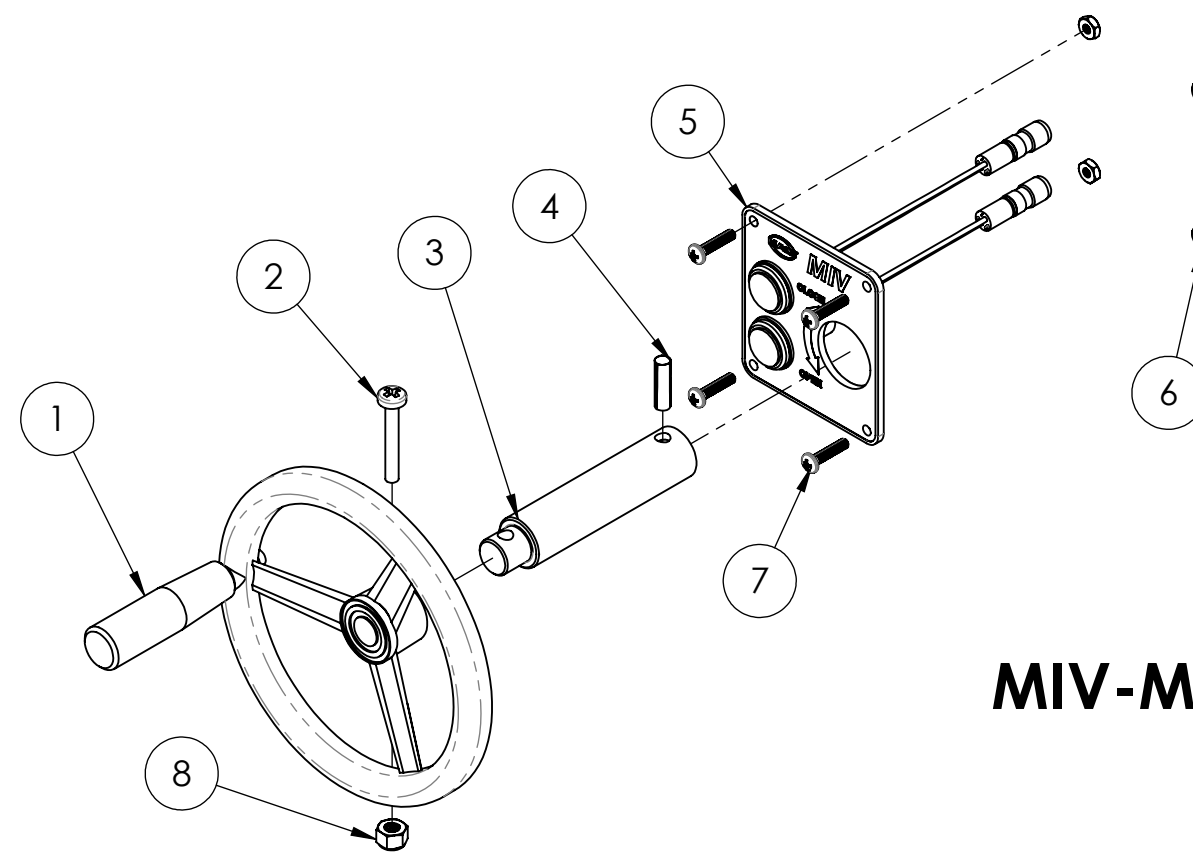
FSG OF IDEX CORPORATION		HALE GODIVA class1	
MATERIAL	TITLE	MIV INSTALLATION/ASSEMBLY	
MADE FROM	DRAWN	TAM	SIZE C
FINISH	APPROVED	MAL	SCALE 1:5
PROJECT	DATE	07/28/2018	DRAWING NUMBER FSG-PL-01491
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY			REV C SHEET 4 OF 6

MIV CONFIGURATIONS



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	513-0273-52-0	MIV-E PLACARD & HARNESS ASSEMBLY	1
2	102525	NUT, 8-32 HEX, SS	8
3	064-7330-00-0	MIV EXTENSION GROOVE PIN	2
4	113404-007	ADAPTOR, MIV-E HANDLE	1
	113404-004	ADAPTOR, MIV-E HANDLE	
5	101-1482-02-0	MIV-E MANUAL OVERRIDE PLACARD	1
6	012-1420-00-0	MIV MANUAL OVERRIDE KNOB	1
7	102529	SCREW, PAN PH 8-32 X 0.75 SS	8
8	018-1212-63-0	SCREW-1/4-20 X 1-1/4 PLTD	1
9	513-00144-000	HARN, MIV CONTROL (NOT SHOWN)	1
10	513-0270-04-0	HARN, MIV POWER CABLE WIRING (NOT SHOWN)	1

IF IN DOUBT ASK



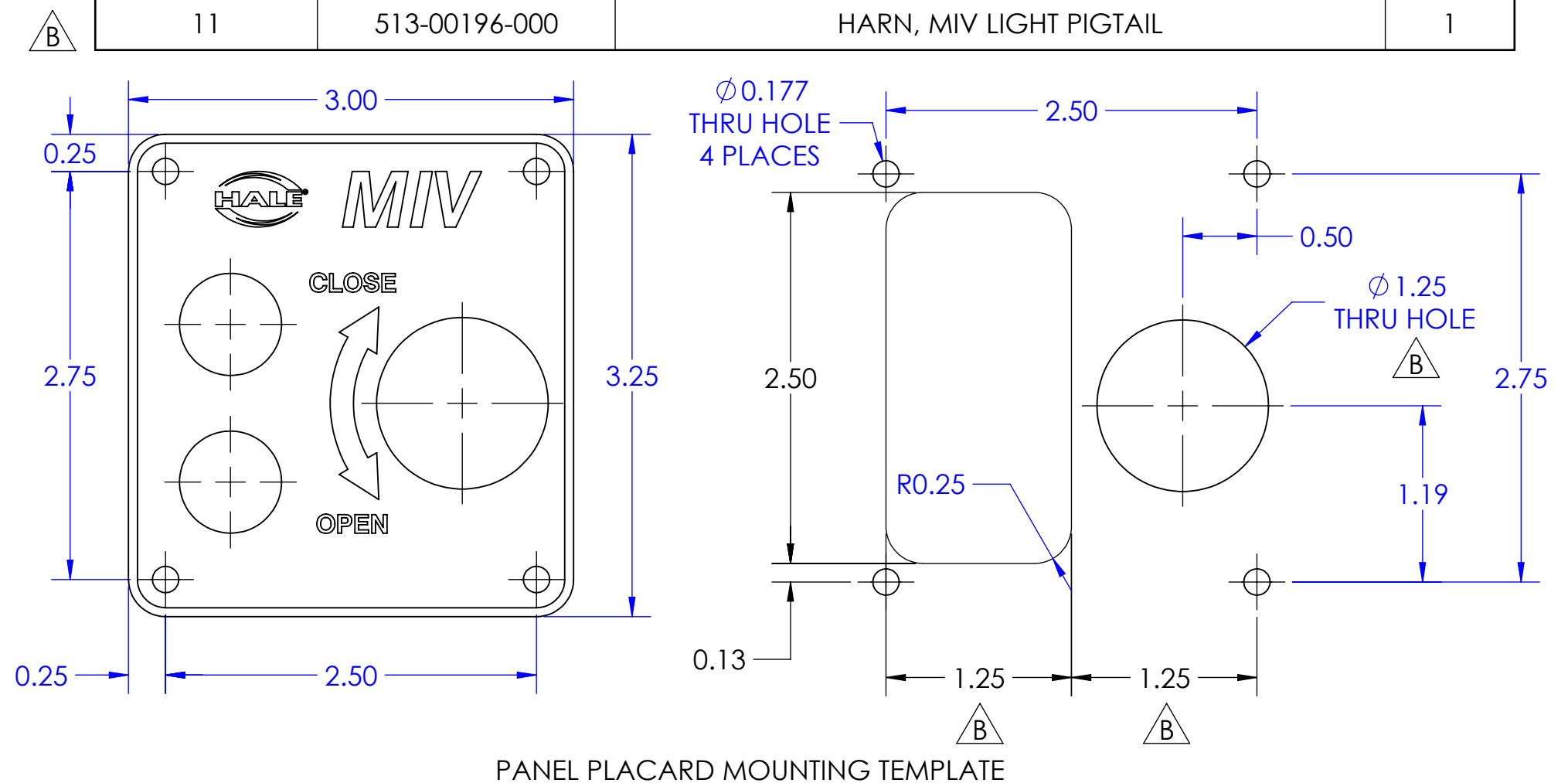
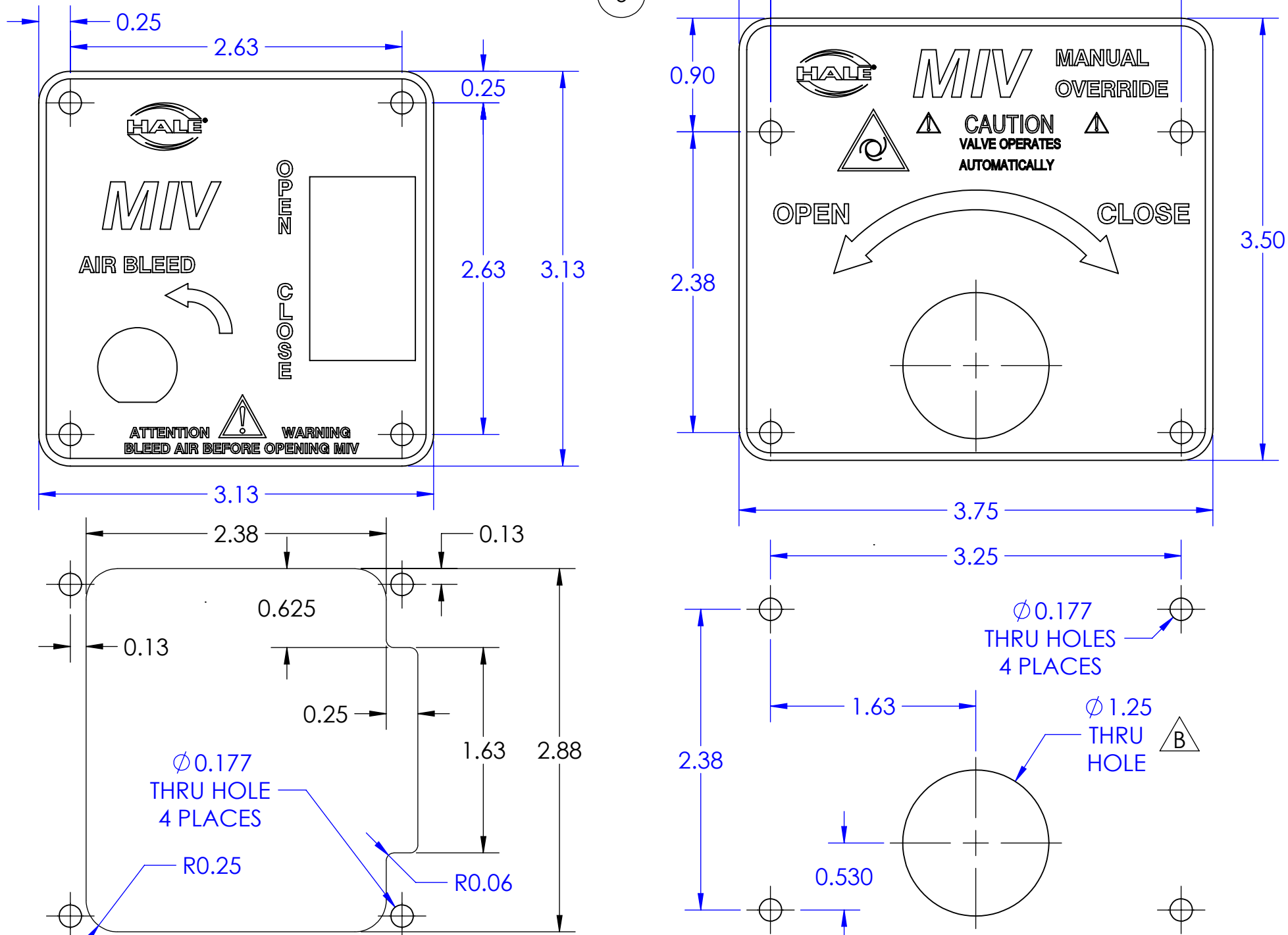
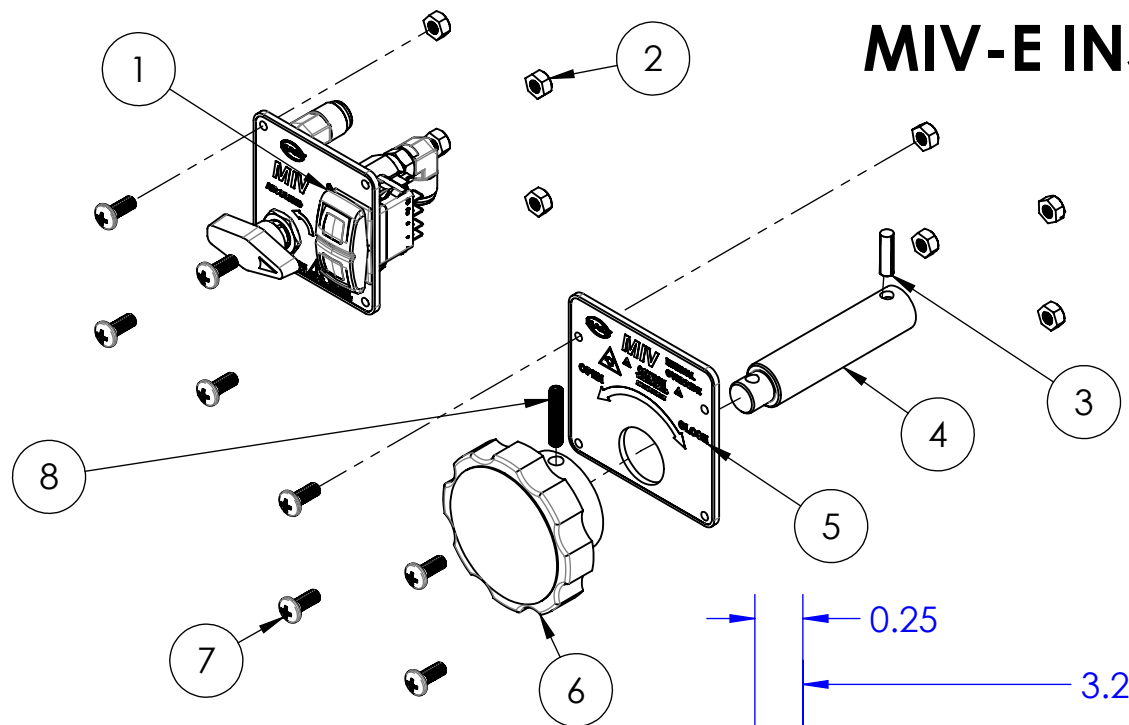
**PROJECTION:**

COMPLIANCE NOTE:  
15 CFR 758.6 These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be re-exported, transferred, or otherwise disposed of, to any other country or to any person other than the authorized ultimate consignee or end-user(s), either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. Government or as otherwise authorized by U.S. law and regulations. The term "authorized" includes exports, re-exports and transfers (in-country) designated under No License Required (NLR). These drawings are trademarks and copy written intellectual property of IDEX and its subsidiaries, and may not be reproduced or replicated without the express written permission of IDEX corp.

### MIV-M INSTALLATION KIT

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	512-0070-00-0	ASSY WHEEL MANUAL ADJUSTING	1
2	018-1214-45-0	SCREW,RND HEAD,1/4-20 X 1.5	1
3	113404-007	ADAPTOR, MIV-E HANDLE	1
	113404-004	ADAPTOR, MIV-E HANDLE	
4	064-7330-00-0	MIV EXTENSION GROOVE PIN	1
5	513-0273-53-0	MIV-M PLACARD & HARNESS ASSEMBLY	1
6	102525	NUT, 8-32 HEX, SS	4
7	102529	SCREW, PAN PH 8-32 X 0.75 SS	4
8	110-1205-11-0	NUT, NYLOCK 1/4-20 SS	1
9	513-00144-000	HARN, MIV CONTROL (NOT SHOWN)	1
10	513-0270-04-0	HARN, MIV POWER CABLE WIRING (NOT SHOWN)	1
11	513-00196-000	HARN, MIV LIGHT PIGTAIL	1

### MIV-E INSTALLATION KIT



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra REMOVE ALL BURRS AND SHARP EDGES, 0.1MAX

**FSG OF IDEX CORPORATION**

**HALE GODIVA class1**

**MIV INSTALLATION/ASSEMBLY**

MATERIAL: \_\_\_\_\_  
 MADE FROM: \_\_\_\_\_  
 FINISH: \_\_\_\_\_  
 PROJECT: \_\_\_\_\_

DATE: 07/28/2018

SCALE: 1:3

DRAWING NUMBER: **FSG-PL-01491**

REV: **C** SHEET 5 OF 6

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	538-1541-00-0	AIR BLEEDER PLACARD ASSEMBLY	1
2	102529	SCREW, PAN PH 8-32 X 0.75 SS	2
3	102525	NUT, 8-32 HEX, SS	2

IF IN DOUBT ASK

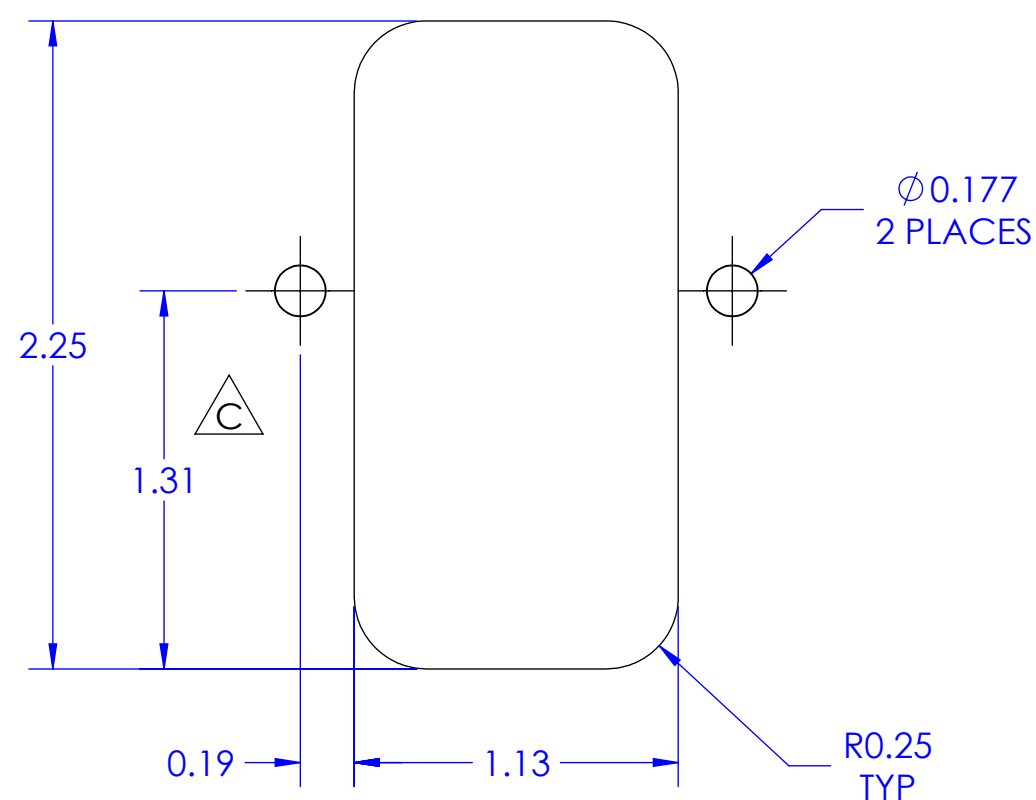
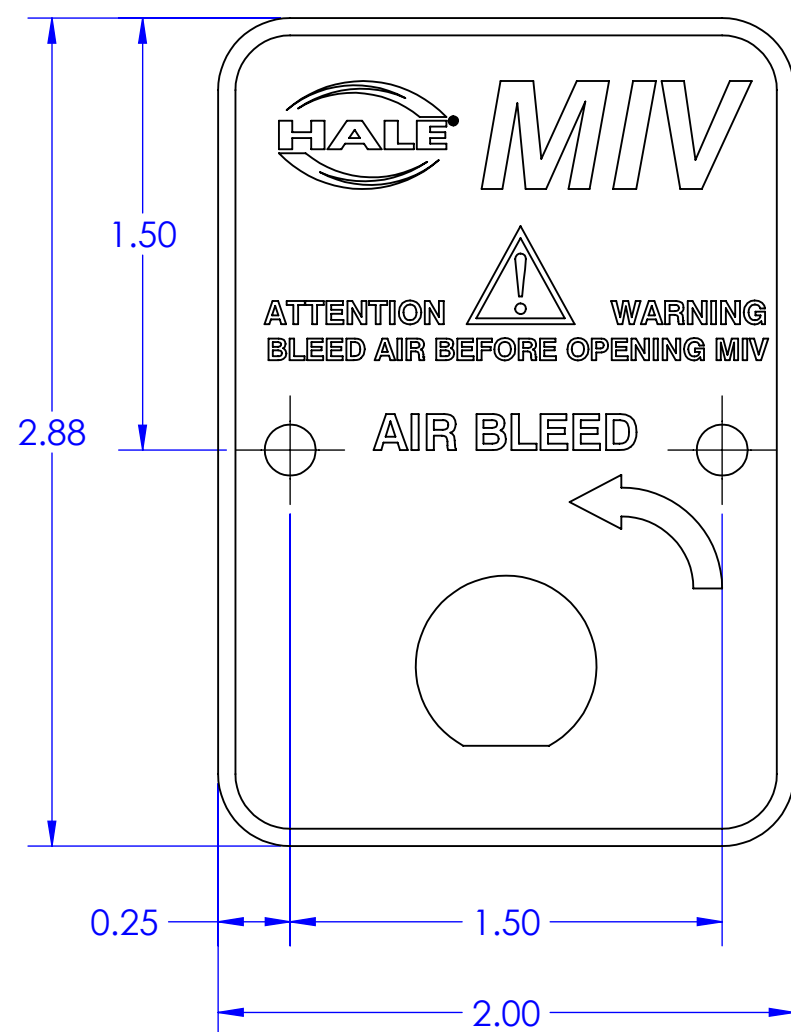
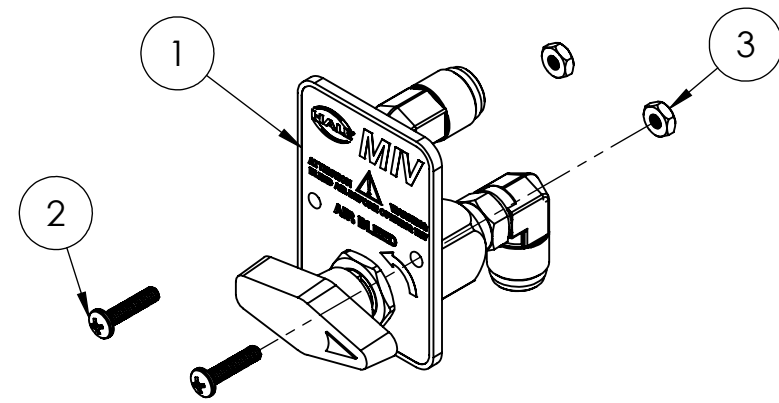
PROJECTION: 

COMPLIANCE NOTE:  
15 CFR 750.6 These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be re-exported, transferred, or otherwise disposed of, to any other country or to any person other than the authorized ultimate consignee or end-user(s), either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. Government or as otherwise authorized by U.S. law and regulations. The term "authorized" includes exports, re-exports and transfers (in-country) designated under No License Required (NLR). These drawings are trademarked and copy written intellectual property of IDEX and its subsidiaries, and may not be reproduced or replicated without the express written permission of IDEX corp.

## AIR BLEEDER VALVE PANEL KIT



NOTE: AIR BLEEDER VALVE KIT TO BE USED WITH MIV MANUAL



PANEL PLACARD MOUNTING TEMPLATE

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN  $\mu\text{m Ra}$   
REMOVE ALL BURRS AND SHARP  
EDGES, 0.1MAX

FSG OF <b>IDEX</b> IDEX CORPORATION		<b>HALE</b> <b>GODIVA</b> <b>Class 1</b>	
MATERIAL	TITLE <b>MIV INSTALLATION/ASSEMBLY</b>		
MADE FROM	FINISH	DRAWN TAM	SIZE <b>C</b>
PROJECT	APPROVED MAL	DATE 07/28/2018	SCALE 1:2
DRAWING NUMBER <b>FSG-PL-01491</b>		REV <b>C</b>	SHEET 6 OF 6



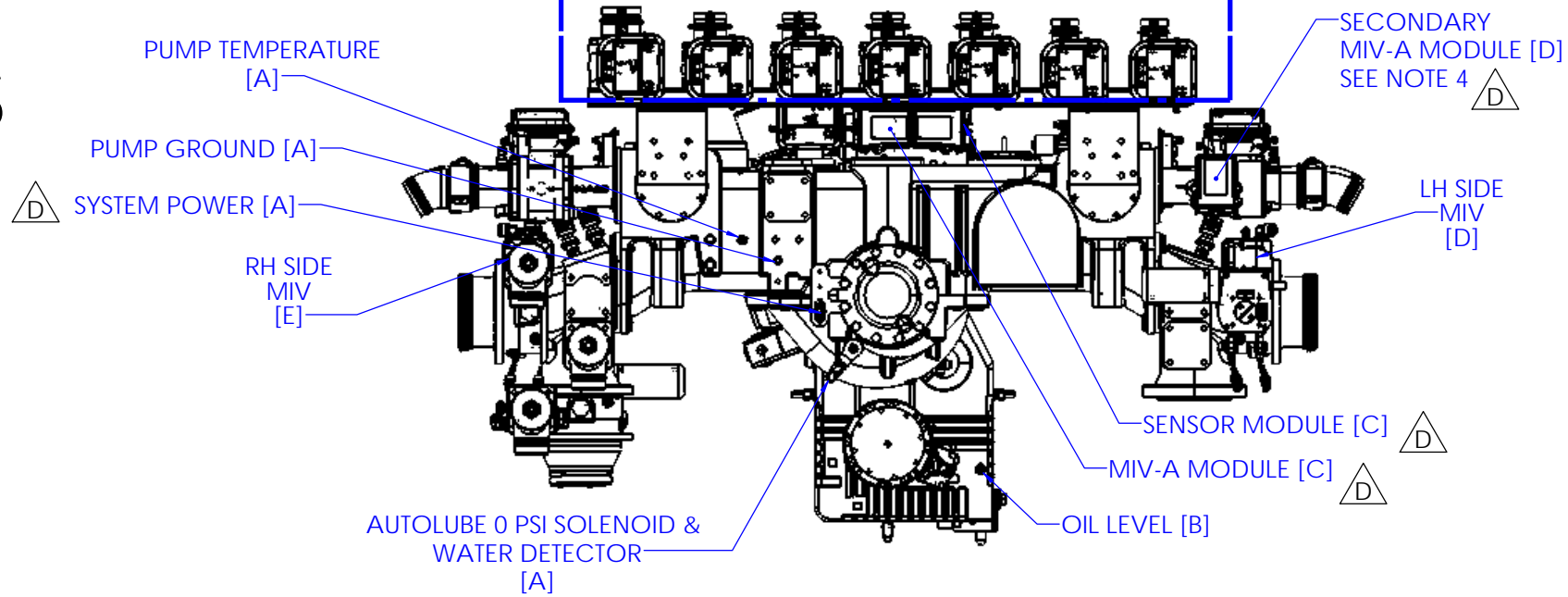
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# SAM QMAX-XS

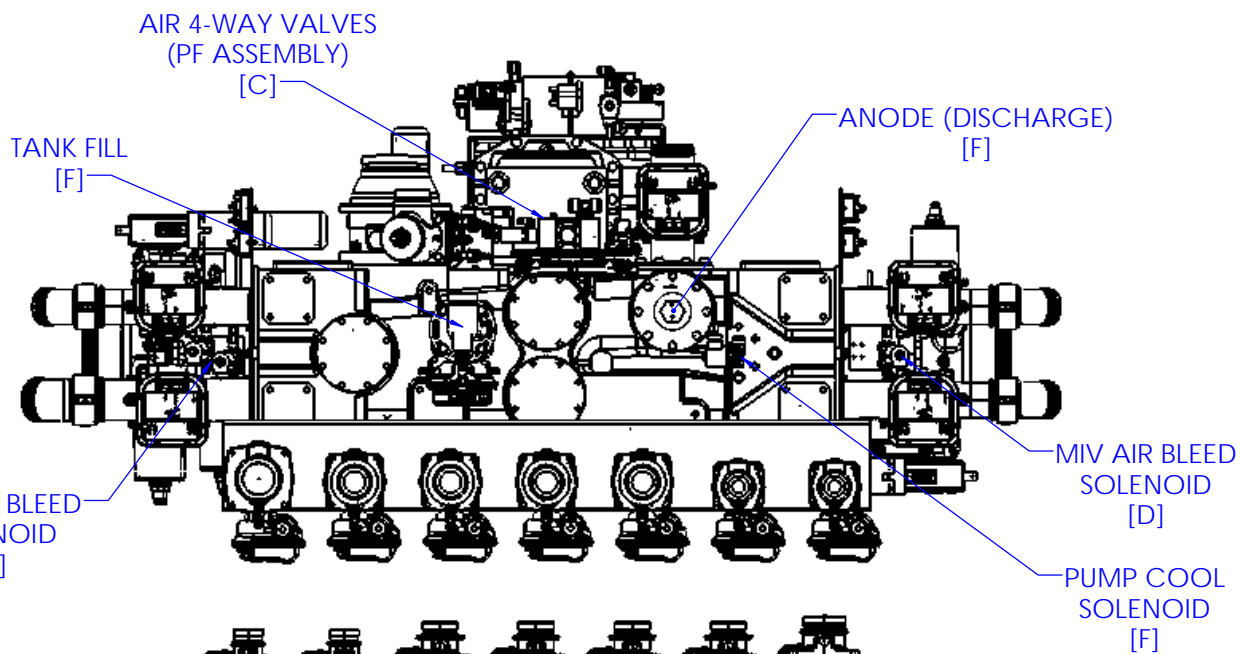
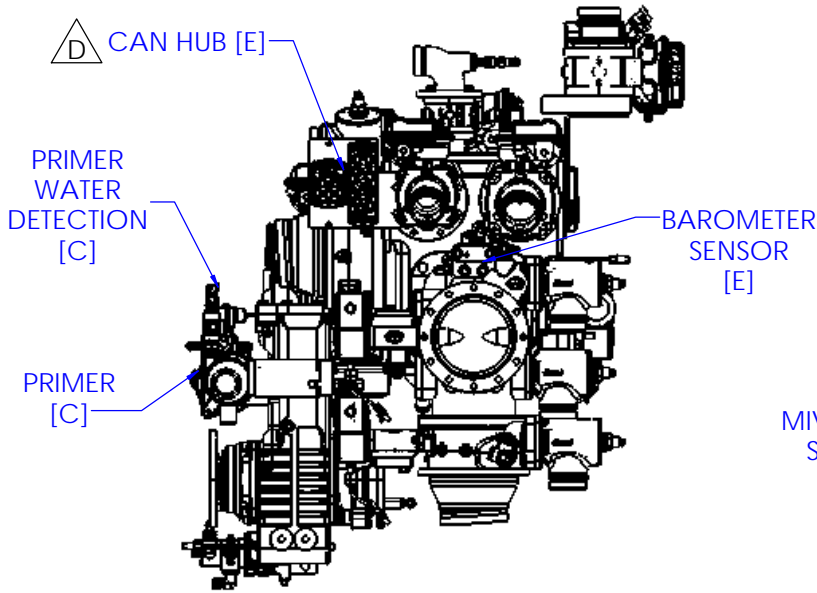
FRONT

SHIP LOOSE VALVES

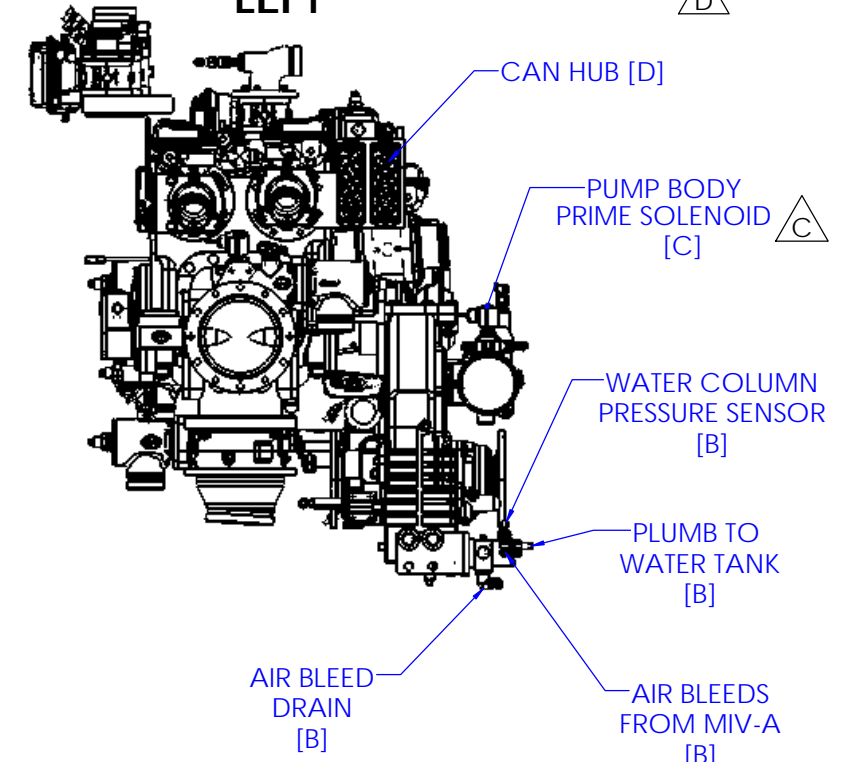
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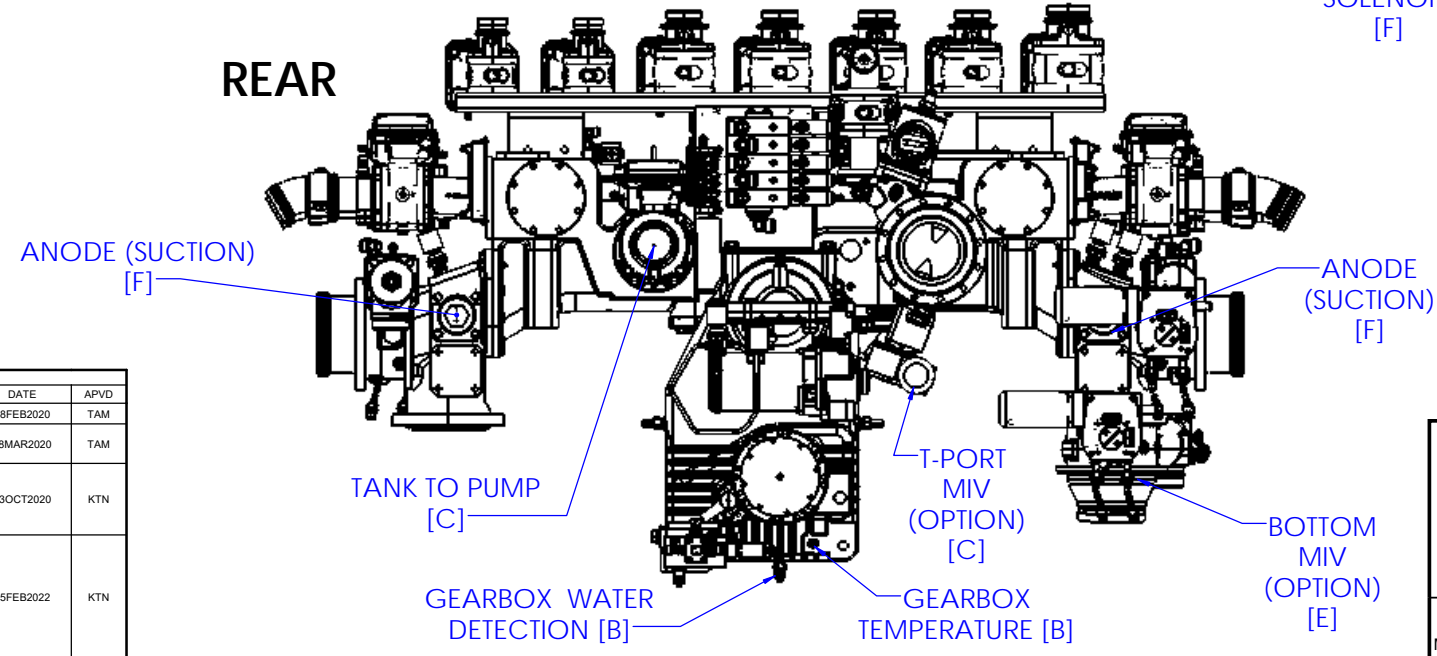
RIGHT



LEFT



REAR



NOTES

- BILL OF MATERIAL DETAILS [A-F] FOR EACH COMPONENT ARE SHOWN IN SUBSEQUENT PAGES OF THIS DRAWING.
- REFERENCE DRAWINGS:
  - BASE QMAX-XS G GEARBOX: PL1207 [INSTALL] & PL1206 [PARTS]
  - BASE QMAX-XS K GEARBOX: FSG-PL-01331 [INSTALL] & FSG-PL-01326 PARTS
  - SAM PANEL COMPONENT DETAILS: FSG-PL-01505
  - SAM CAN NETWORK DIAGRAM: FSG-PL-01504
- SUB-ASSEMBLY DRAWINGS REQUIRED FOR BUILD:
  - 538-00100-000 - WATER TOWER DRAIN MANIFOLD [DETAIL C]
  - 538-00099-001 - PVG BLOCK ASSEMBLY [DETAIL C]
  - FSG-PL-01491 - MIV 2.0 ASSEMBLY [DETAILS C, D, & E]
  - FSG-PL-01506 - SAM VALVE ASSEMBLIES [DETAILS C & E]
  - 538-00101-000 - MIV AIR PRIME CONNECTIONS [DETAILS D & E]
- FOR FOUR OR GREATER MIV, TWO MIV-A MODULES REQUIRED.

REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
	A		ORIGINAL RELEASE	AJG	28FEB2020	TAM
5095	B	3-F4, 5-A4, 5-D4, 6-E4, 7-D4	UPDATED AKRON ELECTRIC ACTUATOR, CORRECTED 038-00107-000 NOTES, ADDED NOTE TO A20, ADDED ADDITIONAL DETAIL TO C1 CONNECTION	KTN	18MAR2020	TAM
5272	C		ADDED ELECTRONIC REPLACEMENT PART NUMBERS, UPDATED MIV-A SOLENOIDS, UPDATED PF4-WAY ASSEMBLY, UPDATED PUMP BODY PRIME SOLENOID LOCATION.	TAM	23OCT2020	KTN
5724	D	B11, B3, D10, D11, D12, E15, F1, 2-F10, 2-J2, 3-D1, 5-A3, 5-A7, 5-E6, 6-A3, 6-B6, 6-C3, 6-F8, 7-A4, 7-C3, 7-E4	UPDATED FOR CAN NETWORK MODULE SYSTEM.	TAM	25FEB2022	KTN

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCHES DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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MATERIAL		TITLE					
MADE FROM		SAM COMPONENT DIAGRAM QMAX-XS					
FINISH		DRAWN	MB	SIZE	DRAWING NUMBER		
PROJECT		APPROVED	TAM	D	FSG-PL-01501		
		DATE	28FEB2020	SCALE	1:8		
				REV	D		
				SHEET 1 OF 8			

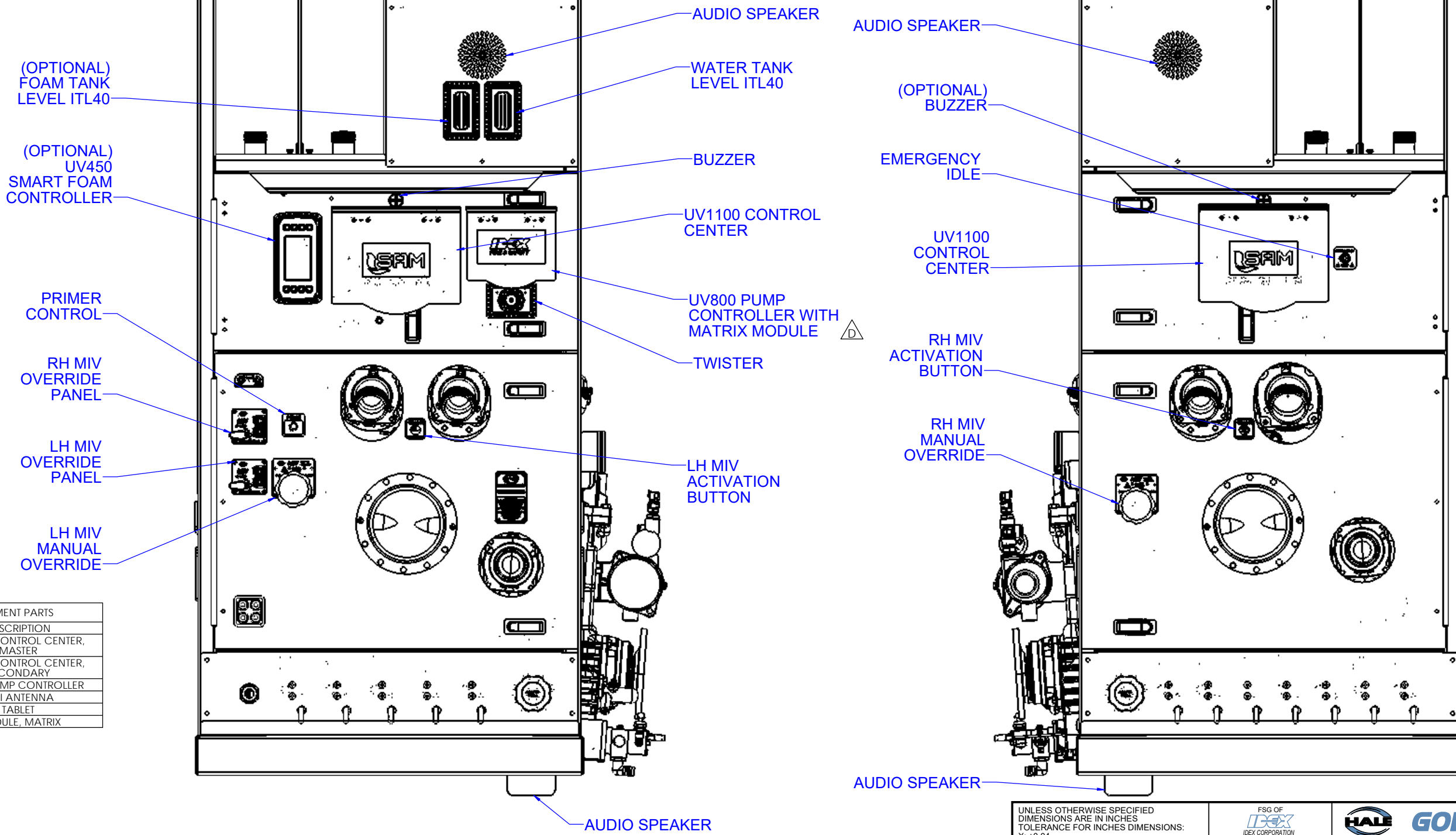


LH (DRIVER)

RH (OFFICER)

# RECOMMENDED PANEL LAYOUT FOR SAM CONTROLS

(Reference FSG-PL-01503 for component details.)



(OPTIONAL)  
FOAM TANK  
LEVEL ITL40

(OPTIONAL)  
UV450  
SMART FOAM  
CONTROLLER

PRIMER  
CONTROL

RH MIV  
OVERRIDE  
PANEL

LH MIV  
OVERRIDE  
PANEL

LH MIV  
MANUAL  
OVERRIDE

AUDIO SPEAKER

WATER TANK  
LEVEL ITL40

BUZZER

UV1100 CONTROL  
CENTER

UV800 PUMP  
CONTROLLER WITH  
MATRIX MODULE

TWISTER

LH MIV  
ACTIVATION  
BUTTON

AUDIO SPEAKER

AUDIO SPEAKER

(OPTIONAL)  
BUZZER

EMERGENCY  
IDLE

UV1100  
CONTROL  
CENTER

RH MIV  
ACTIVATION  
BUTTON

RH MIV  
MANUAL  
OVERRIDE





AUDIO SPEAKER

ELECTRONIC REPLACEMENT PARTS	
PART NO.	DESCRIPTION
610-00060-210-50	UV1100 CONTROL CENTER, MASTER
610-00060-110-50	UV1100 CONTROL CENTER, SECONDARY
610-00060-080-50	UV800 PUMP CONTROLLER
629-00077-50	WIFI ANTENNA
610-00076-001-50	TABLET
610-00052	MODULE, MATRIX

REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCHES DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

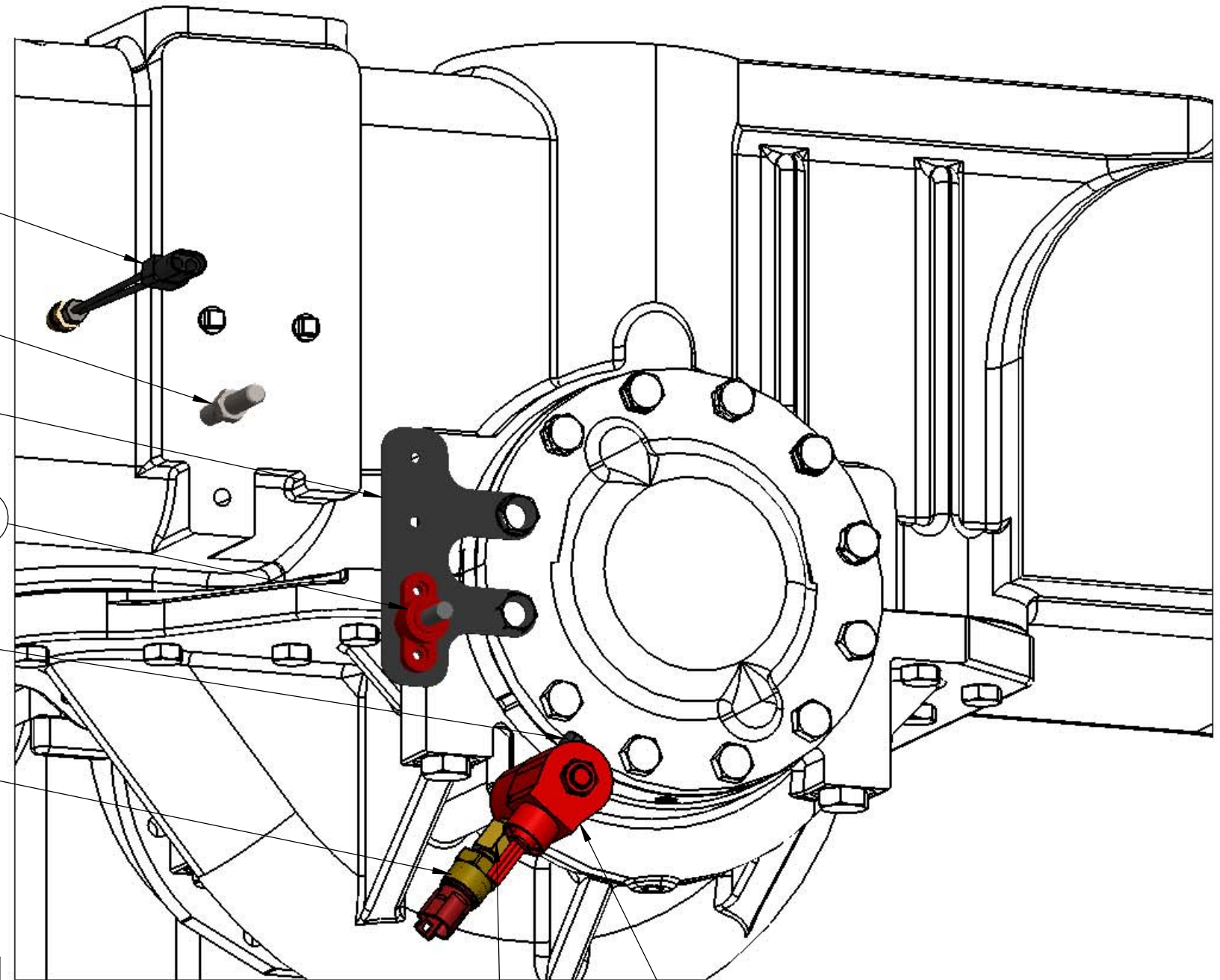
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MATERIAL		TITLE		DRAWN		REV	
MADE FROM		SAM CONTROL PANEL LAYOUT QMAX-XS		MB		D	
FINISH		DATE		APPROVED		SCALE	
PROJECT		28FEB2020		TAM		1:5	
DRAWING NUMBER				SHEET			
FSG-PL-01501				2 OF 8			

IF IN DOUBT ASK

PROJECTION: 

A10 A11  
MOUNT SHORT  
SIDE INTO PUMP A9




**△ D DETAIL A - PUMP FRONT**

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
A1	019-03022-000	BRACKET, POWER STUD	1	N/A
A2	627-00038	STUD, POWER	1	N/A
A3	110-1000-11-0	NUT, 10-24 SST NYLON LOCK	2	MOUNT TO A1
A4	018-01006-080	SCREW, PH 10-24 X 3/4 SST	2	MOUNT TO A1
A5	082-00200-399	NIPPLE, 1/4" MNPT HEX, BRASS	1	INSTALL TO "IN" SIDE OF A8
A6	200-00143-000	SENSOR, WATER DETECTION	1	HARNESS 513-00223-000 "AUTOLUBE WATER IN OIL SENSOR"
A7	082-0248-02-0	ADAPTER, 1/4" MNPT X 1/4" FNPT	1	N/A
A8	038-00100-000	SOLENOID, 0 PSI	1	HARNESS 513-00223-000 "AUTOLUBE 0 PSI SOLENOID"
A9	018-80003-999	STUD, 7/16-14 X 2.63 STEEL	1	N/A
A10	200-1161-00-0	TEMPERATURE SENSOR, 10KP	1	HARNESS 513-00223-000 "SUCTION TEMP SENSOR"
A11	082-0214-02-0	REDUCER, BSHG 1/4 MNPT X 1/8 FNPT BRASS	1	N/A

**△ B**

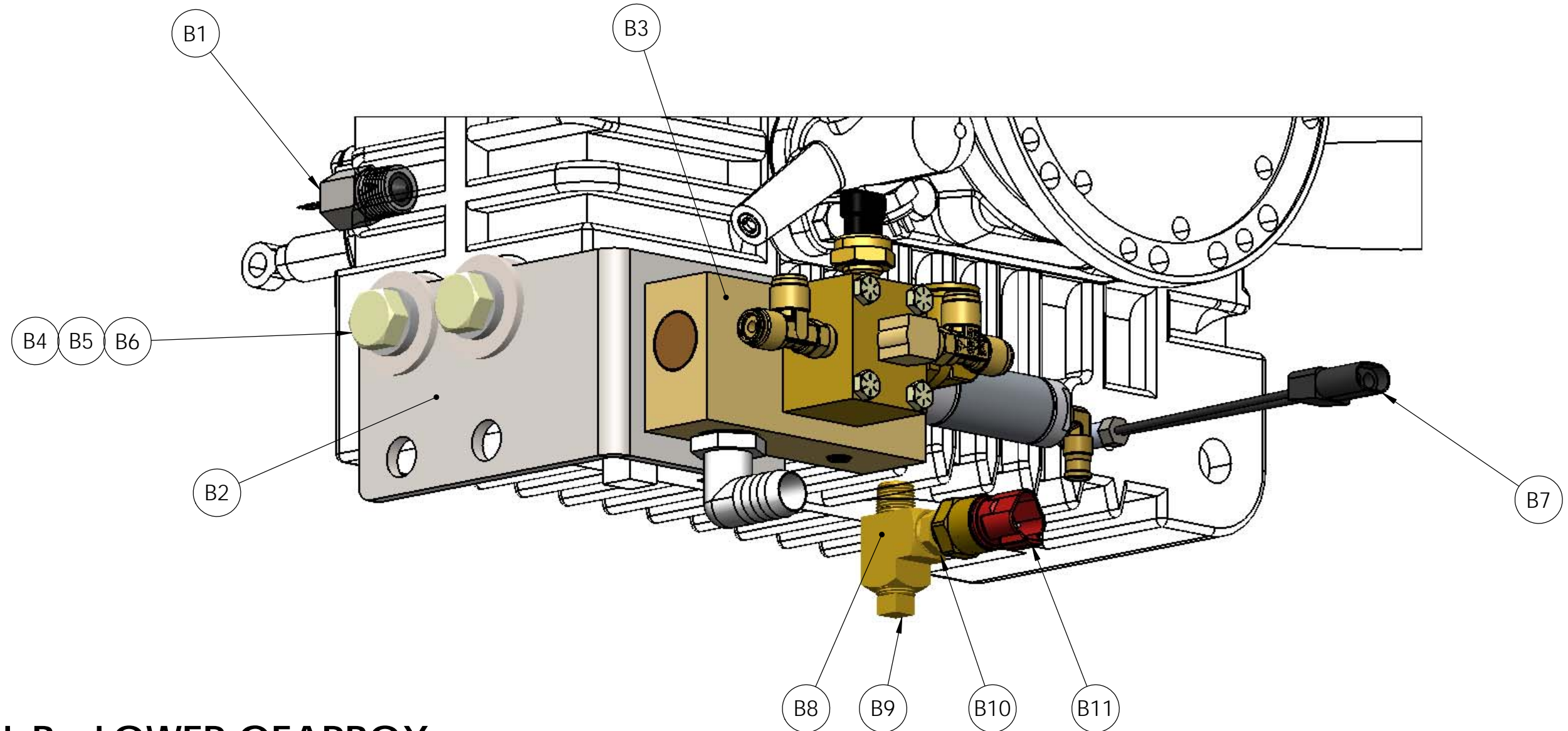
UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

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		<b>TITLE</b> SAM COMPONENTS QMAX-XS - DETAIL A	
MATERIAL	MADE FROM	FINISH	PROJECT
DRAWN	APPROVED	DATE	SIZE <b>B</b> SCALE 1:3
MB	TAM	28FEB2020	DRAWING NUMBER <b>FSG-PL-01501</b>
REV	SHEET		3 OF 8
<b>D</b>			

IF IN DOUBT ASK

PROJECTION: 



## DETAIL B - LOWER GEARBOX

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
B1	200-00144-000	SENSOR, OIL LEVEL	1	HARNESS 513-00223-000 "GB OIL LEVEL SENSOR"
B2	019-03101-001	BRACKET, DRAIN MANIFOLD	1	N/A
B3	538-00100-000	ASY, SAM DRAIN MANIFOLD	1	FOLLOW ASY DWG INSTRUCT.; CONNECT SENSOR TO HARNESS 513-00223-000 "WATER COLUMN SENSOR"
B4	018-2414-25-0	BOLT, HH 5/8-11 X 1.5 LG GR8	2	MOUNT TO GEARBOX
B5	106923	WASHER, 5/8 SPLIT LOCK STEEL	2	MOUNT TO B2
B6	108709	WASHER, 5/8 X 1.75 OD FLAT STEEL	4	MOUNT TO B2
B7	200-1161-00-0	SENSOR, TEMPERATURE 10KP	1	HARNESS 513-00223-000 "GB OIL TEMP SENSOR"
B8	120228	TEE, 3/8 NPT, STREET, M X F X F, BRASS	1	N/A
B9	217-0301-01-0	PLUG, 3/8 MNPT, SQUARE, BRASS	1	N/A
B10	082-0302-02-0	ADAPTER, 3/8 MNPT X 1/4 FNPT, BRASS	1	N/A
B11	200-00143-000	SENSOR, WATER DETECTION	1	HARNESS 513-00223-000 "GB OIL IN WATER SENSOR"

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

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MATERIAL		TITLE		REV	
MADE FROM		DRAWN MB		D	
FINISH		APPROVED TAM		SHEET	
PROJECT		DATE 28FEB2020		4 OF 8	
SCALE 1:2		DRAWING NUMBER		FSG-PL-01501	
SIZE B		HALE GODIVA class1		SAM COMPONENTS QMAX-XS - DETAIL B	

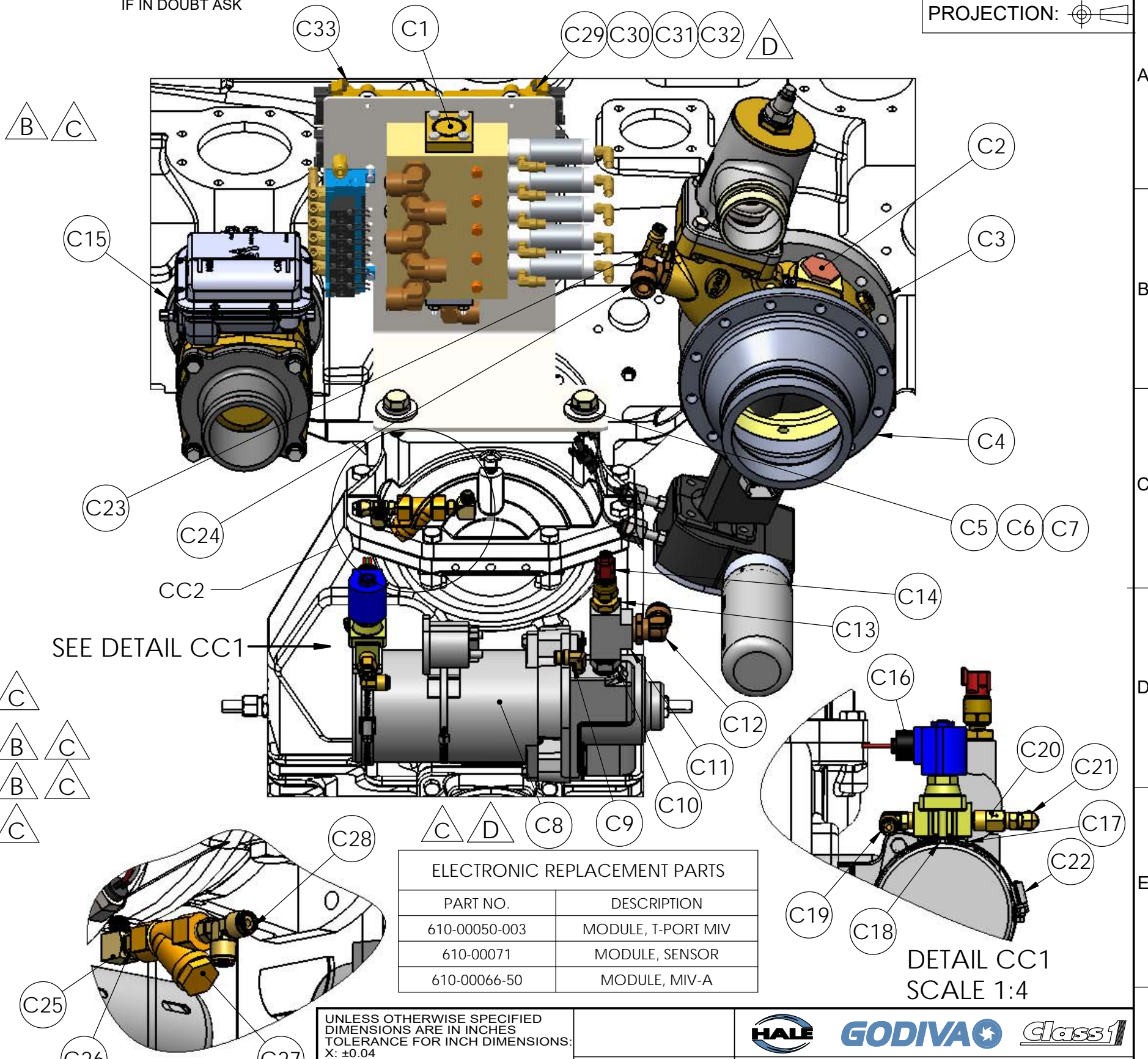


# DETAIL C - PUMP REAR

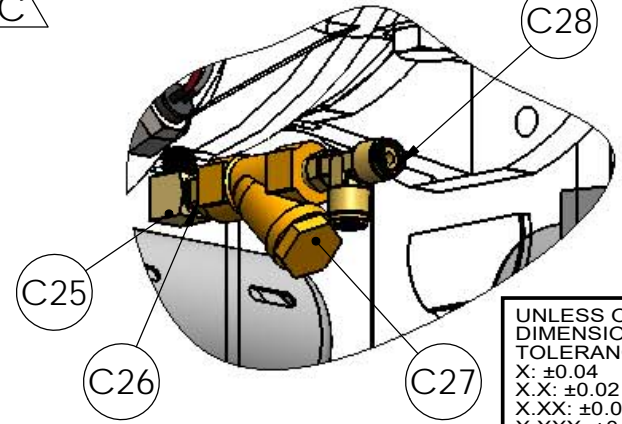
IF IN DOUBT ASK

PROJECTION:

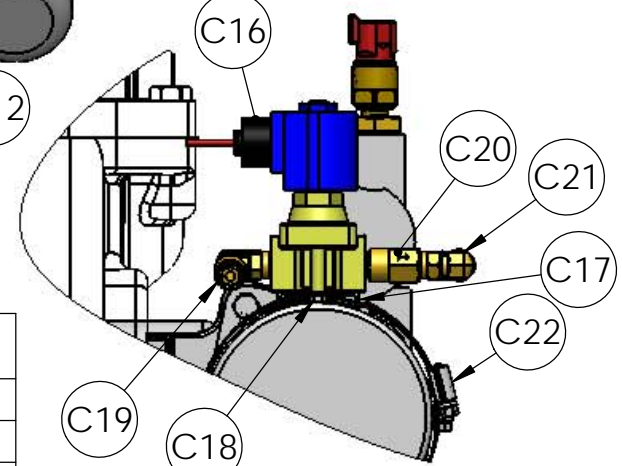
ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
C1	538-00099-001	PF / 4-WAY VALVE ASSEMBLY	1	REFER TO DWG HARNESS 513-00223-000 "PRE-PRIME #", "PUMP BODY PRIME", "AB DRAIN" FOR DUAL MIV-A MODULES, ADD HARNESS 513-00145-004 "PRE-PRIME #"
C2	FSG-PL-01491	MIV 2.0 ASSEMBLY [T-PORT]	1	REFER TO DWG: HARNESS 513-00144-000 "MOTOR MODULE", "ACT MOTOR", "OPEN SW", & "CLOSE SW"
C3	115-0440-02-0	SPACER, 1" THICK SUCTION	1	N/A
C4	007-3490-01-0	ADAPTER, MIV 5" W/ 4" VIC	1	T-PORT
C5	018-2414-25-0	BOLT, HH 5/8-11 X 1.5 LG STEEL	2	MOUNT TO GEARBOX
C6	106923	WASHER, 5/8 SPLIT LOCK STEEL	2	MOUNT TO C1
C7	108709	WASHER, 5/8 X 1.75 OD FLAT STEEL	2	MOUNT TO C1
C8	501-3090-00-0	PRIMER, 12VDC	1	HARNESS 513-00223-000 "PRIMER INPUT" HARNESS 513-00223-000 "PRIMER DRIVER"
C9	104599	ELBOW SWVL 90° 1/8" MNPT X 3.8" POH, BRASS	1	CONNECT TO PART C21
C10	118265	NIPPLE, HEX 2X 3/4" MNPT, BRASS	1	N/A
C11	082-0560-02-0	TEE, 3/4" FNPT, BRASS	1	N/A
C12	105590	ELBOW SWVL 90° 3/4 MNPT X 3/4 POH, BRASS	1	CONNECT TO ASSEMBLY C1
C13	082-0513-02-0	REDUCER BUSHING, 3/4 MNPT X 1/4 FNPT, BRASS	1	N/A
C14	200-00143-000	SENSOR, WATER DETECTION	1	HARNESS 513-00223-000 "WATER IN PRIMER SENSOR"
C15	FSG-PL-01506	VALVE, TANK TO PUMP	1	REFER TO DRAWING: HARNESS 513-00192-00x "TANK TO PUMP"
C16	538-00103-000	VALVE, SOLENOID	1	HARNESS 513-00223-000 "QUICK PRIME SOLENOID"
C17	019-03922	BRACKET, PRIMER SOLENOID	1	MOUNT TO C8
C18	218-00103-008	BOLT, HH M5 X 8MM	1	MOUNT TO C17
C19	104601	ELBOW, 1/4 MNPT X 3/8 POH	1	CONNECT TO PART C28
C20	538-00095-000	CHECK VALVE 1/4 NPT, M X F	1	INSTALL ARROW AWAY FROM VLV
C21	104601	ELBOW, 1/4 MNPT X 3/8 POH	1	CONNECT TO PART C9
C22	111075	CLAMP, HOSE	1	MOUNT TO C8 & C17
C23	082-00302-102	TEE, 1/4 MNPT X 3/8 POH	1	MOUNT TO MIV
C24	105590	ELBOW, 3/4 MNPT X 3/4 POH	1	MOUNT TO MIV
C25	082-0257-02-0	ELBOW, 1/4 MNPT X 1/4 FNPT	1	CONNECT TO PUMP VOLUTE DRAIN
C26	082-0253-02-0	NIPPLE, 1/4 HEX	1	N/A
C27	010-0710-00-0	1/4 WYE STRAINER	1	N/A
C28	104819	TEE, 1/4 MNPT X 3/8 POH	1	CONNECT TO C19
C29	610-00066	MODULE, MIV-A	1	HARNESS 513-00223-000
C30	018-1210-44-0	SCREW, RD PH 1/4-20 X 1.00 SS	4	MOUNT TO C1
C31	097-0020-02-0	WASHER, FLAT 0.25 SS	4	MOUNT TO C1
C32	097-0300-02-0	WASHER, LOCK 0.25 SS	4	MOUNT TO C1
C33	610-00071	MODULE, SENSOR	1	HARNESS 513-00223-000



SEE DETAIL CC1



DETAIL CC2  
SCALE 1:3



DETAIL CC1  
SCALE 1:4

ELECTRONIC REPLACEMENT PARTS	
PART NO.	DESCRIPTION
610-00050-003	MODULE, T-PORT MIV
610-00071	MODULE, SENSOR
610-00066-50	MODULE, MIV-A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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**HALE** **GODIVA** *class1*

**SAM COMPONENTS**  
**QMAX-XS - DETAIL C**

MATERIAL	TITLE
MADE FROM	DRAWN MB
FINISH	APPROVED TAM
PROJECT	DATE 28FEB2020
SIZE <b>B</b>	DRAWING NUMBER <b>FSG-PL-01501</b>
SCALE 1:5	REV <b>D</b>
	SHEET 5 OF 8

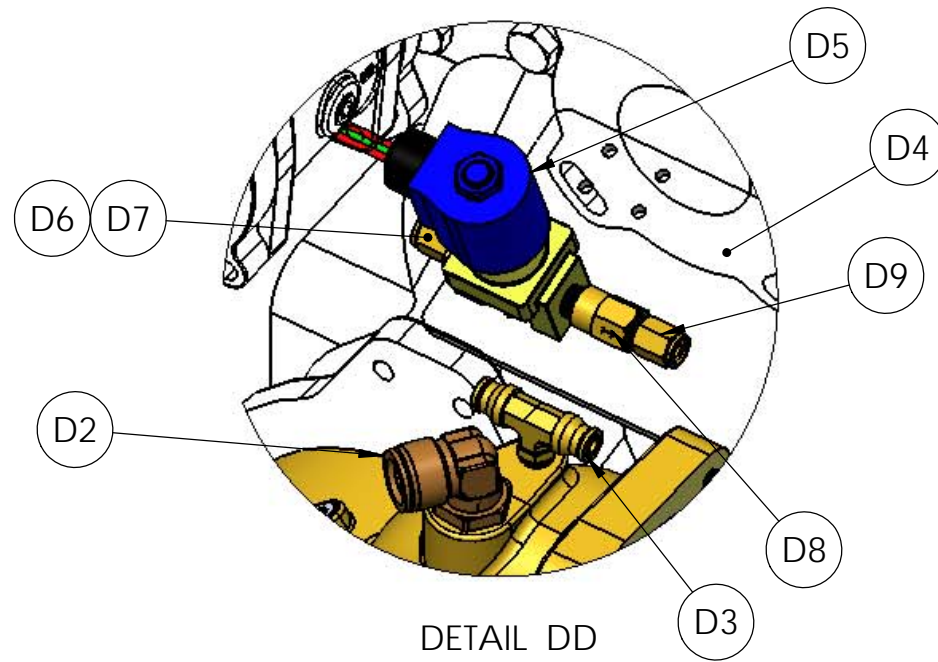


IF IN DOUBT ASK

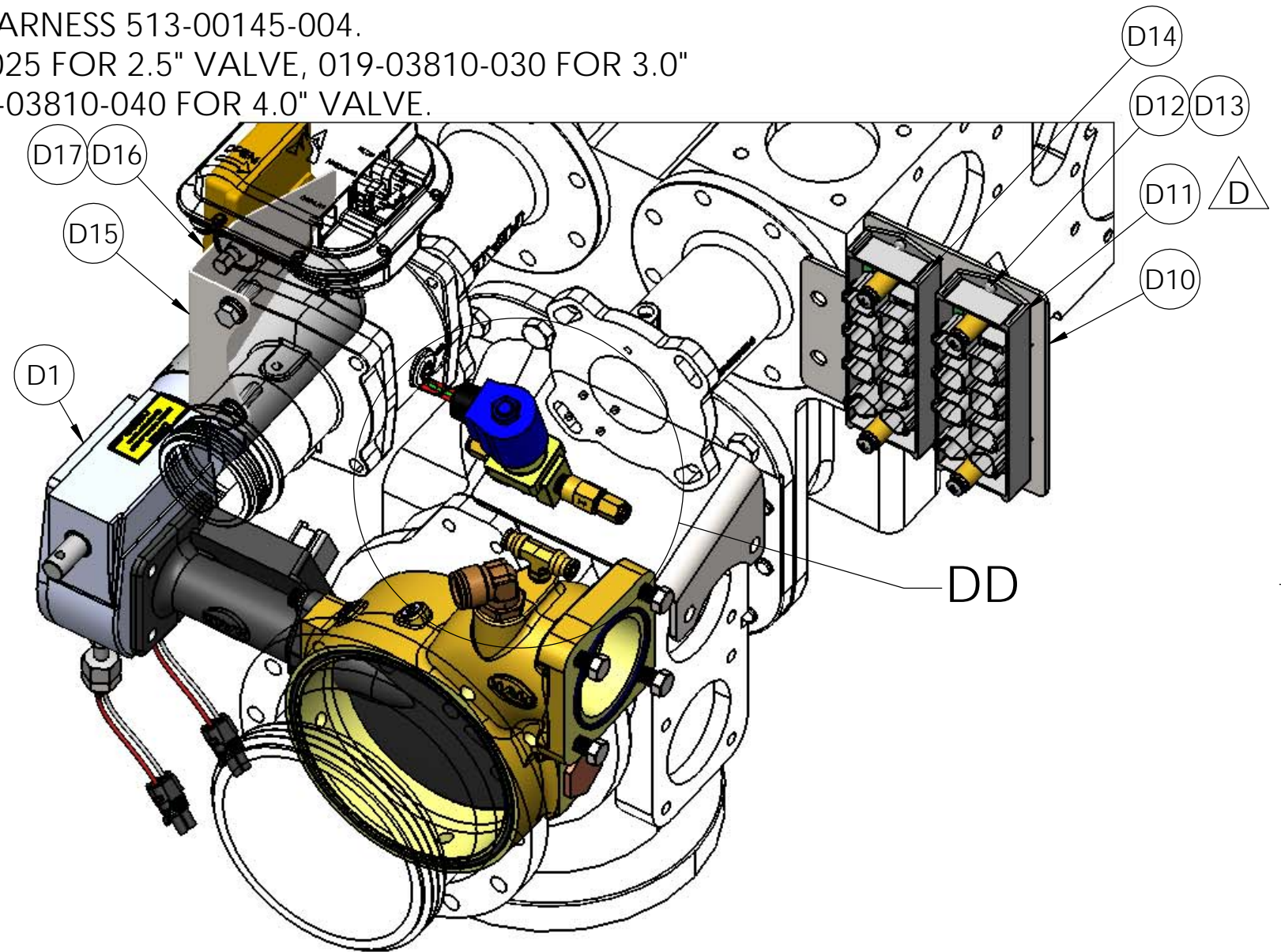
PROJECTION: 

**NOTES:**

1. A 4 STATION CAN MODULE OR 6 STATION CAN MODULE MAY BE USED DEPENDING ON NUMBER OF VALVES.
2. FOR FOUR OR GREATER MIV, TWO MIV-A MODULES AND ADAPTER HARNESS 513-00145-004.
3. 019-03810-025 FOR 2.5" VALVE, 019-03810-030 FOR 3.0" VALVE, 019-03810-040 FOR 4.0" VALVE.






DETAIL DD  
SCALE 1 : 3



**DETAIL D - LH MIV**




ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
D1	FSG-PL-01491	MIV 2.0 ASSEMBLY [LH MIV]	1	REFER TO DWG; HARNESS 513-00144-000 "MOTOR MODULE", "ACT MOTOR", "OPEN SW", & "CLOSE SW"
D2	105590	ELBOW SWVL 90° 3/4 MNPT X 3/4 POH, BRASS	1	CONNECT TO C1
D3	082-00302-102	TEE SWVL 1/4 MNPT X 2X 3/8 POH, BRASS	1	CONNECT PER DWG 538-00101-000
D4	019-03306	BRACKET, SOLENOID	1	N/A
D5	538-00103-000	VALVE, SOLENOID	1	HARNESS 513-00144-000 "ABV SOLENOID"
D6	218-00103-014	SCREW, HH M5 X 14MM	2	CONNECT TO D4
D7	104592	ADPT 1/4 MNPT X 3/8 POH, BRASS	1	INSTALL ON "INLET" SIDE CONNECT PER DWG 538-00101-000
D8	538-00095-000	CHECK VALVE 1/4 NPT, MALE X FEMALE	1	INSTALL ON "OUTLET" SIDE ARROW AWAY FROM VALVE
D9	104592	ADPT 1/4 MNPT X 3/8 POH, BRASS	1	INSTALL ON "OUTLET" SIDE CONNECT PER DWG 538-00101-000
D10	629-00101-011	BRACKET, CAN MODULE, 2433	1	N/A
D11	610-00087/610-00088	MODULE, RED CAN BUS (DISCHARGE)	1	SEE NOTE 1
D12	097-0620-00-0	WASHER, LOCK SPLIT #8 ZINC	4	CONNECT D11/D14 TO D10
D13	018-0803-29-0	SCREW-#8-32X3/8LG. (SEE L,170)	4	CONNECT D11/D14 TO D10
D14	610-00087/610-00088	MODULE, GREEN CAN BUS (INTAKE)	1	SEE NOTE 1
D15	019-03810-###	BRKT, SAM MODULE VLV MOUNT	1	SEE NOTE 2 & NOTE 3
D16	610-00066	MODULE, MIV-A, SECONDARY	1	SEE NOTE 2
D17	110-1203-06-0	NUT, ACORN, 1/4-20, SST	2	CONNECT D16 TO D15

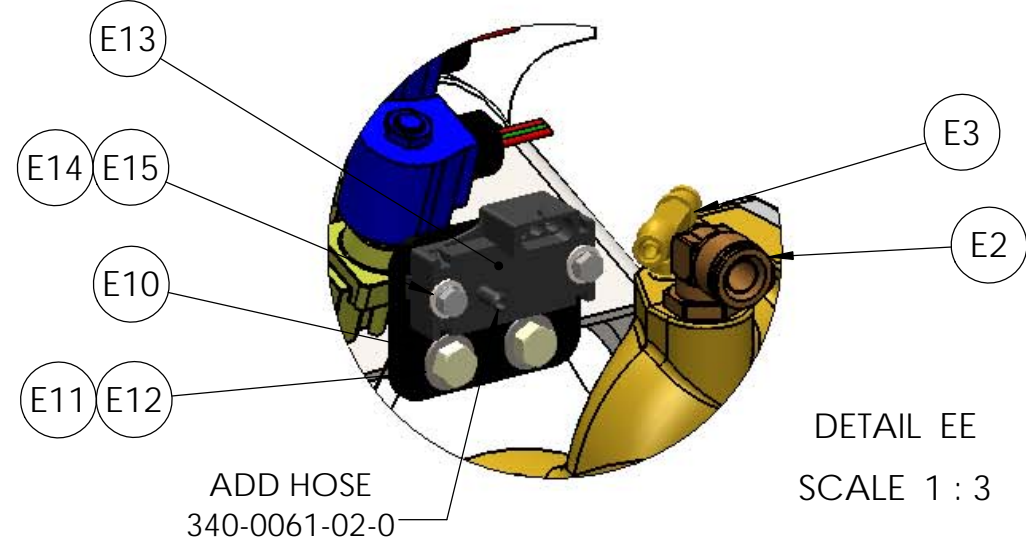


ELECTRONIC REPLACEMENT PARTS	
PART NO.	DESCRIPTION
610-00050	MODULE, LH MIV
610-00066-001-50	MODULE, MIV-A, SECONDARY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX  
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<b>SAM COMPONENTS</b> <b>QMAX-XS - DETAIL D</b>	
MATERIAL	TITLE
MADE FROM	
FINISH	DRAWN MB
PROJECT	APPROVED TAM
	DATE 28FEB2020
SIZE B	DRAWING NUMBER
SCALE 1:4	<b>FSG-PL-01501</b>
REV D	SHEET 6 OF 8



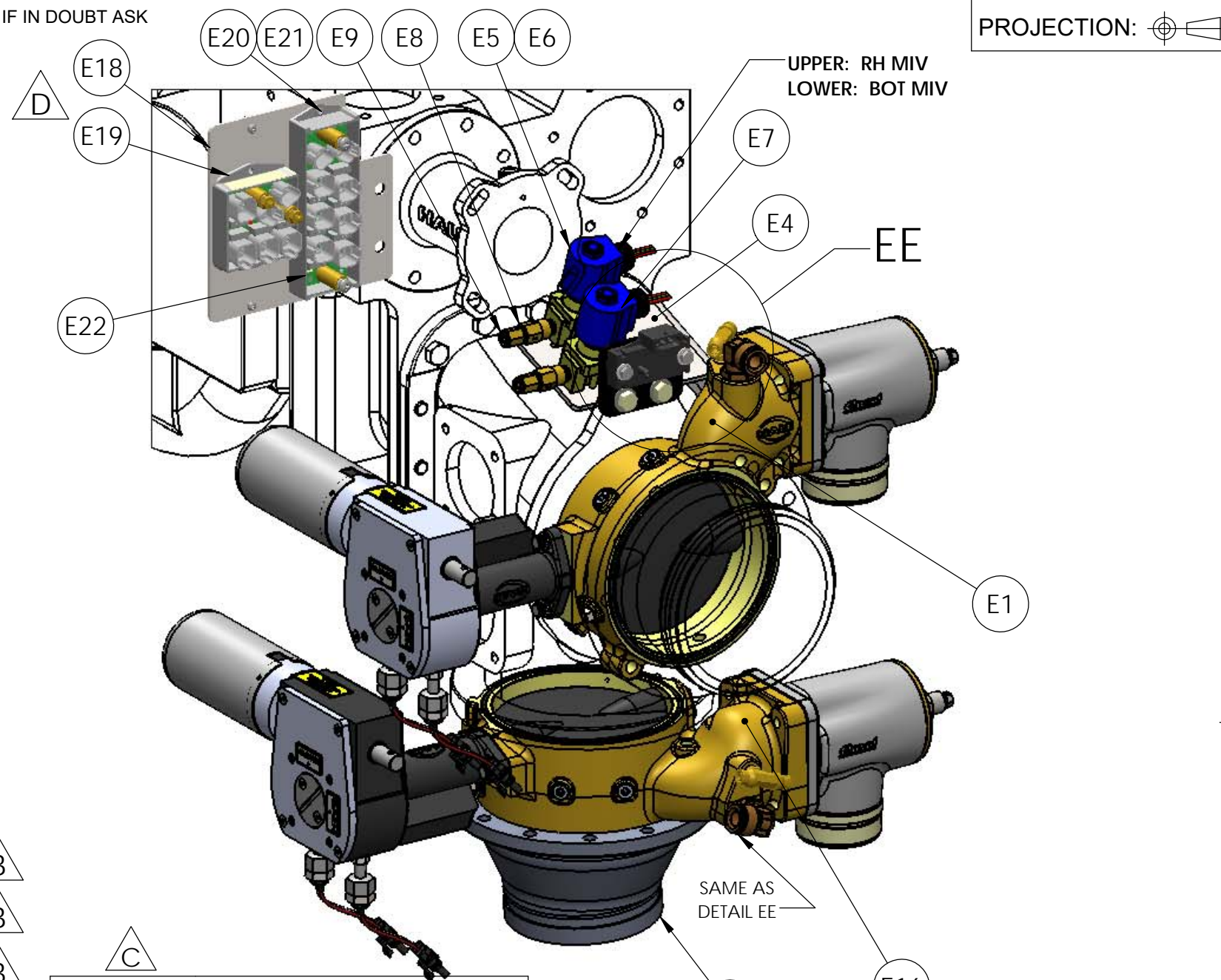


DETAIL EE  
SCALE 1 : 3

# DETAIL E - RH MIV

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
E1	FSG-PL-01491	MIV 2.0 ASSEMBLY [RH MIV]	1	REFER TO DWG; HARNESS 513-00144-000 "MOTOR MODULE", "ACT MOTOR", "OPEN SW", & "CLOSE SW"
E2	105590	ELBOW SWLV 90° 3/4 MNPT X 3/4 POH, BRASS	1	CONNECT TO C1 ASSEMBLY
E3	082-00302-102	TEE SWVL 1/4 MNPT X 2X 3/8 POH, BRASS	1	CONNECT PER DWG 538-00101-000
E4	019-03306	BRACKET, SOLENOID	1	N/A
E5	538-00103-000	VALVE, SOLENOID	2	HARNESS 513-00144-000 "ABV SOLENOID"
E6	218-00103-014	SCREW, HH M5 X 14MM	4	CONNECT TO E4
E7	104592	ADPT 1/4 MNPT X 3/8 POH, BRASS	2	INSTALL ON "INLET" SIDE CONNECT PER DWG 538-00101-000
E8	038-1550-00-0	CHECK VALVE 1/4 NPT, MALE X FEMALE	2	INSTALL ON "OUTLET" SIDE ARROW AWAY FROM VALVE
E9	104592	ADPT 1/4 MNPT X 3/8 POH, BRASS	2	INSTALL ON "OUTLET" SIDE CONNECT PER DWG 538-00101-000
E10	019-03160	BRACKET, BAROMETER	1	N/A
E11	018-1812-25-0	SCREW, 1/4-20 X 1.25LG GR8	2	MOUNT TO PUMP
E12	097-1070-00-0	WASHER, 7/16 FLAT SAE STEEL	2	MOUNT TO PUMP
E13	200-00142-000	SENSOR, BAROMETER	1	HARNESS 513-00223-000; INSTALL HOSE 340-0061-02-0
E14	018-1214-25-0	SCREW, 1/4-20 X 1.50 LG GR8	2	MOUNT TO E12
E15	097-0020-01-0	WASHER, 1/4 FLAT SAE STEEL	2	MOUNT TO E12
E16	FSG-PL-01491	MIV 2.0 ASSEMBLY [BOTTOM MIV]	1	REFER TO DWG; HARNESS 513-00144-000 "MOTOR MODULE", "ACT MOTOR", "OPEN SW", & "CLOSE SW"
E17	007-3490-01-0	ADAPTER 5" W/ 4" W/ VIC	1	N/A
E18	629-00101-011	BRACKET, CAN MODULE 2433	1	N/A
E19	610-00087/610-00088	MODULE, RED CAN BUS (DISCHARGE)	1	SEE NOTE 1
E20	097-0620-00-0	WASHER, LOCK SPLIT #8 ZINC	4	CONNECT E19/E22 TO E18
E21	018-0803-29-0	SCREW-#8-32X3/8LG. (SEE L,170)	4	CONNECT E19/E22 TO E18
E22	610-00087/610-00088	MODULE, GREEN CAN BUS (INTAKE)	1	SEE NOTE 1

IF IN DOUBT ASK



ELECTRONIC REPLACEMENT PARTS	
PART NO.	DESCRIPTION
610-00050-001	MODULE, RH MIV
610-00050-002	MODULE, BOTTOM MIV

**NOTE:**

1. A 4 STATION CAN MODULE OR 6 STATION CAN MODULE MAY BE USED DEPENDING ON NUMBER OF VALVES.

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

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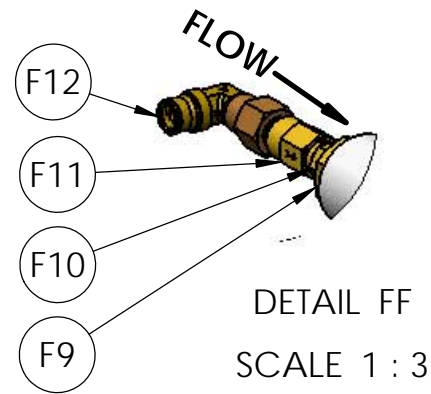
## SAM COMPONENTS QMAX-XS - DETAIL E

MATERIAL	TITLE	REV
MADE FROM	DRAWN MB	D
FINISH	APPROVED TAM	7 OF 8
PROJECT	DATE 28FEB2020	
	SIZE B	
	SCALE 1:5	
	DRAWING NUMBER	
	FSG-PL-01501	

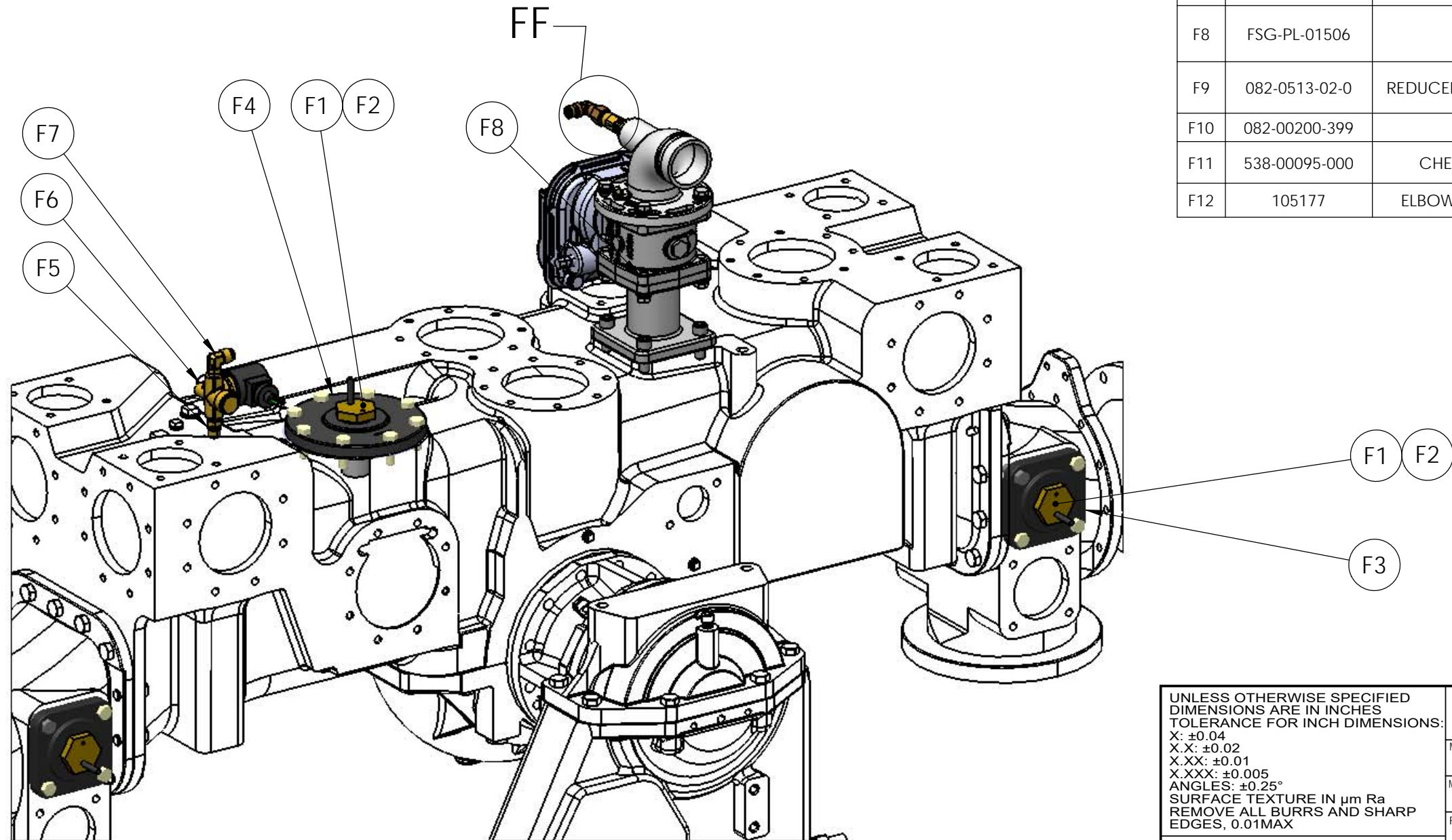
IF IN DOUBT ASK

PROJECTION: 

# DETAIL F - ANODES & TANK FILL



ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
F1	029-0511-05-0	ANODEPRO, ALLOY (1.25 MNPT)	3	HARNES 513-00223-000 "ANODE #"
F2	018-1003-44-0	SCREW, 10-24 X 3/8 LG SST	3	HARNES 513-00223-000 "ANODE #" RING TERM.
F3	115-1260-00-0	FLANGE, 4-BOLT 1.25 FNPT	2	N/A
F4	115-00010-000	FLANGE, 8-BOLT 1.25 FNPT	1	N/A
F5	082-00200-399	NIPPLE, 1/4" MNPT HEX, BRASS	1	INSTALL ON "P" SIDE
F6	038-00107-000	VALVE, SOLENOID	1	HARNES 513-00223-000 "PUMP COOLING SOLENOID"
F7	104601	ELBOW SWLV 90° 1/4 MNPT X 3/8 POH, BRASS	1	INSTALL ON "A" SIDE CONNECT TO F12
F8	FSG-PL-01506	VALVE, TANK FILL	1	REFER TO DWG; HARNES 513-00192-00x "TANK FILL"
F9	082-0513-02-0	REDUCER BUSHING, 3/4 MNPT X 1/4 FNPT, BRASS	1	N/A
F10	082-00200-399	NIPPLE, 1/4 MNPT HEX, BRASS	1	N/A
F11	538-00095-000	CHECK VALVE 1/4 NPT, MALE X FEMALE	1	INSTALL WITH ARROW TOWARD VALVE
F12	105177	ELBOW SWLV 90° 1/4 FNPT X 3/8 POH, BRASS	1	CONNECT TO F7



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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## SAM COMPONENTS QMAX-XS - DETAIL F

MATERIAL	TITLE			
MADE FROM	DRAWN MB			
FINISH	APPROVED TAM	SIZE B	DRAWING NUMBER	REV D
PROJECT	DATE 28FEB2020	SCALE 1:6	FSG-PL-01501	SHEET 8 OF 8



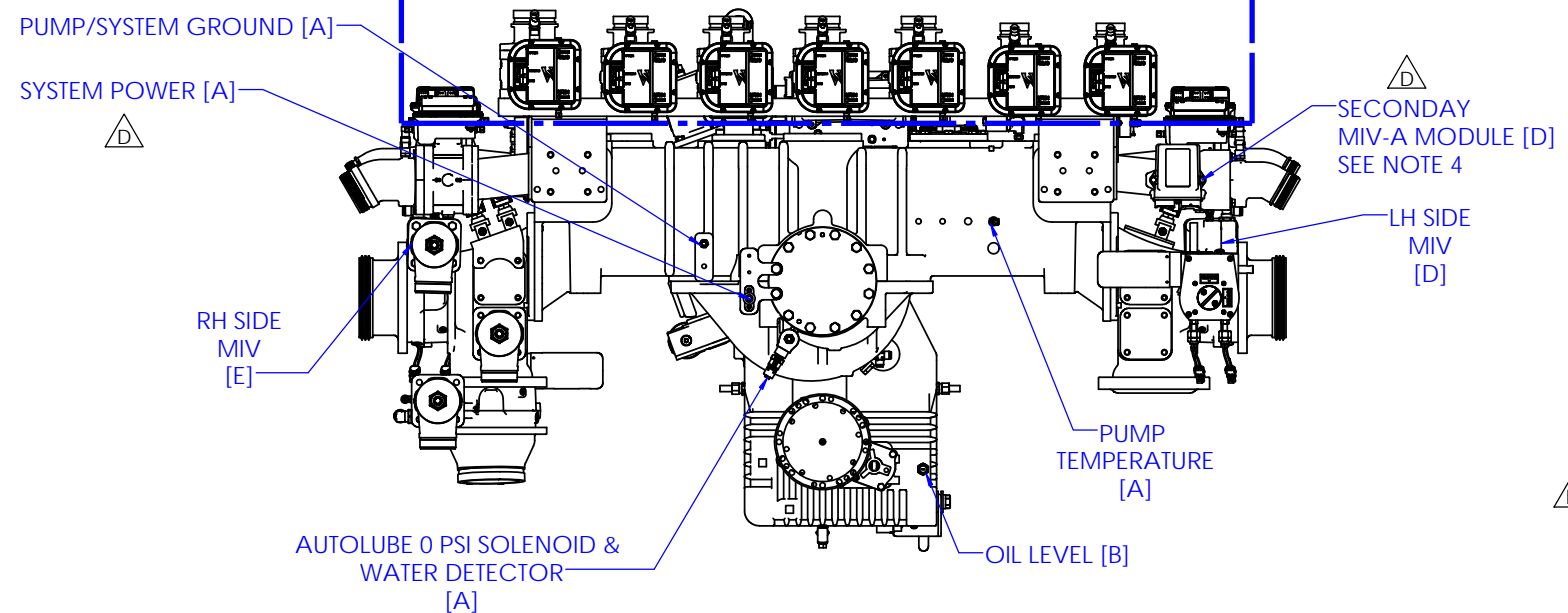
# SAM QMAX

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PROJECTION:

## FRONT

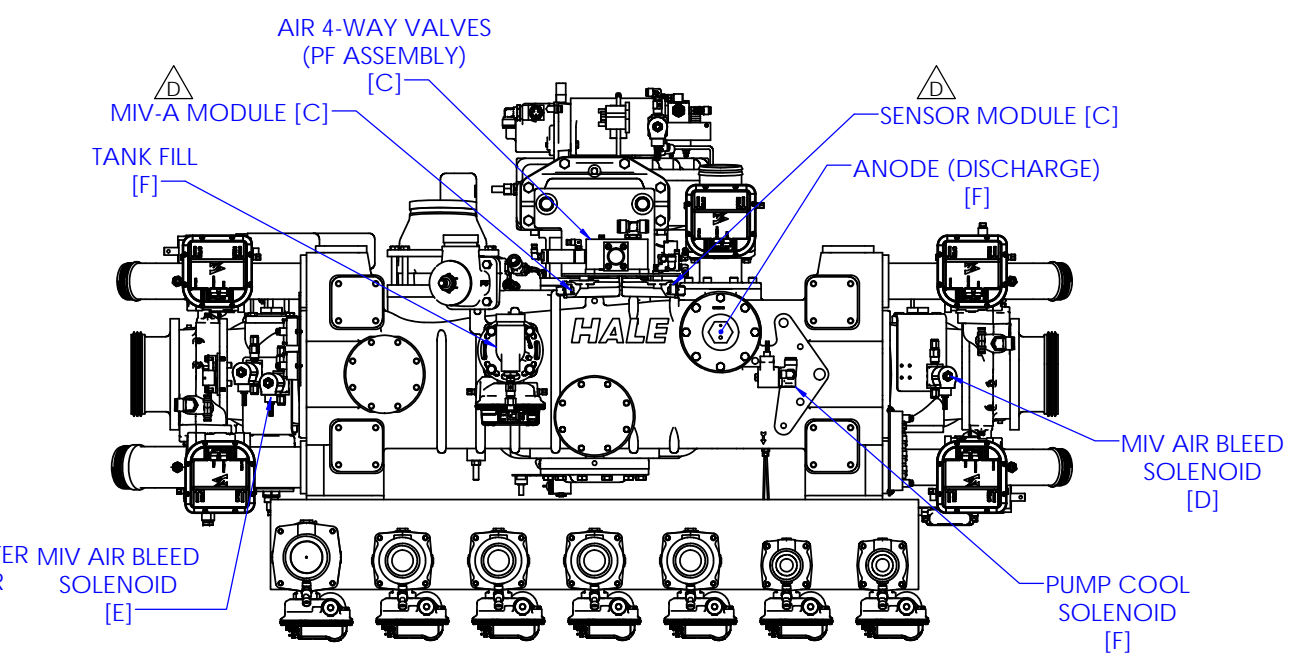
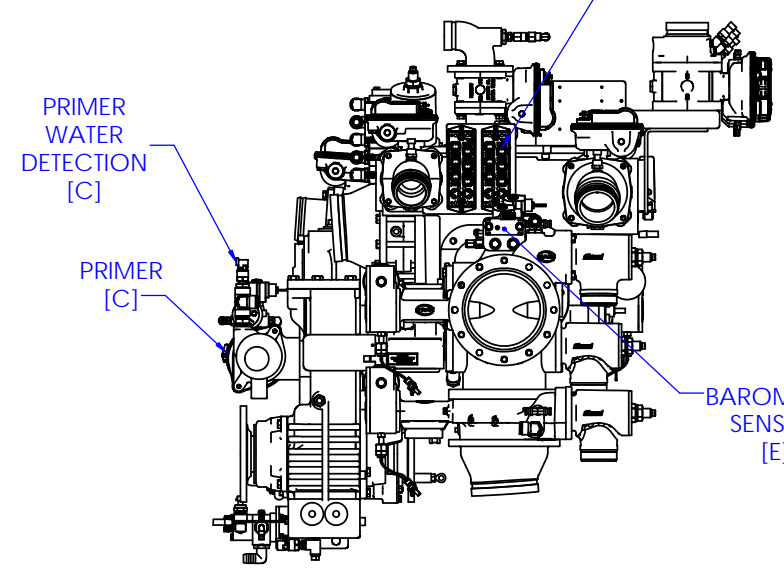
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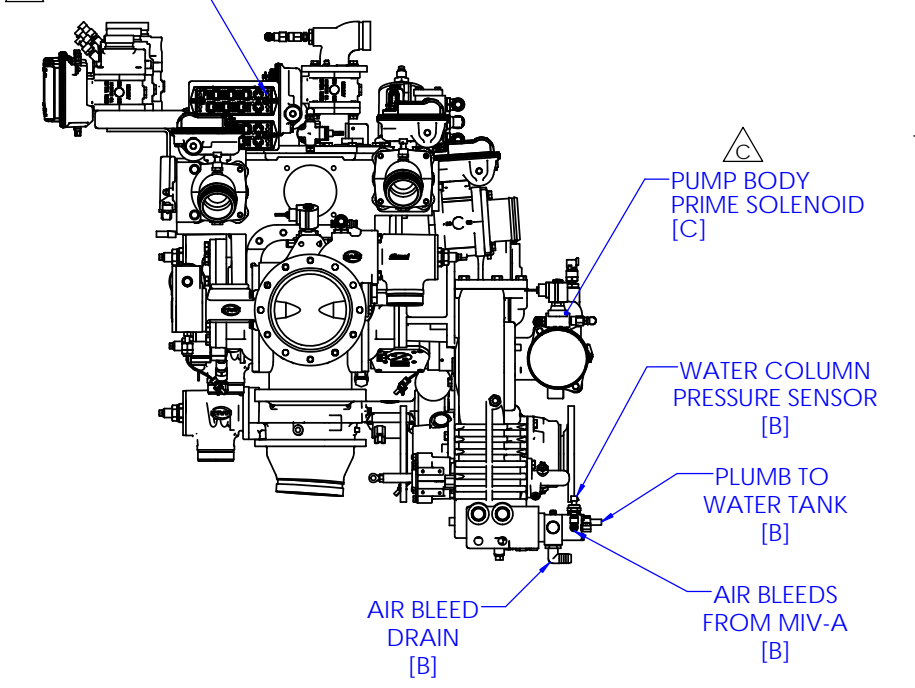
### NOTES

- BILL OF MATERIAL DETAILS [A-F] FOR EACH COMPONENT ARE SHOWN IN SUBSEQUENT PAGES OF THIS DRAWING.
- REFERENCE DRAWINGS:
  - BASE QMAX G GEARBOX: PL887 [INSTALL] & PL886 [PARTS]
  - BASE QMAX K GEARBOX: PL1159 [INSTALL] & PL1156 [PARTS]
  - SAM PANEL COMPONENT DETAILS: FSG-PL-01505
  - SAM CAN NETWORK DIAGRAM: FSG-PL-01504
- SUB-ASSEMBLY DRAWINGS REQUIRED FOR BUILD:
  - 538-00100-000 - WATER TOWER DRAIN MANIFOLD [DETAIL C]
  - 538-00099-001 - PVG BLOCK ASSEMBLY [DETAIL C]
  - FSG-PL-01491 - MIV 2.0 ASSEMBLY [DETAILS C, D, & E]
  - FSG-PL-01506 - SAM VALVE ASSEMBLIES [DETAILS C & E]
  - 538-00101-000 - MIV AIR PRIME CONNECTIONS [DETAILS D & E]
- FOR FOUR OR GREATER MIV, TWO MIV-A MODULES REQUIRED.

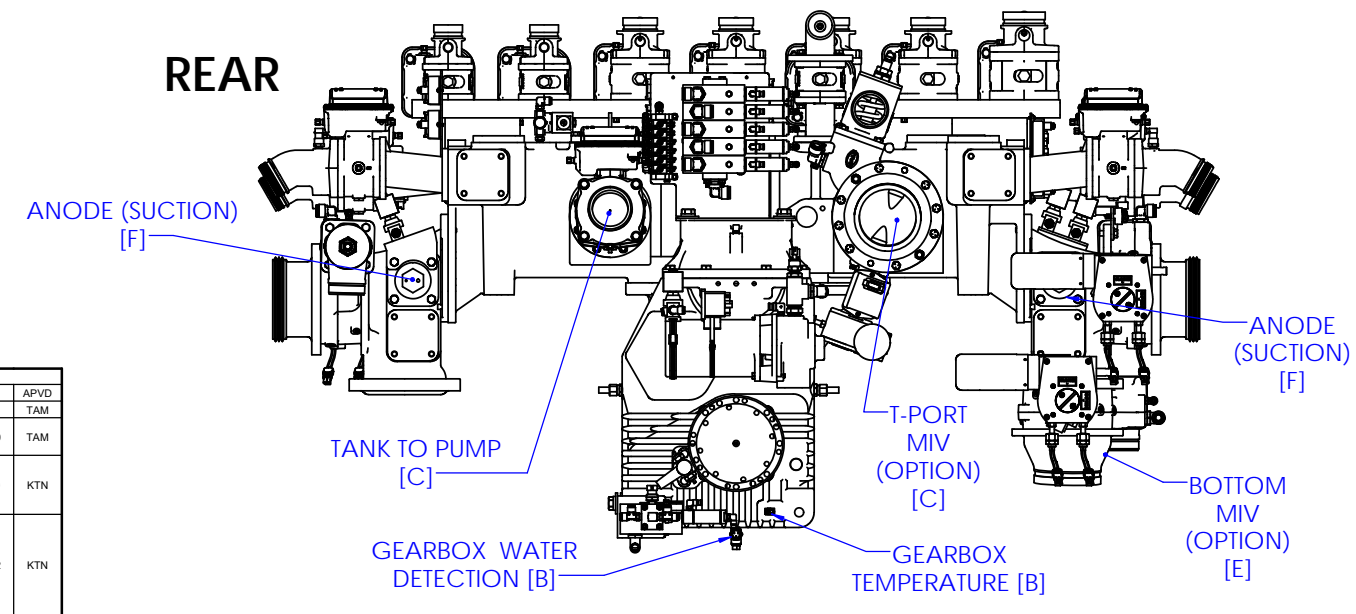
## RIGHT



## LEFT



## REAR



REVISIONS						
ECN	REV.	ZONE	CHANGED FROM ORIGINAL RELEASE	BY	DATE	APVD
	A			AJG	28FEB2020	TAM
5095	B	3-F4, 5-A4, 5-D4, 6-E4, 7-D4	UPDATED AKRON ELECTRIC ACTUATOR, CORRECTED 038-00107-000 NOTES, ADDED NOTE TO A20, ADDED ADDITIONAL DETAIL TO C1 CONNECTION	KTN	18MAR2020	TAM
5272	C	C12, G15, 2-J1, 5-A4, 5-D4, 5-D6, 5-E4, 6-C3, 6-E6, 7-E3, 7-C3	ADDED ELECTRONIC REPLACEMENT PART NUMBERS, UPDATED MIV-A SOLENOIDS, UPDATED PF4-WAY ASSEMBLY, UPDATED PUMP BODY PRIME SOLENOID LOCATION	TAM	23OCT2020	KTN
5724	D	B11, B5, D12, E10, E5, E6, F12, 2-F10, 2-J1, 3-D1, 5-A3, 5-A7, 5-D6, 6-A3, 6-A7, 6-D4, 6-C3, 6-E8, 7-A5, 7-C3, 7-E5	UPDATED FOR CAN NETWORK MODULE SYSTEM.	TAM	03MAR2022	KTN

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCHES DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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MATERIAL		TITLE					
MADE FROM		SAM COMPONENT DIAGRAM QMAX					
FINISH		DRAWN MB APPROVED TAM DATE 28FEB2020	SIZE D SCALE 1:8	DRAWING NUMBER <b>FSG-PL-01502</b>		REV D SHEET 1 OF 8	



IF IN DOUBT ASK

LH (DRIVER)

# RECOMMENDED PANEL LAYOUT FOR SAM CONTROLS

(Reference FSG-PL-01503 for component details.)

RH (OFFICER)

PROJECTION:

UNCLASSIFIED ACFT  
CLASSIFIED ACFT: These items are controlled by the U.S. Government and authorized for export only to the country of origin designated for sale by the original contractor or its wholly owned subsidiary. They may not be re-exported, transferred, or otherwise disposed of to any other country or to any person other than the authorized ultimate consignee or end-user, either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. Government or an authorized subcontractor to U.S. use and requiring the same authorized written reports, records and transfer (in-country) designated under the License Required (LR). These drawings are controlled and copy without individual priority of FSG and its subsidiary, and may not be reproduced or modified without the express written permission of FSG.

(OPTIONAL)  
FOAM TANK  
LEVEL ITL40

(OPTIONAL)  
UV450  
SMARTFOAM  
CONTROLLER

PRIMER  
CONTROL

RH MIV  
OVERRIDE  
PANEL

LH MIV  
OVERRIDE  
PANEL

LH MIV  
MANUAL  
OVERRIDE

AUDIO SPEAKER

WATER TANK  
LEVEL ITL40

BUZZER

UV1100 CONTROL  
CENTER

UV800 PUMP CONTROLLER  
WITH MATRIX MOUNTED

TWISTER

LH MIV  
ACTIVATION  
BUTTON

AUDIO SPEAKER

AUDIO SPEAKER

(OPTIONAL)  
BUZZER

EMERGENCY IDLE

UV1100  
CONTROL  
CENTER

RH MIV  
ACTIVATION  
BUTTON

RH MIV  
MANUAL  
OVERRIDE

AUDIO SPEAKER

ELECTRONIC REPLACEMENT PARTS	
PART NO.	DESCRIPTION
610-00060-210-50	UV1100 CONTROL CENTER, MASTER
610-00060-110-50	UV1100 CONTROL CENTER, SECONDARY
610-00060-080-50	UV800 PUMP CONTROLLER
629-00077-50	WIFI ANTENNA
610-00076-001-50	TABLET
610-00052	MODULE, MATRIX

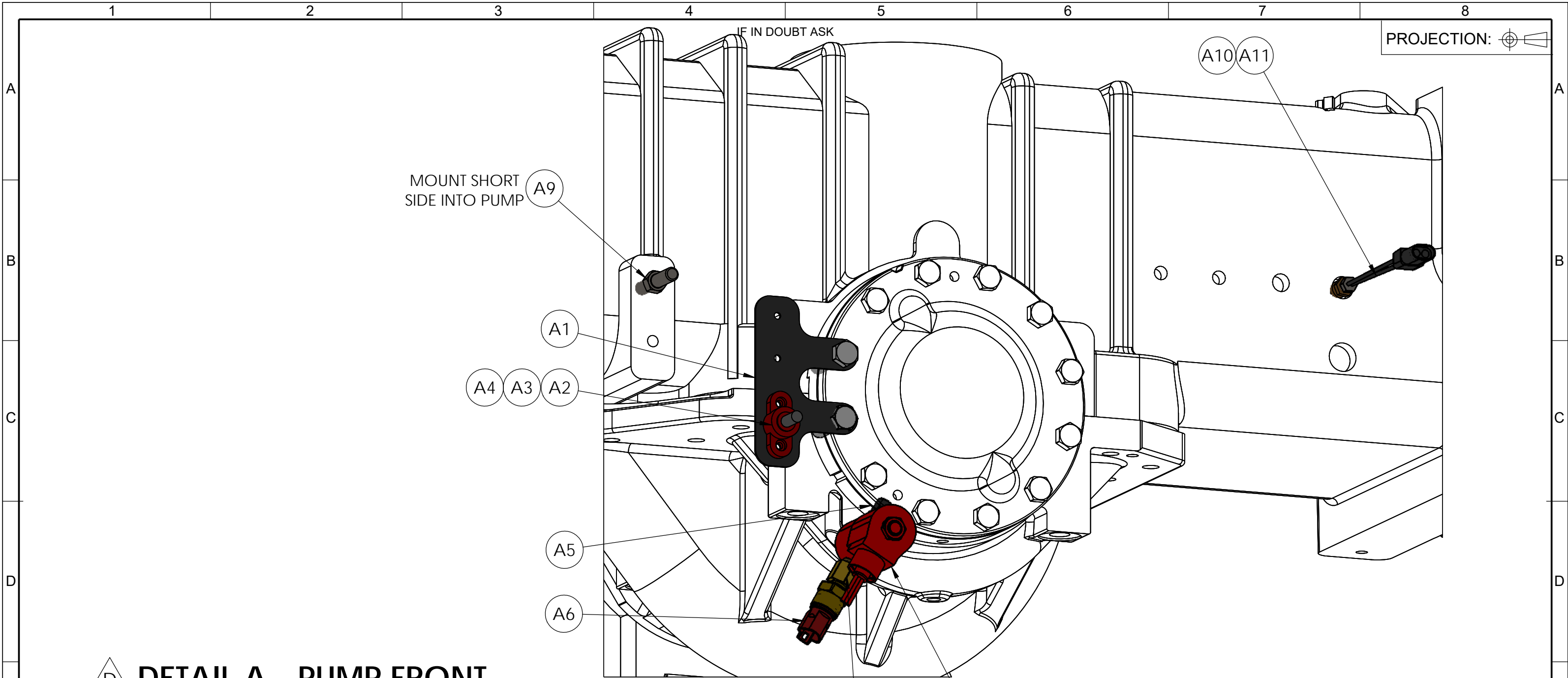
REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCHES DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

FSG OF IDEX CORPORATION	
MATERIAL	TITLE
MADE FROM	
FINISH	DRAWN MB
PROJECT	APPROVED TAM
	DATE 28FEB2020

HALE GODIVA Class1	
SAM CONTROL PANEL LAYOUT QMAX	
SCALE 1:5	DRAWING NUMBER FSG-PL-01502
REV D	SHEET 2 OF 8

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**DETAIL A - PUMP FRONT**

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
A1	019-03022-000	BRACKET, POWER STUD	1	N/A
A2	627-00038	STUD, POWER	1	N/A
A3	110-1000-11-0	NUT, 10-24 SST NYLON LOCK	2	MOUNT TO A1
A4	018-01006-080	SCREW, PH 10-24 X 3/4 SST	2	MOUNT TO A1
A5	082-00200-399	NIPPLE, 1/4" MNPT HEX, BRASS	1	INSTALL TO "IN" SIDE OF A8
A6	200-00143-000	SENSOR, WATER DETECTION	1	HARNESS 513-00223-000 "AUTOLUBE WATER IN OIL SENSOR"
A7	082-0248-02-0	ADAPTER, 1/4" MNPT X 1/4" FNPT	1	N/A
A8	038-00100-000	SOLENOID, 0 PSI	1	HARNESS 513-00145-000 "AUTOLUBE 0 PSI SOLENOID"
A9	018-80003-999	STUD, 7/16-14 X 2.63 STEEL	1	N/A
A10	200-1161-00-0	TEMPERATURE SENSOR, 10KP	1	HARNESS 513-00223-000 "SUCTION TEMP SENSOR"
A11	082-0214-02-0	REDUCER, BSHG 1/4 MNPT X 1/8 FNPT BRASS	1	N/A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES  
 TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

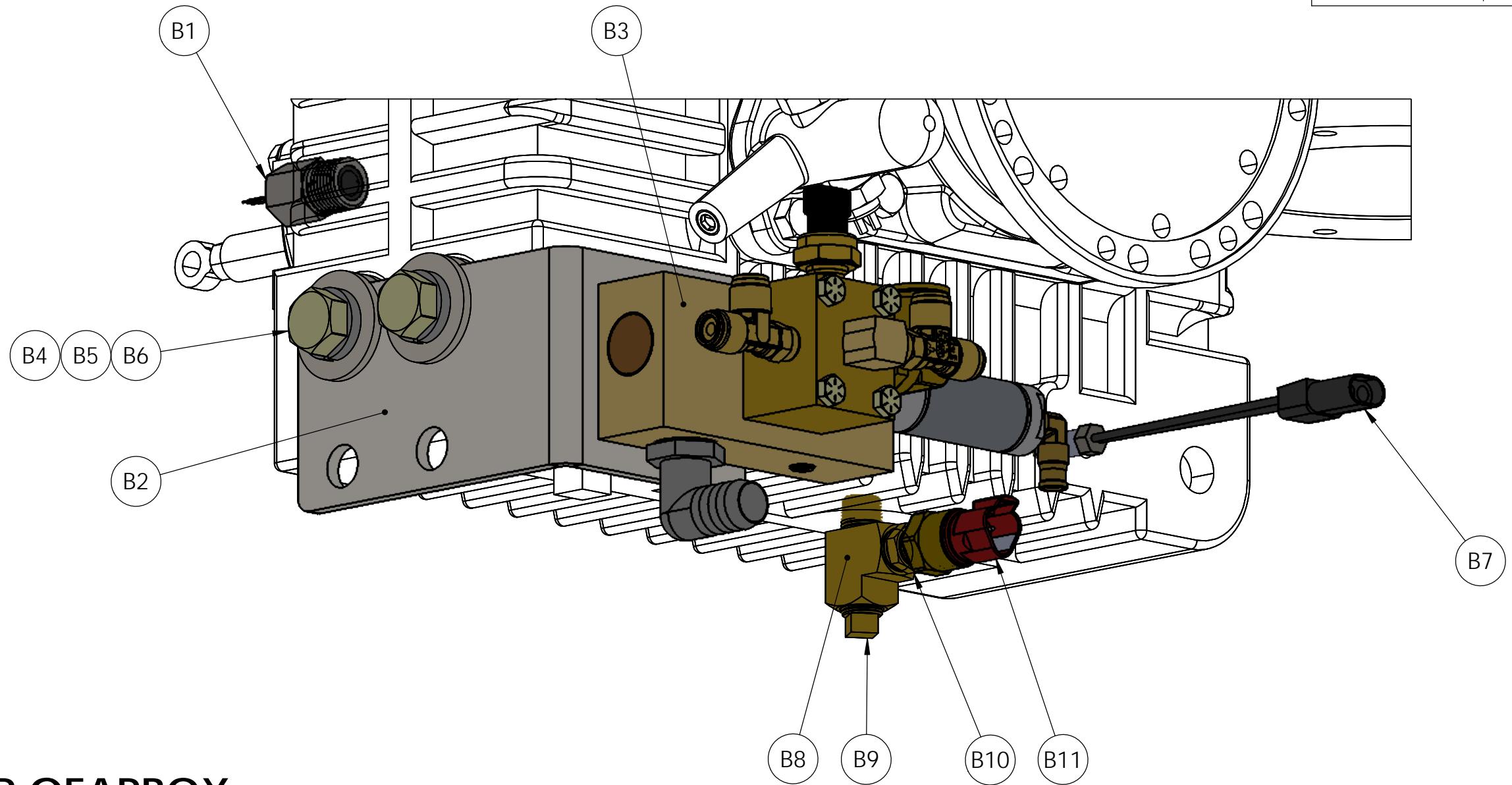
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		<b>TITLE</b> SAM COMPONENTS QMAX - DETAIL A	
MATERIAL	TITLE	DRAWN	MB
MADE FROM		APPROVED	TAM
FINISH		DATE	28FEB2020
PROJECT		SCALE	B 1:5
		DRAWING NUMBER	FSG-PL-01502
		REV	D
		SHEET 3 OF 8	

**B**

IF IN DOUBT ASK

PROJECTION: 



## DETAIL B - LOWER GEARBOX

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
B1	200-00144-000	SENSOR, OIL LEVEL	1	HARNESS 513-00223-000 "GB OIL LEVEL SENSOR"
B2	019-03101-001	BRACKET, DRAIN MANIFOLD	1	N/A
B3	538-00100-000	ASY, SAM DRAIN MANIFOLD	1	FOLLOW ASY DWG INSTRUCT.; CONNECT SENSOR TO HARNESS 513-00223-000 "WATER COLUMN SENSOR"
B4	018-2414-25-0	BOLT, HH 5/8-11 X 1.5 LG GR8	2	MOUNT TO GEARBOX
B5	106923	WASHER, 5/8 SPLIT LOCK STEEL	2	MOUNT TO B2
B6	108709	WASHER, 5/8 X 1.75 OD FLAT STEEL	4	MONT TO B2
B7	200-1161-00-0	SENSOR, TEMPERATURE 10KP	1	HARNESS 513-00223-000 "GB OIL TEMP SENSOR"
B8	120228	TEE, 3/8" NPT, STREET, M X F X F, BRASS	1	N/A
B9	217-0301-01-0	PLUG, 3/8" MNPT, SQUARE, BRASS	1	N/A
B10	082-0302-02-0	ADAPTER, 3/8" MNPT X 1/4" FNPT, BRASS	1	N/A
B11	200-00143-000	SENSOR, WATER DETECTION	1	HARNESS 513-00223-000 "GB OIL IN WATER SENSOR"

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

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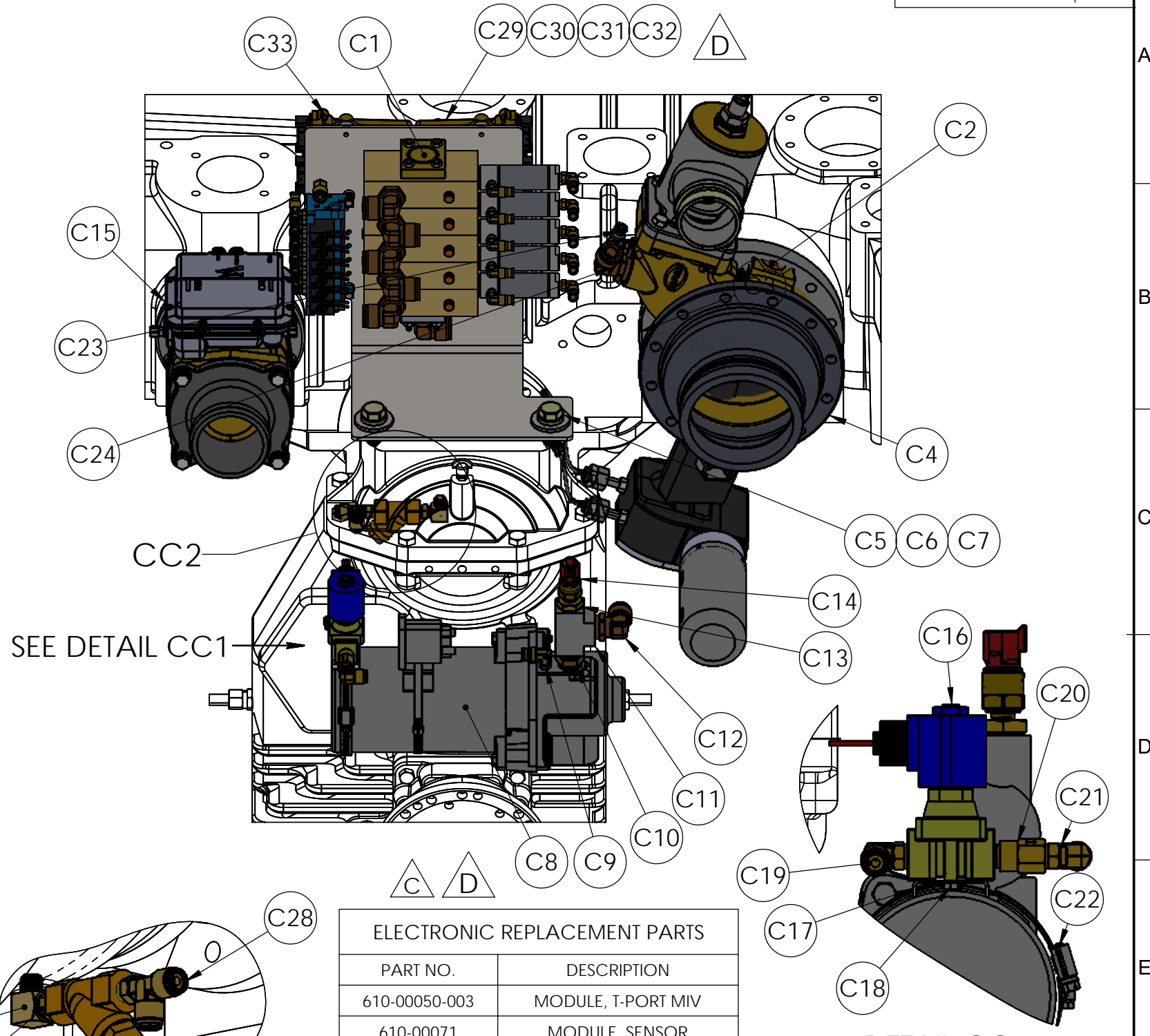
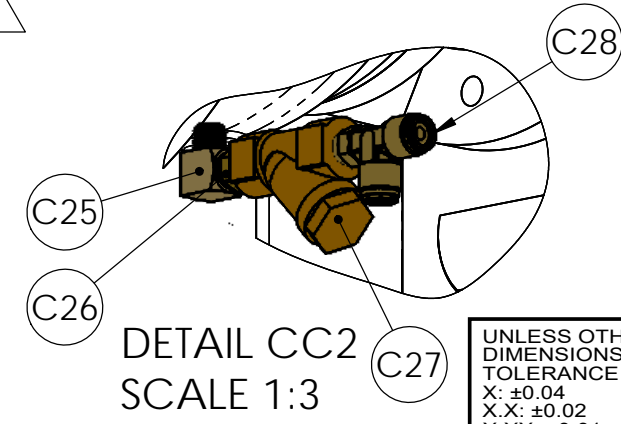
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MADE FROM		SAM COMPONENTS QMAX - DETAIL B		D	
FINISH		DRAWN	MB	SIZE	DRAWING NUMBER
PROJECT		APPROVED	TAM	B	FSG-PL-01502
		DATE	28FEB2020	SCALE	4 OF 8
				1:2	

# DETAIL C - PUMP REAR

IF IN DOUBT ASK

PROJECTION:

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
C1	538-00099-001	PF / 4-WAY VALVE ASSEMBLY	1	REFER TO DWG HARNESS 513-00223-000 "PRE-PRIME #", "PUMP BODY PRIME", "AB DRAIN" FOR DUAL MIV-A MODULES, ADD HARNESS 513-00145-004 "PRE-PRIME #"
C2	FSG-PL-01491	MIV 2.0 ASSEMBLY [T-PORT]	1	REFER TO DWG: HARNESS 513-00144-000 "MOTOR MODULE", "ACT MOTOR", "OPEN SW", & "CLOSE SW"
C3	115-0440-02-0	SPACER, 1" THICK SUCTION	1	N/A
C4	007-3490-01-0	ADAPTER, MIV 5" W/ 4" VIC	1	T-PORT
C5	018-2414-25-0	BOLT, HH 5/8-11 X 1.5 LG STEEL	2	MOUNT TO GEARBOX
C6	106923	WASHER, 5/8 SPLIT LOCK STEEL	2	MOUNT TO C1
C7	108709	WASHER, 5/8 X 1.75 OD FLAT STEEL	2	MOUNT TO C1
C8	501-3090-00-0	PRIMER, 12VDC	1	HARNESS 513-00223-000 "PRIMER INPUT" HARNESS 513-00223-000 "PRIMER DRIVER"
C9	104599	ELBOW SWVL 90° 1/8" MNPT X 3.8" POH, BRASS	1	CONNECT TO PART C21
C10	118265	NIPPLE, HEX 2X 3/4" MNPT, BRASS	1	N/A
C11	082-0560-02-0	TEE, 3/4" FNPT, BRASS	1	N/A
C12	105590	ELBOW SWVL 90° 3/4 MNPT X 3/4 POH, BRASS	1	CONNECT TO ASSEMBLY C1
C13	082-0513-02-0	REDUCER BUSHING, 3/4 MNPT X 1/4 FNPT, BRASS	1	N/A
C14	200-00143-000	SENSOR, WATER DETECTION	1	HARNESS 513-00223-000 "WATER IN PRIMER SENSOR"
C15	FSG-PL-01506	VALVE, TANK TO PUMP	1	REFER TO DRAWING: HARNESS 513-00192-00x "TANK TO PUMP"
C16	538-00103-000	VALVE, SOLENOID	1	HARNESS 513-00223-000 "QUICK PRIME SOLENOID"
C17	019-03922	BRACKET, PRIMER SOLENOID	1	MOUNT TO C8
C18	218-00103-008	BOLT, HH M5 X 8MM	1	MOUNT TO C17
C19	104601	ELBOW, 1/4 MNPT X 3/8 POH	1	CONNECT TO PART C28
C20	538-00095-000	CHECK VALVE 1/4 NPT, M X F	1	INSTALL ARROW AWAY FROM VLV
C21	104601	ELBOW, 1/4 MNPT X 3/8 POH	1	CONNECT TO PART C9
C22	111075	CLAMP, HOSE	1	MOUNT TO C8 & C17
C23	082-00302-102	TEE, 1/4 MNPT X 3/8 POH	1	MOUNT TO MIV
C24	105590	ELBOW, 3/4 MNPT X 3/4 POH	1	MOUNT TO MIV
C25	082-0257-02-0	ELBOW, 1/4 MNPT X 1/4 FNPT	1	CONNECT TO PUMP VOLUTE DRAIN
C26	082-0253-02-0	NIPPLE, 1/4 HEX	1	N/A
C27	010-0710-00-0	1/4 WYE STRAINER	1	N/A
C28	104819	TEE, 1/4 MNPT X 3/8 POH	1	CONNECT TO C19
C29	610-00066	MODULE, MIV-A	1	HARNESS 513-00223-000
C30	018-1210-44-0	SCREW, RD PH 1/4-20 X 1.00 SS	4	MOUNT TO C1
C31	097-0020-02-0	WASHER, FLAT 0.25 SS	4	MOUNT TO C1
C32	097-0300-02-0	WASHER, LOCK 0.25 SS	4	MOUNT TO C1
C33	610-00071	MODULE, SENSOR	1	HARNESS 513-00223-000



PART NO.	DESCRIPTION
610-00050-003	MODULE, T-PORT MIV
610-00071	MODULE, SENSOR
610-00066-50	MODULE, MIV-A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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**HALE** **GODIVA** *class1*

**SAM COMPONENTS**  
**QMAX - DETAIL C**

MATERIAL	TITLE
MADE FROM	DRAWN MB
FINISH	APPROVED TAM
PROJECT	DATE 28FEB2020

SIZE <b>B</b>	DRAWING NUMBER	REV <b>D</b>
SCALE 1:6	<b>FSG-PL-01502</b>	SHEET 5 OF 8



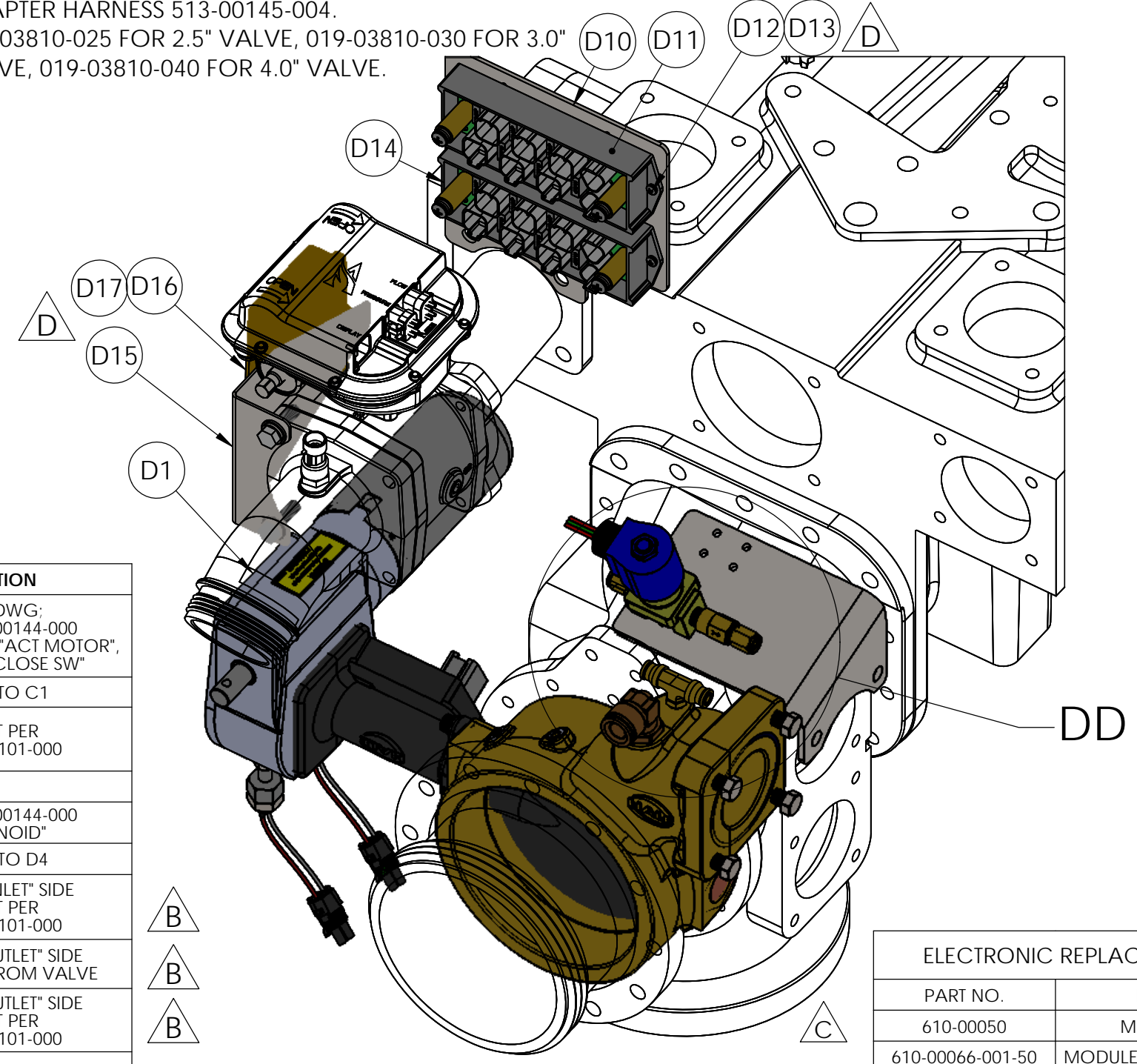
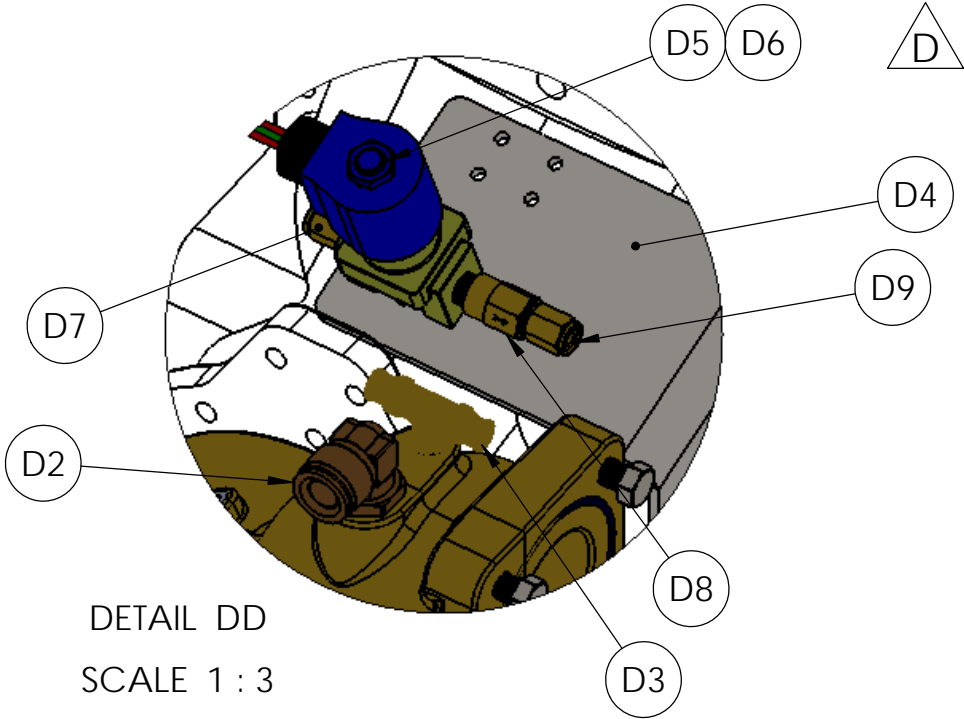
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PROJECTION: 

IF IN DOUBT ASK

**NOTES:**

1. A 4 STATION CAN MODULE OR 6 STATION CAN MODULE MAY BE USED DEPENDING ON NUMBER OF VALVES.
2. FOR FOUR OR GREATER MIV, TWO MIV-A MODULES AND ADAPTER HARNESS 513-00145-004.
3. 019-03810-025 FOR 2.5" VALVE, 019-03810-030 FOR 3.0" VALVE, 019-03810-040 FOR 4.0" VALVE.



# DETAIL D - LH MIV

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
D1	FSG-PL-01491	MIV 2.0 ASSEMBLY [LH MIV]	1	REFER TO DWG; HARNESS 513-00144-000 "MOTOR MODULE", "ACT MOTOR", "OPEN SW", & "CLOSE SW"
D2	105590	ELBOW SWVL 90° 3/4 MNPT X 3/4 POH, BRASS	1	CONNECT TO C1
D3	082-00302-102	TEE SWVL 1/4 MNPT X 2X 3/8 POH, BRASS	1	CONNECT PER DWG 538-00101-000
D4	019-03306	BRACKET, SOLENOID	1	N/A
D5	038-00107-001	VALVE, SOLENOID	1	HARNESS 513-00144-000 "ABV SOLENOID"
D6	218-00103-014	SCREW, HH M5 X 14MM	2	CONNECT TO D4
D7	104592	ADPT 1/4 MNPT X 3/8 POH, BRASS	1	INSTALL ON "INLET" SIDE CONNECT PER DWG 538-00101-000
D8	538-00095-000	CHECK VALVE 1/4 NPT, MALE X FEMALE	1	INSTALL ON "OUTLET" SIDE ARROW AWAY FROM VALVE
D9	104592	ADPT 1/4 MNPT X 3/8 POH, BRASS	1	INSTALL ON "OUTLET" SIDE CONNECT PER DWG 538-00101-000
D10	629-00101-010	BRACKET, CAN MODULE, 115	1	N/A
D11	610-00087/610-00088	MODULE, RED CAN BUS (DISCHARGE)	1	SEE NOTE 1
D12	097-0620-00-0	WASHER, LOCK SPLIT #8 ZINC	4	CONNECT D11/D14 TO D10
D13	018-0803-29-0	SCREW-#8-32X3/8LG. (SEE L,170)	4	CONNECT D11/D14 TO D10
D14	610-00087/610-00088	MODULE, GREEN CAN BUS (INTAKE)	1	SEE NOTE 1
D15	019-03810-###	BRKT, SAM MODULE VLV MOUNT	1	SEE NOTE 2 & 3
D16	610-00066	MODULE, MIV-A, SECONDARY	1	SEE NOTE 2
D17	110-1203-06-0	NUT, ACORN, 1/4-20, SST	2	CONNECT D16 TO D15

ELECTRONIC REPLACEMENT PARTS	
PART NO.	DESCRIPTION
610-00050	MODULE, LH MIV
610-00066-001-50	MODULE, MIV-A, SECONDARY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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## SAM COMPONENTS QMAX - DETAIL D

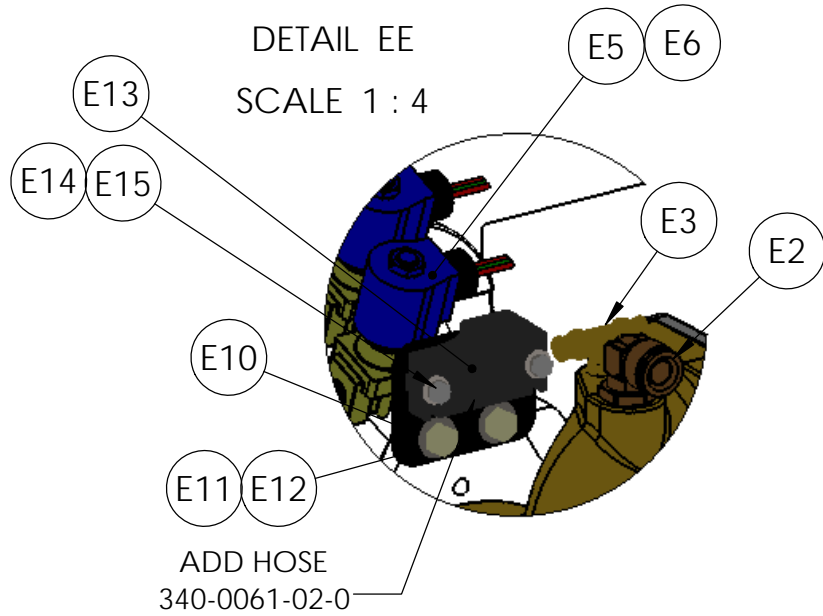
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APPROVED	TAM	<b>B</b>	FSG-PL-01502	<b>D</b>
DATE	28FEB2020	SCALE	1:4	SHEET 6 OF 8

1 2 3 4 5 6 7 8

IF IN DOUBT ASK

PROJECTION: 

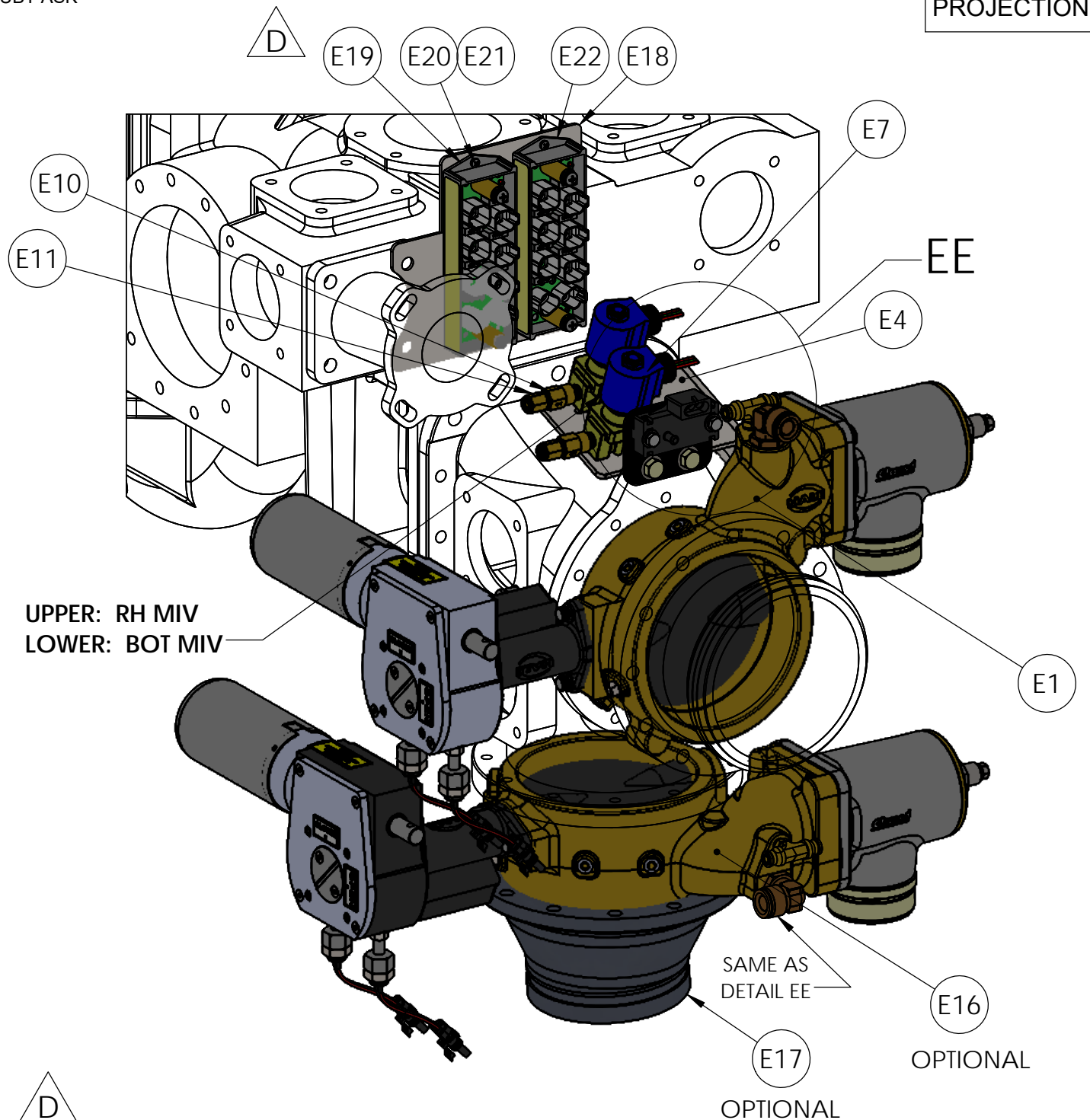
DETAIL EE  
SCALE 1 : 4



ELECTRONIC REPLACEMENT PARTS	
PART NO.	DESCRIPTION
610-00050-001	MODULE, RH MIV
610-00050-002	MODULE, BOTTOM MIV

## DETAIL E - RH MIV

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
E1	FSG-PL-01491	MIV 2.0 ASSEMBLY [RH MIV]	1	REFER TO DWG; HARNESS 513-00144-000 "MOTOR MODULE", "ACT MOTOR", "OPEN SW", & "CLOSE SW"
E2	105590	ELBOW SWLV 90° 3/4 MNPT X 3/4 POH, BRASS	1	CONNECT TO C1 ASSEMBLY
E3	082-00302-102	TEE SWVL 1/4 MNPT X 2X 3/8 POH, BRASS	1	CONNECT PER DWG 538-00101-000
E4	019-03306	BRACKET, SOLENOID	1	N/A
E5	538-00103-000	VALVE, SOLENOID	2	HARNESS 513-00144-000 "ABV SOLENOID"
E6	218-00103-014	SCREW, HH M5 X 14MM	4	CONNECT TO E4
E7	104592	ADPT 1/4 MNPT X 3/8 POH, BRASS	2	INSTALL ON "INLET" SIDE CONNECT PER DWG 538-00101-000
E8	038-1550-00-0	CHECK VALVE 1/4 NPT, MALE X FEMALE	2	INSTALL ON "OUTLET" SIDE ARROW AWAY FROM VALVE
E9	104592	ADPT 1/4 MNPT X 3/8 POH, BRASS	2	INSTALL ON "OUTLET" SIDE CONNECT PER DWG 538-00101-000
E10	019-03160	BRACKET, BAROMETER	1	N/A
E11	018-1812-25-0	SCREW, 1/4-20 X 1.25LG GR8	2	MOUNT TO PUMP
E12	097-1070-00-0	WASHER, 7/16 FLAT SAE STEEL	2	MOUNT TO PUMP
E13	200-00142-000	SENSOR, BAROMETER	1	HARNESS 513-00223-000; INSTALL HOSE 340-0061-02-0
E14	018-1214-25-0	SCREW, 1/4-20 X 1.50 LG GR8	2	MOUNT TO E12
E15	097-0020-01-0	WASHER, 1/4 FLAT SAE STEEL	2	MOUNT TO E12
E16	FSG-PL-01491	MIV 2.0 ASSEMBLY [BOTTOM MIV]	1	REFER TO DWG; HARNESS 513-00144-000 "MOTOR MODULE", "ACT MOTOR", "OPEN SW", & "CLOSE SW"
E17	007-3490-01-0	ADAPTER 5" W/ 4" W/ VIC	1	N/A
E18	629-00101-010	BRACKET, CAN MODULE 115	1	N/A
E19	610-00087/610-00088	MODULE, RED CAN BUS (DISCHARGE)	1	SEE NOTE 1
E20	097-0620-00-0	WASHER, LOCK SPLIT #8 ZINC	4	CONNECT E19/E22 TO E18
E21	018-0803-29-0	SCREW-#8-32X3/8LG. (SEE L,170)	4	CONNECT E19/E22 TO E18
E22	610-00087/610-00088	MODULE, GREEN CAN BUS (INTAKE)	1	SEE NOTE 1



UPPER: RH MIV  
LOWER: BOT MIV

  
**NOTE:**

1. A 4 STATION CAN MODULE OR 6 STATION CAN MODULE MAY BE USED DEPENDING ON NUMBER OF VALVES.

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

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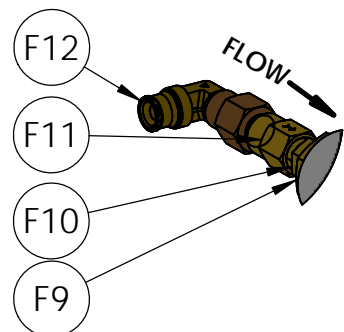
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MADE FROM		SAM COMPONENTS QMAX - DETAIL E	
FINISH		DRAWN	MB
PROJECT		APPROVED	TAM
		DATE	28FEB2020
		SIZE	B
		SCALE	1:5
		DRAWING NUMBER	FSG-PL-01502
		REV	D
		SHEET 7 OF 8	



IF IN DOUBT ASK

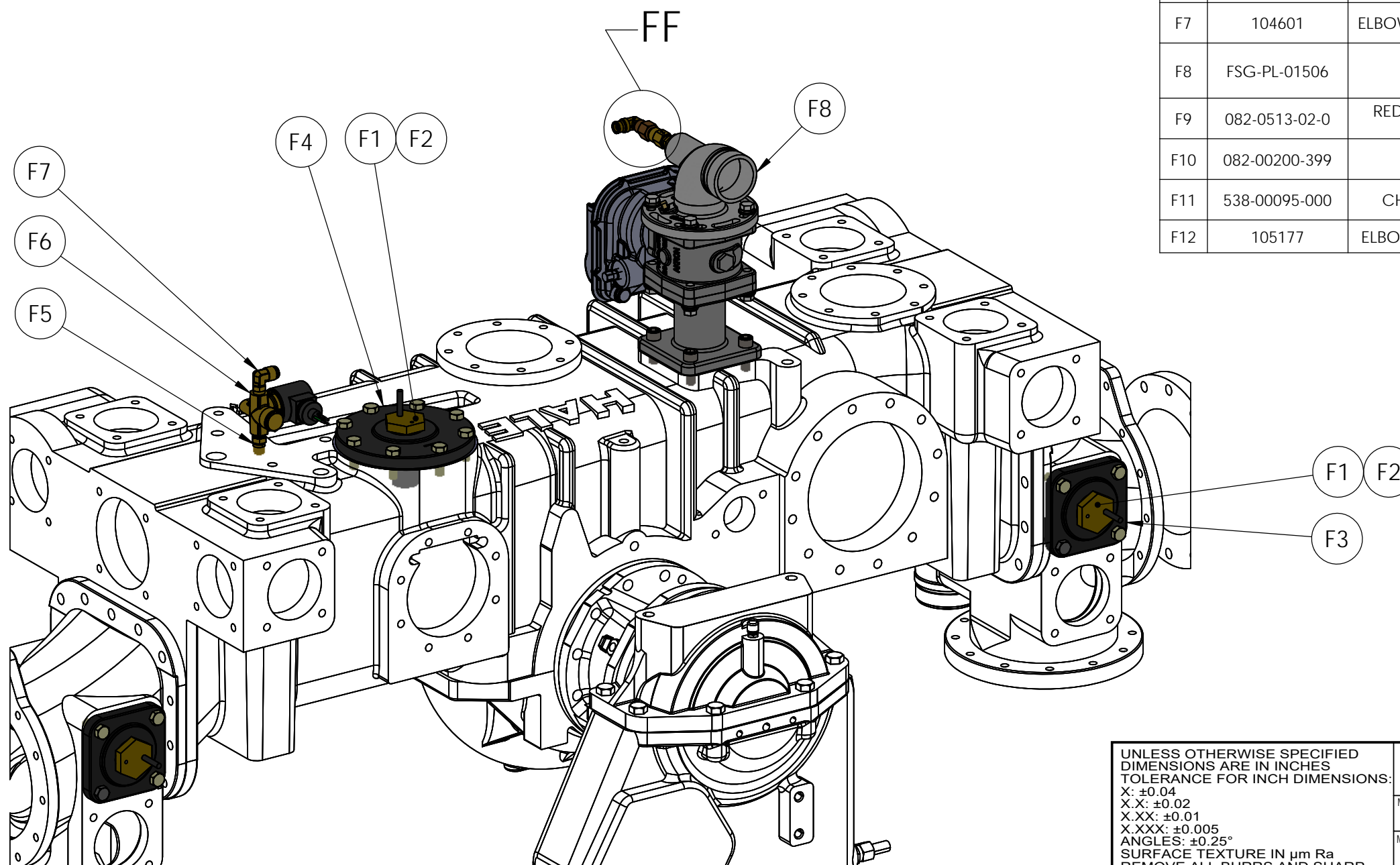
PROJECTION: 

# DETAIL F - ANODES & TANK FILL




DETAIL FF  
SCALE 1 : 3

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
F1	029-0511-05-0	ANODEPRO, ALLOY (1.25" MNPT)	3	HARNESS 513-00223-000 "ANODE #"
F2	018-1003-44-0	SCREW, 10-24 X 3/8 LG SST	3	HARNESS 513-00223-000 "ANODE #" RING TERM.
F3	115-1260-00-0	FLANGE, 4-BOLT 1.25" FNPT	2	N/A
F4	115-00010-000	FLANGE, 8-BOLT 1.25" FNPT	1	N/A
F5	082-00200-399	NIPPLE, 1/4" MNPT HEX, BRASS	1	INSTALL ON "P" SIDE
F6	038-00107-000	VALVE, SOLENOID	1	HARNESS 513-00223-000 "PUMP COOLING SOLENOID"
F7	104601	ELBOW SWLV 90° 1/4" MNPT X 3/8" POH, BRASS	1	INSTALL ON "A" SIDE CONNECT TO F12
F8	FSG-PL-01506	VALVE, TANK FILL	1	REFER TO DWG: HARNESS 513-00192-00x "TANK FILL"
F9	082-0513-02-0	REDUCER BUSHING, 3/4" MNPT X 1/4" FNPT, BRASS	1	N/A
F10	082-00200-399	NIPPLE, 1/4" MNPT HEX, BRASS	1	N/A
F11	538-00095-000	CHECK VALVE 1/4" NPT, MALE X FEMALE	1	INSTALL WITH ARROW TOWARD VALVE
F12	105177	ELBOW SWLV 90° 1/4" FNPT X 3/8" POH, BRASS	1	CONNECT TO F7



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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		TITLE <b>SAM COMPONENTS                  QMAX - DETAIL F</b>	
MATERIAL		DRAWN	MB
MADE FROM		APPROVED	TAM
FINISH		DATE	28FEB2020
PROJECT		SCALE	1:6
DRAWING NUMBER <b>FSG-PL-01502</b>		REV	<b>D</b>
		SHEET 8 OF 8	



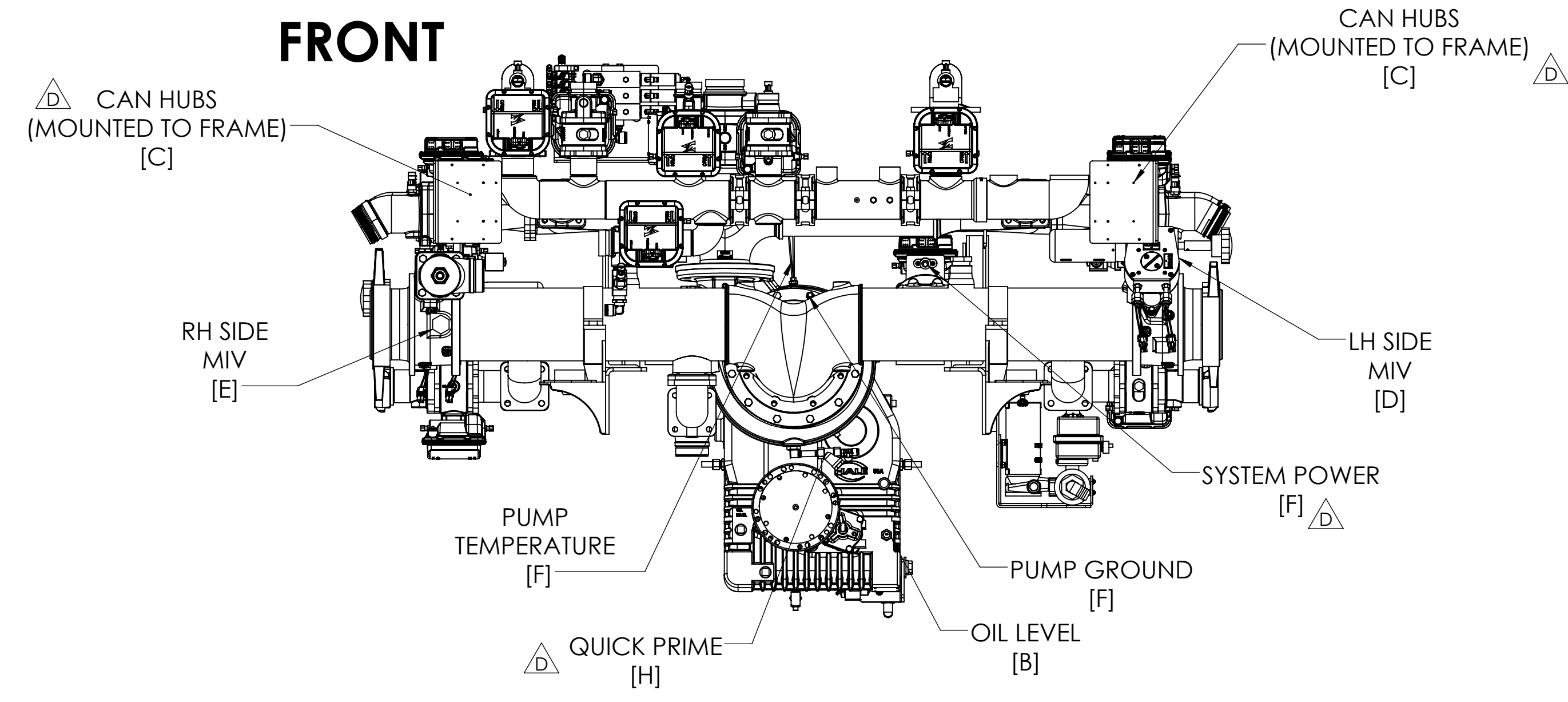
# SAM DSD MODULE

IF IN DOUBT ASK

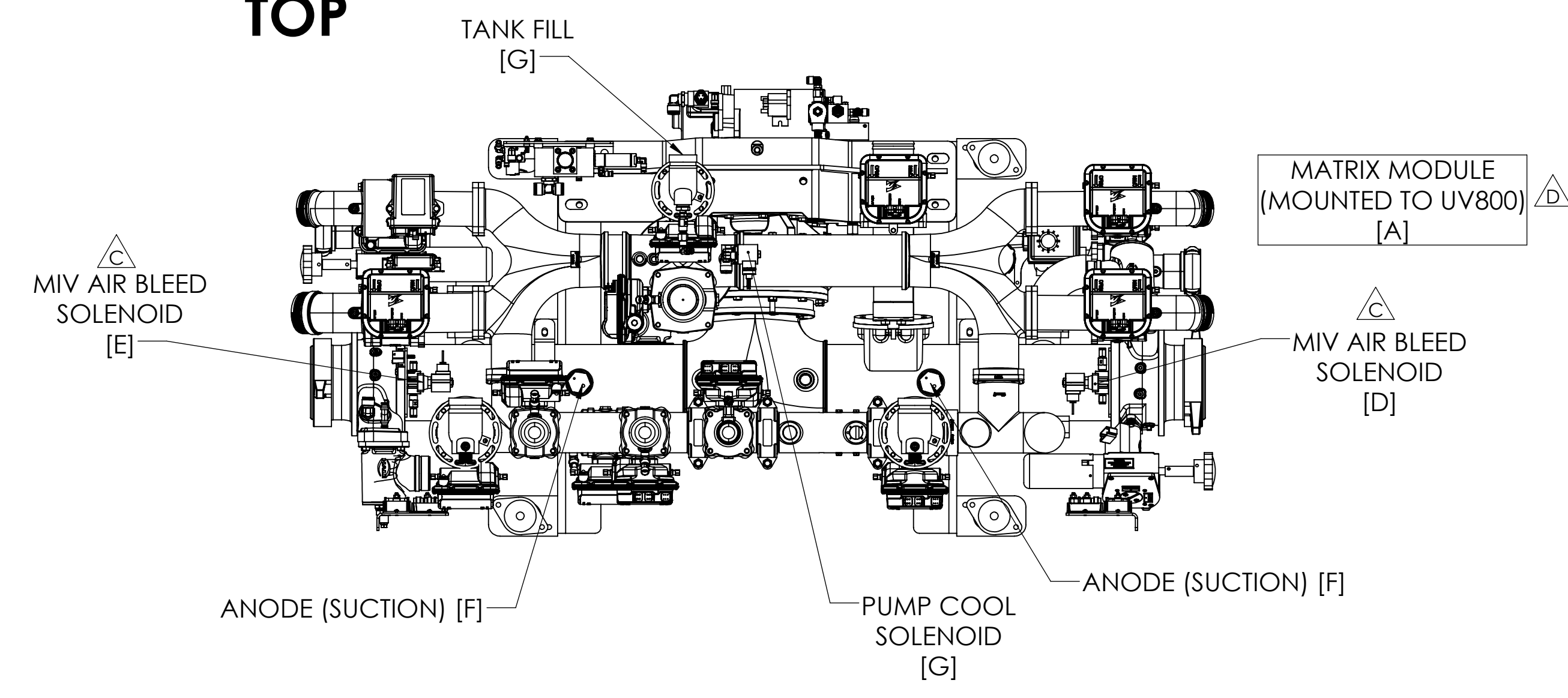
PROJECTION: 

COMPLIANCE NOTE:  
15 CFR 738 These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for use in the ultimate recipient's or end-user's country. They may not be re-exported, transferred, or otherwise disposed of to any other country or to any person other than the authorized ultimate recipient or end-user, either by the original item or after being incorporated into other items, without the written approval from the U.S. Government or an otherwise authorized U.S. Government organization. The term "ultimate recipient" includes persons, entities and countries (including foreign states) that are listed in the U.S. Munitions List. These drawings are unclassified and copy within intellectual property of FSG and its subsidiaries, and may not be reproduced or modified without the express written permission of FSG only.

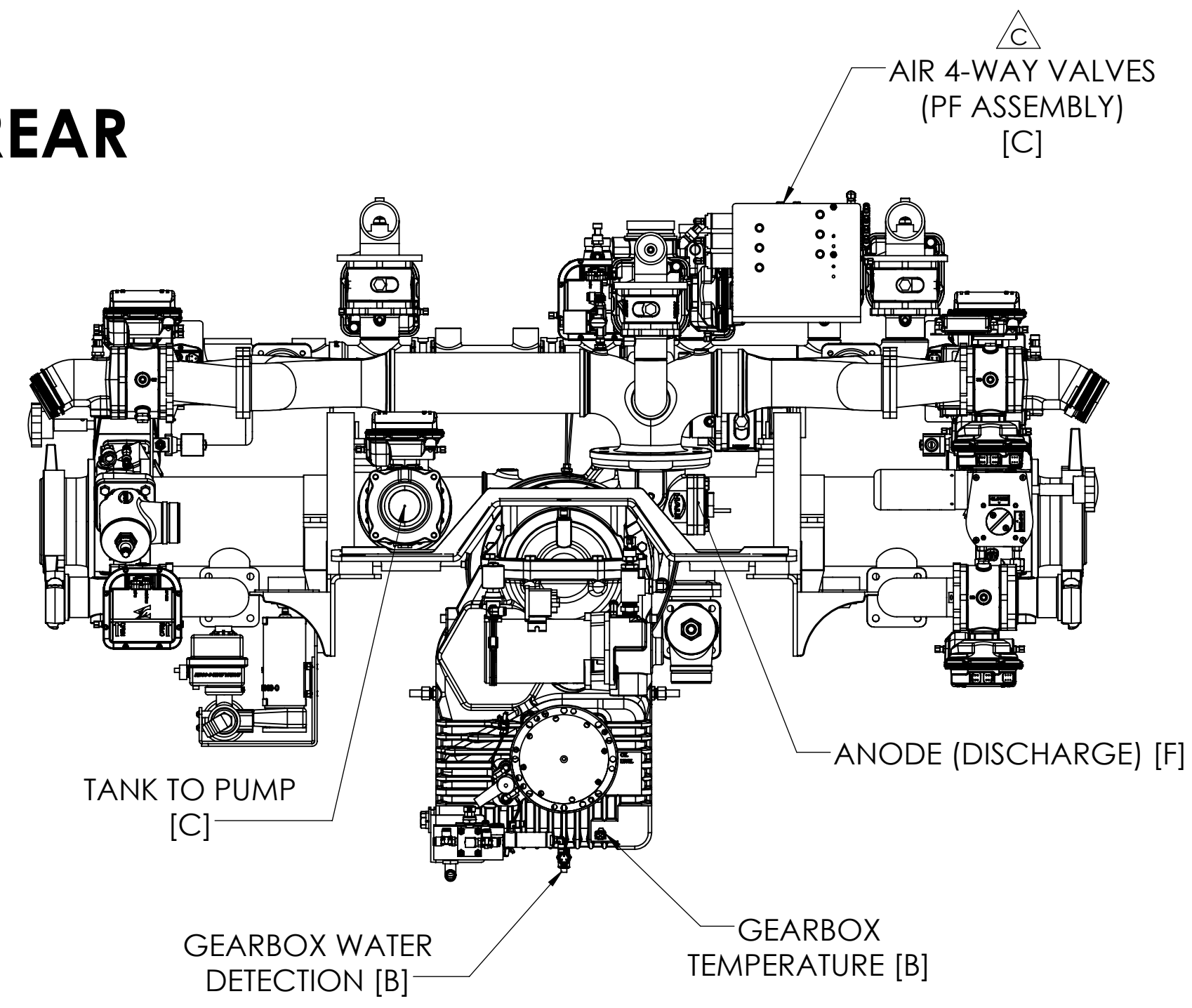
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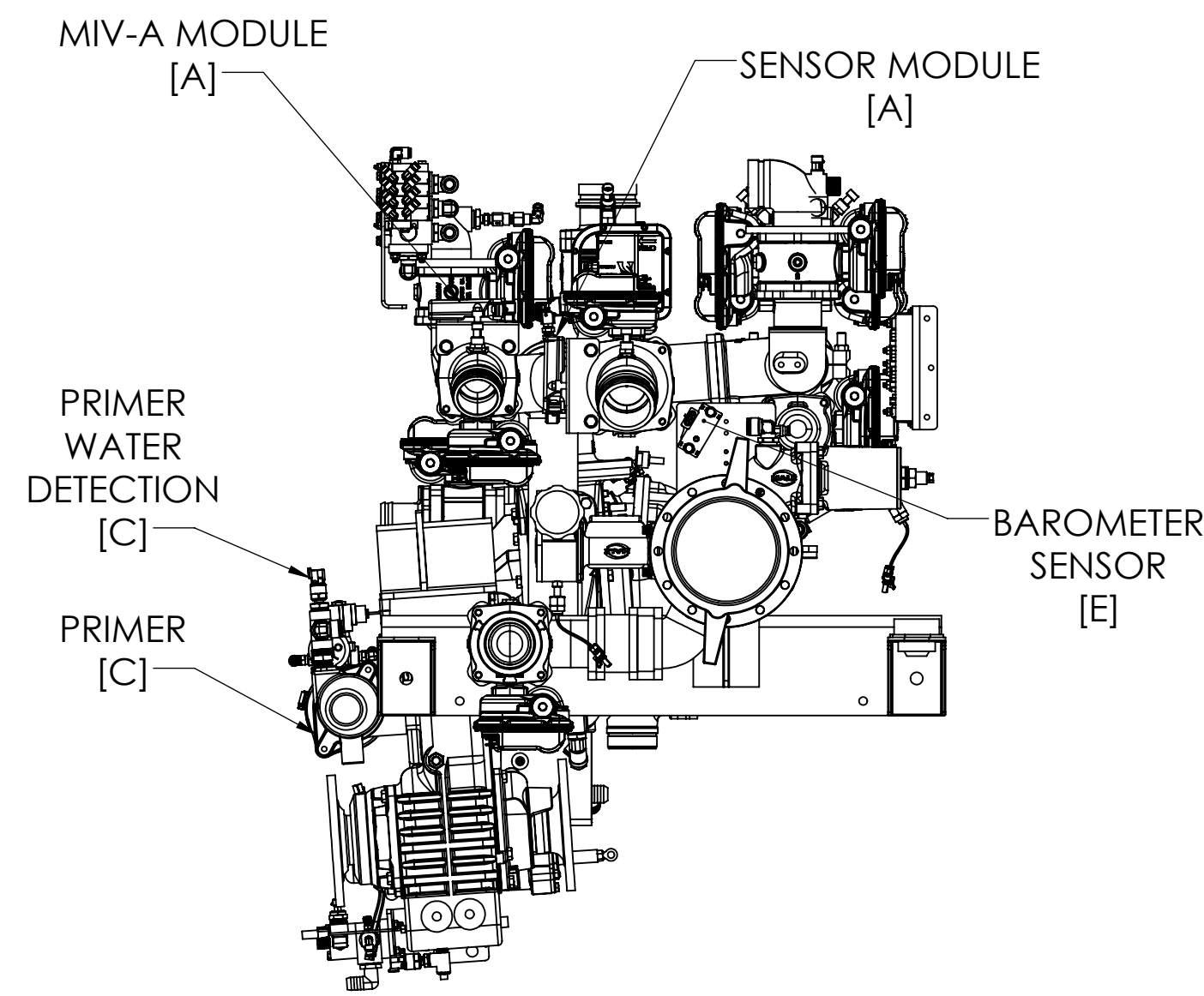
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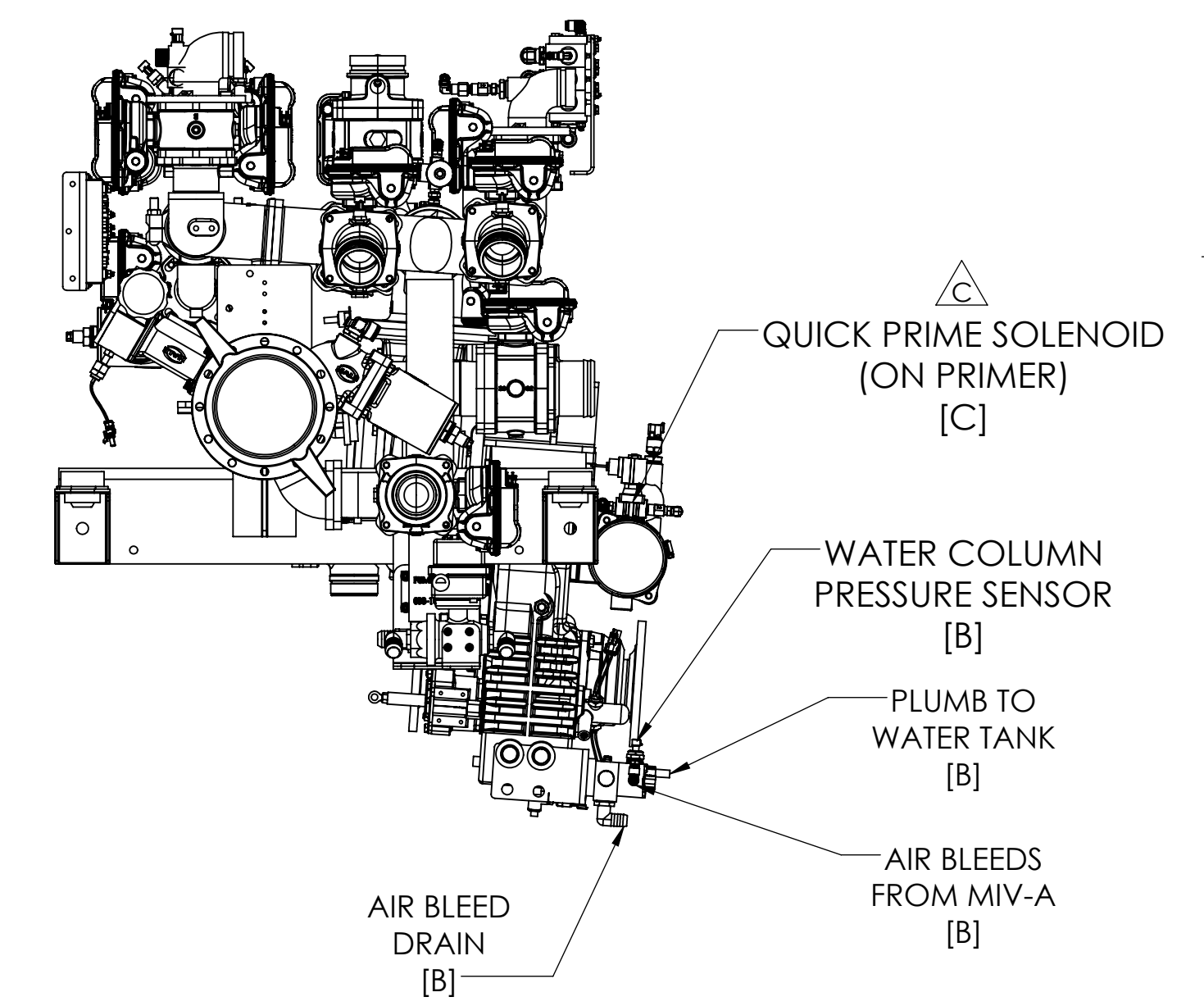
## REAR



## RIGHT



## LEFT







### NOTES

- MODULE FRAME & PANELS NOT SHOWN. THE SAM DSD SYSTEM IS ONLY AVAILABLE AS A COMPLETE PUMP MODULE.
- BILL OF MATERIAL DETAILS [A-G] FOR EACH COMPONENT ARE SHOWN IN SUBSEQUENT PAGES OF THIS DRAWING.
- REFERENCE DRAWINGS:
  - BASE DSD G GEARBOX: PL916 (INSTALL) & PL789 (PARTS)
  - SAM PANEL COMPONENT DETAILS: FSG-PL-01505
  - SAM CAN NETWORK DIAGRAM: FSG-PL-01504
  - SAM PLUMBING DIAGRAM: FSG-PL-01514
- SUB-ASSEMBLY DRAWINGS REQUIRED FOR BUILD:
  - 538-00100-000 - WATER TOWER DRAIN MANIFOLD [DETAIL B]
  - 538-00099-001 - PF BLOCK ASSEMBLY [DETAIL C]
  - FSG-PL-01506 - SAM VALVE ASSEMBLIES [DETAILS C & G]
  - FSG-PL-01491 - MIV 2.0 ASSEMBLY [DETAILS D, & E]
  - 538-00101-000 - MIV AIR PRIME CONNECTIONS [DETAILS D & E]

REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
N/A	A		ORIGINAL RELEASE	AJG	17APR2020	TAM
5144	B	3-D8, 3-E8	UPDATED HARNESS PART NUMBERS ON DETAIL A	AJG	26MAY2020	KTN
5341	C	F11, F6, G16, H10, 5-A4, 5-B3, 5-C2, 6-A3, 6-B2, 6-D2, 7-A1, 7-A3, 7-C2	UPDATED MIV AIR BLEED SOLENOIDS. UPDATE QUICK PRIME SOLENOID LOCATION AND PART NUMBER. UPDATED PF4-WAY ASSEMBLY.	TAM	12JAN2021	KTN
5724	D	A11, A5, D10, D7, F11, 2-E8, 2-H8, 3-A1, 3-C5, 3-E2, 5-B6, 5-B7, 5-C4, 6-C2, 7-E8, 8-C7, 8-D2	UPDATED FOR CAN HUB SYSTEM. ADDED ELECTRONIC REPLACEMENT PART NUMBERS. ADDED SHEET FOR QUICK PRIME FEATURE (DETAIL H).	TAM	01MAR2022	KTN

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCHES DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±1°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

		  	
MATERIAL		TITLE	
MADE FROM		SAM COMPONENT DIAGRAM DSD MODULE	
FINISH	DRAWN	AJG	SIZE
PROJECT	APPROVED	TAM	D
	DATE	17APR2020	SCALE
			1:10
		DRAWING NUMBER	REV
		FSG-PL-01513	D
			SHEET
			1 OF 10

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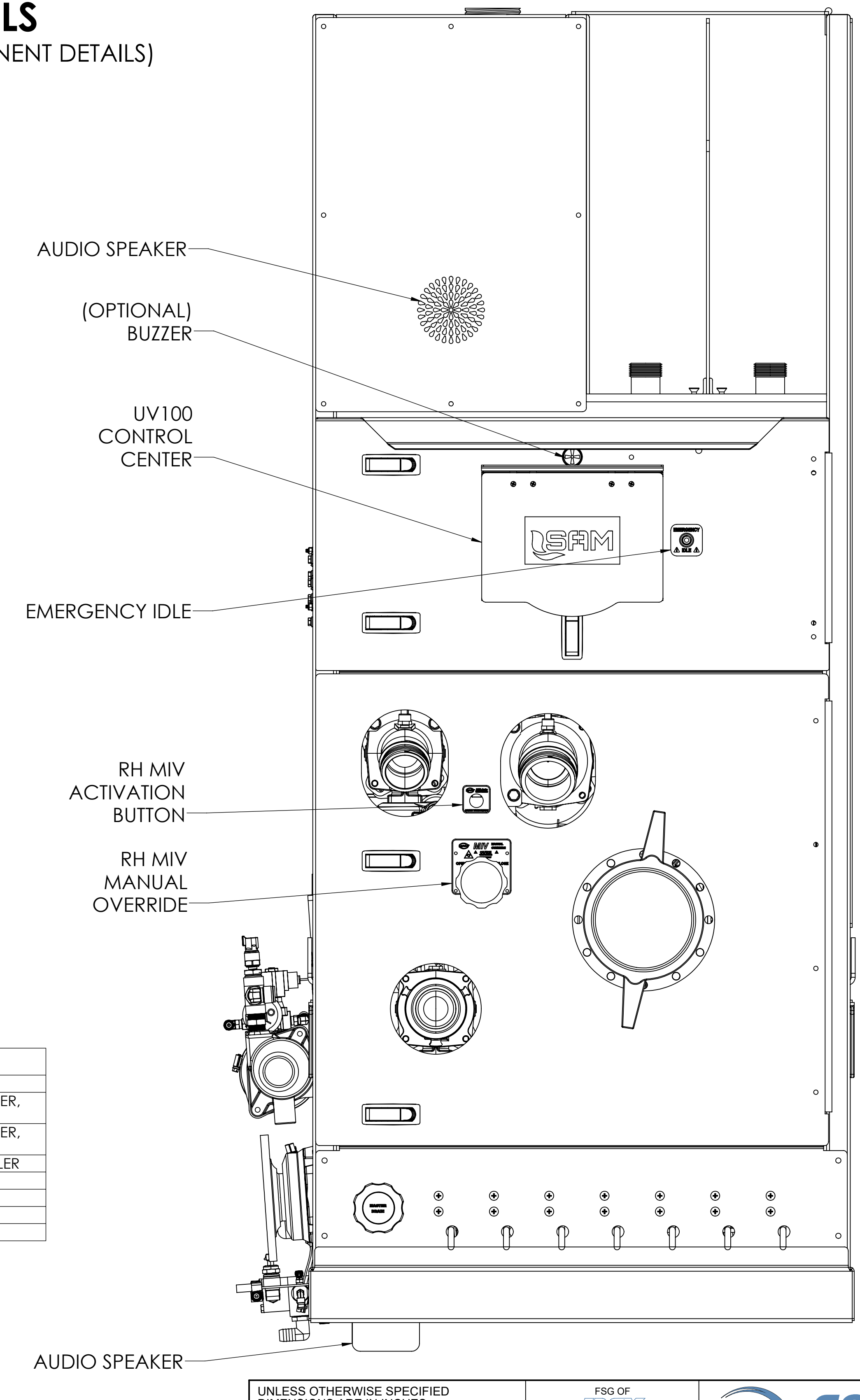
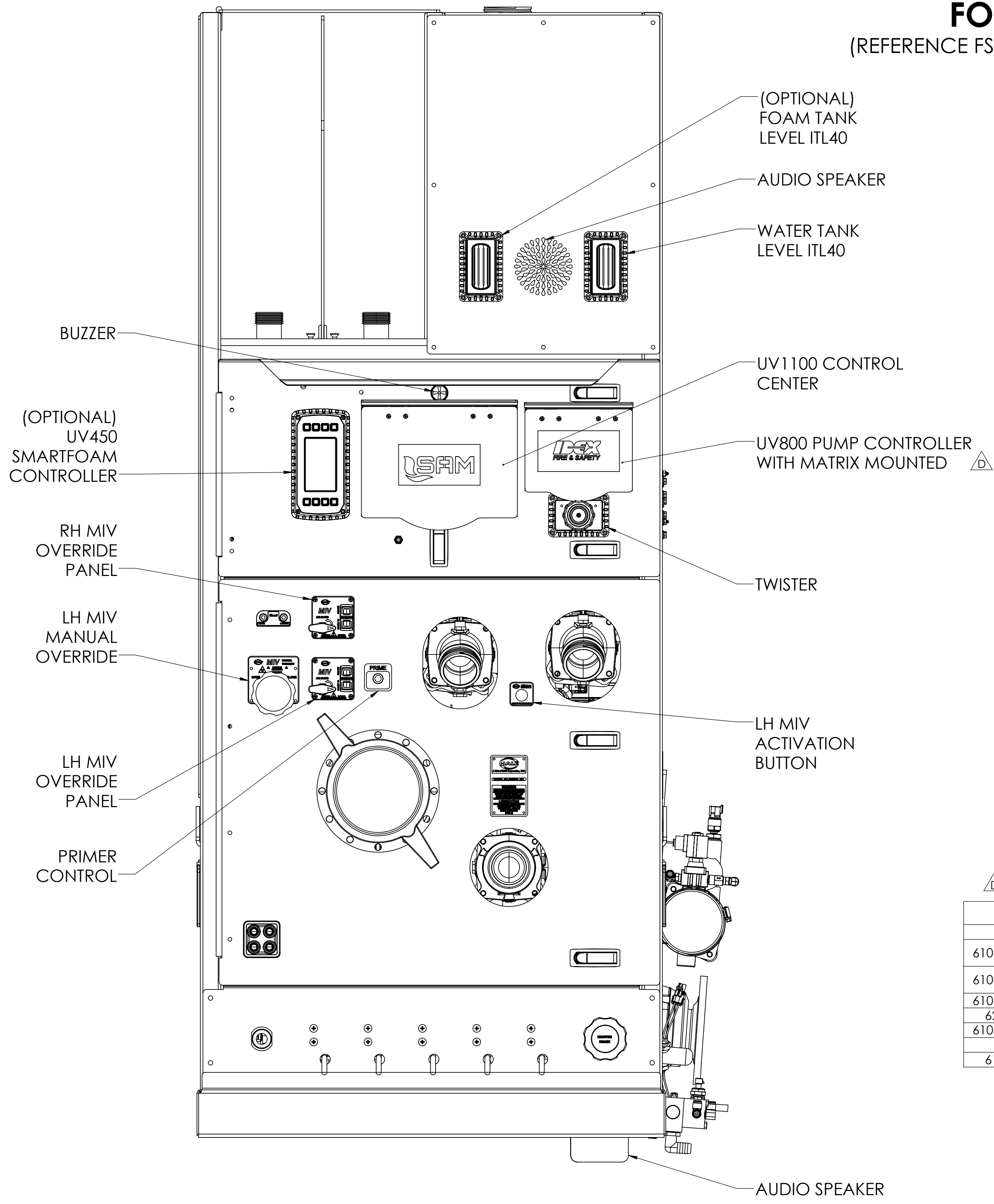


LH (DRIVER)

RH (OFFICER)

**RECOMMENDED PANEL LAYOUT  
FOR SAM CONTROLS**  
(REFERENCE FSG-PL-01503 FOR COMPONENT DETAILS)

PROJECTION: 



ELECTRONIC REPLACEMENT PARTS	
PART NO.	DESCRIPTION
610-00060-210-50	UV1100 CONTROL CENTER, MASTER
610-00060-110-50	UV1100 CONTROL CENTER, SECONDARY
610-00060-080-50	UV800 PUMP CONTROLLER
629-00077-50	WIFI ANTENNA
610-00076-001-50	TABLET
610-00052	MODULE, MATRIX
610-00066-50	MODULE, MIV-A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCHES DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

**FSG OF IDEX CORPORATION**

**HALE GODIVA Class 1**


**SAM CONTROL PANEL LAYOUT DSD MODULE**

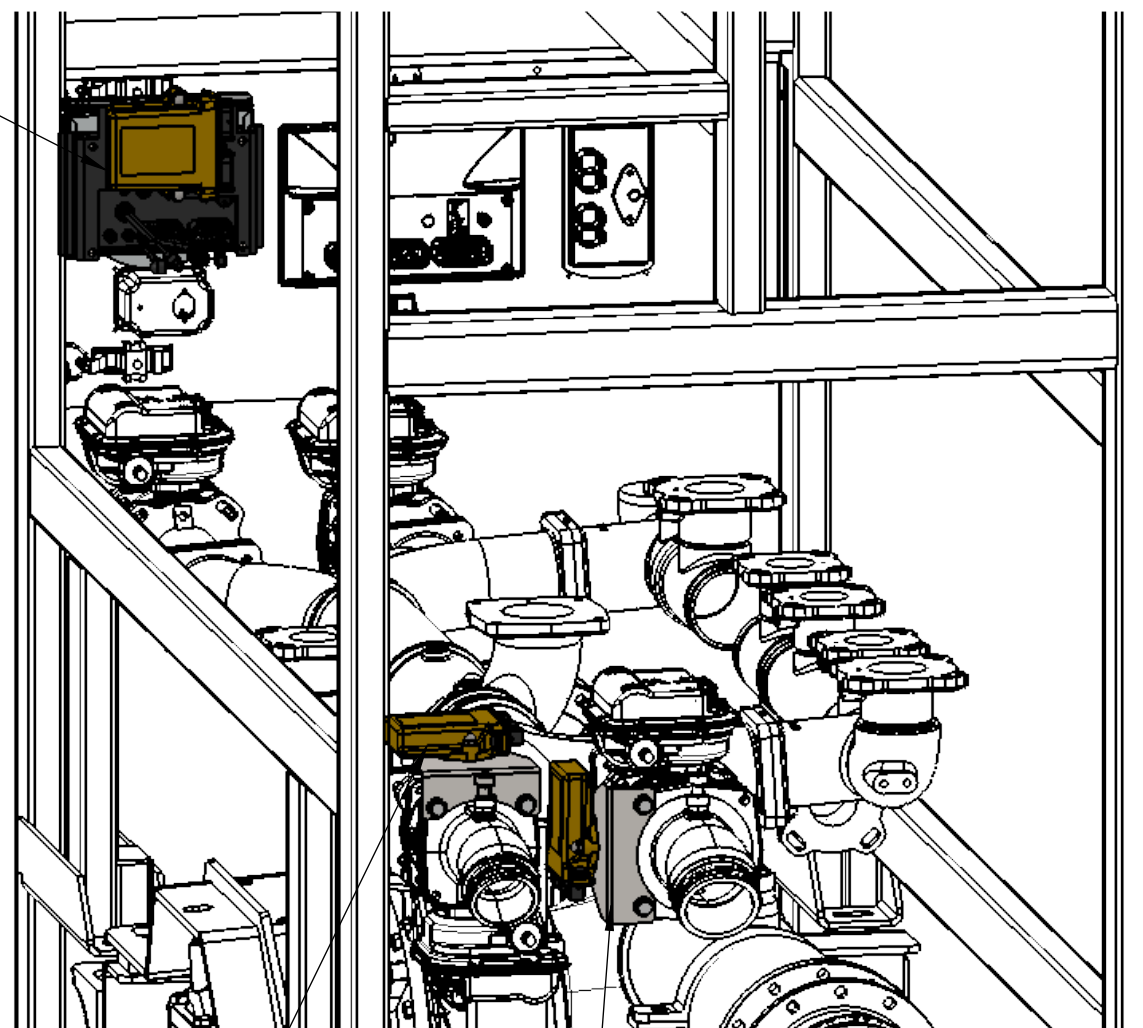
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MADE FROM	PROJECT		APPROVED	TAM	DATE	SCALE	FSG-PL-01513		D
FINISH	DATE		17APR2020	SCALE	1:5			SHEET	D
								2 OF 10	

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PROJECTION: 

  
A3 A2 A1  
UV800



A4 A5 A3  
DISCHARGE #4

A6 A5 A3  
DISCHARGE #3



ELECTRONIC REPLACEMENT PARTS	
PART NO.	DESCRIPTION
610-00071	MODULE, SENSOR
610-00052	MODULE, MATRIX
610-00066-50	MODULE, MIV-A

**NOTES**



1. ACTUAL INSTALLED ORIENTATION OF ELECTRONIC MODULE MAY DIFFER, DEPENDING UPON VALVE SIZE AND SURROUNDING COMPONENTS.
2. 019-03810-025 FOR 2.5" VALVE, 019-03810-030 FOR 3.0" VALVE.

 **DETAIL A - SAM MODULES**

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
A1	610-00052	MODULE, MATRIX	1	HARNESS 513-00224-000; MOUNTED TO UV800 BRACKET
A2	019-03798	MOUNTING BRACKET, PV800	1	N/A
A3	110-1203-06-0	NUT, ACORN 1/4-20 SST	6	N/A
A4	610-00066	MODULE, MIV-A	1	SEE NOTE 1; HARNESS 513-00182-000 (STD) OR 513-00182-001 (EXTENDED)
A5	019-03810-###	BRACKET, SAM MODULE MOUNT (SEE NOTE 2)	2	N/A
A6	610-00071	MODULE, SENSOR	1	SEE NOTE 1; HARNESS 513-00183-000 (STD) OR 513-00183-001 (EXTENDED)

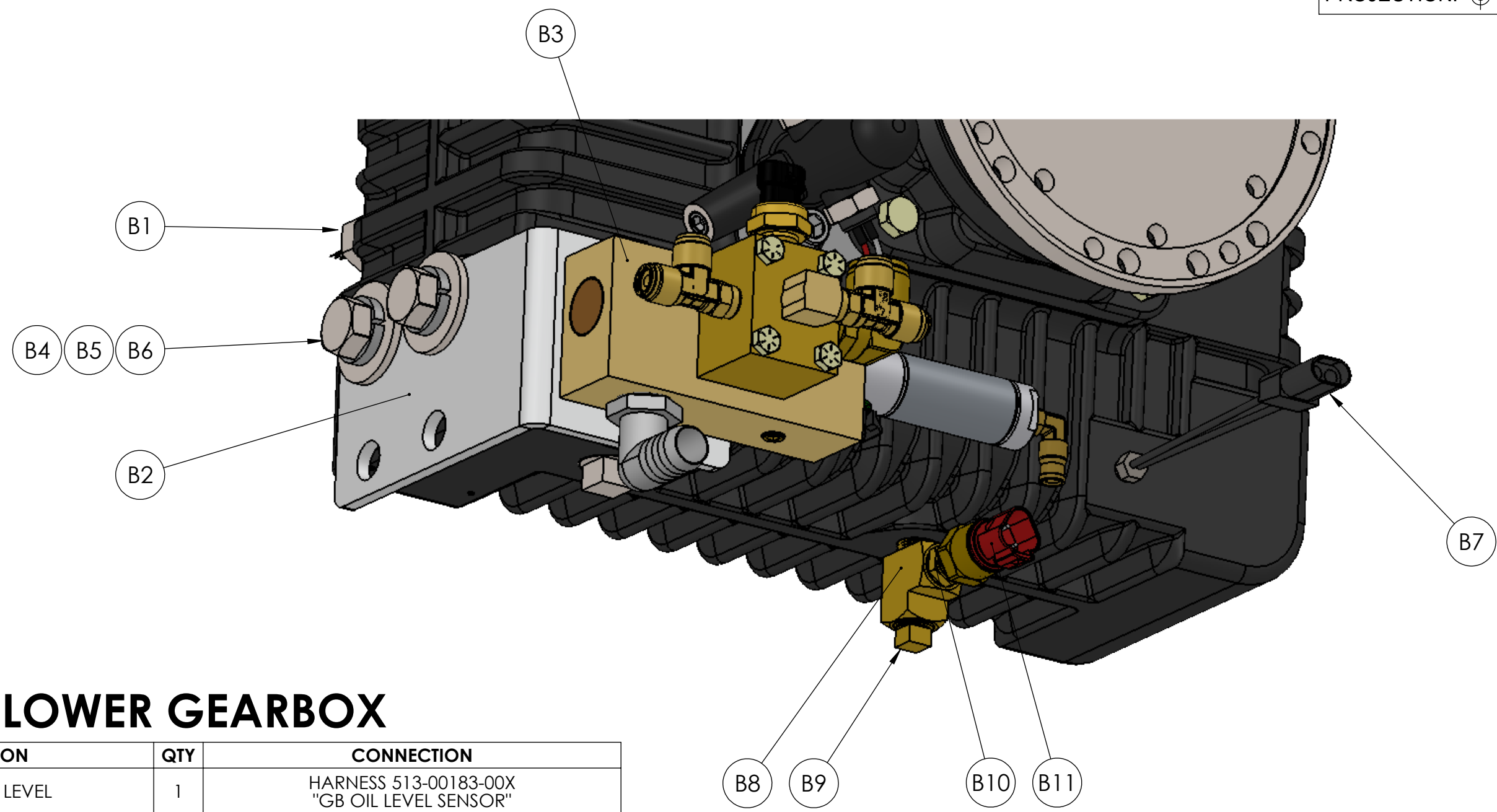
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TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

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MATERIAL		TITLE	
MADE FROM		SAM COMPONENTS DSD MODULE - DETAIL A	
FINISH		DRAWN: AJG APPROVED: TAM DATE: 17APR2020	SIZE: B SCALE: 1:8 DRAWING NUMBER: FSG-PL-01513 REV: D SHEET: 3 OF 10

IF IN DOUBT ASK

PROJECTION: 





## DETAIL B - LOWER GEARBOX

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
B1	200-00144-000	SENSOR, OIL LEVEL	1	HARNESS 513-00183-00X "GB OIL LEVEL SENSOR"
B2	019-03101-001	BRACKET, DRAIN MANIFOLD	1	N/A
B3	538-00100-000	ASY, SAM DRAIN MANIFOLD	1	FOLLOW ASY DWG INSRUCT.; CONNECT SENSOR TO HARNESS 513-00182-00X "WATER COLUMN SENSOR"
B4	018-2414-25-0	BOLT, HH 5/8-11 X 1.5 LG GR8	2	MOUNT TO GEARBOX
B5	106923	WASHER, 5/8 SPLIT LOCK STEEL	2	MOUNT TO B2
B6	108709	WASHER, 5/8 X 1.75 OD FLAT STEEL	4	MOUNT TO B2
B7	200-1161-00-0	SENSOR, TEMPERATURE 10KP	1	HARNESS 513-00183-00X "GB OIL TEMP SENSOR"
B8	120228	TEE, 3/8 NPT, STREET, M X F X F, BRASS	1	N/A
B9	217-0301-01-0	PLUG, 3/8 MNPT, SQUARE, BRASS	1	N/A
B10	082-0302-02-0	ADAPTER, 3/8 MNPT X 1/4 FNPT, BRASS	1	N/A
B11	200-00143-000	SENSOR, WATER DETECTION	1	HARNESS 513-00183-00X "GB WATER IN OIL SENSOR"

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

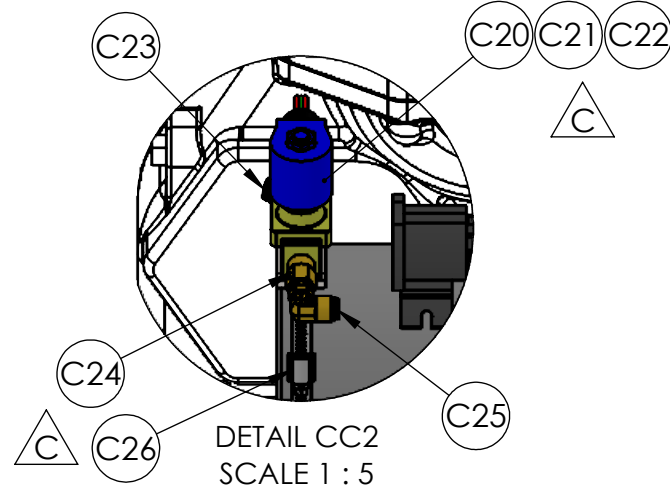
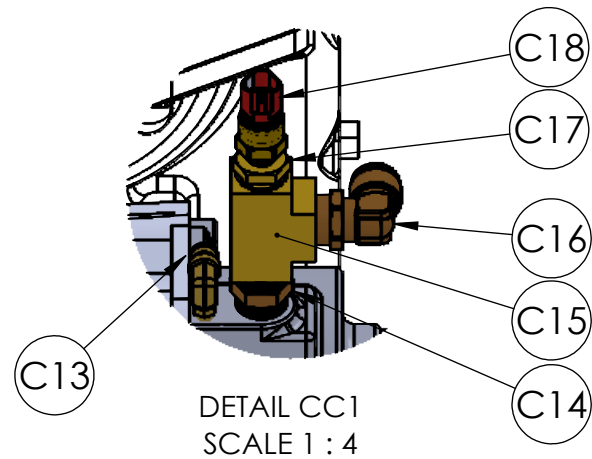
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MATERIAL		TITLE	
MADE FROM		SAM COMPONENTS DSD MODULE - DETAIL B	
FINISH		DRAWN	AJG
PROJECT		APPROVED	TAM
		DATE	17APR2020
		SIZE	B
		SCALE	1:2
		DRAWING NUMBER	FSG-PL-01513
		REV	D
		SHEET 4 OF 10	



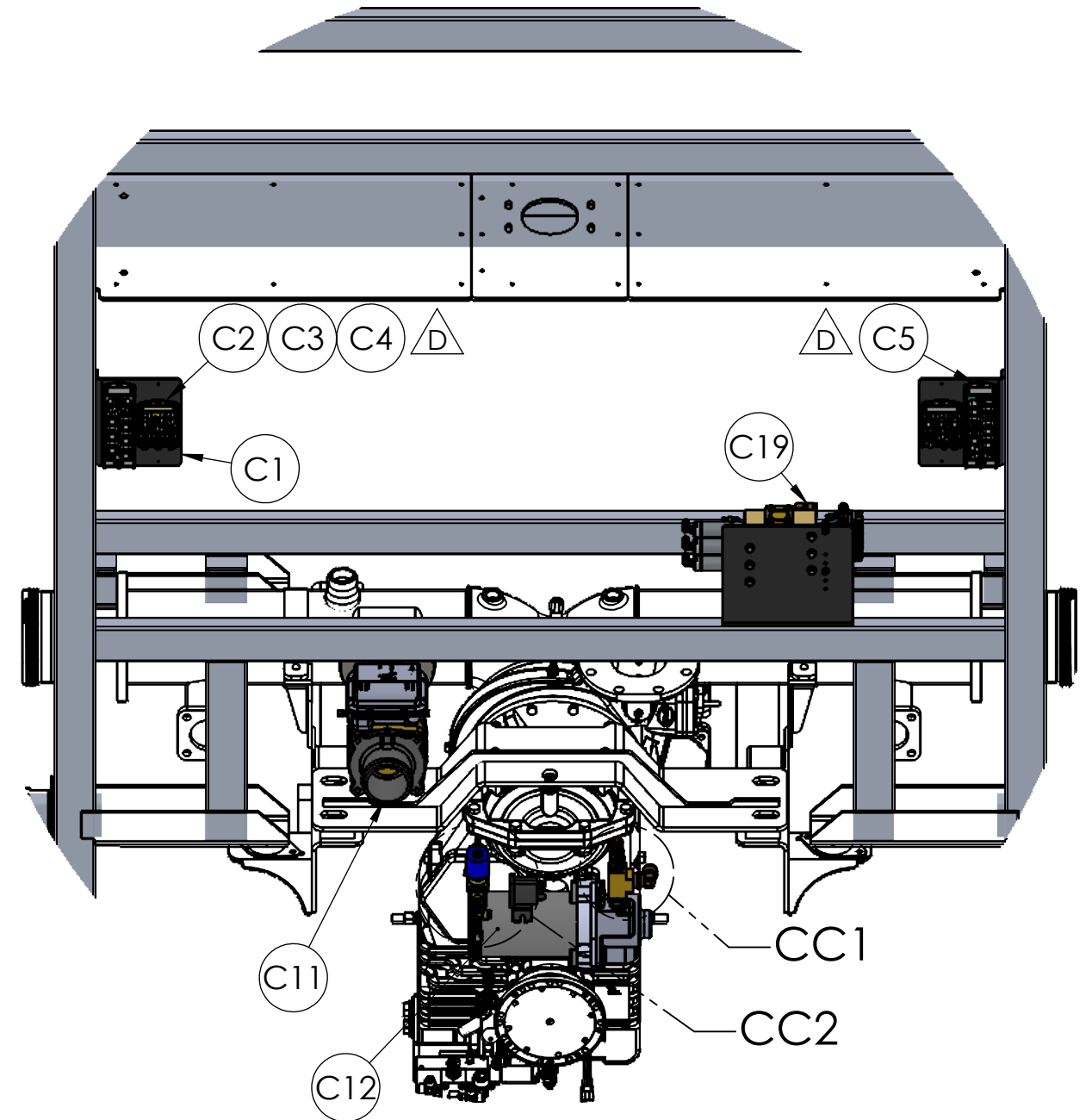
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PROJECTION: 





**DETAIL C - PUMP REAR**

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
C1	019-04815	BRACKET, CAN HUB	2	MOUNT TO MODULE FRAME
C2	610-00087/610-00088	HUB, RED CAN BUS (DISCHARGE)	2	SEE NOTE 1
C3	097-0620-00-0	WASHER, LOCK SPLIT #8 ZINC	8	CONNECT C2/C5 TO C1
C4	018-0803-29-0	WASHER, FLAT 1/4 ID X 5/8 OD, SST	8	CONNECT C2/C5 TO C1
C5	610-00087/610-00088	HUB, GREEN CAN BUS (INTAKE)	2	SEE NOTE 1
C11	FSG-PL-01506	VALVE, TANK TO PUMP	1	REFER TO DWG; HARNESS 513-00192-00x
C12	501-3090-00-0	PRIMER, 12VDC	1	HARNESS 513-00183-00x "PRIMER INPUT" HARNESS 513-00182-00x "PRIMER DRIVER"
C13	104599	ELBOW SWVL 90° 1/8 MNPT X 3/8 POH, BRASS	1	CONNECT TO PART C25
C14	118265	NIPPLE, HEX 2X 3/4 MNPT, BRASS	1	N/A
C15	082-0560-02-0	TEE, 3/4 FNPT, BRASS	1	N/A
C16	105590	ELBOW, SWVL 90° 3/4 MNPT X 3/4 POH, BRASS	1	CONNECT TO ASSEMBLY C19
C17	082-0513-02-0	REDUC. BUSH, 3/4 MNPT X 1/4 FNPT, BRASS	1	N/A
C18	200-00143-000	SENSOR, WATER DETECTION	1	HARNESS 513-00182-00x "WATER IN PRIMER SENSOR"
C19	538-00099-001	PF / 4-WAY VALVE ASSEMBLY	1	REFER TO DWG; HARNESS 513-00182-00x "PRE-PRIME #", "PUMP BODY PRIME", "AB DRAIN" FOR DUAL MIV-A MODULES, ADD HARNESS 513-00145-004 "PRE-PRIME #"
C20	538-00103-000	VALVE, SOLENOID	1	HARNESS 513-00183-00x "QUICK PRIME SOLENOID"
C21	019-03922	BRACKET, PRIMER SOLENOID	1	MOUNT TO C12
C22	218-00103-014	BOLT, HH M5 X 14 MM	2	MOUNT TO C19
C23	104601	ELBOW 1/4 MNPT X 3/8 POH, BRASS	1	CONNECT TO H5
C24	538-00095-000	CHECK VALVE 1/4 NPT, M X F	1	INSTALL ARROW AWAY FROM VALVE
C25	104601	ELBOW 1/4 MNPT X 3/8 POH, BRASS	1	CONNECT TO C13
C26	111075	CLAMP, HOSE	1	MOUNT TO C12 & C21



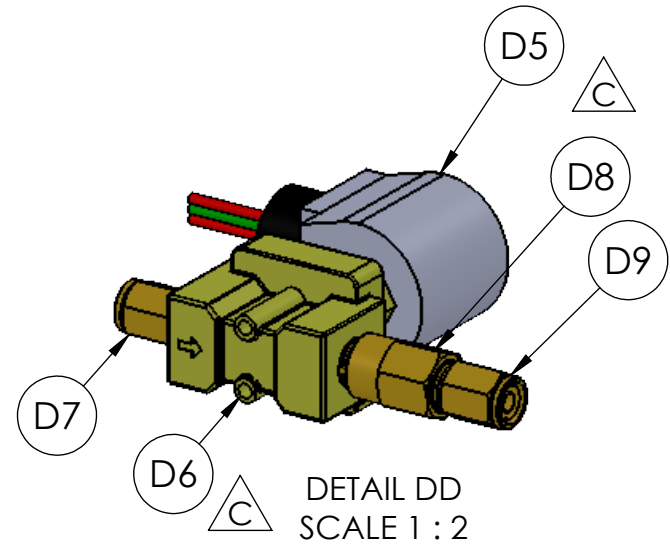
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X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
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EDGES, 0.01MAX

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MATERIAL		TITLE	
MADE FROM		SAM COMPONENTS DSD MODULE - DETAIL C	
FINISH		DRAWN: AJG APPROVED: TAM DATE: 17APR2020	SIZE: B SCALE: 1:12 DRAWING NUMBER: FSG-PL-01513 REV: D SHEET: 5 OF 10

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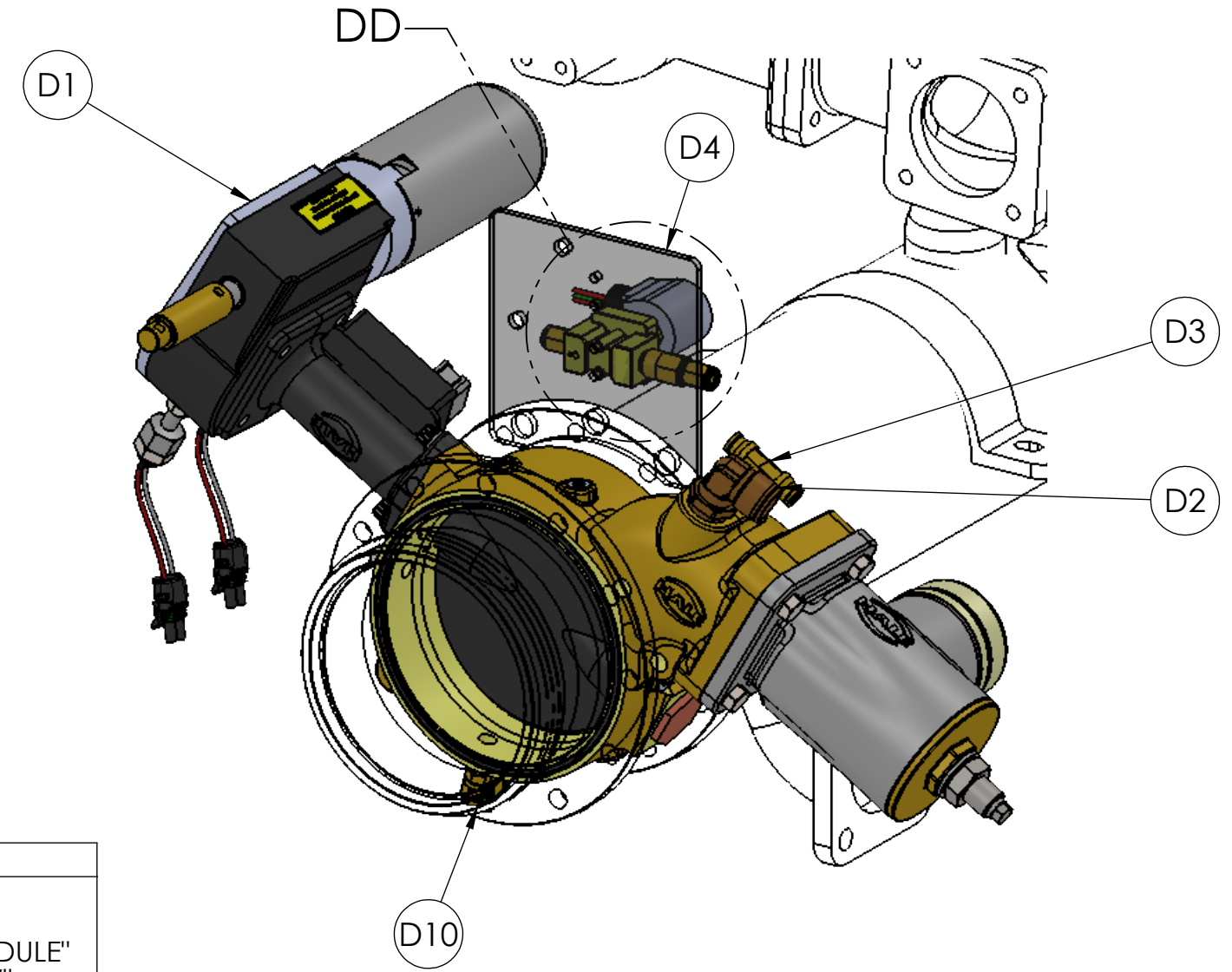
PROJECTION: 



ELECTRONIC REPLACEMENT PARTS	
PART NO.	DESCRIPTION
610-00050	MODULE, LH MIV



**DETAIL D - LH MIV**

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
D1	FSG-PL-01491	MIV 2.0 ASSEMBLY [LH MIV]	1	REFER TO DWG; HARNESS 513-00144-000 "MOTOR MODULE", "ACT MODULE" "OPEN SW", & "CLOSE SW"
D2	105590	ELBOW SWVL 90° 3/4 MNPT X 3/4 POH, BRASS	1	CONNECT TO C19
D3	082-00302-102	TEE SWVL 1/4 MNPT X 2X 3/8 POH, BRASS	1	CONNECT PER DWG 538-00101-000
D4	019-03508	BRACKET, SOLENOID	1	N/A
D5	538-00103-000	VALVE, SOLENOID	1	HARNESS 513-00144-000 "ABV SOLENOID"
D6	218-00103-014	SCREW, HHC M5 X 14MM	2	MOUNT D5 TO D4
D7	104592	ADPT 1/4 MNPT X 3/8 POH, BRASS	1	INSTALL ON INLET SIDE CONNECT PER DWG 538-00101-000
D8	538-00095-000	CHECK VALVE 1/4 NPT, MALE X FEMALE	1	INSTALL ON OUTLET SIDE ARROW AWAY FROM SOLENOID
D9	104592	ADPT 1/4 MNPT X 3/8 POH, BRASS	1	INSTALL ON OUTLET SIDE CONNECT PER DWG 538-00101-000
D10	104601	ELBOW 1/4 MNPT X 3/8 POH, BRASS	1	CONNECT TO MASTER DRAIN



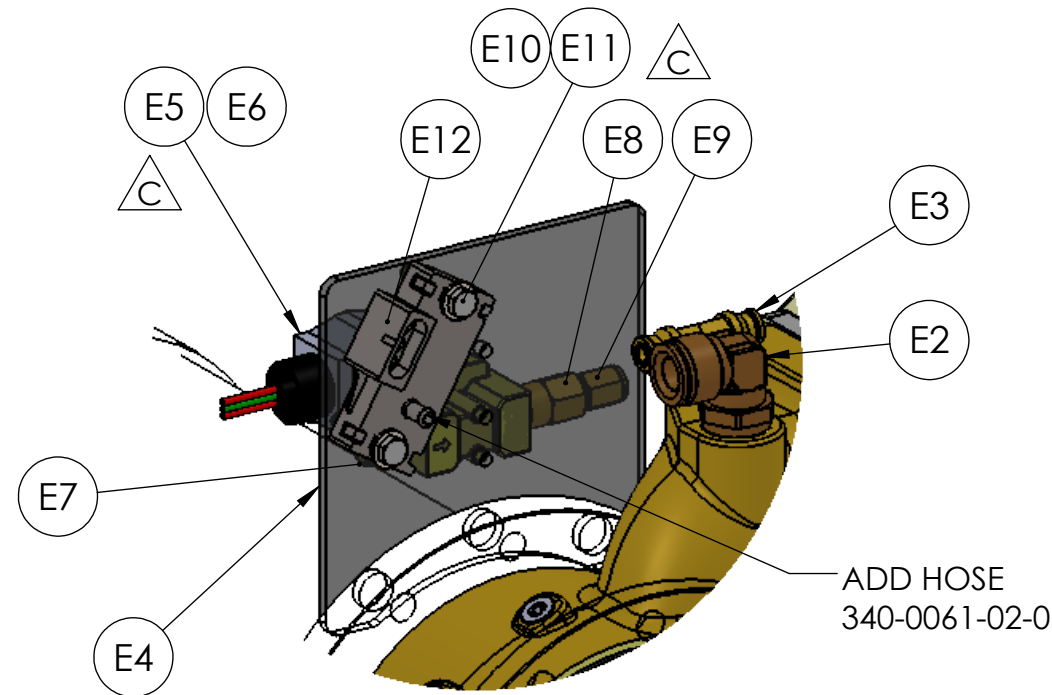
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X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
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MATERIAL		TITLE	
MADE FROM		SAM COMPONENTS DSD MODULE - DETAIL D	
FINISH		DRAWN	AJG
PROJECT		APPROVED	TAM
		DATE	17APR2020
		SIZE	B
		SCALE	1:4
		DRAWING NUMBER	FSG-PL-01513
		REV	D
		SHEET 6 OF 10	

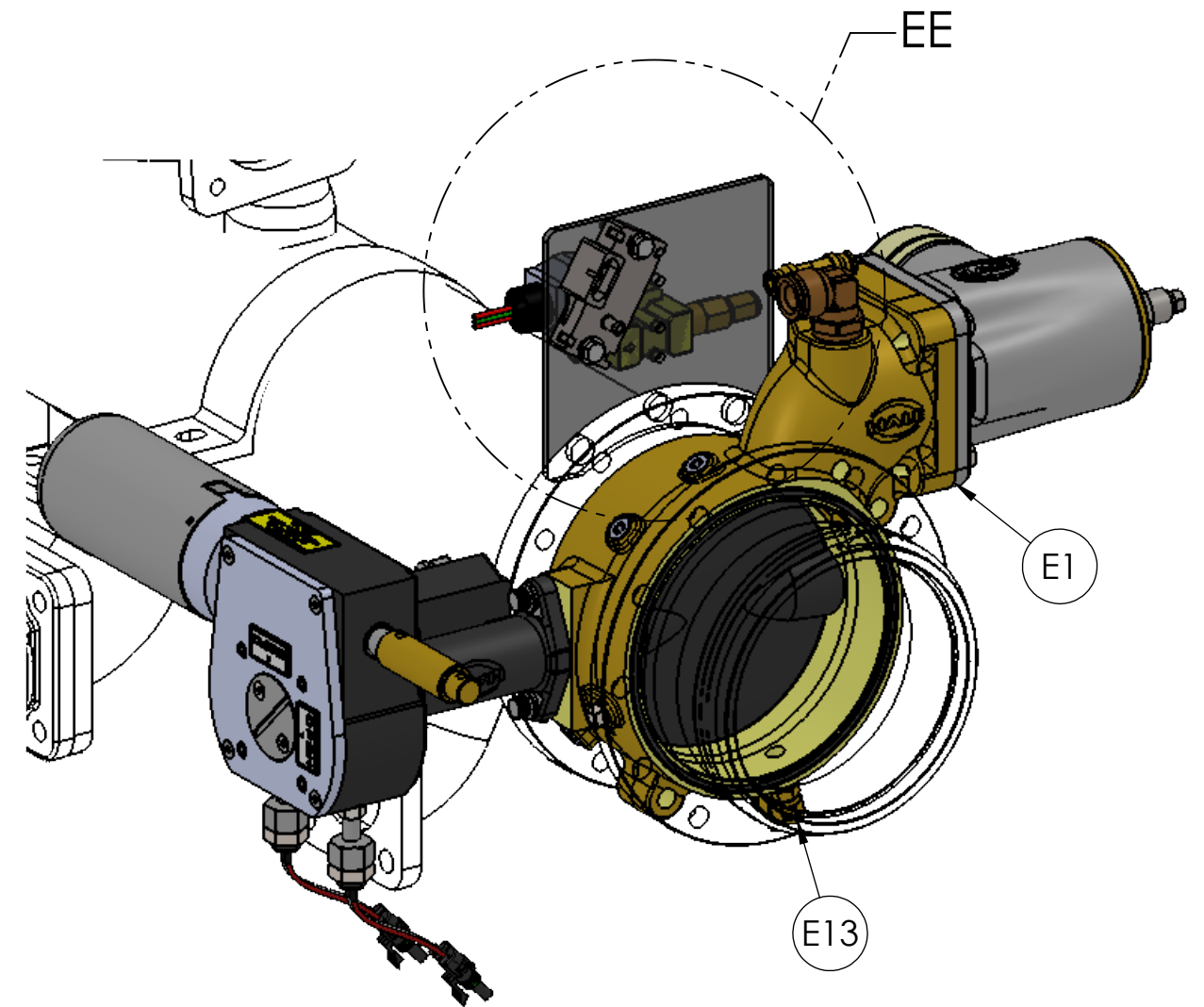
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PROJECTION: 



DETAIL EE  
SCALE 1 : 3

 **DETAIL E - RH MIV**







ELECTRONIC REPLACEMENT PARTS	
PART NO.	DESCRIPTION
610-00050-001	MODULE, RH MIV

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
E1	FSG-PL-01491	MIV 2.0 ASSEMBLY [LH MIV]	1	REFER TO DWG; HARNESS 513-00144-000 "MOTOR MODULE", "ACT MODULE" "OPEN SW", & "CLOSE SW"
E2	105590	ELBOW SWVL 90° 3/4 MNPT X 3/4 POH, BRASS	1	CONNECT TO C19
E3	082-00302-102	TEE SWVL 1/4 MNPT X 2X 3/8 POH, BRASS	1	CONNECT PER DWG 538-00101-000
E4	019-03508	BRACKET, SOLENOID	1	N/A
E5	538-00103-000	VALVE, SOLENOID	1	HARNESS 513-00144-000 "ABV SOLENOID"
E6	218-00103-014	SCREW, HHC M5 X 14MM	2	MOUNT TO E5 TO E4
E7	104592	ADPT 1/4 MNPT X 3/8 POH, BRASS	1	INSTALL ON INLET SIDE CONNECT PER DWG 538-00101-000
E8	538-00095-000	CHECK VALVE 1/4 NPT, MALE X FEMALE	1	INSTALL ON OUTLET SIDE ARROW AWAY FROM SOLENOID
E9	104592	ADPT 1/4 MNPT X 3/8 POH, BRASS	1	INSTALL ON OUTLET SIDE CONNECT PER DWG 538-00101-000
E10	200-00142-000	SENSOR, BAROMETER	1	HARNESS 513-00183-00x INSTALL HOSE 340-0061-02-0
E11	018-1214-25-0	SCREW, 1/4-20 X 1.50 LG GR8	2	MOUNT E10 TO E4
E12	097-0020-01-0	WASHER, 1/4 FLAT SAE STEEL	2	MOUNT E10 TO E4
E13	104601	ELBOW 1/4 MNPT X 3/8 POH, BRASS	1	CONNECT TO MASTER DRAIN

UNLESS OTHERWISE SPECIFIED  
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TOLERANCE FOR INCH DIMENSIONS:  
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X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

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MATERIAL		TITLE	
MADE FROM		<b>SAM COMPONENTS DSD MODULE - DETAIL E</b>	
FINISH	PROJECT	DRAWN: AJG APPROVED: TAM DATE: 17APR2020	SIZE: <b>B</b> SCALE: 1:4 DRAWING NUMBER: <b>FSG-PL-01513</b> REV: <b>D</b> SHEET: 7 OF 10



IF IN DOUBT ASK

PROJECTION: 

REQUIRES SPACER  
SEE PL789 FOR DETAILS

F1 F2 F3

F1 F2

F4 F5

F6

F1 F2

△ F7

F8 F9 F10

△ D

△ **DETAIL F - ANODES**

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
F1	029-0511-05-0	ANODEPRO, ALLOY (1.25" MNPT)	3	HARNESS 513-00183-00x "ANODE #"
F2	018-1003-44-0	SCREW, 10-24 X 3/8 LG SST	3	HARNESS 513-00183-00x "ANODE #" RING TERMINAL
F3	115-1260-00-0	FLANGE, 4-BOLT 1.25" FNPT	1	N/A
F4	200-1161-00-0	TEMPERATURE SENSOR, 10KP	1	HARNESS 513-00183-00x "SUCTION TEMP SENSOR"
F5	048-00065-000	REDUCER, BSHG 3/8 MNPT X 1/8 FNPT, BRASS	1	N/A
F6	018-80003-999	STUD, 7/16-14 X 2.63 STEEL	1	CONNECT TO SYSTEM GROUND
F7	019-04817	BRACKET, DSD POWER STUD	1	N/A
F8	627-00038	STUD, POWER	1	N/A
F9	110-1000-11-0	NUT, 10-24 SST NYLONG LOCK	2	CONNECT F8 TO F7
F10	018-01006-080	SCREW, PH 10-24 X 3/4 SST	2	CONNECT F8 TO F7

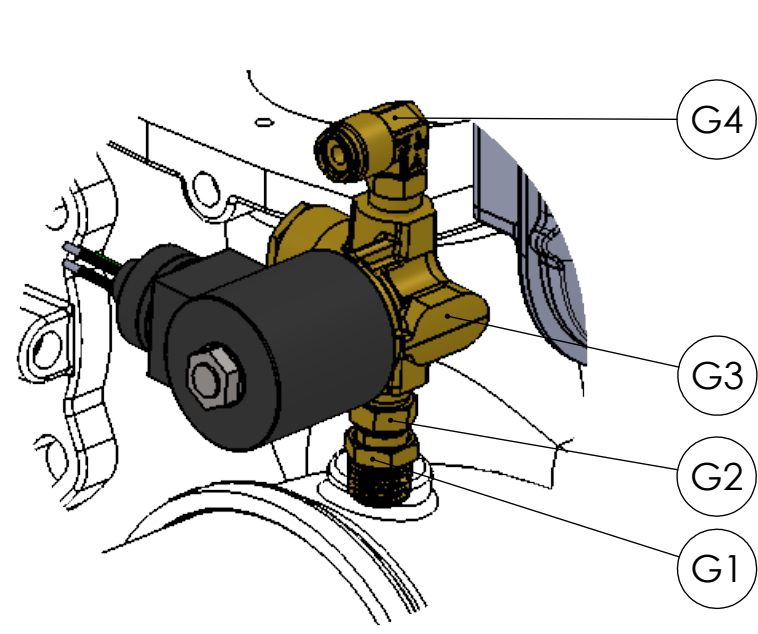
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X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
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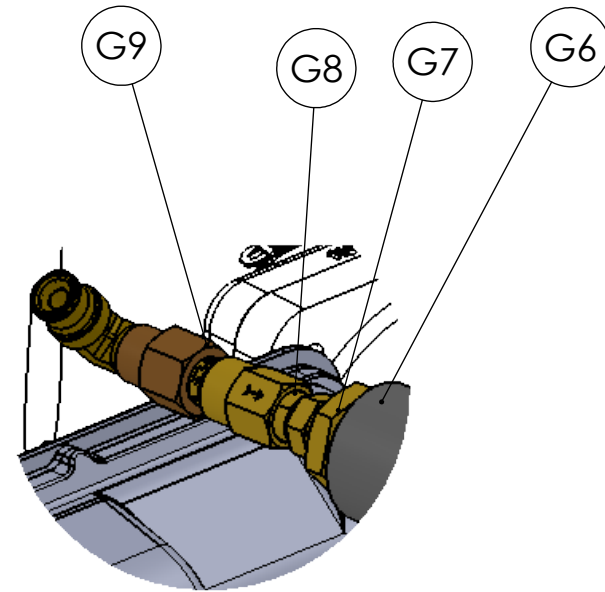
FSG OF <b>DEX</b> IDEX CORPORATION		<b>HALE</b> <b>GODIVA</b> <i>class1</i>	
MATERIAL		TITLE <b>SAM COMPONENTS DSD MODULE - DETAIL F</b>	
MADE FROM		FINISH	DRAWN AJG
PROJECT		APPROVED TAM	DATE 17APR2020
SCALE 1:3		SIZE <b>B</b>	DRAWING NUMBER <b>FSG-PL-01513</b>
		REV <b>D</b>	SHEET 8 OF 10

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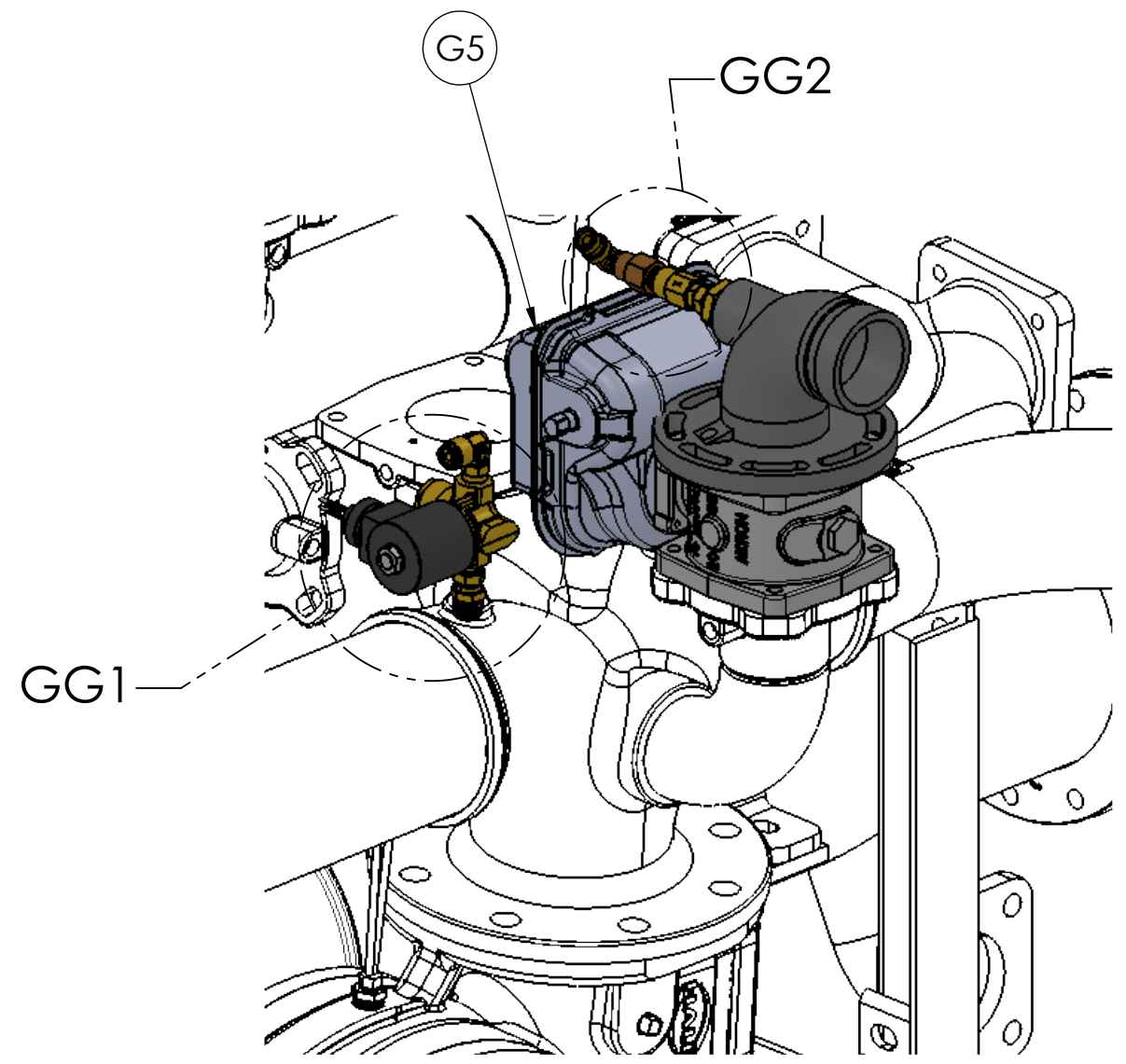
PROJECTION: 



**DETAIL GG1**  
SCALE 1 : 2



**DETAIL GG2**  
SCALE 1 : 2





## DETAIL G - TANK FILL

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
G1	082-0302-02-0	REDUC. BUSHING, 3/8 MNPT X 1/8 FNPT, BRASS	1	N/A
G2	082-00200-399	NIPPLE, 1/4 MNPT HEX, BRASS	1	INSTALL ON "P" SIDE
G3	038-00107-000	VALVE, SOLENOID	1	HARNES 513-00183-00x "PUMP COOLING SOLENOID"
G4	104601	ELBOW SWVL 90° 1/4 MNPT X 3/8 POH, BRASS	1	INSTALL ON "A" SIDE CONNECT TO G9
G5	FSG-PL-01506	VALVE, TANK FILL	1	REFER TO DWG; HARNES 513-00192-00x
G6	082-0513-02-0	REDUC. BUSHING, 3/4 MNPT X 1/4 FNPT, BRASS	1	N/A
G7	082-00200-399	NIPPLE, 1/4 MNPT HEX, BRASS	1	N/A
G8	538-00095-000	CHECK VALVE 1/4 NPT, MALE X FEMALE	1	INSTALL WITH ARROW TOWARD VALVE
G9	105177	ELBOW SWLV 90° 1/4 FNPT X 3/8 POH, BRASS	1	CONNECT TO G4

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
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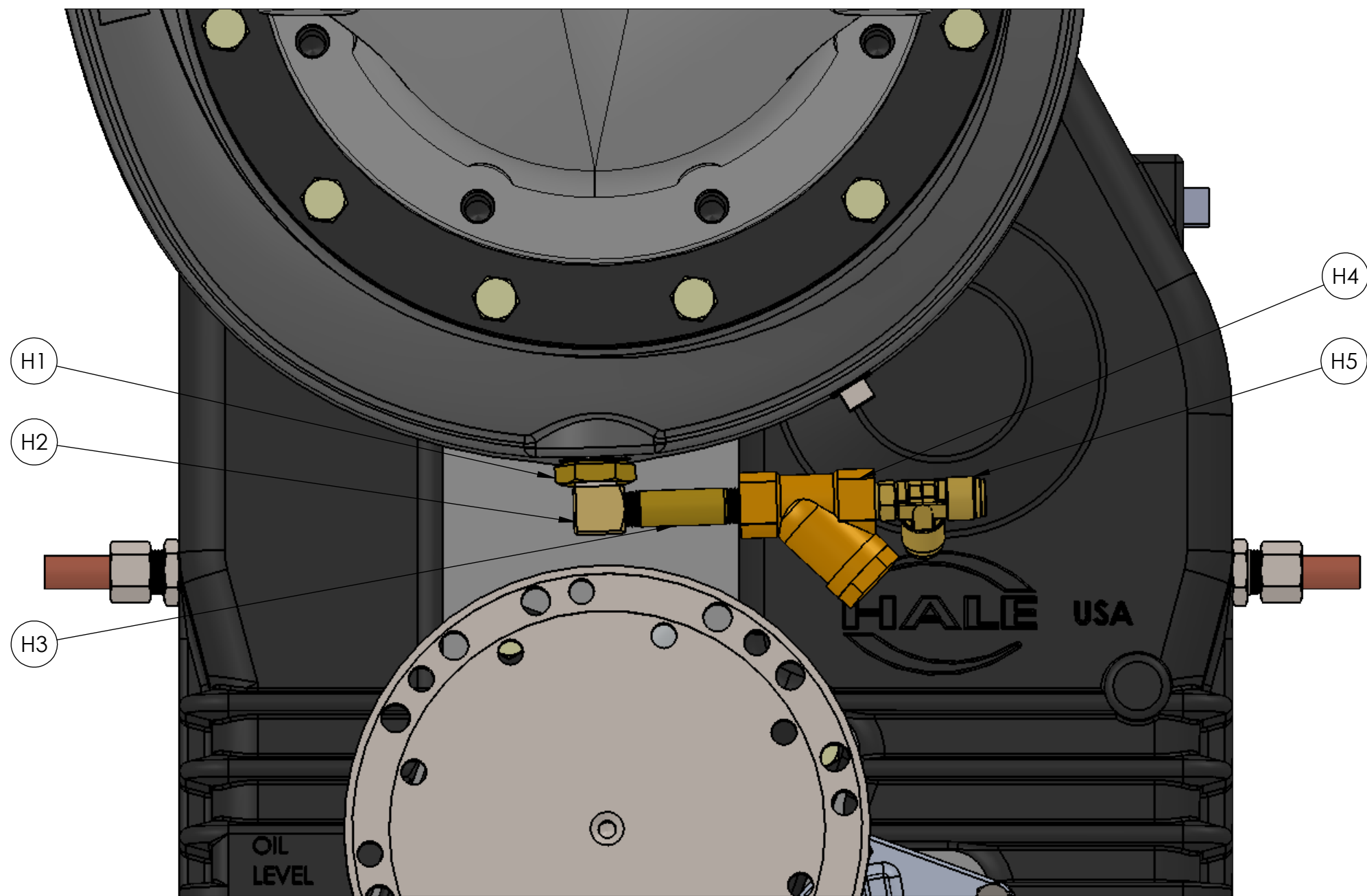
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MATERIAL		TITLE	
MADE FROM		SAM COMPONENTS DSD MODULE - DETAIL G	
FINISH		DRAWN	AJG
PROJECT		APPROVED	TAM
		DATE	17APR2020
		SIZE	B
		SCALE	1:4
		DRAWING NUMBER	FSG-PL-01513
		REV	D
		SHEET	9 OF 10



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PROJECTION: 



## DETAIL H - QUICK PRIME

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
H1	082-0513-02-0	REDUC. BUSHING, 3/4 MNPT X 1/4 FNPT, BRASS	1	CONNECT TO PUMP VOLUTE DRAIN
H2	082-0257-02-0	ELBOW, 1/4 MNPT X FNPT	1	N/A
H3	082-0213-02-0	NIPPLE, 1/4 NPT - 2.5 LG	1	N/A
H4	010-0710-00-0	1/4 NPT WYE STRAINER	1	N/A
H5	104819	TEE, 1/4 MNPT X 3/8 POH	1	CONNECT TO C23

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

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MATERIAL	TITLE <b>SAM COMPONENTS DSD MODULE - DETAIL H</b>		
MADE FROM	DRAWN	AJG	SIZE <b>B</b>
FINISH	APPROVED	TAM	DRAWING NUMBER <b>FSG-PL-01513</b>
PROJECT	DATE	17APR2020	SCALE 1:2
			REV <b>D</b> SHEET 10 OF 10



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PROJECTION: 

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- MODULE, SENSOR	GREEN	5
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- DISPLAY, SMARTFOAM	GREEN & ORANGE	11
- DISPLAY, SMARTCAFS	GREEN & ORANGE	12
- MODULE, FOAM PUMP MOTOR CONTROL	ORANGE	13
- ITL40 FOAM LEVEL	ORANGE	14
- VALVE, SMARTCAFS ARC	ORANGE	14
<b>GENERAL CONNECTOR ASSEMBLIES</b>		
- DELPHI / PACKARD	N/A	15
- DEUTSCH	N/A	16
- TYCO, PARTS EXPRESS, & PANDUIT	N/A	17

	POWERTRAIN CAN BUSS
	AFS CAN BUSS
	DISCHARGE VALVE CAN BUSS
	FOAM/CAFS CAN BUSS

**NOTES**

- REFER TO FSG-PL-01504 FOR ELECTRICAL CAN HOOKUP LAYOUT.
- THE CONNECTORS SHOWN IN THIS DOCUMENT FOR EACH COMPONENT REFER TO THE REQUIRED HARNESS CONNECTOR.

REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
	A		ORIGINAL RELEASE	KTN	19NOV2019	MAL
N/A	B		REVISED SHEET 1 & SHEET LAYOUT	AJG	25FEB2020	TAM
N/A	C		ADDED SHEETS 15-17	AJG	04MAR2020	TAM
5144	D	7-E1, 7-E3, 8-E1, 8-E5	REVISED SHEETS 7 & 8 TO SHOW DIFFERENT DEUTSCH LOCKS FOR THE AKRON VALVE FLOW & PRESSURE CONNECTORS	AJG	27MAY2020	KTN
5724	E	C1, 7-C7, 8-D6	ADDED CAN NETWORK MODULES	TAM	03AUG2022	KTN

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS: X: ±0.04 X.X: ±0.02 X.XX: ±0.01 X.XXX: ±0.005 ANGLES: ±1° SURFACE TEXTURE IN µm Ra REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX	FSG OF  IDEX CORPORATION		  				
	MATERIAL	TITLE					
	MADE FROM	SAM ELECTRIC COMPONENT PINOUTS					
	FINISH	DRAWN	KTN	SIZE	DRAWING NUMBER		
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY	PROJECT	APPROVED	MAL	SCALE	1:1	REV	E
		DATE	20NOV2019				

**RED BUSS**  
**GREEN BUSS**

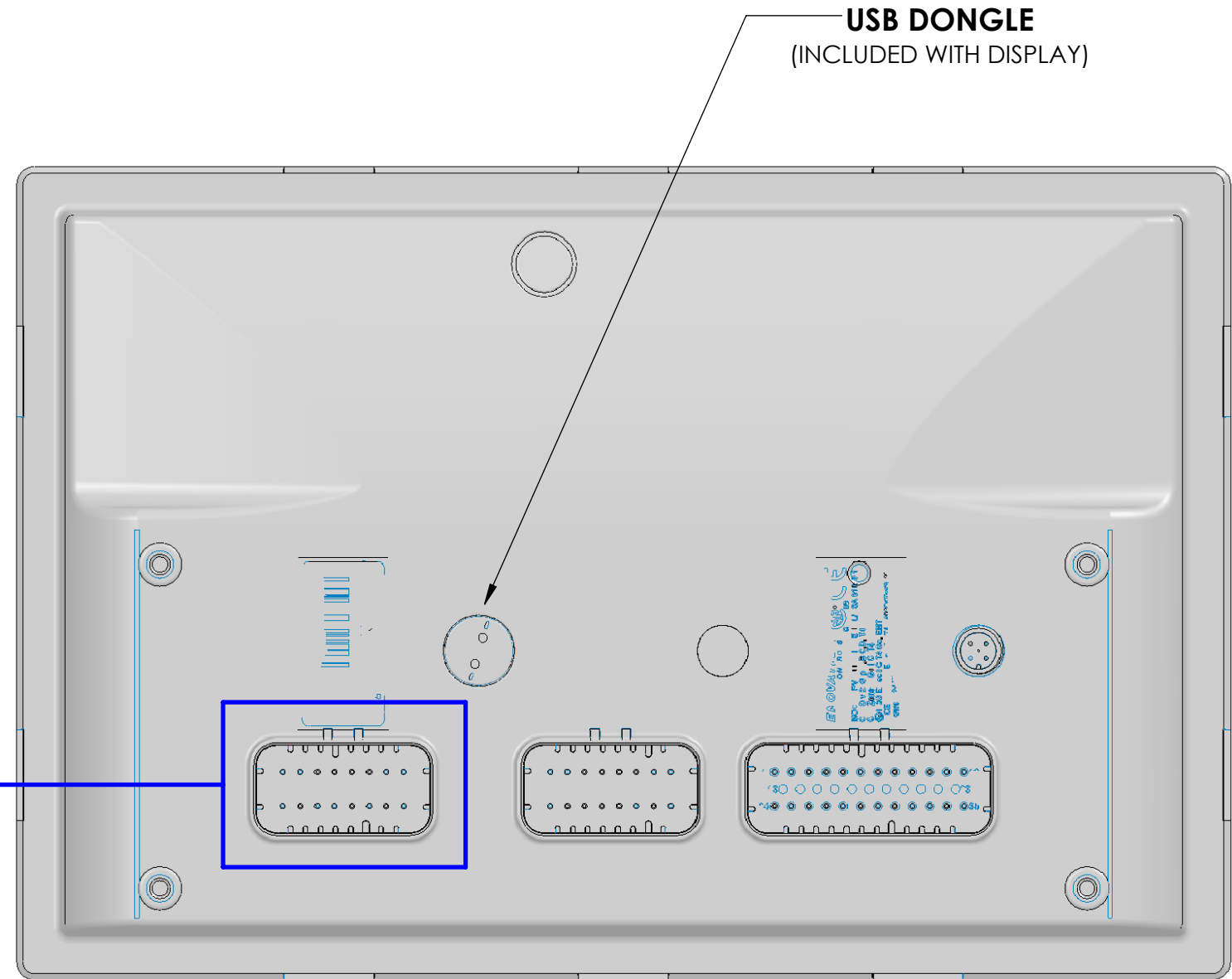
IF IN DOUBT ASK

PROJECTION:

# SAM CONTROL CENTER DISPLAY(S)

UV1100 DISPLAY			
CONNECTOR AMP/TYCO: 770680-1 (BLACK) FEMALE			
TERMINAL TYCO: 770520-1 (TIN)			
TERMINAL AMP/TYCO: 770520-3 (GOLD)			
CAVITY PLUG AMP/TYCO: 770678-1 (NATURAL)			
POS	CIRCUIT	COLOR	GA
1	ENGINE IDLE INPUT*	RED	18GXL
2	770678-1	----	----
3	770678-1	----	----
4	770678-1	----	----
5	<b>CAN LOW (AFS)</b>	<b>GREEN</b>	<b>103349</b>
6	<b>CAN HIGH (AFS)</b>	<b>YELLOW</b>	<b>103349</b>
7	SYSTEM POWER	RED	16GXL
8	SYSTEM GROUND	BLACK	16GXL
9	770678-1	----	----
10	770678-1	----	----
11	770678-1	----	----
12	770678-1	----	----
13	770678-1	----	----
14	770678-1	----	----
15	IGNITION	WHITE	16GXL
16	SYSTEM GROUND	BLACK	16GXL
17	SYSTEM POWER	RED	16GXL
18	<b>CAN LOW (DISCHARGE)</b>	<b>GREEN</b>	<b>103349</b>
19	<b>CAN HIGH (DISCHARGE)</b>	<b>YELLOW</b>	<b>103349</b>
20	770678-1	----	----
21	770678-1	----	----
22	770678-1	----	----
23	770678-1	----	----

\*FOR AUXILIARY DISPLAYS ONLY



REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

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MAKE OTHER DRAWINGS OR MACHINERY

FSG OF <b>IDEX</b> IDEX CORPORATION		<b>HALE</b> <b>GODIVA</b> <i>Class 1</i>	
MATERIAL	TITLE		
MADE FROM	SAM ELECTRIC COMPONENT PINOUTS		
FINISH	DRAWN	KTN	SIZE
PROJECT	APPROVED	MAL	<b>B</b>
	DATE	20NOV2019	SCALE
			1:1
	DRAWING NUMBER		REV
	<b>FSG-PL-01503</b>		<b>E</b>
			SHEET
			2 OF 17

**GREEN BUSS**  
**BLUE BUSS**

# PUMP GOVERNOR CONTROL CENTER

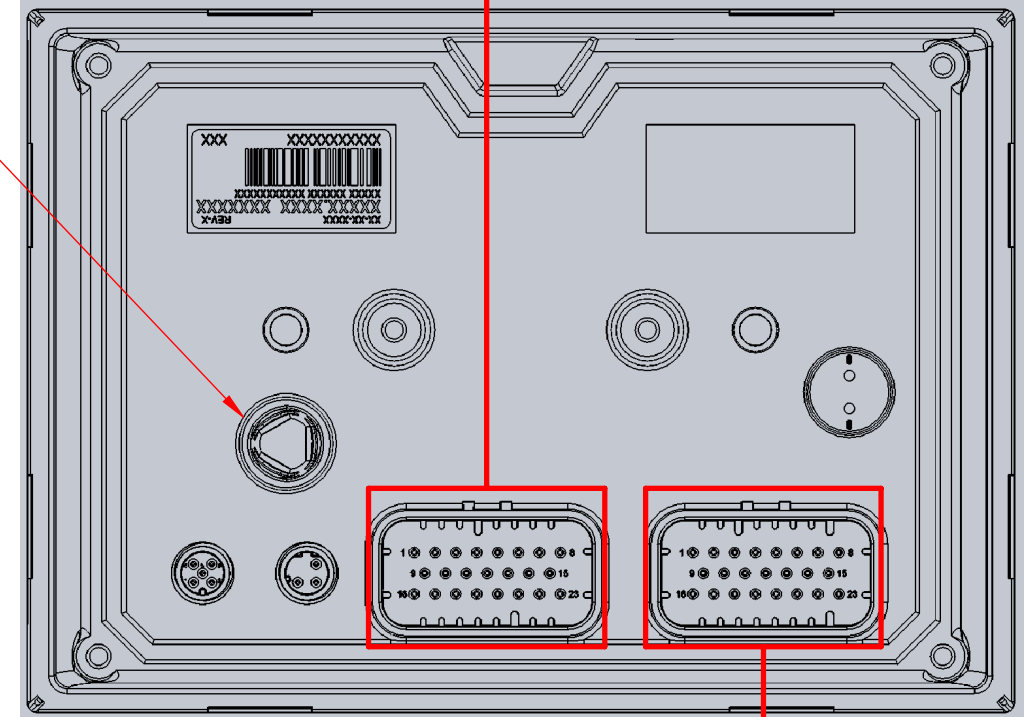
IF IN DOUBT ASK

PROJECTION:

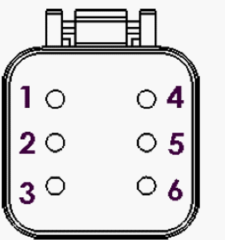
UV800 DISPLAY			
CONNECTOR AMP/TYCO: 770680-1 (BLACK) FEMALE			
TERMINAL TYCO: 770520-1 (TIN)			
TERMINAL AMP/TYCO: 770520-3 (GOLD)			
CAVITY PLUG AMP/TYCO: 770678-1 (NATURAL)			
POS	CIRCUIT	COLOR	GA
1	770678-1	----	----
2	770678-1	----	----
3	770678-1	----	----
4	770678-1	----	----
5	CAN LOW (CHASSIS)	GREEN	103349
6	CAN HIGH (CHASSIS)	YELLOW	103349
7	SYSTEM POWER	RED	16GXL
8	SYSTEM GROUND	BLACK	16GXL
9	770678-1	----	----
10	770678-1	----	----
11	770678-1	----	----
12	770678-1	----	----
13	770678-1	----	----
14	770678-1	----	----
15	IGNITION	WHITE	16GXL
16	SYSTEM GROUND	BLACK	16GXL
17	SYSTEM POWER	RED	16GXL
18	CAN LOW (AFS)	GREEN	103349
19	CAN HIGH (AFS)	YELLOW	103349
20	770678-1	----	----
21	770678-1	----	----
22	BUZZER ALARM OUTPUT	BLACK	18GXL
23	770678-1	----	----

UV800 AUDIO/VIDEO			
CONNECTOR AMP/TYCO: 770680-5 (BLUE) FEMALE			
TERMINAL TYCO: 770520-1 (TIN)			
CAVITY PLUG AMP/TYCO: 770678-1 (NATURAL)			
POS	CIRCUIT	COLOR	GA
1	770678-1	----	----
2	770678-1	----	----
3	770678-1	----	----
4	770678-1	----	----
5	VIDEO INPUT 3 POS	BROWN	18GXL
6	VIDEO INPUT 2 POS	YELLOW	18GXL
7	VIDEO INPUT 1 POS	WHITE	18GXL
8	770678-1	----	----
9	770678-1	----	----
10	770678-1	----	----
11	770678-1	----	----
12	VIDEO INPUT 3 NEG	GREEN	18GXL
13	VIDEO INPUT 2 NEG	GREEN	18GXL
14	VIDEO INPUT 1 NEG	GREEN	18GXL
15	770678-1	----	----
16	AUDIO 1 OUT LEFT POS	WHITE	18GXL
17	AUDIO 1 OUT LEFT NEG	BLACK	18GXL
18	AUDIO 1 OUT RIGHT POS	RED	18GXL
19	AUDIO 1 OUT RIGHT NEG	BLACK	18GXL
20	770678-1	----	----
21	770678-1	----	----
22	770678-1	----	----
23	770678-1	----	----

**USB DONGLE**  
(INCLUDED WITH DISPLAY)



TWISTER			
CONNECTOR DEUTSCH: DT06-6S (GREY)			
LOCK DEUTSCH: W6S (ORANGE)			
TERM DEUTSCH: 0462-0201-16131			
POS	CIRCUIT	COLOR	GA
1	SYSTEM POWER	YELLOW	16GXL
2	SYSTEM GROUND	BLACK	16GXL
3	INTERLOCK	WHITE	16GXL
4	CAN HIGH (AFS)	YELLOW	103349
5	CAN LOW (AFS)	GREEN	103349
6	CAN SHIELD (AFS)	BLACK	103349



REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

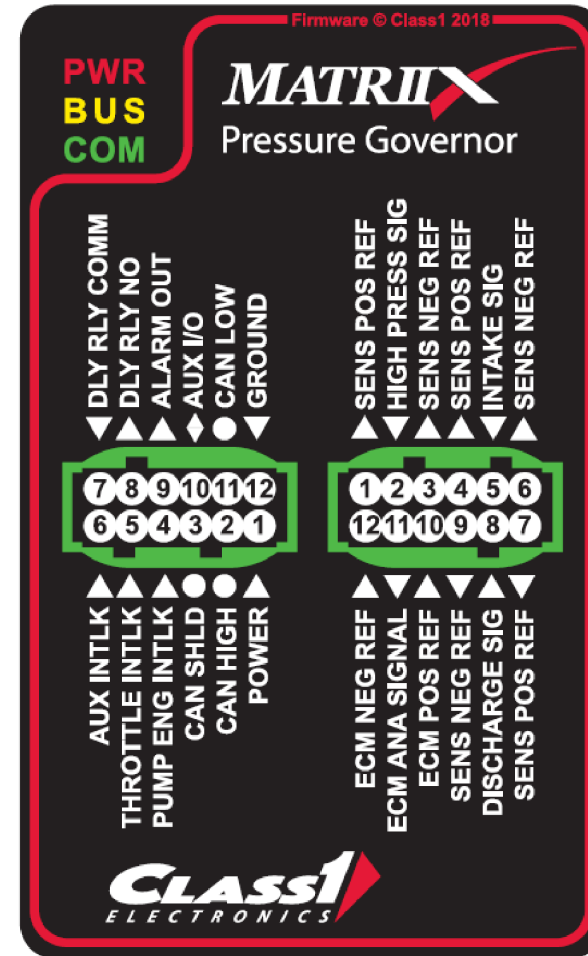
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FSG OF <b>ITEX</b> IDEX CORPORATION		<b>HALE</b> <b>GODIVA</b> <i>class1</i>	
MATERIAL	TITLE		
MADE FROM	SAM ELECTRIC COMPONENT PINOUTS		
FINISH	DRAWN	KTN	SIZE
PROJECT	APPROVED	MAL	<b>B</b>
	DATE	20NOV2019	SCALE
			1:1
	DRAWING NUMBER		REV
	<b>FSG-PL-01503</b>		<b>E</b>
			SHEET
			3 OF 17



# MATRIX PUMP PRESSURE GOVERNOR MODULE

MATRIX GOVERNOR MODULE "A"			
CONNECTOR DEUTSCH: DTM06-12SA (GREY)			
LOCK DEUTSCH: WM-12S (ORANGE)			
TERM DEUTSCH: 0462-0201-20141 (18-16)			
TERM DEUTSCH: 0462-0201-2031 (GOLD)			
POS	CIRCUIT	COLOR	GA
1	SYSTEM POWER	RED	16GXL
2	CAN HIGH (CHASSIS)	YELLOW	103349
3	CAN SHIELD (CHASSIS)	BLACK	18GXL
4	PUMP ENGAGED	WHITE	16GXL
5	THROTTLE READY	WHITE	16GXL
6	OEM AUX	YELLOW	16GXL
7	0413-204-2005	----	----
8	0413-204-2005	----	----
9	0413-204-2005	----	----
10	0413-204-2005	----	----
11	CAN LOW (CHASSIS)	GREEN	103349
12	SYSTEM GROUND	BLACK	16GXL



MATRIX GOVERNOR MODULE "B"			
CONNECTOR DEUTSCH: DTM06-12SB (BLACK)			
LOCK DEUTSCH: WM-12S (ORANGE)			
TERM DEUTSCH: 0462-0201-20141 (18-16)			
POS	CIRCUIT	COLOR	GA
1	0413-204-2005	----	----
2	0413-204-2005	----	----
3	0413-204-2005	----	----
4	INTAKE POS REF	RED	BEL9364
5	INTAKE SIG REF	WHITE	BEL9364
6	INTAKE NEG REF	BLACK	BEL9364
7	DISCHARGE POS REF	RED	BEL9364
8	DISCHARGE SIG REF	WHITE	BEL9364
9	DISCHARGE NEG REF	BLACK	BEL9364
10	0413-204-2005	----	----
11	0413-204-2005	----	----
12	0413-204-2005	----	----

REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

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FSG OF <b>ITEX</b> IDEX CORPORATION		<b>HALE</b> <b>GODIVA</b> <b>class1</b>	
MATERIAL	TITLE		
MADE FROM	SAM ELECTRIC COMPONENT PINOUTS		
FINISH	DRAWN	KTN	SIZE
PROJECT	APPROVED	MAL	<b>B</b>
	DATE	20NOV2019	SCALE
			1:1
DRAWING NUMBER		REV	
<b>FSG-PL-01503</b>		<b>E</b>	
		SHEET	
		4 OF 17	



# SENSOR MODULE

SENSOR MODULE "A"			
CONNECTOR DEUTSCH: DTM06-12SA (GREY)			
LOCK DEUTSCH: WM-12S (ORANGE)			
TERM DEUTSCH: 0462-0201-20141 (18-16)			
TERM DEUTSCH: 0462-0201-2031 (GOLD)			
POS	CIRCUIT	COLOR	GA
1	GB OIL LEVEL SIG	WHITE	16GXL
2	CAN HIGH (AFS)	YELLOW	103349
3	CAN SHIELD (AFS)	BLACK	18GXL
4	0413-204-2005	----	----
5	0413-204-2005	----	----
6	PUMP DRAIN	BLACK	16GXL
7	AUTOLUBE SOL NEG	BLACK	16GXL
8	QUICK PRIME	BLACK	16GXL
9	0413-204-2005	----	----
10	PUMP COOL SOLENOID	BLACK	16GXL
11	CAN LOW (AFS)	GREEN	103349
12	SYSTEM GROUND	BLACK	16GXL



SENSOR MODULE "B"			
CONNECTOR DEUTSCH: DTM06-12SB (BLACK)			
LOCK DEUTSCH: WM-12S (ORANGE)			
TERM DEUTSCH: 0462-0201-20141 (18-16)			
TERM DEUTSCH: 0462-0201-2031 (GOLD)			
POS	CIRCUIT	COLOR	GA
1	ANODE 1	GREY	16GXL
2	ANODE 2	GREY	16GXL
3	ANODE 3	GREY	16GXL
4	GB WATER IN OIL SIG	WHITE	16GXL
5	PRIMER INPUT	RED	16GXL
6	0413-204-2005	----	----
7	BAROMETER +5V REF	RED	16GXL
8	BAROMETER GND REF	BLACK	16GXL
9	A/L WATER IN OIL SIG	WHITE	16GXL
10	BAROMETER SIGNAL	WHITE	16GXL
11	GB OIL TEMP	GREEN	16GXL
12	SUCTION WATER TEMP	ORANGE	16GXL

REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY

FSG OF IDEX CORPORATION		HALE GODIVA class1	
MATERIAL	TITLE		
MADE FROM	SAM ELECTRIC COMPONENT PINOUTS		
FINISH	DRAWN	KTN	SIZE
PROJECT	APPROVED	MAL	B
	DATE	20NOV2019	SCALE
			1:1
		DRAWING NUMBER	
		FSG-PL-01503	
			REV
			E
			SHEET
			5 OF 17

**GREEN BUSS**

IF IN DOUBT ASK

PROJECTION: 





# MIV-A MODULE

MIV AUTO MODULE "A"			
CONNECTOR DEUTSCH: DTM06-12SA FML (GRY)			
LOCK DEUTSCH: WM-12S (ORANGE)			
TERM DEUTSCH: 0462-0201-20141 (18-16)			
TERM DEUTSCH: 0462-0201-2031 (18-16)			
POS	CIRCUIT	COLOR	GA
1	PRE-PRIME #3	RED	16GXL
2	CAN HIGH (AFS)	YELLOW	103349
3	CAN SHIELD (AFS)	BLACK	18GXL
4	AIR PRIME	RED	16GXL
5	PB SW LED #1	GREEN	16GXL
6	PB SW LED #3	GREEN	16GXL
7	PUMP BODY PRIME	RED	16GXL
8	PB SW LED #2	GREEN	16GXL
9	PRE-PRIME #1	RED	16GXL
10	0413-204-2005	----	----
11	CAN LOW (AFS)	GREEN	103349
12	SYSTEM GROUND	BLACK	16GXL



MIV AUTO MODULE "B"			
CONNECTOR DEUTSCH: DTM06-12SB FML (BLK)			
LOCK DEUTSCH: WM-12S (ORANGE)			
TERM DEUTSCH: 0462-0201-20141 (18-16)			
TERM DEUTSCH: 0462-0201-2031 (18-16)			
POS	CIRCUIT	COLOR	GA
1	AB DRAIN	RED	16GXL
2	PRE-PRIME #2	RED	16GXL
3	PRIMER START	RED	16GXL
4	WTR IN PRIMER DETECT	WHITE	16GXL
5	WTR COLUMN SIGNAL	WHITE	BEL9364
6	SW-1 MOMENTARY	RED	16GXL
7	SW-2 MOMENTARY	RED	16GXL
8	SW-3 MOMENTARY	RED	16GXL
9	0413-204-2005	----	----
10	0413-204-2005	----	----
11	+5V REF	RED	BEL9364
12	-5V REF	BLACK	BEL9364

REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS: X: ±0.04 X.X: ±0.02 X.XX: ±0.01 X.XXX: ±0.005 ANGLES: ±0.25° SURFACE TEXTURE IN µm Ra REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX	FSG OF 		  	
	MATERIAL		TITLE	
	MADE FROM		SAM ELECTRIC COMPONENT PINOUTS	
	FINISH		DRAWN KTN	
PROJECT		APPROVED MAL		SIZE <b>B</b>
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		DATE 20NOV2019		SCALE 1:1
		DRAWING NUMBER		REV <b>E</b>
		FSG-PL-01503		SHEET 6 OF 17

# GREEN BUSS

IF IN DOUBT ASK

PROJECTION:

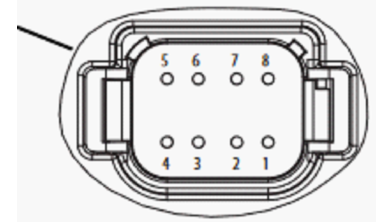
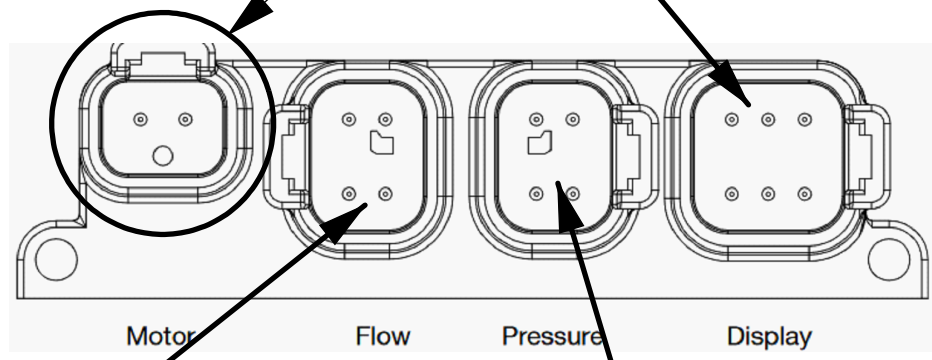
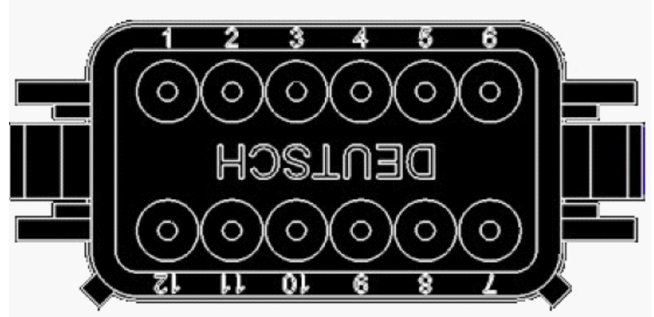
ITL40 WATER LEVEL			
CONNECTOR DEUTSCH: DT06-12SB (BLACK)			
LOCK DEUTSCH: W12S (ORANGE)			
TERM DEUTSCH: 0462-0201-16141			
POS	CIRCUIT	COLOR	GA
1	SYSTEM POWER	RED	16GXL
2	CAN HIGH (AFS)	YELLOW	103349
3	CAN SHIELD (AFS)	BLACK	18GXL
4	114017	----	----
5	XDCR POSITIVE REF	RED	BEL9364
6	XDCR SIGNAL REF	WHITE	BEL9364
7	XDCR GROUND REF	BLACK	BEL9364
8	DRIVER MODULE GND	BLACK	16GXL
9	114017	----	----
10	114017	----	----
11	CAN LOW (AFS)	GREEN	103349
12	SYSTEM GROUND	BLACK	16GXL

AKRON VALVE (NON-DISCHARGE)			
VALVES: TANK FILL, TANK-TO-PUMP, INTAKE			
CONNECTOR DEUTSCH: DT06-6S (GREY)			
LOCK DEUTSCH: W6S (ORANGE)			
TERM DEUTSCH: 0462-0201-161 (20-16) GOLD			
TERM DEUTSCH: 0462-0209-16141 (16-14) TIN			
POS	CIRCUIT	COLOR	GA
1	CAN HIGH (AFS)	YELLOW	103349
2	114017	BLACK	18GXL
3	SYSTEM GROUND	BLACK	14GXL
4	SYSTEM POWER	RED	14GXL
5	114017	----	----
6	CAN LOW (AFS)	GREEN	103349

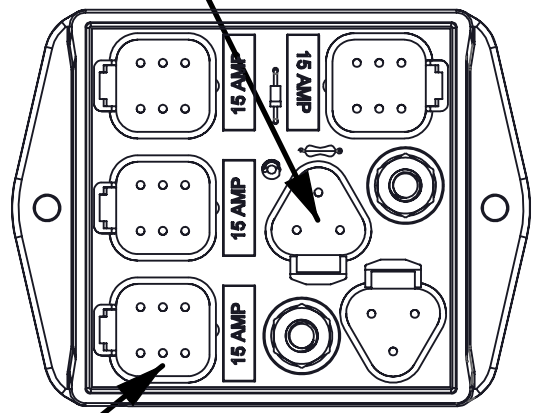
NAVIGATOR DISPLAY (NON-DISCHARGE)			
VALVES: TANK FILL, TANK-TO-PUMP, INTAKE			
CONNECTOR DEUTSCH: DT06-6S (GREY)			
LOCK DEUTSCH: W8S (ORANGE)			
TERM DEUTSCH: 0462-0201-1631 (18) GOLD			
TERM DEUTSCH: 0462-0209-16141 (14) TIN			
POS	CIRCUIT	COLOR	GA
1	114017	----	----
2	CAN HIGH (DISCH.)	YELLOW	18GXL
3	GROUND OUT	WHITE	14GXL
4	GROUND IN	VIOLET	14GXL
5	BATTERY VOLTAGE IN	GREEN	14GXL
6	BATTERY VOLTAGE OUT	YELLOW	14GXL
7	CAN LOW (DISCH.)	GREEN	18GXL
8	114017	----	----

CAN NETWORK (CAN NETWORK MODULE)			
CONNECTOR DEUTSCH: DT06-3S-CE05 (BLK) FML			
LOCK DEUTSCH: W3S-1939 (BLUE)			
TERM DEUTSCH: 0462-0201-1631 (20-18) GOLD			
POS	CIRCUIT	COLOR	GA
1	CAN HIGH	YELLOW	103349
2	CAN LOW	GREEN	103349
3	CAN SHIELD	BLACK	18GXL

NOT USED ON AKRON ELECTRIC ACTUATORS AFTER SPRING 2020



AFS BUSS (CAN NETWORK MODULE)			
CONNECTOR DEUTSCH: DT06-6S (GREY)			
LOCK DEUTSCH: W6S (ORANGE)			
TERM DEUTSCH: 0462-0201-161 (20-16) GOLD			
TERM DEUTSCH: 0462-0209-16141 (16-14) TIN			
POS	CIRCUIT	COLOR	GA
1	CAN HIGH (AFS)	YELLOW	103349
2	CAN SHIELD (AFS)	BLACK	18GXL
3	SYSTEM GROUND	BLACK	14GXL
4	SYSTEM POWER	RED	14GXL
5	114017	----	----
6	CAN LOW (AFS)	GREEN	103349



AKRON VALVE FLOW			
CONNECTOR DEUTSCH: DT06-4S-E008 (GREY)			
LOCK DEUTSCH: W4SB-P012 (BLACK)			
TERM DEUTSCH: 0462-0201-1631 (GOLD)*			
TERM DEUTSCH: 0462-0209-16141 (TIN)			
POS	CIRCUIT	COLOR	GA
1	SIGNAL	WHITE	BEL9364
2	SHIELD*	DRAIN	BEL9364
3	POWER (-)	BLACK	BEL9364
4	POWER (+)	RED	BEL9364

AKRON VALVE PRESSURE			
CONNECTOR DEUTSCH: DT06-4S-E008 (GREY)			
LOCK DEUTSCH: W4SA-P012 (GREY)			
TERM DEUTSCH: 0462-0201-1631 (GOLD)*			
TERM DEUTSCH: 0462-0209-16141 (TIN)			
POS	CIRCUIT	COLOR	GA
1	SIGNAL	WHITE	BEL9364
2	SHIELD*	DRAIN	BEL9364
3	POWER (-)	BLACK	BEL9364
4	POWER (+)	RED	BEL9364

D

D

E

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY

FSG OF IDEX CORPORATION		HALE GODIVA class1	
MATERIAL	TITLE		
MADE FROM	SAM ELECTRIC COMPONENT PINOUTS		
FINISH	DRAWN	KTN	SIZE
PROJECT	APPROVED	MAL	B
	DATE	20NOV2019	SCALE
			1:1
DRAWING NUMBER		REV	
FSG-PL-01503		E	
SHEET		7 OF 17	

REVISIONS

ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-



# RED BUSS

IF IN DOUBT ASK

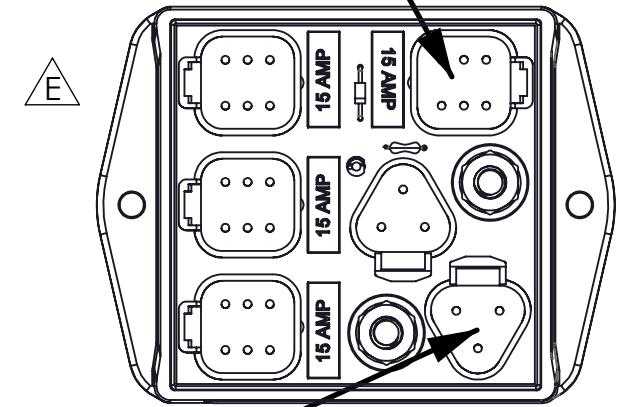
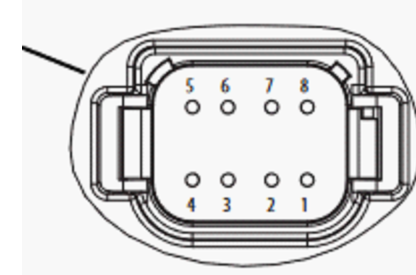
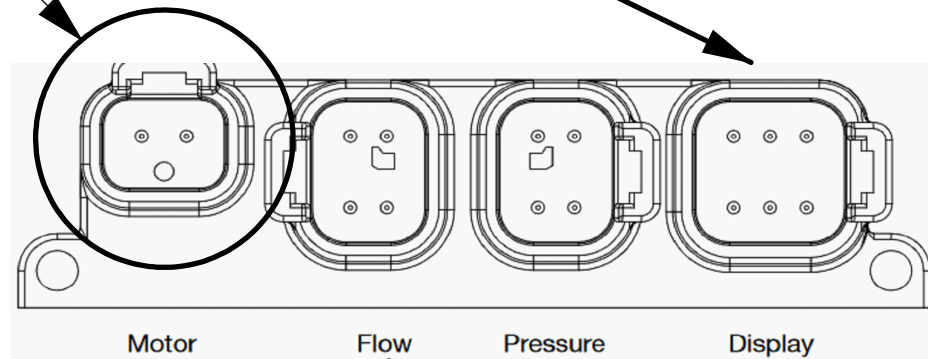
PROJECTION:

AKRON VALVE DISPLAY (DISCHARGE)			
VALVES: DISCHARGES			
CONNECTOR DEUTSCH: DT06-6S (GREY)			
LOCK DEUTSCH: W6S (ORANGE)			
TERM DEUTSCH: 0462-0201-161 (20-16) GOLD			
TERM DEUTSCH: 0462-0209-16141 (16-14) TIN			
POS	CIRCUIT	COLOR	GA
1	CAN HIGH (DISCH.)	YELLOW	103349
2	CAN SHIELD (DISCH.)	BLACK	18GXL
3	SYSTEM GROUND	BLACK	14GXL
4	SYSTEM POWER	RED	14GXL
5	114017	----	----
6	CAN LOW (DISCH.)	GREEN	103349

NAVIGATOR DISPLAY (DISCHARGE)			
VALVES: DISCHARGES			
CONNECTOR DEUTSCH: DT06-6S (GREY)			
LOCK DEUTSCH: W8S (ORANGE)			
TERM DEUTSCH: 0462-0201-1631 (18) GOLD			
TERM DEUTSCH: 0462-0209-16141 (14) TIN			
POS	CIRCUIT	COLOR	GA
1	114017	----	----
2	CAN HIGH (TWISTED)	YELLOW	18GXL
3	GROUND OUT	WHITE	14GXL
4	GROUND IN	VIOLET	14GXL
5	BATTERY VOLTAGE IN	GREEN	14GXL
6	BATTERY VOLTAGE OUT	YELLOW	14GXL
7	CAN LOW (TWISTED)	GREEN	18GXL
8	114017	----	----

DISCHARGE BUSS (CAN NETWORK MODULE)			
CONNECTOR DEUTSCH: DT06-6S (GREY)			
LOCK DEUTSCH: W6S (ORANGE)			
TERM DEUTSCH: 0462-0201-161 (20-16) GOLD			
TERM DEUTSCH: 0462-0209-16141 (16-14) TIN			
POS	CIRCUIT	COLOR	GA
1	CAN HIGH (AFS)	YELLOW	103349
2	CAN SHIELD (AFS)	BLACK	18GXL
3	SYSTEM GROUND	BLACK	14GXL
4	SYSTEM POWER	RED	14GXL
5	114017	----	----
6	CAN LOW (AFS)	GREEN	103349

NOT USED ON AKRON ELECTRIC ACTUATORS AFTER SPRING 2020



AKRON VALVE FLOW			
CONNECTOR DEUTSCH: DT06-4S-E008 (GREY)			
LOCK DEUTSCH: W4SB-P012 (BLACK)			
TERM DEUTSCH: 0462-0201-1631 (GOLD)*			
TERM DEUTSCH: 0462-0209-16141 (TIN)			
POS	CIRCUIT	COLOR	GA
1	SIGNAL	WHITE	BEL9364
2	SHIELD*	DRAIN	BEL9364
3	POWER (-)	BLACK	BEL9364
4	POWER (+)	RED	BEL9364

AKRON VALVE PRESSURE			
CONNECTOR DEUTSCH: DT06-4S-E008 (GREY)			
LOCK DEUTSCH: W4SA-P012 (GREY)			
TERM DEUTSCH: 0462-0201-1631 (GOLD)*			
TERM DEUTSCH: 0462-0209-16141 (TIN)			
POS	CIRCUIT	COLOR	GA
1	SIGNAL	WHITE	BEL9364
2	SHIELD*	DRAIN	BEL9364
3	POWER (-)	BLACK	BEL9364
4	POWER (+)	RED	BEL9364

CAN NETWORK (CAN NETWORK MODULE)			
CONNECTOR DEUTSCH: DT06-3S-CE05 (BLK) FML			
LOCK DEUTSCH: W3S-1939 (BLUE)			
TERM DEUTSCH: 0462-0201-1631 (20-18) GOLD			
POS	CIRCUIT	COLOR	GA
1	CAN HIGH	YELLOW	103349
2	CAN LOW	GREEN	103349
3	CAN SHIELD	BLACK	18GXL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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FSG OF IDEX IDEX CORPORATION

HALE GODIVA class1

TITLE: SAM ELECTRIC COMPONENT PINOUTS

MATERIAL: \_\_\_\_\_

MADE FROM: \_\_\_\_\_

FINISH: \_\_\_\_\_

PROJECT: \_\_\_\_\_

DRAWN: KTN

APPROVED: MAL

DATE: 20NOV2019

SIZE: B

SCALE: 1:1

DRAWING NUMBER: FSG-PL-01503

REV: E

SHEET: 8 OF 17

REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

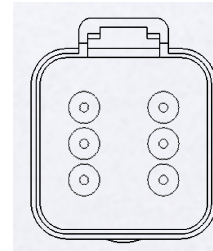


# GREEN BUSS

IF IN DOUBT ASK

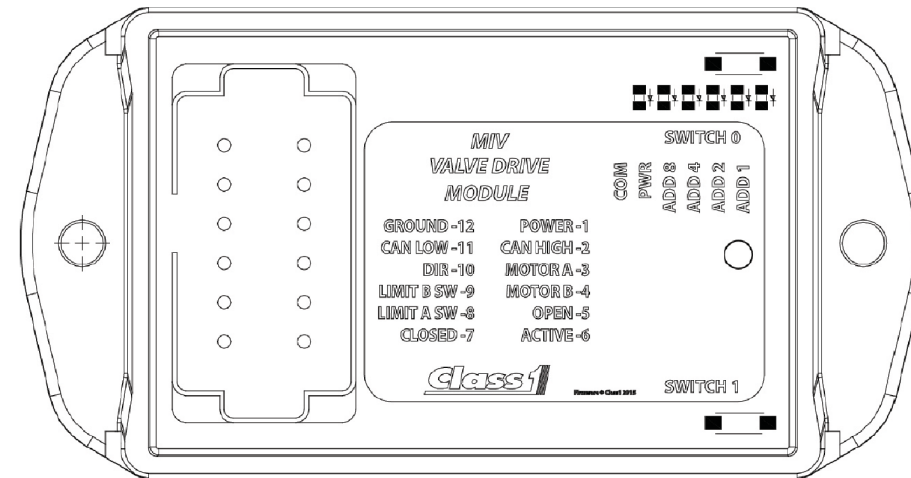
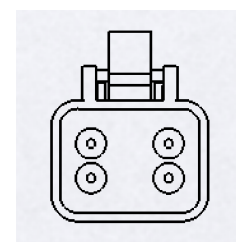
PROJECTION: 

MIV ROCKER SWITCH			
CONNECTOR DEUTSCH: DT06-6S FEMALE (GREY)			
LOCK DEUTSCH: W6S (ORANGE)			
TERM DEUTSCH: 0462-0201-16141 (18-16)			
POS	CIRCUIT	COLOR	GA
1	SYSTEM GROUND	BLACK	16GXL
2	DIRECTION SW SIGNAL	WHITE	16GXL
3	SYSTEM POWER	RED	16GXL
4	CLOSE VALVE INDICATOR	RED	16GXL
5	SYSTEM POWER	RED	16GXL
6	OPEN VALVE INDICATOR	GREEN	16GXL



MIV 2.0 CONTROL MODULE			
MASTER CIRCUIT LEGEND			
POS	CIRCUIT	COLOR	GA
1	SYSTEM POWER	RED	14GXL
2	CAN HIGH (DISCH.)	YELLOW	103349
3	MOTOR A	VIOLET	14GXL
4	MOTOR B	WHITE	14GXL
5	OPEN VLV INDICATOR	GREEN	16GXL
6	ABV SOLENOID -	CLACK	14GXL
7	CLOSE VLV INDICATOR	RED	16GXL
8	CLOSED STOP SWITCH	RED	16GXL
9	OPEN STOP SWITCH	GREEN	16GXL
10	DIRECTION SW SIGNAL	WHITE	16GXL
11	CAN LOW (DISCH.)	GREEN	103349
12	SYSTEM GROUND	BLACK	14GXL





AUTO MIV BUTTON			
CONNECTOR DEUTSCH: DT04-4P MALE (GREY)			
LOCK DEUTSCH: W4P (GREEN)			
TERM DEUTSCH: 0462-0202-16141 (18-16)			
POS	CIRCUIT	COLOR	GA
1	SYSTEM POWER	RED	16GXL
2	SW-2 MOMENTARY	RED	16GXL
3	SW-2 LED	GREEN	16GXL
4	SYSTEM GROUND	BLACK	16GXL



REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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MATERIAL		TITLE		DRAWN		REV	
MADE FROM		SAM ELECTRIC COMPONENT PINOUTS		KTN		E	
FINISH		APPROVED		MAL		SHEET	
PROJECT		DATE		20NOV2019		9 OF 17	
SCALE		1:1		DRAWING NUMBER		FSG-PL-01503	

A  
B  
C  
D  
E  
F

A  
B  
C  
D  
E  
F

1 2 3 4 5 6 7 8

1 2 3 4 5 6 7 8

# WIFI CONNECTION

IF IN DOUBT ASK

PROJECTION: 

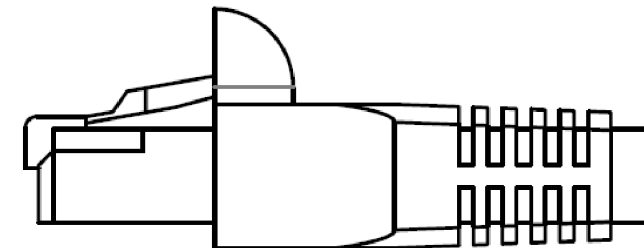
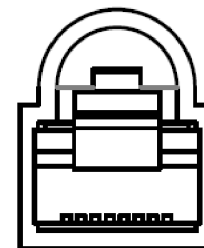
WIFI POWER SUPPLY (12V)			
CONNECTOR DELPHI: 12010973 BLK (SHROUD)			
TERMINAL DELPHI: 12124582 MALE (TIN)			
SEAL DELPHI: 15324982 GRN (18-16)			
POS	CIRCUIT	COLOR	GA
1	POWER	RED	18GXL
2	GROUND	BLACK	18GXL



WIFI POWER SUPPLY (24V)			
CONNECTOR DELPHI: 12103784 GRY (TOWER)			
TERMINAL DELPHI: 12124580 FEMALE (TIN)			
SEAL DELPHI: 15324982 GRN (18-16)			
POS	CIRCUIT	COLOR	GA
1	POWER	YELLOW	18GXL
2	GROUND	BLACK	18GXL



WIFI ANTENNA				
CAT6 CABLE				
POS	CIRCUIT	COLOR	GA	SPL
1	NO IMPRINT	WHITE/ORANGE	24AWG	----
2	NO IMPRINT	ORANGE	24AWG	----
3	NO IMPRINT	WHITE/GREEN	24AWG	----
4	NO IMPRINT	BLUE	24AWG	SPLPWR
5	NO IMPRINT	WHITE/BLUE	24AWG	SPLPWR
6	NO IMPRINT	GREEN	24AWG	----
7	NO IMPRINT	WHITE/BROWN	24AWG	SPLGND
8	NO IMPRINT	BROWN	24AWG	SPLGND



UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

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FSG OF <b>IDEX</b> IDEX CORPORATION		<b>HALE</b> <b>GODIVA</b> <i>class1</i>	
MATERIAL	TITLE		
MADE FROM	SAM ELECTRIC COMPONENT PINOUTS		
FINISH	DRAWN	KTN	SIZE
PROJECT	APPROVED	MAL	<b>B</b>
	DATE	20NOV2019	SCALE
			1:1
DRAWING NUMBER		REV	
<b>FSG-PL-01503</b>		<b>E</b>	
		SHEET	
		10 OF 17	

## REVISIONS

ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

**GREEN BUSS**  
**ORANGE BUSS**

IF IN DOUBT ASK

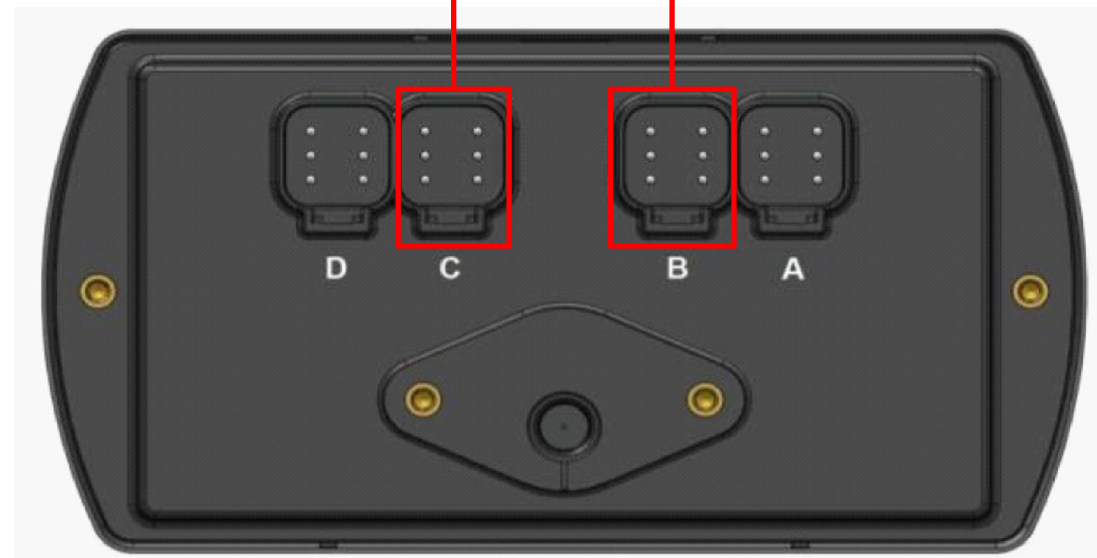
PROJECTION: 

# OPTIONAL SMARTFOAM DISPLAY

UV450 SMARTFOAM DISPLAY			
CONNECTOR DEUTSCH: DT06-6S (GREY)			
LOCK DEUTSCH: W6S (ORANGE)			
TERM DEUTSCH: 0462-0201-1631 (18) GOLD			
TERM DEUTSCH: 0462-0209-16141 (16-14) TIN			
POS	CIRCUIT	COLOR	GA
1	114017	----	----
2	<b>CAN HIGH (DISCH.)</b>	<b>YELLOW</b>	<b>18GXL</b>
3	<b>CAN LOW (DISCH.)</b>	<b>GREEN</b>	<b>18GXL</b>
4	SW COMMON	BLACK	18GXL
5	SW NO	ORANGE	18GXL
6	114017	----	----

UV450 SMARTFOAM DISPLAY			
CONNECTOR DEUTSCH: DT06-6S (GREY)			
LOCK DEUTSCH: W6S (ORANGE)			
TERM DEUTSCH: 0462-0201-1631 (18) GOLD			
TERM DEUTSCH: 0462-0209-16141 (16-14) TIN			
POS	CIRCUIT	COLOR	GA
1	POWER	PINK	18GXL
2	<b>CAN HIGH (FOAM)</b>	<b>YELLOW</b>	<b>18GXL</b>
3	<b>CAN LOW (FOAM)</b>	<b>GREEN</b>	<b>18GXL</b>
4	REMOTE LED (-)	RED	18GXL
5	POWER	PINK	18GXL
6	GROUND	BLACK	16GXL

PINS 2 & 3 MODIFIED FROM ORIGINAL SMARTFOAM HARNESS 513-00101-20X C6 CONNECTOR TO WORK WITH SAM



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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FSG OF <b>DEX</b> IDEX CORPORATION		<b>HALE</b> <b>GODIVA</b> <b>class1</b>	
MATERIAL	TITLE		
MADE FROM	SAM ELECTRIC COMPONENT PINOUTS		
FINISH	DRAWN	KTN	SIZE
PROJECT	APPROVED	MAL	<b>B</b>
	DATE	20NOV2019	SCALE
			1:1
DRAWING NUMBER		REV	
<b>FSG-PL-01503</b>		<b>E</b>	
SHEET		11 OF 17	

**REVISIONS**

ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

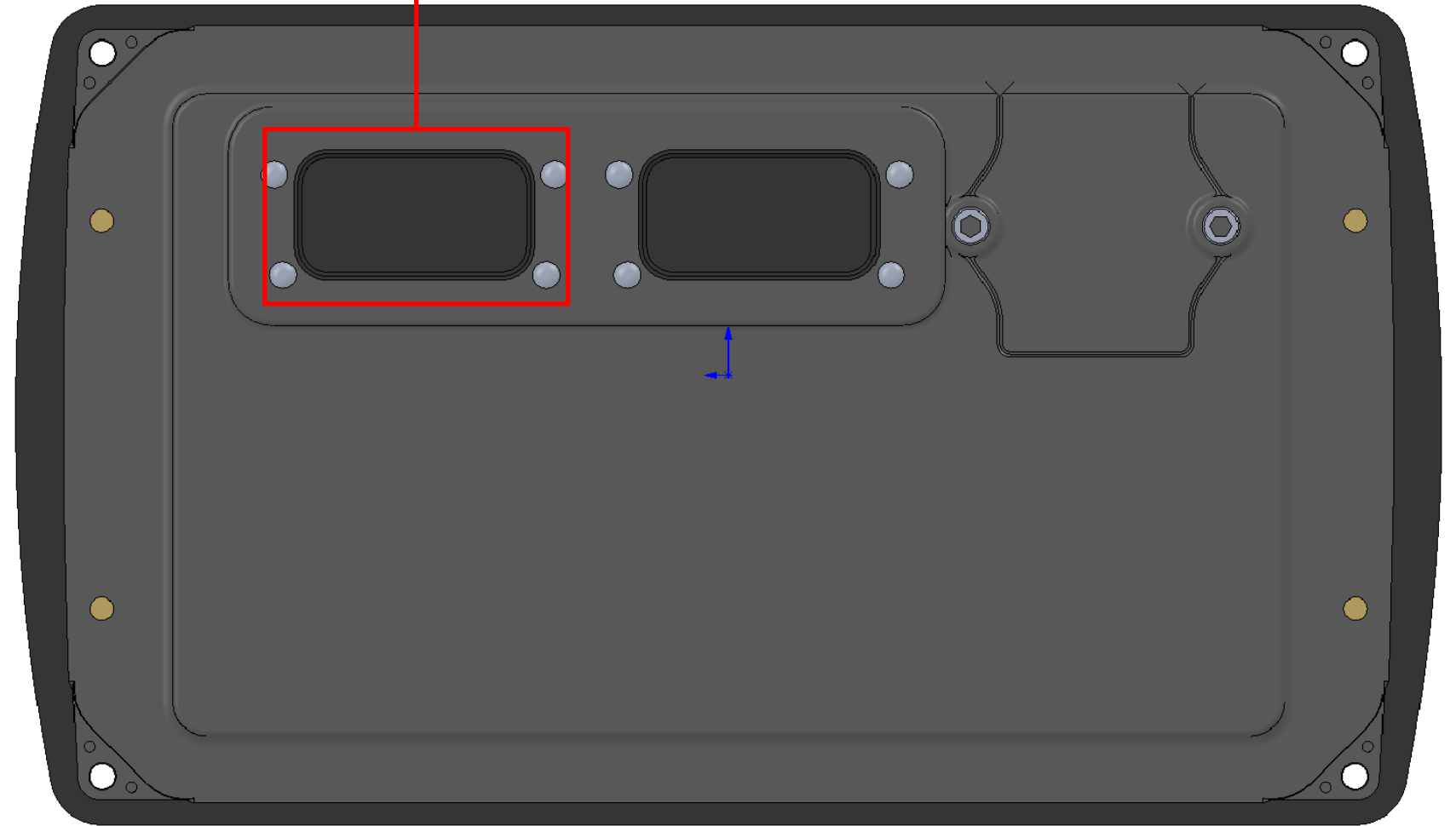
**GREEN BUSS**  
**ORANGE BUSS**

IF IN DOUBT ASK

PROJECTION: 

# OPTIONAL SMARTCAFS DISPLAY

UV780 SMARTCAFS DISPLAY			
CONNECTOR AMP/TYCO: 770680-1 (BLACK) FEMALE			
TERMINAL TYCO: 770520-1 (TIN)			
CAVITY PLUG AMP/TYCO: 770678-1 (NATURAL)			
POS	CIRCUIT	COLOR	GA
1	DIGITAL INPUT #1	RED	18GXL
2	770678-1	----	----
3	770678-1	----	----
4	770678-1	----	----
5	CAN LOW (FOAM)	GREEN	103349
6	CAN HIGH (FOAM)	YELLOW	103349
7	SUPPLY POWER	RED	16GXL
8	SUPPLY GROUND	BLACK	16GXL
9	770678-1	----	----
10	770678-1	----	----
11	770678-1	----	----
12	770678-1	----	----
13	770678-1	----	----
14	770678-1	----	----
15	SUPPLY POWER	RED	16GXL
16	770678-1	----	----
17	770678-1	----	----
18	CAN LOW (DISCH.)	GREEN	103349
19	CAN HIGH (DISCH.)	YELLOW	103349
20	770678-1	----	----
21	770678-1	----	----
22	DIGITAL OUTPUT	BLACK	16GXL
23	770678-1	----	----



UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

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MATERIAL	TITLE		
MADE FROM	SAM ELECTRIC COMPONENT PINOUTS		
FINISH	DRAWN	KTN	SIZE
PROJECT	APPROVED	MAL	<b>B</b>
	DATE	20NOV2019	SCALE
			1:1
DRAWING NUMBER		REV	
<b>FSG-PL-01503</b>		<b>E</b>	
SHEET		12 OF 17	

REVISIONS

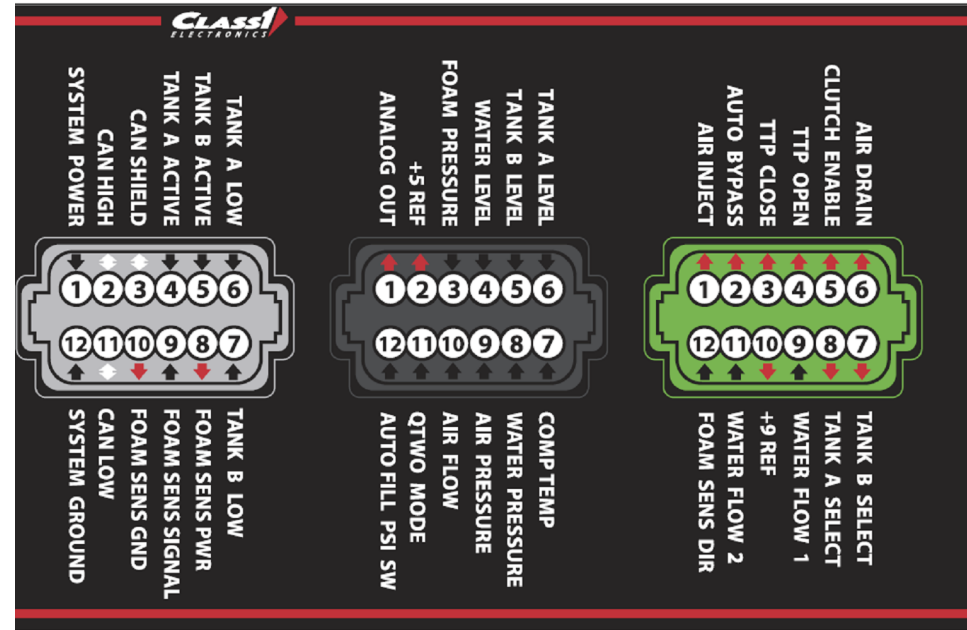
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-



**ORANGE BUSS**

IF IN DOUBT ASK

PROJECTION: 



# FOAM PUMP MOTOR DRIVER MODULE





SMART FOAM MOTOR DRIVER (GRAY)	
CONNECTOR DEUTSCH: DT06-12A (GRAY)	
LOCK DEUTSCH: W12S (ORANGE)	
TERM DEUTSCH: 0462-0209-16141 (TIN)	
TERM DEUTSCH: 0462-0201-1631 (GOLD)	
POS	CIRCUIT
1	SYSTEM POWER
2	CAN HIGH (FOAM)
3	CAN SHIELD (FOAM)
4	TANK A ACT/SEL
5	TANK B ACT/SEL
6	TANK A LOW
7	TANK B LOW
8	FOAM SENSOR POWER
9	FOAM SENSOR SIGNAL
10	FOAM SENSOR GROUND
11	CAN LOW (FOAM)
12	SYSTEM GROUND

SMART FOAM MOTOR DRIVER (BLACK)	
CONNECTOR DEUTSCH: DT06-12B (BLACK)	
LOCK DEUTSCH: W12S (ORANGE)	
TERM DEUTSCH: 0462-0209-16141 (TIN)	
TERM DEUTSCH: 0462-0201-1631 (GOLD)	
POS	CIRCUIT
1	ANALOG OUT
2	+5V REF
3	FOAM PRESSURE
4	WATER LEVEL
5	TANK B LEVEL
6	TANK A LEVEL
7	COMP TEMP
8	WATER PRESSURE
9	AIR PRESSURE
10	AIR FLOW
11	QTWO MODE
12	AUTOFILL PSI SWITCH

SMART FOAM MOTOR DRIVER (GREEN)	
CONNECTOR DEUTSCH: DT06-12C (GRAY)	
LOCK DEUTSCH: W12S (ORANGE)	
TERM DEUTSCH: 0462-0209-16141 (TIN)	
TERM DEUTSCH: 0462-0201-1631 (GOLD)	
POS	CIRCUIT
1	AIR INJECT
2	AUTO BYPASS
3	TTP CLOSE
4	TTP OPEN
5	CLUTCH ENABLE
6	AIR DRAIN
7	TANK B SELECT
8	TANK A SELECT
9	WATER FLOW 1
10	+9 REF
11	WATER FLOW 2
12	FOAM SENS DIR

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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MATERIAL		TITLE					
MADE FROM		SAM ELECTRIC COMPONENT PINOUTS					
FINISH		DRAWN	KTN	SIZE	DRAWING NUMBER		REV
PROJECT		APPROVED	MAL	<b>B</b>	FSG-PL-01503		<b>E</b>
		DATE	20NOV2019	SCALE			SHEET
				1:1			13 OF 17

REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

# ORANGE BUSS

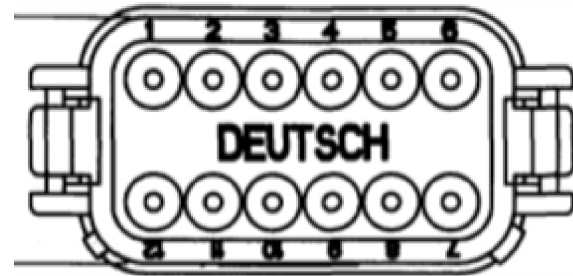
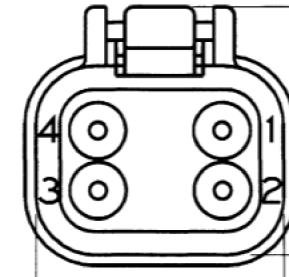
IF IN DOUBT ASK





PROJECTION: 

ITL40 FOAM LEVEL			
CONNECTOR DEUTSCH: DT06-12SB (BLACK)			
LOCK DEUTSCH: W12S (ORANGE)			
TERM DEUTSCH: 0462-0201-16141			
POS	CIRCUIT	COLOR	GA
1	SYSTEM POWER	RED	18GXL
2	CAN HIGH (FOAM)	YELLOW	103349
3	CAN SHIELD (FOAM)	----	18GXL
4	114017	----	----
5	XDCR + REFERENCE	RED	18GXL
6	XDCR SIGNAL	WHITE	18GXL
7	XDCR GROUND	BLACK	18GXL
8	114017	----	----
9	114017	----	----
10	114017	----	----
11	CAN LOW (FOAM)	GREEN	103349
12	SYSTEM POWER	BLACK	18GXL

PINS 2, 3, & 11 MODIFIED FROM ORIGINAL ITL40 HARNESS 118485-10 TO WORK WITH SAM

SMARTCAFS ARC VALVE			
CONNECTOR DEUTSCH: DT06-4S			
LOCK DEUTSCH: W4S			
TERM DEUTSCH: 0462-201-16141			
POS	CIRCUIT	COLOR	GA
1	SUPPLY GROUND	BLACK	16GXL
2	CAN LOW (FOAM)	GREEN	103349
3	CAN HIGH (FOAM)	YELLOW	103349
4	SUPPLY POWER	RED	16GXL



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS: X: ±0.04 X.X: ±0.02 X.XX: ±0.01 X.XXX: ±0.005 ANGLES: ±0.25° SURFACE TEXTURE IN µm Ra REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX	FSG OF 		  	
	MATERIAL		TITLE	
	MADE FROM		SAM ELECTRIC COMPONENT PINOUTS	
	FINISH		DRAWN	KTN
PROJECT		APPROVED	MAL	
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		DATE	20NOV2019	
		SIZE	B	
		SCALE	1:1	
		DRAWING NUMBER	FSG-PL-01503	
		REV	E	
		SHEET	14 OF 17	

### REVISIONS

ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

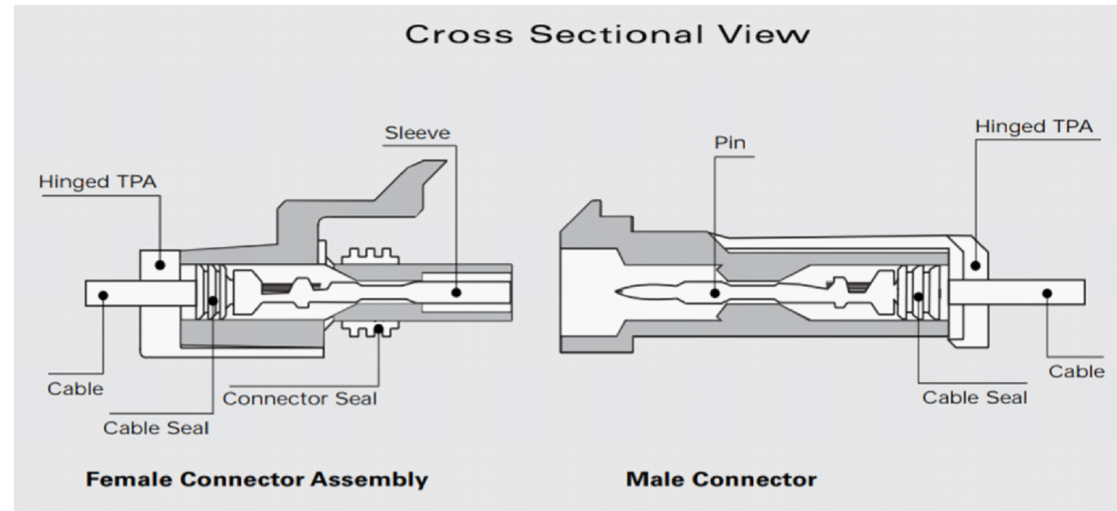
IF IN DOUBT ASK

# DELPHI / PACKARD CONNECTORS

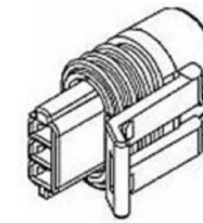
PROJECTION:

## WEATHER-PACK SERIES

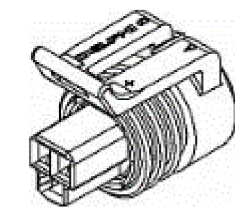
Cross Sectional View



## METRI-PACK 150 SERIES



1 ROW



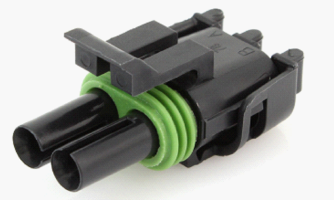
2 ROWS

### METRI-PACK 150 CONNECTORS & TERMINALS

CAVITIES	TYPE	ORIENTATION	CONNECTOR P/N	TERMINAL P/N
3	FEMALE	1 ROW	12162279	12162279
3	FEMALE	2 ROWS	12065287	12065287

CONNECTORS

### TOWER



### SHROUD



### WEATHER-PACK CONNECTORS

CAVITIES	TYPE	P/N
1	TOWER	12015791
1	SHROUD	12010996
2	TOWER	12015792
2	SHROUD	12010973
3	TOWER	12015793
3	SHROUD	12010717

TERMINALS

### FEMALE



### MALE



### WEATHER-PACK TERMINALS

AWG	TYPE	P/N
12-10	FEMALE	12124581
12-10	MALE	12124587
16-14	FEMALE	12124580
16-14	MALE	12124582

SEALS



### WEATHER-PACK SEALS

AWG	COLOR	P/N
12-10	BLUE	15324981
14-12	GRAY	15324980
16-14	GREEN	15324982
20-18	RED	15324983

PLUG



### WEATHER-PACK PLUG

AWG	COLOR	P/N
ALL	GREEN	12010300

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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MATERIAL		TITLE		DRAWN		KTN	
MADE FROM		SAM ELECTRIC COMPONENT PINOUTS		APPROVED		MAL	
FINISH		DATE		20NOV2019		SCALE	
PROJECT		DRAWING NUMBER		FSG-PL-01503		REV	
		1:1		E		SHEET 15 OF 17	

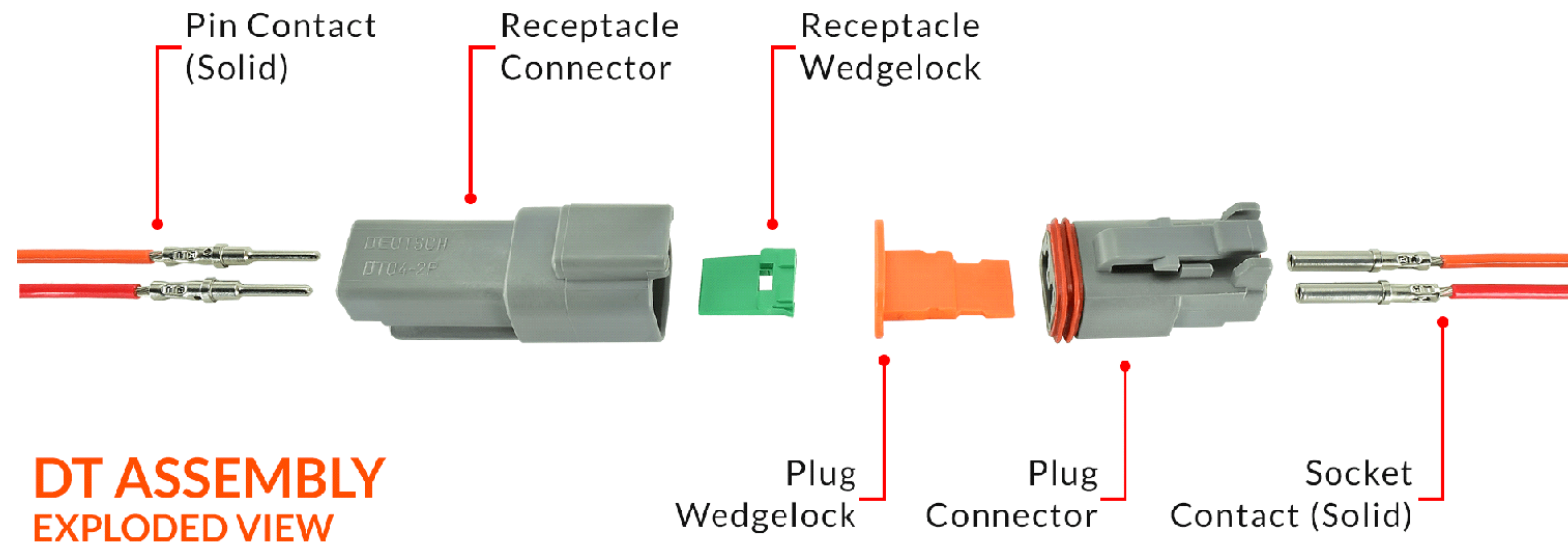
### REVISIONS

ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

IF IN DOUBT ASK

PROJECTION: 

# DEUTSCH CONNECTOR ASSEMBLIES



## NOTES FOR DEUTSCH CONNECTOR ASSEMBLIES:

- CONNECTOR STYLES & WIRE SIZES:
  - DT: 16 GA GXL [NOMINAL], WITH 18-14 GA ACCEPTABLE.
  - DTP: 12 GA GXL [NOMINAL], WITH 14-10 GA ACCEPTABLE.
  - DTM: 20 GA GXL [NOMINAL], WITH 20-16 GA ACCEPTABLE.
- FOR 3-CAVITY CONNECTORS, ONLY THE WATER DETECTOR SENSORS UTILIZE THE -CE02 CONNECTOR MODIFICATION, WHICH PROVIDES REDUCED DIAMETER SEALS.
- ALL CAN NETWORK WIRES UTILIZE GOLD-PLATED TERMINALS, WHICH PROVIDES A HIGHER CURRENT RATING.

### DEUTSCH CONNECTORS & LOCKS

STYLE	CAVITIES	TYPE	CONNECTOR P/N	LOCK P/N	NOTES
DT	2	PLUG	DT06-2S	W2S	
DT	2	RECEPTACLE	DT04-2P	W2P	
DT	3	PLUG	DT06-3S & DT06-3S-CE02	W3S	NOTE 2
DT	3	RECEPTACLE	DT04-3P	W3P	
DTP	4	PLUG	DTP06-4S-CE02	WP-4S	
DT	4	RECEPTACLE	DT04-4P	W4P	
DT	6	PLUG	DT06-6S	W6S	
DT	8	RECEPTACLE	DT04-08PA	W8P	
DT	12	PLUG	DT06-12S	W12S	
DTM	12	RECEPTACLE - A	DTM04-12PA	WM-12P	
DTM	12	RECEPTACLE - B	DTM04-12PB	WM-12P	
DTM	12	PLUG - A	DTM06-12SA	WM-12S	
DTM	12	PLUG - B	DTM06-12SB	WM-12S	

### DEUTSCH TERMINALS

AWG	TYPE	PLATING	P/N	NOTES
20	SOCKET	TIN	0462-201-20141	
20	PIN	TIN	0460-202-20141	
20	SOCKET	GOLD	0462-201-2031	NOTE 3
20	PIN	GOLD	0460-202-2031	NOTE 3
18-16	SOCKET	TIN	0462-201-16141	
18-16	PIN	TIN	0460-202-16141	
18-16	SOCKET	GOLD	0462-201-1631	NOTE 3
18-16	PIN	GOLD	0460-202-1631	NOTE 3
14	SOCKET	TIN	0462-209-16141	
12	SOCKET	TIN	0462-203-12141	

### DEUTSCH PLUGS





STYLE	P/N
DT	114017
DTP	114017
DTM	0413-204-2005

#### REVISIONS

ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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MATERIAL		TITLE		SAM ELECTRIC COMPONENT PINOUTS			
MADE FROM		DRAWN		KTN		SIZE	
FINISH		APPROVED		MAL		SCALE	
PROJECT		DATE		20NOV2019		DRAWING NUMBER	
						FSG-PL-01503	
						REV E	
						SHEET 16 OF 17	



IF IN DOUBT ASK

PROJECTION: 

# TYCO/AMPSEAL CONNECTOR ASSEMBLIES



# PARTS EXPRESS CONNECTORS (AUDIO/VIDEO)

RCA SOCKET - P/N 090-265



# PANDUIT CONNECTOR (BUZZER ALARM)

RIGHT-ANGLE FEMALE DISCONNECT  
P/N DNFR14250FIB-KD



RCA PLUG - P/N 090-250



## AMPSEAL CONNECTOR

CAVITIES	TYPE	CONNECTOR P/N	COLOR
23	PLUG	770680-5	BLUE
23	PLUG	770680-1	BLACK
23	PLUG	770680-4	GREY

## AMPSEAL TERMINALS

AWG	TYPE	PLATING	P/N	NOTES
20	FEMALE	TIN	770520-1	
20	FEMALE	GOLD	770520-3	NOTE 1

NOTES FOR DEUTSCH CONNECTOR ASSEMBLIES:

- ALL CAN NETWORK WIRES UTILIZE GOLD-PLATED TERMINALS, WHICH PROVIDES A HIGHER CURRENT RATING.

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
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SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

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FSG OF <b>DEX</b> IDEX CORPORATION		<b>HALE</b> <b>GODIVA</b> <b>class1</b>	
MATERIAL	TITLE SAM ELECTRIC COMPONENT PINOUTS		
MADE FROM	DRAWN	KTN	SIZE <b>B</b>
FINISH	APPROVED	MAL	SCALE 1:1
PROJECT	DATE	20NOV2019	DRAWING NUMBER <b>FSG-PL-01503</b>
			REV <b>E</b> SHEET 17 OF 17

### REVISIONS

ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-



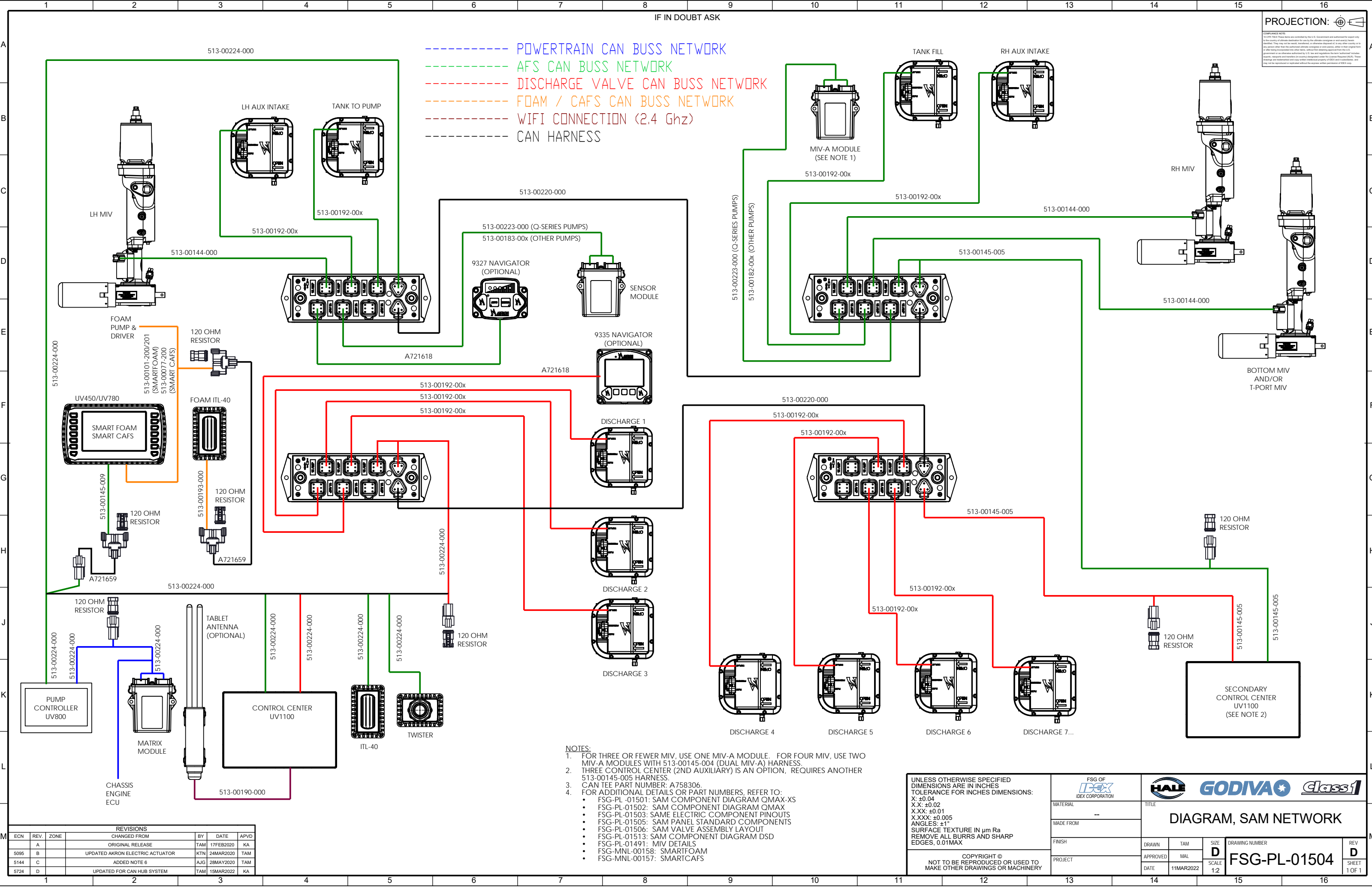
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12 CFR 101.5 These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein. This may not be used, transferred, or otherwise disposed of in any other country or to any person other than the authorized consignee or end-user(s), unless the export license from the authority responsible for the item, which the shipping document from the U.S. Government is an exception authorized by U.S. law and requires the use of the license number, is attached to the item and the recipient is a designated recipient for License Requirement (LOR). These items are controlled and copy under intellectual property of ODC and its subsidiaries, and they will be maintained in a restricted state without the written permission of ODC.

- POWERTRAIN CAN BUSS NETWORK
- AFS CAN BUSS NETWORK
- DISCHARGE VALVE CAN BUSS NETWORK
- FOAM / CAFS CAN BUSS NETWORK
- WIFI CONNECTION (2.4 Ghz)
- CAN HARNESS



- NOTES:**
- FOR THREE OR FEWER MIV, USE ONE MIV-A MODULE. FOR FOUR MIV, USE TWO MIV-A MODULES WITH 513-00145-004 (DUAL MIV-A) HARNESS.
  - THREE CONTROL CENTER (2ND AUXILIARY) IS AN OPTION, REQUIRES ANOTHER 513-00145-005 HARNESS.
  - CAN TEE PART NUMBER: A758306.
  - FOR ADDITIONAL DETAILS OR PART NUMBERS, REFER TO:
    - FSG-PL-01501: SAM COMPONENT DIAGRAM QMAX-XS
    - FSG-PL-01502: SAM COMPONENT DIAGRAM QMAX
    - FSG-PL-01503: SAME ELECTRIC COMPONENT PINOUTS
    - FSG-PL-01505: SAM PANEL STANDARD COMPONENTS
    - FSG-PL-01506: SAM VALVE ASSEMBLY LAYOUT
    - FSG-PL-01513: SAM COMPONENT DIAGRAM DSD
    - FSG-PL-01491: MIV DETAILS
    - FSG-MNL-00158: SMARTFOAM
    - FSG-MNL-00157: SMARTCAFS

REVISIONS					
ECN	REV.	ZONE	CHANGED FROM	BY	DATE
	A		ORIGINAL RELEASE	TAM	17FEB2020
5095	B		UPDATED AKRON ELECTRIC ACTUATOR	KTN	24MAR2020
5144	C		ADDED NOTE 6	AJG	28MAY2020
5724	D		UPDATED FOR CAN HUB SYSTEM	TAM	15MAR2022

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCHES DIMENSIONS: X: ±0.04 X.X: ±0.02 X.XX: ±0.01 X.XXX: ±0.005 ANGLES: ±1° SURFACE TEXTURE IN µm Ra REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX					
MATERIAL: --		TITLE: <b>DIAGRAM, SAM NETWORK</b>			
MADE FROM: --		FINISH: --	PROJECT: --	DATE: 11MAR2022	SCALE: 1:2
DRAWN: TAM		APPROVED: MAL		DRAWING NUMBER: <b>FSG-PL-01504</b>	REV: <b>D</b>
SIZE: <b>D</b>		SHEET: 1 OF 1			



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**NOTES**

- FOR SAM COMPONENT DIAGRAMS ON PUMP & PANEL, REFER TO:
  - FSG-PL-01501 - QMAX-XS
  - FSG-PL-01502 - QMAX
- FOR SAM CAN NETWORK DIAGRAM, REFER TO FSG-PL-01504.

# STANDARD PANEL MOUNTED SAM COMPONENTS

## SUPPLIED WITH EVERY SAM SYSTEM

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**CONTROL CENTER, UV1100**

- MASTER
- P/N: 610-00060-210
  - HARNESS: 513-00224-000
  - BRACKET: 629-00071
  - AUXILIARY
  - P/N: 610-00060-110
  - HARNESS: 513-00145-005
  - BRACKET: 629-00071

**PUMP CONTROLLER, UV800**

- P/N: 610-00060-080  
 HARNESS
- CAN: 513-00224-000
  - AUDIO/VIDEO: 513-00144-005
  - GROUND LOOP ISOLATOR 200-00156-001
- BRACKET: 019-03798  
 MATRIX MODULE: 629-00052

**TANK LEVEL, ITL40**

- P/N: ITL-40 (WATER) / ITLF-40 (FOAM)  
 HARNESS
- WATER: 513-00224-000
  - FOAM: 513-00190-0000
- MANUAL: 118253

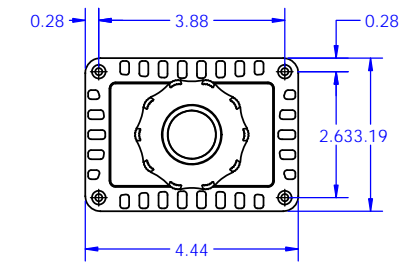
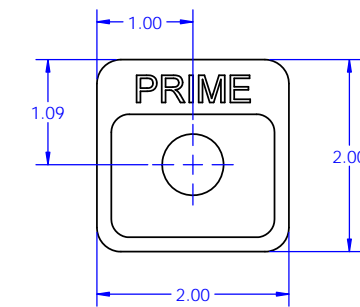
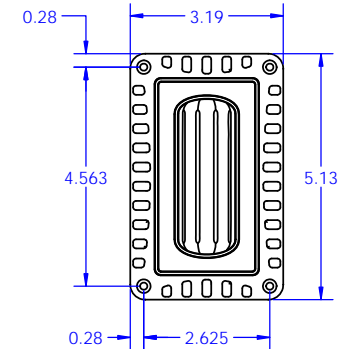
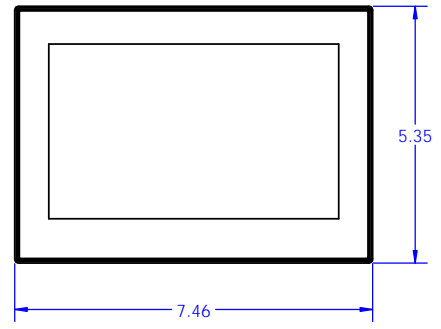
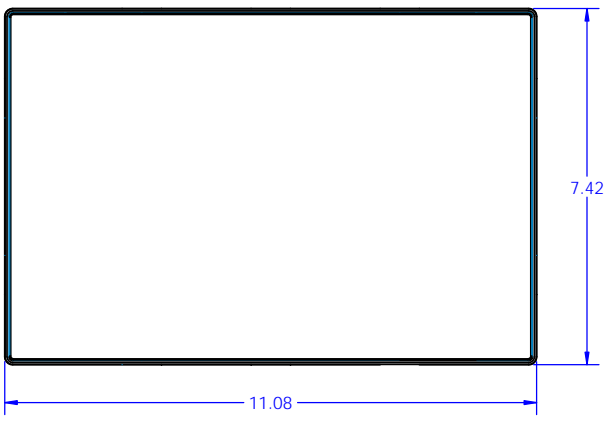
**PRIMER CONTROL BUTTON**

- P/N: 200-0120-04-0  
 HARNESS: 513-00223-000 (Q-SERIES)  
 513-00182-00X (VOLUTE)

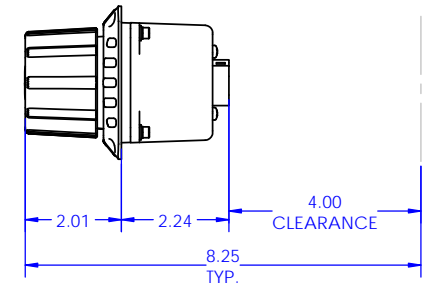
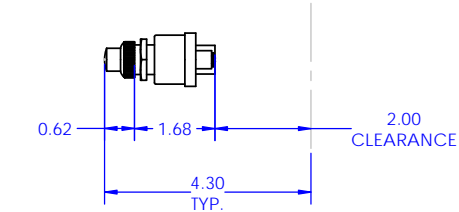
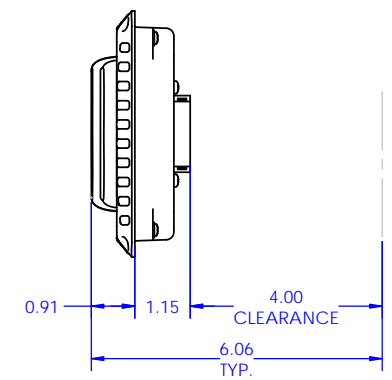
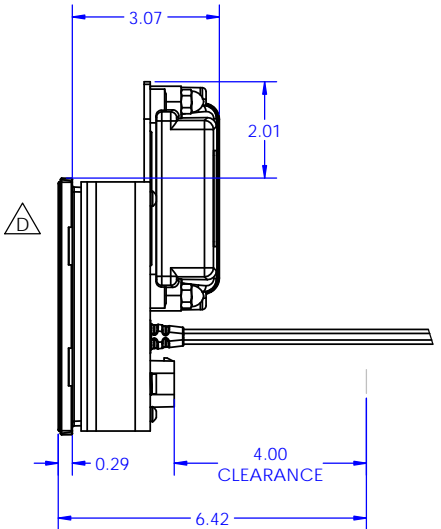
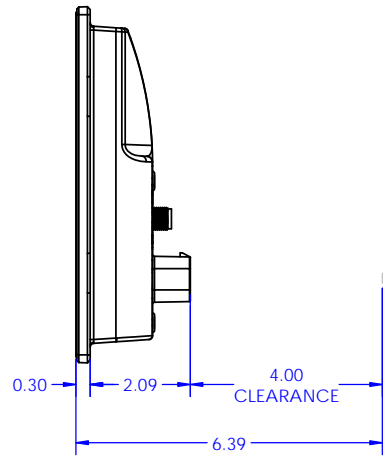
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- P/N: 119970  
 HARNESS: 513-00224-000  
 MANUAL: 120477

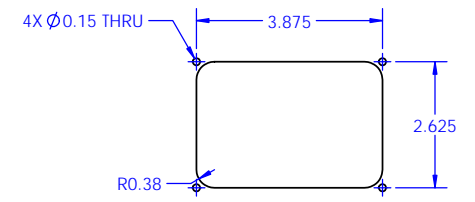
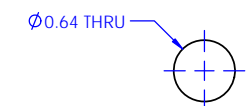
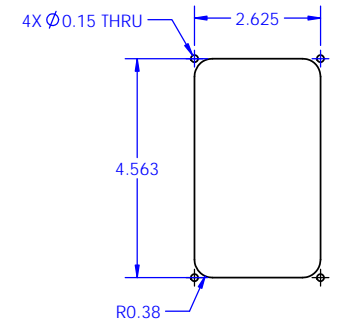
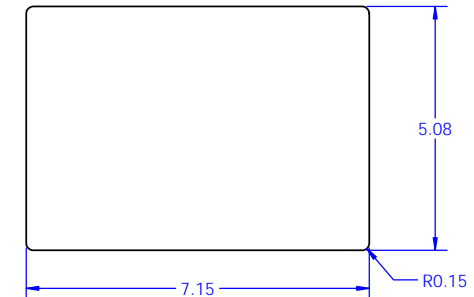
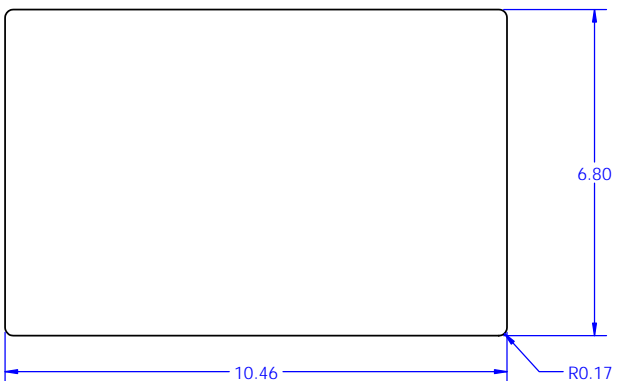
FRONT DIMENSIONS



SIDE DIMENSIONS



PANEL CUTOUTS



REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
	A		ORIGINAL RELEASE	AJG	24FEB2020	TAM
	B		ADDED PLACARD P/N FOR MIV ACTIVATION BUTTON AND IDLE OVERRIDE SWITCH	TAM	05MAR2020	JLS
5095	C	3-M8	ADDED MOUNTING NOTE FOR SPEAKERS	KTN	19MAR2020	TAM
5724	D	B2, B5, G6, 2-KG, 4-C8	UPDATED FOR CAN HUB SYSTEM. MIV MANUAL OVERRIDE PANEL HOLE CUTOUT UPDATED.	TAM	04MAR2022	KTN

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCHES DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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MATERIAL		TITLE	
MADE FROM		SAM - PANEL COMPONENT DETAILS	
FINISH	DRAWN	MB	SIZE
PROJECT	APPROVED	TAM	D
DATE	24FEB2020	SCALE	1:24
DRAWING NUMBER		REV	
FSG-PL-01505		D	
SHEET		1 OF 5	

**NOTES**

1. FOR ADDITIONAL MIV 2.0 DETAILS, REFER TO FSG-PL-01491.

# STANDARD PANEL MOUNTED SAM COMPONENTS

## SUPPLIED WITH EVERY SAM SYSTEM

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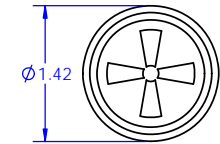
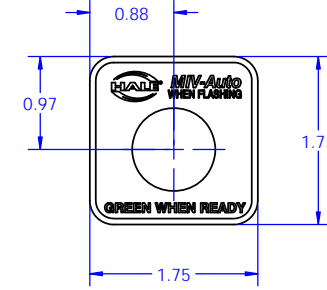
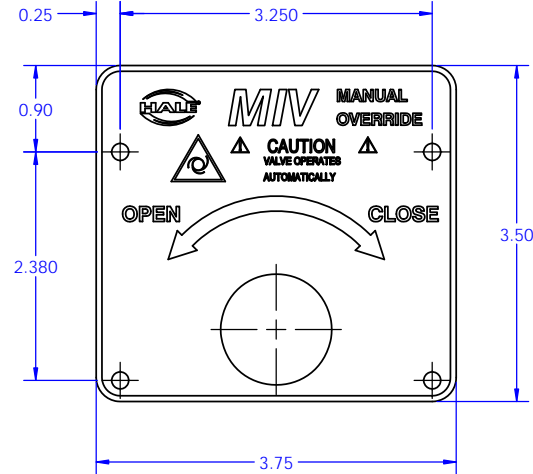
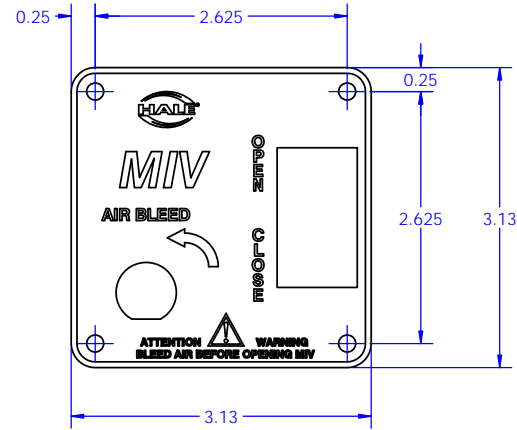
**MIV-E OVERRIDE PANEL ASSEMBLY**  
 (1 PER MIV)  
 P/N: 513-0273-52-0  
 HARNESS: 513-00144-000

**MIV MANUAL OVERRIDE PANEL**  
 (1 PER MIV)  
 P/N: 101-1482-02-0  
 HARNESS: N/A

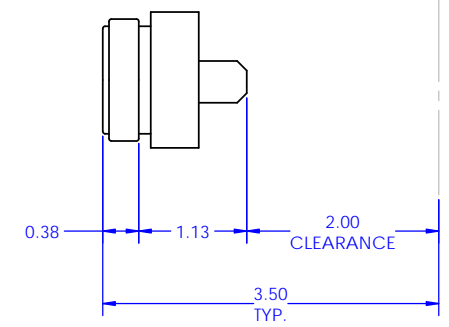
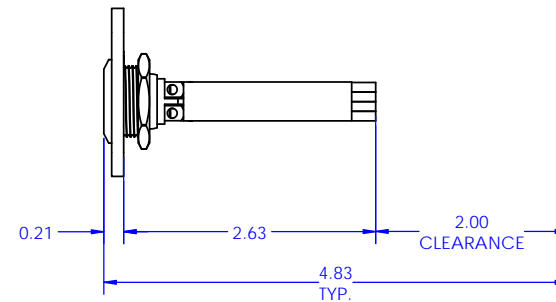
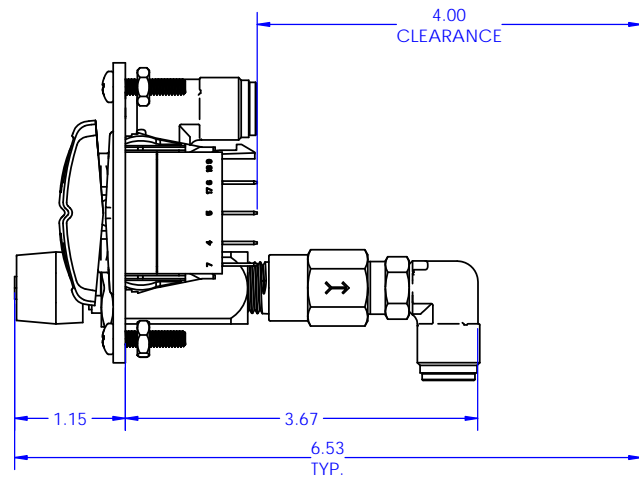
**MIV ACTIVATION BUTTON**  
 (1 PER MIV)  
 P/N: 622-00043-000  
 PLACARD: 101-1482-04-0  
 HARNESS: 513-00223-000  
 NOTE : LOCATE NEAR SUCTION CONNECTION OF MIV

**BUZZER**  
 (1 PER CONTROL CENTER)  
 P/N: 105503  
 HARNESS: 513-00224-000  
 NOTE: LOCATE NEAR CONTROL CENTER

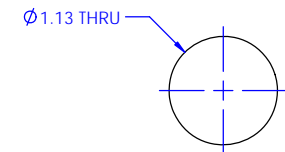
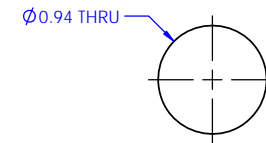
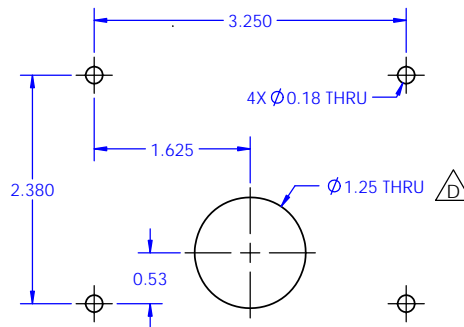
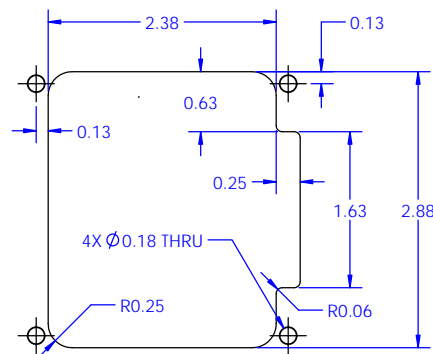
FRONT DIMENSIONS



SIDE DIMENSIONS



PANEL CUTOUPS



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCHES DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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FSG OF IDEX CORPORATION		TITLE	
MATERIAL		SAM - PANEL COMPONENT DETAILS	
MADE FROM		DRAWN KTN	
FINISH		APPROVED TAM	
PROJECT		DATE 24FEB2020	
SIZE D		DRAWING NUMBER	
SCALE 1:24		FSG-PL-01505	
REV D		SHEET 2 OF 5	







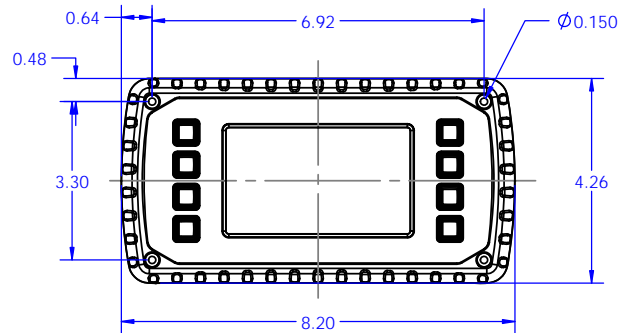
# OPTIONAL MOUNTING COMPONENTS

PROJECTION: 

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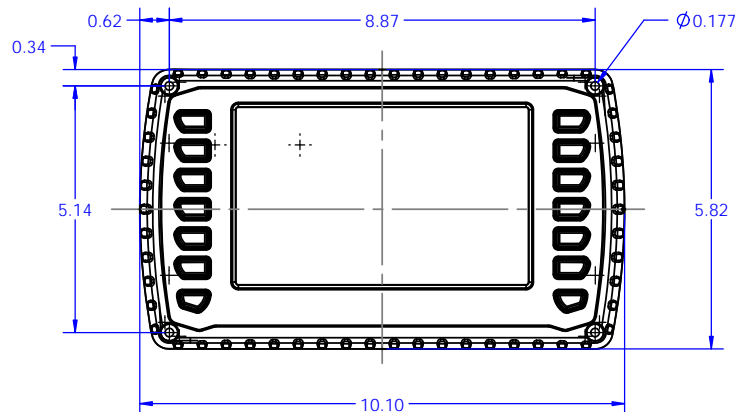
## SMARTFOAM, UV450

P/N: 610-00039 (REVISION 1.25 OR NEWER)  
 HARNESS: 513-00144-009 & 513-00101-200/201  
 MANUAL: FSG-MNL-00158



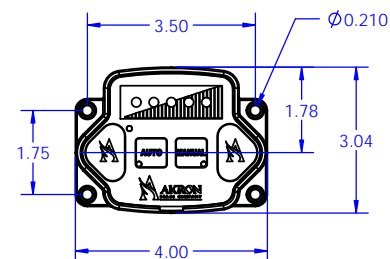
## SMARTCAFS, UV780

P/N: 610-00038 (REVISION 1.39 OR NEWER)  
 HARNESS: 122883 & 513-00077-200  
 MANUAL: FSG-MNL-00157



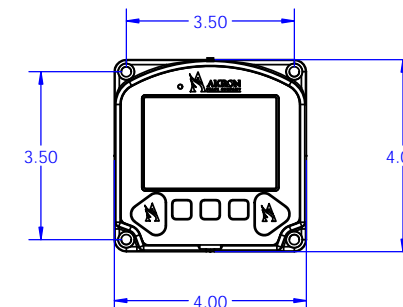
## NAVIGATOR, 9327

P/N: A93270003  
 HARNESS: A721618  
 MANUAL: #126898



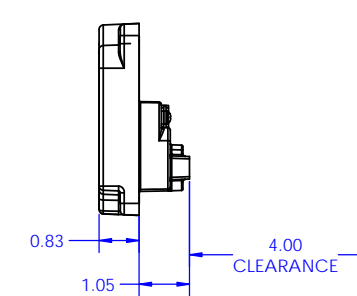
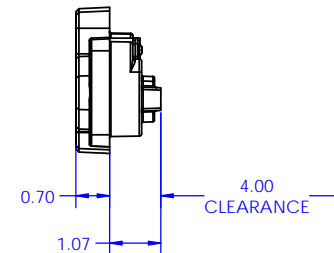
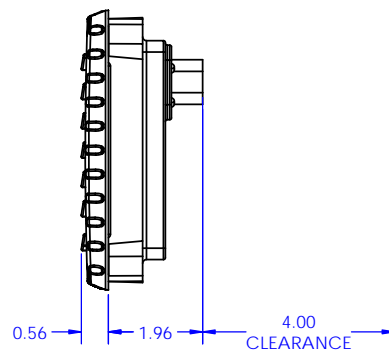
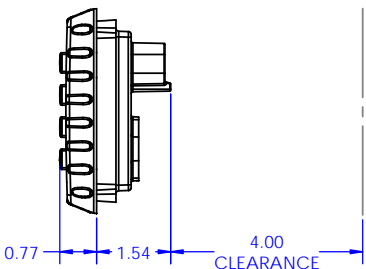
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P/N: A93350003  
 HARNESS: A721618  
 MANUAL: #126914

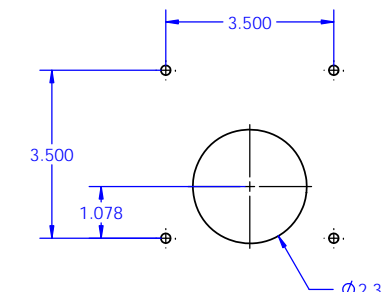
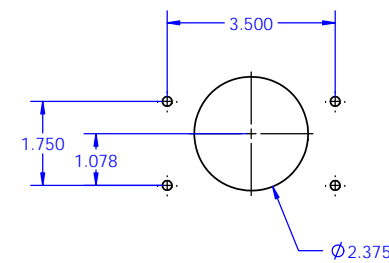
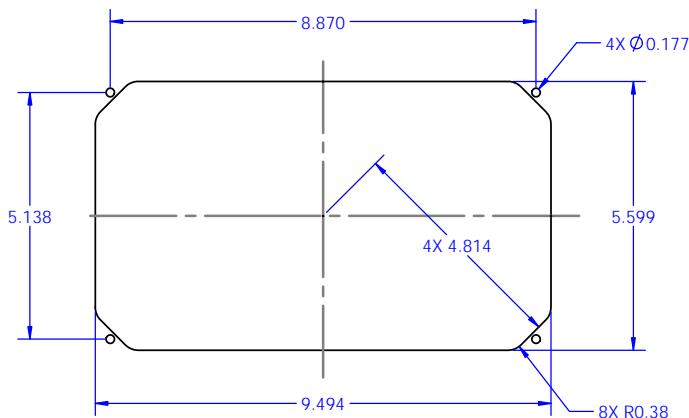
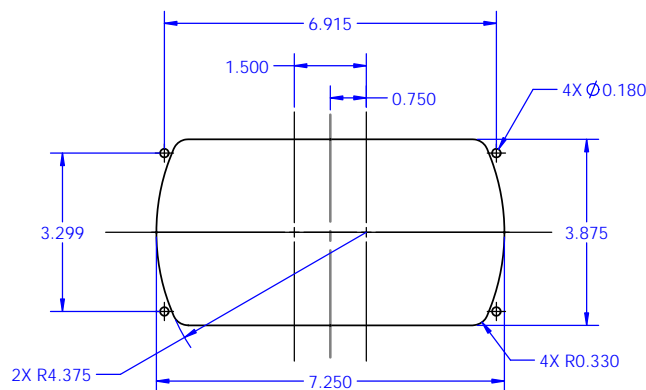


FRONT DIMENSIONS

SIDE DIMENSIONS



PANEL CUTOUTS



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES  
 TOLERANCE FOR INCHES DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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FSG OF IDEX CORPORATION		HALE GODIVA Class1	
MATERIAL		TITLE	
MADE FROM		SAM - PANEL COMPONENT DETAILS	
FINISH	DRAWN	KTN	SIZE
PROJECT	APPROVED	TAM	D
DATE	24FEB2020	SCALE	1:2
DRAWING NUMBER		REV	
FSG-PL-01505		D	
SHEET		5 OF 5	



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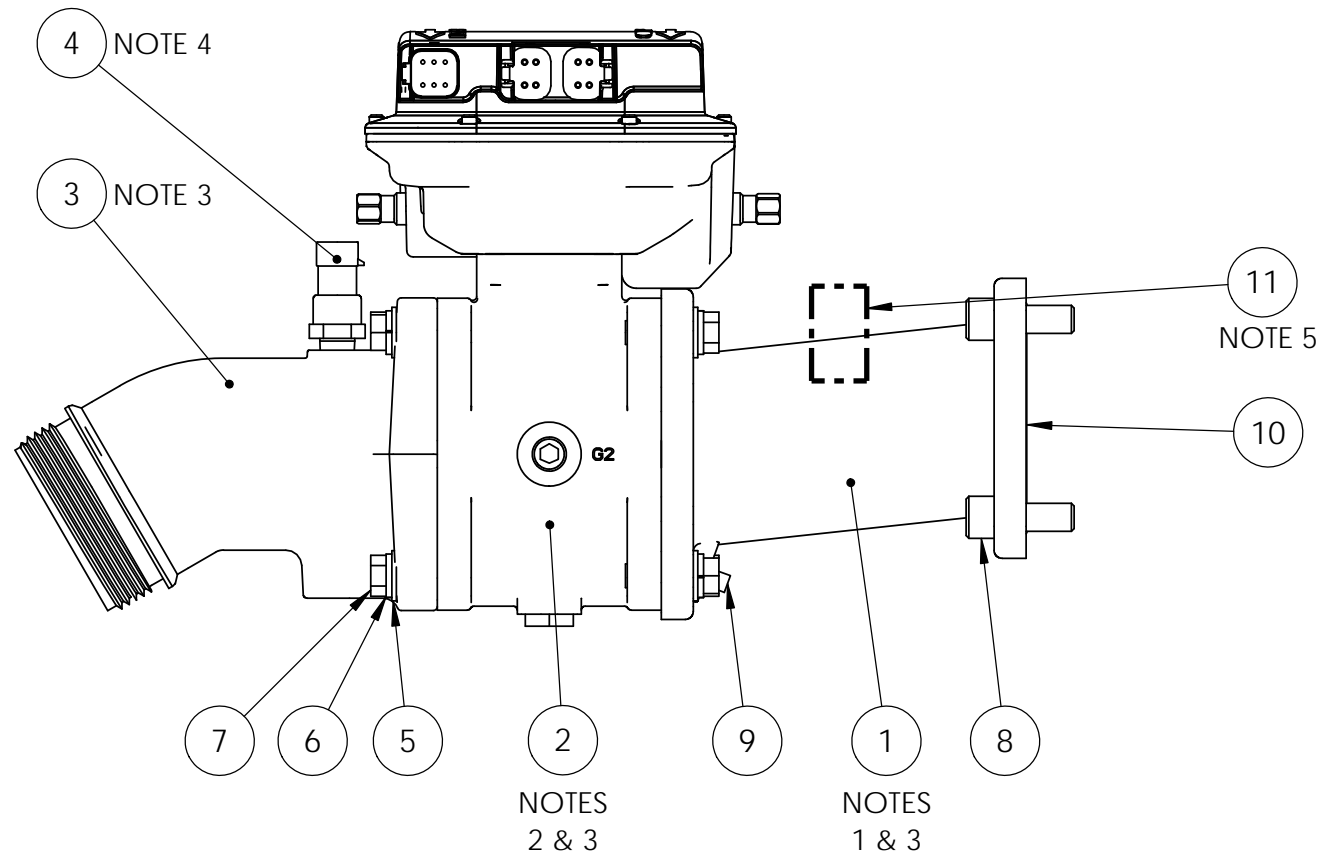
PROJECTION: 

COMPLIANCE NOTE:  
15 CFR 758.6 These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be resold, transferred, or otherwise disposed of, to any other country or to any person other than the authorized ultimate consignee or end-user(s), either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. government or as otherwise authorized by U.S. law and regulations the term "authorized" includes exports, reexports and transfers (in-country) designated under No License Required (NLR). These drawings are trademarked and copy written intellectual property of IDEX and its subsidiaries, and may not be reproduced or replicated without the express written permission of IDEX corp.

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NOTES

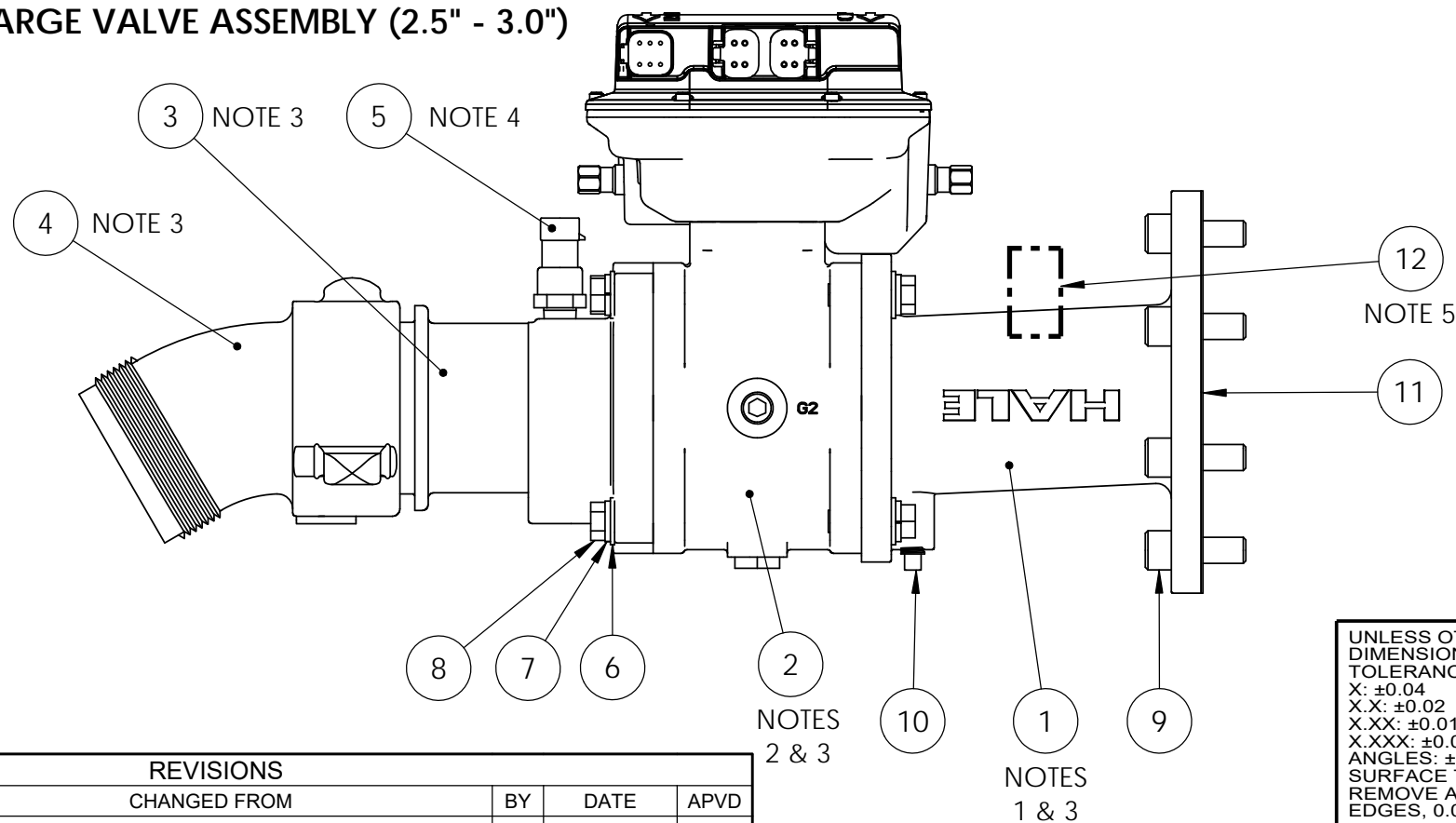
- PUMP ADAPTER ORIENTATION
  - FOR PORT O/P (DISCHARGE #1/#3): INSTALL ITEM 1 WITH DOWNWARD SLOPE UNLESS OTHERWISE SPECIFIED BY ORDER.
  - FOR PORT Q/R (DISCHARGE #2/#4): INSTALL ITEM 1 WITH UPWARD SLOPE UNLESS OTHERWISE SPECIFIED BY ORDER.
- INSTALL ELECTRIC MOTOR AS SHOWN UNLESS OTHERWISE SPECIFIED BY ORDER. REFER TO FSG-PL-01504 FOR ELECTRIC CONNECTIONS AND FSG-PL-01508 FOR REPLACEMENT VALVE DETAILS.
- CHECK BOM FOR CORRECT PART TO INSTALL ON UNIT.
- PRESSURE TRANSDUCER
  - INSTALL PRESSURE SENSOR HARNESS (A721768) AND CONNECT TO VALVE CONTROLLER.
  - USE 082-0280-02-0 FITTING ON ITEM 4 TO AVOID INTERFERENCE IF NECESSARY.
- FLOWMETER (OPTIONAL)
  - INSTALL FLOW SENSOR TO ITEM 1 WITH SENSOR MOUNTED UPWARD, UNLESS OTHERWISE SPECIFIED BY ORDER
  - CONNECT FLOWMETER HARNESS (A93001001) TO VALVE CONTROLLER.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	Q-SERIES PUMP ADAPTER	SEE NOTES 1 & 3	1
2	AKRON ELECTRIC VALVE	SEE NOTES 2 & 3	1
3	AKRON DISCHARGE FLANGE	SEE NOTE 3	1
4	200-00092	TRANSDUCER, 1/4" MNPT - 300 PSI	1
5	097-5730-01-0	WASHER, FLAT M10 SS	8
6	097-0140-02-0	WASHER, LOCK 0.38 SS	8
7	113890	CSW HH 3/8-16 X 1.25	8
8	018-1812-08-0	SCREW, SOC HD 7/16-14 X 1.25" LG	4
9	102669	PLUG, PIPE 1/8 MNPT SQ BRS	1
10	142-0390-00-0	O-RING SEAL SQUARE CUT	1
11	A93001001	AKRON FLOW SENSOR	*1

Q-SERIES DISCHARGE VALVE ASSEMBLY (2.5" - 3.0")

QMAX-XS DISCHARGE VALVE ASSEMBLY (2.5" - 3.0")





ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	QMAX-XS PUMP ADAPTER	SEE NOTES 1 & 3	1
2	AKRON ELECTRIC VALVE	SEE NOTES 2 & 3	1
3	AKRON DISCHARGE FLANGE	FLG, 2.5" VLV X MNH W/ DRAIN - 5" LG	1
4	DISCHARGE ADAPTER	ADAPTER, 2.5 FNST 2.5 MNST 30° SWIVEL	1
5	200-00092	TRANSDUCER, 1/4" MNPT - 300 PSI	1
6	097-5730-01-0	WASHER, FLAT M10 SS	8
7	097-0140-02-0	WASHER, LOCK 0.38 SS	8
8	113890	CSW HH 3/8-16 X 1.25 G8 ZINC	8
9	018-1812-08-0	SCREW, SOC HD 7/16-14 X 1.25" LG	8
10	102669	PLUG, PIPE 1/8 MNPT SQ BRS	1
11	117830	GASKET 8-BOLT RD	1
12	A93001001	AKRON FLOW SENSOR	*1

REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
N/A	A		ORIGINAL RELEASE	KTN	30JAN2020	AJG
5095	B		UPDATED AKRON ELECTRIC ACTUATOR	KTN	18MAR2020	AJG

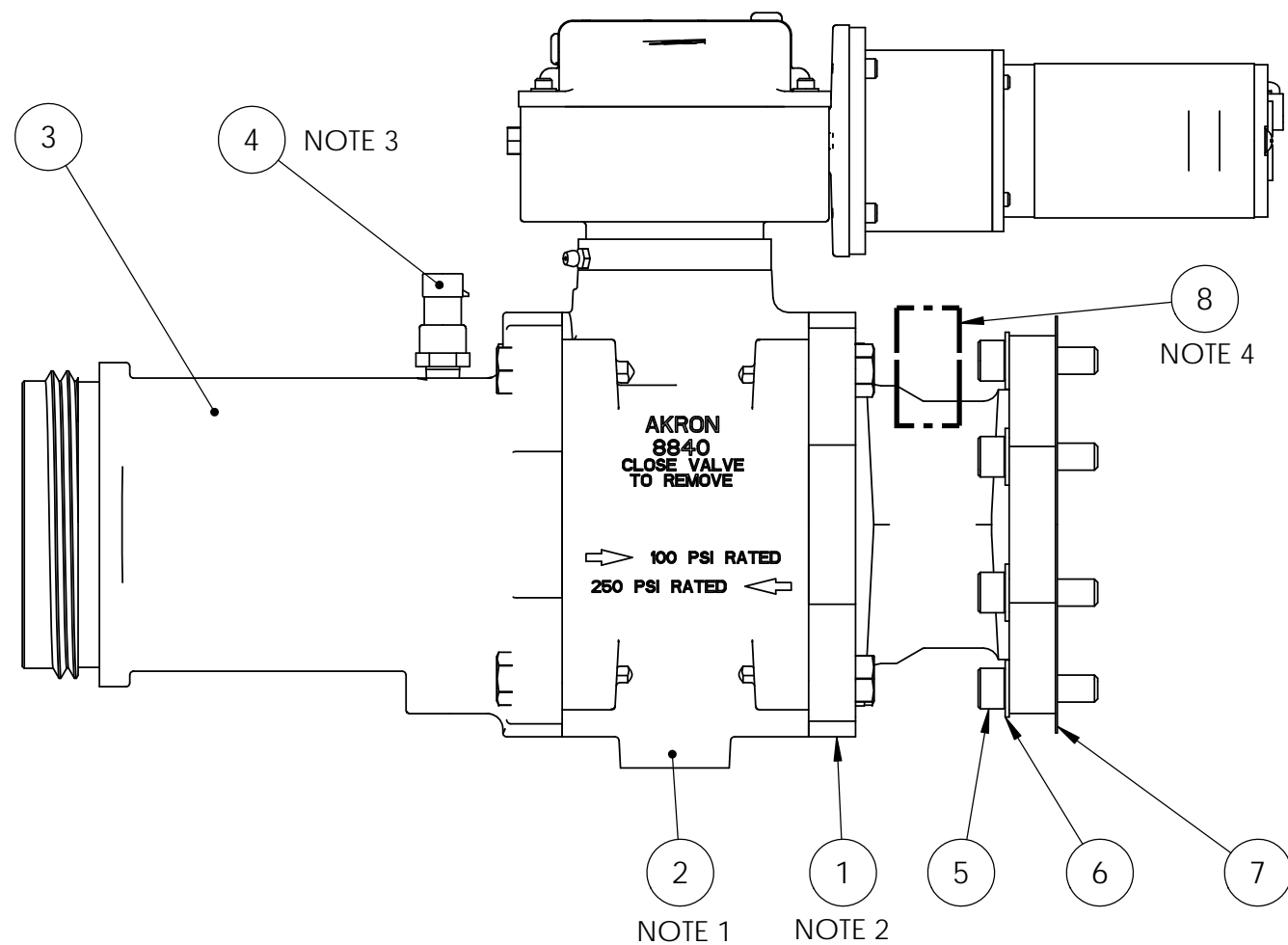
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±1°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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MATERIAL		TITLE	
MADE FROM		SAM VALVE ASSEMBLY LAYOUT	
FINISH		DRAWN	KTN
PROJECT		APPROVED	AJG
		DATE	30JAN2020
		SIZE	B
		SCALE	1:3
		DRAWING NUMBER	FSG-PL-01506
		REV	B
		SHEET	1 OF 4

**NOTES**

1. INSTALL ELECTRIC MOTOR AS SHOWN UNLESS OTHERWISE SPECIFIED BY ORDER. REFER TO FSG-PL-01504 FOR ELECTRIC CONNECTIONS AND FSG-PL-01508 FOR REPLACEMENT VALVE DETAILS.
2. CHECK BOM FOR CORRECT PART TO INSTALL ON UNIT.
3. PRESSURE TRANSDUCER
  - INSTALL PRESSURE SENSOR HARNESS (A721768) AND CONNECT TO VALVE CONTROLLER.
  - USE 082-0280-02-0 FITTING ON ITEM 4 TO AVOID INTERFERENCE IF NECESSARY.
4. FLOWMETER (OPTIONAL)
  - INSTALL FLOW SENSOR TO ITEM 1 WITH SENSOR MOUNTED UPWARD, UNLESS OTHERWISE SPECIFIED BY ORDER.
  - CONNECT FLOWMETER HARNESS (A93001001) TO VALVE CONTROLLER.
5. INSTALL PARTS PROVIDED WITH ITEMS 1 & 2.



**4.0" DISCHARGE VALVE ASSEMBLY**

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	PUMP ADAPTER	SEE NOTE 2	1
2	4.0 Akron Electric	4.0" AKRON ELECTRIC VALVE	1
3	78400471	FLG, 4.0" VLV X NH - 8.75" LG	1
4	200-00092	TRANSDUCER, 1/4" MNPT - 300 PSI	1
5	018-1814-08-0	SCREW, SOC HD 7/16-14 X 1.5" LG	8
6	097-1070-00-0	WASHER, 7/16 ZINC PLT STEEL FLAT	8
7	117830	GASKET 8-BOLT RD	1
8	A93001001	AKRON FLOW SENSOR	*1

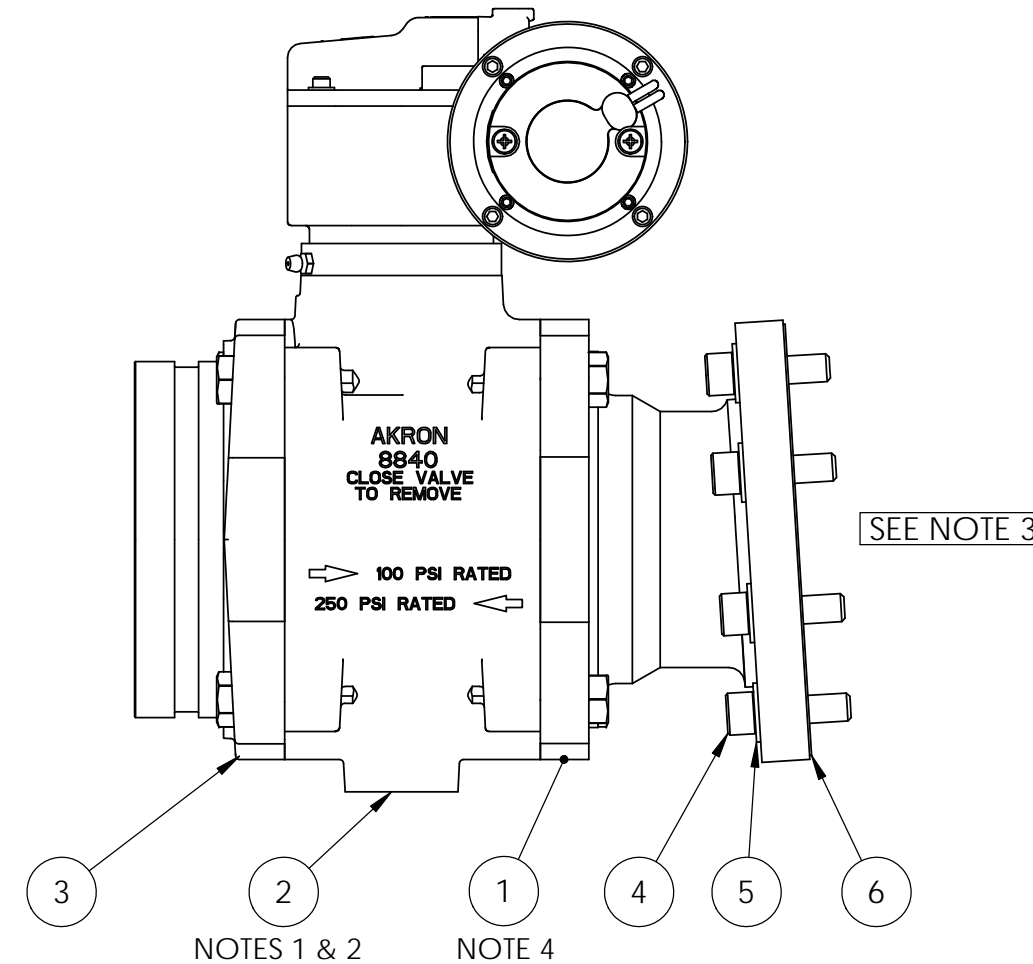
**REVISIONS**

ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

**NOTES**

1. INSTALL ELECTRIC MOTOR AS SHOWN UNLESS OTHERWISE SPECIFIED BY ORDER. REFER TO FSG-PL-01504 FOR ELECTRIC CONNECTIONS AND FSG-PL-01508 FOR REPLACEMENT VALVE DETAILS.
2. CHECK BOM FOR CORRECT PART TO INSTALL ON UNIT.
3. INSTALL FLAPPER CHECK VALVE ON PUMP BEFORE INSTALLING VALVE.
4. INSTALL ITEM 1 AS SHOWN UNLESS OTHERWISE SPECIFIED BY ORDER.
5. INSTALL PARTS PROVIDED WITH ITEMS 1 & 2.

PROJECTION:



**4.0" TANK-TO-PUMP VALVE ASSEMBLY**

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	A116112	FLANGE, 4.0" VLV X 2433 ANG	1
2	4.0 Akron Electric	4.0" AKRON ELECTRIC VALVE	1
3	116119	FLG, 4.0 NPT/5" VIC	1
4	018-1814-08-0	SCREW, SOC HD 7/16-14 X 1.5" LG	8
5	097-1070-00-0	WASHER, 7/16 ZINC PLT STEEL FLAT	8
6	117830	GASKET 8-BOLT RD	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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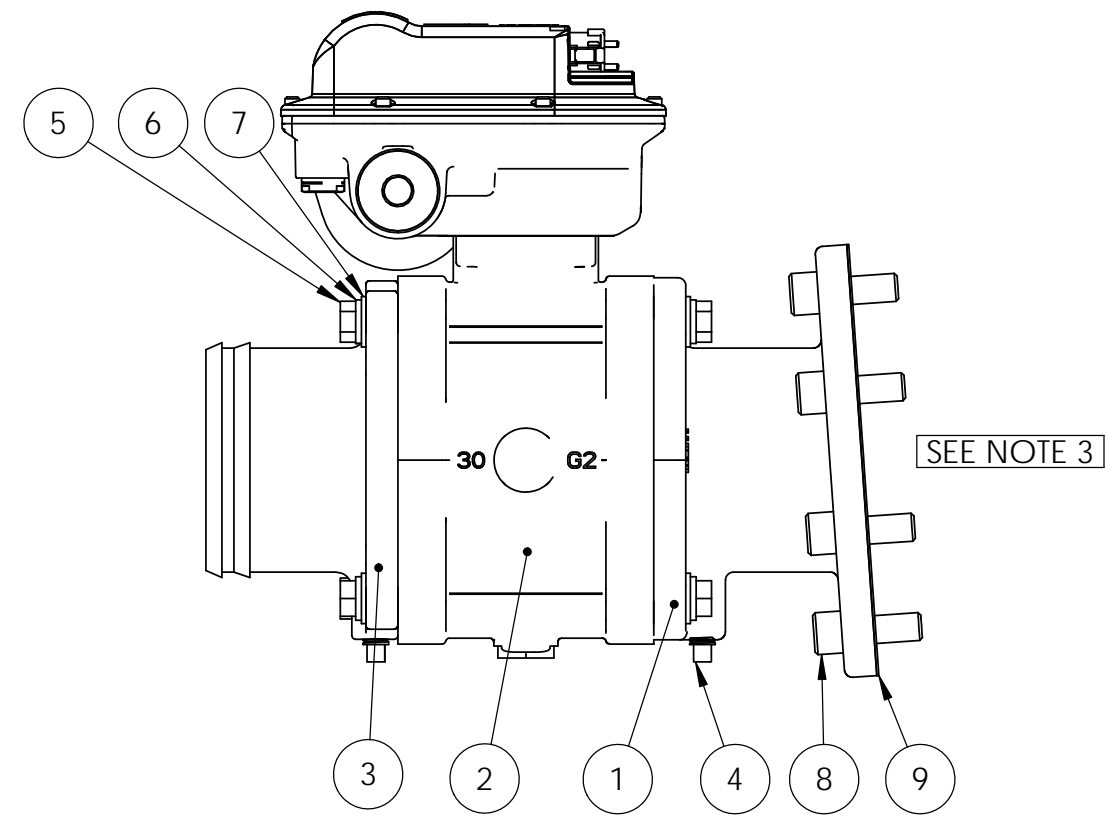
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MADE FROM	SAM VALVE ASSEMBLY LAYOUT		
FINISH	DRAWN	KTN	SIZE
PROJECT	APPROVED	AJG	B
	DATE	30JAN2020	SCALE
			1:3
DRAWING NUMBER		REV	
FSG-PL-01506		B	
		SHEET 2 OF 4	



IF IN DOUBT ASK

**NOTES**

1. INSTALL ELECTRIC MOTOR AS SHOWN UNLESS OTHERWISE SPECIFIED BY ORDER. REFER TO FSG-PL-01504 FOR ELECTRIC CONNECTIONS AND FSG-PL-01508 FOR REPLACEMENT VALVE DETAILS.
2. CHECK BOM FOR CORRECT PART TO INSTALL ON UNIT.
3. INSTALL FLAPPER CHECK VALVE ON PUMP BEFORE INSTALLING VALVE.
4. INSTALL ITEM 1 AS SHOWN UNLESS OTHERWISE SPECIFIED BY ORDER.

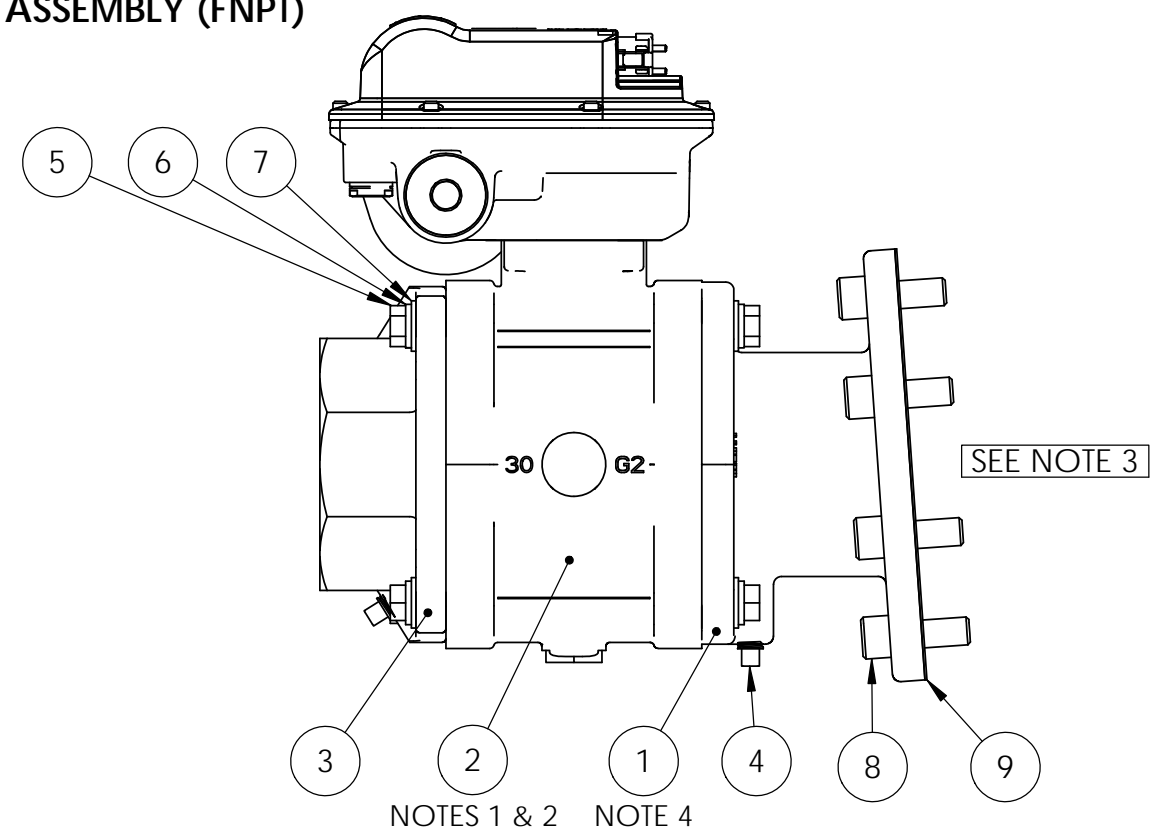


**3.0" TANK-TO-PUMP VALVE ASSEMBLY (HOSE BARB)**

NOTES 1 & 2  
NOTE 4

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	113273	ADPT SS 8-BOLT 4° TO 3.0 VLV	1
2	AKRON ELECTRIC VALVE	3.0" AKRON ELECTRIC VALVE	1
3	044-1781-07-0	3" HOSE ADAPTER	1
4	102669	PLUG, PIPE 1/8 MNPT SQ BRS	2
5	113890	CSW HH 3/8-16 X 1.25 G8 ZINC	8
6	097-0140-02-0	WASHER, LOCK 0.38 SS	8
7	097-5730-01-0	WASHER, FLAT M10 SS	8
8	018-1812-08-0	SCREW, SOC HD 7/16-14 X 1.25" LG	8
9	117830	GASKET 8-BOLT RD	1

**3.0" TANK-TO-PUMP VALVE ASSEMBLY (FNPT)**



NOTES 1 & 2  
NOTE 4

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	113273	ADPT SS 8-BOLT 4° TO 3.0 VLV	1
2	AKRON ELECTRIC VALVE	3.0" AKRON ELECTRIC VALVE	1
3	044-1781-02-0	FLANGE VLV 3.0 FNPT	1
4	102669	PLUG, PIPE 1/8 MNPT SQ BRS	2
5	113890	CSW HH 3/8-16 X 1.25 G8 ZINC	8
6	097-0140-02-0	WASHER, LOCK 0.38 SS	8
7	097-5730-01-0	WASHER, FLAT M10 SS	8
8	018-1812-08-0	SCREW, SOC HD 7/16-14 X 1.25" LG	8
9	117830	GASKET 8-BOLT RD	1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

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FSG OF IDEX CORPORATION

HALE GODIVA Class1

TITLE: SAM VALVE ASSEMBLY LAYOUT

DRAWN: KTN  
 APPROVED: AJG  
 DATE: 30JAN2020

SIZE: B  
 SCALE: 1:3

DRAWING NUMBER: FSG-PL-01506

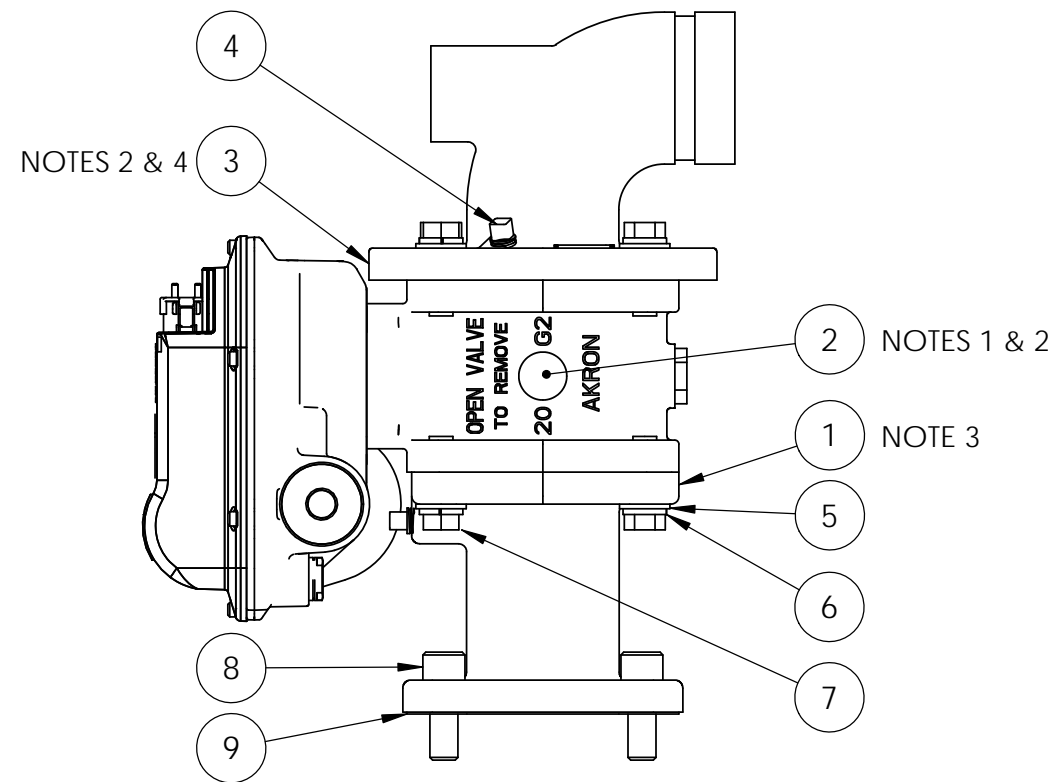
REV: B  
 SHEET: 3 OF 4

REVISIONS					
ECN	REV.	ZONE	CHANGED FROM	BY	DATE
-	-	See Sheet1	See Sheet1	-	-

**NOTES**

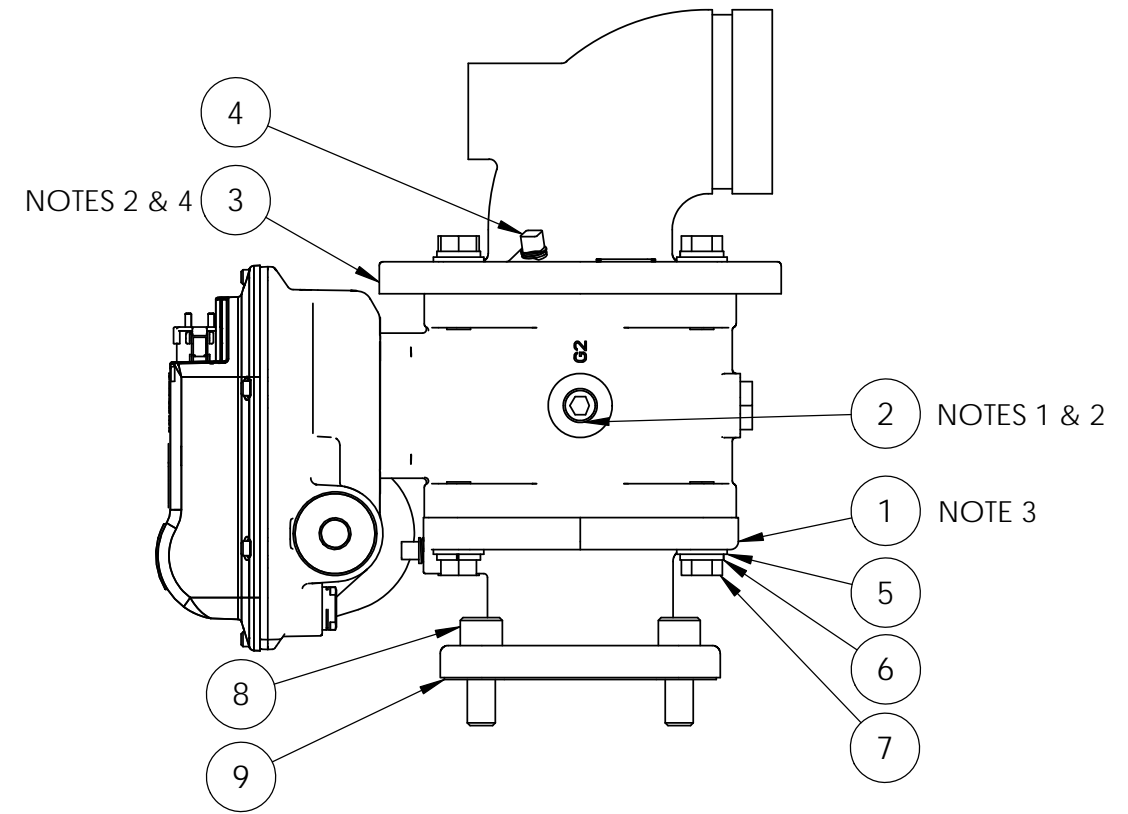
1. INSTALL ELECTRIC MOTOR AS SHOWN UNLESS OTHERWISE SPECIFIED BY ORDER. REFER TO FSG-PL-01504 FOR ELECTRIC CONNECTIONS AND FSG-PL-01508 FOR REPLACEMENT VALVE DETAILS.
2. CHECK BOM FOR CORRECT PART TO INSTALL ON UNIT.
3. INSTALL ASSEMBLY TO PORT B UNLESS OTHERWISE SPECIFIED BY ORDER.
4. INSTALL ITEM 3 FACING REAR OF PUMP UNLESS OTHERWISE SPECIFIED BY ORDER.

PROJECTION:



**2.0" TANK FILL VALVE ASSEMBLY**

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	113271	ADPT SS 115 TO 2.0 VLV	1
2	AKRON ELECTRIC VALVE	2.0" AKRON ELECTRIC VALVE	1
3	DISCHARGE FLANGE	SEE NOTE 2 & 4	1
4	102669	PLUG, PIPE 1/8 MNPT SQ BRS	2
5	097-5730-01-0	WASHER, FLAT M10 SS	8
6	097-0140-02-0	WASHER, LOCK 0.38 SS	8
7	113890	CSW HH 3/8-16 X 1.25 G8 ZINC	8
8	018-1812-08-0	SCREW, SOC HD 7/16-14 X 1.25" LG	4
9	117829	GASKET 115 4-BOLT SQ	1



**2.5" TANK FILL VALVE ASSEMBLY**

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	112408	ADPT S/S 115 TO 2.5 VLV FLANGE	1
2	AKRON ELECTRIC VALVE	2.5" AKRON ELECTRIC VALVE	1
3	DISCHARGE FLANGE	SEE NOTE 2 & 4	1
4	102669	PLUG, PIPE 1/8 MNPT SQ BRS	2
5	097-5730-01-0	WASHER, FLAT M10 SS	8
6	097-0140-02-0	WASHER, LOCK 0.38 SS	8
7	113890	CSW HH 3/8-16 X 1.25 G8 ZINC	8
8	018-1812-08-0	SCREW, SOC HD 7/16-14 X 1.25" LG	4
9	117829	GASKET 115 4-BOLT SQ	1

**REVISIONS**

ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS:  
 X: ±0.04  
 X.X: ±0.02  
 X.XX: ±0.01  
 X.XXX: ±0.005  
 ANGLES: ±0.25°  
 SURFACE TEXTURE IN µm Ra  
 REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX

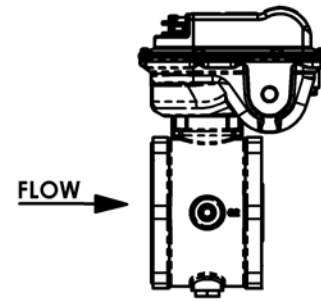
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MATERIAL	TITLE		
MADE FROM	SAM VALVE ASSEMBLY LAYOUT		
FINISH	DRAWN	KTN	SIZE
PROJECT	APPROVED	AJG	B
	DATE	30JAN2020	SCALE
			1:3
DRAWING NUMBER		REV	
FSG-PL-01506		B	
		SHEET 4 OF 4	

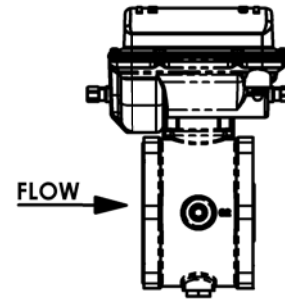


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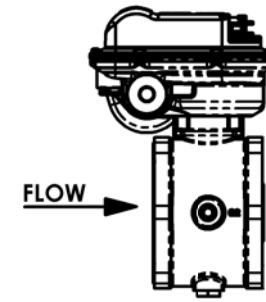
**AKRON NEW  
ELECTRIC ACTUATOR  
(AFTER APRIL 2020)**



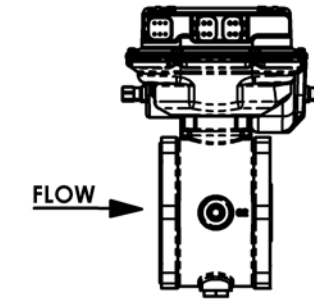
POSITION 1



POSITION 2

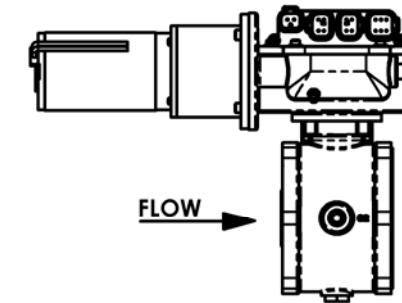
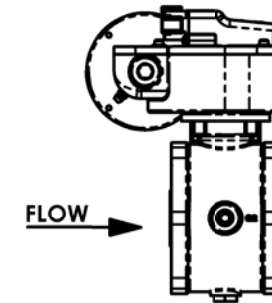
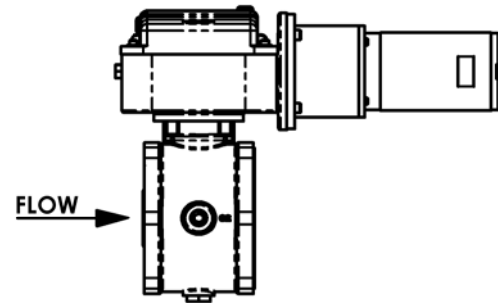
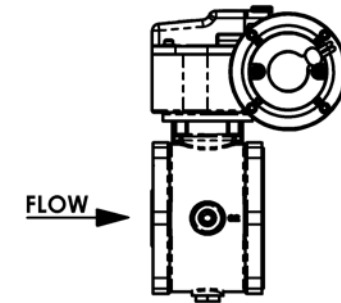


POSITION 3



POSITION 4

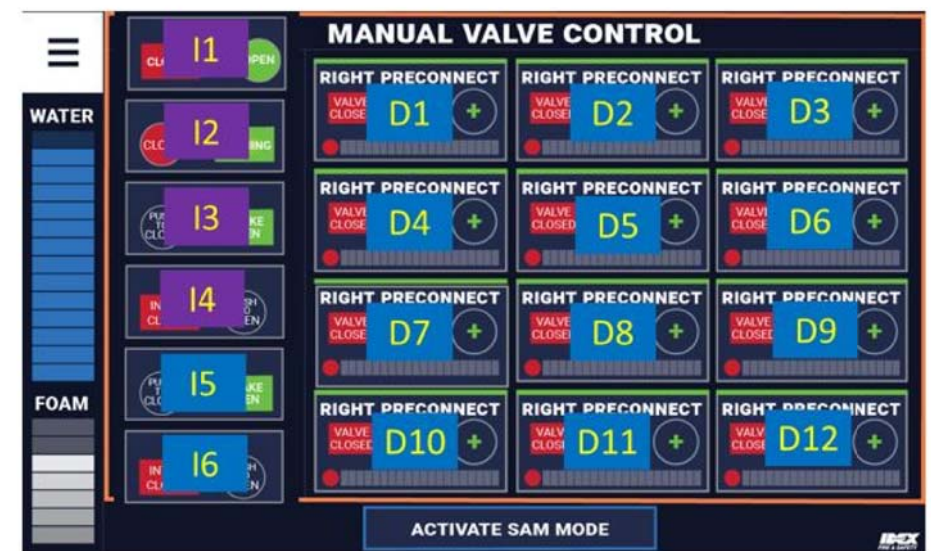
**AKRON ORIGINAL  
ELECTRIC ACTUATOR  
(BEFORE MARCH 2020)**



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VALVE P/N	VALVE DESCRIPTION
538-00090-000	2.0" TANK FILL AUTO VALVE ASSEMBLY
538-00090-001	3.0" TANK TO PUMP AUTO VALVE ASSEMBLY
538-00090-002	2.0" DISCHARGE AUTO
538-00090-003	2.5" DISCHARGE AUTO
538-00090-004	3.0" DISCHARGE AUTO
538-00090-005	4.0" DISCHARGE AUTO
538-00090-006	5.0" DISCHARGE AUTO
538-00090-007	6.0" DISCHARGE AUTO
538-00090-008	1.5" DISCHARGE AUTO
538-00090-009	2.5" TANK FILL AUTO VALVE ASSEMBLY
538-00090-010	3.0" TANK FILL AUTO VALVE ASSEMBLY
538-00090-011	4.0" TANK TO PUMP AUTO VALVE ASSEMBLY
538-00090-012	2.5" INTAKE (LR)
538-00090-013	3.0" INTAKE (LR)
538-00090-014	2.5" INTAKE (RF)
538-00090-015	3.0" INTAKE (RF)
538-00090-016	2.5" INTAKE (LF)
538-00090-017	3.0" INTAKE (LF)
538-00090-018	2.5" INTAKE (RR)
538-00090-019	3.0" INTAKE (RR)

REQUIRED REPLACEMENT VALVE INFORMATION					
VALVE P/N	VALVE MOTOR POSITION	NAME ON CONTROL SCREEN	SCREEN LOCATION	COLOR	WATER ONLY/FOAM/CAFS



UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCH DIMENSIONS  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±1°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.1MAX

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FSG OF IDEX CORPORATION		GODVAO Class1	
MATERIAL	TITLE	REPLACEMENT SAM VALVE	
MADE FROM	DRAWN	TM	SIZE
FINISH	APPROVED	JLS	C
PROJECT	DATE	25FEB2020	SCALE
SAM			1.4
	DRAWING NUMBER	FSG-PL-01508	
	REV	B	SHEET
		1	OF 1

REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
N/A	A		ORIGINAL RELEASE	TAM	25FEB2020	JLS
5095	B		ADDED NEW ELECTRIC ACTUATOR VIEWS	AJG	20MAY2020	TAM





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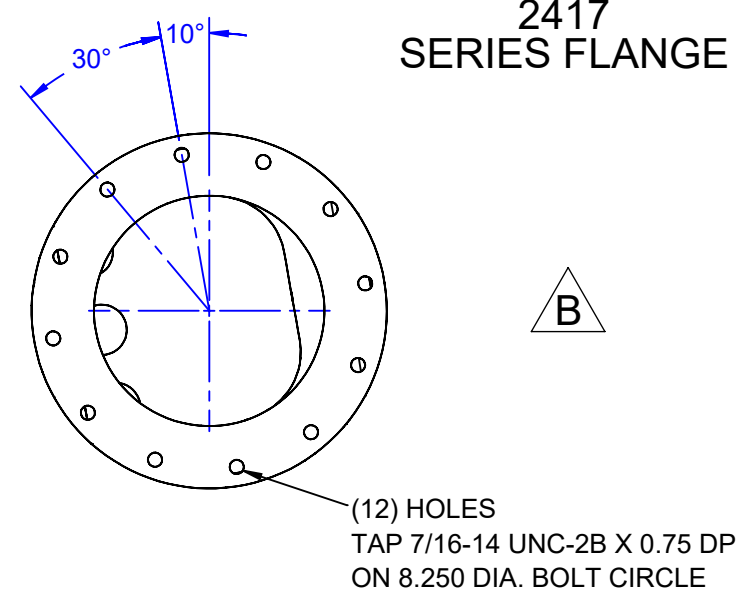
# PORT DIAGRAM



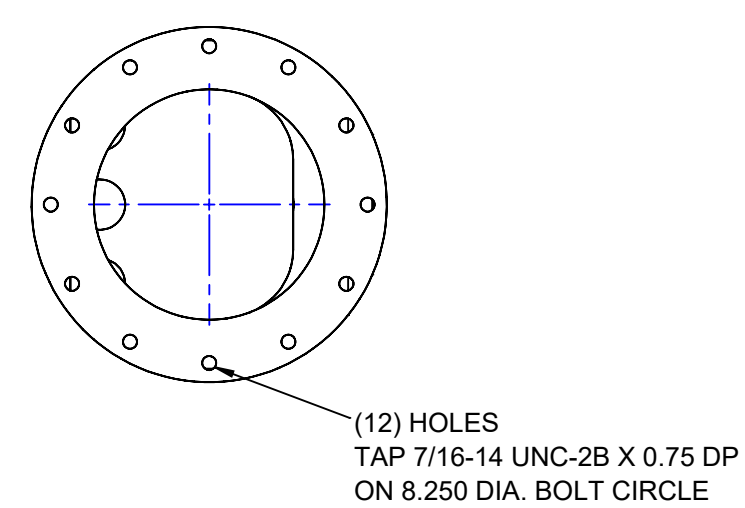
## PORT BOLT PATTERN DIAGRAMS

\* DENOTES OPTIONAL BOLT PATTERN

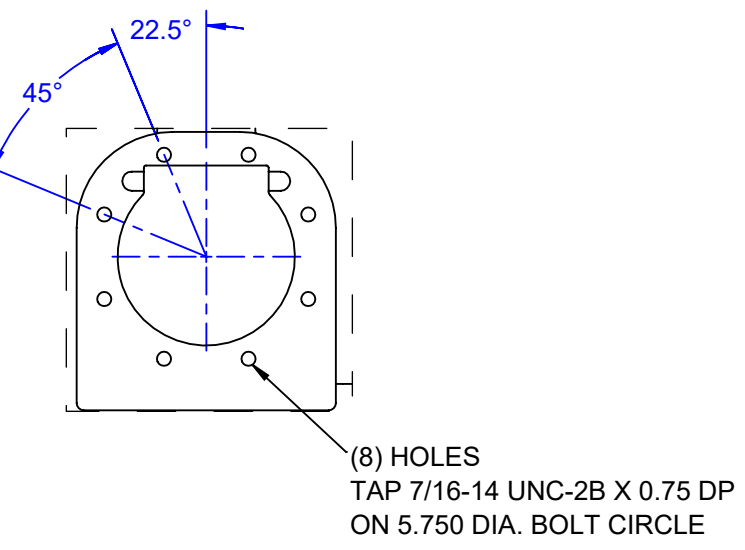
### 2417 SERIES FLANGE



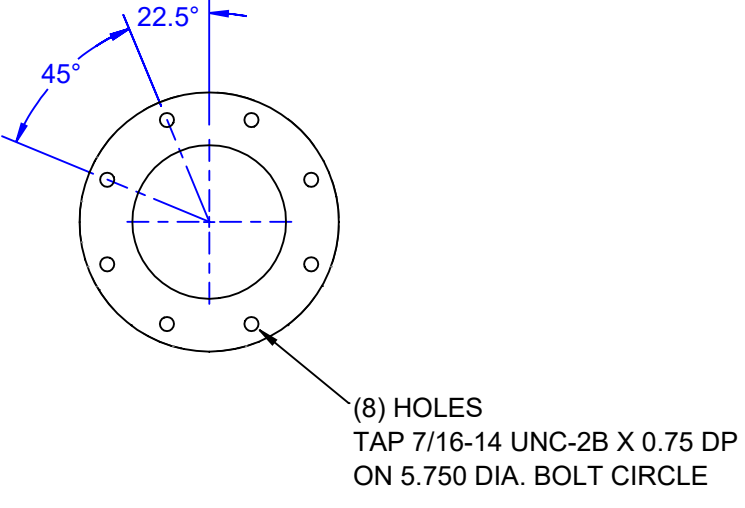
### 2417 SERIES FLANGE



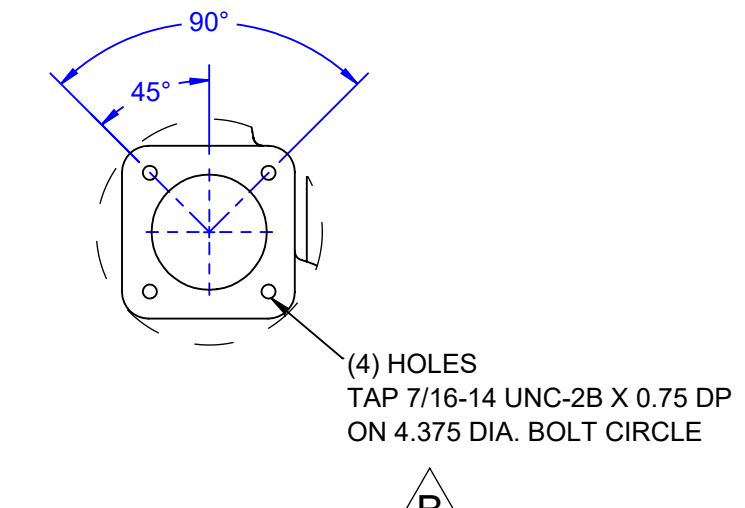
### TANK SUCTION



### 2433 SERIES FLANGE



### 115 SERIES FLANGE



T  
REQ'D.  
2250  
GPM

BOTTOM\*

S T\*

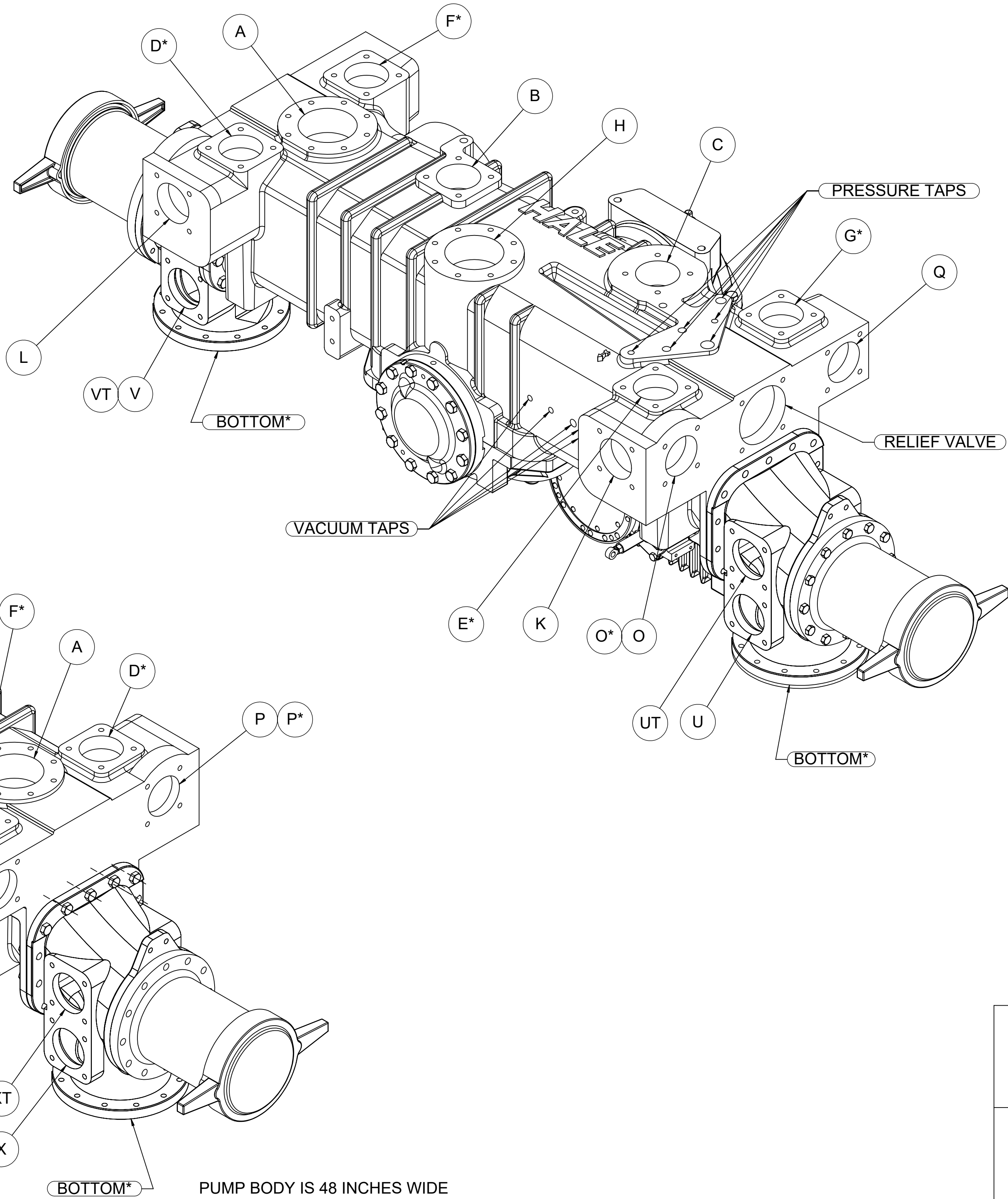
A C\* H O\* P\*

B D\* F\* K M O Q U UT  
W WT C E\* G\* L N  
P R V VT X XT

LEFT SIDE SUCTION  
EXTENSION: \_\_\_\_\_  
MIV: \_\_\_\_\_  
TUBE: \_\_\_\_\_  
CAP: \_\_\_\_\_

RIGHT SIDE SUCTION  
EXTENSION: \_\_\_\_\_  
MIV: \_\_\_\_\_  
TUBE: \_\_\_\_\_  
CAP: \_\_\_\_\_

PUMP BODY IS 48 INCHES WIDE



- PRESSURE TAPS**  
(1) 3/4" - 14 NPT  
(1) 1/2" - 14 NPT  
(2) 3/8" - 18 NPT  
(2) 1/4" - 18 NPT
- VACUUM TAPS**  
(1) 3/4" - 14 NPT  
(1) 1/2" - 14 NPT  
(1) 3/8" - 18 NPT  
(2) 1/4" - 18 NPT

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCHES DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

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MAKE OTHER DRAWINGS OR MACHINERY

REVISIONS				BY	DATE	APVD
ECN	REV.	ZONE	CHANGED FROM			
	A		ORIGINAL RELEASE	DMB	9NOV2017	JLS
4950	B	D2, L12, M2	4.735. ADDED T PORT VIEW, CHANGED TOLERANCE TO INCHES AND SCALE OF DRAWING	MB	2OCT2019	JSZ

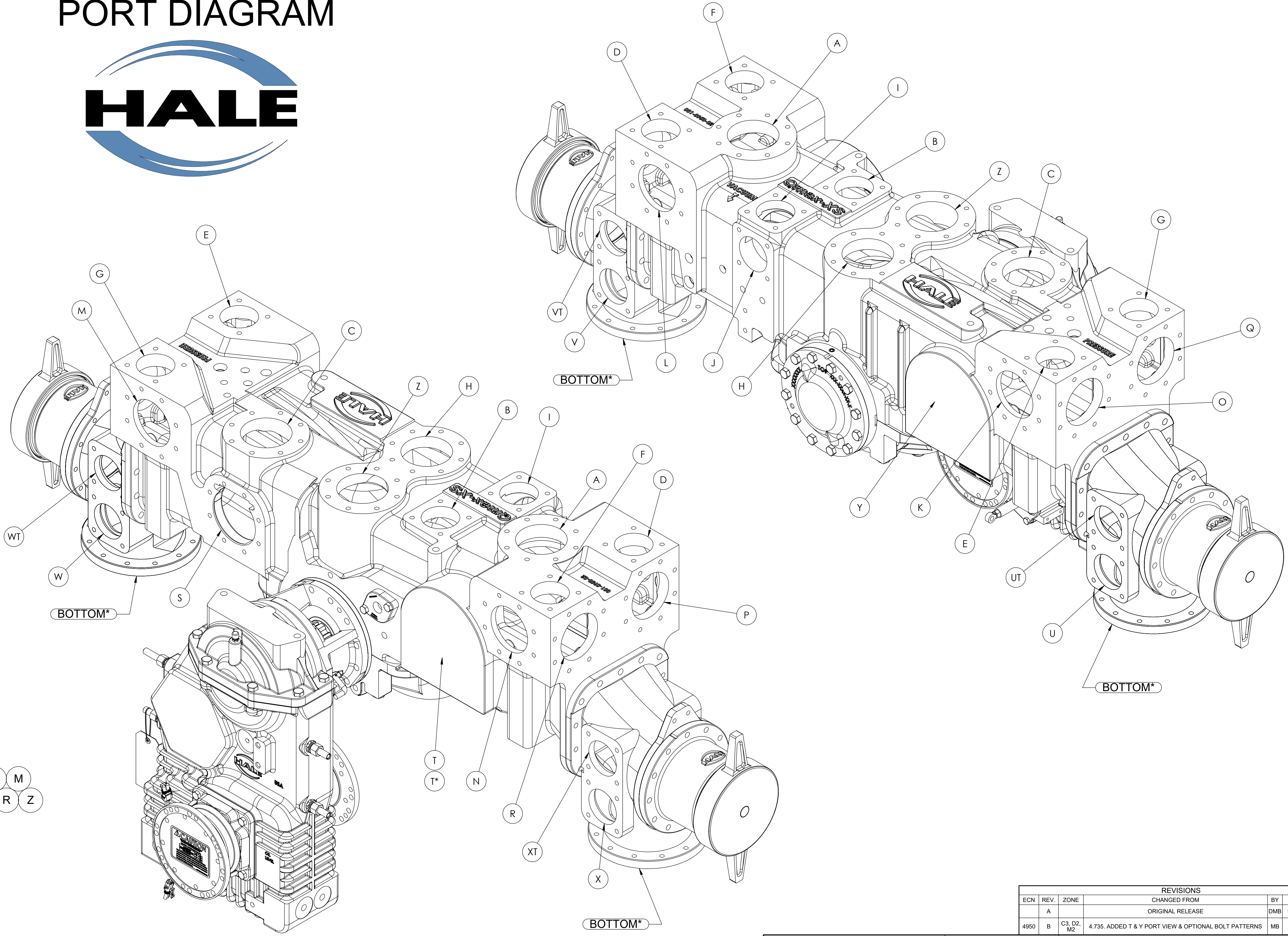
MATERIAL		TITLE	
MADE FROM		QMAX PORT DIAGRAM	
FINISH	DRAWN	DMB	SIZE
	APPROVED	JLS	D
PROJECT	DATE	11/09/2017	SCALE
			1:5
DRAWING NUMBER		REV	
FSG-PL-01509		B	
SHEET		1 OF 1	



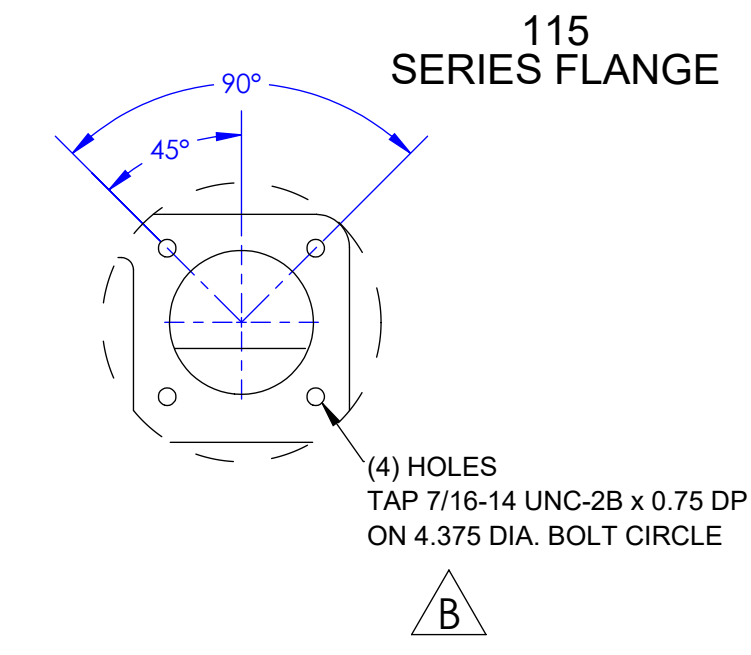
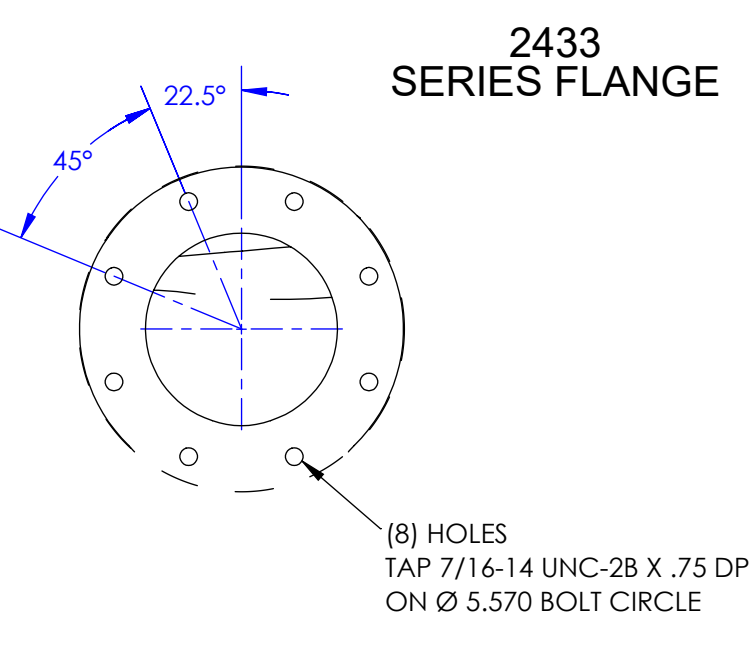
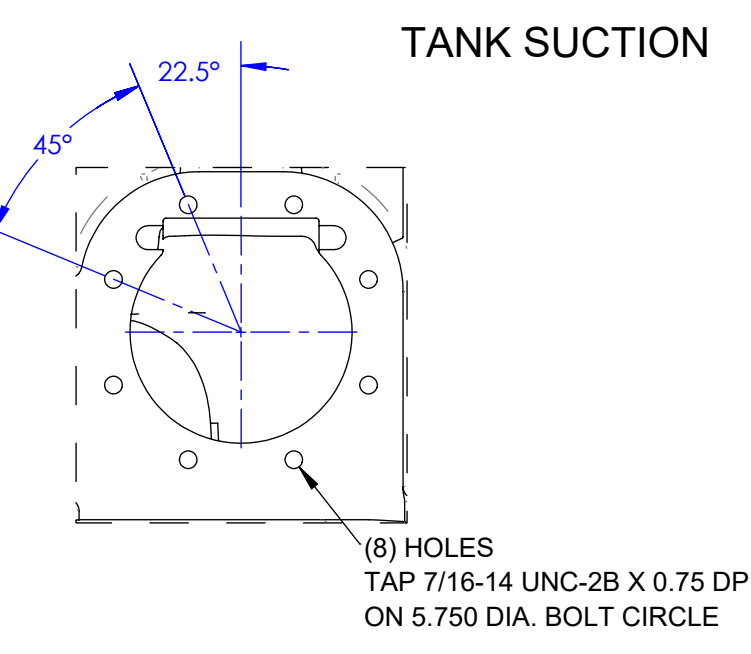
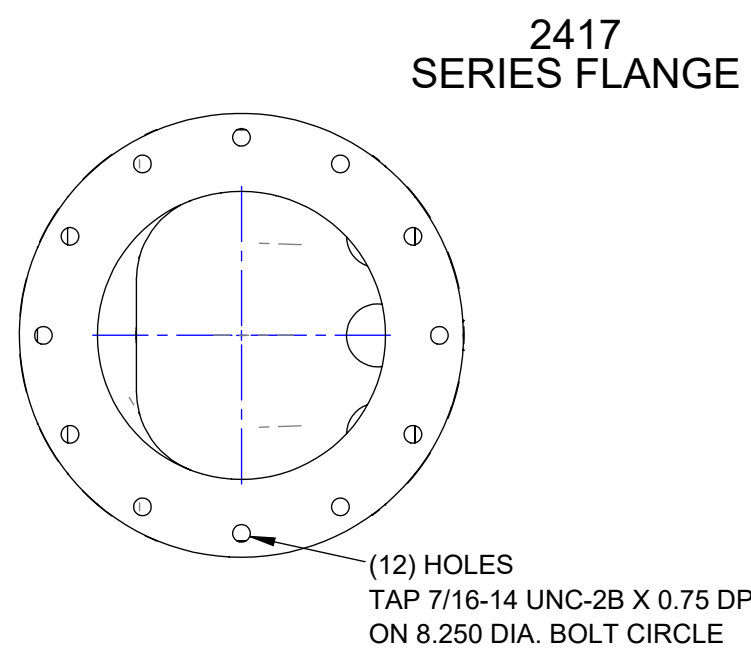
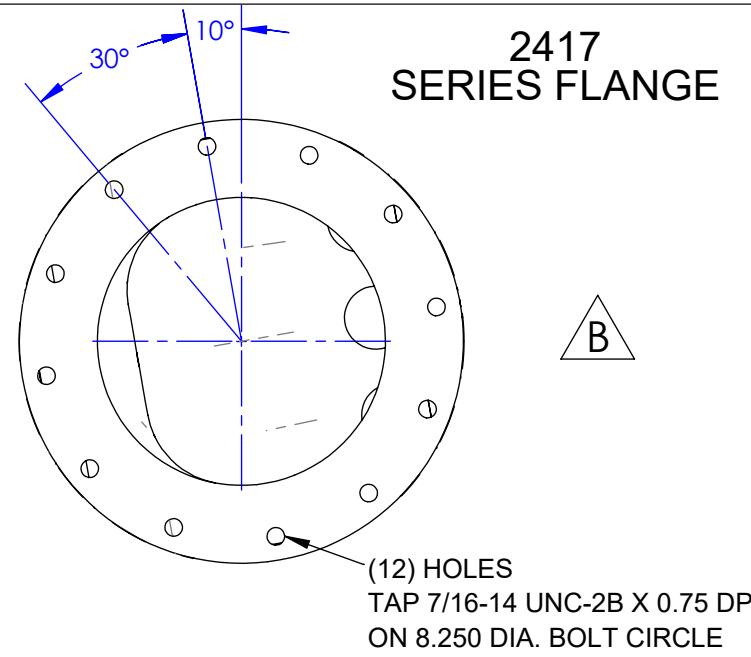
IF IN DOUBT ASK

PROJECTION: 

# PORT DIAGRAM



**PORT BOLT PATTERN DIAGRAMS**  
\* DENOTES OPTIONAL BOLT PATTERN



T Y

BOTTOM\*

S T\*

A C H K L M  
N O P Q R Z

B D E F G I J U  
V V T W W T X X T

**LEFT SIDE SUCTION**  
EXTENSION: \_\_\_\_\_  
MIV: \_\_\_\_\_  
TUBE: \_\_\_\_\_  
CAP: \_\_\_\_\_

**RIGHT SIDE SUCTION**  
EXTENSION: \_\_\_\_\_  
MIV: \_\_\_\_\_  
TUBE: \_\_\_\_\_  
CAP: \_\_\_\_\_

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCE FOR INCHES DIMENSIONS:  
X: ±0.04  
X.X: ±0.02  
X.XX: ±0.01  
X.XXX: ±0.005  
ANGLES: ±0.25°  
SURFACE TEXTURE IN µm Ra  
REMOVE ALL BURRS AND SHARP  
EDGES, 0.01MAX

FSG OF  
**IDEX**  
IDEX CORPORATION

MATERIAL		TITLE	
MADE FROM		QMAX-XS-PUMP ASSEMBLY	
FINISH	DRAWN	DATE	REV
PROJECT	APPROVED	11/09/2017	B
SIZE		DRAWING NUMBER	SHEET
SCALE 1:4		FSG-PL-01510	1 OF 1

REVISIONS				BY	DATE	APVD
ECN	REV.	ZONE	CHANGED FROM			
	A		ORIGINAL RELEASE	DMB	9NOV2017	JLS
4950	B	C3, D2, M2	4.735. ADDED T & Y PORT VIEW & OPTIONAL BOLT PATTERNS	MB	2OCT2019	JS2

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## APPENDIX A. MANUFACTURERS INFORMATION

This section provides a list that includes the name, address, and telephone number of the manufacturer's points of contact. Each provides the name address and telephone number of the manufacturer's representative and/or service organization that can provide replacements and is most convenient to the project sight.

### A.1. Manufacturers Information

Additionally, included herein is warranty information.

#### MANUFACTURERS INFORMATION

Division	Address	Telephone
Class 1	Mailing: 607 NW 27th Ave, Ocala, FL 34475 Email: <a href="https://www.haleproducts.com">https://www.haleproducts.com</a>	(800) 533-3569
Hale Products	Mailing: 607 NW 27th Ave, Ocala, FL 34475 Email: <a href="https://www.haleproducts.com">https://www.haleproducts.com</a>	(800) 533-3569
Godiva LTD (A Unit of IDEX Corp.)	Mailing: Charles Street, Warwick, England, CV34 5LR Email: <a href="mailto:godiva@idexcorp.com">godiva@idexcorp.com</a>	Tel: +44 (0) 1926 623600 FAX: +44 (0) 1926 623666

### A.2. Warranty

See the Hale website ([www.haleproducts.com](http://www.haleproducts.com)) for product specific warranty and warranty procedures.