



PARTS MANUAL FOR HALE SAM



BY

HALE PRODUCTS, INC.

A Unit of IDEX Corporation

607 NW 27th Ave, Ocala, FL 34475

(800) 533.3569

(800) 520.3473 (FAX)

www.haleproducts.com



MANUAL P/N FSG-MNL-00212 Revision A

COPYRIGHT © 2019 – 2020 BY HALE PRODUCTS, INC. ALL RIGHTS RESERVED



TABLE OF CONTENTS

Section	Title	Page
1.	SAFETY.....	1
1.1	Safety Headings.....	1
1.2	Safety Summary	1
2.	SAM ILLUSTRATED BREAKDOWNS	7
2.1	SAM Numbering and Specifications References.....	7
2.2	SAM Pump Kits And Modules	8
2.2.1	Discharge/Intake To Port Cross Reference (Valve Positions)	8
2.2.2	General Information For SAM Akron Brass Swing-Out™ Valves	8
2.2.2.1	Installation	9
2.2.2.2	Repair Part Kits	9
2.2.2.3	Replacement Valves.....	9
2.3	Component To Drawing Cross–Reference.....	10
	SAM DRAWING PACKAGE.....	21 - 84
APPENDIX A.	MANUFACTURERS INFORMATION	A-1
A.1.	Manufacturers Information.....	A-1
A.2.	Warranty.....	A-1

LIST OF FIGURES

Number	Title	Page
Figure 1.	Hale ID Tag With Sample Markings.....	7

LIST OF TABLES

Number	Title	Page
Table 1.	Component To Drawing Cross–Reference.....	10



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 IMMERSED IN WATER. DO NOT ALLOW THE TOUCHSCREENS TO BE COMPLETELY COVERED/IMMERSED 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 INTER-CHANGE 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) 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).

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)
	538-00099-000	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
Barometer Sensor	FSG-PL-01501	1 and 7	Location Identification Connection Part Numbers
	FSG-PL-01502	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 Part Numbers

Table 1. Component To Drawing Cross-Reference – CONTINUED

Component/Item	Plate/Drawing	Sheet	Content
Buzzer	FSG-PL-01501	2	Location (General)
	FSG-PL-01502	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
Check Valve (Tank Fill)	FSG-PL-01501	8	Location Identification Connection Part Numbers
	FSG-PL-01502	8	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
Circuit Breaker (15 A)	FSG-PL-01507	1	Location Identification Connection Part Numbers
Circuit Breaker (30 A)	FSG-PL-01507	1	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)

Table 1. Component To Drawing Cross-Reference – CONTINUED

Component/Item	Plate/Drawing	Sheet	Content
Dual Action Air Cylinder (Part of SAM Drain Manifold Assembly)	FSG-PL-01501	4	Location
	FSG-PL-01502	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
	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-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
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-01491	2 thru 5	Part Numbers
		2	Repair Kits
MIV Control Module	FSG-PL-01491	4	Location
		2	Part Numbers
	610-00050	1	Connector P/N Info

Table 1. Component To Drawing Cross-Reference – CONTINUED

Component/Item	Plate/Drawing	Sheet	Content
MIV-A Control Module	FSG-PL-01501	1	Location (General)
		3	Identification Connection Part Numbers
	FSG-PL-01502	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)
		3	Identification Connection Part Numbers
	FSG-PL-01502	1	Location (General)
		3	Identification Connection Part Numbers
	FSG-PL-01503	4	Connector Part Numbers
	FSG-PL-01504	1	Identification Connection
Power Breaker Box	FSG-PL-01501	1	Location (General)
		3	Location Identification
	FSG-PL-01502	1	Location (General)
		3	Location Identification
	FSG-PL-01507	1	Identification Connection Part Numbers
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
	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-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-01503	2 and 17	Connector Part Numbers
	FSG-PL-01504	1	Identification Connection
	FSG-PL-01505	1	Connection Part Numbers

Table 1. Component To Drawing Cross-Reference – CONTINUED

Component/Item	Plate/Drawing	Sheet	Content
SAM Pump Controller	FSG-PL-01501	2	Location (General)
	FSG-PL-01502	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)
		3	Location Identification Connection Part Numbers
	FSG-PL-01502	1	Location(General)
		3	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)
	(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-01503	15	Connector Part Numbers
	(Auxiliary Pump Cooling) FSG-PL-01501	8	Location Identification Connection Part Numbers
	FSG-PL-01502	8	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
Solenoid – CONTINUED (Quick Prime)	FSG-PL-01501	5	Location Identification Connection Part Numbers
	FSG-PL-01502	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-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)
		5	Location Identification Connection
	FSG-PL-01502	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-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-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	3	Connector Part Numbers
	FSG-PL-01504	1	Connection
	FSG-PL-01505	1	Connection Part Numbers
Water Detector (All) (Autolube)	FSG-PL-01501	1	Location (General)
	FSG-PL-01502	1	Location(General)
	FSG-PL-01501	3	Location Identification Connection Part Numbers
	FSG-PL-01502	3	Location Identification Connection Part Numbers
	FSG-PL-01503	16	Connector Part Numbers

Table 1. Component To Drawing Cross-Reference – CONTINUED

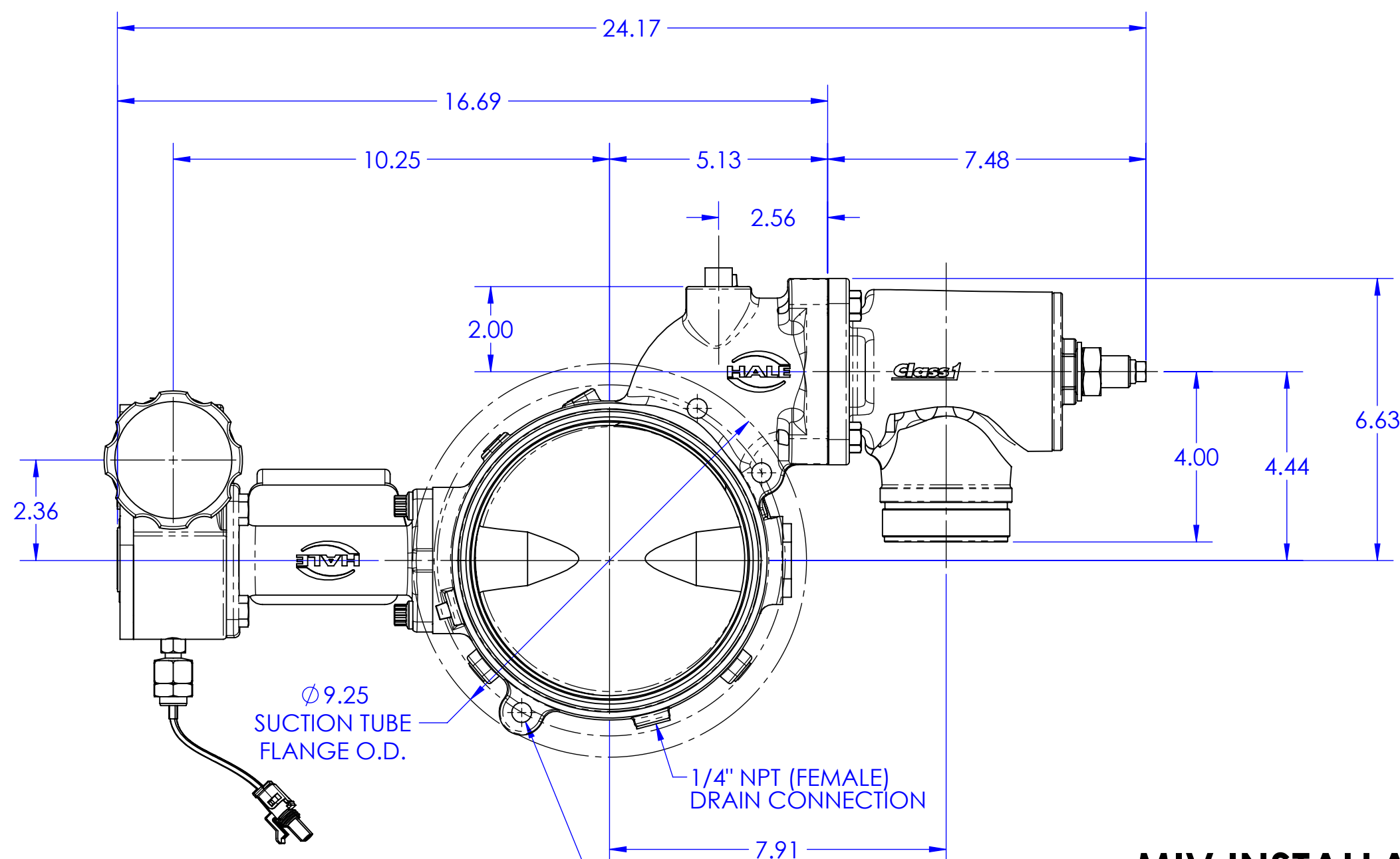
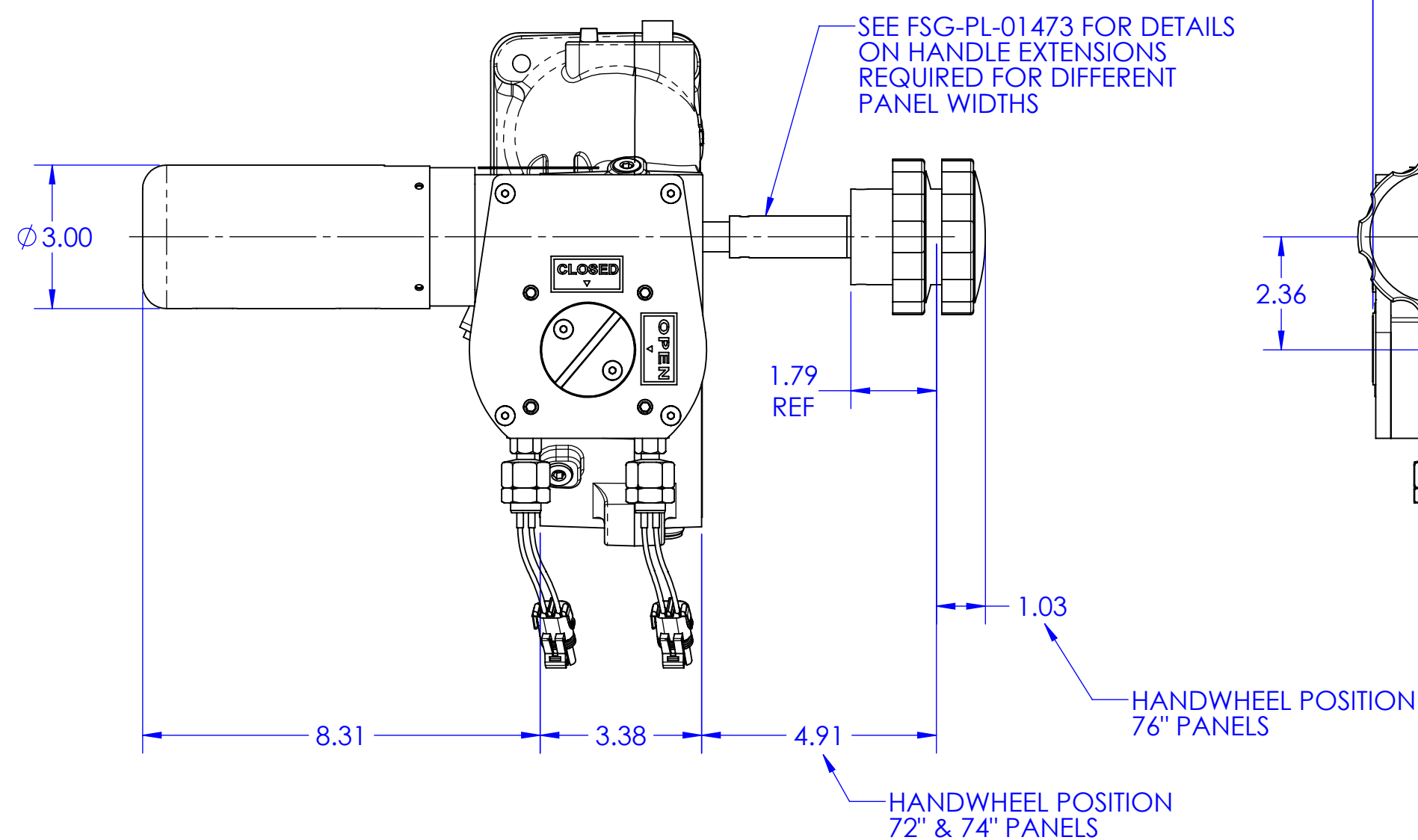
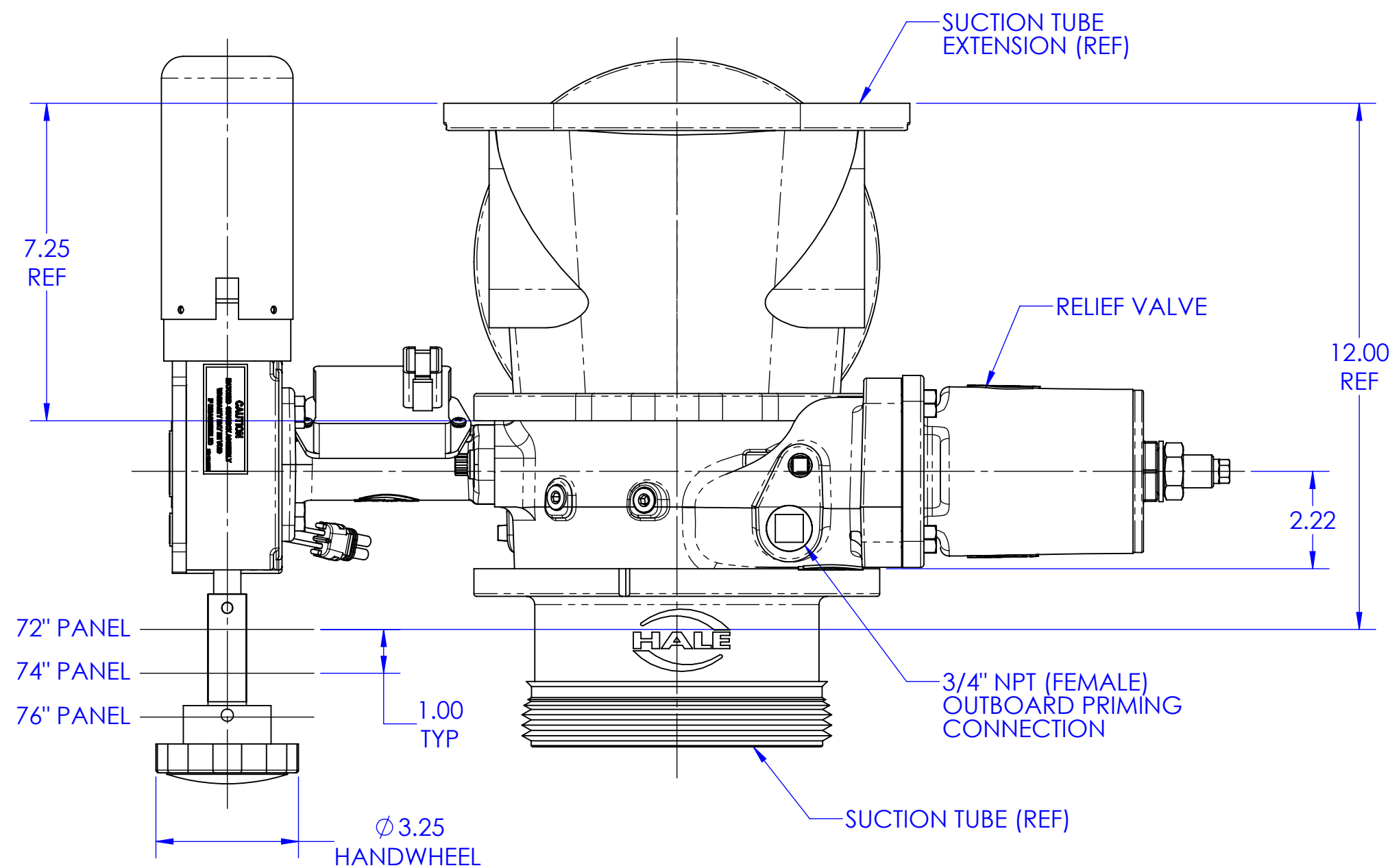
Component/Item	Plate/Drawing	Sheet	Content
Water Detector – CONTINUED (Gearbox) (Primer)	FSG-PL-01501	3	Location Identification Connection Part Numbers
	FSG-PL-01502	3	Location Identification Connection Part Numbers
	FSG-PL-01503	16	Connector Part Numbers
	FSG-PL-01501	3	Location Identification Connection Part Numbers
	FSG-PL-01502	3	Location Identification Connection Part Numbers
	FSG-PL-01503	16	Connector Part Numbers
OPTIONAL Component/Item	Plate/Drawing	Sheet	Content
Auxiliary Intake (Pony) (Akron Brass Swing-Out™ valve) (Multiple sizes available for each position.)	(All) FSG-PL-01504	1	Connection
	(LF) FSG-PL-01508	1	Part Numbers
	(LR)		
	(RF)		
	(RR)		
Auxiliary SAM Control Center (1 and/or 2)	FSG-PL-01501	2	Location (General)
	FSG-PL-01502	2	Location(General)
	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

Table 1. Component To Drawing Cross-Reference – CONTINUED

Component/Item	Plate/Drawing	Sheet	Content
OPTIONAL Component/Item – CONTINUED			
ITL-40 (Foam Tank A or Foam Tank B)	FSG-PL-01501	2	Location
	FSG-PL-01502	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
Wi-Fi Router	FSG-PL-01503	10	Connector Part Numbers
	FSG-PL-01505	4	Connection Part Numbers

THIS PAGE INTENTIONALLY BLANK.

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.

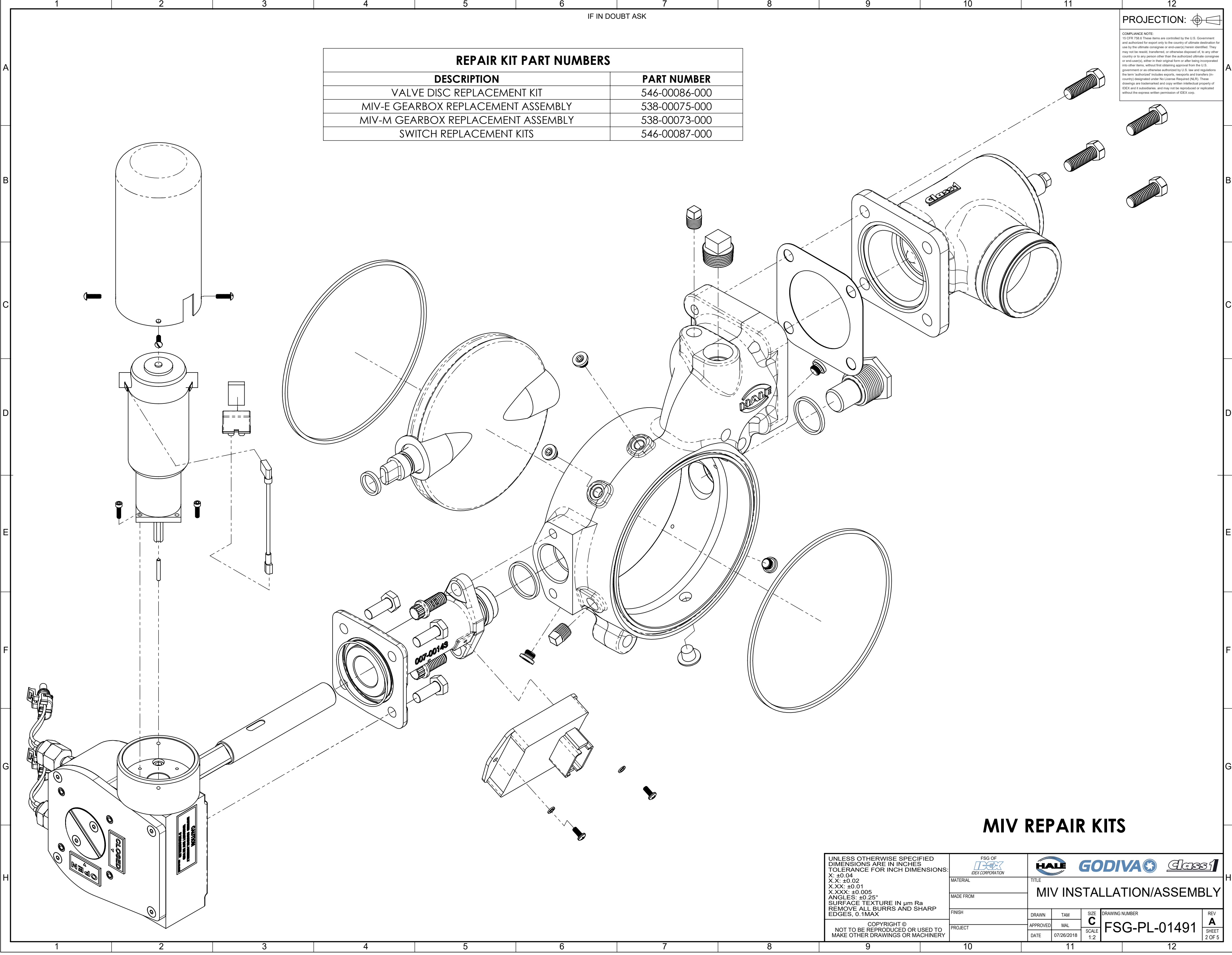


MIV INSTALLATION

(12) $\frac{7}{16}$ " MOUNTING BOLTS
EQUALLY SPACED ON 8.25" B.C.
NOTE: ONLY 10 BOLTS ARE USED

REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
	A		ORIGINAL RELEASE	TAM	17JAN2020	MAL

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 COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY	FSG OF IDEX CORPORATION		 GODIVA  <i>Class 1</i>				
	MATERIAL	TITLE					
	MADE FROM	MIV INSTALLATION/ASSEMBLY					
	FINISH	DRAWN	TAM	SIZE	DRAWING NUMBER		REV
PROJECT	APPROVED	MAL	SCALE	FSG-PL-01491		A	
	DATE	07/26/2018					1:3
SHEET 1 OF 5							



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

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.

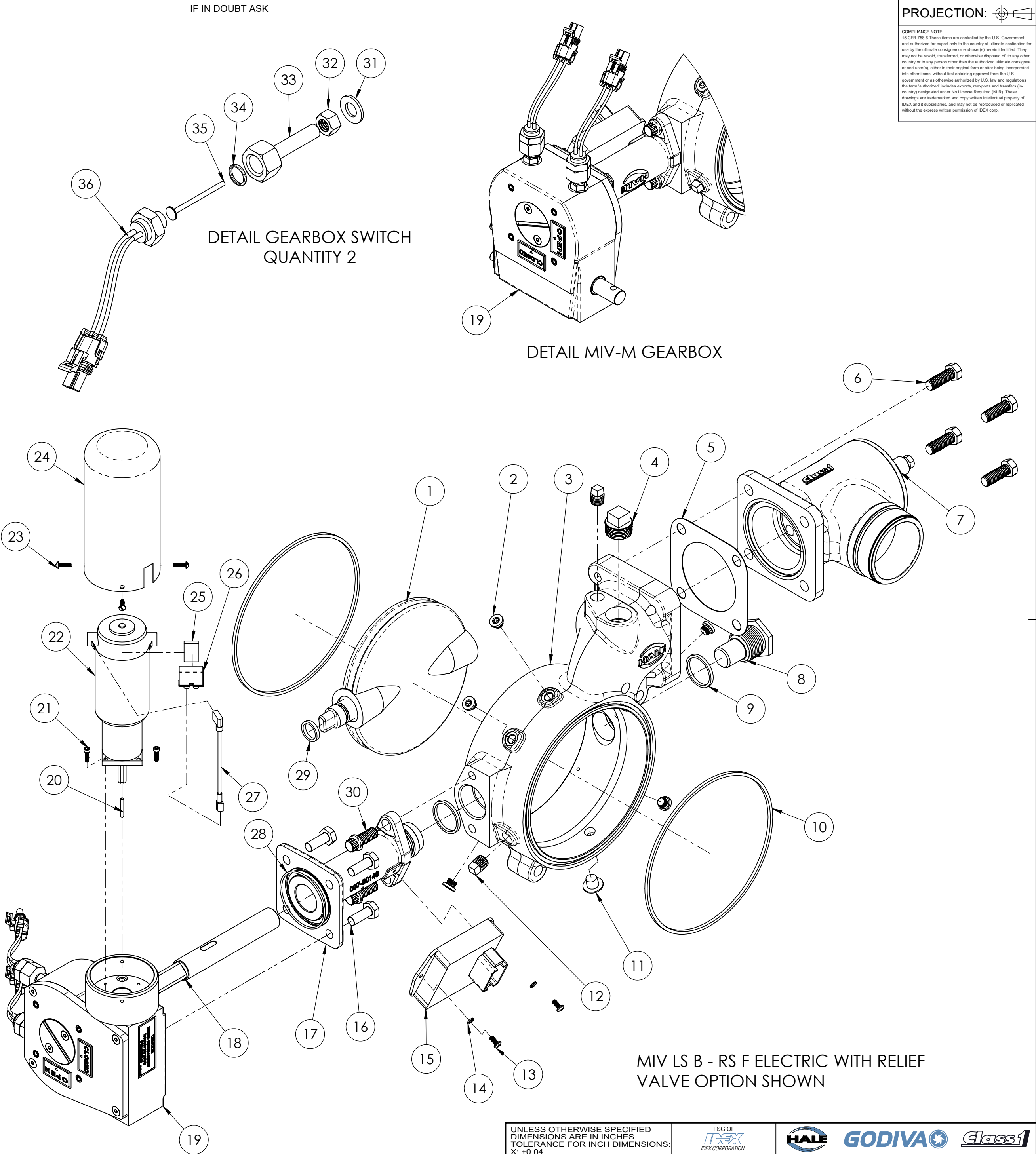
MIV REPAIR KITS

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		  	
		MATERIAL		TITLE	
MADE FROM		FINISH		DRAWN	
PROJECT		APPROVED		TAM	
DATE		07/28/2018		MAL	
NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		SCALE		C	
		1:2		DRAWING NUMBER	
				FSG-PL-01491	
				REV	
				A	
				SHEET	
				2 OF 5	

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

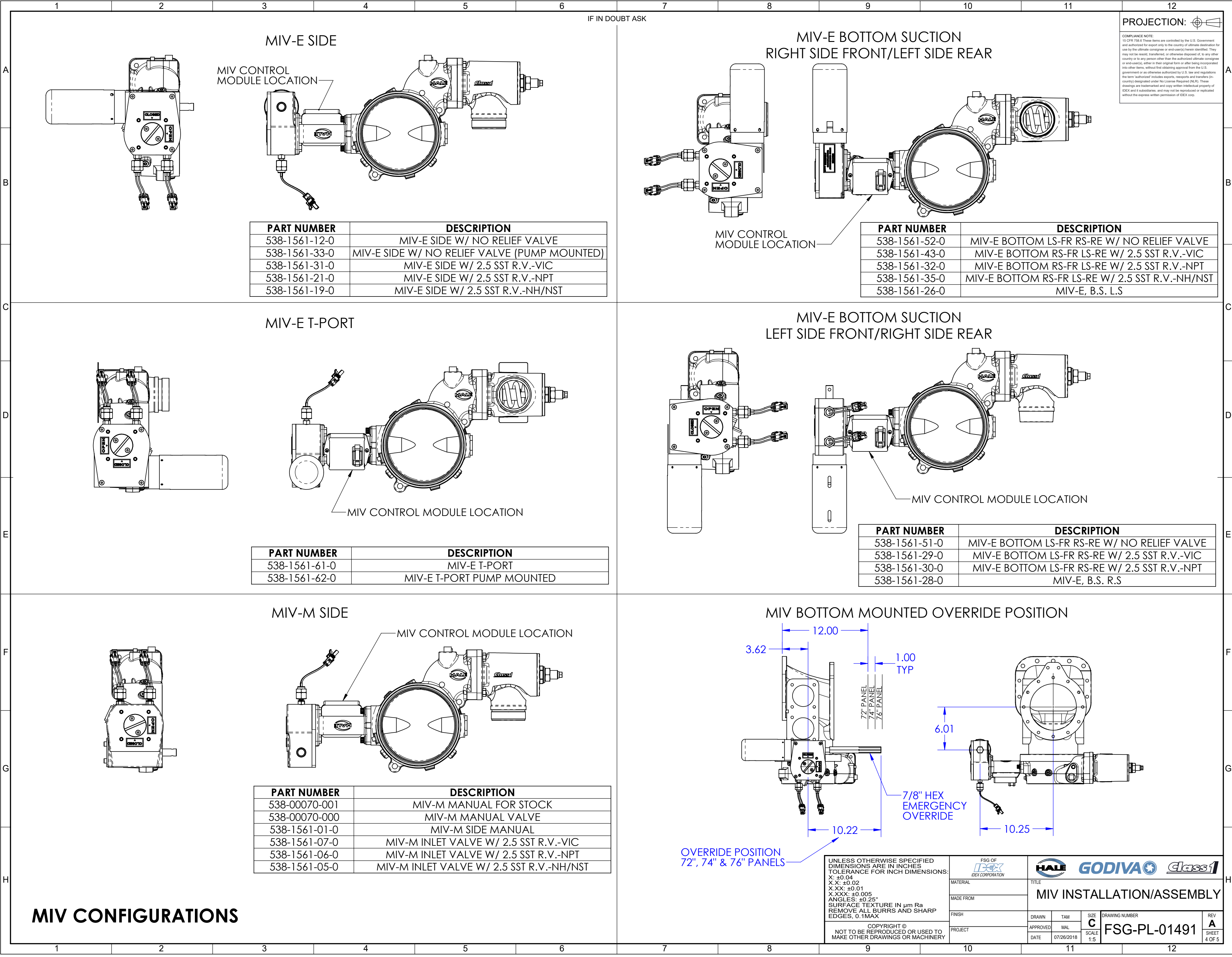
TABLE 'A' - ITEM 7 - VALVE, ASSEM, RELIEF		
PART NUMBER	DESCRIPTION	QTY.
538-1920-00-0	VALVE, RELIEF, 2.5 SUCTION, VIC	1
538-1920-10-0	VALVE, RELIEF, 2.5 SUCTION, NPT	1
538-1920-20-0	VALVE, RELIEF, 2.5 SUCTION, NST	1

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



MIV PARTS LIST

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 		
		MATERIAL	TITLE MIV INSTALLATION/ASSEMBLY	
MADE FROM		FINISH	DRAWN	TAM
PROJECT		APPROVED	DATE	MAL
		SCALE	1:3	
		DRAWING NUMBER	FSG-PL-01491	
		REV	A	
		SHEET	3 OF 5	



MIV CONFIGURATIONS

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 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.

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

MIV-E INSTALLATION KIT

PANEL PLACARD MOUNTING TEMPLATE

MANUAL OVERRIDE PANEL PLACARD MOUNTING TEMPLATE

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

MIV-M INSTALLATION KIT

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 µm Ra
REMOVE ALL BURRS AND SHARP
EDGES, 0.1MAX

FSG OF
IDEX CORPORATION

MATERIAL

MADE FROM

FINISH

PROJECT

TITLE
MIV INSTALLATION/ASSEMBLY

DRAWN
TAM

APPROVED
MAL

DATE
07/28/2018

SIZE
C

DRAWING NUMBER
FSG-PL-01491

REV
A

SHEET
5 OF 5



THIS PAGE INTENTIONALLY BLANK.

SAM QMAX-XS

FRONT

SHIP LOOSE VALVES

PUMP TEMPERATURE
[A]

PUMP GROUND [A]

SYSTEM GROUND [A]

RH SIDE
MIV
[E]

LH SIDE
MIV
[D]

MATRIX MODULE [A]

MIV-A MODULE [A]

SENSOR MODULE [A]

AUTOLUBE 0 PSI SOLENOID &
WATER DETECTOR
[A]

POWER
BREAKER BOX
[A]

OIL LEVEL [B]

AIR 4-WAY VALVES
(PF ASSEMBLY)
[C]

TANK FILL
[F]

ANODE (DISCHARGE)
[F]

BAROMETER
SENSOR
[E]

MIV AIR BLEED
SOLENOID
[E]

MIV AIR BLEED
SOLENOID
[D]

PUMP COOL
SOLENOID
[F]

REAR

ANODE (SUCTION)
[F]

ANODE (SUCTION)
[F]

TANK TO PUMP
[C]

GEARBOX
TEMPERATURE [B]

BOTTOM
MIV
(OPTION)
[E]

GEARBOX WATER
DETECTION [B]

1. T-PORT MIV AIR BLEED
SOLENOID (OPTION)
2. PUMP BODY PRIME
SOLENOID (ON BRACKET)
[DETAIL C]

RIGHT

PRIMER
WATER
DETECTION
[C]

PRIMER
[C]

LEFT

WATER COLUMN
PRESSURE SENSOR
[B]

PLUMB TO
WATER TANK
[B]

AIR BLEED
DRAIN
[B]

AIR BLEEDS
FROM MIV-A
[B]

NOTES

1. BILL OF MATERIAL DETAILS [A-F] FOR EACH COMPONENT ARE SHOWN IN SUBSEQUENT PAGES OF THIS DRAWING.
2. 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 NEWTORK DIAGRAM: FSG-PL-01504
3. SUB-ASSEMBLY DRAWINGS REQUIRED FOR BUILD:
 - FSG-PL-01507 - POWER BREAKER BOX [DETAIL A]
 - 538-00100-000 - WATER TOWER DRAIN MANIFOLD [DETAIL C]
 - 538-00099-000 - 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]

PROJECTION: 

COMPLIANCE NOTICE:
15 CFR 758. These items are controlled by the U.S. Government and authorized for export only for the purpose of defense activities for sale by the United States Government. These items may not be re-exported, transferred, or otherwise disposed of, in any other country or to any person other than the authorized ultimate consignee or end-user, without the express written permission of the U.S. Government. These items are controlled by the U.S. Government and authorized for export only for the purpose of defense activities for sale by the United States Government. These items may not be re-exported, transferred, or otherwise disposed of, in any other country or to any person other than the authorized ultimate consignee or end-user, without the express written permission of the U.S. Government. These items are controlled by the U.S. Government and authorized for export only for the purpose of defense activities for sale by the United States Government. These items may not be re-exported, transferred, or otherwise disposed of, in any other country or to any person other than the authorized ultimate consignee or end-user, without the express written permission of the U.S. Government.

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: $\pm 0.25^\circ$
SURFACE TEXTURE IN μm Ra
REMOVE ALL BURRS AND SHARP
EDGES, 0.01MAX

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

FSG OF
IDEX
IDEX CORPORATION

MATERIAL

MADE FROM

FINISH

PROJECT

HALE

GODIVA *Class 1*

SAM COMPONENT
DIAGRAM QMAX-XS

DRAWN

MB

APPROVED

TAM

DATE

28FEB2020

DRAWING NUMBER

D
SCALE 1:8
FSG-PL-01501

REV

A
SHEET 1 OF 8

REVISIONS

CHANGED FROM

ORIGINAL RELEASE

BY

AJG

DATE

28FEB2020

APVD

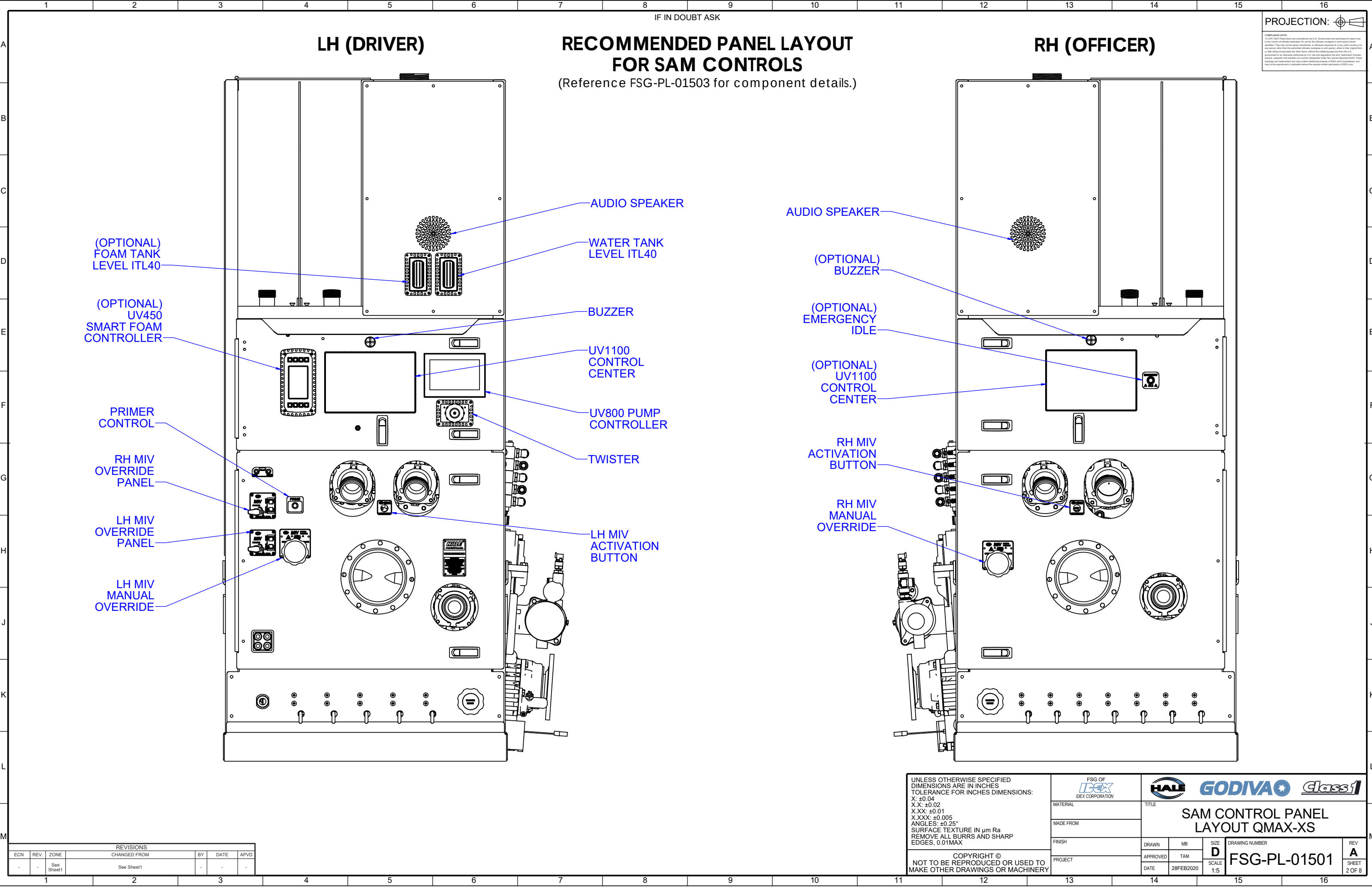
TAM

ECN

REV.

A

ZONE



PROJECTION: 

COMPLIANCE NOTICE:
15 CFR 738. These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for sale by the ultimate consignee or end-user(s) thereof. 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 an otherwise authorized U.S. law enforcement agency. The user is responsible for obtaining all necessary export, re-export and transfer (in-country) designations under the License Required (LR). These drawings are unclassified and carry no export restrictions of E.O. 12958 and its successors, and may not be reproduced or registered without the express written permission of IDEX Corp.

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

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

FSG OF IDEX IDEX CORPORATION	
MATERIAL	
MADE FROM	
FINISH	
PROJECT	

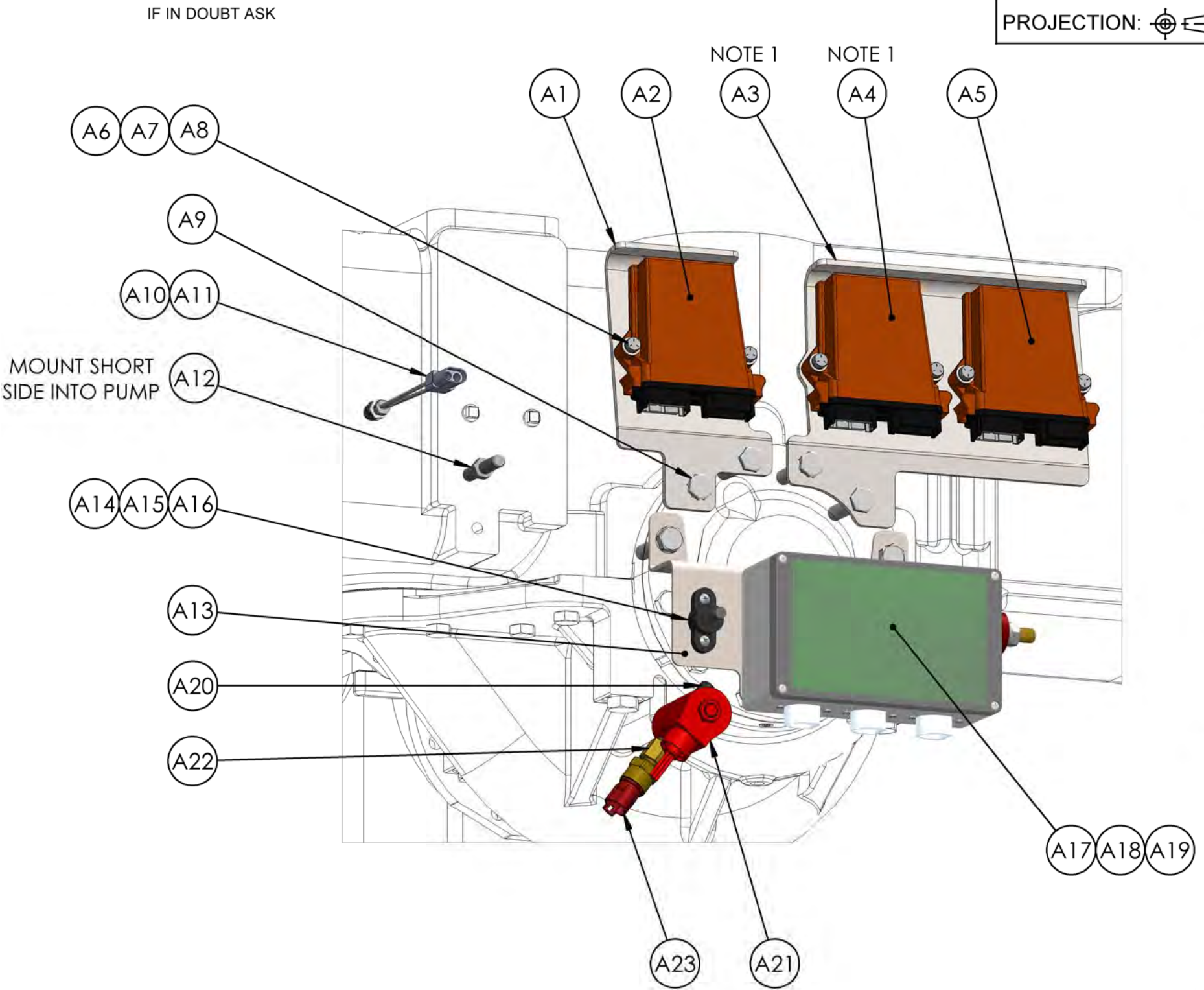
  	
TITLE SAM CONTROL PANEL LAYOUT QMAX-XS	
DRAWN MB	SIZE D
APPROVED TAM	SCALE 1:5
DATE 28FEB2020	DRAWING NUMBER FSG-PL-01501
REV A	SHEET 2 OF 8

NOTES

1. FOR THREE OR FEWER MIV, USE DOUBLE BRACKET AND ONE MIV-A MODULE.
FOR FOUR OR GREATER MIV, USE TRIPLE BRACKET, TWO MIV-A MODULES, & ADAPTER HARNESS 513-00145-004.

DETAIL A - PUMP FRONT

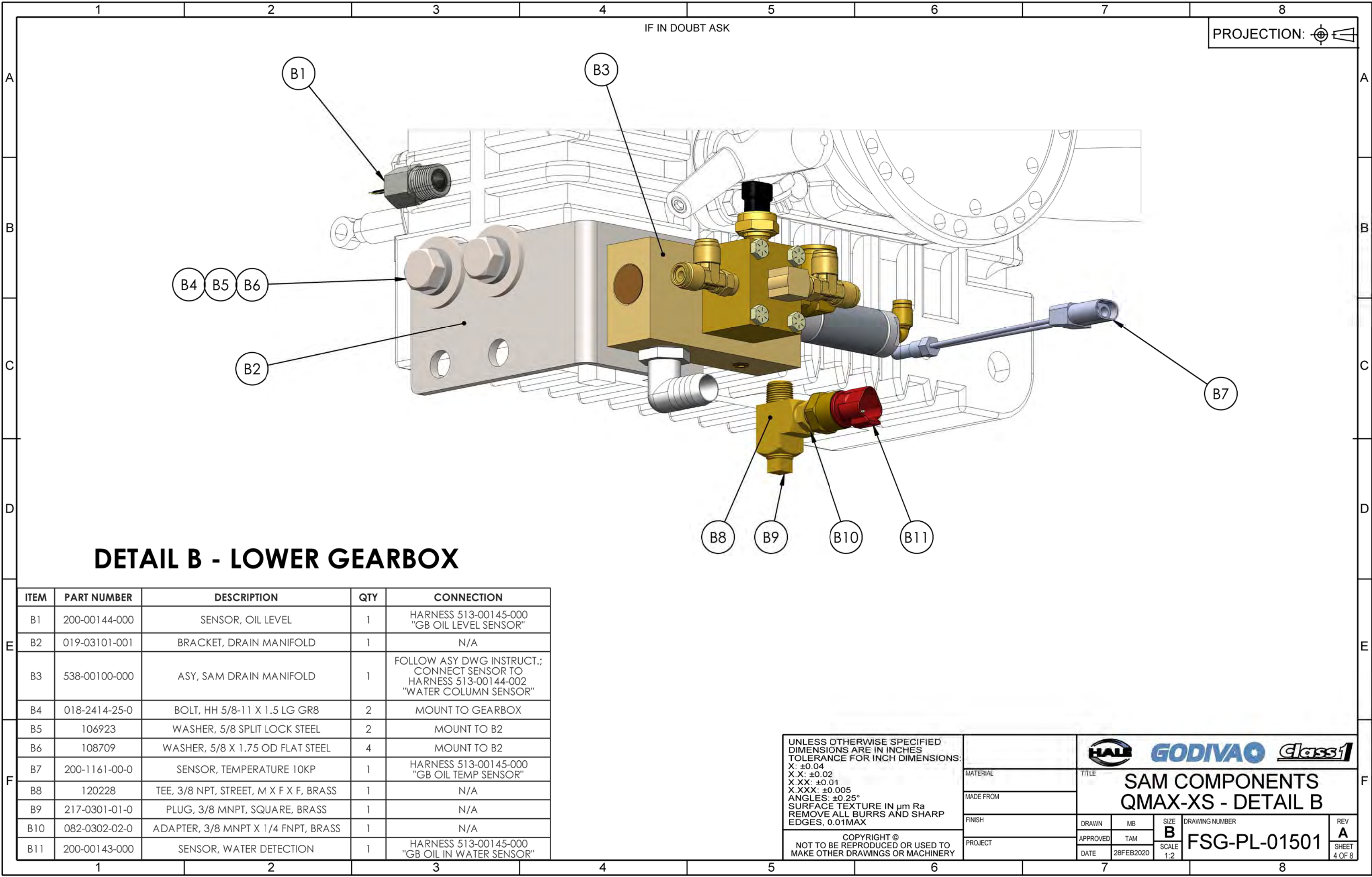
ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
A1	019-03426	BRACKET, MODULE, SINGLE	1	N/A
A2	610-00071	MODULE, SENSOR	1	HARNESS 513-00145-000
A3	019-03427	BRACKET, MODULE DOUBLE	1	SEE NOTE 1
A3*	019-03428	BRACKET, MODULE TRIPLE	*	SEE NOTE 1
A4	610-00066	MODULE, MIV-A	1*	SEE NOTE 1; HARNESS 513-00144-002
A5	610-00052	MODULE, MATRIX	1	HARNESS 513-00144-002
A6	018-1212-02-0	BOLT, HH 1/4-20 X 1.25 GR5	6	MOUNT TO A1 & A3
A7	097-0020-01-0	WASHER, FLAT 0.25 SAE STEEL	6	MOUNT TO A1 & A3
A8	097-0300-01-0	WASHER, LOCK SPLIT 0.25 STEEL	6	MOUNT TO A1 & A3
A9	018-2022-25-0	BOLT, HH 1/2-13 X 2.25 GR8	6	BOLTS ARE 1/4" LONGER THAN STANDARD AUTOLUBE BOLTS
A10	200-1161-00-0	TEMPERATURE SENSOR, 10KP	1	HARNESS 513-00145-000 "SUCTION TEMP SENSOR"
A11	082-0214-02-0	REDUCER, BSHG 1/4 MNPT X 1/8 FNPT BRASS	1	N/A
A12	018-80003-999	STUD, 7/16-14 X 2.63 STEEL	1	CONNECT TO A14 WITH HARNESS 513-00159-004
A13	159-1200-03-0	BRACKET, BREAKER BOX	1	INSTALL TO AUTOLUBE COVER WITH A9 BOLTS
A14	108414	STUD, GROUND		CONNECT TO A12 WITH HARNESS 513-00159-004
A15	018-01006-080	SCREW, PH 10-24 X 3/4 SST	2	MOUNT TO A13
A16	110-1000-11-0	NUT, 10-24 SST NYLON LOCK	2	MOUNT TO A13
A17	610-00084	POWER BREAKER BOX	1	REFER TO FSG-PL-01507
A18	260048	SCREW, PH 6-32 X 1/2 SST	4	MOUNT TO A13
A19	102513	NUT, 6-32 SST NYLOCK LOCK	4	MOUNT TO A13
A20	082-00200-399	NIPPLE, 1/4" MNPT HEX, BRASS	1	N/A
A21	038-00100-000	SOLENOID, 0 PSI	1	HARNESS 513-00145-000 "AUTOLUBE 0 PSI SOLENOID"
A22	082-0248-02-0	ADAPTER, 1/4" MNPT X 1/4" FNPT	1	N/A
A23	200-00143-000	SENSOR, WATER DETECTION	1	HARNESS 513-00145-000 "AUTOLUBE WATER IN OIL SENSOR"

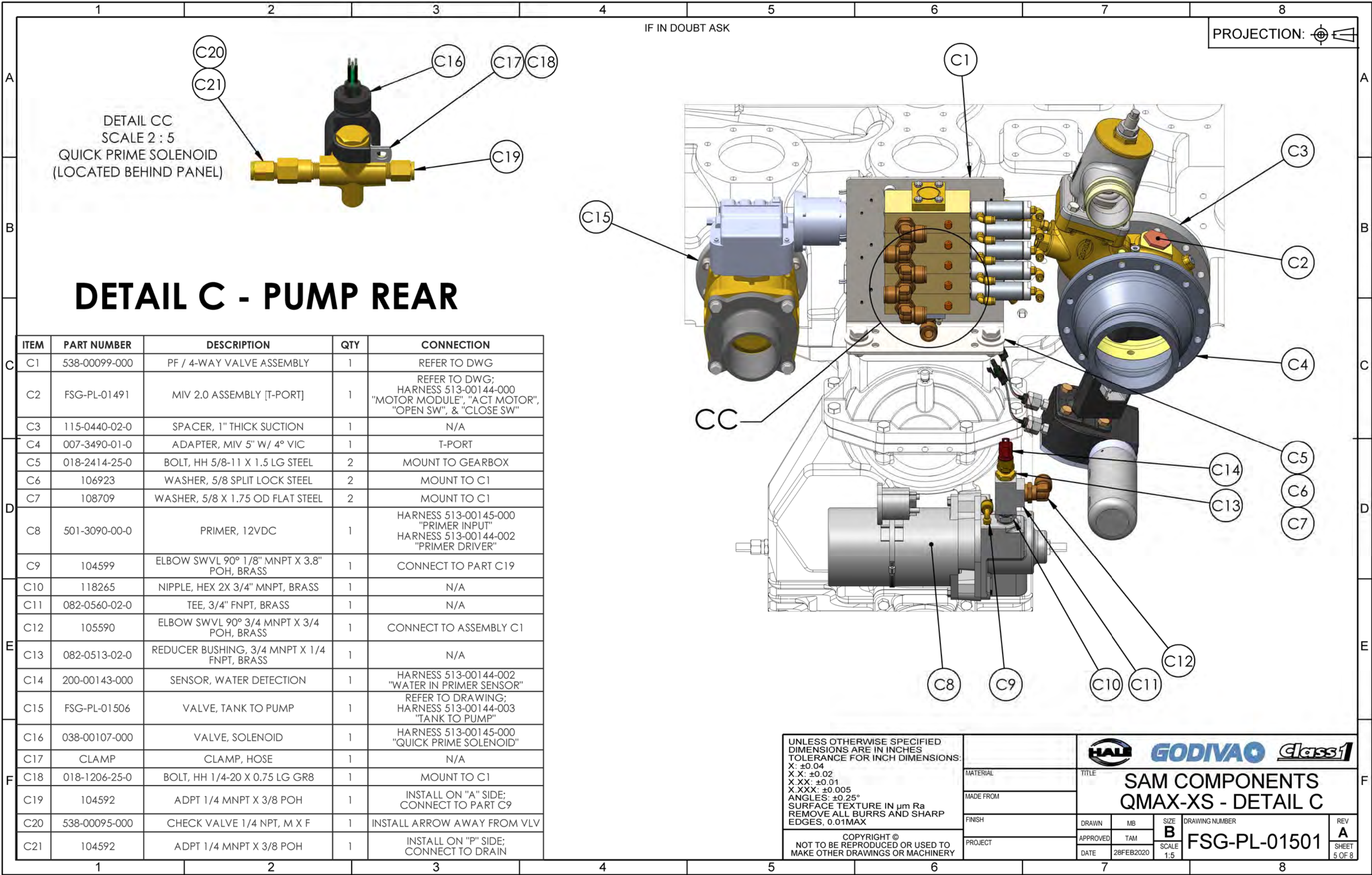


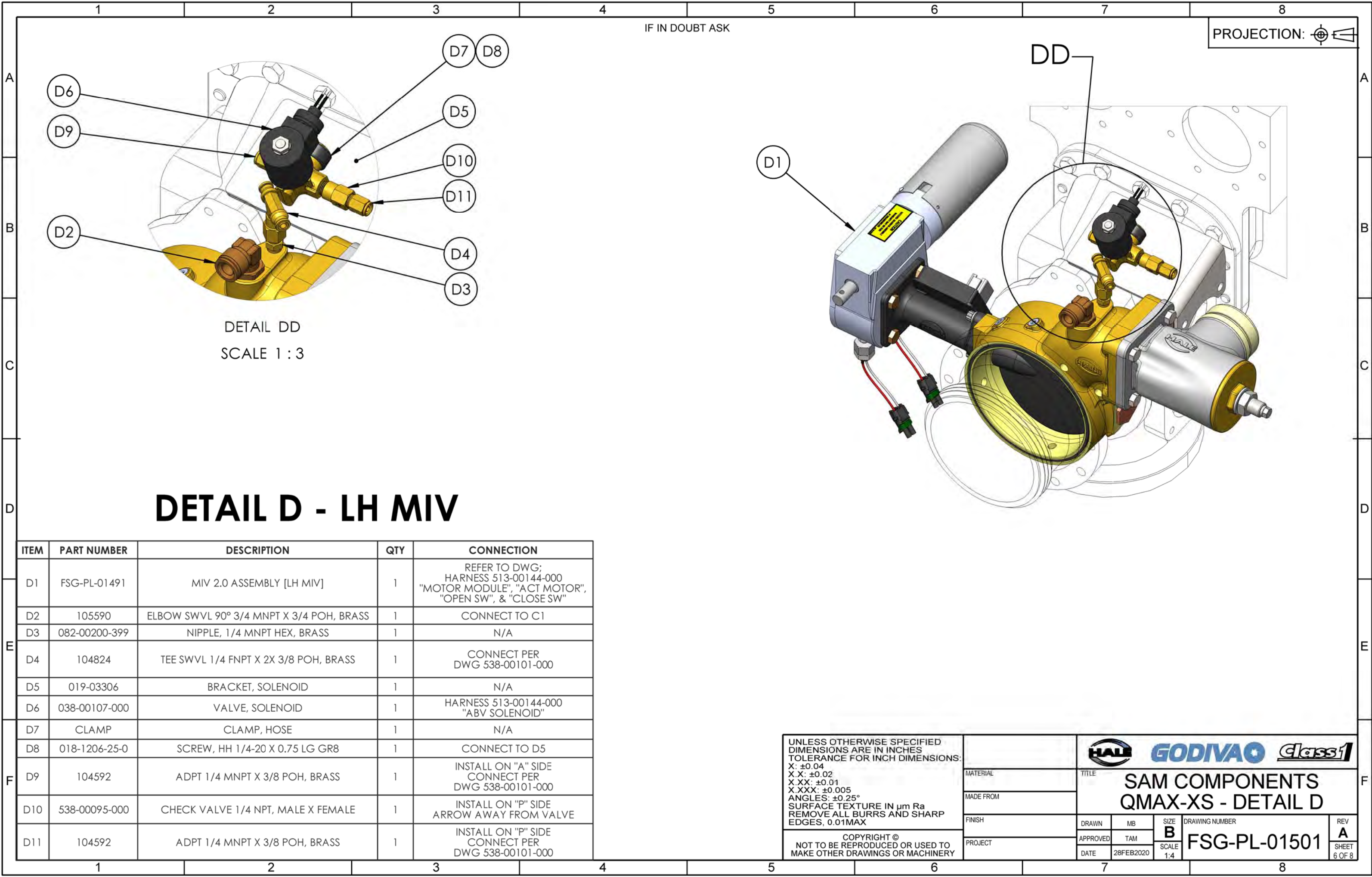
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE FOR INCH DIMENSIONS:
X: ±0.04
X.X: ±0.02
X.XX: ±0.01
X.XXX: ±0.005
ANGLES: ±0.25°
SURFACE TEXTURE IN µm Ra
REMOVE ALL BURRS AND SHARP
EDGES, 0.01MAX

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

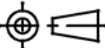
MATERIAL	TITLE	DRAWN		MB	SIZE	DRAWING NUMBER	REV
MADE FROM	SAM COMPONENTS QMAX-XS - DETAIL A	APPROVED	TAM	B	SCALE 1:4	FSG-PL-01501	A SHEET 3 OF 8
FINISH		DATE	28FEB2020				
PROJECT							







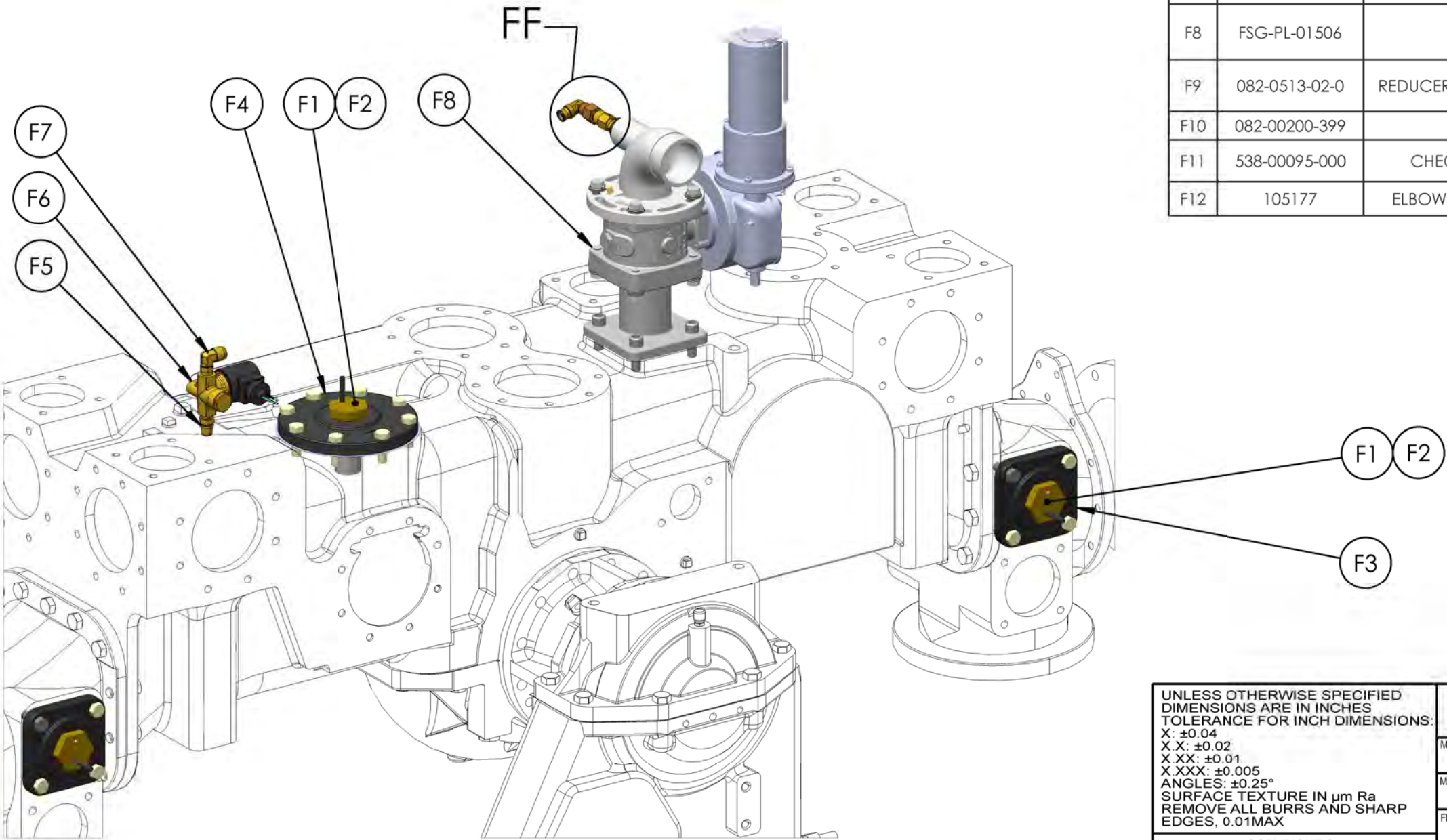
IF IN DOUBT ASK

PROJECTION: 

DETAIL F - ANODES & TANK FILL

ITEM	PART NUMBER	DESCRIPTION	QTY	CONNECTION
F1	029-0511-05-0	ANODEPRO, ALLOY (1.25 MNPT)	3	HARNESS 513-00145-000 "ANODE #"
F2	018-1003-44-0	SCREW, 10-24 X 3/8 LG SST	3	HARNESS 513-00145-000 "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 513-00145-000 "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 513-00144-003 "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

DETAIL FF
SCALE 1 : 3



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

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



MATERIAL

MADE FROM

FINISH

PROJECT

TITLE

SAM COMPONENTS
QMAX-XS - DETAIL F

DRAWN

APPROVED

DATE

MB

TAM

28FEB2020

SIZE

B

SCALE

1:6

DRAWING NUMBER

FSG-PL-01501

REV

A

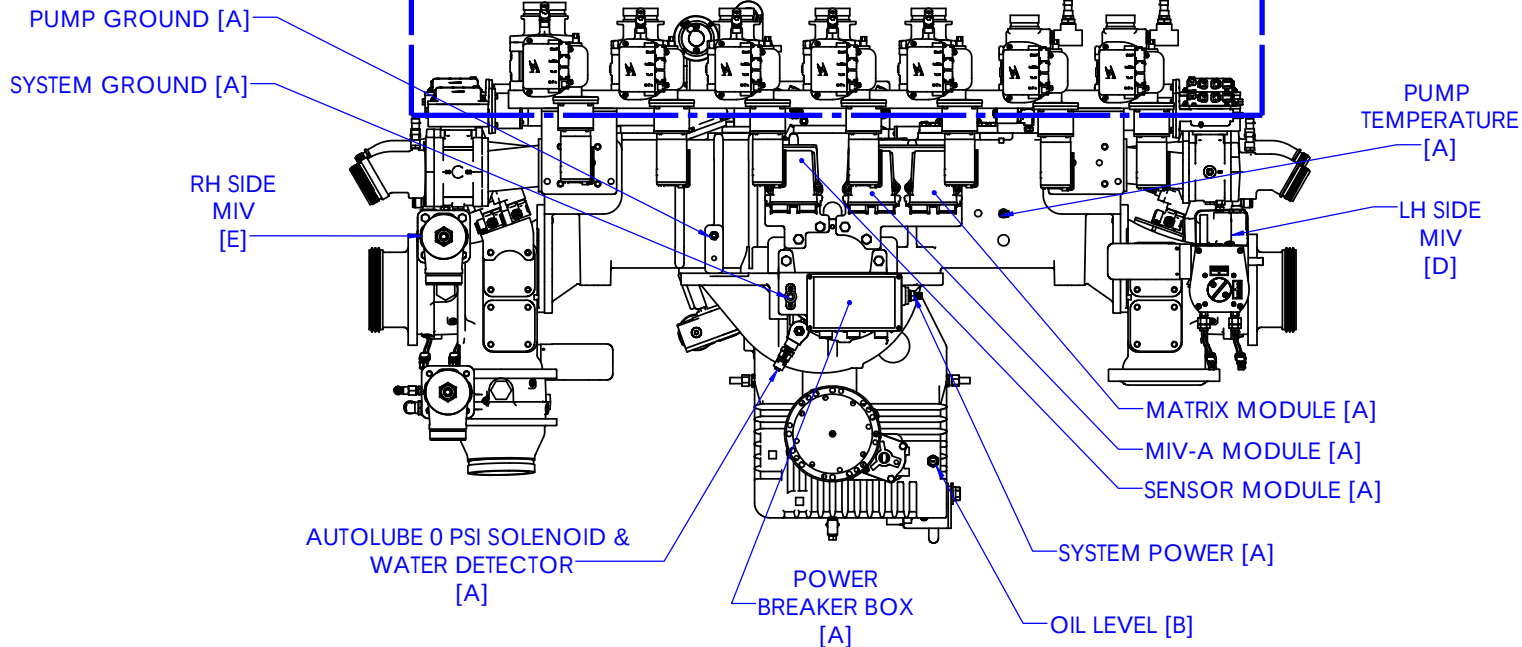
SHEET

8 OF 8

SAM QMAX

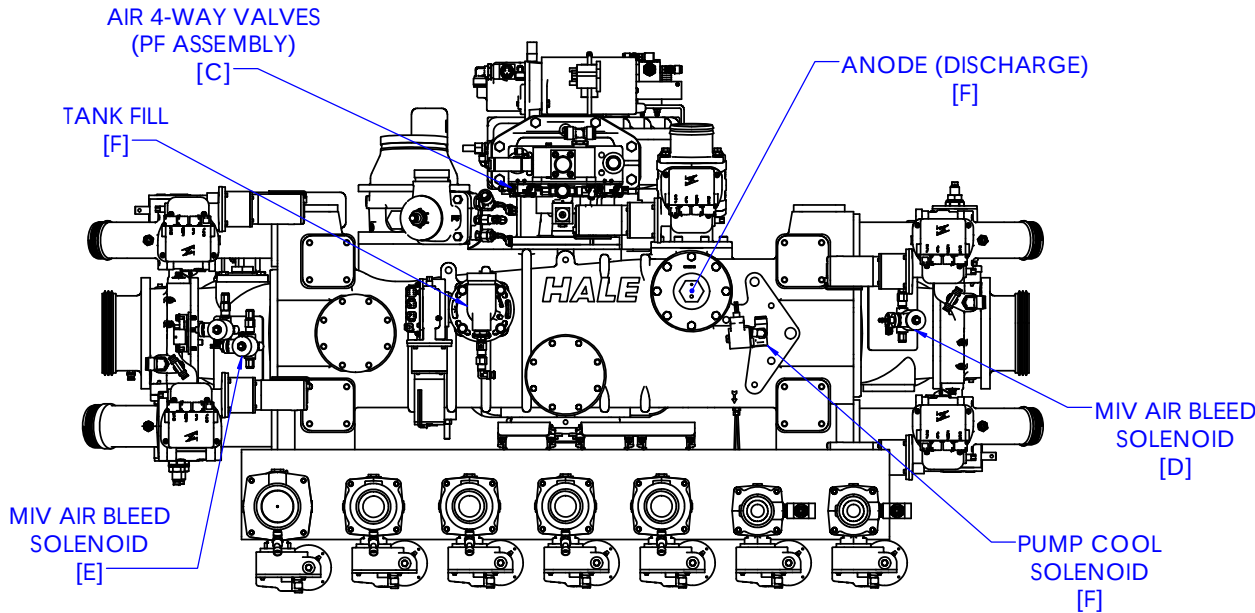
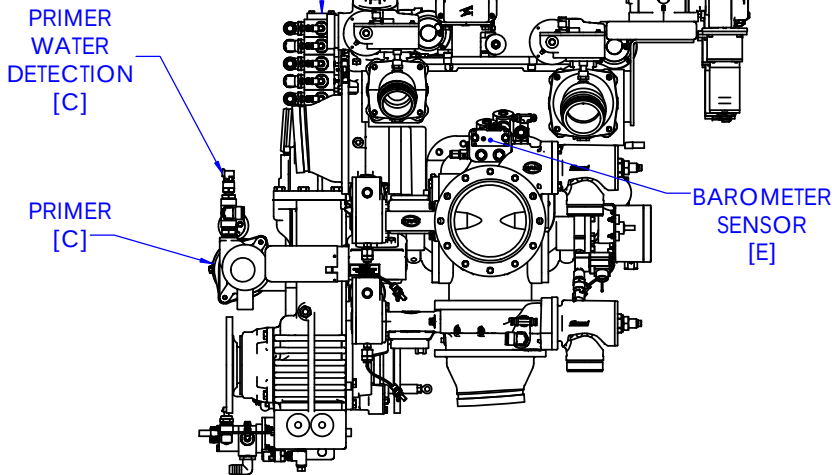
FRONT

SHIP LOOSE VALVES

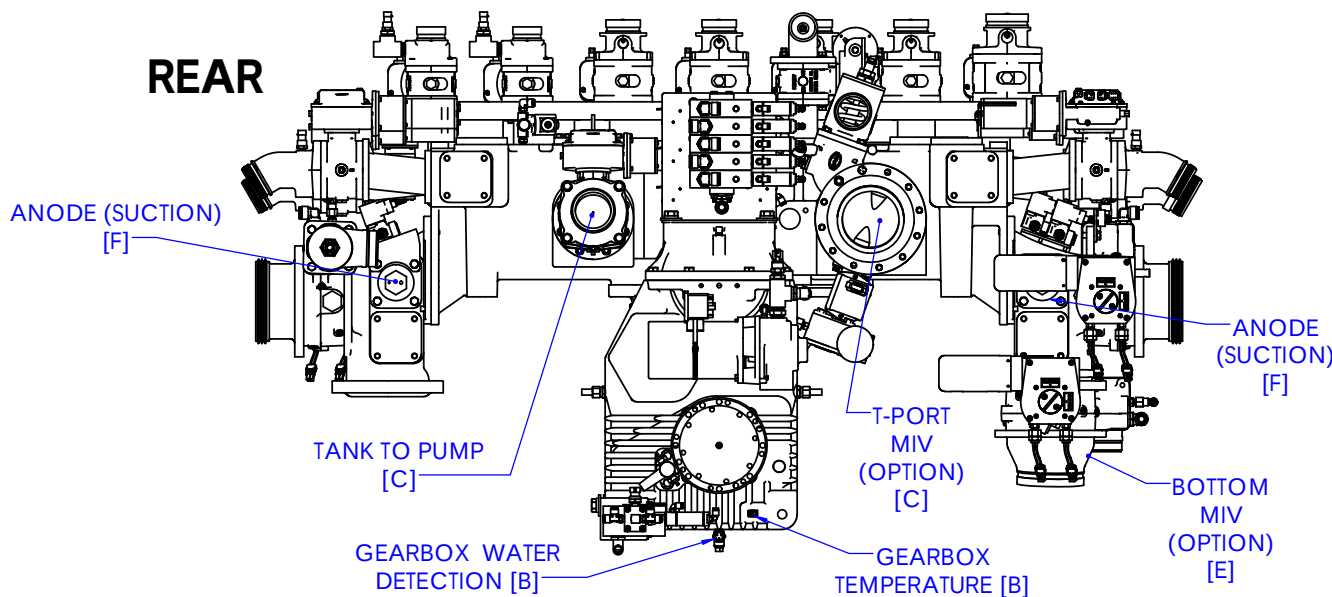


1. T-PORT MIV AIR BLEED SOLENOID (OPTION)
2. PUMP BODY PRIME SOLENOID (ON BRACKET) [DETAIL C]

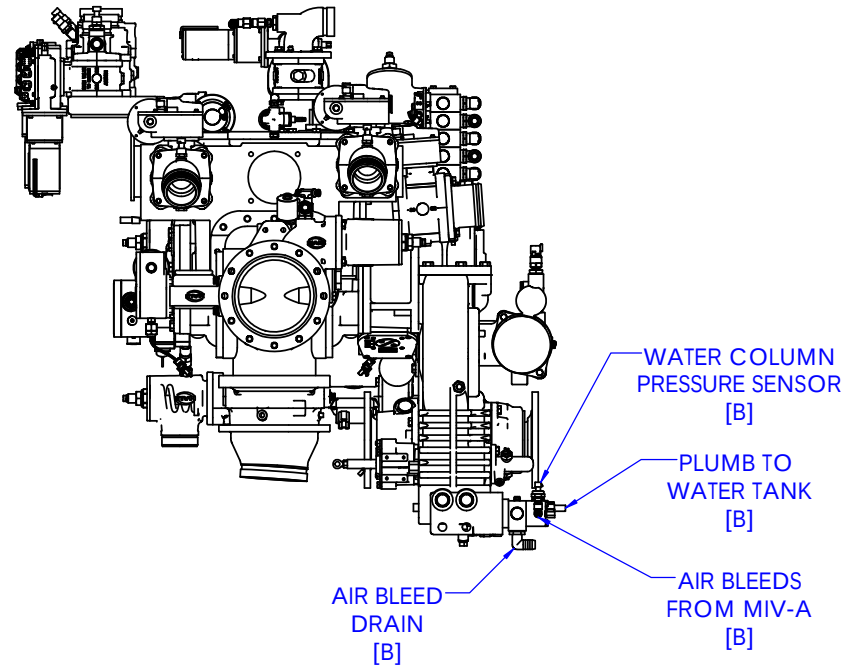
RIGHT



REAR



LEFT



PROJECTION:

COMPLIANCE NOTICE:
15 CFR 758. These items are controlled by the U.S. Government and authorized for export only for the purpose of defense activities for sale by the defense companies and countries listed. They may not be re-exported, transferred, or otherwise disposed of, in any other country or to any person other than the authorized defense companies or countries, without the express written permission of the U.S. Government. These items are controlled by the U.S. Government and authorized for export only for the purpose of defense activities for sale by the defense companies and countries listed. They may not be re-exported, transferred, or otherwise disposed of, in any other country or to any person other than the authorized defense companies or countries, without the express written permission of the U.S. Government. These items are controlled by the U.S. Government and authorized for export only for the purpose of defense activities for sale by the defense companies and countries listed. They may not be re-exported, transferred, or otherwise disposed of, in any other country or to any person other than the authorized defense companies or countries, without the express written permission of the U.S. Government.

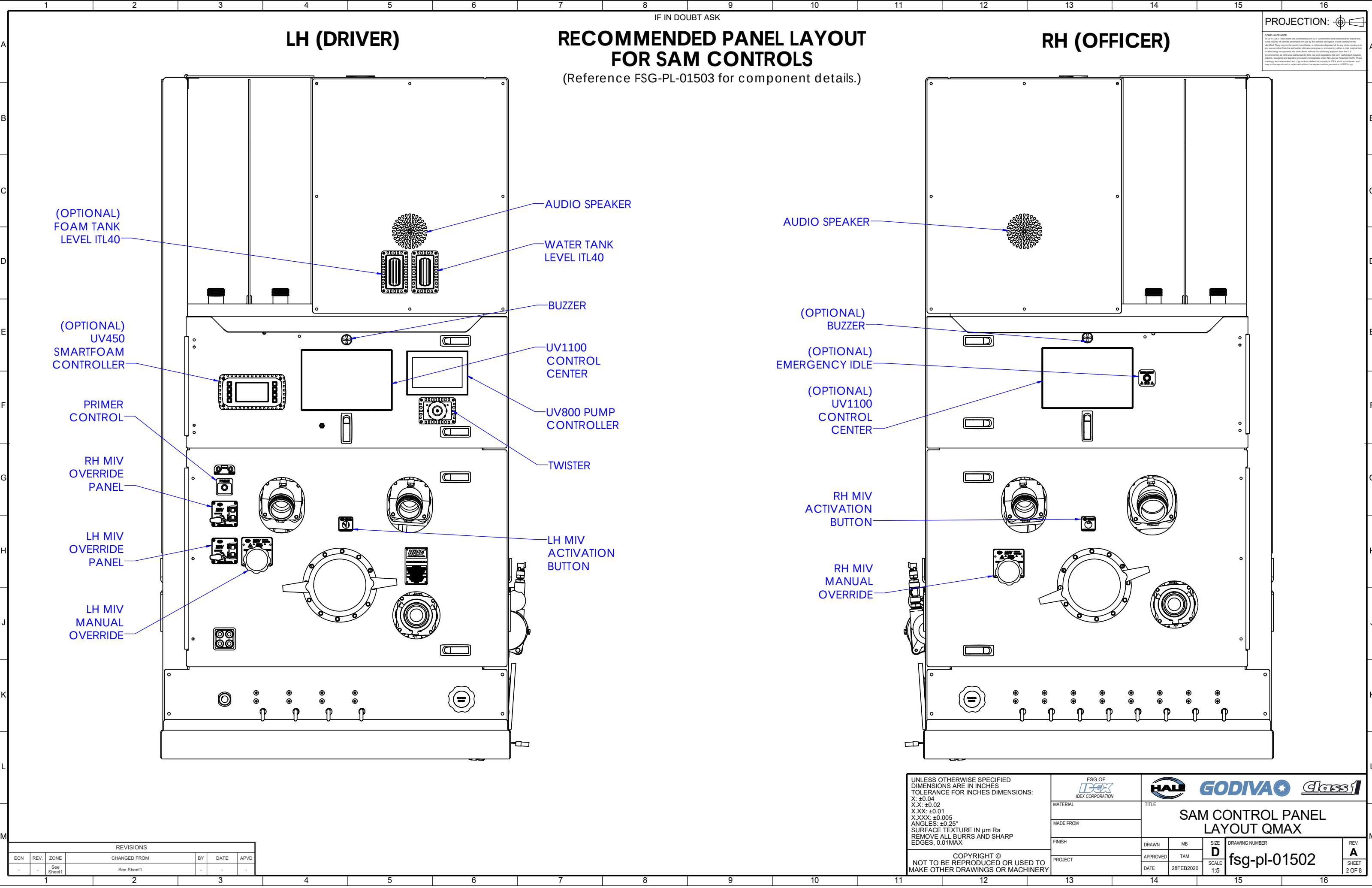
NOTES

1. BILL OF MATERIAL DETAILS [A-F] FOR EACH COMPONENT ARE SHOWN IN SUBSEQUENT PAGES OF THIS DRAWING.
2. 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
3. SUB-ASSEMBLY DRAWINGS REQUIRED FOR BUILD:
 - FSG-PL-01507 - POWER BREAKER BOX [DETAIL A]
 - 538-00100-000 - WATER TOWER DRAIN MANIFOLD [DETAIL C]
 - 538-00099-000 - 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]

REVISIONS					
ECN	REV.	ZONE	CHANGED FROM	BY	DATE
	A		ORIGINAL RELEASE	AJG	28FEB2020

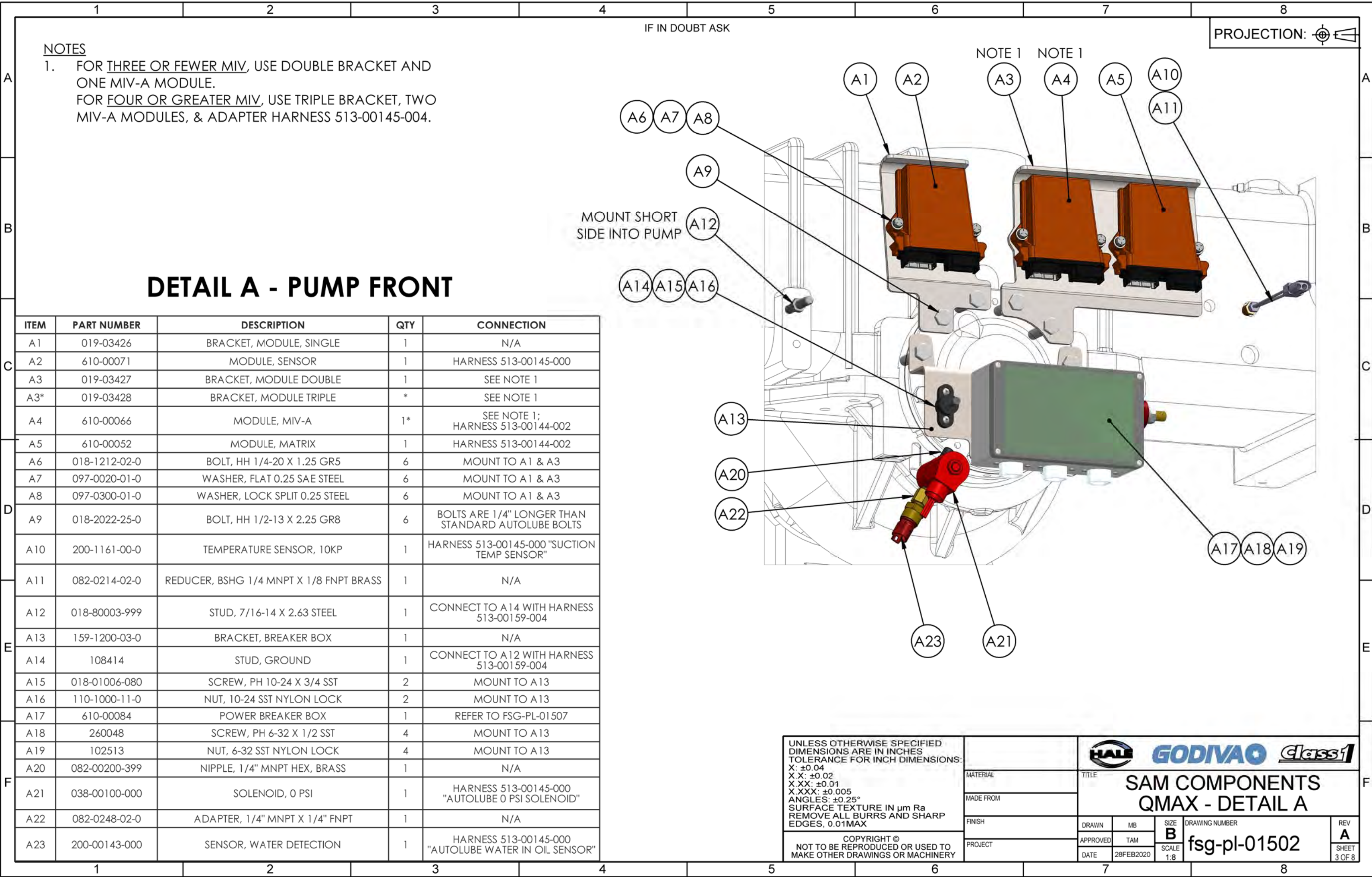
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCHES DIMENSIONS: X: ±0.04 X.X: ±0.02 X.XX: ±0.01 X.XXX: ±0.005 ANGLES: ±0.25° SURFACE TEXTURE IN µm Ra REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX					
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY					

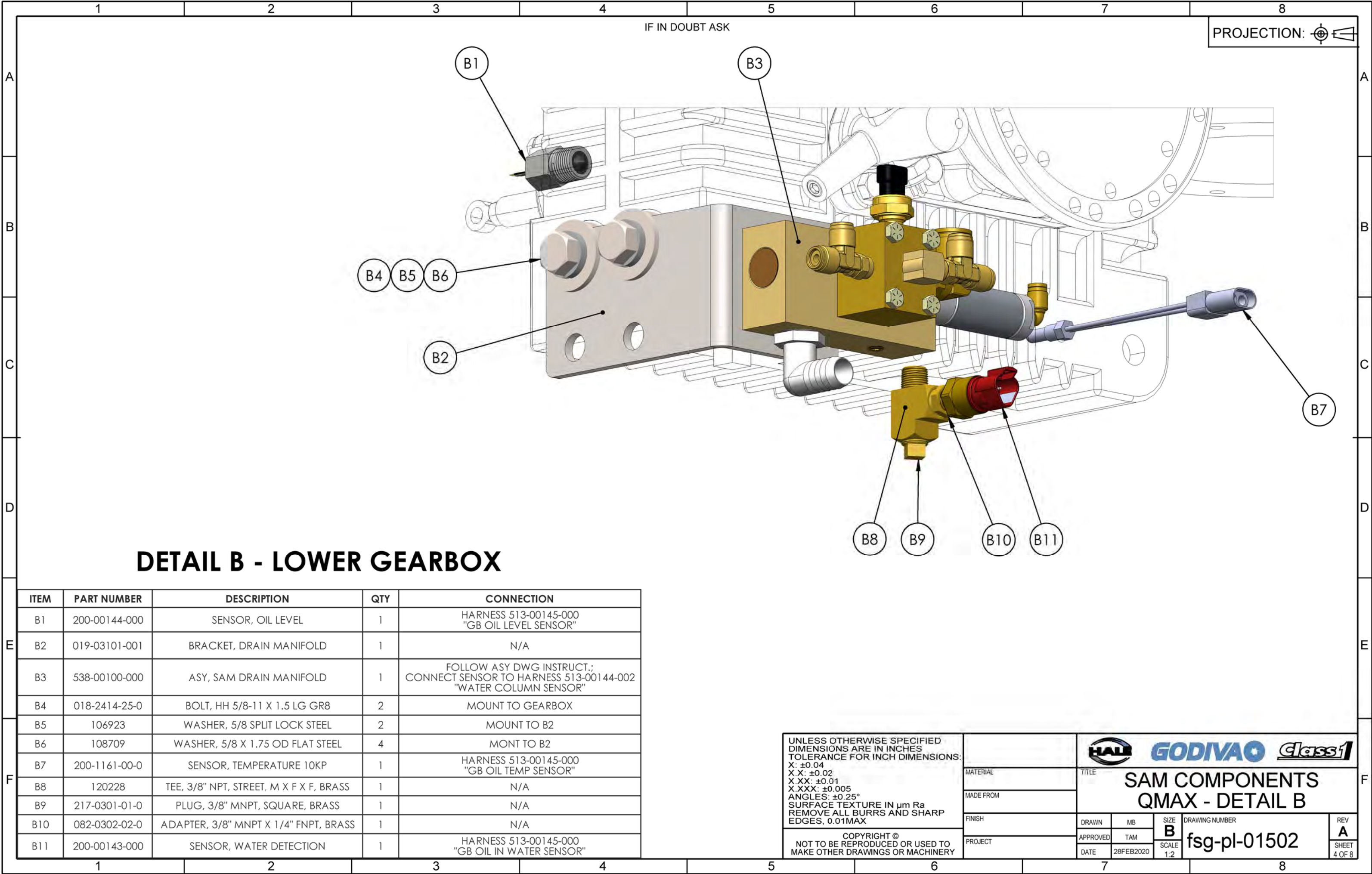
FSG OF IDEX CORPORATION		TITLE SAM COMPONENT DIAGRAM QMAX			
MATERIAL		DRAWN		SIZE D	
MADE FROM		APPROVED		SCALE 1:8	
FINISH		DATE		DRAWING NUMBER fsg-pl-01502	
PROJECT		28FEB2020		REV A	
				SHEET 1 OF 8	



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

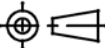
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS: X: ±0.04 X.X: ±0.02 X.XX: ±0.01 X.XXX: ±0.005 ANGLES: ±0.25° SURFACE TEXTURE IN µm Ra REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX	FSG OF  IDEX CORPORATION		  				
	MATERIAL		TITLE				
	MADE FROM		SAM CONTROL PANEL LAYOUT QMAX				
	FINISH		DRAWN	MB	SIZE	DRAWING NUMBER	REV
	PROJECT		APPROVED	TAM	D	fsg-pl-01502	A
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		DATE	28FEB2020	SCALE	1:5	SHEET 2 OF 8	



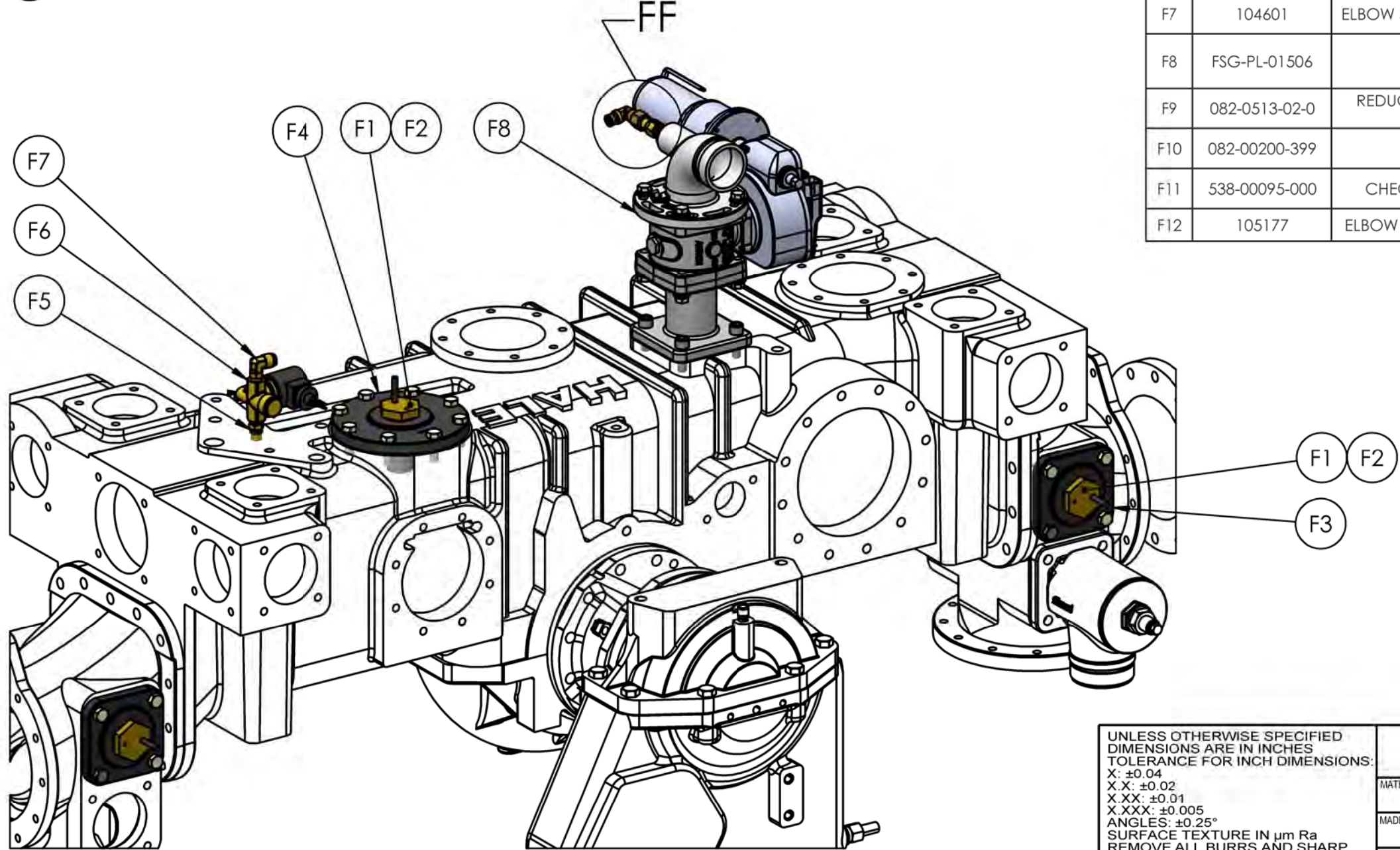
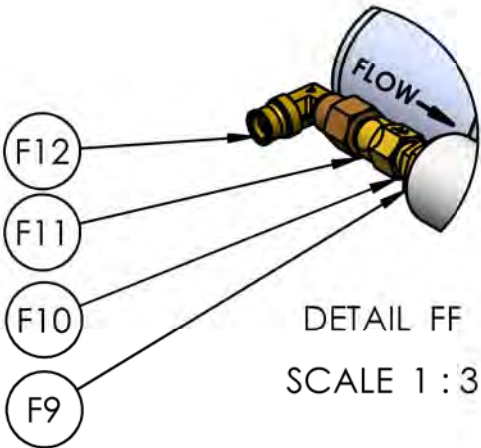


</

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	HARNESS 513-00145-000 "ANODE #"
F2	018-1003-44-0	SCREW, 10-24 X 3/8 LG SST	3	HARNESS 513-00145-000 "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 513-00145-000 "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 513-00144-003 "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

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

MATERIAL	TITLE			
MADE FROM	SAM COMPONENTS			
FINISH	QMAX - DETAIL F			
PROJECT	DRAWN	MB	SIZE	DRAWING NUMBER
	APPROVED	TAM	B	fsg-pl-01502
	DATE	28FEB2020	SCALE	1:6

REV	A
SHEET	8 OF 8

1

2

3

4

5

6

7

8

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 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 it subsidiaries. and may not be reproduced or replicated without the express written permission of IDEX corp.

TABLE OF CONTENTS

ITEM	BUSS	SHEET #
SAM CONTROLS		
- CONTROL CENTER, SAM	RED & GREEN	2
- CONTROL CENTER, PUMP GOVERNOR	GREEN & BLUE	3
- TWISTER	GREEN	3
SAM MODULES		
- MODULE, MATRIX GOVERNOR	BLUE	4
- MODULE, SENSOR	GREEN	5
- MODULE, MIV-A	GREEN	6
WATERFLOW SYSTEM		
- ITL40 WATER LEVEL	GREEN	7
- VALVE CONTROLLER, NON-DISCHARGE	GREEN	7
- NAVIGATOR DISPLAY, NON-DISCHARGE	GREEN	7
- VALVE CONTROLLER, DISCHARGE	RED	8
- NAVIGATOR DISPLAY, DISCHARGE	RED	8
MIV SYSTEM		
- MODULE, MIV 2.0 CONTROL	GREEN	9
- MIV ROCKER SWITCH	GREEN	9
- AUTO MIV BUTTON	GREEN	9
WIFI SYSTEM		
- WIFI, POWER SUPPLY (12VDC)	N/A	10
- WIFI, POWER SUPPLY (24VDC)	N/A	10
- WIFI, ANTENNA	N/A	10
FOAM & CAFS SYSTEM		
- 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
GENERAL CONNECTOR ASSEMBLIES		
- 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

1. REFER TO FSG-PL-01504 FOR ELECTRICAL CAN HOOKUP LAYOUT.

2. 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

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

COPYRIGHT ©

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

FSG OF IDEX CORPORATION

MATERIAL

MADE FROM

FINISH

PROJECT

HALE

GODIVA

Class1

TITLE

SAM ELECTRIC COMPONENT PINOUTS

DRAWN

KTN

APPROVED

MAL

DATE

20NOV2019

SIZE

B

SCALE

1:1

DRAWING NUMBER

FSG-PL-01503

REV

C

SHEET

1 OF 17

1

2

3

4

5

6

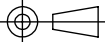
7

8

RED BUSS
GREEN BUSS

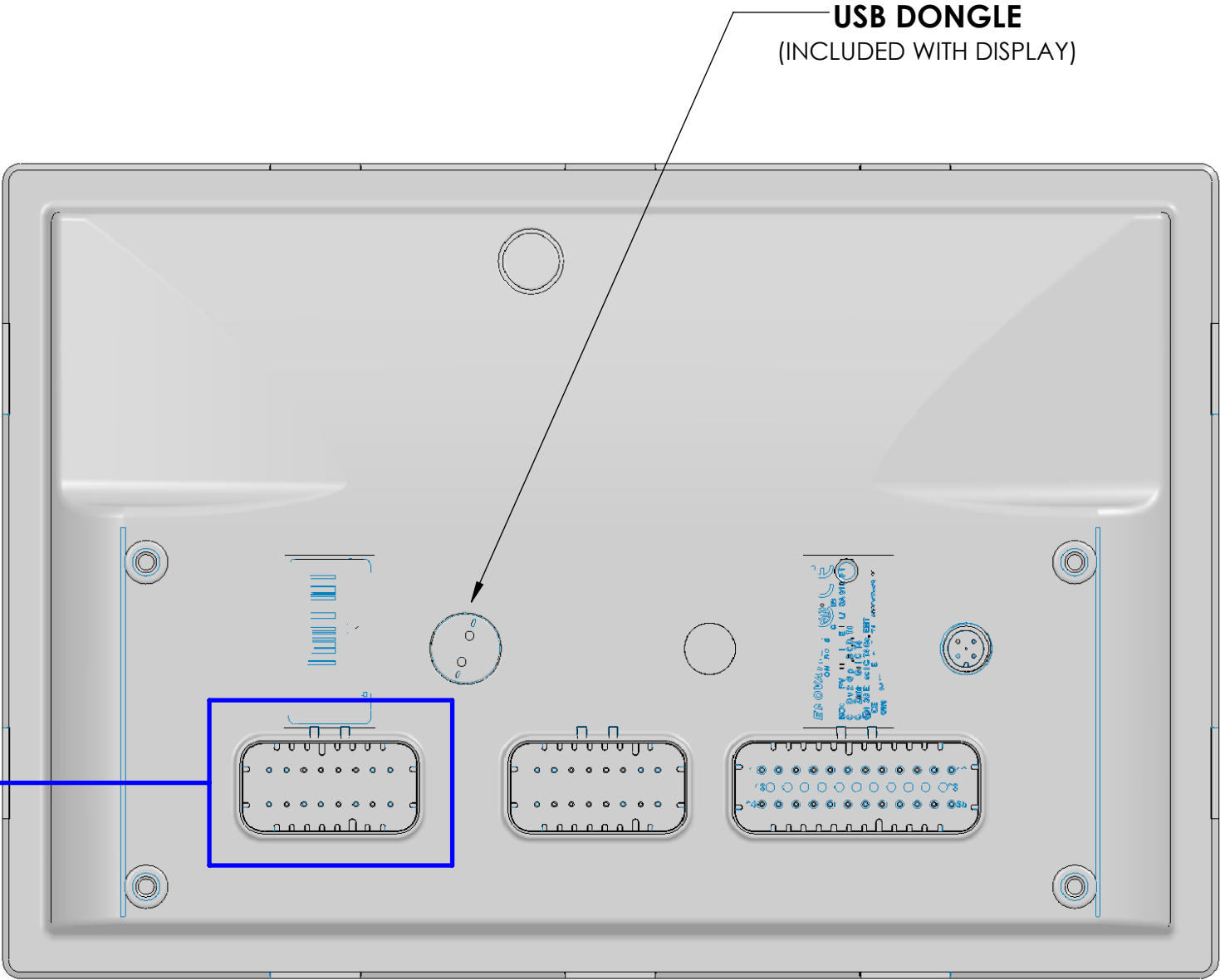
SAM CONTROL CENTER DISPLAY(S)

IF IN DOUBT ASK

PROJECTION: 

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	CAN LOW (AFS)	GREEN	103349
6	CAN HIGH (AFS)	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 (DISCHARGE)	GREEN	103349
19	CAN HIGH (DISCHARGE)	YELLOW	103349
20	770678-1	----	----
21	770678-1	----	----
22	770678-1	----	----
23	770678-1	----	----

*FOR AUXILIARY DISPLAYS ONLY



USB DONGLE
(INCLUDED WITH DISPLAY)

REVISIONS					
ECN	REV.	ZONE	CHANGED FROM	BY	DATE
-	-	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  IDEX CORPORATION		  			
	MATERIAL		TITLE SAM ELECTRIC COMPONENT PINOUTS			
	MADE FROM					
	FINISH		DRAWN	KTN	SIZE B	DRAWING NUMBER FSG-PL-01503
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		PROJECT		APPROVED		
				DATE	20NOV2019	SCALE 1:1

GREEN BUSS
BLUE BUSS

PUMP GOVERNOR CONTROL CENTER

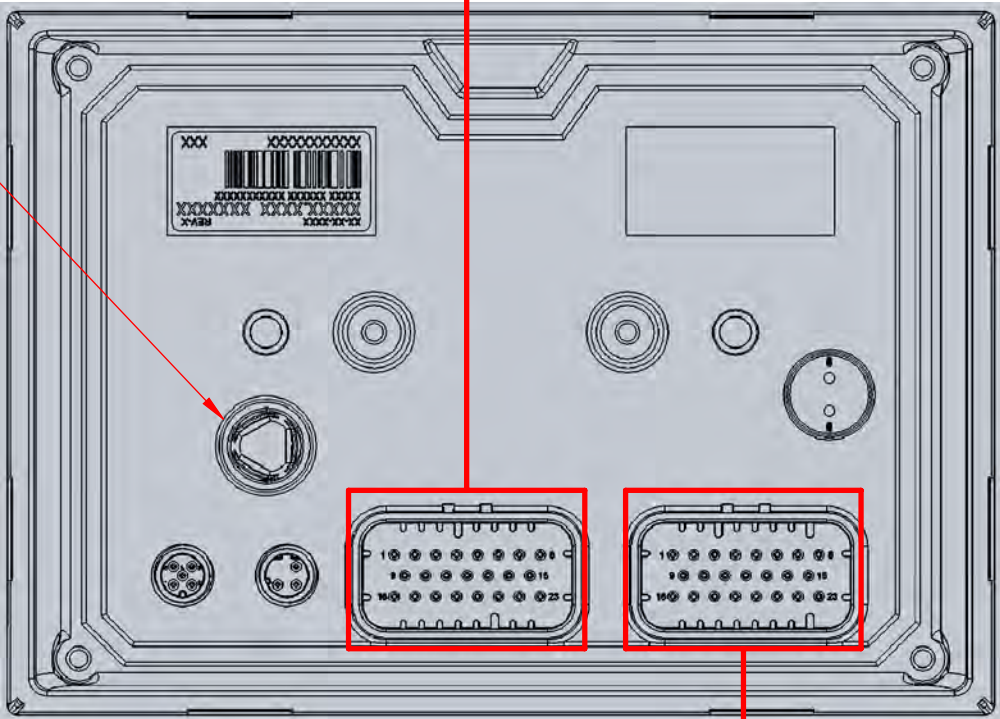
IF IN DOUBT ASK

PROJECTION: 

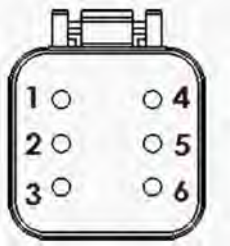
UV800 DISPLAY			
CONNECTOR AMP/TYCO: 770680-1 (BLACK) FEMALE			
TERMINAL TYCO: 770520-1 (TIN)			
TERMINAL AMP/TYCO: 770520-3 (GOLD)			
CAVITY PLUG AMP/TYCO: 770678-1 (NATURAL)			
POS	CIRCUIT	COLOR	GA
1	770678-1	----	----
2	770678-1	----	----
3	770678-1	----	----
4	770678-1	----	----
5	CAN LOW (CHASSIS)	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
-	-	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

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

FSG OF  IDEX CORPORATION		  					
MATERIAL		TITLE					
MADE FROM		SAM ELECTRIC COMPONENT PINOUTS					
FINISH		DRAWN	KTN	SIZE	DRAWING NUMBER		REV
PROJECT		APPROVED	MAL	B	FSG-PL-01503		C
		DATE	20NOV2019	SCALE			SHEET
				1:1			3 OF 17

BLUE BUSS

MATRIX PUMP PRESSURE GOVERNOR MODULE

PROJECTION:

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
-	-	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  IDEX CORPORATION							
	MATERIAL		TITLE SAM ELECTRIC COMPONENT PINOUTS					
	MADE FROM							
	FINISH		DRAWN	KTN	SIZE B	DRAWING NUMBER FSG-PL-01503		REV C
PROJECT		APPROVED	MAL	SCALE 1:1				SHEET 4 OF 17
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		DATE	20NOV2019					

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
-	-	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 SAM ELECTRIC COMPONENT PINOUTS					
	MADE FROM							
	FINISH		DRAWN	KTN	SIZE B	DRAWING NUMBER FSG-PL-01503	REV C	
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		APPROVED		MAL			SHEET 5 OF 17	
		DATE		20NOV2019				

GREEN BUSS

MIV-A MODULE

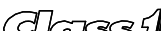
PROJECTION:

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



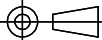
MIV AUTO MODULE "B"			
CONNECTOR DEUTSCH: DTM06-12SB FML (BLK)			
LOCK DEUTSCH: WM-12S (ORANGE)			
TERM DEUTSCH: 0462-0201-20141 (18-16)			
TERM DEUTSCH: 0462-0201-2031 (18-16)			
POS	CIRCUIT	COLOR	GA
1	AB DRAIN	RED	16GXL
2	PRE-PRIME #2	RED	16GXL
3	PRIMER START	RED	16GXL
4	WTR IN PRIMER DETECT	WHITE	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
-	-	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 IDEX CORPORATION							
	MATERIAL		TITLE SAM ELECTRIC COMPONENT PINOUTS					
	MADE FROM							
	FINISH		DRAWN	KTN	SIZE B	DRAWING NUMBER FSG-PL-01503		
PROJECT		APPROVED	MAL	SCALE 1:1				
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		DATE	20NOV2019					

GREEN BUSS

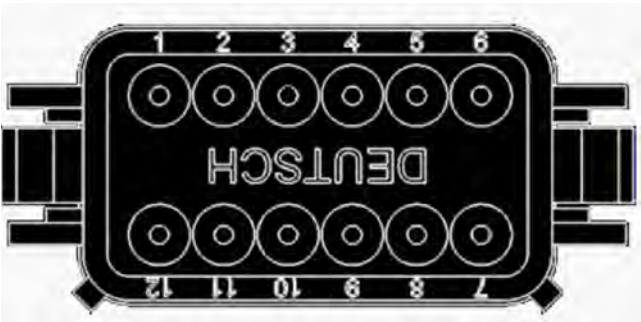
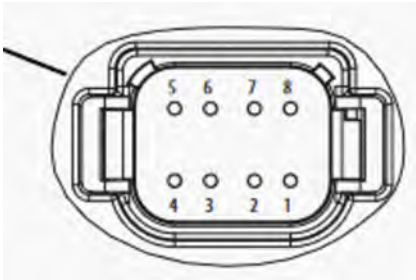
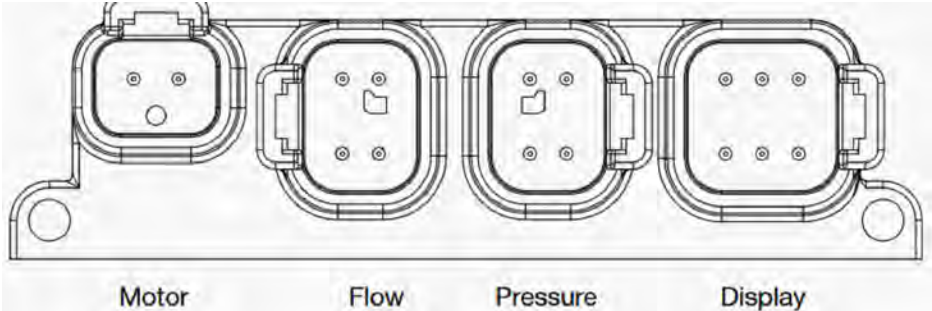
IF IN DOUBT ASK

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	CAN SHIELD (AFS)	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	----	----



AKRON VALVE PRESSURE/FLOW			
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

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

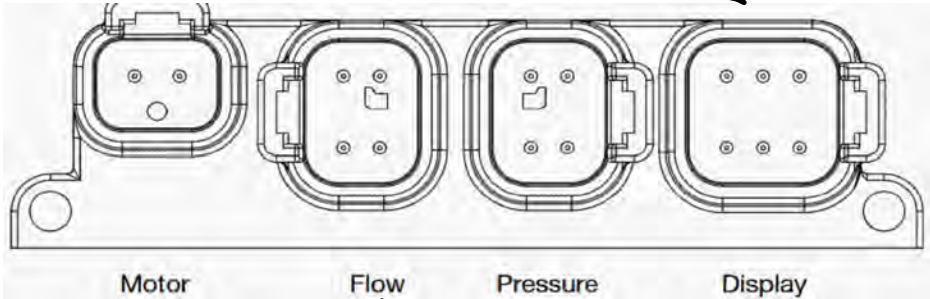
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCE FOR INCH DIMENSIONS:
X: ±0.04
X.X: ±0.02
X.XX: ±0.01
X.XXX: ±0.005
ANGLES: ±0.25°
SURFACE TEXTURE IN µm Ra
REMOVE ALL BURRS AND SHARP
EDGES, 0.01MAX

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

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

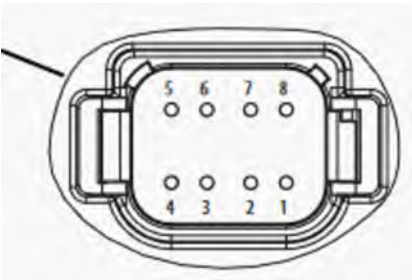
RED BUSS

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



AKRON VALVE PRESSURE/FLOW			
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

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	----	----

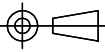


REVISIONS					
ECN	REV.	ZONE	CHANGED FROM	BY	DATE
-	-	See Sheet1	See Sheet1	-	-

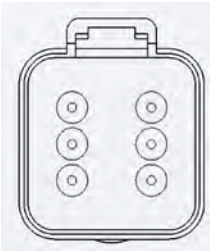
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE FOR INCH DIMENSIONS: X: ±0.04 X.X: ±0.02 X.XX: ±0.01 X.XXX: ±0.005 ANGLES: ±0.25° SURFACE TEXTURE IN µm Ra REMOVE ALL BURRS AND SHARP EDGES, 0.01MAX	FSG OF  IDEX CORPORATION		  					
	MATERIAL		TITLE SAM ELECTRIC COMPONENT PINOUTS					
	MADE FROM							
	FINISH		DRAWN	KTN	SIZE B	DRAWING NUMBER FSG-PL-01503	REV C	
PROJECT		APPROVED	MAL	SCALE 1:1			SHEET 8 OF 17	
		DATE	20NOV2019					

GREEN BUSS

IF IN DOUBT ASK

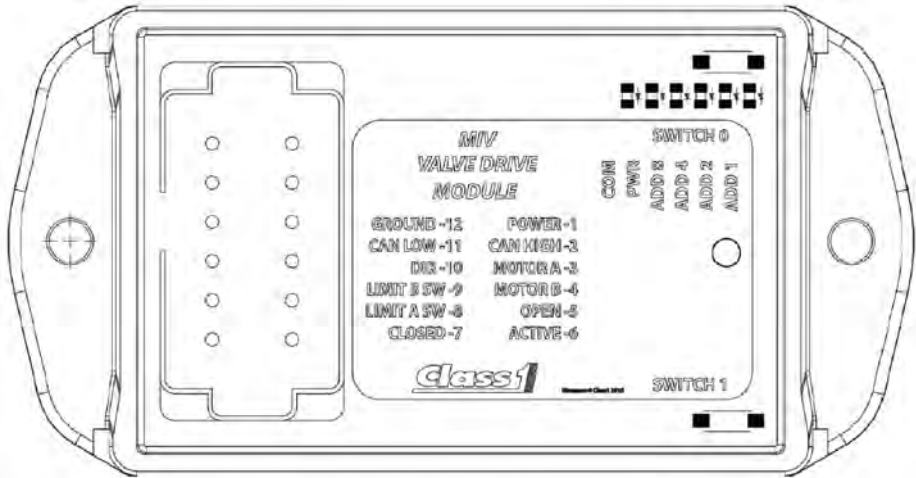
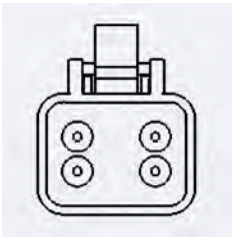
PROJECTION: 

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

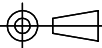


REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

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	FSG OF  IDEX CORPORATION		  				
	MATERIAL		TITLE SAM ELECTRIC COMPONENT PINOUTS				
	MADE FROM						
	FINISH		DRAWN	KTN	SIZE B	DRAWING NUMBER FSG-PL-01503	REV C
PROJECT		APPROVED	MAL	SCALE 1:1			
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		DATE		20NOV2019			

WIFI CONNECTION

IF IN DOUBT ASK

PROJECTION: 

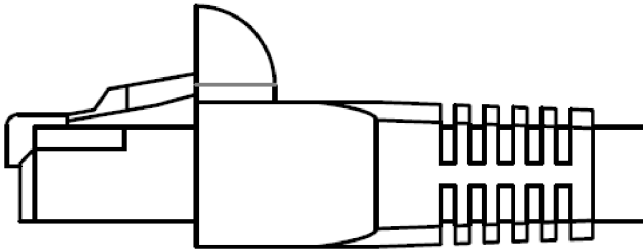
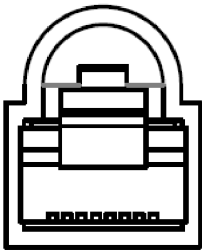
WIFI POWER SUPPLY (12V)			
CONNECTOR DELPHI: 12010973 BLK (SHROUD)			
TERMINAL DELPHI: 12124582 MALE (TIN)			
SEAL DELPHI: 15324982 GRN (18-16)			
POS	CIRCUIT	COLOR	GA
1	POWER	RED	18GXL
2	GROUND	BLACK	18GXL



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



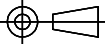
REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

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  IDEX CORPORATION		  				
	MATERIAL		TITLE SAM ELECTRIC COMPONENT PINOUTS				
	MADE FROM						
	FINISH		DRAWN	KTN	SIZE B	DRAWING NUMBER FSG-PL-01503	REV C
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		APPROVED		MAL			SHEET 10 OF 17
		DATE		20NOV2019	SCALE 1:1		

GREEN BUSS
ORANGE BUSS

OPTIONAL SMARTFOAM DISPLAY

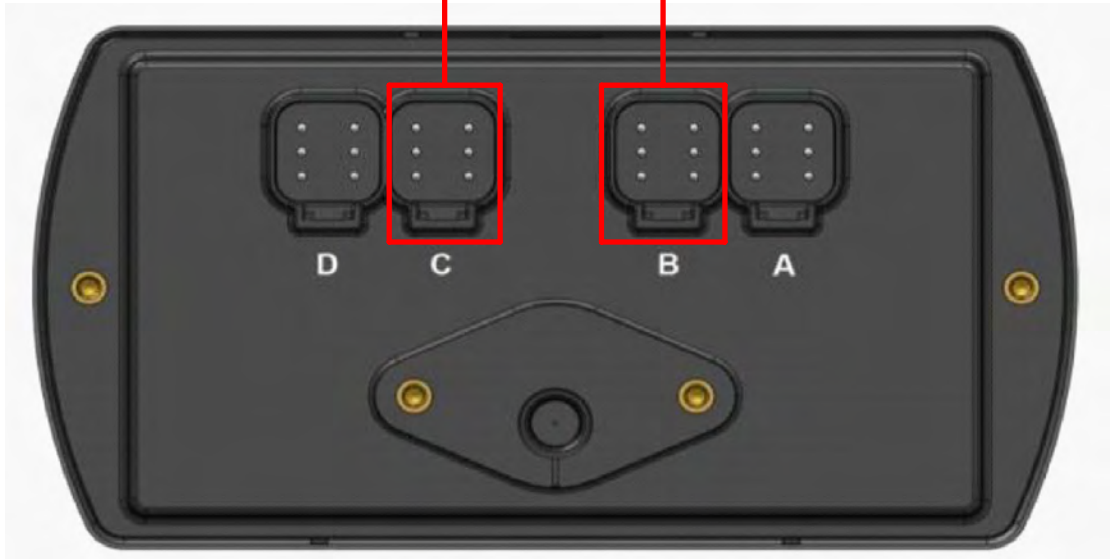
IF IN DOUBT ASK

PROJECTION: 

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

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	CAN HIGH (DISCH.)	YELLOW	18GXL
3	CAN LOW (DISCH.)	GREEN	18GXL
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	CAN HIGH (FOAM)	YELLOW	18GXL
3	CAN LOW (FOAM)	GREEN	18GXL
4	REMOTE LED (-)	RED	18GXL
5	POWER	PINK	18GXL
6	GROUND	BLACK	16GXL



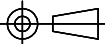
REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

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	FSG OF  IDEX CORPORATION		  			
	MATERIAL		TITLE SAM ELECTRIC COMPONENT PINOUTS			
	MADE FROM					
	FINISH		DRAWN	KTN	SIZE B	DRAWING NUMBER FSG-PL-01503
PROJECT		APPROVED	MAL	SCALE 1:1		
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		DATE	20NOV2019			

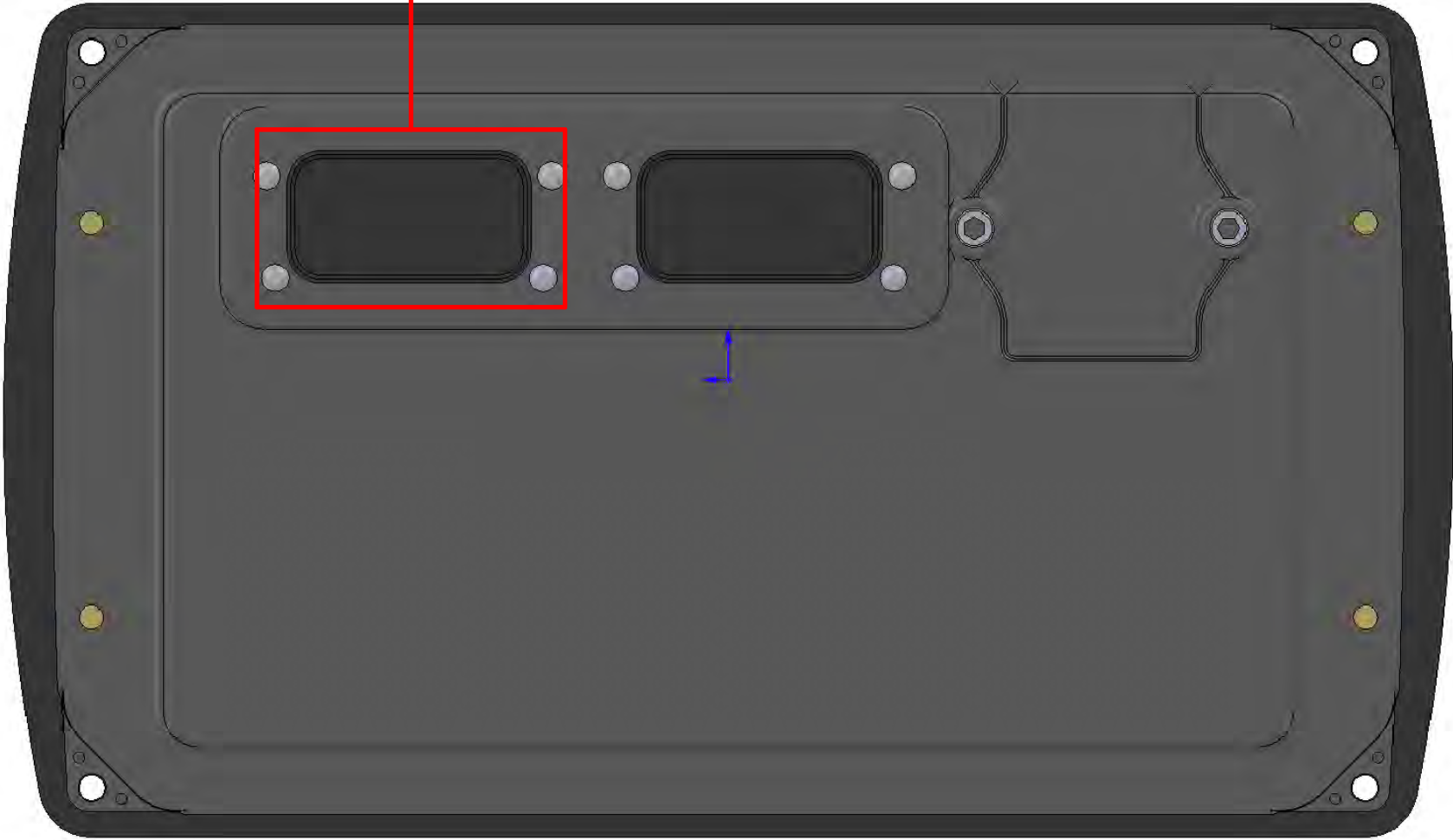
GREEN BUSS
ORANGE BUSS

OPTIONAL SMARTCAFS DISPLAY

IF IN DOUBT ASK

PROJECTION: 

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	----	----

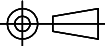


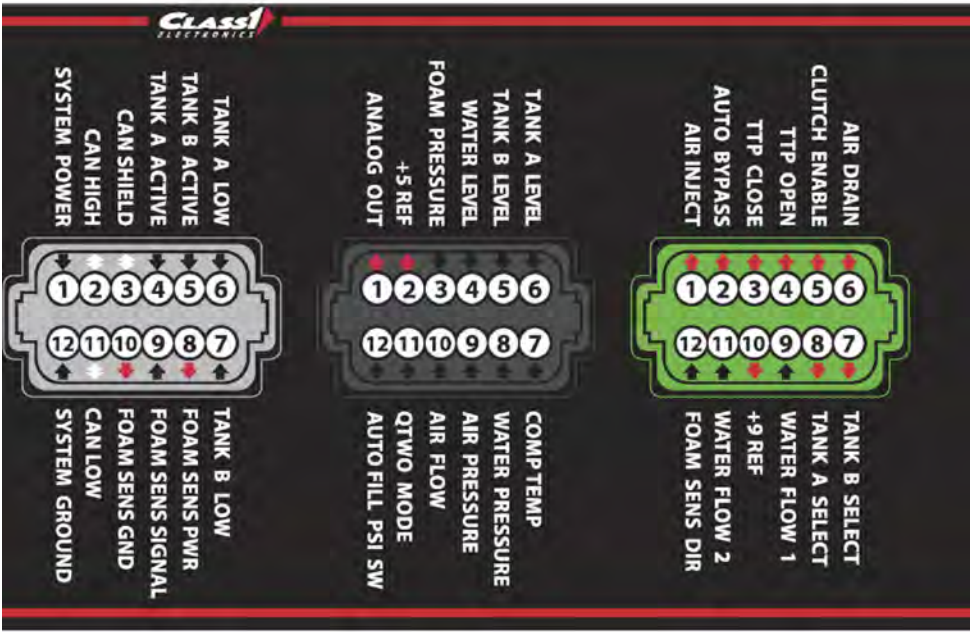
REVISIONS					
ECN	REV.	ZONE	CHANGED FROM	BY	DATE
-	-	See Sheet1	See Sheet1	-	-

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  IDEX CORPORATION		  			
	MATERIAL		TITLE SAM ELECTRIC COMPONENT PINOUTS			
	MADE FROM					
	FINISH		DRAWN	KTN	SIZE B	DRAWING NUMBER FSG-PL-01503
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		PROJECT		APPROVED		
				DATE	20NOV2019	SCALE 1:1

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

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  IDEX CORPORATION							
	MATERIAL		TITLE SAM ELECTRIC COMPONENT PINOUTS					
	MADE FROM							
	FINISH		DRAWN	KTN	SIZE B	DRAWING NUMBER FSG-PL-01503		REV C
PROJECT		APPROVED	MAL	SCALE 1:1				SHEET 13 OF 17
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		DATE		20NOV2019				

ORANGE BUSS

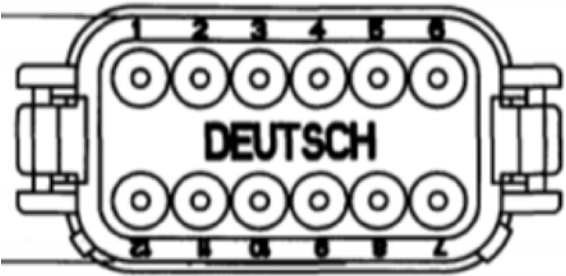
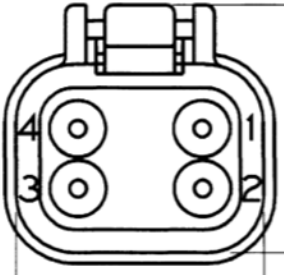
IF IN DOUBT ASK

PROJECTION: 

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

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

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



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  IDEX CORPORATION	  				
	MATERIAL	TITLE SAM ELECTRIC COMPONENT PINOUTS				
	MADE FROM					
	FINISH	DRAWN	KTN	SIZE B	DRAWING NUMBER FSG-PL-01503	REV C SHEET 14 OF 17
PROJECT	APPROVED	MAL	SCALE 1:1			
		DATE		20NOV2019		
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY						

12345678

A

IF IN DOUBT ASK

DELPHI / PACKARD CONNECTORS

PROJECTION: 

A

B

C

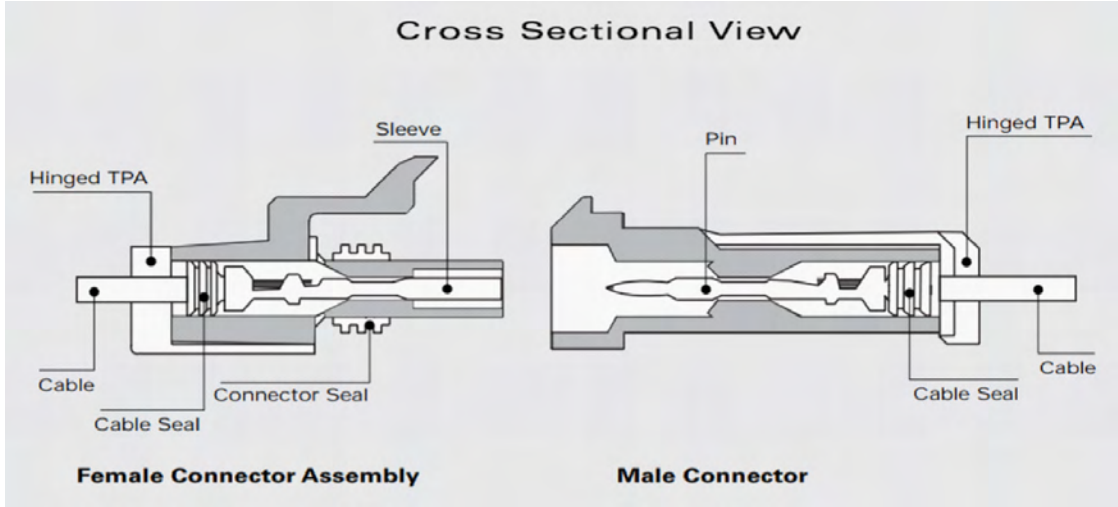
D

E

F

WEATHER-PACK SERIES

Cross Sectional View



Female Connector AssemblyMale Connector

WEATHER-PACK CONNECTORS

TOWER

SHROUD

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

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

SEALS



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

PLUG



AWG	COLOR	P/N
ALL	GREEN	12010300

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

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

IDEX CORPORATION

MATERIAL

MADE FROM

FINISH

PROJECT



TITLE

SAM ELECTRIC COMPONENT PINOUTS

DRAWN

APPROVED

DATE

KTN

MAL

20NOV2019

SIZE
B

SCALE
1:1

DRAWING NUMBER

FSG-PL-01503

REV
C

SHEET
15 OF 17

REV

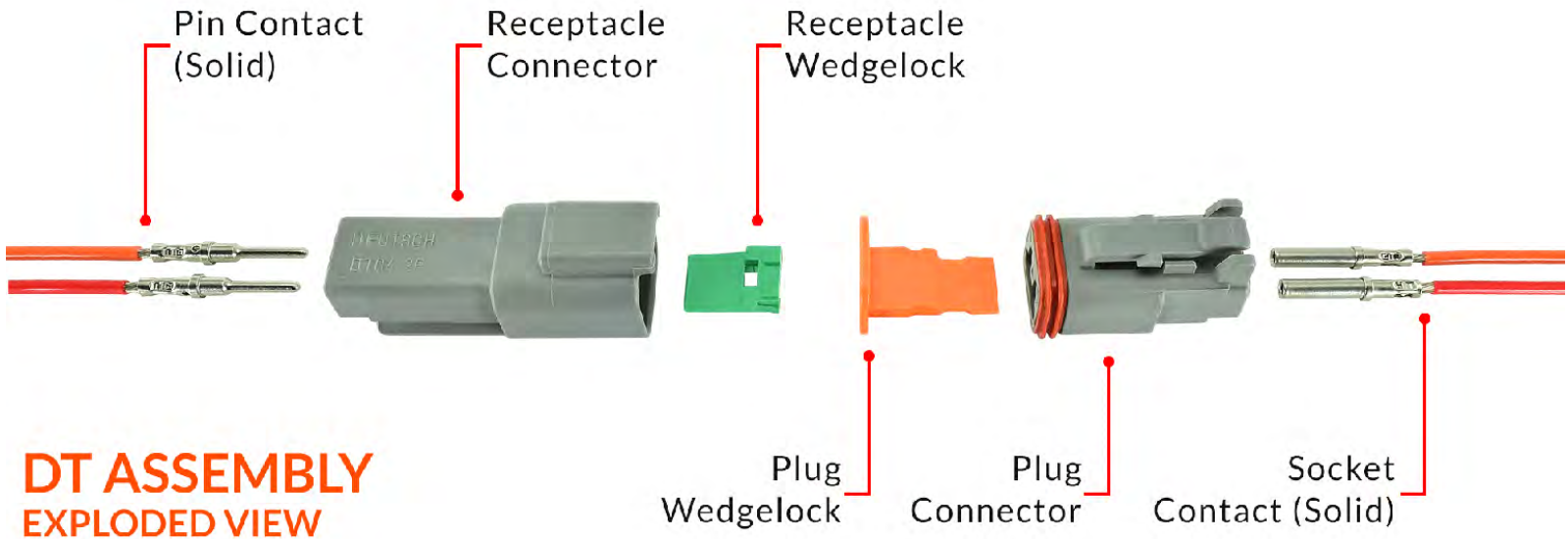
15

REVISIONS

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

12345678

DEUTSCH CONNECTOR ASSEMBLIES



NOTES FOR DEUTSCH CONNECTOR ASSEMBLIES:

- 1. 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.
- 2. FOR 3-CAVITY CONNECTORS, ONLY THE WATER DETECTOR SENSORS UTILIZE THE -CE02 CONNECTOR MODIFICATION, WHICH PROVIDES REDUCED DIAMETER SEALS.
- 3. 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	

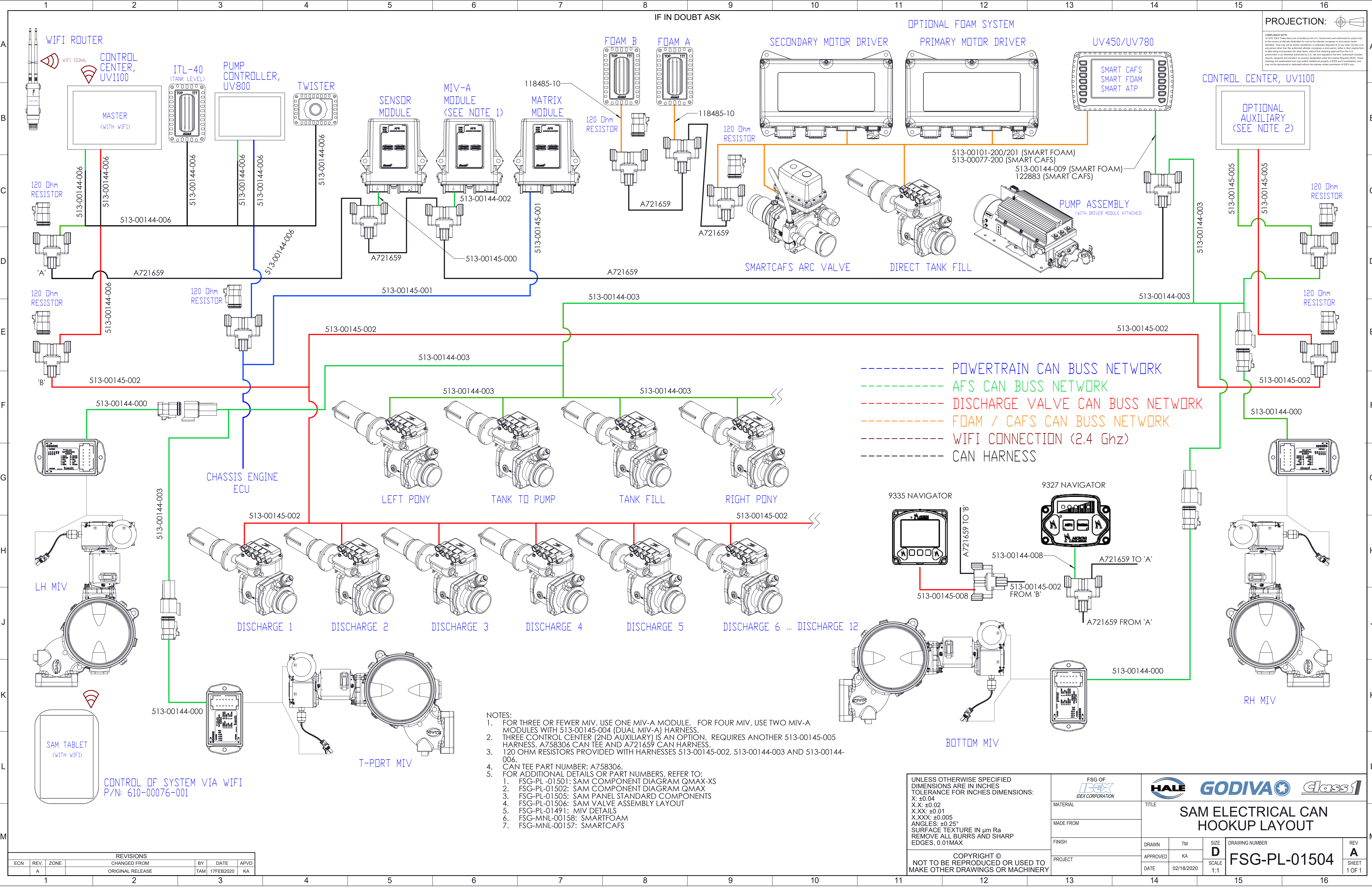
DEUTSCH PLUGS	
STYLE	P/N
DT	114017
DTP	114017
DTM	0413-204-2005

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	FSG OF  IDEX CORPORATION		 GODIVA 				
	MATERIAL		TITLE SAM ELECTRIC COMPONENT PINOUTS				
	MADE FROM						
	FINISH		DRAWN	KTN	SIZE	DRAWING NUMBER FSG-PL-01503	REV
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		APPROVED	MAL	B	C		
		DATE	20NOV2019	SCALE 1:1	SHEET 16 OF 17		



THIS PAGE INTENTIONALLY BLANK.



PROJECTION:

DISCLAIMER NOTE:
13 CFR 120.9 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 consignee or end user(s) without the express written approval of the U.S. Government or an authorized representative of the U.S. Government. These items are controlled under the U.S. Government's export control regulations (13 CFR 120.9) and are not to be re-exported, transferred, or otherwise disposed of to any other country or to any person other than the authorized consignee or end user(s) without the express written approval of the U.S. Government or an authorized representative of the U.S. Government. These items are controlled under the U.S. Government's export control regulations (13 CFR 120.9) and are not to be re-exported, transferred, or otherwise disposed of to any other country or to any person other than the authorized consignee or end user(s) without the express written approval of the U.S. Government or an authorized representative of the U.S. Government.

- 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:
1. 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.
 2. THREE CONTROL CENTER (2ND AUXILIARY) IS AN OPTION, REQUIRES ANOTHER 513-00145-005 HARNESS, A758306 CAN TEE AND A721659 CAN HARNESS.
 3. 120 OHM RESISTORS PROVIDED WITH HARNESSES 513-00145-002, 513-00144-003 AND 513-00144-006.
 4. CAN TEE PART NUMBER: A758306.
 5. FOR ADDITIONAL DETAILS OR PART NUMBERS, REFER TO:
 1. FSG-PL-01501: SAM COMPONENT DIAGRAM QMAX-XS
 2. FSG-PL-01502: SAM COMPONENT DIAGRAM QMAX
 3. FSG-PL-01505: SAM PANEL STANDARD COMPONENTS
 4. FSG-PL-01506: SAM VALVE ASSEMBLY LAYOUT
 5. FSG-PL-01491: MIV DETAILS
 6. FSG-MNL-00158: SMARTFOAM
 7. FSG-MNL-00157: SMARTCAFS

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 		TITLE SAM ELECTRICAL CAN HOOKUP LAYOUT	
MATERIAL		MADE FROM		DRAWN TM	
FINISH		PROJECT		APPROVED KA	
DATE 02/18/2020		SCALE 1:1		DRAWING NUMBER FSG-PL-01504	
NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		COPYRIGHT © 2020 IDEX CORPORATION		REV A SHEET 1 OF 1	

REVISIONS					
ECN	REV.	ZONE	CHANGED FROM	BY	DATE
	A		ORIGINAL RELEASE	TAM	17FEB2020



THIS PAGE INTENTIONALLY BLANK.

NOTES

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

STANDARD PANEL MOUNTED SAM COMPONENTS
SUPPLIED WITH EVERY SAM SYSTEM

CONTROL CENTER, UV1100

- MASTER
- P/N: 610-00060-210
 - HARNESS: 513-00144-006
- AUXILIARY
- P/N: 610-00060-110
 - HARNESS: 513-00145-005
- BRACKET: 629-00071 (X1)

PUMP CONTROLLER, UV800

- P/N: 610-00060-080
- HARNESS
- CAN: 513-00144-006
 - AUDIO/VIDEO: 513-00144-005 & GROUND LOOP ISOLATOR 200-00156-000
- BRACKET: 629-00068 (X2)

TANK LEVEL, ITL40

- P/N: ITL-40 (WATER) / ITLF-40 (FOAM)
- HARNESS
- WATER: 513-00144-006
 - FOAM: 118485-10
- MANUAL: 118253

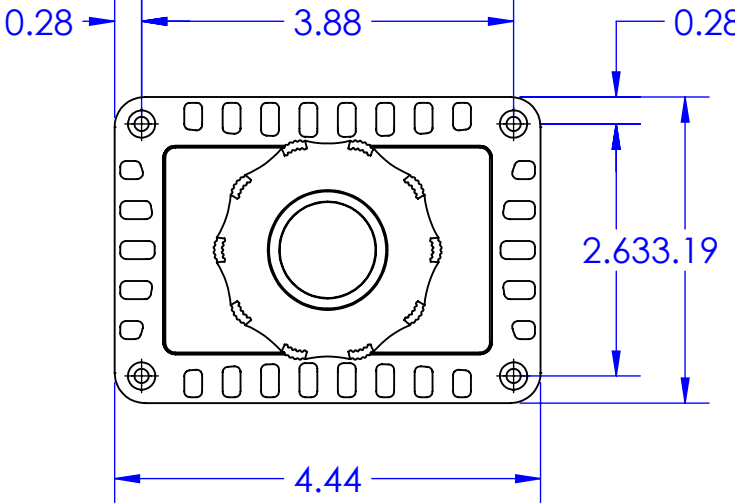
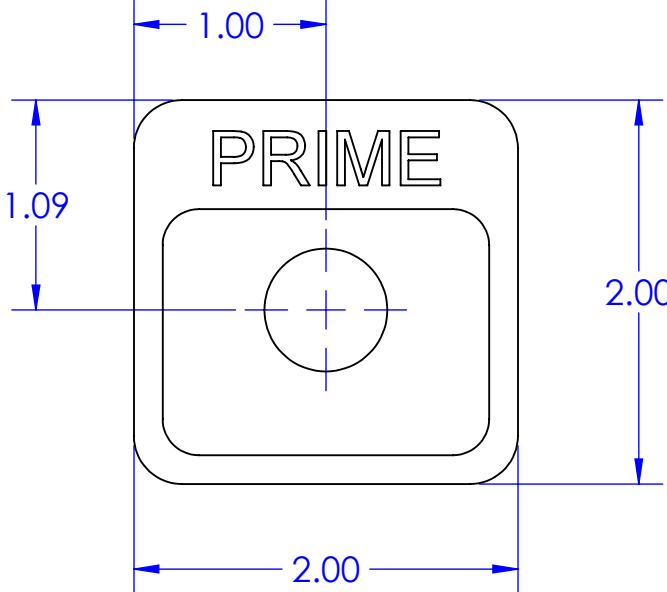
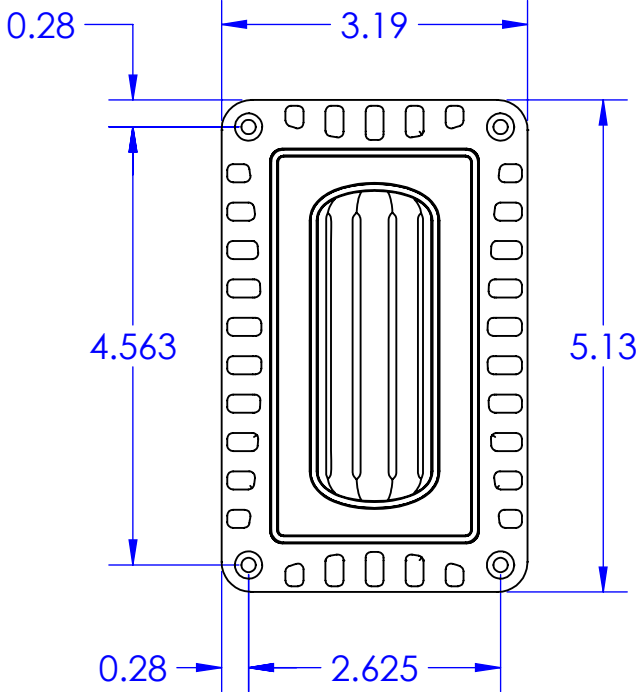
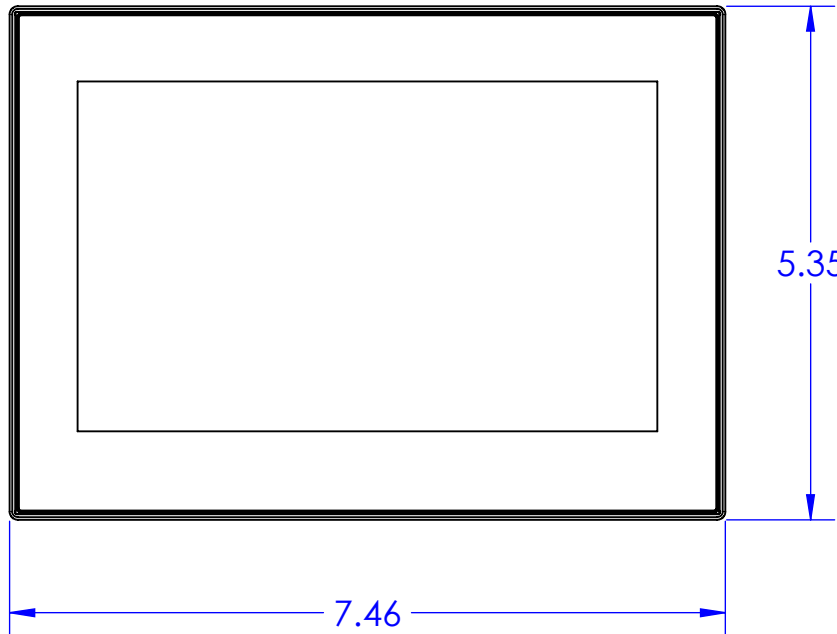
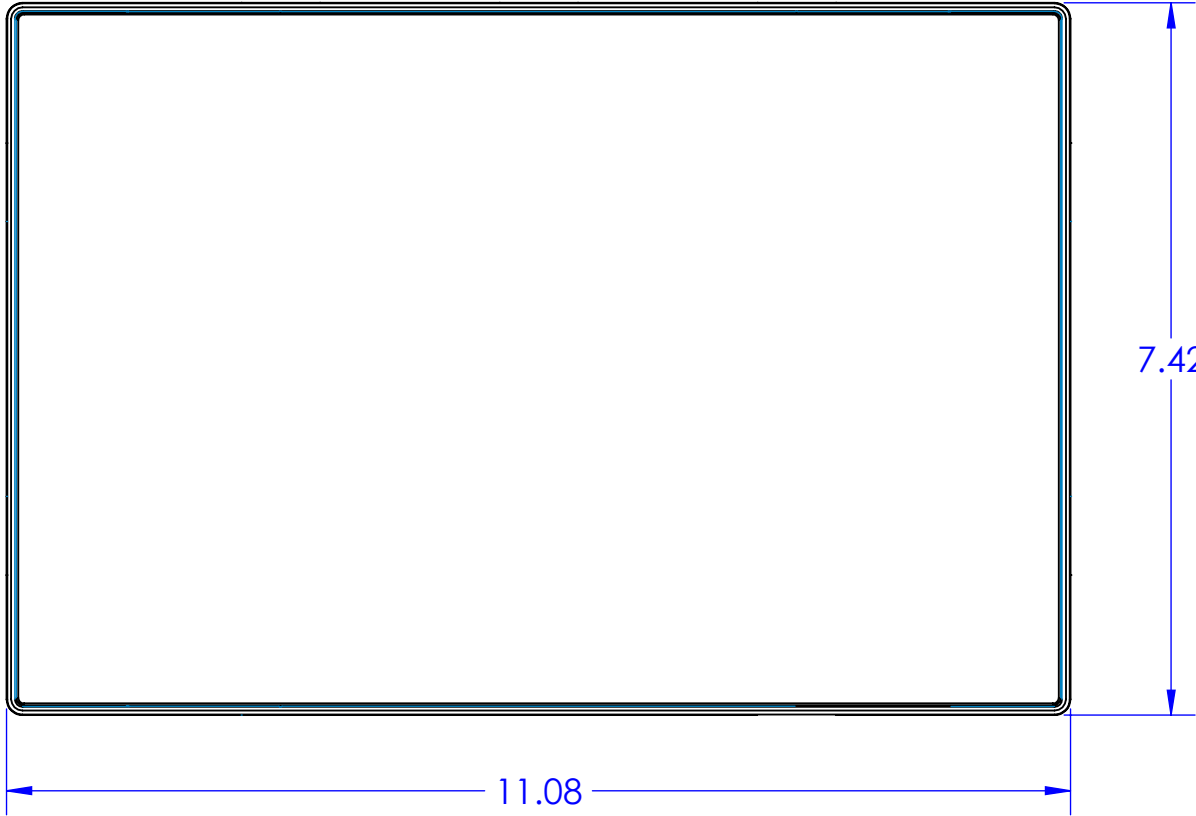
PRIMER CONTROL BUTTON

- P/N: 200-0120-04-0
- HARNESS: 513-00144-002

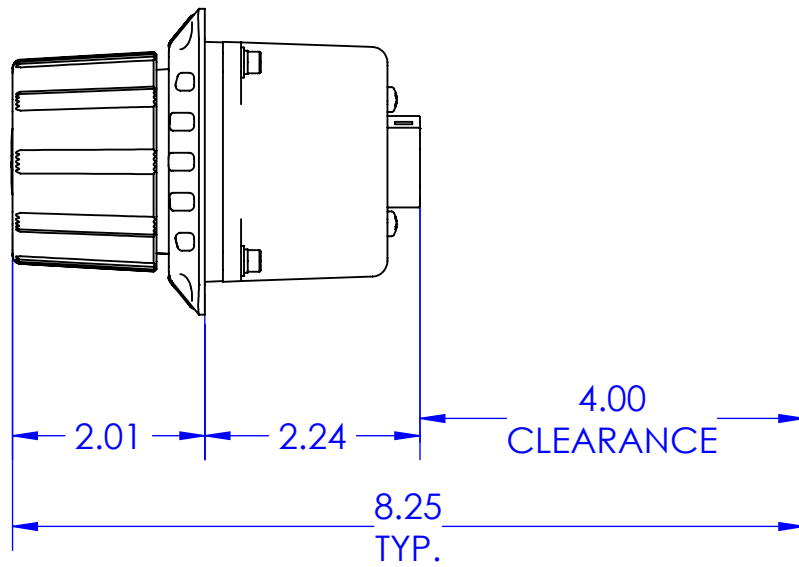
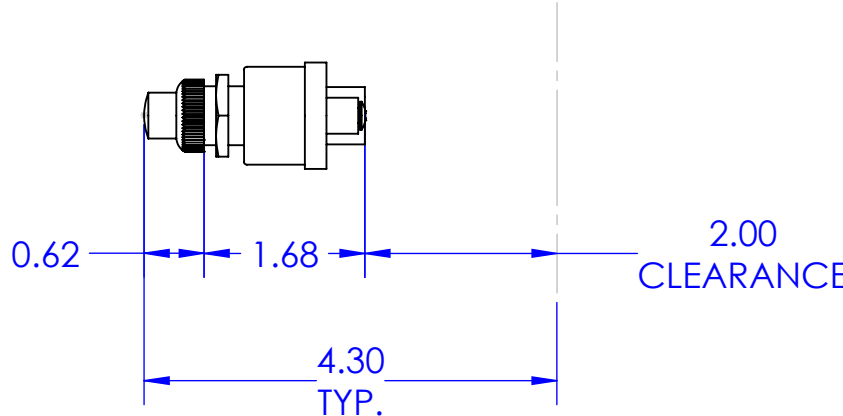
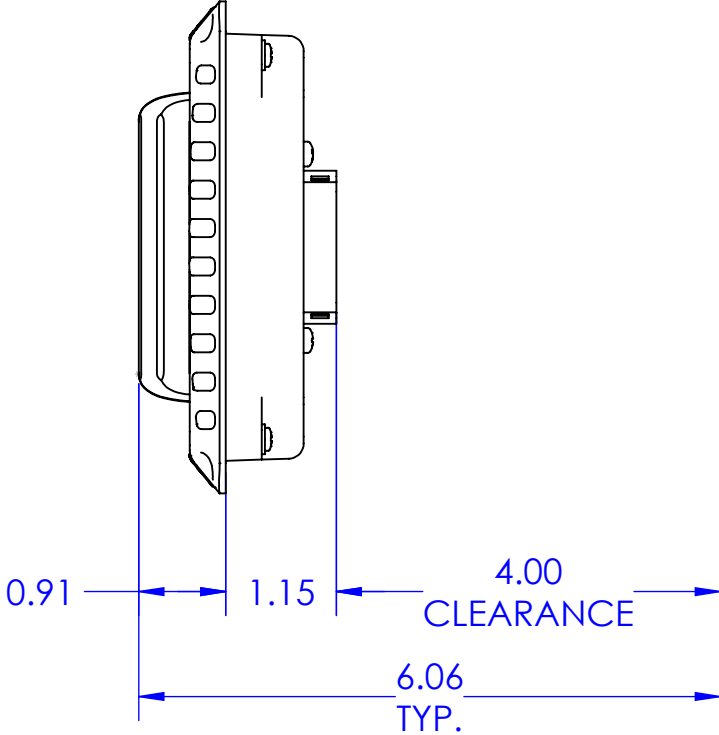
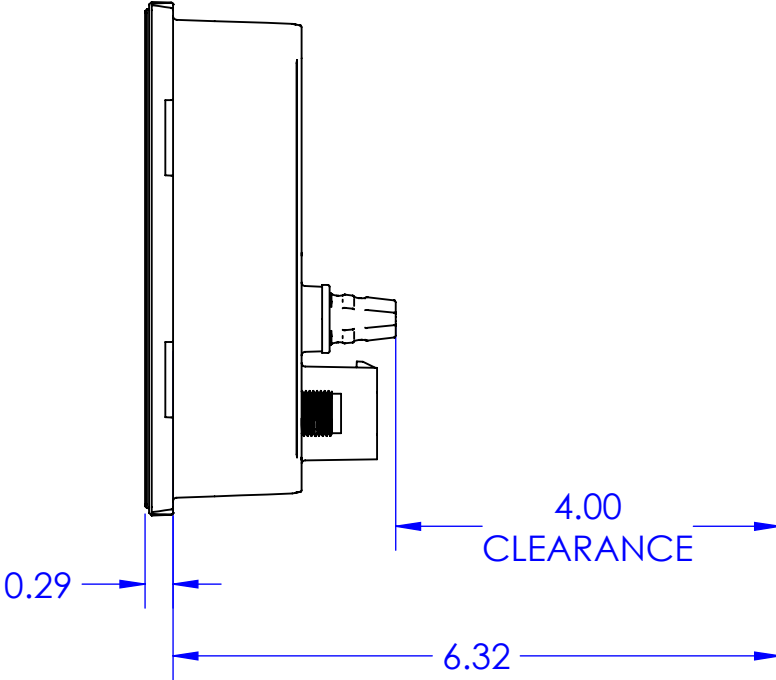
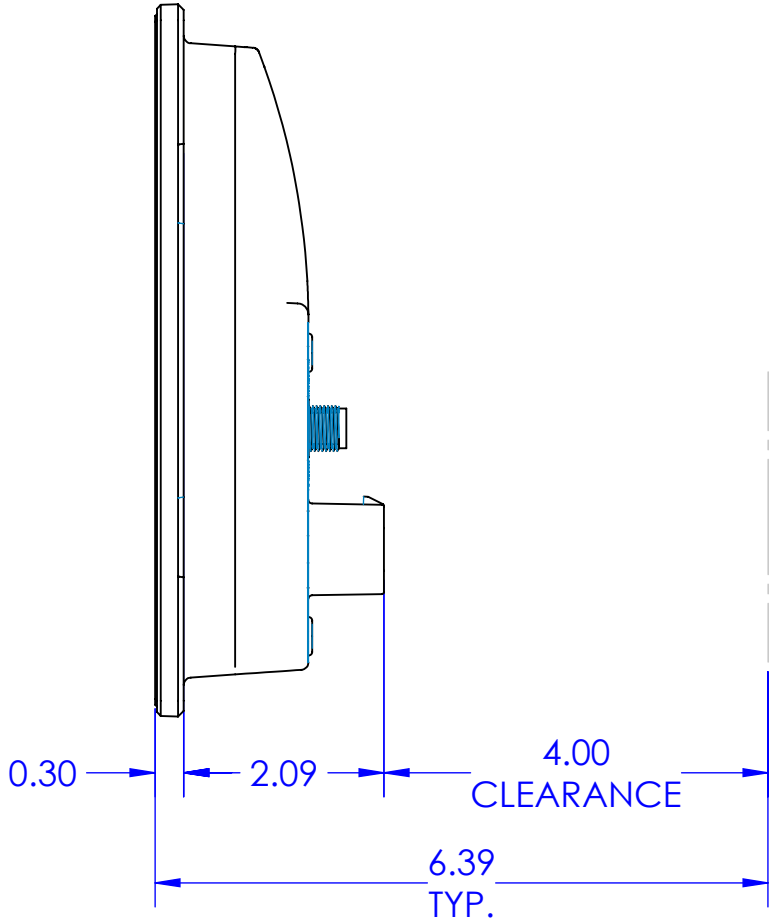
TWISTER

- P/N: 119970
- HARNESS: 513-00144-006
- MANUAL: 120477

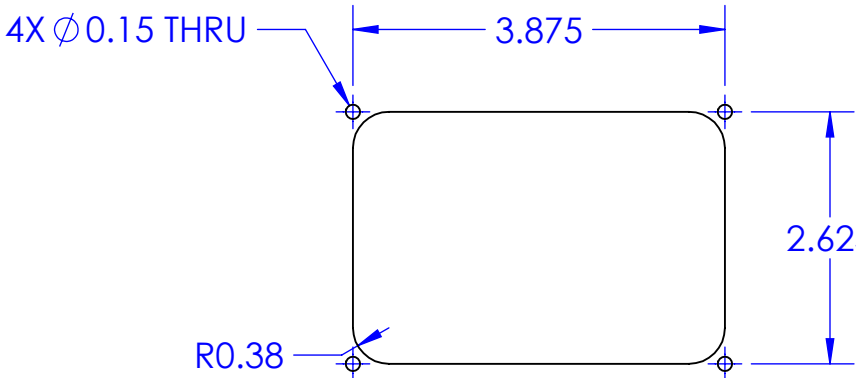
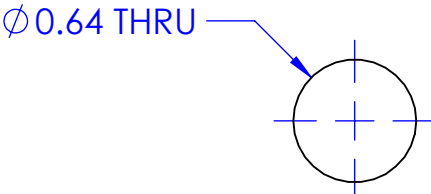
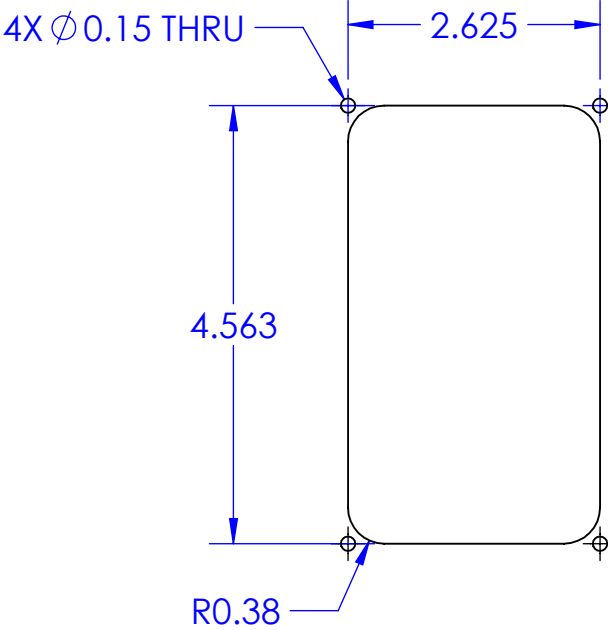
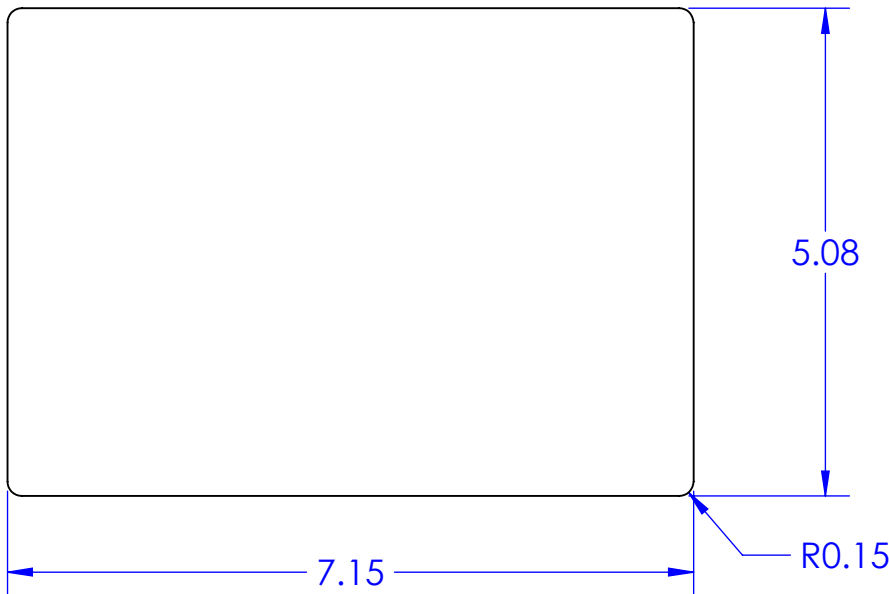
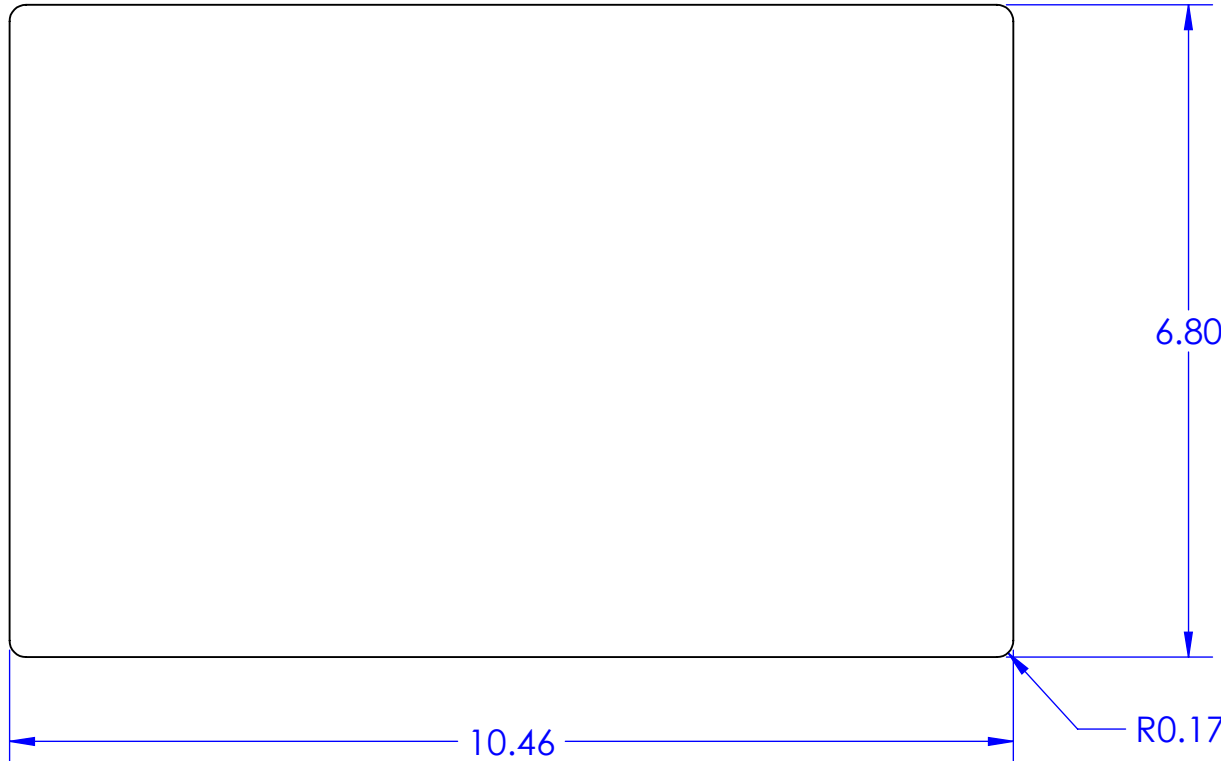
FRONT DIMENSIONS



SIDE DIMENSIONS



PANEL CUTOUTS



REVISIONS					
ECN	REV.	ZONE	CHANGED FROM	BY	DATE
	A		ORIGINAL RELEASE	AJG	24FEB2020
	B		ADDED PLACARD P/N FOR MIV ACTIVATION BUTTON AND IDLE OVERRIDE SWITCH	TAM	05MAR2020

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 class1	
MATERIAL		MADE FROM		FINISH	
PROJECT		DATE		DRAWN APPROVED	
NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		24FEB2020		MB TAM	
		SIZE SCALE		DRAWING NUMBER FSG-PL-01505	
				REV SHEET	

NOTES

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

IF IN DOUBT ASK

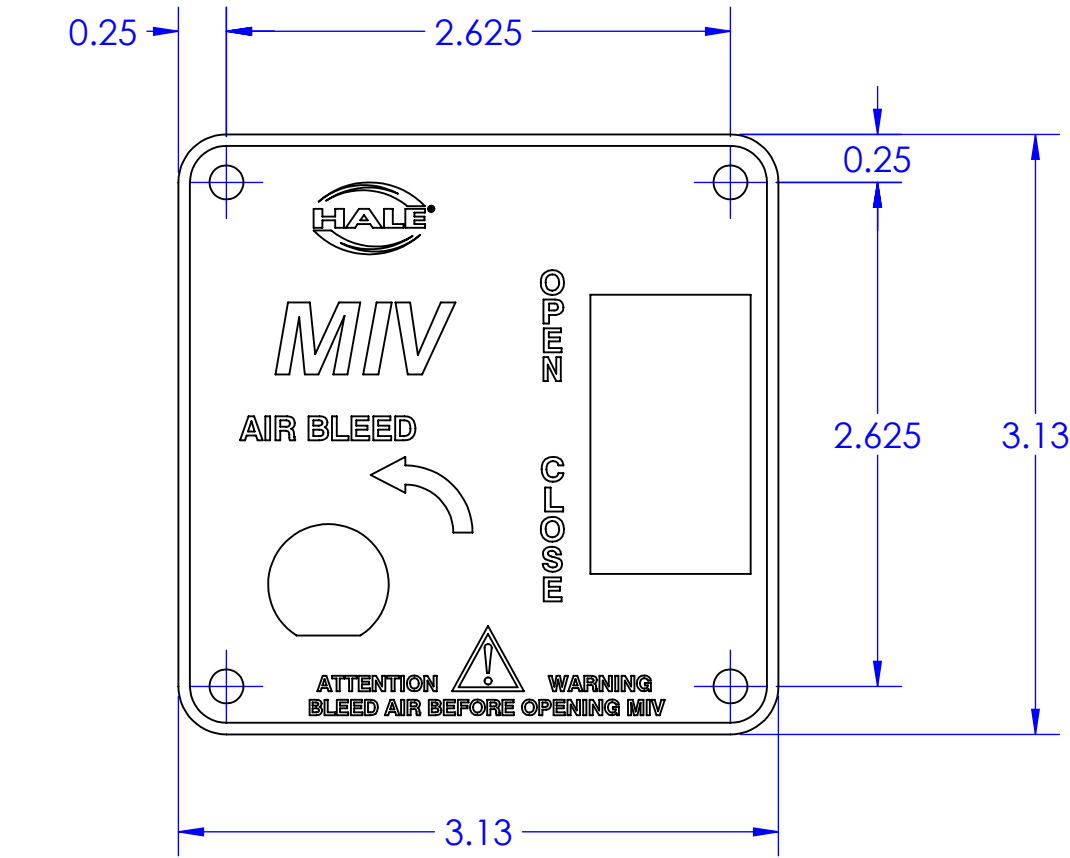
STANDARD PANEL MOUNTED SAM COMPONENTS
SUPPLIED WITH EVERY SAM SYSTEM

PROJECTION:

COPYRIGHT NOTICE:
15 CFR 758.9 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) herein without the express written approval of the U.S. Government or as otherwise authorized by U.S. law and without the express written approval of the U.S. Government or as otherwise authorized by U.S. law and without the express written approval of the U.S. Government or as otherwise authorized by U.S. law and without the express written approval of the U.S. Government. These drawings are trademarks and copy without restriction property of IDEX and its subsidiaries and may not be reproduced or replicated without the express written permission of IDEX Corp.

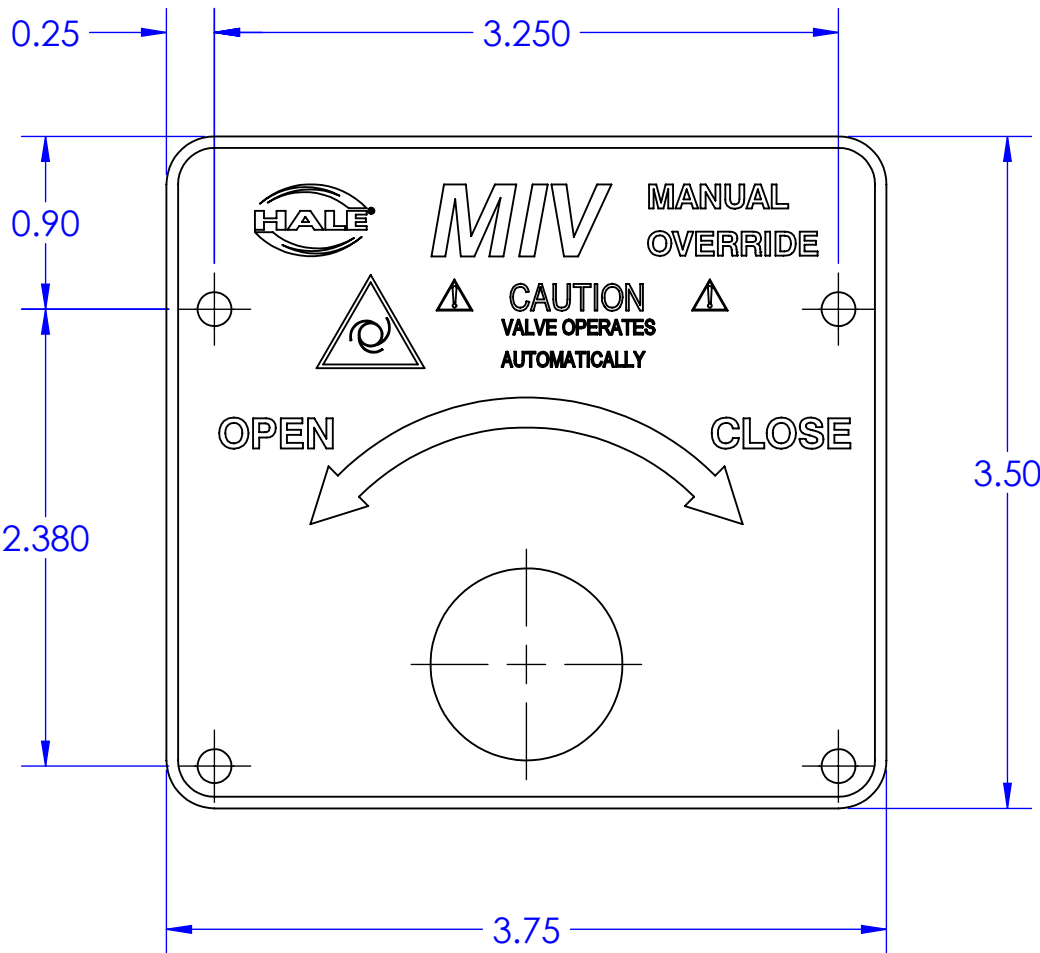
MIV-E OVERRIDE PANEL ASSEMBLY

(1 PER MIV)
P/N: 513-0273-52-0
HARNESS: 513-00144-000



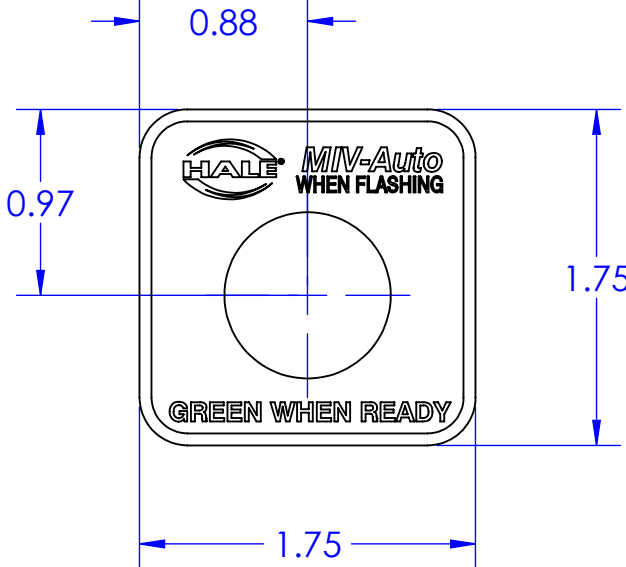
MIV MANUAL OVERRIDE PANEL

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



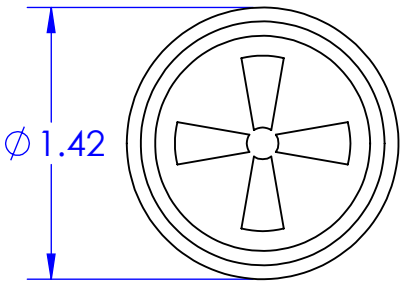
MIV ACTIVATION BUTTON

(1 PER MIV)
P/N: 622-00043-000
PLACARD: 101-1482-04-0
HARNESS: 513-00144-002
NOTE : LOCATE NEAR SUCTION CONNECTION OF MIV



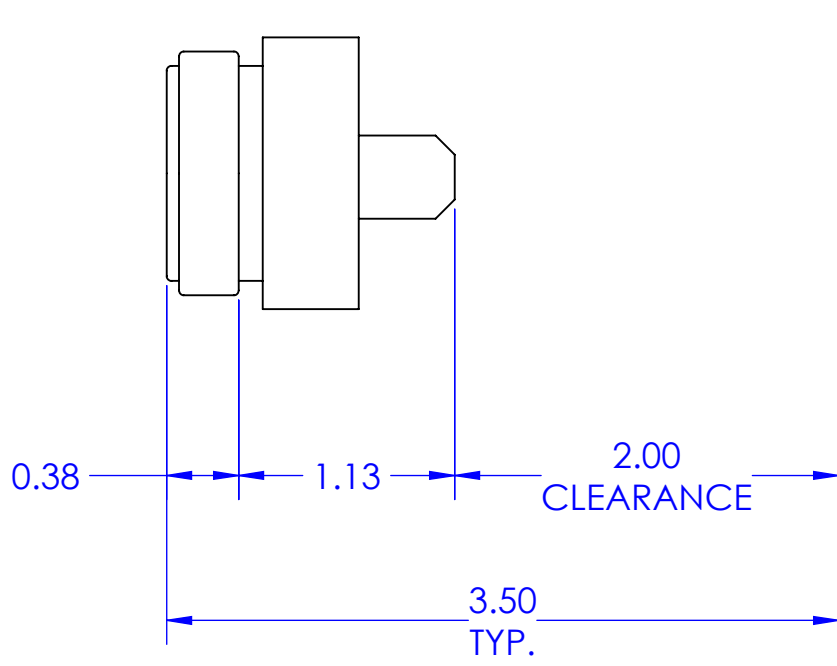
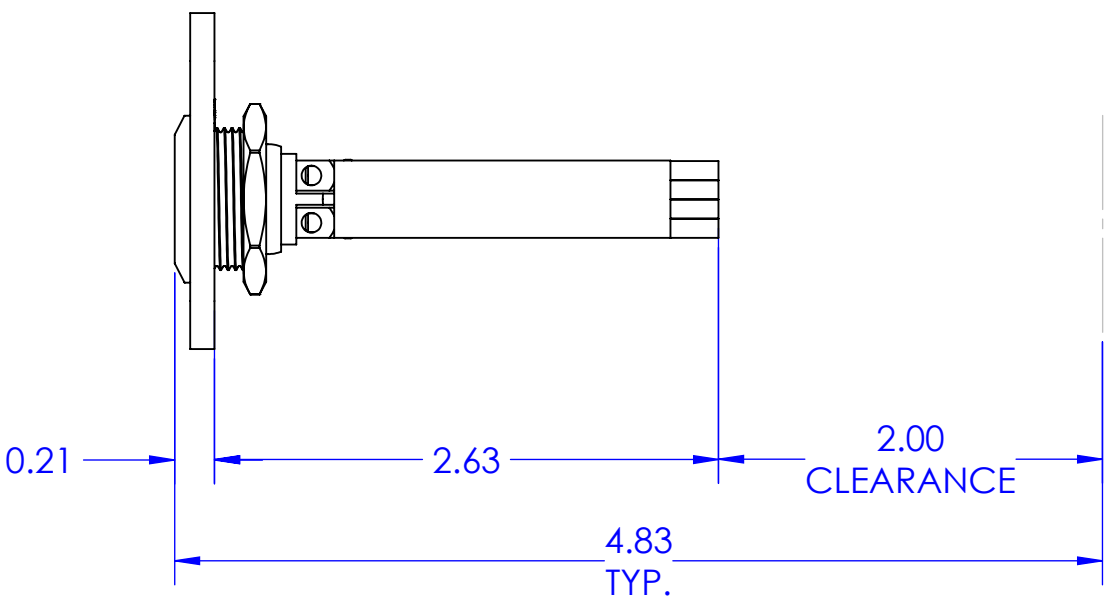
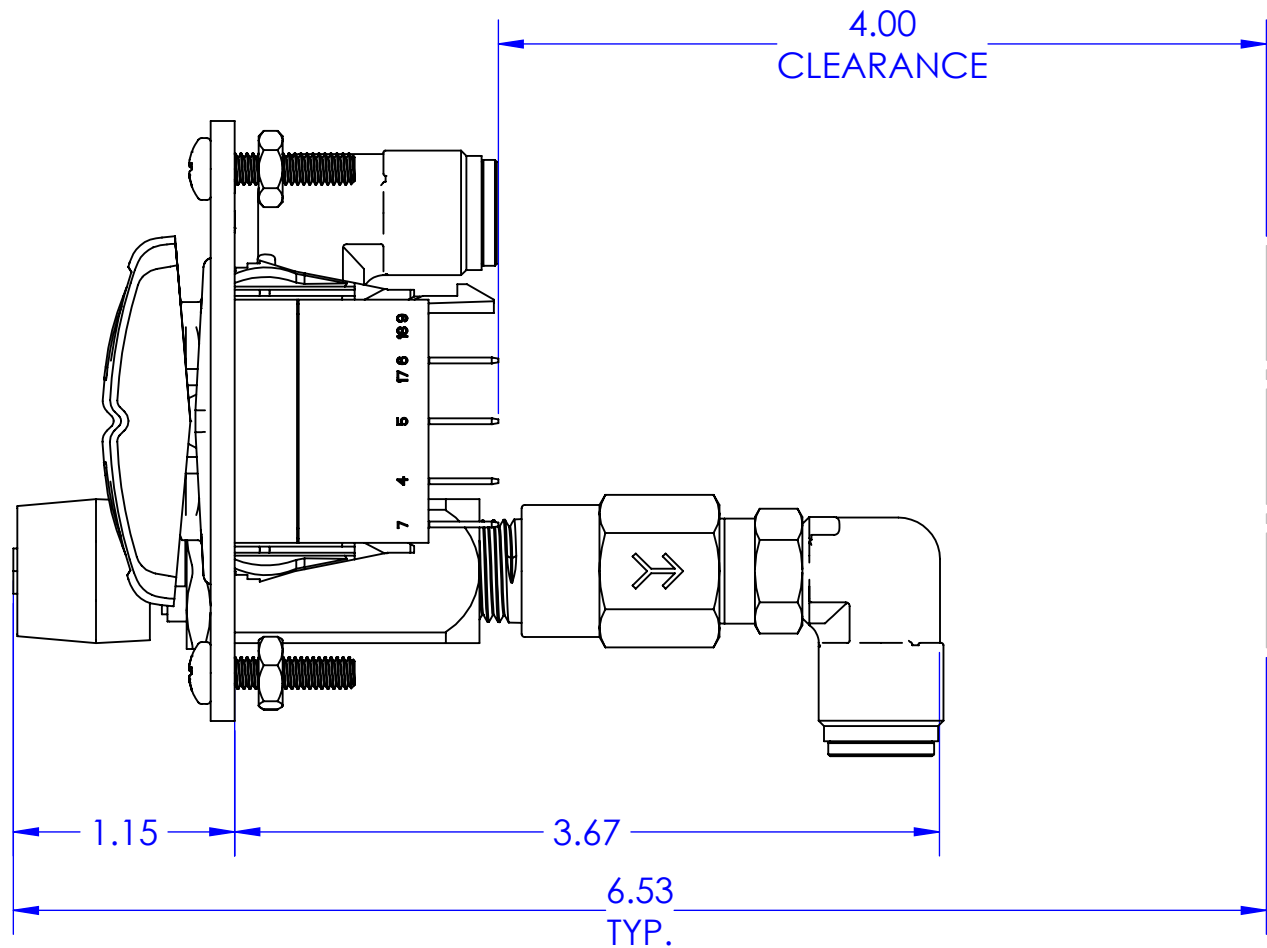
BUZZER

(1 PER CONTROL CENTER)
P/N: 105503
HARNESS: 513-00144-006
NOTE: LOCATE NEAR CONTROL CENTER

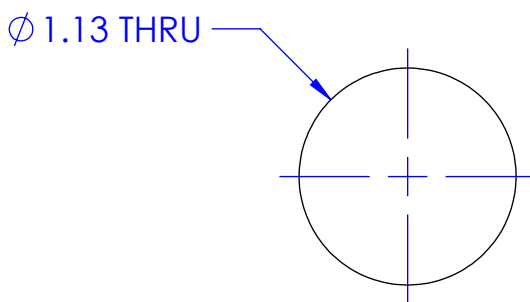
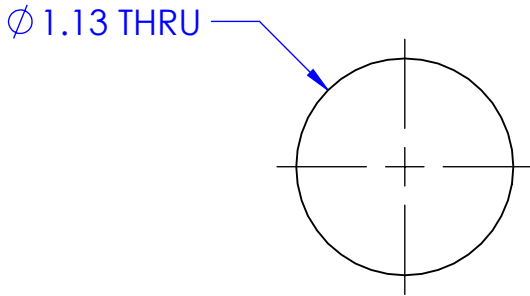
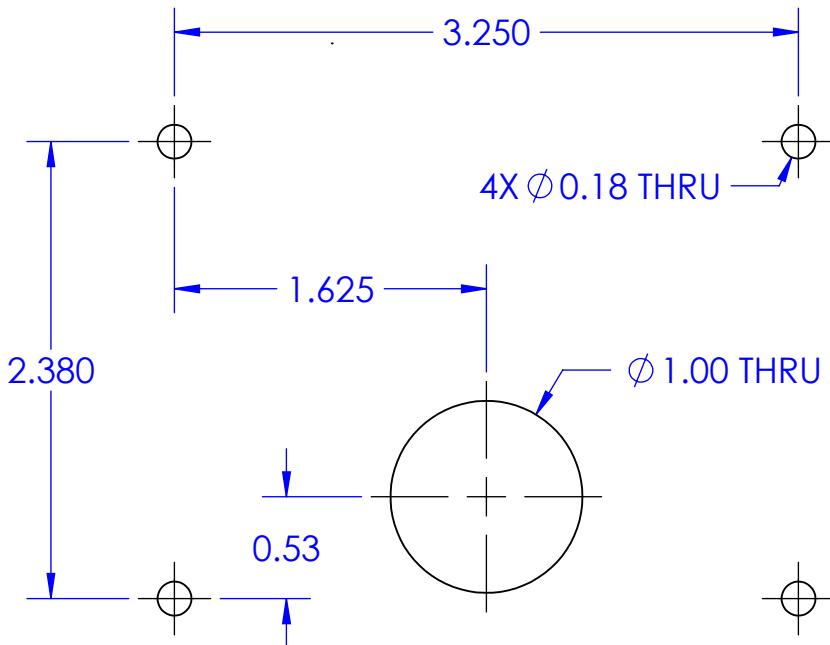
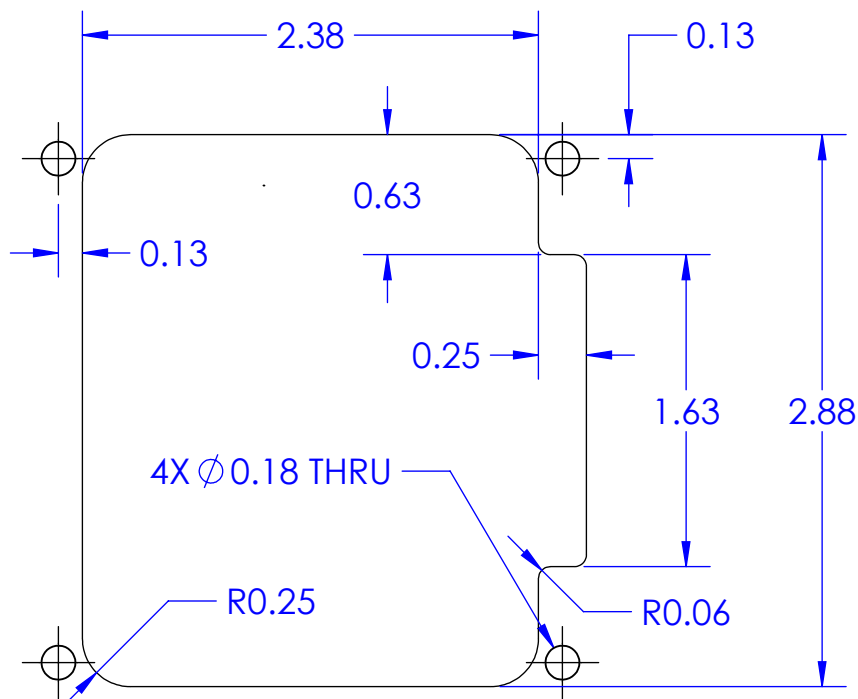


FRONT DIMENSIONS

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

FSG OF
IDEX CORPORATION

MATERIAL

MADE FROM

FINISH

PROJECT

HALE

GODIVA

class1

TITLE

SAM - PANEL COMPONENT DETAILS

DRAWN

APPROVED

DATE

KTN

TAM

24FEB2020

SIZE
D

SCALE
1:24

DRAWING NUMBER
FSG-PL-01505

REV
B

SHEET
2 OF 5

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

COPYRIGHT ©

PROJECTION: 

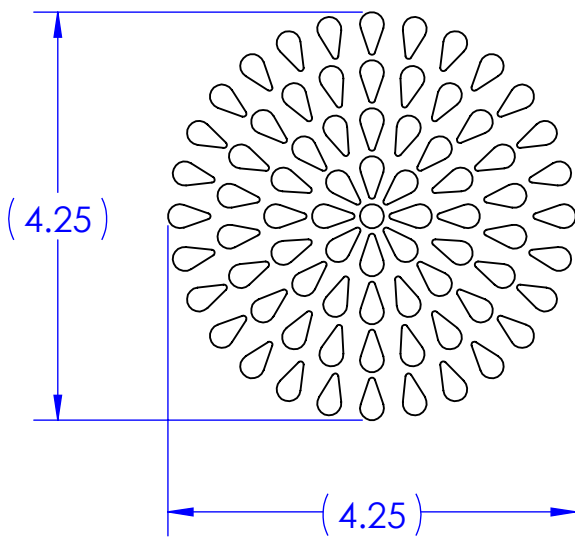
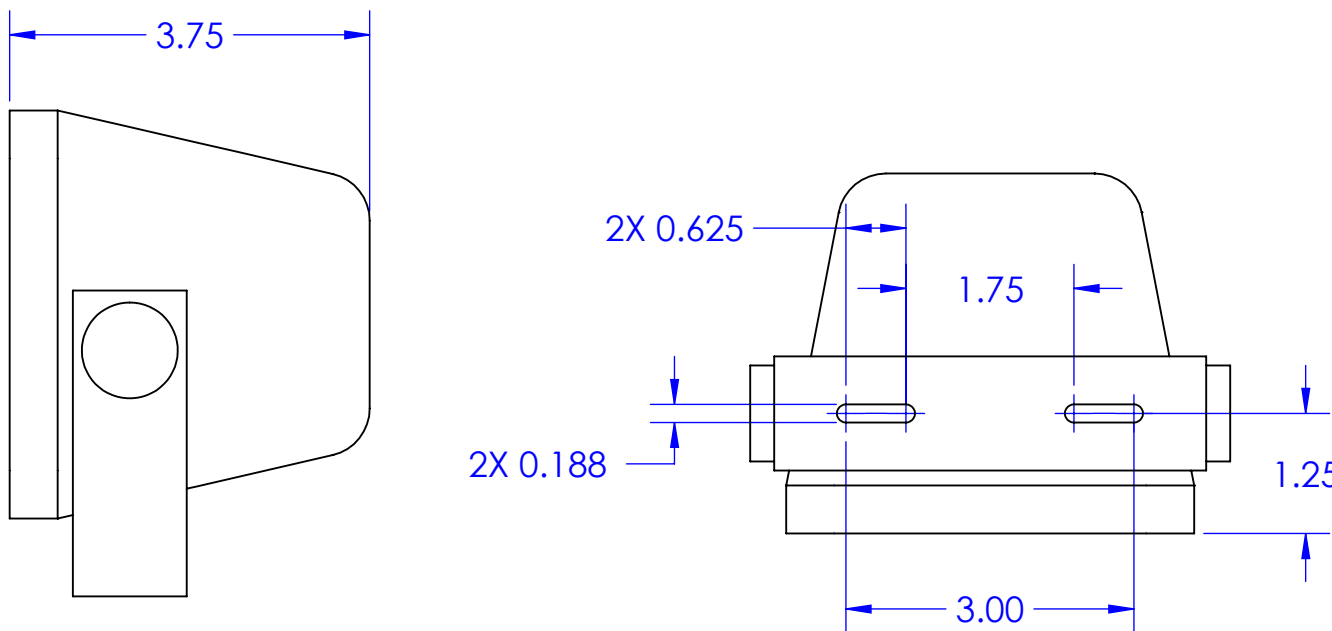
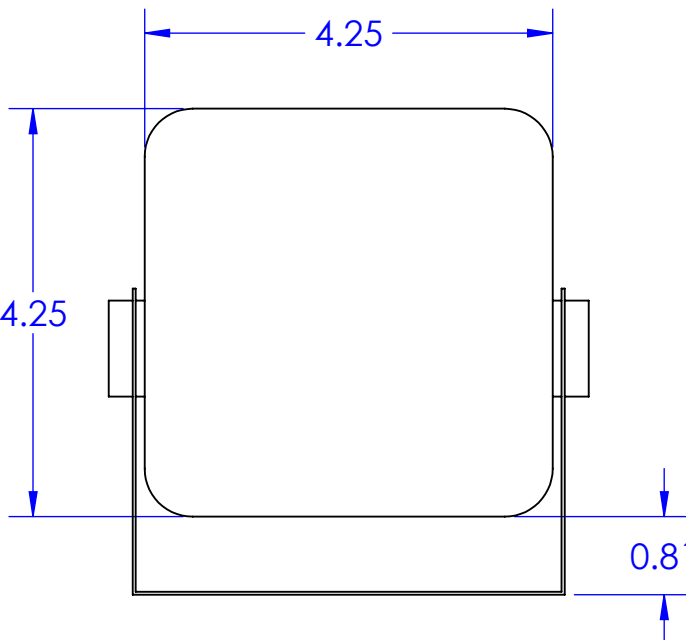
COMPLIANCE NOTE: 15 CFR 758.6 These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be resold, transferred, or otherwise disposed of, to any other country 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 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.

(4 SPEAKERS PROVIDED PER UNIT)

P/N: 200-00157-000

HARNESS: 513-00144-007

HARNESS: 513-00144-007



- LOCATION FOR HIGH SPEAKERS (LEFT AND RIGHT SIDE) SHOULD BE BEHIND AN UPPER PANEL.
- LOCATION FOR LOW SPEAKERS (LEFT AND RIGHT SIDE) SHOULD BE LOWER IN THE MODULE COMPARTMENT.

FSG OF
IDEX
IDEX CORPORATION

MATERIAL

TITLE

SAM - PANEL COMPONENT DETAILS

FINISH

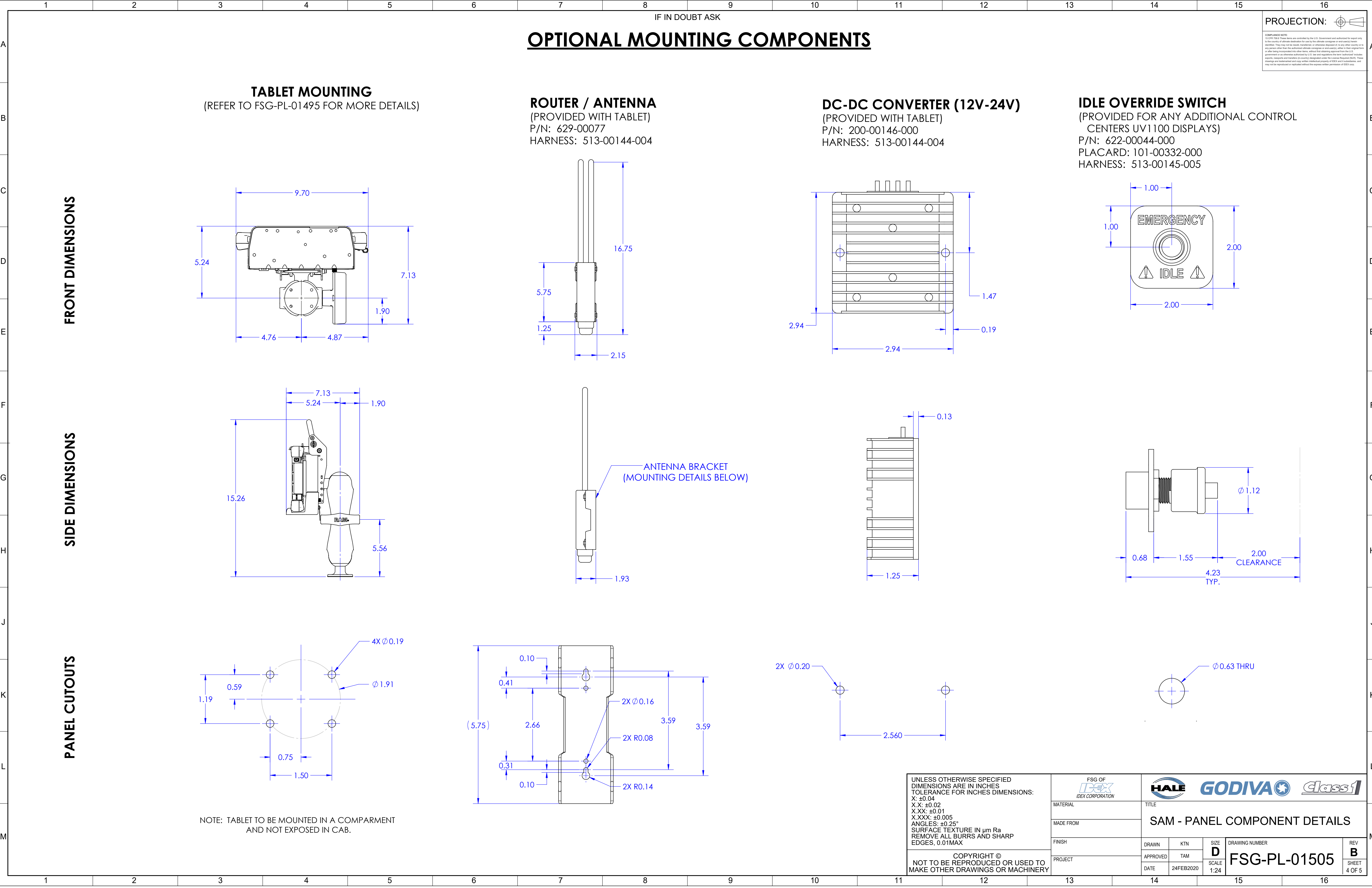
DRAWN	KTN
-------	-----

SIZE	DRAWING NUMBER
------	----------------

D
SCALE
1:24

FSG-PL-01505

B
SHEE
3 OF



PROJECTION:

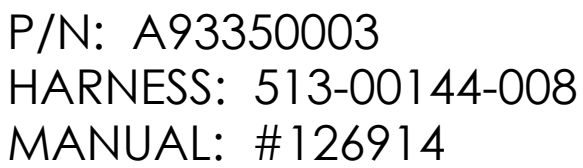
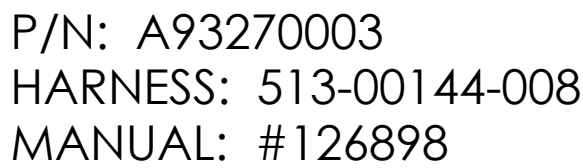
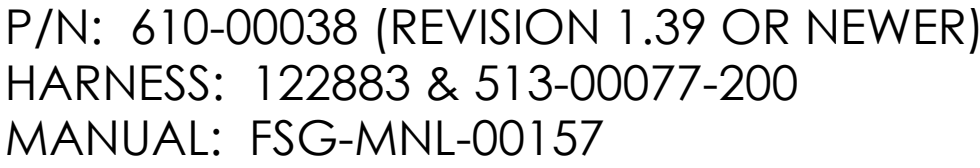
COPYRIGHT NOTICE:
15 CFR 708.9 These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end user(s) herein identified. They may not be re-exported, transferred, or otherwise disposed of to any other country or to any person other than the authorized consignee or end user(s) herein without the express written approval of the U.S. Government or an otherwise authorized U.S. law and regulations for items authorized for export. These drawings are reproduced and copy without restriction of U.S. and U.S. citizens and may not be reproduced or replicated without the express written permission of IDEX Corp.

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		TITLE 	
MATERIAL		MADE FROM		DRAWN KTN	
FINISH		PROJECT		APPROVED TAM	
DATE 24FEB2020		SIZE D		DRAWING NUMBER	
NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		SCALE 1:24		REV B	
				SHEET 4 OF 5	

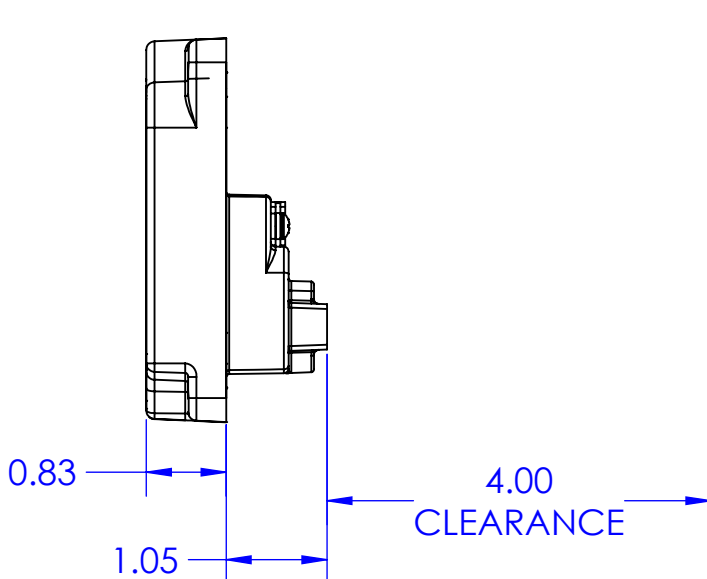
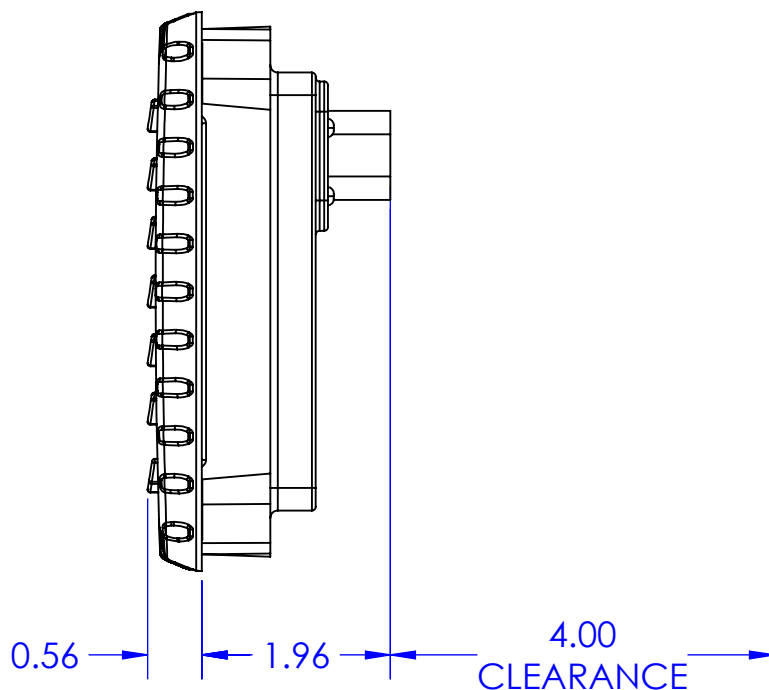
OPTIONAL MOUNTING COMPONENTS

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 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.

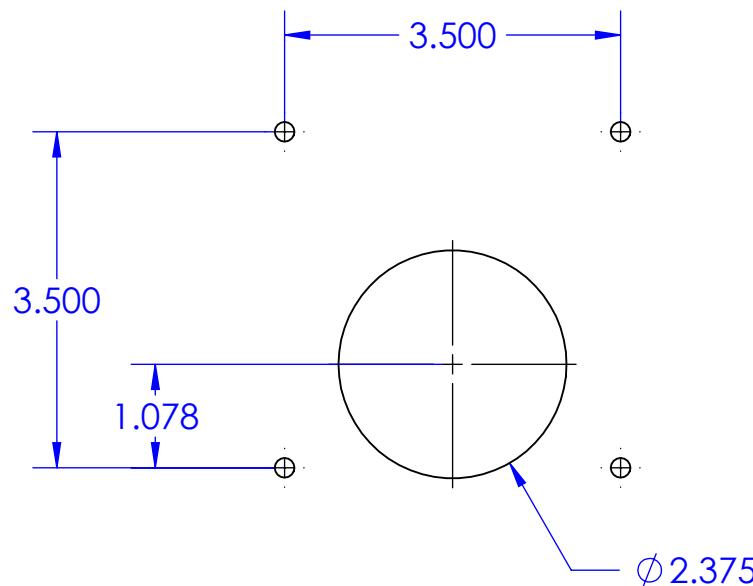
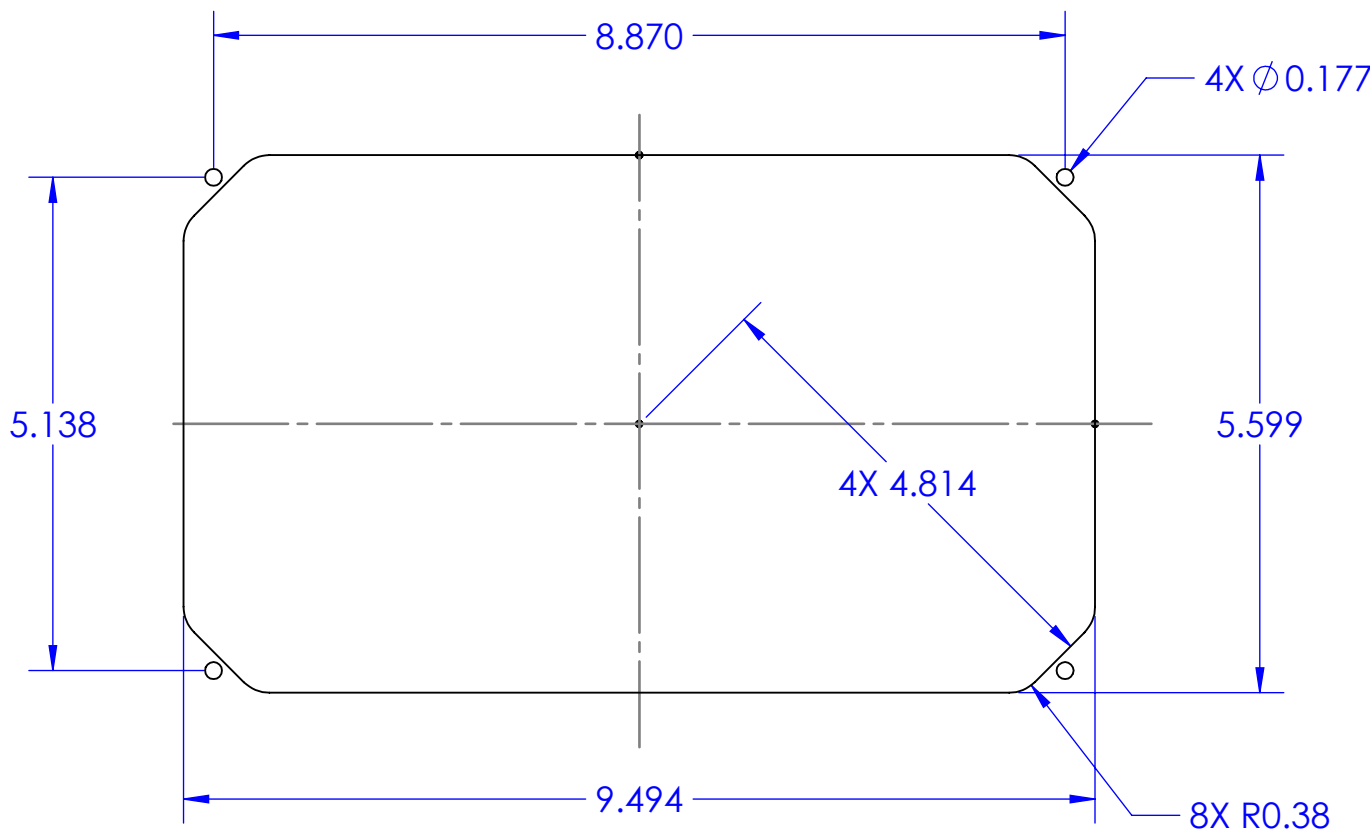
P/N: 610-00039 (REVISION 1.25 OR NEWER)
HARNESS: 513-00144-009 & 513-00101-200/201
MANUAL: FSG-MNL-00158



SIDE DIMENSIONS



PANEL CUTOUTS



			
TITLE			
SAM - PANEL COMPONENT DETAILS			

DRAWN	KTN	SIZE	DRAWING NUMBER	REV
APPROVED	TAM	D	FSG-PL-01505	B
DATE	24FEB2020	SCALE 1:2		SHEET 5 OF 5



THIS PAGE INTENTIONALLY BLANK.

1

2

3

4

5

6

7

8

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.

3

4

NOTE 3

AKRON 8840

CLOSE VALVE TO REMOVE

100 PSI RATED

250 PSI RATED

2

NOTE 1

1

NOTE 2

5

6

7

8

NOTE 4

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:

AKRON 8840

CLOSE VALVE TO REMOVE

100 PSI RATED

250 PSI RATED

SEE NOTE 3

3

2

1

4

5

6

NOTES 1 & 2

NOTE 4

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

FSG OF IDEX IDEX CORPORATION

MATERIAL

MADE FROM

FINISH

PROJECT

HALE

GODIVA

class1

TITLE

SAM VALVE ASSEMBLY LAYOUT

DRAWN

KTN

DATE

30JAN2020

APPROVED

TAM

SCALE

1:3

DRAWING NUMBER

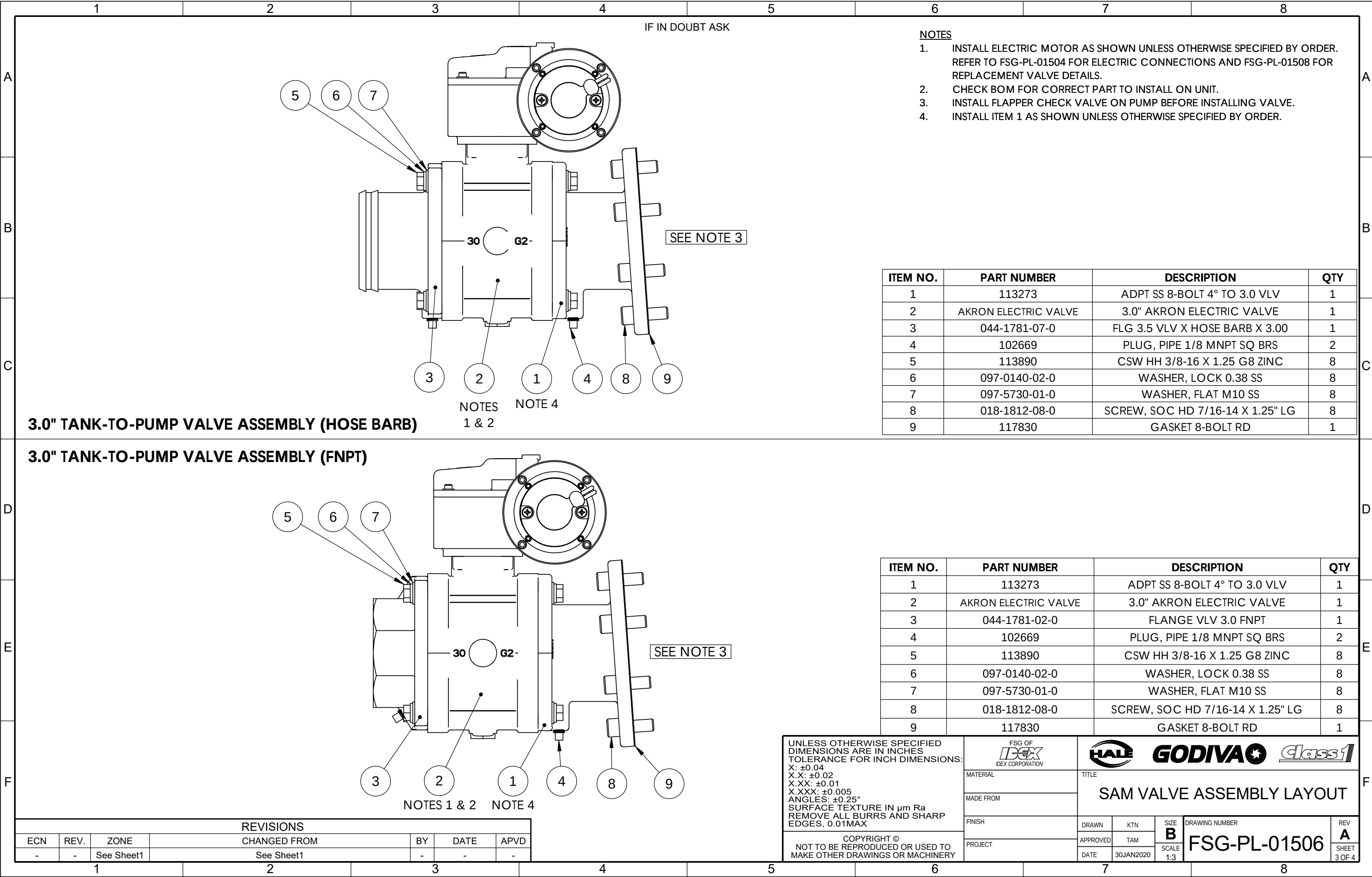
FSG-PL-01506

REV

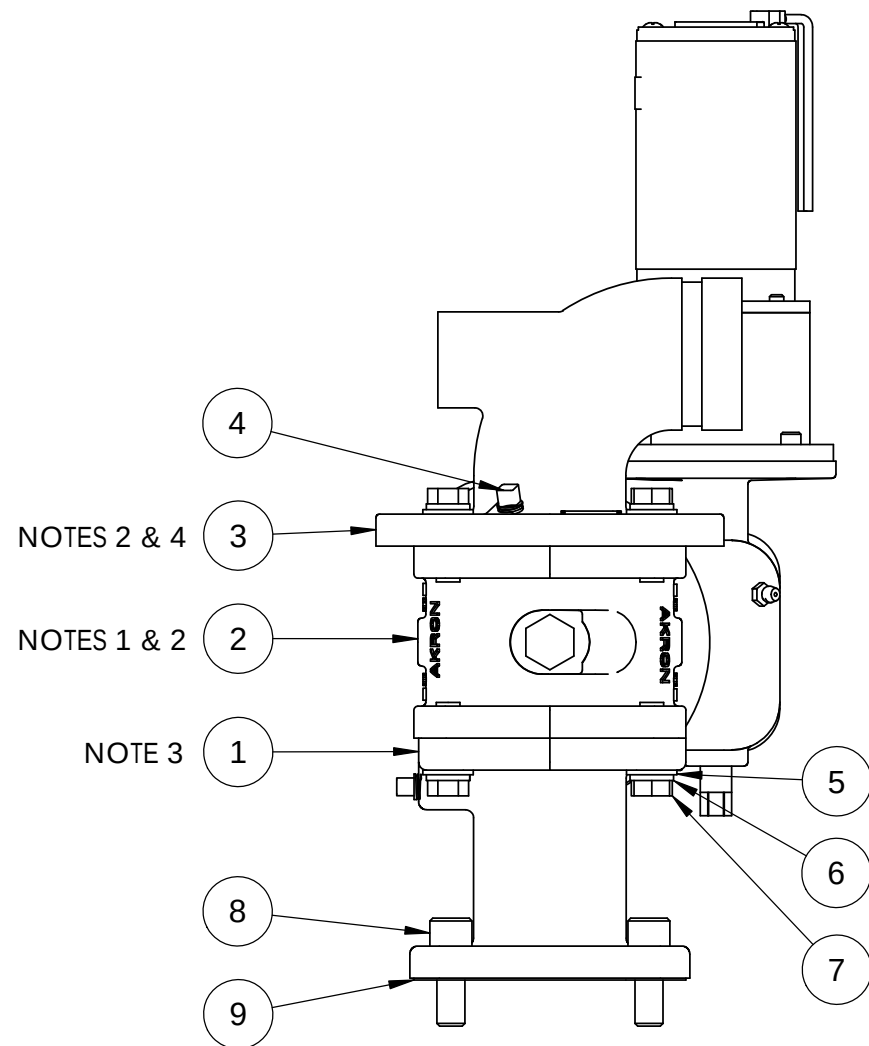
A

SHEET

2 OF 4



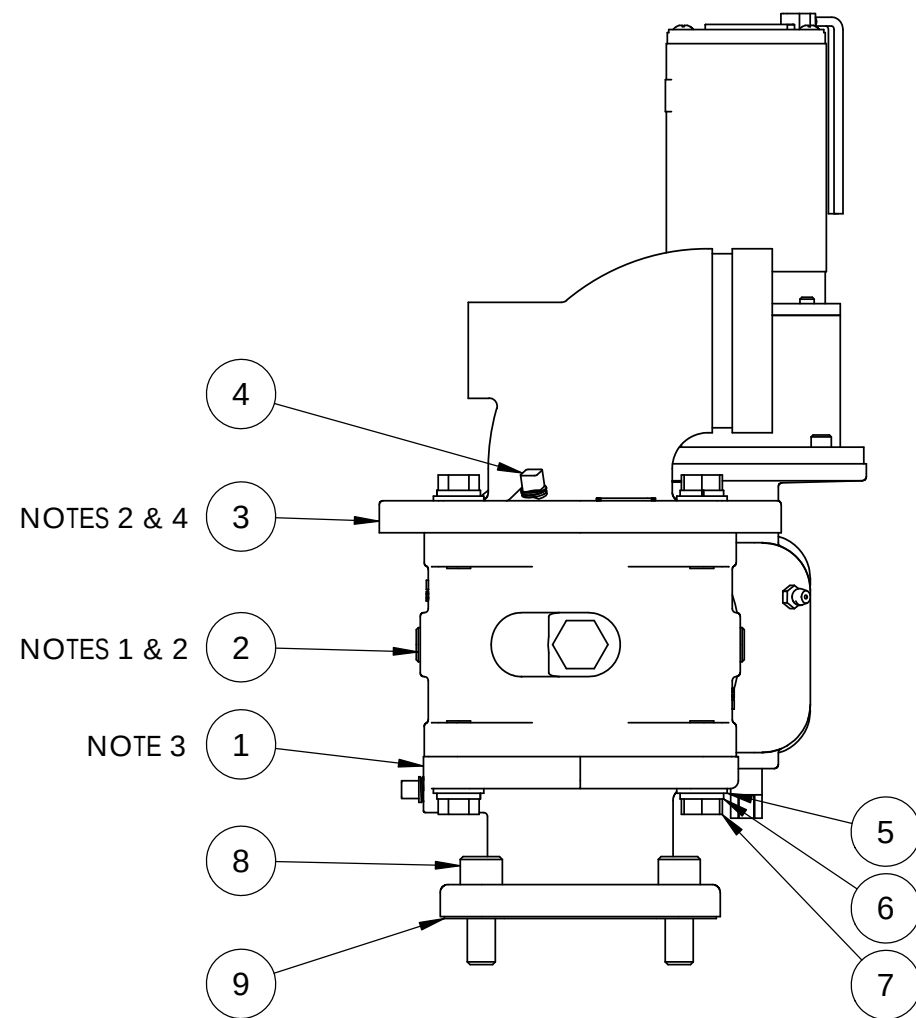
1. INSTALL ELECTRIC MOTOR AS SHOWN UNLESS OTHERWISE SPECIFIED BY ORDER. REFER TO FSG-PL-01504 FOR ELECTRIC CONNECTIONS AND FSG-PL-01508 FOR REPLACEMENT VALVE DETAILS.
2. CHECK BOM FOR CORRECT PART TO INSTALL ON UNIT.
3. INSTALL ASSEMBLY TO PORT B UNLESS OTHERWISE SPECIFIED BY ORDER.
4. INSTALL ITEM 3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



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

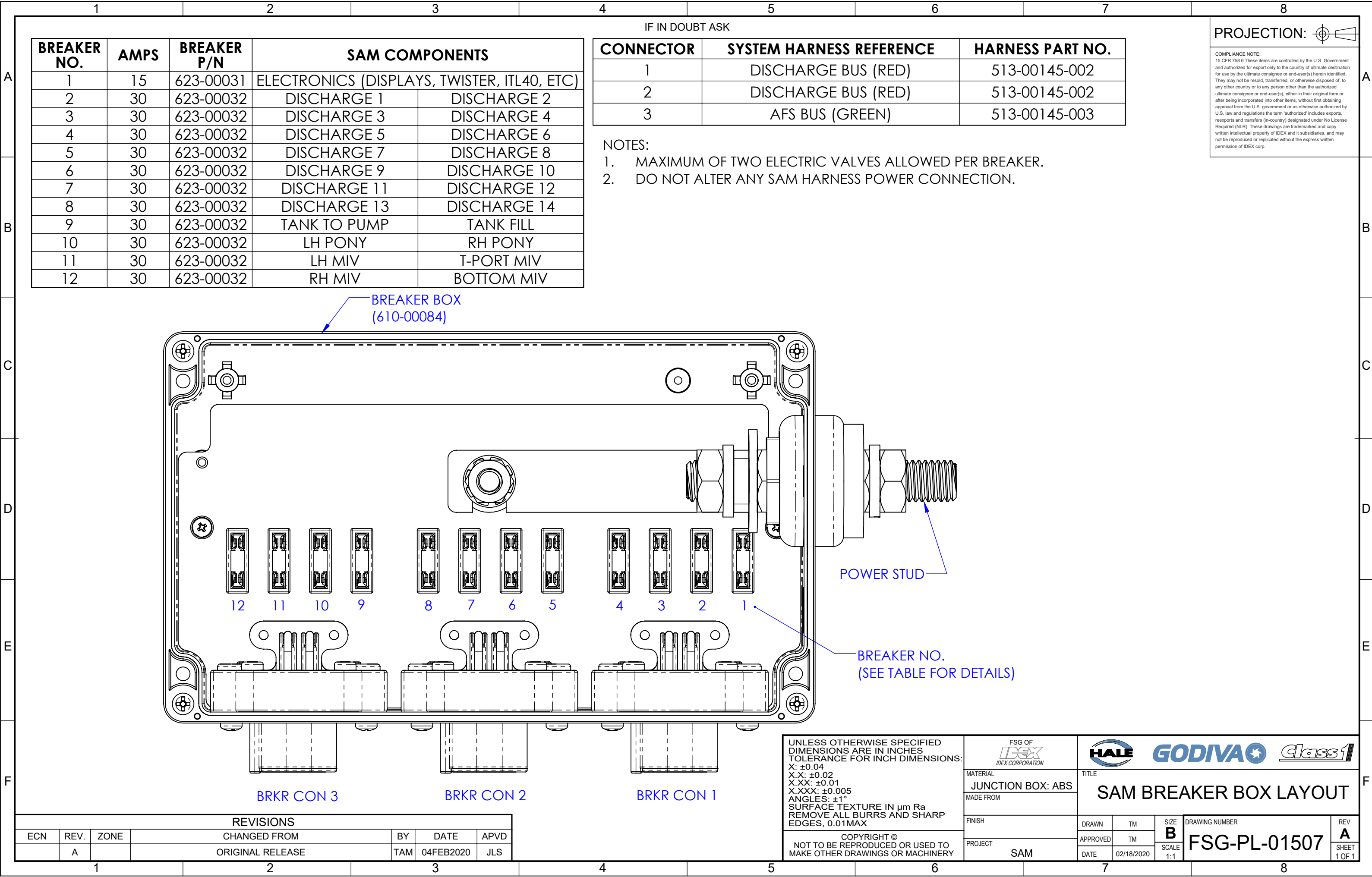
REVISIONS						
ECN	REV.	ZONE	CHANGED FROM	BY	DATE	APVD
-	-	See Sheet1	See Sheet1	-	-	-

PROJECTION: 



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

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  IDEX CORPORATION	HALE  				
	MATERIAL	TITLE SAM VALVE ASSEMBLY LAYOUT				
	MADE FROM					
	FINISH	DRAWN	KTN	SIZE B	DRAWING NUMBER FSG-PL-01506	REV A
PROJECT	APPROVED	TAM	SCALE 1:3	SHEET 4 OF 4		
COPYRIGHT © NOT TO BE REPRODUCED OR USED TO MAKE OTHER DRAWINGS OR MACHINERY		DATE	30JAN2020			



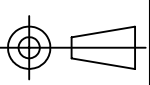


THIS PAGE INTENTIONALLY BLANK.



THIS PAGE INTENTIONALLY BLANK.

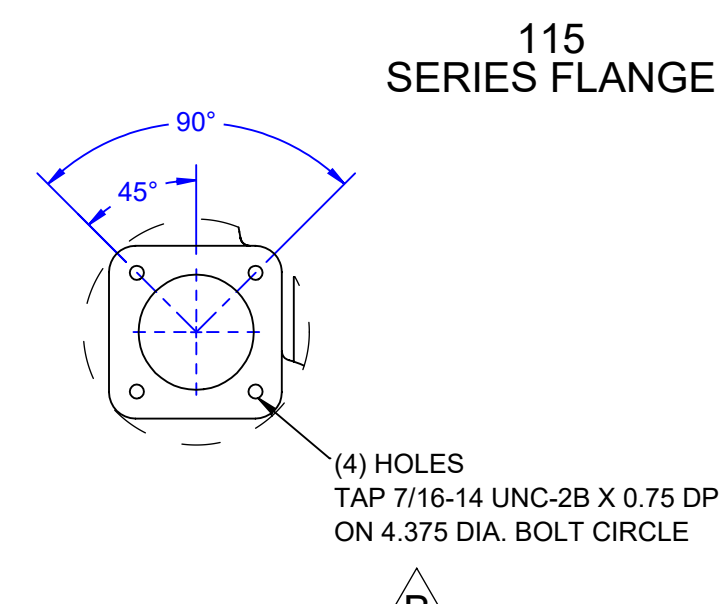
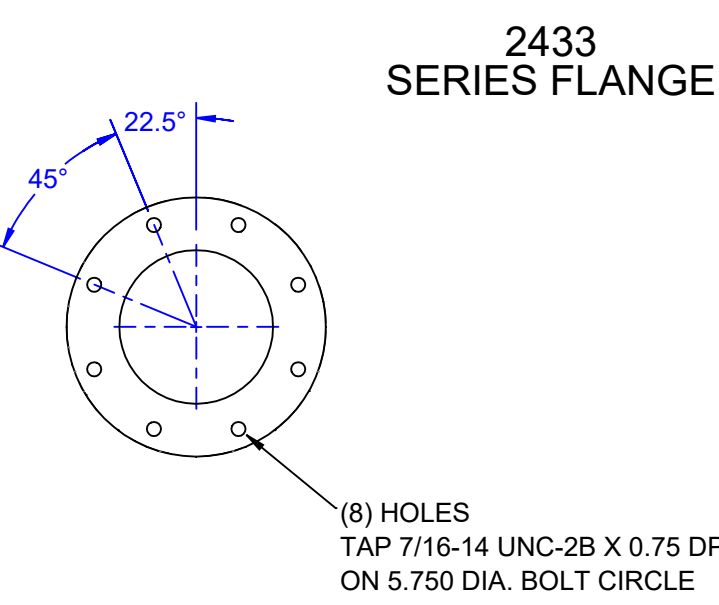
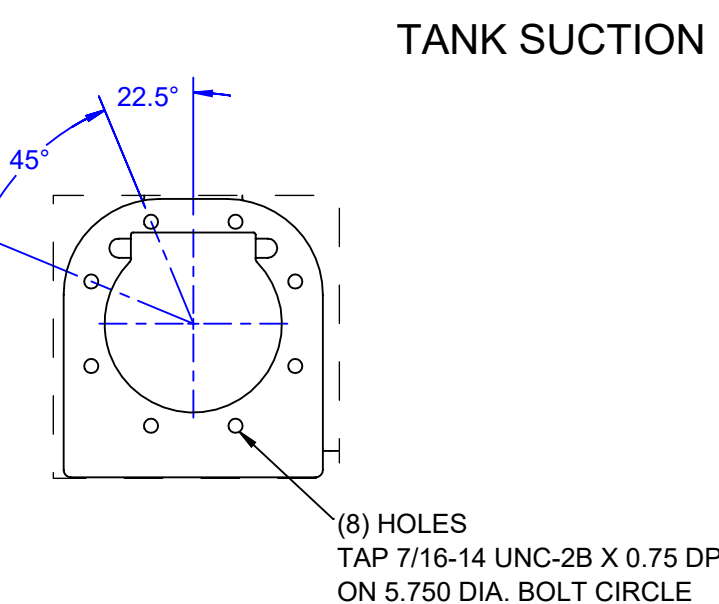
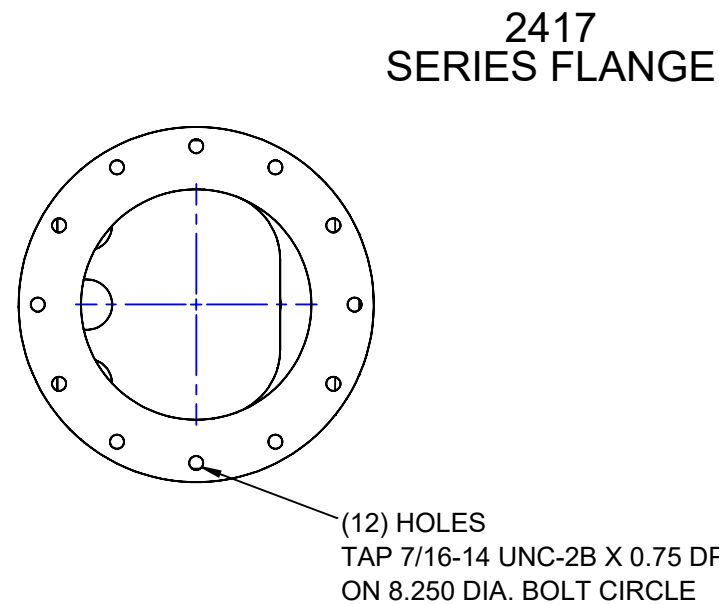
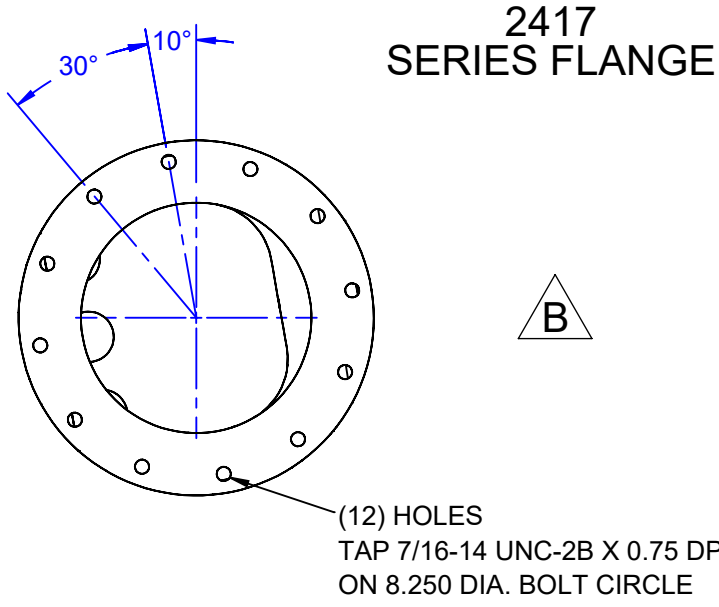
IF IN DOUBT ASK

PROJECTION: 

PORT DIAGRAM



PORT BOLT PATTERN DIAGRAMS
* DENOTES OPTIONAL BOLT PATTERN



T
REQ'D.
2250
GPM

BOTTOM*

S T*

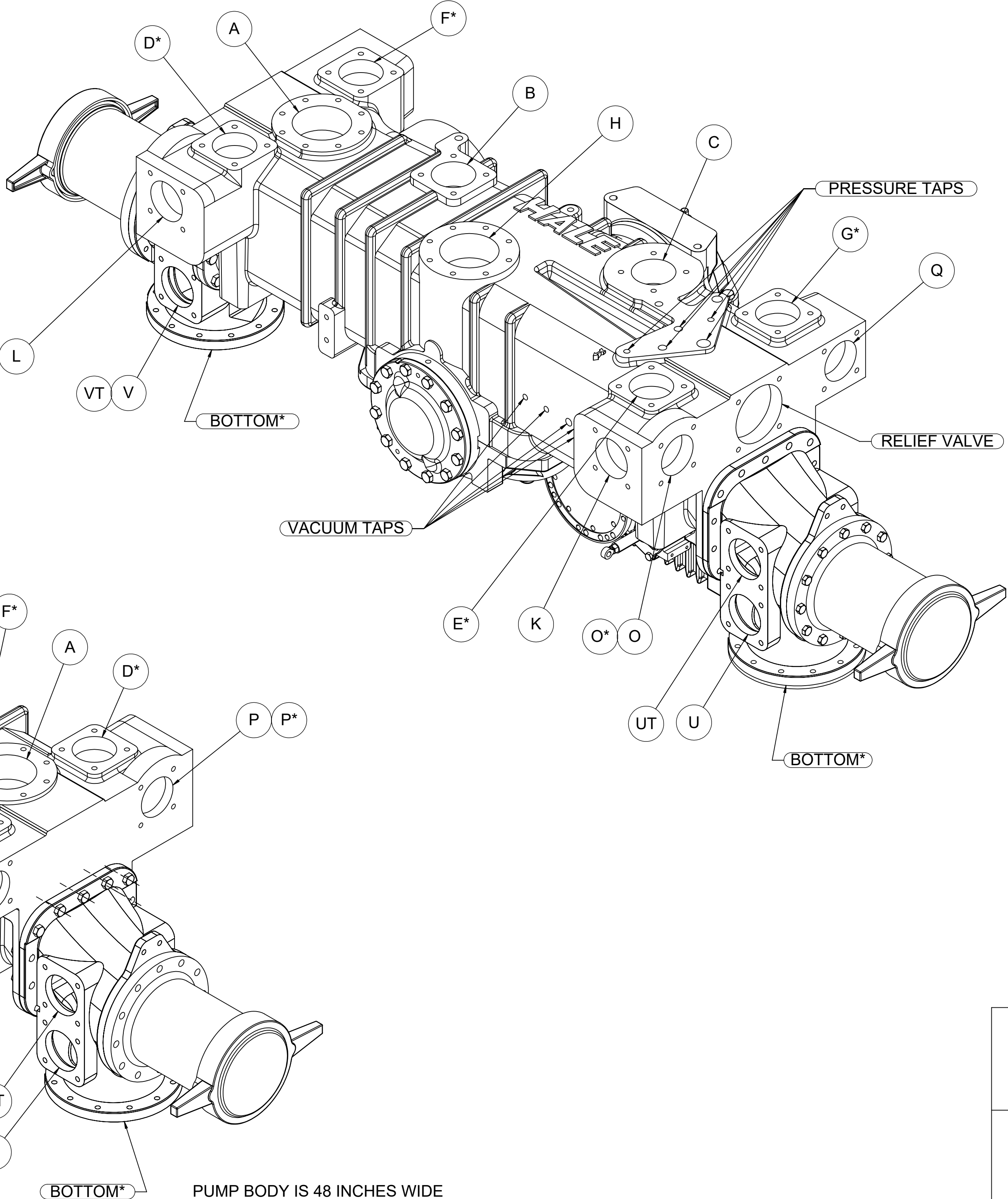
A C* H O* P*

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

B

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

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

FSG OF
IDEX CORPORATION

MATERIAL

MADE FROM

FINISH

PROJECT

HALE GODIVA class1

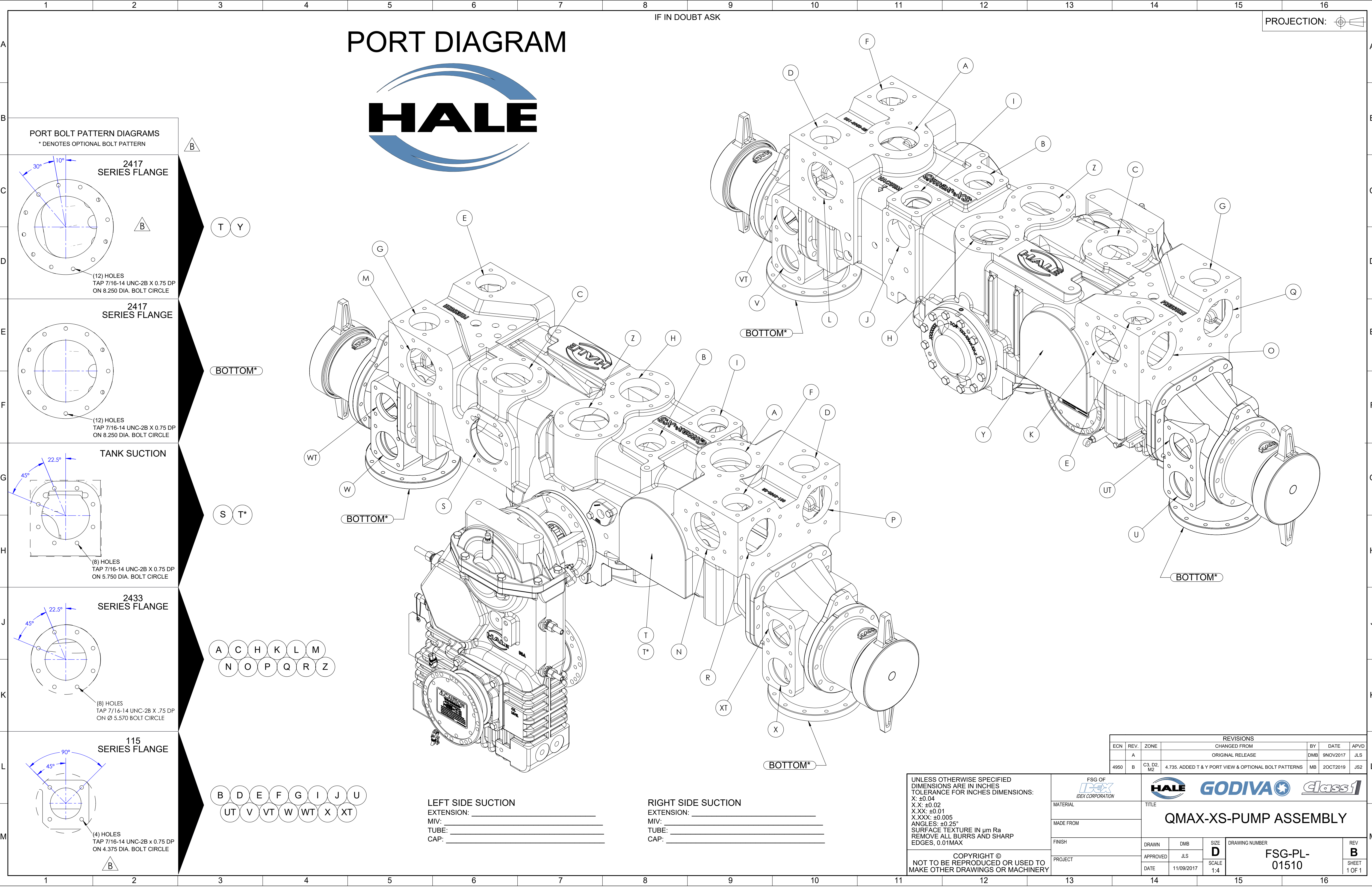
QMAX PORT DIAGRAM

DRAWN	DMB	SIZE	D	DRAWING NUMBER	REV
APPROVED	JLS	SCALE	1:5	FSG-PL-01509	B
DATE	11/09/2017				SHEET 1 OF 1

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



THIS PAGE INTENTIONALLY BLANK.



PORT DIAGRAM



PORT BOLT PATTERN DIAGRAMS
* DENOTES OPTIONAL BOLT PATTERN

2417
SERIES FLANGE

(12) HOLES
TAP 7/16-14 UNC-2B X 0.75 DP
ON 8.250 DIA. BOLT CIRCLE

2417
SERIES FLANGE

(12) HOLES
TAP 7/16-14 UNC-2B X 0.75 DP
ON 8.250 DIA. BOLT CIRCLE

TANK SUCTION

(8) HOLES
TAP 7/16-14 UNC-2B X 0.75 DP
ON 5.750 DIA. BOLT CIRCLE

2433
SERIES FLANGE

(8) HOLES
TAP 7/16-14 UNC-2B X .75 DP
ON Ø 5.570 BOLT CIRCLE

115
SERIES FLANGE

(4) HOLES
TAP 7/16-14 UNC-2B x 0.75 DP
ON 4.375 DIA. BOLT CIRCLE

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 VT W WT X XT

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

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

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

FSG OF IDEX IDEX CORPORATION		HALE GODIVA class1	
MATERIAL		TITLE	
MADE FROM		QMAX-XS-PUMP ASSEMBLY	
FINISH	DRAWN	DMB	SIZE
	APPROVED	JLS	D
DATE	11/09/2017	SCALE	1:4
DRAWING NUMBER			REV
FSG-PL-01510			B
			SHEET 1 OF 1



THIS PAGE INTENTIONALLY BLANK.



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

A.2. Warranty

See the Hale website (www.haleproducts.com) for product specific warranty and warranty procedures.