



AtlasX Start-up/Service Manual

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Approvals

Gasboy, Greensboro, is an ISO 9001:2000 registered facility.

Underwriters Laboratories (UL):

UL File#	Products listed with UL
MH66252	All AtlasX dispensers and self-contained pumping units.

National Conference of Weights and Measures (NCWM) - Certificate of Compliance (CoC):

Gasboy pumps and dispensers are evaluated by NCWM under the National Type Evaluation Program (NTEP). NCWM has issued the following CoC:

CoC#	Product	Model #
24-005	AtlasX	8800G, 9100G, 9800G

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Table of Contents

1 – Read This First	1-1
Introduction	1-1
Purpose	1-1
Important Information About Releases	1-1
Topics in This Section	1-1
Who Must Use This Manual	1-2
Service Protocol	1-2
Using Replacement Parts	1-2
Gasboy Contact Information	1-2
Related Documents	1-3
Abbreviations and Acronyms	1-4
Common Terms Used	1-6
DEF Special Considerations	1-7
Troubleshooting DEF Freeze	1-8
If DEF Freezes	1-9
Model Information	1-10
Mechanical Commercial Pump/Dispenser	1-10
Electronic Pump/Dispenser	1-11
Serial Number Label and Date Codes	1-12
Model Series	1-13
Model Flow Rates	1-13
AtlasX Model Number Table	1-13
Listing of AtlasX Model Suffixes	1-14
Options Overview	1-14
Vapor Recovery	1-15
High Hose Retriever	1-15
Internal Hose Retriever	1-15
Satellite Piping	1-15
Hand Crank	1-15
Solenoid Valve	1-15
Pulse Output	1-15
Local Area Network (LAN) Interface	1-15
Electro-Mechanical Totalizer	1-16
2 – Important Safety Information	2-1
3 – Start-up Procedures	3-1
Introduction	3-1
Purpose	3-1
Important Information About Releases	3-1
Topics in This Section	3-1
How to Use This Section	3-1
Certificate of Conformance (CoC) Numbers	3-1
Start-up Checklists	3-2
Installation Checklists	3-2
Mechanical and Hydraulic Related Items Checklist	3-2
Electrical Related Items Checklist	3-3
Meter Calibration	3-4
Gasboy AtlasX (Gallon Unit of Measure)	3-4

Satellite Start-up	3-4
Completion Checklist	3-4
Start-up	3-5
4 – Pump Programming	4-1
<hr/>	
Introduction	4-1
Purpose	4-1
Important Information About Releases	4-1
Topics in This Section	4-1
Programming Overview	4-1
8800/9800 Series Electronic Units	4-1
Mechanical Commercial Units	4-3
Opening the Bezel Assembly	4-3
Opening the Lower Panel Assembly	4-5
Reassembling the Lower Panel	4-6
Programming Electronic Units	4-8
Manager Keypad Details	4-8
Manager Keypad Key Definitions and Use	4-8
Programming Errors	4-8
General Programming Operation	4-9
PIN Code Entry	4-9
Display Conventions	4-10
Totals Examples	4-10
Non-resettable Money and Volume Totals	4-10
Money and Volume Totals	4-10
Programming Steps for 8800/9800 Series Units	4-11
Security/PIN Code Entry	4-12
AtlasX Programming Instructions	4-12
Level One CCs	4-12
CC19: Set AtlasX Related Options	4-12
FC1: Set Pulse Out Mode	4-13
FC2: Set Pulse Output Rate per Volume Unit	4-13
FC3: Blank Money and PPU Displays	4-13
CC20: Set PPU Values	4-14
CC22: Set Preset Types and Values	4-14
CC24: Set Operations Mode	4-15
CC25: Set Volume Allocation	4-16
CC27: Review ATC Data	4-17
CC28: Change First Level PIN	4-18
CC31: Set Money Allocation	4-19
Level Two CCs	4-20
CC42: Set Decimal Point Options	4-21
CC43: PPU Blinking Options	4-23
CC45: Set Lamp Test Time	4-24
CC46: Set Comma/Decimal Point	4-24
CC47: Set Two-wire Options	4-25
CC48: Zero Previous Transaction	4-41
CC49: STP Controls	4-42
CC51: Set Main Beeper	4-44
CC52: Set VaporVac Alarm	4-44
CC53: Set Timeouts	4-45
FC Descriptions for CC53	4-46
CC54: Set Slowdown Valve	4-49
CC55: Set Hose Pressurization	4-49
CC56	4-50

CC58	4-50
CC60: Set Clock and Calendar	4-50
CC62: Two-wire Remapping Grade	4-52
Level Three CCs	4-53
CC71: Set Volume Units	4-53
CC72	4-53
CC73: Set/Display Money Totals	4-54
CC74: Set/Display Volume Totals	4-55
CC75: Set Fuel Density (ATC Only)	4-56
CC76: Money Rounding Display Method	4-57
CC77: Change PIN Code	4-58
Change PIN Codes – FCs 1- 4	4-59
Electronic Calibration	4-59
CC80: Set Maximum Flow Rate	4-60
CC82: Setting Prover Can Size	4-60
CC83: Set Alternative Fuel Mode	4-62
Level Four CCs	4-64
CC84: Set Pulser Type	4-64
CC90: Set Unit Type	4-64
CC91: Select Installed Options	4-66
CC92: Set Side Exists	4-70
CC93: Set Cash/Credit at Dispenser	4-70
CC94: Set Zero PPU Option	4-71
CC96: Set Select Feature	4-72
CC98: Inlet Assignment Per Grade (Multi-Hose Universal Blender)	4-73
Additional Manager Functions for AtlasX	4-73
Unit Totals Retrieval Convention	4-73
Totals Examples	4-73
Non-resettable Money and Volume Totals	4-73
Money and Volume Totals	4-73
Programming DEF Dispensers	4-74
CCs	4-74
CC54	4-74
CC82	4-74
CC83	4-74
CC91: FC12	4-74

5 – Electronic and Electrical Components **5-1**

Introduction	5-1
Purpose	5-1
Important Information About Releases	5-1
Topics in This Section	5-1
How to Use This Section	5-1
Electronics Highlights	5-2
8800/9800 Series Electronic Units	5-2
System and Component Overview	5-2
About Service Procedures	5-3
Working on Electronic and Electrical Components	5-4
Preparing for Service	5-4
Preventing ESD	5-4
Hazardous Materials	5-5
Replaceable Batteries	5-5
Replacing Fuses	5-5
Helpful Service Information	5-5
PCAs	5-6

Pump Control Node 5 (M18446A101), Replacement Part# M19203A501	5-6
Board Connections and Cables	5-7
Jumpers	5-8
Status LEDs and Function	5-8
LEDs Boot-Up Status and Activity PCN5	5-10
Test Points	5-10
PCN5 Replacement Process	5-11
Pump Control Node 4+ (M18666A001)	5-13
Status LEDs and Function	5-14
State LEDs (Initialization)	5-15
Test Points	5-16
Jumpers	5-16
Service Tips	5-17
Retaining Data While Replacing Pump Boards	5-17
Ultra-Hi Interface PCA (M08223A001)	5-20
Board Connections and Cables	5-20
Combi Display 6-6-4 PCA (M17206A001)	5-21
Board Connections and Cables	5-22
Status LEDs and Function	5-22
Test Points	5-22
Jumpers	5-22
Address Settings	5-23
Self-Test Mode	5-23
M07555A004 Power Supply	5-24
Varistors	5-25
STP Relays	5-25
Fuse Block (M07362A002)	5-26
Service Tips	5-27
LED Indicators	5-27
STP Indicators	5-27
M07555A004 Power Supply with M08223A001 Ultra-Hi Interface Board (Ultra-Hi Units Only)	5-29
Troubleshooting Tips	5-29
International Power supply Assembly (IPS) - M20411A001 (HF, UHF, and Warm Weather DEF only)	5-31
Omnia PCA (M16181A002)	5-32
Omnia Connections and Cables	5-33
Omnia Jumpers	5-34
Omnia Status LEDs and Function	5-34
DCM3 [(Dispenser Communications Module, (M15724A001))]	5-35
DCM3 Connections and Cables	5-35
DCM3 Status LEDs and Function	5-36
CAT-5 Adapter PCA (M20276A001)	5-36
I.S. Barrier PCA (T19301-G1)	5-37
Board Connections and Cables	5-37
Pulse Out PCA (M19206A001)	5-38
Board Connections and Cables	5-38
Status LEDs and Function	5-39
ATC-I.S. Barrier-TMeter PCA (M18983A001)	5-39
Board Connections and Cables	5-40
Status LEDs and Function	5-40
Address Setting	5-40
Front Load Satellite Control PCA (M07366A001)	5-41
Board Connections and Cables	5-41
Status LEDs and Function	5-41
E700 Satellite Indicator PCA (M19060A001)	5-42

Board Connections and Cables	5-42
Status LEDs and Function	5-42
Coriolis Meter Interface Board (M10030A001)	5-43
Service Tips	5-44
PCA Connections and Cables (Cold Weather DEF)	5-46
PCA Connections and Cables (Warm Weather DEF)	5-46
E2 Temperature Control Board [M14100A001 (AtlasX Cold Weather DEF Only)]	5-47
Heater (DEF Only)	5-48
DEF Heating System (Cold Weather DEF Units Only)	5-48
PCA Connections and Cables (Cold Weather DEF)	5-49
Electronic/Mechanical Registers and Electro-Mechanical Totalizers	5-50
About Displays	5-50
Electro-Mechanical Totalizer	5-50
Service Tips	5-51
Pulsers	5-52
About Pulsers	5-52
Testing Pulsers and I.S. Barriers (Ultra-Hi Units Only)	5-53
Pulser Drive Assembly	5-53
Special Note for Canadian Installations	5-53
Service Tips	5-53
6 – Hydraulic/Mechanical Components	6-1
Introduction	6-1
Purpose	6-1
Important Information About Releases	6-1
Topics in This Section	6-1
How to Use This Section	6-1
Hydraulic and Mechanical Highlights	6-2
2-Stage Solenoid Valve	6-2
Meter Assembly	6-3
CFT Meter	6-4
Pumping Unit	6-5
GPU+ M09593A102 (2024 Onwards)	6-5
Air Gap (Electronic Units Only)	6-5
Performance Concerns with M09593A102 Pumping Units	6-5
General Service Procedures	6-6
Working on Hydraulic Components	6-6
Servicing Hydraulic Components	6-7
Before Beginning	6-7
After Repairing	6-7
Servicing Seals, O-rings, and Gaskets	6-8
Pipes and Hydraulic Plumbing	6-8
Service Hints	6-8
Torque Specifications	6-9
Screws and Bolts (Plated)	6-9
Pipe and Tube Fittings	6-9
Flanged and Compression Tube Fittings	6-9
Self-contained Pumping Units	6-10
Meter Bolts	6-10
Purging Air from System	6-10
About Purging System	6-10
Purging Product Lines (New Installations)	6-11
Amount to Purge at Nozzle	6-11
Purging Pumps and Dispensers (With Fuel in Product Lines)	6-12

Table of Contents

Using Nozzle to Purge Unit	6-12
Amount to Purge at Nozzle	6-12
Performance Concerns with M09593A102 Pumping Units	6-13
Purging Air in DEF Systems	6-13
Measuring Flow Rate	6-14
Measuring Pressure and Vacuum	6-15
Using Pressure Gauge	6-15
Pressure Measuring Locations on Unit	6-16
For Dispensers	6-16
Measuring STP Pressure for Dispensers	6-17
For Self-contained Pumps	6-17
Measuring Pressure Drop for Pumps and Dispensers	6-18
Analyzing Pressure Drop for Pumps and Dispensers	6-19
Determining if Components Are Faulty	6-19
Reaching Required Flow Rate	6-20
Measuring Vacuum for Pump	6-21
About Vacuum Readings	6-21
Measuring Dry Vacuum for Pump	6-21
Measuring Wet Vacuum and Pressure for Pump	6-22
Acceptable Range Tables	6-23
Acceptable Ranges (Pumps) - Standard and High-Flow Rate Units	6-23
Acceptable Ranges - Metric Measure	6-23
Probable Causes of Low Flow Rate for Pumps	6-24
Meter Calibration	6-24
About Calibrating Meters	6-24
CFT Meter Calibration Adjustment for High-Flow and Mechanical Register Models	6-25
Setting Calibration	6-26
AtlasX (Gallon Unit of Measure)	6-27
Causes of Known Calibration Problems	6-27
Electronic Calibration Steps	6-27
Meters	6-30
About Meters	6-30
Model and Date Codes	6-30
Piston Meters	6-31
Service Tips	6-31
Repairing CFT Meters	6-32
Before You Begin	6-32
Removing/Replacing Gasboy CFT Meters	6-32
After Repairing Meters	6-33
Replacing Cylinder Cover and Gasket (Cylinder Cover Leaks)	6-33
Replacing O-rings (Body and Cover Leaks)	6-34
Calibrating Wheel Parts Repair	6-35
Replacing Piston Cups	6-35
Removing/Replacing Shaft Seal and Gasket (Upper Seal Leaks)	6-36
Liquid Controls (LC)/Total Control Systems (TCS) Meters	6-37
Service Tips	6-37
Removing/Replacing LC/TCS Meters	6-37
DEF Magmeter	6-38
Filters and Strainers	6-39
About Filters	6-39
Servicing Filters	6-40
Removing Filters	6-40
Installing New Filters	6-41
Service Tips	6-42

	About Strainers	6-42
	DEF Strainer	6-42
	Servicing Strainers	6-42
	Service Tips	6-42
Hanging Hardware		6-43
	About Hanging Hardware	6-43
	Hoses and Flow Restrictors	6-43
	Inspecting Hoses	6-43
	Hose Retrieval Mechanisms	6-44
	Hose Retriever Tensioning	6-44
	Replacing Hoses	6-45
	Flow Restrictors	6-47
	Breakaway Valves	6-47
	Replacing Breakaways	6-48
	Resetting Breakaways	6-49
	Service Tips	6-49
	Testing Hose and Hanging Hardware Continuity	6-50
	Internal Hose Retrievers and Clamps	6-52
	Replacing Retriever Reels, Cables, and Hose Clamps	6-52
Pumping Unit		6-54
	About Pumping Unit	6-54
	General Pumping Unit Service Procedures	6-55
	Draining the Pumping Unit	6-55
	Servicing Strainer Check Valve	6-56
	Installing Strainer Check Valve	6-57
	Service Tips	6-57
	Servicing Pressure Control Valve (PCV)	6-58
	Removing PCV	6-58
	Installing PCV	6-59
	Service Tips	6-59
	Servicing Bypass/Pressure Relief Valve (PRV)	6-59
	Service Tips	6-60
	Optimizing Adjustment on Pump Bypass Preload	6-60
	Servicing Rotor and Shaft Assembly	6-61
	Service Tips	6-61
Pump Motor		6-62
	About Electric Motor for Self-contained Pump Units	6-62
	Motor Loads	6-62
	Thermal Overload	6-62
	Service Tips	6-62
	Motor Voltage Selection Wiring	6-63
	Belts and Pulleys	6-64
	Inspecting Belts and Pulleys	6-64
	Service Tips	6-64
	Setting Belt Tension	6-64
	Belt Adjustment	6-65
	Inspecting Pulleys	6-65
	Adjusting Belt	6-65
Valves		6-66
	Solenoid Valves	6-66
	Rebuilding or Replacing	6-67
	Service Tips	6-67
	Solenoid Valve and Filter Manifold	6-68
	About Valve and Filter Manifolds	6-68
	Recommended Solenoid Valve Repair Kits	6-68
	Service Tips	6-69

Table of Contents

Solenoid Valves for 8850, 9850, and 9X53 with Satellite Outlet Piping	6-69
Troubleshooting	6-69
Rebuilding or Replacing	6-69
Service Steps	6-69
Meter Check Valve	6-70
Potential Problems	6-70
Service Steps	6-70
Shear Valves	6-71
Inspecting Shear Valves	6-72
T-52A Pressure Regulator Valve Option	6-73
Vapor Recovery Stage 2 Balance Type	6-73
Troubleshooting	6-73
Mechanical Computers	6-74
Power Reset External Adjustment (Mechanical Units)	6-74
DEF Nozzle	6-75
Nozzle Door Mechanism (Cold Weather Units Only)	6-76
Hose Reel Tension Adjustment for AtlasX Cold Weather DEF	6-76

7 – Troubleshooting Tables 7-1

Introduction	7-1
Purpose	7-1
Important Information About Releases	7-1
Topics in This Section	7-1
How to Use This Section	7-1
Example	7-1
Troubleshooting Tables (Electronic Units)	7-3
Sample Troubleshooting Form	7-3
Priority Codes	7-4
Operating the Satellite Dispenser	7-11
Theory of Operation	7-12
Understanding Flow Rate	7-12
Flow Rate Restrictors	7-12
How a Standard Dispenser Works	7-14
How a Self-contained Pumping Unit Works	7-15
How a Master/Satellite - Ultra-Hi Dispenser Works	7-16
Unit Descriptions	7-16
Types of Operation	7-17
Master and Remote Satellite Piping	7-17
Operation	7-18
How ATC Works	7-19
AtlasX ECs	7-19
E1 - E12	7-19
0 - 50	7-20
4000 - 4999	7-20
5000 - 5025	7-20
5026 - 5099	7-20
5100 - 5121	7-21
5126 - 5199	7-21
5378 - 5724	7-21
EC31	7-21
Operating the Satellite Dispenser	7-22

8 – Wiring and Configuration 8-1

Introduction	8-1
------------------------	-----

Purpose	8-1
Important Information About Releases.	8-1
Topics in This Section	8-1
Cable Block Diagrams	8-1
Block Diagram AtlasX M19569	8-1
AtlasX Hydraulics, Bezel, and Door Configurations	8-37
9 – Preventive Maintenance and Inspection	9-1
<hr/>	
Introduction	9-1
Purpose	9-1
Important Information About Releases.	9-1
Topics in This Section	9-1
How to Use This Section	9-1
Preventive Maintenance	9-1
Maintenance Procedures and Parts	9-1
Maintenance of Vendor Supplied Parts	9-2
Use Only Authorized Parts	9-2
Performing Inspections	9-2
Safety Warnings	9-2
General Inspections	9-3
Component Inspections	9-3
Replacements and Adjustments	9-4
Filter/Strainer Replacement	9-4
Special Setup Required for Aircraft Fueling	9-4
Adjusting Belts (Suction Pumps Only)	9-4
Preserving Finish.	9-5
Preserving Finish of Fueling Equipment	9-5
Preventive Maintenance Table	9-6
Index	Index-1
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1 – Read This First

Introduction

Purpose

This section contains a general introduction, service protocol, safety, and model number information.

Sections of this manual provide start-up and service information for AtlasX pumps and dispensers. This manual is a general service guide and not a replacement for Gasboy® AtlasX certified training. Certified training includes instructions on safety procedures, use of test equipment and common tools, wiring requirements, and electrical service procedures.

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to Gilbarco® Online Documentation (GOLDSM).

This section was last updated in July 2025.

Topics in This Section

Topic	Page
Introduction	1-1
DEF Special Considerations	1-7
Model Information	1-10

Who Must Use This Manual

This manual is intended for Gasboy AtlasX Authorized Service Contractors (ASCs) who have been trained and certified on AtlasX. These ASCs must be aware of the safety requirements and basic troubleshooting techniques, such as reading a volt/ohmmeter, reading pressure, and so on, and understanding the differences between various Gasboy AtlasX products, options, and functionalities.

If you have not attended the Gasboy training, contact the Gasboy Training Department. For contact information, refer to [“Gasboy Contact Information”](#).

Service Protocol

A Service Technician requesting technical assistance must do the following:

- 1 Be available at the site.
- 2 When placing the call, ensure that the following are available:
 - Unit model and serial number
 - Site name and telephone number
 - Your technician number
 - Problem description and history
 - All required recommended spare parts
 - Manuals available for reference
- 3 Call the Technical Support Department at 1-800-444-5529. Refer to the Customer Service Report (CSR) number, if previously assigned.

Using Replacement Parts

Use only genuine Gasboy AtlasX replacement parts. Use of other parts will void warranty and could affect unit conformance to various national, local or state codes.

Gasboy Contact Information

Information Required	Contact Details
Schedule training	Contact your Gasboy Certified Trainer or Distributor.
Logging into Saba or enrolling into training courses.	Technical Training Department at: 1-336-547-5743 or technicaltraining@gilbarco.com .
Technical Assistance	Gasboy Technical Support at: 1-800-444-5529 or Gso.Ser.gasboysupportquestion@gilbarco.com .
Warranty Service/Claims information	Warranty Department at: 1-888-800-7498 or warranty@gilbarco.com
Equipment commissioning issues	Registration Team at: 1-888-800-7498 (Option 2) or gvr.gso.ser.commissionings@gilbarco.com
Gasboy Solutions, Products, and Services	Gasboy Sales at: sales@gasboy.com
Technical literature, parts manuals, and other documents	Refer to GOLD and Technician Resources on the Extranet.

Related Documents

The following documents may be helpful when servicing the Gasboy AtlasX equipment:

Document Number	Description	GOLD Library
FE-371	Field Wiring Diagram AtlasX	Gasboy Parts List and Wiring Diagrams
MDE-2188	C, C+, and HD Meter Quad Ring Top Seal Replacement Kits (K35222 and K35222-01)	Advantage® and Legacy Models
MDE-2713	Universal Distribution Box (D-Box) Installation Manual	<ul style="list-style-type: none"> Advantage and Legacy Models Encore and Eclipse® Passport POS Peripheral Devices
MDE-2714	Universal D-Box Service Manual	<ul style="list-style-type: none"> Advantage and Legacy Models Encore and Eclipse POS Peripheral Devices
MDE-2755	STP Control and Dispenser Isolation Relay Box	<ul style="list-style-type: none"> Advantage and Legacy Models Encore and Eclipse Encore and Eclipse Installers
MDE-3026	Standardized Service Coding/Terminology	Gilbarco Forms
MDE-3860	Programming Quick Reference Card	Gasboy Atlas Pumps/Dispensers
MDE-3892	Meter Master Seal Service Kits (K96618 and M08182K001) Installation Instructions	<ul style="list-style-type: none"> Encore and Eclipse Encore and Eclipse Installers
MDE-3921	Laptop Tool User Reference Guide	<ul style="list-style-type: none"> Encore and Eclipse Encore and Eclipse Installers
MDE-4255	Gasboy Warranty Policy Statement for USA and Canada	Gasboy Atlas Pumps/Dispensers
MDE-4281	Calibration Quick Reference Card	<ul style="list-style-type: none"> Encore and Eclipse Encore and Eclipse Installers Installers Public Documents Service Manual
MDE-5374	Atlas Startup and Commissioning Check List	Gasboy AtlasX Pumps/Dispensers
MDE-5662	Gear GPU+ Operation and Service Manual	Service Manual
MDE-5692	AtlasX Fuel Systems Installation Manual	Gasboy AtlasX Pumps/Dispensers
MDE-5693	AtlasX Fuel Systems Site Preparation Manual	Gasboy AtlasX Pumps/Dispensers
MDE-5695	AtlasX Fuel Systems Owner's Manual	Gasboy AtlasX Pumps/Dispensers
MDE-5793	AtlasX Startup and Commissioning Checklist (V 06/24) (Form A)	Gasboy AtlasX Pumps/Dispensers
PT-1973	AtlasX Recommended Spare Parts List	Gasboy AtlasX Pumps/Dispensers
PT-1974	AtlasX Pump and Dispenser Illustrated Parts Manual	<ul style="list-style-type: none"> Gasboy AtlasX Pumps/Dispensers Parts Manual
RP-100	PEI Recommended Practices for Underground Liquid Storage Systems	N/A
RP-400	PEI Recommended Procedures for Testing Electrical Continuity of Petroleum Dispensing Systems	N/A
RP-500	PEI Publication	N/A
-	NIST Handbook 44 (National Institute of Standards and Technology)	N/A

Notes: 1) M19569 AtlasX Block Diagrams are available on GLADs.

2) In addition to these documents, Gasboy AtlasX marketing and information sheets are sources of information.

Abbreviations and Acronyms

Term	Description
ASC	Authorized Service Contractor
ATC	Automatic Temperature Compensation
BRCM	Back Room Communications Module
CAT5	Category 5
CC	Command Code
CEC	Canadian Electrical Code
CFR	Code of Federal Regulations
CFT	Center Flow Through
CNG	Compressed Natural Gas
CoC	Certificate of Conformance
CPU	Central Processing Unit
CSR	Customer Service Report
D-Box	Distribution Box
DEF	Diesel Exhaust Fluid
E-Cal	Electronic Calibration
EC	Error Code
ESD	Electrostatic Discharge
FC	Function Code
FMS	Fuel Management System
GGE	Gasoline Gallon Equivalent
GLE	Gasoline Liter Equivalent
GOLD	Gilbarco Online Documentation
GPM	Gallons Per Minute
GPU	Global Pumping Unit
IFSF	International Forecourt Standards Forum
IPS	International Power Supply
I.S.	Intrinsic Safety
J-box	Junction Box
LAN	Local Area Network
LC	Liquid Control
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LNG	Liquefied Natural Gas
LPM	Liters Per Minute
LSD	Least Significant Digit
MSD	Most Significant Digits
NEC®	National Electrical Code
NFPA	National Fire Protection Association
NIST	National Institute of Standard and Technology
OIML	International Organization of Legal Metrology
OLC	Over-Legacy-Cable
OSHA	Occupational Safety and Health Administration

Term	Description
PAM	Pump Access Module
PCA	Printed Circuit Assembly
PCB	Printed Circuit Board
PCN	Pump Control Node
PCV	Pressure Control Valve
PEI	Petroleum Equipment Institute
PIN	Personal Identification Number
POS	Point of Sale
PPG	Pulse Per Gallon
PPU	Price Per Unit
PRV	Pressure Relief (Bypass) Valve
PSI	Pounds (of Pressure) per Square Inch
RAM	Random Access Memory
SAE	Society of Automotive Engineers
STP	Submersible Turbine Pump
TCP/IP	Transmission Control Protocol/Internet Protocol
TCS	Total Control Systems
TRP	Technician Resources Page
UL®	Underwriters' Laboratories
VAC	Voltage Alternate Current
VCF	Volume Correction Factor
VDC	Voltage Direct Current
VUT	Volume Unit Type
WAN	Wide Area Network
W&M	Weights and Measures

Common Terms Used

Term	Description
Allocation	Maximum amount of fuel that can be dispensed from a nozzle for a given transaction.
Cold Start	Clears pump and configuration data.
Command Code	Listing under Command Level for setting software parameters.
Command Level	A level of programming accessed by Personal Identification Number [PIN(s)].
Dispenser	A dispensing unit that relies on an Submersible Turbine Pump (STP) in the storage tank to send fuel to the dispenser.
DEF	A clear, colorless, non-toxic, non-flammable, non-combustible liquid. It is made up of 32.5% urea with the balance distilled or de-ionized water. Urea and water are completely miscible and do not separate in storage. Diesel Exhaust Fluid (DEF) is mildly corrosive.
Dual Hose	Same as Twin Hose.
E85	Gasoline ethanol blend with 85% ethanol.
Function Code	One or more procedures within a Command Code.
Grade	Indicates the fuel grade available at the nozzle. In case of blender dispensers, a grade is created by blending products.
Manager Keypad	Device within the dispenser for setting programming parameters.
Money Display	A display that shows the total value of the product dispensed during normal operation.
Option Code	A choice that is available on entering a Function Code.
Product	Indicates the base fuel grade available in the storage tank. Not to be confused with "Grade"; however, in a non-blending environment, a grade is the same as a product.
Prover Can	A calibrated container used by Weights and Measures (W&M) officials and calibrating technicians to accurately check or calibrate meters in a fuel dispenser.
Pump	Refers to a dispensing unit that has a self-contained suction pump in the unit's cabinet.
Side 1	Indicates the electrical access side of the dispenser. The Manager Keypad is accessed from Side 1 of the dispenser.
Two-wire	Proprietary communication system for AtlasX series units
Volume Display	A six-digit display that shows the total volume of product dispensed during normal operation.

DEF Special Considerations

Several important considerations exist for DEF. The service technician must be aware of the following when servicing or supporting DEF units:

- DEF is non-flammable or explosive.
- The fluid is slightly corrosive and can damage tools or equipment that are not stainless steel or plastic. It can also damage the electronic components.
- DEF spills can be cleaned with water and a damp rag. Failure to thoroughly clean spills may result in corrosive damage to components or metals.
- DEF can cause serious eye injury if sprayed in the eyes or may affect those with sensitive skin. Wear protective gloves and eye protection, as required. Flush eyes immediately with water, if sprayed.
- DEF freezes at approximately 11.3 °F (-11.5 °C). If it freezes in hydraulic components, it may permanently damage the meters, valves, breakaways, and possibly other devices. It is extremely important that DEF fluid in the dispenser does not fall below that temperature.
- DEF must not be contaminated with diesel fuel, contaminants or other fluids or materials. Such contamination can cause serious damage to vehicle's catalytic converters.
- A dedicated stainless steel calibration prover (with SS valve, if equipped) must be used with DEF to avoid contamination of the product with diesel fuel or gasoline. No exceptions are allowed.
- DEF can be returned to the storage tank only if it is not contaminated. Contaminated DEF must be disposed of in an environmentally safe manner. Do not dump DEF in storm sewers or any location, where the fluid or its constituents may enter a waterway.
- DEF must never be introduced into diesel fuel tanks or serious damage to the vehicle's engine may occur. Only dispense DEF into vehicle tanks dedicated for DEF.
- DEF when stored at temperatures above 100 °F (37.7 °C) may break down into ammonia gas over a time. Take care when opening the cabinets, tank vaults, or other areas, where DEF may have leaked or been spilt to avoid inhaling any toxic ammonia vapors.
- When exposed to air, the water in DEF will evaporate and result in development of urea crystals. Crystals may be fine and sharp. They will dissolve in water.
- DEF is much heavier than fuels such as gasoline. Be careful to avoid injury when lifting heavier prover Cans and so on, by the following proper safe lifting techniques.

Troubleshooting DEF Freeze

DEF freezes at approximately 11.3 °F (-11.5 °C). If it freezes in hydraulic components, it may permanently damage the meters, valves, breakaways and possibly other devices. It is extremely important that DEF fluid in the dispenser does not fall below that temperature.

CAUTION

Applicable during Installation and Operation of the Dispenser: DEF freezes at approximately 11 °F (-11.5 °C). Power to the dispenser and heater must always remain ON in cold weather. If power is lost and the temperature drops below this point, the system must be inspected for freeze damage before restart. For sites that experience occasional power losses or for sites that are located in very cold climates, it is recommended that a back up power generator be used to maintain constant power to the dispenser. Do not use any additives to lower the freezing point of DEF. Additives of any type must not be used in DEF.

Prolonged storage at temperatures above 77 °F (25 °C) can impair the quality of DEF and reduce its shelf life.

If the unit experiences a freeze, it will be required to thaw all components and repair the damage that may have occurred. Close proximity heating devices that are non-explosion proof cannot be used. However, before using electrical heating devices with heat extension ducting, ensure that such devices or their power cords are not in hazardous vicinity near diesel, gasoline, other fueling equipment, or hazardous vapors or liquids. To determine any hazard zone involved, consult the installation or service manuals for other equipment. As other damage either missed or not detected may exist, very closely monitor the equipment looking for leaks when the lines are pressurized. Wear eye protection.

CAUTION

DEF is mildly corrosive. It can corrode components that are made from incompatible material(s) and reduce their integrity. The use of incompatible material(s) may lead to leaks and spills, and can contaminate and degrade the DEF. When dispensing DEF, verify with the manufacturer if the material of all plumbing components are compatible with the DEF being dispensed.

CAUTION

Do not use prover Cans meant for engine fuel with DEF or vice versa. Use stainless steel prover Cans for DEF. DEF and engine fuel must not be mixed with each other or be contaminated by each other. Else, damage to a vehicle's engine or pollution control devices could occur. DEF crystallizes as its water base evaporates. Pouring out liquid will not guarantee that no corrosive DEF remains in the prover Can. DEF must not be contaminated with diesel fuel, contaminants, or other fluids or materials. Such contamination can cause serious damage to vehicle catalytic converters.

- Conventional fluid handling precautions are also applicable to DEF.
- Avoid contact with eyes, skin, and clothing. Ensure that eyewash stations and safety showers are close to the work location.
- DEF is mildly corrosive and non-flammable.
- Clean the DEF spill with water and dry the area with clean rags, especially areas that contain metallic parts. Spilt DEF can be slippery and will corrode certain types of metallic parts. Wear eye protection and rubber gloves during any cleanup activity.
- DEF is heavier than gasoline. Be aware that prover Cans, containers filled with DEF, and so on will be considerably heavier than gasoline.

If DEF Freezes

If DEF freezes, proceed as follows:

- 1 Remove power to the pump and dispenser.
- 2 Check for any damage to breakaways, nozzles, hoses/hanging hardware, and meter. Perform required repairs. Valve damage can often be detected by looking for seals slightly protruding from the valve body (compared to the new valve). Hose breakaways may only partially separate.
- 3 Correct the issue that is causing the loss of heat.
- 4 Thaw components of the dispenser. Dispenser units can be thawed using directed exhaust from a vehicle, as long as electronic boards or connections are not present in the area. They can also be thawed using a non-flame heating device.
Notes: 1) Electronic boards or connections must not be present in the area where you thaw the components of the dispenser, as any resulting condensation may damage the electronics.
2) Electrical cords or the heating device must not be used within a designated hazardous area around any fueling pump or dispenser. To identify the designated hazardous area, refer to MDE-5692 AtlasX Fuel Systems Installation Manual.
- 5 Check for leaks. Some leaks can be significant. You may be required to turn off the unit immediately.
- 6 Check if there is any damage to the above ground tank system or heated above ground plumbing. For assistance, consult the tank manufacturer.
- 7 For more details on the significance and impact of freezing in DEF, refer to “[DEF Heating System \(Cold Weather DEF Units Only\)](#)” on [page 5-48](#).

CAUTION

Certain special alternative fuels such as E85 and additives can degrade pump/dispenser performance or integrity, if the dispensers are not designed for use with such fuels. Additionally, converting to certain standard fuels (gasoline, diesel, kerosene, and so on) from alternative fuels such as those with ethanol (E85), methanol, or biodiesel or from alternative fuels to standard fuels can degrade dispenser performance or integrity. Similar effects can also occur when converting units to different standard fuel types. **As per Underwriters' Laboratories (UL) 87A requirements, nozzles dispensing E85 fuel and DEF must not be used to dispense any other type of fuel such as Gasoline.**

Leaks and potential environmental hazards can result or components may fail prematurely.

To avoid these issues, follow the guidelines for dispensing E85 fuel and DEF in this manual.

Model Information

Mechanical Commercial Pump/Dispenser

The external components of a Gasboy pump/dispenser (Mechanical unit) are shown in [Figure 1-1](#). Mechanical units have mechanical type displays as opposed to electronic digital type displays.

Figure 1-1: AtlasX Mechanical Unit



Electronic Pump/Dispenser

The external components of a Gasboy pump/dispenser (Electronic unit) are shown in [Figure 1-2](#). Electronic units have digital displays as opposed to mechanical displays. In units that are Electronic Commercial instead of Retail, the external components are the same, except that they do not have a Monetary Sale amount, a PPU display, or Monetary Totalizer display.

Figure 1-2: AtlasX Electronic Retail Unit



Serial Number Label and Date Codes

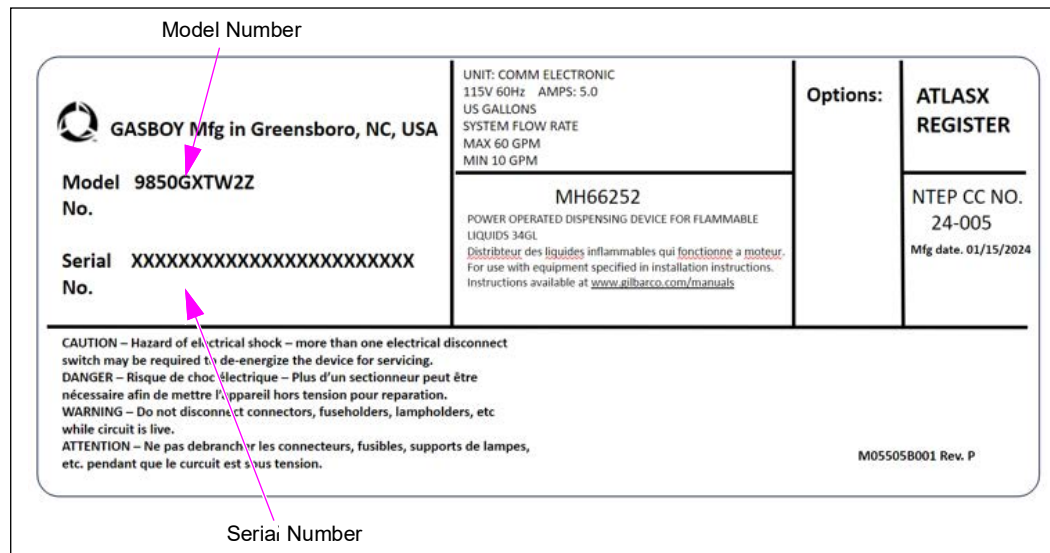
A two-letter date code is printed on the serial number label before the serial number. This code shows the month and year of manufacture. For warranty purposes, refer to the date code to determine the age of the equipment. The serial number label is located on the “A” side at the bottom of the unit attached to the inside of the frame.

To determine the date code on a Gasboy pump or dispenser, refer to the following tables:

Month Codes		
A = January	E = May	J = September
B = February	F = June	K = October
C = March	G = July	L = November
D = April	H = August	M = December

Year Codes		
A = 2012	H = 2019	R = 2026
B = 2013	J = 2020	S = 2027
C = 2014	K = 2021	T = 2028
D = 2015	L = 2022	U = 2029
E = 2016	M = 2023	W = 2030
F = 2017	N = 2024	X = 2031
G = 2018	P = 2025	

Figure 1-3: Serial Number/Model Identification



For example, a serial number label printed “BP AT000199” contains the following information:

- Date code [BP] - This unit was manufactured in B = February, P = 2025.
- Serial Number [AT000199]

Model Series

Series	Description
8800G	Electronic Retail Pumps and Dispensers
9100G	Mechanical Commercial Pumps and Dispensers
9800G	Electronic Commercial Pumps and Dispensers
9860GX	Electronic DEF Dispensers Only

Model Flow Rates

Series Designation (Digits 1 and 2)	Flow Rate Designation (Digits 3, 4, and 5)	Flow Rate Quantity
88/91/98	53G	22 GPM (83 LPM)
88/98	50G	50 GPM (190 LPM)
88/98	62G (DEF Only)	10 GPM (38 LPM)

Note: The flow rates shown are under ideal conditions and will vary depending on the hanging hardware involved, STP sizing, number of units dispensing at the same time, and inlet piping to the unit. These are not guaranteed flow rates.

AtlasX Model Number Table

The AtlasX model number uses a series of four numbers and five letters printed on the serial label to denote the machine type and configuration. To determine the pump/dispenser type that is printed on the serial label, refer to the following table:

AtlasX Model Codes						
Digit	1 and 2	3	4	5	6	Pumps 6-8 or Dispenser 7-9
	Product Series	Model Type	Flow Rates	AtlasX	Pump/Dispenser	Hydraulic Configuration
Product Series						
	Retail Electronic	88				
	Commercial Mechanical	91				
	Satellite	92				
	Commercial Electronic	98				
Model Type						
	Satellite		1			
	Standard, High-Flow, Ultra-Hi		5			
	DEF Dispenser		6			
Flow Rates						
	Ultra-Hi (50 GPM)			0		
	Standard-Flow (10 GPM)			2		
	High-Flow (18-22 GPM)			3		
	Satellite High-Flow			6		
AtlasX Model Designation						
Pump/dispenser						
	Self-contained Pump			G		Blank
	Dispenser					X

AtlasX Model Codes						
Digit	1 and 2	3	4	5	6	Pumps 6-8 or Dispenser 7-9
	Product Series	Model Type	Flow Rates	AtlasX	Pump/Dispenser	Hydraulic Configuration
Hydraulic Configuration						
	1-Grade, 1-Hose					Blank
	1-Grade, 2-Hose					TW1
	2-Grade, 2-Hose					TW2
	Combo (Ultra-Hi only)					TW3

Listing of AtlasX Model Suffixes

For information on options that are available for a particular unit, refer to “[AtlasX Model Number Table](#)” on [page 1-13](#). The following is a list of some of the options that are available on some models:

- CX - 10:1 Pulser, Quantity
- CC - 100:1 Pulser, Quantity
- F - Internal Filter Adapter
- I - Internal Hose Retrievers
- K - Hand Crank
- L - Lighted Brand Panel
- P - AtlasX PRIME options followed by:

Sides	OrCU	HID
1	1=None	0=None
2	2=OrCU	1=Standard 2=Indala

- PP - Slowdown Valve
- R - Liters Registration
- S - Internal Satellite Piping
- SS - Stainless Steel - All Panels
- SSA - Stainless Steel - Front and Back
- SSTS - Stainless Steel - Top and Sides
- WW - Warm Weather (DEF Units Only)
- X - Remote Dispenser
- Y - Vapor Recovery Ready
- Z - Front Load Nozzle Boot
- 25 - 230 VAC, 50 Hz Motor

Options Overview

This section provides an overview of the options available in AtlasX dispensers.

Omnia

Omnia, which can be ordered for any AtlasX electronic unit, provides an end-to-end cloud-based platform that provides customers remote access, visibility, and control on their fuel dispensers.

AtlasX PRIME

The AtlasX PRIME is a Fleet Management System that is integrated in to AtlasX Commercial units. It can be ordered on any 9800 unit. The AtlasX PRIME allows several options (contactless tag reader, insert mag card reader, keypad entry, etc.) for fueling access and web-based interface for local reporting. Each PRIME panel is equipped with a 4.3-inch multimedia color display to guide the user through the fuel access sequence.

Vapor Recovery

Balanced Vapor Recovery kits are available for all the G pump units except AtlasX DEF dispensers. The following two kits are available:

- Vapor Recovery Complete
- Vapor Recovery

The Vapor Recovery Complete kit provides everything required for a balanced system from the high hose retriever to the splitter, all the way to the nozzle.

The Vapor Recovery kit is a retrofit kit used when providing your own vapor recovery system. This kit will provide a new nozzle boot and hook to allow a stage two nozzle to be mounted on the dispenser.

High Hose Retriever

High Hose Retrievers are also available for standard hoses. Hose clamps are available for a variety of hose sizes, up to lengths of 15 inches.

Internal Hose Retriever

Internal Hose Retrievers are also available for some AtlasX pump models. The AtlasX DEF cold weather unit has a built-in hose reel.

Satellite Piping

Satellite Piping is available on all remote dispensers except AtlasX DEF dispensers. This option will provide the internal piping required to connect to a 9216 satellite dispenser.

Hand Crank

Hand Cranks are available for installations in locations, where power availability is a concern. This option is only available for mechanical register suction pumps.

Solenoid Valve

A two-stage slow down valve is available for units in retail applications. This option is standard on all remote dispensers.

Pulse Output

Pulse output is available for all the 9800 pump models and some 8800 models. The pulse output board for the 8800 model will be the same as the 9800 model. Veeder-Root® pulsers will be provided for mechanical units, when specified. An additional pulse output board must be ordered when connecting an Electronic unit to an FMS requiring mechanical type pulses. Factory installation as well as field retrofit kits will be available for all pulse output options.

Local Area Network (LAN) Interface

When an AtlasX PRIME is mounted in the 9800 model, a LAN cable is factory installed with a LAN jack at the end in the Junction Box (J-box) for Transmission Control Protocol/Internet Protocol (TCP/IP) communications.

Electro-Mechanical Totalizer

The electro-mechanical totalizer provides accurate, reliable measurement of dispensed fuel and affords integration with other systems (for example, fleet management, tracking, and monitoring purposes).

2 – Important Safety Information

Notes: 1) Save this Important Safety Information section in a readily accessible location.

2) Although DEF is non-flammable, Diesel is flammable. Therefore, for DEF cabinets that are attached to Diesel dispensers, follow all the notes in this section that pertain to flammable fuels.

This section introduces the hazards and safety precautions associated with installing, inspecting, maintaining, or servicing this product. Before performing any task on this product, read this safety information and the applicable sections in this manual, where additional hazards and safety precautions for your task will be found. Fire, explosion, electrical shock, or pressure release could occur and cause death or serious injury, if these safe service procedures are not followed.


Preliminary Precautions


You are working in a potentially dangerous environment of flammable fuels, vapors, and high voltage or pressures. Only trained or authorized individuals knowledgeable in the related procedures should install, inspect, maintain, or service this equipment.

Emergency Total Electrical Shut-Off

The first and most important information you must know is how to stop all fuel flow to the pump/dispenser and island. Locate the switch or circuit breakers that shut off all power to all fueling equipment, dispensing devices, and Submerged Turbine Pumps (STPs).

⚠ WARNING

 The EMERGENCY STOP, ALL STOP, and PUMP STOP buttons at the cashier's station WILL NOT shut off electrical power to the pump/dispenser. This means that even if you activate these stops, fuel may continue to flow uncontrolled.

 You must use the TOTAL ELECTRICAL SHUT-OFF in the case of an emergency and not the console's ALL STOP and PUMP STOP or similar keys.

Total Electrical Shut-Off Before Access

Any procedure that requires access to electrical components or the electronics of the dispenser requires total electrical shut off of that unit. Understand the function and location of this switch or circuit breaker before inspecting, installing, maintaining, or servicing Gilbarco equipment.

Evacuating, Barricading, and Shutting Off

Any procedure that requires access to the pump/dispenser or STPs requires the following actions:



- An evacuation of all unauthorized persons and vehicles from the work area
- Use of safety tape, cones, or barricades at the affected unit(s)
- A total electrical shut-off of the affected unit(s)

Read the Manual

Read, understand, and follow this manual and any other labels or related materials supplied with this equipment. If you do not understand a procedure, call the Gasboy Authorized Service Contractor or call the Gasboy Support Center at 1-800-444-5529. It is imperative to your safety and the safety of others to understand the procedures before beginning work.

Follow the Regulations

Applicable information is available in National Fire Protection Association (NFPA) 30A; Code for Motor Fuel Dispensing Facilities and Repair Garages, NFPA 70; National Electrical Code (NEC), Occupational Safety and Health Administration (OSHA) regulations and federal, state, and local codes. All these regulations must be followed. Failure to install, inspect, maintain, or service this equipment in accordance with these codes, regulations, and standards may lead to legal citations with penalties or affect the safe use and operation of the equipment.

Replacement Parts

Use only genuine Gilbarco replacement parts and retrofit kits on your pump/dispenser. Using parts other than genuine Gilbarco replacement parts could create a safety hazard and violate local regulations.

Federal Communications Commission (FCC) Warning

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

Safety Symbols and Warning Words

This section provides important information about warning symbols and boxes.





Alert Symbol



This safety alert symbol is used in this manual and on warning labels to alert you to a precaution which must be followed to prevent potential personal safety hazards. Obey safety directives that follow this symbol to avoid possible injury or death.

Signal Words

These signal words used in this manual and on warning labels tell you the seriousness of particular safety hazards. The precautions below must be followed to prevent death, injury, or damage to the equipment:

-  **DANGER:** Alerts you to a hazard or unsafe practice which will result in death or serious injury.
-  **WARNING:** Alerts you to a hazard or unsafe practice that could result in death or serious injury.
-  **CAUTION with Alert symbol:** Designates a hazard or unsafe practice which may result in minor injury.
-  **CAUTION without Alert symbol:** Designates a hazard or unsafe practice which may result in property or equipment damage.

Working With Fuels and Electrical Energy Prevent Explosions and Fires

Fuels and their vapors will explode or burn, if ignited. Spilled or leaking fuels cause vapors. Even filling customer tanks will cause potentially dangerous vapors in the vicinity of the dispenser or island.

DEF is non-flammable. Therefore, explosion and fire safety warnings do not apply to DEF lines.

Important Safety Information

No Open Fire



Open flames from matches, lighters, welding torches or other sources can ignite fuels and their vapors.

No Sparks - No Smoking



Sparks from starting vehicles, starting or using power tools, burning cigarettes, cigars or pipes can also ignite fuels and their vapors. Static electricity, including an electrostatic charge on your body, can cause a spark sufficient to ignite fuel vapors. Every time you get out of a vehicle, touch the metal of your vehicle, to discharge any electrostatic charge before you approach the dispenser island.

Working Alone

It is highly recommended that someone who is capable of rendering first aid be present during servicing. Familiarize yourself with Cardiopulmonary Resuscitation (CPR) methods, if you work with or around high voltages. This information is available from the American Red Cross. Always advise the station personnel about where you will be working, and caution them not to activate power while you are working on the equipment. Use the OSHA Lockout/Tagout procedures. If you are not familiar with this requirement, refer to this information in the service manual and OSHA documentation.

Working With Electricity Safely

Ensure that you use safe and established practices in working with electrical devices. Poorly wired devices may cause a fire, explosion or electrical shock. Ensure that grounding connections are properly made. Take care that sealing devices and compounds are in place. Ensure that you do not pinch wires when replacing covers. Follow OSHA Lockout/Tagout requirements. Station employees and service contractors need to understand and comply with this program completely to ensure safety while the equipment is down.

Hazardous Materials

Some materials present inside electronic enclosures may present a health hazard if not handled correctly. Ensure that you clean hands after handling equipment. Do not place any equipment in the mouth

WARNING

In the event of inclement weather, including snow, ice, or flooding that makes driving conditions dangerous, please avoid servicing units. Always use available door stops to secure upper doors against unwanted/unexpected movement, especially during high winds. If necessary, reschedule service to avoid damage to the equipment. Weather may change unexpectedly; be aware of local weather conditions. During service, if conditions develop making service unsafe, close the unit(s) and proceed to a safe location.

WARNING

The pump/dispenser contains a chemical known to the State of California to cause cancer.

WARNING

The pump/dispenser contains a chemical known to the State of California to cause birth defects or other reproductive harm.



Gilbarco Veeder-Root encourages the recycling of our products. Some products contain electronics, batteries, or other materials that may require special management practices depending on your location. Please refer to your local, state, or country regulations for these requirements.

In an Emergency

Inform Emergency Personnel

Compile the following information and inform emergency personnel:

- Location of accident (for example, address, front/back of building, and so on)
- Nature of accident (for example, possible heart attack, run over by car, burns, and so on)
- Age of victim (for example, baby, teenager, middle-age, elderly)
- Whether or not victim has received first aid (for example, stopped bleeding by pressure, and so on)
- Whether or not a victim has vomited (for example, if swallowed or inhaled something, and so on)

WARNING



Gasoline/DEF ingested may cause unconsciousness and burns to internal organs. Do not induce vomiting. Keep airway open. Oxygen may be needed at scene. Seek medical advice immediately.

WARNING

DEF generates ammonia gas at higher temperatures. When opening enclosed panels, allow the unit to air out to avoid breathing vapors. If respiratory difficulties develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention.

WARNING



Gasoline inhaled may cause unconsciousness and burns to lips, mouth and lungs. Keep airway open. Seek medical advice immediately.

WARNING



Gasoline/DEF spilled in eyes may cause burns to eye tissue. Irrigate eyes with water for approximately 15 minutes. Seek medical advice immediately.

WARNING



Gasoline/DEF spilled on skin may cause burns. Wash area thoroughly with clear water. Seek medical advice immediately.

WARNING





DEF is mildly corrosive. Avoid contact with eyes, skin, and clothing. Ensure that eyewash stations and safety showers are close to the work location. Seek medical advice/recommended treatment if DEF spills into eyes.

IMPORTANT: Oxygen may be needed at scene if gasoline has been ingested or inhaled. Seek medical advice immediately.

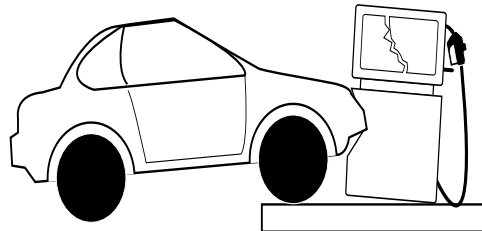
Lockout/Tagout

Lockout/Tagout covers servicing and maintenance of machines and equipment in which the unexpected energization or start-up of the machine(s) or equipment or release of stored energy could cause injury to employees or personnel. Lockout/Tagout applies to all mechanical, hydraulic, chemical, or other energy, but does not cover electrical hazards. Subpart S of 29 CFR Part 1910 - Electrical Hazards, 29 CFR Part 1910.333 contains specific Lockout/Tagout provision for electrical hazards.

Hazards and Actions

 WARNING	
	Spilled fuels, accidents involving pumps/dispensers, or uncontrolled fuel flow create a serious hazard.
	Fire or explosion may result, causing serious injury or death.
	Follow established emergency procedures.
	DEF is non-flammable. However, it can create a slip hazard. Clean up spills promptly.

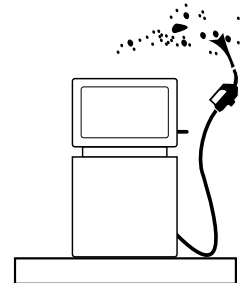
The following actions are recommended regarding these hazards:



Collision of a Vehicle with Unit



Fire at Island



Fuel Spill

- Do not go near a fuel spill or allow anyone else in the area.
- Use station EMERGENCY CUTOFF immediately. Turn off all system circuit breakers to the island(s).
- Do not use console E-STOP, ALL STOP, and PUMP STOP to shut off power. These keys do not remove AC power and do not always stop product flow.
- Take precautions to avoid igniting fuel. Do not allow starting of vehicles in the area. Do not allow open flames, smoking or power tools in the area.
- Do not expose yourself to hazardous conditions such as fire, spilled fuel or exposed wiring.
- Call emergency numbers.

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3 – Start-up Procedures

Introduction

Purpose

Gasboy AtlasX units require this start-up process for pumps and dispensers as well require upon the completion of the start-up that all pumps and dispensers installed in the United States and Canada be registered. This procedure ensures proper installation and warranty registration of the equipment.

The start-up process and checklists are used to ensure that the unit(s) are installed and function properly.

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to GOLD.

This section was last updated in May 2024.

Topics in This Section

Topic	Page
Introduction	3-1
Certificate of Conformance (CoC) Numbers	3-1
Start-up Checklists	3-2
Meter Calibration	3-4

How to Use This Section

Make copies of the installation checklist found in *MDE-5692 AtlasX Fuel Systems Installation Manual* to ensure that all units have been installed correctly and function properly.

Certificate of Conformance (CoC) Numbers

CoC numbers are required during installation and start-up of new sites. You may be asked for these numbers by a W&M official. For information on CoC numbers, refer to the cover page of this document.

Start-up Checklists

Installation Checklists

To ensure proper and safe operation of all equipment and to maintain warranty coverage, it is required that the checklist be completed at this time. Many of the items on the list must have been checked by the electrician already. Forms must be provided with each unit; if not, contact the Gasboy AtlasX Distributor. Make copies of the checklists for use in the field, to preserve originals for future use.

Mechanical and Hydraulic Related Items Checklist

Item	Procedure	Refer To	Checked
1	Shear valves must be installed as per the valve manufacturer's recommendations. Shear point is ± 0.75 -inch of grade and properly mounted.		
2	Flexible pipes must not be used within the dispenser. However, flexible pipes meeting local and state codes can be used below the pump/dispenser, when allowed by regulatory authorities.	<i>MDE-5693 AtlasX Fuel Systems Site Preparation Manual</i>	
3	Pumps (self-contained units) must have a vacuum actuated pressure regulating valve to prevent positive pressure at the pump base, when used with above ground tanks.	<i>MDE-5693 AtlasX Fuel Systems Site Preparation Manual</i>	
4	Pumps require a check valve.	<i>MDE-5693 AtlasX Fuel Systems Site Preparation Manual</i>	
5	Hose breakaways must be used and installed as per the manufacturer's recommendations. For units with retrievers, breakaways, and whip hoses, hose breakaways must be attached to the nozzle end. For units without retrievers, the hose breakaway is attached to the dispenser end.	Manufacturer's specifications	
6	The unit must be anchored to the island properly.		
7	Vapor recovery piping at the pump/dispenser must have no traps or sags.		
8	Verify if there are correct nozzles, piping, and brand panels for each grade.	Unit order specific	
9	All code, regulatory agency, or customer specified safety warning signs, labels, or decals have been installed.	As provided with and for unit	
10	Long hose lengths beyond Gasboy AtlasX recommendations must not be used without special retrievers; for VaporVac [®] hoses, no more than 6 inches of hose length may rest on the ground when nozzle is resting in boot. For balance vapor recovery, no portion of the hose may be on the ground.	NFPA 30A	
11	The unit is mounted using the proper quantity, size, and strength mounting hardware.		
12	The unit must pump fuel, as calibrated. All displays showing the calibrated parameters must be accurate.		
13	The pump must have a vertical lift of no more than 11 feet to deliver the fuel.		
14	The inlet piping used in the pump to deliver fuel must be of appropriate diameter.		
15	The distance of the pump from the under ground tank must not exceed 50 feet.		

Electrical Related Items Checklist

Item	Procedure	Refer To	Checked
1	Equipment must be installed in conjunction with an emergency power cut-off to shut off all power from the equipment in case of an emergency.	<ul style="list-style-type: none"> • MDE-5693 AtlasX Fuel Systems Site Preparation Manual • FE-371 Field Wiring Diagram AtlasX 	
2	STP isolation relays are required for all dispensers.		
3	Use twisted-pair wires as specified for wire-pair communication for new installations or where new wire is pulled. Do not use a shielded wire.		
4	All wiring must be stranded copper of the gauge and insulation casing specified.		
5	All grounds must be properly connected as per the installation manual requirements as well as state, local, and national codes.	<i>MDE-5692 AtlasX Fuel Systems Installation Manual</i>	
6	Conduit must be approved for hazardous locations and properly sized for the wiring involved.	<ul style="list-style-type: none"> • NFPA 30A • NFPA 70® • UL 87 • NEC 	
7	Properly size all circuit breakers for the units/unit options involved.	NEC and local codes	
8	All pump/dispenser wiring must be properly spaced and isolated from wiring for electrically noisy devices such as variable speed STPs, station equipment motors, and other devices.	<i>MDE-5693 AtlasX Fuel Systems Site Preparation Manual</i>	
9	All power wiring and circuit breakers to Gasboy AtlasX equipment must be dedicated and not be shared with other equipment.		
10	At temperatures below 15 °F (-9.44 °C) for DEF units filled with fluid, power must be supplied to the DEF heater as well as for external plumbing.		
11	All circuit breakers to Gasboy AtlasX equipment must be clearly labeled and readily accessible.		
12	All Distribution Boxes (D-Boxes) must be clearly labeled showing the pump/dispenser number connections.		
13	All pumps/dispensers must be wired to the same phase of electrical power.		
14	New site wiring must be Megger® tested. Old site wiring must be continuity and short-tested with a digital meter.		
15	Wiring color must be coded or tagged, sized for distance and application, and resistant to gas and oil.		
16	Confirm proper wiring, if used with a Gasboy FMS (using the appropriate FMS installation manual).	<i>MDE-5411 ForeHB Islander PRIME Installation Manual</i>	

Meter Calibration

Calibrate all the units before their use by customers. For instructions on calibrating units, refer to [“Hydraulic/Mechanical Components”](#) on [page 7-1](#).

Note: DEF units must be purged properly before calibration or calibration verification. Incomplete purging of air can result in inaccurate calibration or errors in calibration verification testing. Improper purging can cause damage to meters and shorten their life. DEF units create special difficulties regarding purging, especially because of the ability of the fluid to hold air and commonly the pumps used with the devices have no air separation capability. Overhead plumbing is especially troublesome.

Gasboy AtlasX (Gallon Unit of Measure)

For Gasboy Retail unit, temporary pricing must have already been entered into the unit as outlined in [“Purging Air from System”](#) on [page 7-10](#) to allow dispensing and calibration.

Current production Gasboy AtlasX pumps/dispensers, excluding units designed for DEF are tested using U.S. gallons (calibration verification is still required) and programmed to default programming values. Electronic register units may be operated and purged in normal mode after entering prices. On electronic register units, purging can be done for units eventually, to be converted to metric mode while the unit is in gallon mode.

Satellite Start-up

Completion Checklist

The following information must be reviewed to verify the proper installation of the satellite dispensing unit. If the installation does not meet the following criteria, correct the problem before the start-up is performed.

- 1 If connected to an AtlasX Series 9800G dispenser, to avoid damage to the Ultra-Hi Interface board, verify if the RESET COMPLETE, FAST FLOW, SUBM. STARTER DRIVE, and SLOW and FAST SATELLITE RETURN wires are not shorted to conduit or chassis.
- 2 The unit must be properly secured to the island.
- 3 All plumbing must be complete and tight. All liquid-carrying lines must be checked for leaks.
- 4 All conduit work must be complete. All J-box covers must be secured. Conduits must not be sealed until the wiring is verified through proper operation.
- 5 The unit must be properly grounded.
- 6 Before any testing begins, remove any water in the tank through a fill opening, using a suitable pump. Do not use the Gasboy pump or dispenser and submersible pump to remove water. Serious damage may occur.
- 7 A sufficient volume of fuel must be put in the tank to ensure that the liquid level is high enough to allow the submersible pump to operate efficiently (dispensers). This section provides information specific to the installation of AtlasX pumps/dispensers.

Start-up

After successfully verifying the installation against the completion checklist, the unit is ready for start-up. To perform start-up of the satellite dispensing unit, proceed as follows:

- 1 Turn on the circuit breaker(s) for the various control lines to the dispenser to be tested.
- 2 Remove the nozzle for Side 1 from its holder and turn on the pump handle.
- 3 Dispense fuel. If the unit contains a slow/fast flow valve, verify if it opens. Check all plumbing for leaks at this time.
- 4 Turn the pump handle off. Open the nozzle. No fuel must be dispensed.

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4 – Pump Programming

Introduction

Purpose

This section provides instructions for programming and changing settings in Gasboy AtlasX 9800 and 8800 series pumps and dispensers. Programming and settings for each series will be explained separately. Depending on the series, units will have electronic or mechanical means to display the fuel dispensed. Retail units may also show the cost of the fuel dispensed.

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to GOLD.

This section was last updated in June 2025.

Topics in This Section

Topic	Page
Introduction	4-1
Programming Overview	4-1
Programming Electronic Units	4-8
AtlasX Programming Instructions	4-12
Additional Manager Functions for AtlasX	4-73
Programming DEF Dispensers	4-74

Programming Overview

The purpose of this overview is to show the display characteristics that allow visual reference for identifying each series of pumps and dispensers. This is accompanied by a brief description of the programming methods. For detailed information, refer to [“Programming Electronic Units”](#) on page 4-8.

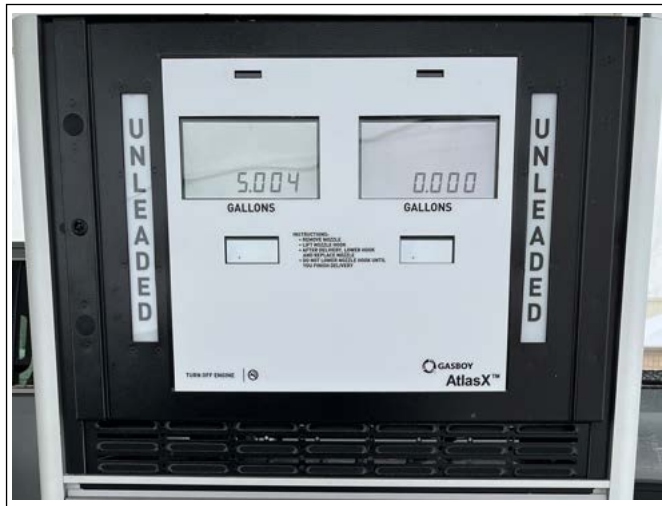
8800/9800 Series Electronic Units

The Gasboy 8800/9800 Series Electronic units manage all the common functions for a low hose compact dispenser such as sale control, total maintenance, Automatic Temperature Compensation (ATC) functions, electro-mechanical totalizers, and so on. The unit can operate in a standalone or online mode. In online mode, external communication utilizes a proprietary wired-pair (two-wire) communication system, which is used or can be used by a host of Point of Sale (POS)/controllers as manufactured by Gilbarco, Ruby VeriFone®, Allied, and other manufacturers. If needed, interface devices for communication such as a Gilbarco Pump Access Module (PAM) 1000 can also be used to convert the wired-pair (two-wire) communication to a usable format for other POS manufacturers who cannot connect directly to the two-wire system. The Electronic Commercial units (9800 models) can be connected to various Fleet Fueling Systems, such as AtlasX PRIME or Gasboy Islander PRIME Fuel

Control System. At instances where a mechanical dispenser interface is used to control these electronic units, a pulse-out option is available. The Gasboy 9800 series units contain a volume display only (money display & PPU are omitted).

The type of display associated with the 9800 series units is shown in [Figure 4-1](#).

Figure 4-1: Electronic Commercial Display



The type of display associated with the 8800 series unit is shown in [Figure 4-2](#).

Figure 4-2: Electronic Retail Display



Mechanical Commercial Units

The 9100 series would be programmed at the fuel management system based on control wire assignment applied in the FMS.

The 9100 series units use a mechanical computing device.

The type of display associated with the 9100 series unit is shown in [Figure 4-3](#).

Figure 4-3: Mechanical Commercial Display

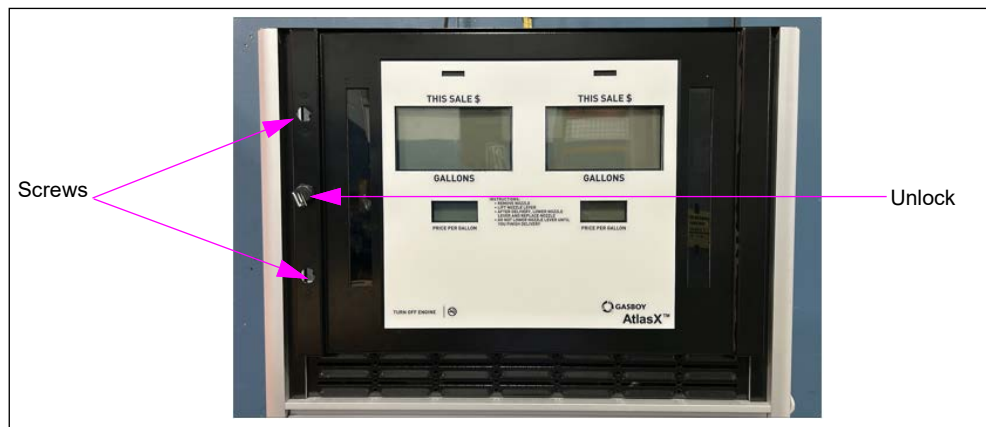


Opening the Bezel Assembly

To change the settings and/or programming in Gasboy AtlasX 8800 or 9800 series pumps and dispensers, the bezel assembly must be opened. To open the bezel assembly for AtlasX 8800 or 9800 series pumps and dispensers, proceed as follows:

- 1 Loosen and remove the two screws and washers holding the bezel door assembly.
Note: Retain the screws for re-installation. Right side of the bezel door is hinged.
- 2 Unlock the lock using a key.

Figure 4-4: Bezel Door Assembly



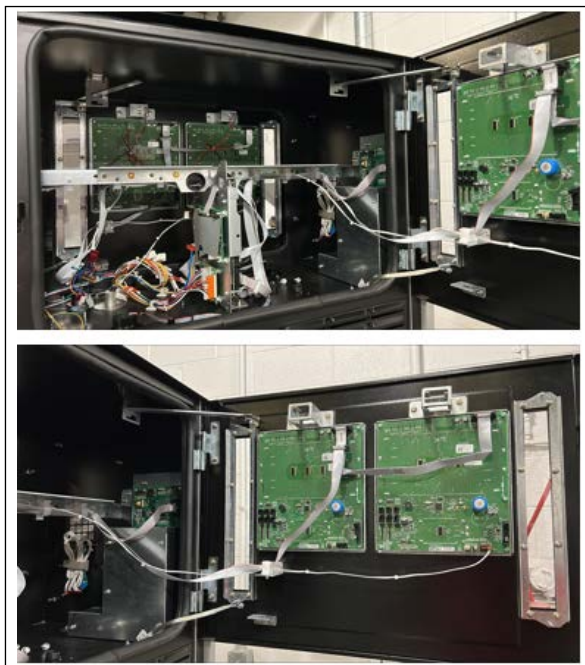
- 3 Open the bezel door 90 degrees until the prop rod engages.

Figure 4-5: Opening the Bezel Door



- 4 The bezel door will lock in place. Ensure that the door is locked in place before you proceed.

Figure 4-6: Bezel Door Open



Opening the Lower Panel Assembly

To access the lower panel, proceed as follows:

- 1 Unlock the lock using a key.

Figure 4-7: Lower Panel Assembly



- 2 Using the key in the lock, pull the door upward and then tilt outward.

Figure 4-8: Opening the Lower Panel Door



- 3 Remove the door by pulling up to unmount from the bottom hooks.

Figure 4-9: Bottom Hooks



Reassembling the Lower Panel

To assemble the lower panel, proceed as follows:

- 1 Secure the door in the hooks on the bottom of the frame.

Figure 4-10: Bottom Hooks



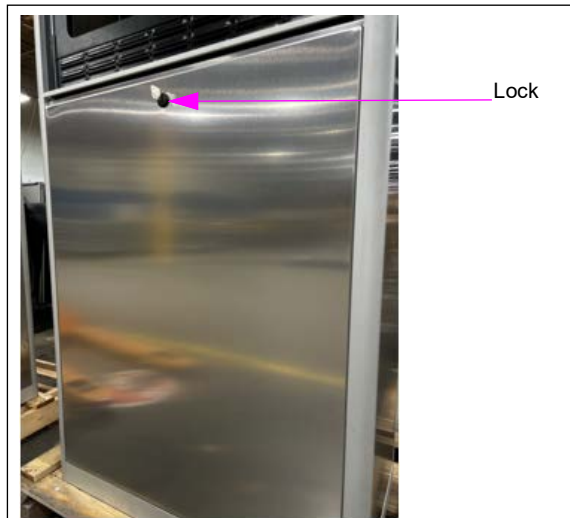
- 2 Tilt the lower panel door back into position, aligning the slots on the door with the hooks.

Figure 4-11: Closing the Lower Panel Door



- 3 Lock the door using a key.

Figure 4-12: Locking the Lower Panel Assembly



Programming Electronic Units

For 8800/9800 series units, the programming mode can only be entered when both sides of the dispenser are in an idle mode, using the Manager Keypad. The nozzles must be in the nozzle boots. Dispenser programming results in the unit being placed offline with regard to external communications. Dispenser programming is started by pressing **F1** on the Manager Keypad. The following sub-sections describe general dispenser operation while in programming mode.

Manager Keypad Details

Figure 4-13 shows the Manager keypad details.

Figure 4-13: Manager Keypad Layout



Manager Keypad Key Definitions and Use

Key(s)	Definition/Use
0-9	Numeric Values
F1	Function 1 – Used to start dispenser programming and sequence among programming and function codes. In general, each depression of F1 will take you back to a previous programming function selection. Pressing F1 from the normal dispenser state will always initiate the Programming mode. Note that displays are always activated during the Programming mode.
F2	Function 2 – Used to exit the programming mode and return to normal mode.
\$Totals	Money Totals – Used to display money totals by side and grade. This key does not require a security code. Clear is used to exit the Money Totals mode.
Vol. Total	Volume Totals – Used to display volume totals by side and grade. This key does not require a security code. Clear key is used to exit the Volume Totals mode.
ENTER	Value entry keys – Sends the entered value to the pump.
CLEAR	Clear key – Used to clear the last keypad entry, and exit the Money and Volume Totals mode.

Programming Errors

If the data entered (command code, function code, or parameter) is invalid, data field will go blank for two seconds and double beep will sound. After two seconds, the invalid value will resume flashing. This error cycle will be repeated until a valid code is entered.

General Programming Operation

After F1 key depression, dispenser will go offline, and all main display LCDs will appear blank and money display will show 8888. This action is followed by entry of a four-digit security code for the required security level. As each digit of security code is entered, a dash (-) will be displayed on main money display for that digit. Once all security digits are entered, ENTER key is depressed and released. If security code is accepted, main money display will change to flashing 0000. Otherwise, money display will show flashing 8888 to indicate an invalid security code.

If a valid security code is entered, user may then enter command code and proceed with dispenser programming as described in sections that follow. If an invalid security code is entered, user simply re-keys the code and presses ENTER again. Otherwise, user may press the F2 key to exit programming mode or simply allow dispenser to time-out (1 minute) and return to normal mode automatically. Upon valid security code entry, display will show 0000 until first digit of a command code is entered. Upon entry of first digit, display will go blank showing entered digit as flashing and left justified to position 6. As each new digit is entered, digits flash and follow in positions 5, 4, and so on.

When a complete command code is entered, it will flash until ENTER key is depressed.

Once a programming mode is activated, the default or first selectable entry for that mode will be shown as flashing. Defaults and further keypad entries will show as flashing digits and will update display as they are keyed in. This action continues until ENTER key is depressed. Once ENTER key is depressed, the next programming field will start flashing, indicating an operator action is required. This keypad/display functionality will continue until the programming mode is exited.

Note: It is important to note that each programming level utilizes a unique set of programming codes as shown in the following table. The reason for this is to allow room for future expansion of AtlasX Series programming features. Function codes within a command code begin at one.

Entry into a command code will present data in either DEFAULT format or last programmed values for that command code. Only one command code and function code/parameter may be programmed/changed at a time.

The following table shows currently allocated security and command codes that have been assigned for use in AtlasX. These codes can be user modified by use of command code 77.

PIN Code Entry

Programming Level	Default PIN Code	Command Code Range
Level 1	2222	19 - 39
Level 2	1503	40 - 69
Level 3	1309	70 - 89
Level 4	0128	90 - 109

- 1) Press **F1** to perform additional programming.
- 2) Press **ENTER** after making selection in all Levels.
- 3) Press **F2** to exit programming.

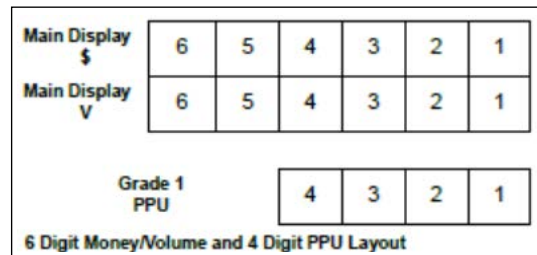
Note: Use of a higher-level PIN code will allow access to lower-level programming codes as well (For example, keying the level 3 PIN code will allow access to level 1, 2, and 3 programming but not level 4).

**Requires the security switch to be moved to the sealed position before entry; otherwise, the unit will respond with a double beep.*

Display Conventions

The programming digit positions for the main money and volume displays are shown in Figure 4-14. This applies even in cases where more than six display digits are available for display purposes. The information will be displayed on all grade PPUs when required and will be restricted to digits 4 through 1, unless otherwise noted.

Figure 4-14: Location of Data on Displays at Power Up Programming Digit Positions for Main Money and Volume Displays



During programming, the command code is always shown left justified in the main money display, starting at digit position 6. Other display information will be dependent on specific programming command codes and function codes within the command code.

Flashing fields indicate a selected parameter where data may be entered or simply inspected.

Programming parameters are shown in LCD displays as soon as the parameter selection key is pressed. Parameters are entered into the pump control system only after **Enter** is pressed.

Totals Examples

To toggle between the grade and side selection for both **\$Total** and **Vol Total** key, press **ENTER** as found on the Manager Keypad.

Non-resettable Money and Volume Totals

The dispenser maintains a set of non-resettable totals for each dispensed fuel grade. These totals reflect the total value of money and volume of fuel, since the dispenser was installed.

Money and Volume Totals

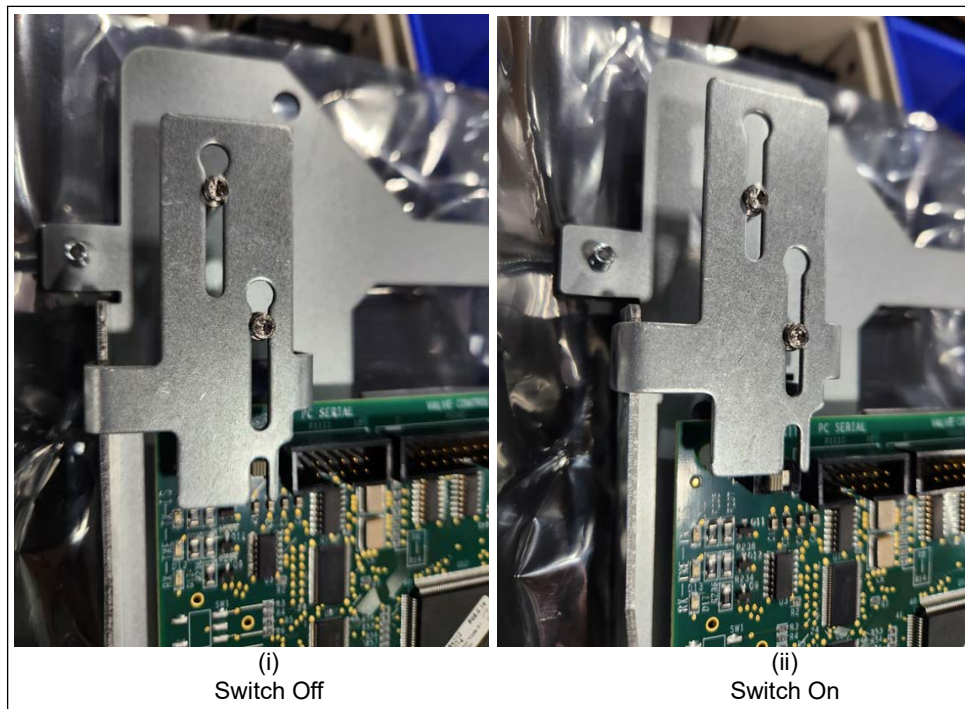
\$Total is used to retrieve money totals for each fuel grade. This key does not require a security code. **Clear** is used to exit Money Totals mode. **1** displayed in the leftmost \$ Total display indicates that this total is a non-resettable money total. The **Vol Total** key displays the volume for the grade selected. Volume for both sides of the unit can be viewed. **Clear** is used to exit the Volume Total mode.

Programming Steps for 8800/9800 Series Units

This section provides the programming steps for 8800/9800 Series units.
(In standalone mode, programming can be entered at any time by going to step 3.)

- 1 Authorize pump from POS or FCC or when the AtlasX unit is programmed for **Pulse Out mode**, ensure that the FMS has AtlasX units set for bypass mode and then perform programming.
- 2 Send PUMP STOP from POS or FCC (repeat steps 1 and 2 three times).
Note: Once unlocked, the unit will remain unlocked for five minutes to allow access.
- 3 Press **F1** or when the AtlasX unit is program for two-wire, the procedure is to power down the dispenser, disconnect the two- wire connector from the pump control node (P1109), power up the dispenser, wait 5 minutes, and then perform programming.
- 4 Enter PIN code for higher-level programming as required (refer to [PIN Code Entry](#) on page 4-9).
- 5 Toggle the Weights and Measures (W&M) switch to ON position, if required.

Figure 4-15: W&M Switch



- 6 Program the unit as required.
- 7 When finished programming, toggle W&M switch to OFF position.
- 8 Press **F2** to exit programming.*
*Note: *Requires the security switch to be moved to the sealed position before entry; otherwise, the unit will respond with a double beep.*

⚠ CAUTION
 Ensure to return AtlasX units back to FMS control by returning unit to online mode or re-establishing two-wire communications.

Security/PIN Code Entry

It is strongly recommended that the appropriate station authority change/reset the security codes to enhance security. The security codes default factory settings are shown in PIN Code Entry (For more information, refer to “General Programming Operation” on page 4-9) earlier in this section.

AtlasX Programming Instructions

Level One CCs

Level 1 commands are those commands most commonly performed on site by station owner/operator.

Programming Level	Default PIN Code	CC Range
Level 1	2222	19-39

- Press **F1** to perform additional programming.
- Press **ENTER** after making selection in all levels.
- Press **F2** to exit programming.

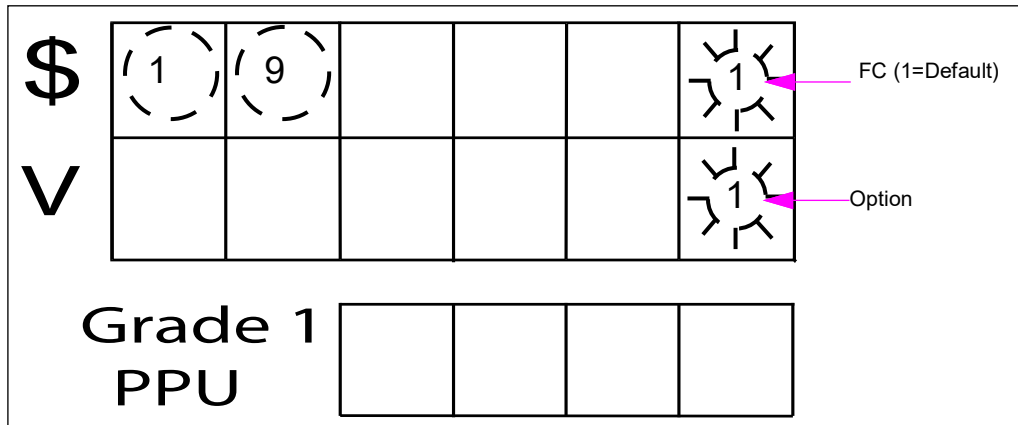
Note: Entry of Level 2, 3, or 4 PIN Codes will also allow entry into Level 1 programming.

The following CCs described show the layout and digit position meaning for programming features:

CC19: Set AtlasX Related Options

CC19 is entered in Level 1 programming to set AtlasX related options such as pulse out, pulse output rate, and blanking money & PPU displays. Entry into CC19 will select FC1 by default. The layout and meaning of each digit position for these programming features are shown in Figure 4-16.

Figure 4-16: Setting AtlasX Related Options



Note: Function Code changes require the security switch to be moved to the unsealed position before entry; otherwise, the unit will respond with a double beep.

FC1: Set Pulse Out Mode

The Pulse out mode setting determines if the dispenser operates without external control or is controlled via the AUTH input and provides pulse output signals. The pulse output provides a DC output that indicates the quantity of product dispensed. Pulse out mode is not available unless the operation mode is set to Standalone.

- 1 Press **1, 9**, and then press **ENTER** to access this CC.
- 2 Press **1** (FC 1) and press **ENTER**.
- 3 Select the Pulse Out Mode option using the following table:
Option Pulse out Mode
1 = (Default) Disabled
2 = Enabled
- 4 Press **ENTER** to accept the setting.

FC2: Set Pulse Output Rate per Volume Unit

This function code configures the Pulse-output rate required by the monitoring equipment (ex: Islander PRIME with mechanical pump interface). The pulse output rate represents the pulses per unit (gallon, liter, etc.). The pulse output rate is not available unless pulse out mode is enabled.

- 1 Press **1, 9**, and then press **ENTER** to access this CC.
- 2 Press **2** (FC 2) and press **ENTER**.
- 3 Select Pulse Output Rate option using the following table:
Option Pulse output Rate
0 = Not Programmed*
1 = 1 Pulse per Volume Unit
2 = 10 Pulses per Volume Unit
3 = 100 Pulses per Volume Unit
4 = 250 Pulses per Volume Unit (N/A for Liters)
5 = 500 Pulses per Volume Unit (N/A for Liters)
- 4 Press **ENTER** to accept the setting.

FC3: Blank Money and PPU Displays

This function code configures the data shown on the main display. The disabled setting (default) shows all data (\$total, volume, and PPU) on the main display. This setting is used for retail units (8800 models). The enabled setting blanks out the \$total and PPU displays and only shows the volume on the main display. This function code must be enabled for all commercial units (9800 models).

- 1 Press **1, 9**, and then press **ENTER** to access this CC.
- 2 Press **3** (FC 3) and press **ENTER**.

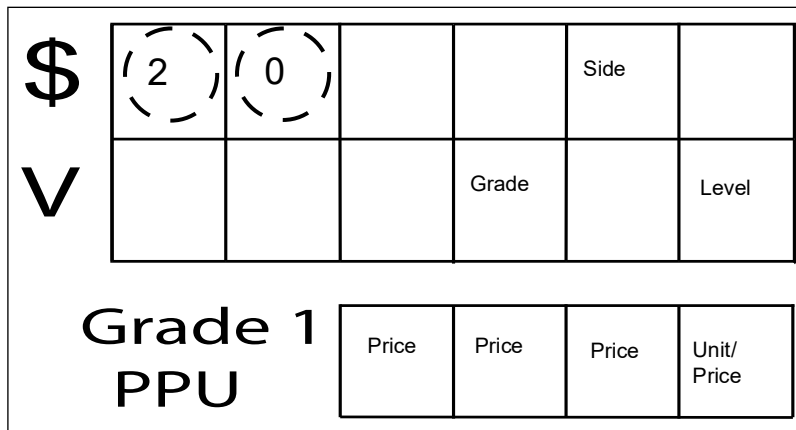
- 3 Select the Blank Money and PPU Displays option using the following table:
Blank Money and PPU Displays
 1 (Default) Disabled - Show Money and PPU Values
 2 Enabled - Blank Money and PPU Displays
- 4 Press **ENTER** to accept the setting.

CC20: Set PPU Values

Layout and digit position meaning for this programming feature are shown in [Figure 4-17](#).

Set PPU Values is not available unless the operation mode is set to Standalone. Attempting to enter CC20 will double beep.

Figure 4-17: Setting the PPU Values



- 1 Press **2, 0**, and then press **ENTER** to access this CC.
- 2 Select side and press **ENTER**.

To Program	Press Configuration
Side 1 (side with J-box)	1
Side 2	2
Both Sides	3
- 3 Select Price Level (Cash/Credit).
- 4 Enter the new PPU number.
Note: Repeat for other side, grade, and price level.

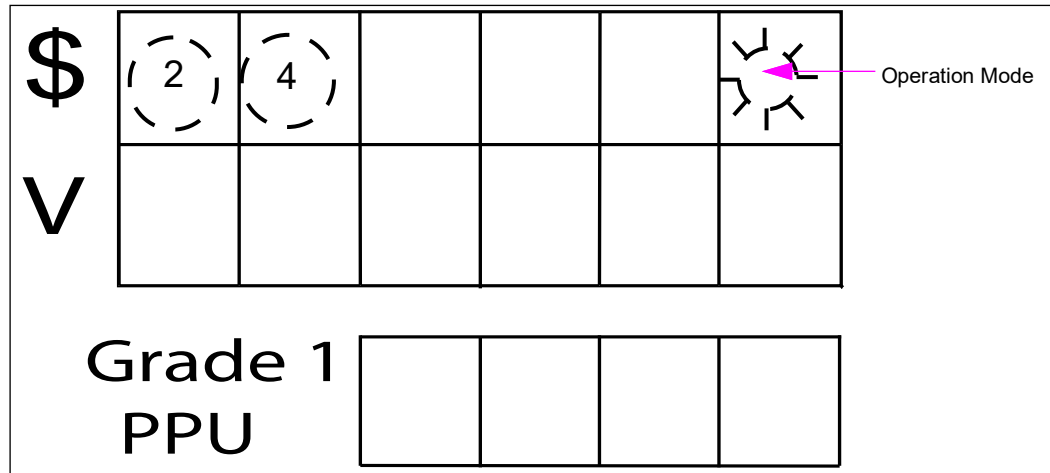
CC22: Set Preset Types and Values

Not available on AtlasX.

CC24: Set Operations Mode

CC24 is entered in Level 1 programming to set the dispenser operating mode. Operation mode setting determines how the dispenser is controlled remotely or if it operates without external control. Available choices for operation mode setting are shown in [Figure 4-18](#).

Figure 4-18: Setting Operations Mode



- 1 Press 2, 4, and then press **ENTER** to access this CC.
- 2 Select Mode of Operation option using the following table:

Option	Operation Mode
1 (Default)	Two-wire
2	Standalone

- 3 Press **ENTER** to accept mode of operation.

CC25: Set Volume Allocation

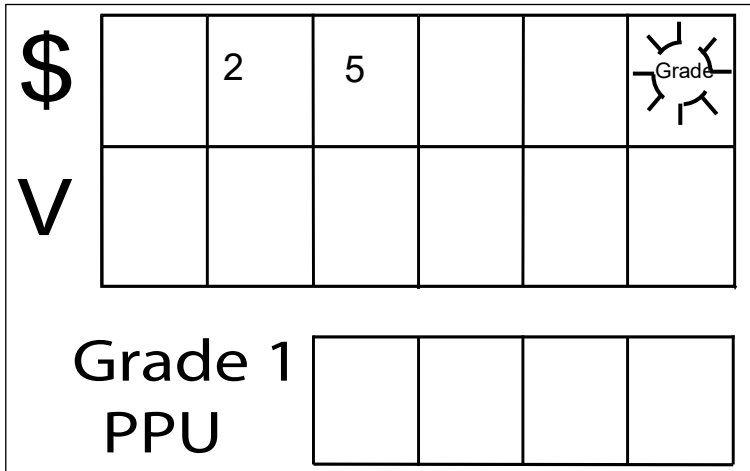
CC25 is entered in Level 1 programming to set side and grade allocation volumes.

Note: Decimal point position may change in main volume display depending on its location from display decimal point programming. Default allocation setting is none or all zeros.

- 1 Press **2**, **5**, and then press **ENTER** to access this CC.

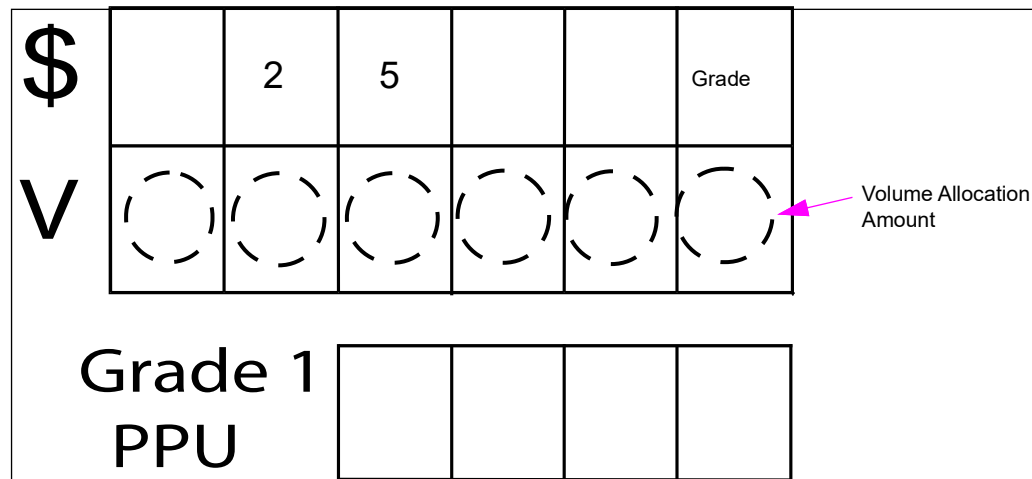
Note: Layout and meaning of the digit position for this programming feature are shown in Figure 4-19.

Figure 4-19: Grade Selection



- 2 Select Grade and press **ENTER**.

Figure 4-20: Setting Volume Allocation Amount



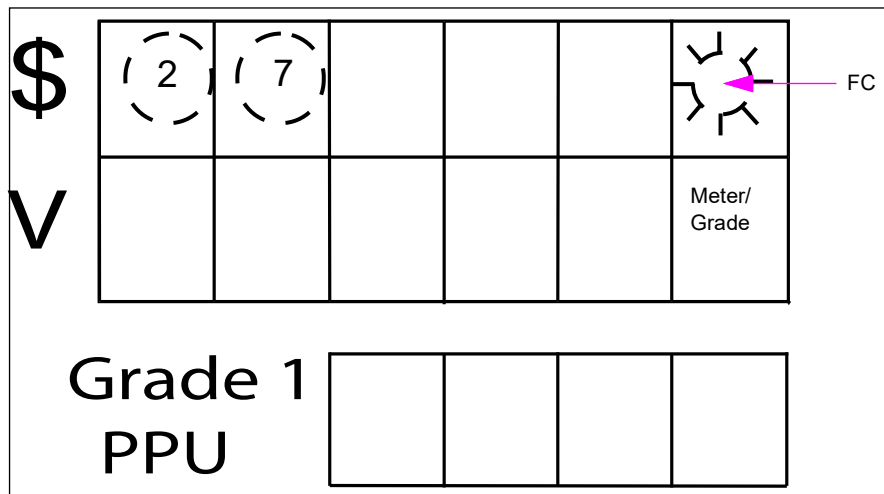
- 3 Set Volume Allocation Amount in the volume display and press **ENTER**.

CC27: Review ATC Data

CC27 is entered in Level 2 programming to access ATC data. FCs in this programming level provide read only access to ATC operating parameters. No changes can be made to operating parameters at this level. Default FC (1) provides audit of last transaction data.

- Notes: 1) Attempting to use this CC when ATC is not installed will result in a display error as described in "Pump Programming" on page 4-1.
 2) Complete ATC data will be shown in displays depending on specific FCs as described in sub-sections that follow.

Figure 4-21: Reviewing ATC Data



- 1 Press 2, 7, and then press **ENTER** to access this CC.
- 2 Select FC number (1-6) using the following table and press **ENTER**.

The following table shows available FCs and keypad programming for CC27:

FC	ATC Functions and Description	FC Keypad Programming in CC27
1 (Default)	Audit last transaction: Provides display of uncompensated and compensated product volumes (single meter) in main money and volume displays respectively. Average transaction temperature for the selected inlet is shown in PPU display for selected meter. ATC data is reported after inlet selection has been entered in main volume display.	<ul style="list-style-type: none"> • Press ENTER (accepts default FC). • Select meter. • Press ENTER. • Select next meter. • Press ENTER.
2	Display VCF: Provides display of VCF for a selected product (meter). VCF is based on currently sensed meter temperature. ATC data is reported after meter selection has been entered in main volume display.	<ul style="list-style-type: none"> • Select FC 2. • Press ENTER. • Select meter. • Press ENTER. • Select Grade. • Press ENTER.
3	Display fuel density: Provides display of density for a selected meter. Displayed density for a particular grade reflects density assignment made in Level 4 programming. ATC data is reported after grade selection has been entered in main volume display.	<ul style="list-style-type: none"> • Select FC 3. • Press ENTER. • Select meter. • Press ENTER. • Select next meter. • Press ENTER.

FC	ATC Functions and Description	FC Keypad Programming in CC27
4	Display temperature: Provides display of the temperature in Celsius for a selected meter.	<ul style="list-style-type: none"> • Select FC 4. • Press ENTER. • Select meter. • Press ENTER (refer to Note 1 on page 4-17). • Select next meter. • Press ENTER (refer to Note 1 on page 4-17).
5	Display gross volume totals: Provides display of gross volume totals for a selected meter.	<ul style="list-style-type: none"> • Select FC5. • Press ENTER. • Select meter. • Press ENTER. • Select next meter. • Press ENTER.
6	Display software version: Provides display of ATC neuron software version number.	<ul style="list-style-type: none"> • Select FC 6. • Press ENTER.

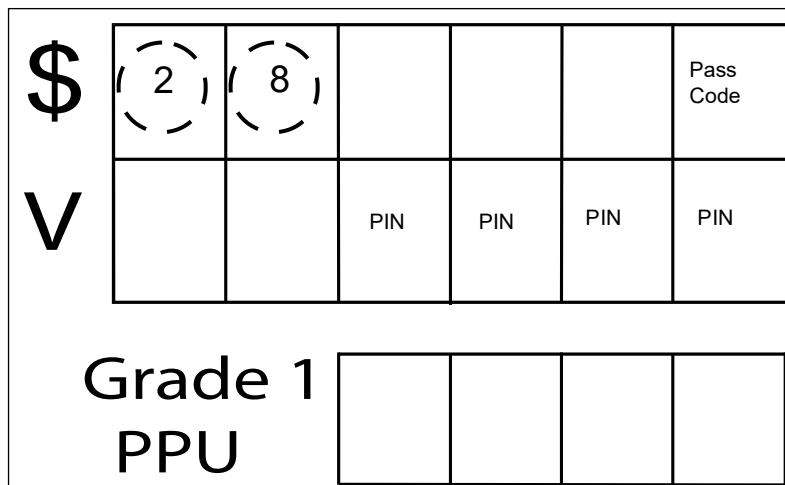
Note: Display indicates '0' for a negative temperature value and is blank for a positive value (Current PPU display cannot display a "-" character)

CC28: Change First Level PIN

Allows site manager to change site management level (Level 1) PIN Code. Entering new digits for new code, changes the display as digits are entered. Display does not show actual PIN digit. It only shows "0" to signify that a number was entered. Same PIN Code must be entered twice to be accepted.

First pass at entering PIN Code is signaled by a "1" appearing in Pass Code display. Second pass is signaled by a "2" appearing in Pass Code display. Acceptance of a PIN Code is signaled by a "3" appearing in Pass Code display. A "0" in Pass Code display indicates that the PIN Code was not accepted. Layout and digit position are shown in [Figure 4-22](#).

Figure 4-22: Changing the First Level PIN



1 Press **2**, **8**, and then press **ENTER** to access this CC.
 Note: Pass Code displays 1 for first pass.

2 Enter PIN Code: XXXX and press **ENTER**.
 Note: Pass Code displays 2, prompting a second pass.

3 Enter PIN Code again and press **ENTER**.

CC31: Set Money Allocation

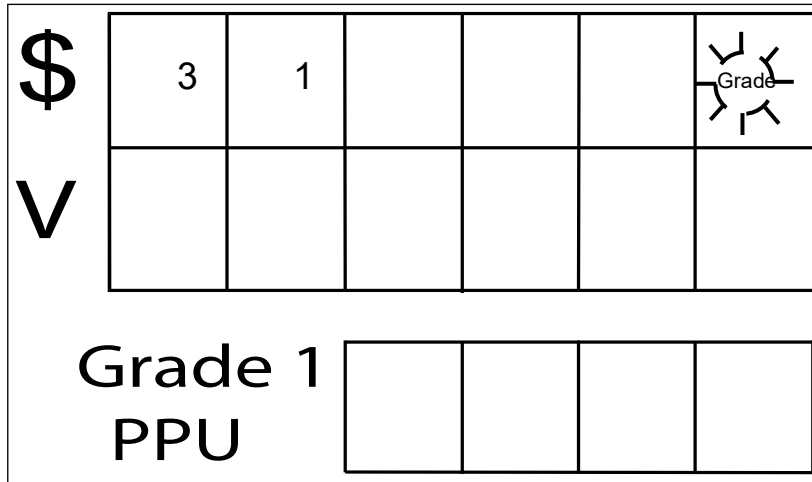
CC31 is entered in Level 1 programming to set side and grade money allocation.

Note: Decimal point position may change in money display depending on its location from display decimal point programming. Default allocation setting is none or all zeros.

- 1 Press **3**, **1**, and then press **ENTER** to access this CC.

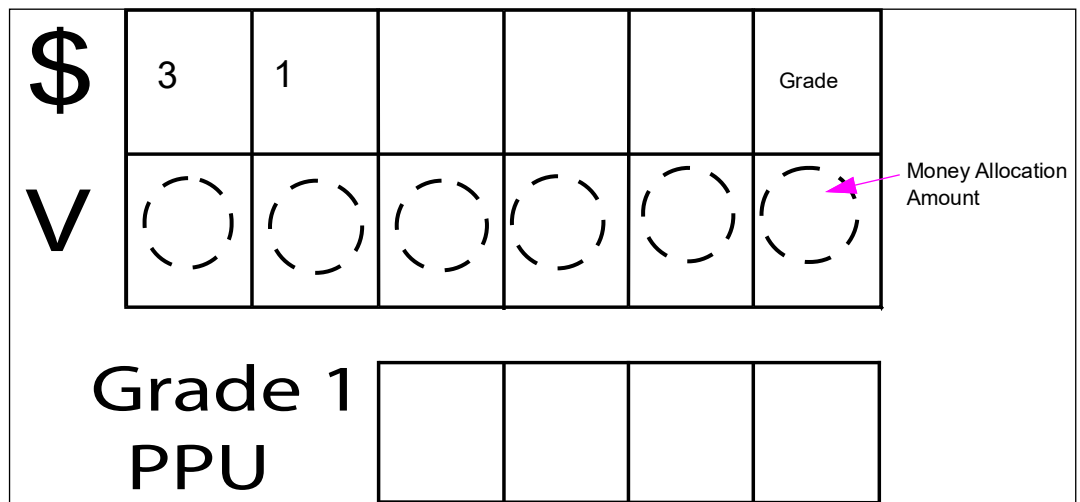
Note: Layout and meaning of the digit position for this programming feature are shown in Figure 4-23.

Figure 4-23: Grade Selection



- 2 Select Grade and press **ENTER**.

Figure 4-24: Setting Money Allocation Amount



- 3 Set Money Allocation Amount in the Money display and press **ENTER**.

Level Two CCs

CC40: Set Two-wire ID (Pump Number)

CC40 is entered in Level 2 programming to set the pump ID number. Address range is 1-16. Pump side ID default values are side 1 = 7 and side 2 = 11. Layout and digit position meaning for this programming feature are shown in [Figure 4-25](#).

Figure 4-25: Setting Pump ID Number

\$	4	0				Side
					Pump ID	Pump ID
V						
	Grade 1					
	PPU					

- 1 Press **4, 0**, and then press **ENTER** to access this CC.
- 2 Select side and press **ENTER**.

To Program	Press Configuration
Side 1 (side with J-box or side with W&M switch)	1
Side 2	2

Figure 4-26: Pump ID Number

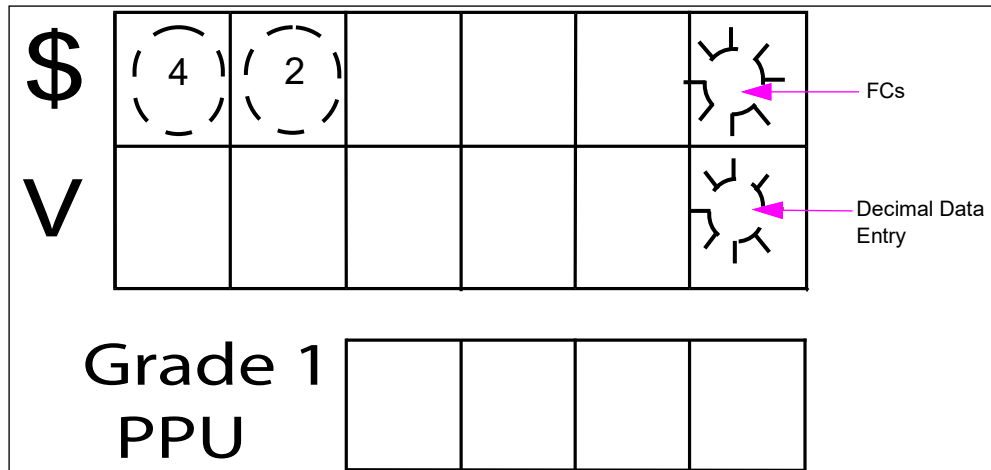
\$	4	0				
					Pump ID	Pump ID
V						
	Grade 1					
	PPU					

- 3 Enter address (1-16) and press **ENTER**.

CC42: Set Decimal Point Options

CC42 is entered in Level 2 programming to assign decimal point locations. FCs 1 through 4 are selected to set the location of money and volume decimal points for display and calculation purposes. Entry into CC42 will select FC1 by default. Layout and meaning of each digit position for this programming feature are shown in Figure 4-27.

Figure 4-27: Set Decimal Point Options



- 1 Press 4, 2, and then press **ENTER** to access this CC.
- 2 Select FC (1-4) using the following table and press **ENTER**.

FC1: Set Money Decimal Point Position for Display

The following table indicates locations where main money display decimal point can be positioned through CC42, FC1:

Position Parameter Options	Decimal Point Positions
1	X
2	X.X
3 (Default)	X.XX
4	X.XXX

- 1 Select FC1 and then press **ENTER**.
Note: Accepts default FC - Main Money Display.
- 2 Select Position Parameter Option (1-4) and press **ENTER**.

FC2: Set Volume Decimal Point Position for Display

The following table indicates the locations where main money display decimal point can be positioned through CC42, FC2:

Position Option	Decimal Point Positions
3	XXXX.XX
4 (Default)	XXX.XXX

- 1 Select FC2 and then press **ENTER**.
- 2 Select Position Parameter Option (3-4).
- 3 Press **ENTER** to save the setting.

FC3: Set PPU Decimal Point Position for Calculations (Canada Only)

The following table indicates locations where PPU calculation decimal point can be located. Default PPU decimal point for calculations is position 4.

- 1 Select FC3 and press **ENTER** to access this CC.
- 2 Select Position Parameter Option (1-4) and press **ENTER**.

Position Option	Decimal Point Positions
1	X
2	X.X
3	X.XX
4 (Default)	X.XXX

FC4: Set PPU Decimal Point Position for Display

The following table indicates where PPU display decimal point can be positioned. Default PPU decimal point for display is position 4.

- 1 Select FC4 and then press **ENTER** to access this CC.
- 2 Select Position Parameter Option (1-4) using the following table and press **ENTER**.

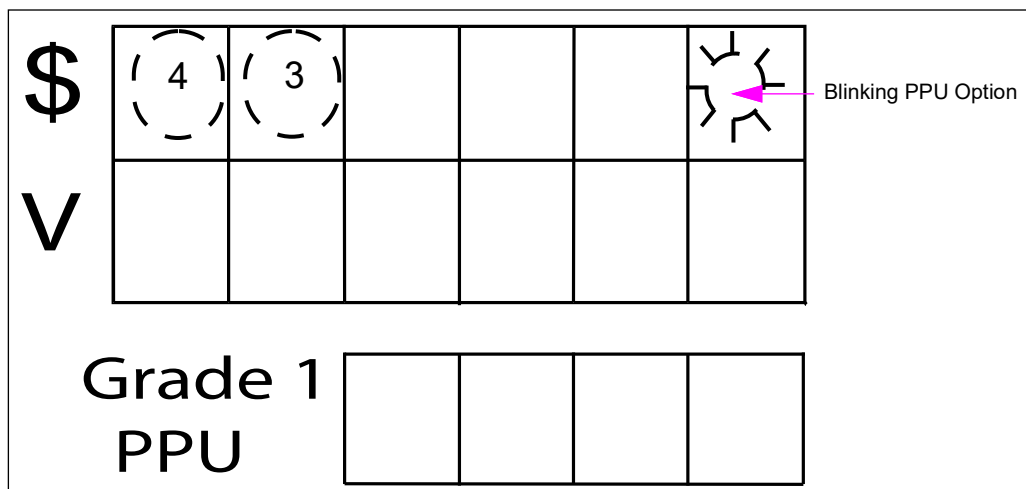
Position Option	Decimal Point Positions
1	X
2	X.X
3	X.XX
4 (Default)	X.XXX

CC43: PPU Blinking Options

CC43 is entered in Level 2 programming to set PPU blinking functionality. This allows programmer to set PPU displays for blinking on and off under certain conditions. On a single-hose blender, MPD, or Master/Satellite, setting this option to “ON” will cause all PPU displays to blink after pump handle is raised (or in this case if nozzle is removed from an auto-on pump handle). Blinking stops when grade select button is pressed. Default for this option is selection 1. This programming option affects all sides of dispenser – all sides are programmed the same.

Note: CC43 is used to specify PPU blinking options for dispensers without grade indicator lights installed with the PPU displays. Because of this, this option is typically not used with Encore S/700 S units. When CC96 is set to 1, regardless of dispenser model type, this CC will function as described.

Figure 4-28: PPU Blinking Options



- 1 Press 4, 3, and then press **ENTER** to access this CC.
- 2 Select “ON”/“OFF” Option using the following table.

The following table shows the available options for this CC:

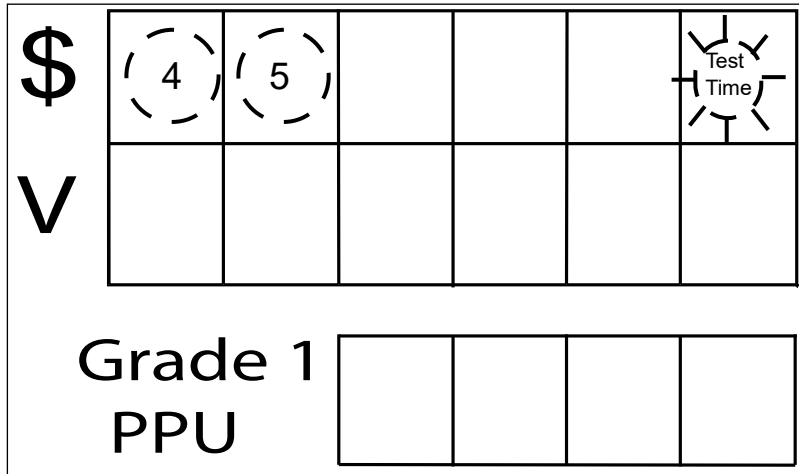
Blinking Code	Option	State
1 (Default)		On
2		Off

- 3 Press **ENTER**.

CC45: Set Lamp Test Time

CC45 is entered in Level 2 programming to set the time duration of lamp test. Lamp test time determines the amount of time allotted for the system to run a line leak test before opening the dispenser valves. Maximum allowed lamp test time is 9 seconds, minimum is 0 seconds, and default test time is 3 seconds. Basic test sequence is all 8s, blanks, 0s, transaction PPU.

Figure 4-29: Setting Lamp Test Time

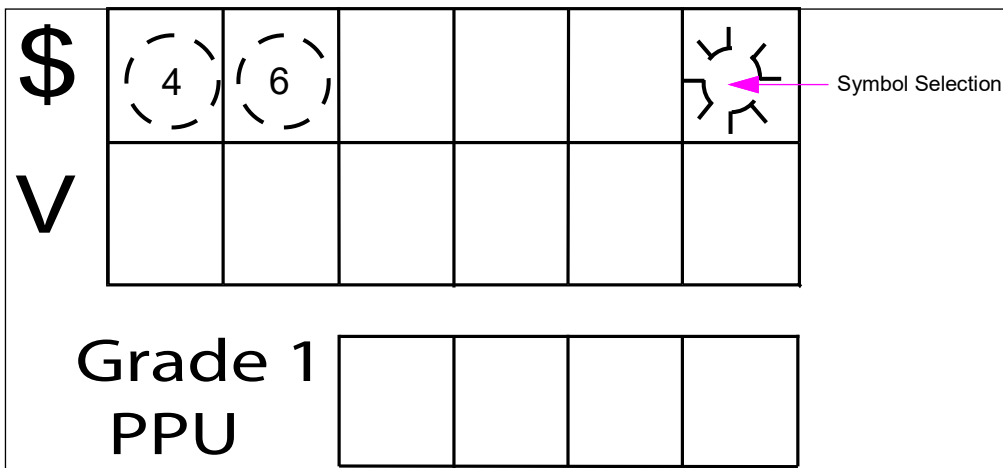


- 1 Press 4, 5, and then press **ENTER** to access this CC.
- 2 Select Lamp Test time (0-9 seconds).
- 3 Press **ENTER**.

CC46: Set Comma/Decimal Point

CC46 is entered in Level 2 programming to select comma or decimal point display at main transaction and PPU displays.

Figure 4-30: Setting Comma/Decimal Point



- 1 Press **4**, **6**, and then press **ENTER** to access this CC.
- 2 Select the symbol option (1-2) using the following table:

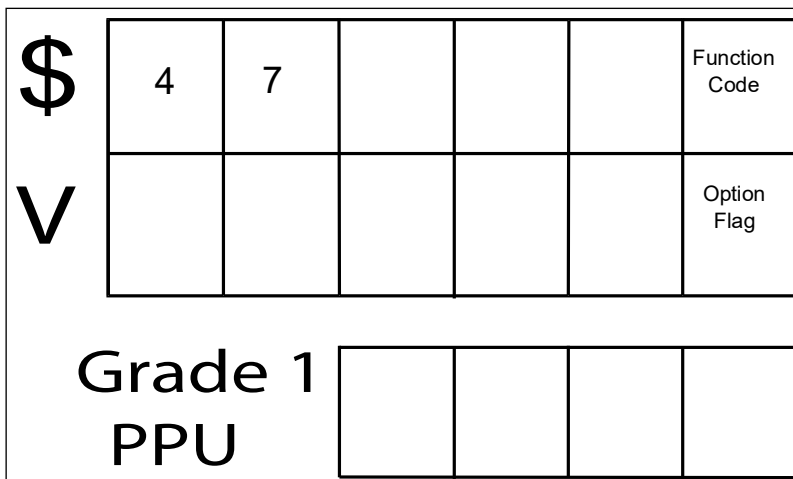
Symbol Options	Symbol
1 (Default)	Decimal Point
2	Comma

- 3 Press **ENTER**.

CC47: Set Two-wire Options

This command allows the user, technician, or factory associate to set up the two-wire communications parameters. Historically, CC47 was solely used to set the 5 or 6 digit two-wire money mode. Now this CC is divided into multiple FCs. However, if, over ZModem, a configuration file is received that sets CC47 with no FC, this will be interpreted as setting only the 5 or 6 digit money mode. This CC is protected by the security switch. Without the switch being open, the unit will double beep and prevent entering a new value. All changes will be logged into the Regulatory Log.

Figure 4-31: Setting the Reported Money Size



The following table describes the relationship between FCs and installable options:

FC	Dispenser Option Description
1 (Default)	Set Reported Money Size
2	Set Reported Volume Format
3	Set VRC States in Transaction Data
4	Set Status Response Format
5	Set Baud Rate
6	Set Communications Lost Method
7	Set Real-time Data Format
8	Set Preset With Pump Stop Method
9	Set Remote Preset Display

FC1: Set Reported Money Size

For programming option 1, the least significant digit (shown as Y in the example above) is not used and should be discarded. All known consoles or Point of Sale (POS) in the USA use this default.

Option 2 means that all six digits of the money display are returned with an implied decimal point as selected for the money display. In this case all 6 digits of the money reported over the 2-wire communications loop are meaningful.

Option 3 and 4 set to extended two-wire modes.

The following table shows the available options for this FC:

Selection	Option
1 (Default)	5 Digit Money
2	6 Digit Money
3	7 Digit Money (Extended Two-wire)
4	8 Digit Money (Extended Two-wire)

Figure 4-32 shows an example on how to set report money size as 6 digit.

Figure 4-32: Setting the Reported Money Size as 6 Digit - Example

Keypad: 1 - Pick Reported Money Format

\$	4	7				1
V						1

**Grade1
PPU**

--	--	--	--

Keypad: Enter

\$	4	7				1
V						1

**Grade 1
PPU**

--	--	--	--

Keypad: 2 - 6 Digit Format

\$	4	7				1
V						2

**Grade1
PPU**

--	--	--	--

Keypad: Enter

\$	4	7				1
V						2

**Grade1
PPU**

--	--	--	--

Note: The F1 key will allow additional programming or the F2 key may be used to exit programming.

FC2: Set Reported Volume Format

For standard two-wire modes (CC47 FC1 set to 1 or 2), this function can be used to report volume in either XXX.XXX format by default or report volume as it is displayed. This is the volume as reported in Real-Time volume or Transaction Data only.

The following table shows the available options for this FC:

Selection	Option
1	Volume As Displayed
2 (Default)	Volume In XXX.XXX

Figure 4-33 shows an example on how to set the volume in “Volume as Displayed” format.

Figure 4-33: Setting the Volume Format to “Volume as Displayed” - Example

Keypad: 2 - Volume Format

\$	4	7				2
V						2

Grade 1 PPU

--	--	--	--	--	--

Keypad: Enter

\$	4	7				2
V						2

Grade 1 PPU

--	--	--	--	--	--

Keypad: 2 - Pick Volume Format as Displayed

\$	4	7				2
V						1

Grade 1 PPU

--	--	--	--	--	--

Keypad: Enter

\$	4	7				2
V						1

Grade 1 PPU

--	--	--	--	--	--

FC3: Set VRC States in Transaction Data

This option is not used on AtlasX. This function code must be left at its default value.

FC4: Set Status Response Format

For standard or extended two-wire modes, an alternate status response message can be configured for specialty equipment to gather extra information during BUSY, STOP, and FEOT/PEOT pump states.

The following table shows the available options for this FC:

Option	Definition
1 (Default)	Standard Response
2	Alternate Response

Figure 4-34 shows an example on how to set alternate status poll responses.

Figure 4-34: Setting the Alternate Status Poll Responses - Example

Keypad: 4 - Status Response Format						
\$	4	7				4
V						1
Grade 1 PPU						
Keypad: Enter						
\$	4	7				4
V						1
Grade 1 PPU						
Keypad: 2 - Pick Status Response Format						
\$	4	7				4
V						2
Grade 1 PPU						
Keypad: Enter						
\$	4	7				4
V						2
Grade 1 PPU						

FC5: Set Baud Rate

Many markets require different two-wire baud rates. The AtlasX can handle any baud rates specified here, depending on hardware used external to the pump for managing communications.

The following table shows the available options for this FC:

Option	Definition
1 (Default)	5787 (Standard)
2	1200
3	2400
4	4800
5	9600
6	19200
7	38400
8	57600

Figure 4-35 shows an example on how to set a baud rate of 9600.

Figure 4-35: Setting the Baud Rate of 9600 - Example

Keypad: 5 - Baud Rate						
\$	4	7				5
V						1
Grade 1 PPU						
Keypad: Enter						
\$	4	7				5
V						1
Grade 1 PPU						
Keypad: 2 - Pick Baud Rate						
\$	4	7				5
V						5
Grade 1 PPU						
Keypad: Enter						
\$	4	7				5
V						5
Grade 1 PPU						

FC6: Lost Communication Function

The setting of this function determines the method for how the pump operates when communicating to a controlling system over two-wire cease. The default method of the pump, for both safety and theft reasons, is to suspend the transaction based upon the timeout setting in CC53 FC6. However, a special option can be set to allow the current transaction to continue dispensing fuel, despite communications being lost.

The following table shows the available options for this FC:

Selection	Option
1 (Default)	Suspend (Based on Timeout)
2	Continue

Figure 4-36 is an example showing setting to continue on communications lost.

Figure 4-36: Setting to Continue on Communications Lost - Example

Keypad: 6 - Lost Communications Function

\$	4	7				6
V						1

Grade 1 PPU

--	--	--	--

Keypad: Enter

\$	4	7				6
V						1

Grade 1 PPU

--	--	--	--

Keypad: 2 - Pick Lost Communication Function

\$	4	7				6
V						2

Grade 1 PPU

--	--	--	--

Keypad: Enter

\$	4	7				6
V						2

Grade 1 PPU

--	--	--	--

FC7: Real-Time Data Format

The default setting for two-wire in standard or extended mode is Real-Time Money. An alternate Real-Time Volume is configurable to be sent over the same Real-Time Money message where the Volume is representative of the Transaction Volume format. Two new options exist for Real-Time All Data where sends Money, Volume, and Grade; and an Alternate Real-Time Volume (command 7) that can augment Real-Time Money. This setting must be compatible with the controller that the pump communicates to.

The following table shows the available options for this FC:

Selection	Option
1 (Default)	Real-Time Money
2	Real-Time Volume
3	Real-Time All Data
4	Real-Time Money with Alternate Real-Time Volume

Figure 4-37 shows an example on how to set Real-Time Volume.

Figure 4-37: Setting Real-Time Volume - Example

Keypad: 7 - Real-Time Data Format

\$	4	7				7
V						1

Grade 1 PPU

--	--	--	--

Keypad: Enter

\$	4	7				7
V						1

Grade 1 PPU

--	--	--	--

Keypad: 2 - Pick Real-Time Data Format

\$	4	7				7
V						2

Grade 1 PPU

--	--	--	--

Keypad: Enter

\$	4	7				7
V						2

Grade 1 PPU

--	--	--	--

FC8: Preset Mode Without Pump Stop

The setting of this function determines the method for how the pump handles two-wire Preset Commands. By the Gilbarco two-wire specification, a pump can only accept one preset message and all subsequent presets will not be honored unless a pump stop is sent to cancel the previous preset. Setting this option to 2 will allow all preset messages to be handled, in essence, overriding the previous preset as long as a pump is in OFF, AUTH, or CALL state.

The following table shows the available options for this FC:

Selection	Option
1 (Default)	Allow One Preset
2	Allow Any Preset Until Fueling Starts

Figure 4-38 shows an example on how to preset mode without pump stop.

Figure 4-38: Setting Preset Mode Without Pump Stop - Example

Keypad: 8 - Preset Mode Without Pump Stop

\$	4	7				8
V						1

Grade 1 PPU

Keypad: Enter

\$	4	7				8
V						1

Grade 1 PPU

Keypad: 2 - Pick Preset Mode

\$	4	7				8
V						2

Grade 1 PPU

Keypad: Enter

\$	4	7				8
V						2

Grade 1 PPU

FC9: Remote Preset Display

The setting of this function determines whether the remote preset display functionality is enabled or not. Setting this value to 1 prevents remote preset display from occurring. Setting this value to two will show a remote preset (received from a controller on Gilbarco two-wire). A money preset will be shown in the money display and subsequently a volume preset will be shown in the volume display. The method of remote preset display will be dependent on the function of CC48 (Zero Previous Transaction) on whether the opposite display is blank or not and whether the display will flash or not. The duration of the remote preset display is dependent on the setting of the preselect timeout in CC53, FC2. If no timeout is set, the remote preset display will be persistent. If a timeout is set, the remote preset display will be shown for the number of seconds configured. When the display is reverted, the previous transaction data is refreshed and displayed.

The following table shows the available options for this FC:

Selection	Option
1 (Default)	No Remote Preset Display
2	Remote Preset Display Configured

Figure 4-39 shows an example on how to set remote preset display.

Figure 4-39: Setting Remote Preset Display - Example

Keypad: 9 - Remote Preset Display

\$	4	7				9
V						1

Grade 1 PPU

--	--	--	--

Keypad: Enter

\$	4	7				9
V						1

Grade 1 PPU

--	--	--	--

Keypad: 2 - Pick Remote Preset Display

\$	4	7				9
V						2

Grade 1 PPU

--	--	--	--

Keypad: Enter

\$	4	7				9
V						2

Grade 1 PPU

--	--	--	--

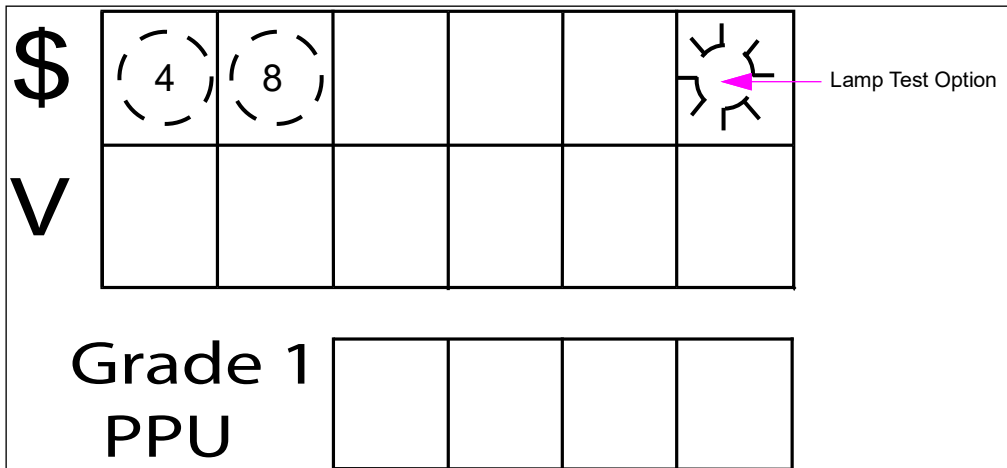
CC48: Zero Previous Transaction

CC48 is entered in Level 2 programming to determine when dispenser displays will be zeroed out and previous transaction cleared internally. Default is option 1 after lamp test. Option 2, before lamp test, results in the dispenser being reset to zero, the transaction displayed after:

- The pump handle is activated (raised) and unit is authorized
- No fuel is dispensed
- The handle is deactivated (lowered)

Note: Option 2 is required in New Jersey and is generally known as the New Jersey Display Option.

Figure 4-40: Zero Previous Transaction



- 1 Press **4**, **8**, and then press **ENTER** to access this CC.
- 2 Select (1-2) for the Lamp Test Option using the following table:

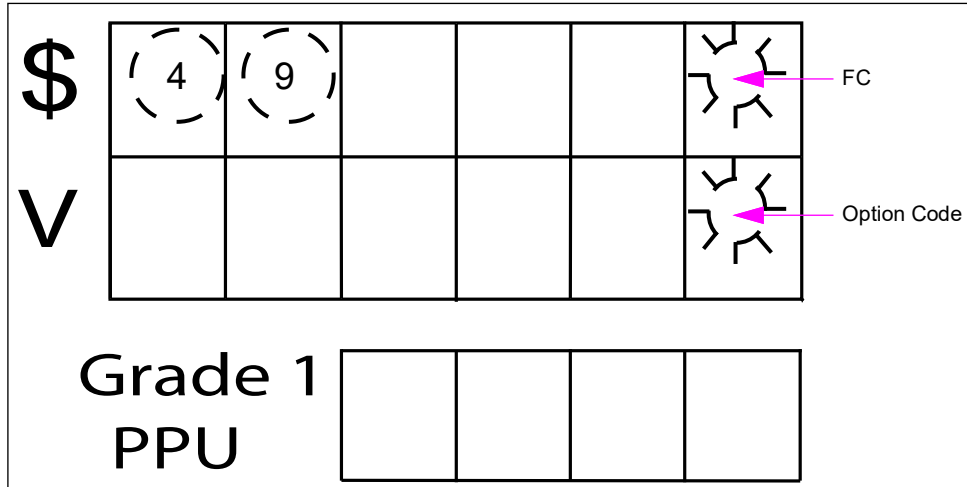
Option	Setting
1 (Default)	After Lamp Test
2	Before Lamp Test
3	Before Lamp Test or After Preset Keypad Use (Chile)

- 3 Press **ENTER**.

CC49: STP Controls

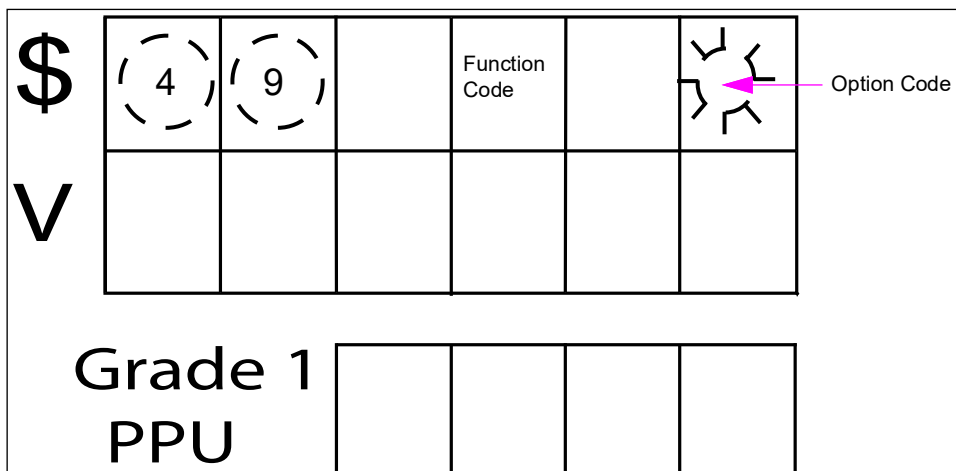
CC49 programming is used to set when the STPs will turn on, which STPs will be activated, and where the STP relay signal originates. Sub-sections that follow describe each FC programming option. Layout and meaning of each digit position for this programming feature are shown in Figure 4-41.

Figure 4-41: STP Controls



- 1 Press 4, 9, and then press **ENTER** to access this CC.
- 2 Select the FC (1-3) using the following listing.
- 3 Select the appropriate Option Code.

Figure 4-42: Selecting the Option Code



FC1: Set STP Pre-start

STP pre-start must be programmed depending on the type of leak detection implemented in the dispenser. Pre-start must be set to “ON” for mechanical line leak detectors and “OFF” for electrical line leak detectors. Default for this option is selection 1, “PRESTART OFF”.

“PRESTART ON” turns the STPs on when the handle switch is activated.

- 1 Select option (1-2) using the following table:

Option	Function
1 (Default)	Pre-start OFF
2	Pre-start ON

- 2 Press **ENTER**.

FC2: Set STP Control

STP control determines how STPs will be controlled during a fueling operation. Option 1 is default and results in only the STP(s) required for fueling operation to be turned on. Option 2 turns on all STPs anytime there is a fueling operation.

- 1 Select option (1-2) using the following table:

Option	STP Option
1 (Default)	Turn on ONLY selected STP (Default)
2	Turn on ALL STPs

- 2 Press **ENTER**

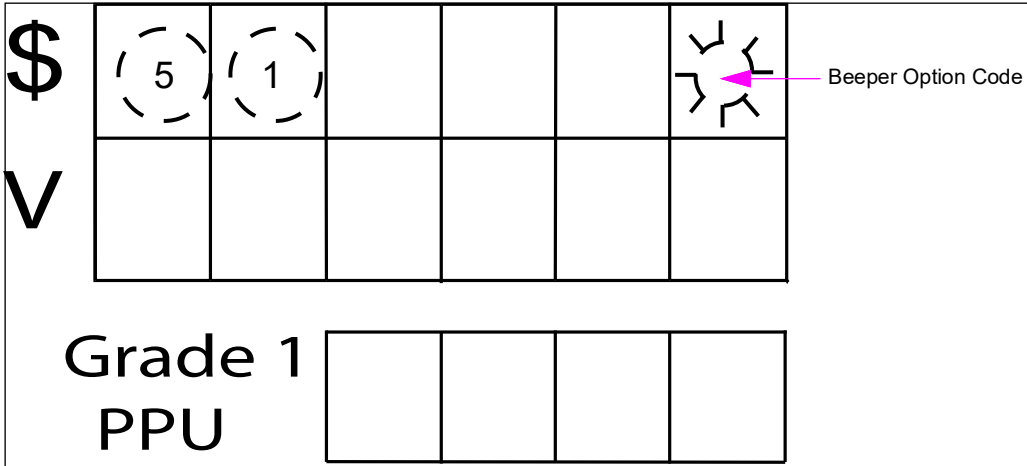
FC9: Set STP Side Mapping

This FC is not used on AtlasX. This function code must be left at its default value.

CC51: Set Main Beeper

CC51 is entered in Level 2 programming to set beeper functionality. The following table indicates beeper programming options. If beeper option is set to “ON”, the beeper will sound when pump handles are lifted, when the dispenser is authorized, and when any pump switches/keypads are activated. Default for this option is selection 1 - beeper “ON”.

Figure 4-43: Setting the Main Beeper



- 1 Press 5, 1, and then press **ENTER** to access this CC.
- 2 Select option (1-2) using the following table:

<u>Option Code</u>	<u>Beeper</u>
1 (Default)	ON
2	OFF

- 3 Press **ENTER**.

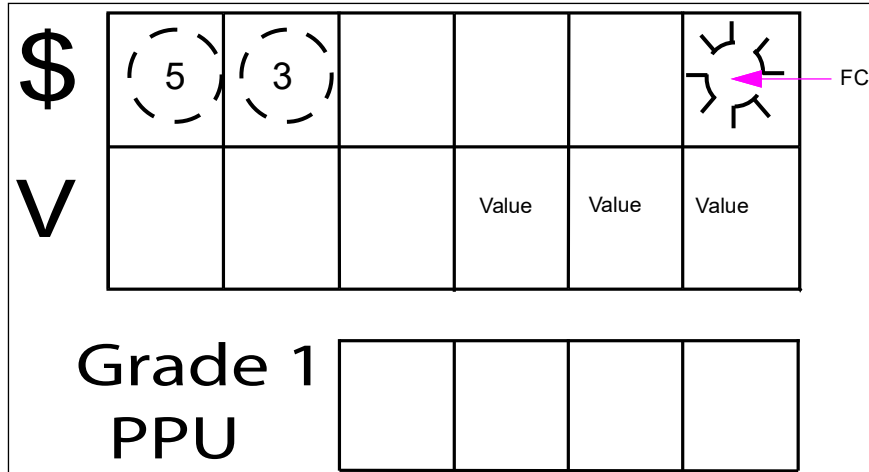
CC52: Set VaporVac Alarm

CC52 is not used on AtlasX. This command code must be left at its default value.

CC53: Set Timeouts

CC53 is entered in Level 2 programming to set the dispenser timeout options. FCs 1 through 3 are selected to set various dispenser timeouts. Sub-sections that follow describe each timeout programming option. Entry into CC53 will select FC1 by default. Layout and digit position meaning for this programming feature are shown in [Figure 4-44](#).

Figure 4-44: Setting Timeouts

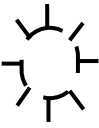
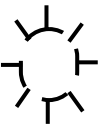
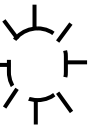


- 1 Press **5, 3**, and then press **ENTER** to access this CC.
- 2 Select option (1-3) using the following table:

Note: For more information, refer to “FC Descriptions for CC53” on page 4-46.

FC Option	Timeout Option
1	Beeper Timeout
2	Pre-select Timeout
3	Dispenser Timeout
4	Initial Dispenser Timeout
5	Initial Beeper Timeout
6	Two-wire No Communications Timeout
7	Display Backlight Timeout
8	Maximum Authorize Time
9	Maximum Dispensing Time
10	Disable Dispenser Timeout
11	Stop Door Security Alarm Timeout

Figure 4-45: FC Settings

\$	5	3				Function Code
						
V						
Grade 1 PPU						

3 Press ENTER.

FC Descriptions for CC53

FC1: Set Beeper Timeout

This programming option determines the amount of time the beeper sounds after the dispenser timeout has expired. This timer starts as soon as the dispenser timeout expires and continues to run (beeping once per second) until it has expired, the nozzle is replaced, or pulses are received. Upon expiration, the fueling point will deauthorize with EC29. The allowed range for this timeout is 0 to 999 seconds. The DEFAULT value is 0 or no beeper timeout. If this option is set to 0, the fueling point will deauthorize immediately following the dispenser timeout.

FC2: Pre-select Timeout

Pre-select timeout will set pre-select timeout timer period allowed for grade select buttons to be pressed, before handle is raised for a non-Nozzle activated unit. Timer starts when the dispenser is authorized and times out until the customer lifts the pump handle. After pre-select timeout has occurred, grade selected is lost and must be re-selected by customer. Pump does NOT change state when this timeout occurs. A zero value means there is no timeout. Pump Preset is also under the control of pre-select timeout. If pre-select timeout occurs, preset keypad entry must re-entered. Allowed range for this timer is from 0 to 999 seconds. Default value for this function is 15 seconds.

FC3: Dispenser Timeout

This programming option will set the time allowed for a pump to remain authorized without receiving pulses before starting the beeper timeout. This timer starts as soon as pulses stop being received and continues to run until it has expired, the nozzle is replaced, or pulses are received. Upon expiration, the fueling point will start the Beeper Timeout. The DEFAULT value for dispenser timeout is 0 seconds.

If fueling is resumed, beeper will stop sounding and timer is reset.

*Note: If this is a nozzle activated (Option 91 Function 12) unit, this value is ignored and treated as if value was set to "0". **NOZZLE ACTIVATED PUMPS (AUTO-ON) MUST NOT ALLOW PRE-SELECTION OF GRADE or PUSH-TO START.** Pump Preset can still be preselected.*

FC4: Initial Dispenser Timeout

This programming option will set the time allowed for a pump to remain authorized without receiving pulses before starting the Initial Beeper Timeout. This timer starts as soon as lamp test finishes and continues to run until it has expired, the nozzle is replaced, or pulses are received. Upon expiration, the fueling point will start the Initial Beeper Timeout. The allowed range for this timeout is 0 to 999 seconds. The DEFAULT value for Initial Dispenser Timeout is 0 seconds.

FC5: Initial Beeper Timeout

This programming option determines the amount of time the initial beeper sounds after the initial dispenser timeout has expired. This timer starts as soon as the initial dispenser timeout expires and continues to run (beeping once per second) until it has expired, the nozzle is replaced, or pulses are received. Upon expiration, the fueling point will deauthorize with EC29. The allowed range for this timeout is 0 to 999 seconds. The DEFAULT value is 0 or no beeper timeout. If this option is set to 0, the fueling point will deauthorize immediately following the initial dispenser timeout.

FC6: Two-wire No Communication Timeout

This programming option will set the amount of time allowed that the dispenser can receive no communications while fueling until the sale is suspended. The sale can be restarted with an authorization. The DEFAULT value for the two-wire No Communication Timeout is 30 seconds. This option will be ignored if CC47 FC6, Lost Communications Function, is set to "Continue Transaction". The allowed range for this timeout is 0 to 999 seconds.

FC7: Display Backlight Timeout

This programming option will set the amount of time allowed for an idle pump that will dim the display backlights for Door Nodes that support this feature. Presently, Door Node 5 and Door Node 5 7 Digit are the only two model Door Nodes that support this. And Idle pump is any pump not in Keypad Dispenser Programming, W&M Review, Totals Review, Authorized, with Handle out or Grade selected. In any of these scenarios, the display backlight will be normal. Any time any of these features stops, then timer will start for the duration of this configured time in seconds. Once the timer expires, the backlight will dim. The DEFAULT value for the display backlight timeout is 0 seconds.

FC8: Maximum Authorize Time

This programming option will set the amount of time allowed to remain in two-wire authorize state before a transaction starts. When configured for 0, Authorize state is allowed indefinitely. Programming to a non-zero number is allowed in increments of 10. Programming for less than 10 will result in a 0 value being used. Programming to 11 means that 10 is stored. The reason for this is that the internal International Forecourt Standards Forum (IFSF) data only stores this value as 0 to 250 values stored as increments of 10. Maximum value entered can be 2500.

When this timeout is configured, this is the maximum time Authorize state is allowed before putting the pump back to the OFF (Idle) state.

The DEFAULT value for the Maximum Authorize Time is 0 seconds (off).

FC9: Maximum Dispense Time

This programming option will set the amount of time allowed to perform a transaction once a transaction starts and motors/valves are actuated. When configured for 0, dispensing time can be for as long as the customer allows the transaction to be or until a limit is reached.

Programming to a non-zero number is allowed in increments of 10. Programming for less than 10 will result in a 0 value being used. Programming to 11 means that 10 is stored. The reason for this is that the internal IFSF data only stores this value as 0 to 250 values stored as increments of 10. Maximum value entered can be 2500.

When this timeout is configured, this is the maximum time allowed for dispensing. In two-wire mode, when the limit is reached the pump will go to the STOP state and can be reauthorized. When in standalone mode, the pump goes to an OFF state and cannot continue.

The DEFAULT value for the Maximum Fill Time is 0 seconds (off).

FC10: Disable Dispenser Timeout

FC10 is used to set the disable timeout feature. If CC91 FC37 or FC42 is set to 3 or 5, this value sets the durations (in minutes) for which the side or dispenser will be disabled after the upper door or hydraulics panel is closed. For example, if the value is 10 and the door or panel is closed, the side or dispenser is automatically enabled after 10 minutes. If the alarm option is enabled (CC91 FC38), the alarm will shut off when the side or dispenser has been enabled.

FC11: Stop Door Security Alarm Timeout

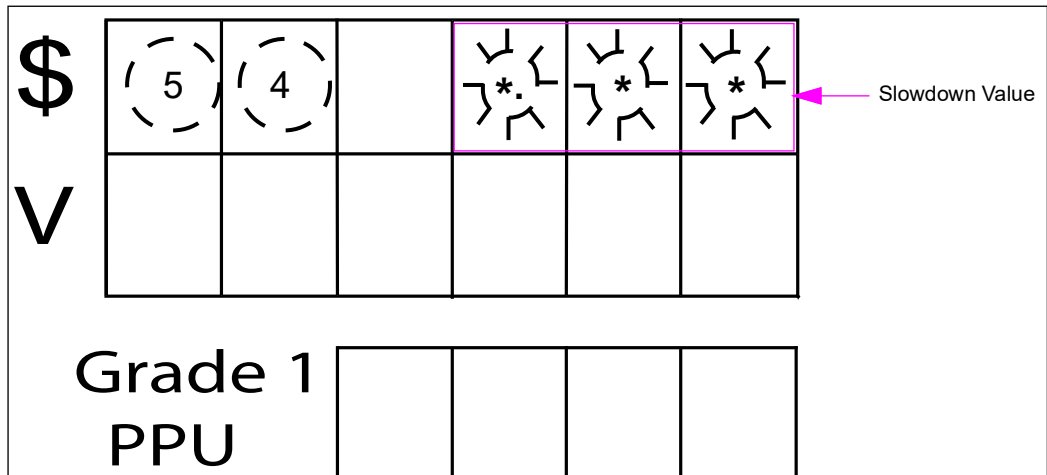
FC11 is used to set the alarm timeout feature. If CC91 FC38 is set to 2, this value sets the duration (in seconds) for which the alarm will sound, provided it is not silenced by clearing the condition that initiated it. For example, if it is set to 600 (10 minutes) and the upper door or hydraulics panel is left open, the alarm will turn off after 10 minutes even though the door or panel remains open. If the condition that initiated the alarm is cleared (door or panel is closed and the unit is enabled) before the timeout is reached, the alarm will turn off.

CC54: Set Slowdown Valve

CC54 is entered in level two programming (or higher) to determine when the dispenser goes into slowdown mode prior to reaching the transaction preset value. The programmer enters the slowdown value using the digit keys. The slowdown value is in terms of volume units with a DEFAULT value of 0.20. The range of values is 0.20 to 9.99 for US gallons and 0.30 to 9.99 for liters. All changes will be logged into the Regulatory Log.

Slowdown cannot be set less than 0.6 liters or 0.2 gallons.

Figure 4-46: Setting Slowdown Valve - 2



- 1 Press **5**, **4**, and then press **ENTER** to access this CC.
- 2 Enter the amount of volume before preset to enter slow down mode.
- 3 Press **ENTER**.

CC55: Set Hose Pressurization

Note: This option is not allowed to be programmed when the Volume Unit Type is set to US gallons.

CC55 is entered in Level 2 programming to pressurize hose before dispensing, by not registering flow up to 20 pulses or 1 second, whichever comes first.

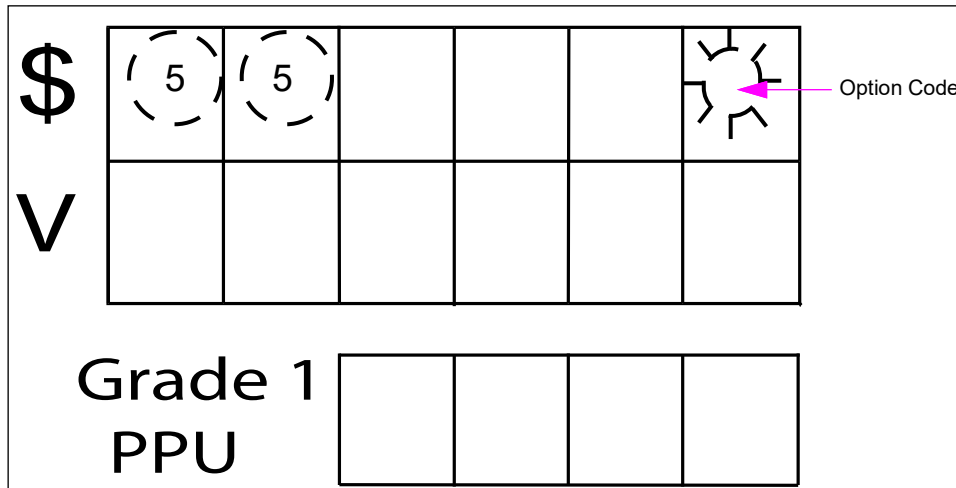
Note: This flow will open on the customer's display.

This option is used in cold climates, where fuel in hose may have contracted after a period of inactivity. This can cause what is commonly referred to as 'meter jump' at the beginning of a transaction. Default value is selection 1, "OPTION OFF". This function will pressurize hose during lamp test of first transaction after power-up or during lamp test of first transaction after a period of inactivity defined by programming option code.

Note: Fuel passing through meter during hose pressurization will not be registered on displays nor counted toward the sale before start of delivery.

IMPORTANT INFORMATION
CC55 is not intended as a fix for defective equipment such as a leaky meter, meter check valve, nozzle or vapor recovery hoses. Always fix the problems quickly.

Figure 4-47: Setting Hose Pressurization



1 Press **5, 5**, and then press **ENTER** to access this CC.

2 Select option (1-3) using the following table:

Option	Hose Option
1 (Default)	Option OFF
2	Unit has sat inactive for 10 minutes
3	Unit has sat inactive for 30 minutes.

3 Press **ENTER**.

CC56

Not available on AtlasX.

CC58

Not available on AtlasX.

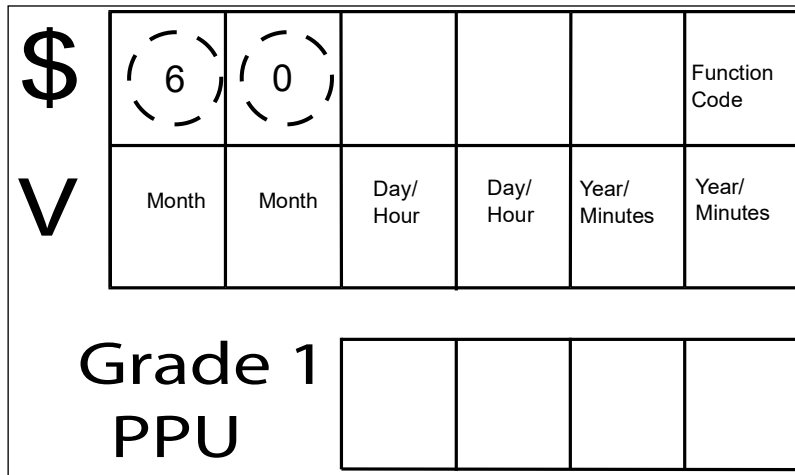
CC60: Set Clock and Calendar

Settings for time and date programming may be completed from the manager keypad or sent from console/controller. As a result, the dispenser always uses last settings made by either programmer or console/controller. Not setting the correct values may affect reports, closing shifts, and dispenser event logs. Properly time stamped event logs are valuable in service situations.

There are two FCs applicable to CC60, FC1 for setting time and FC2 for setting date. Default selection after entering into CC60 is FC1 for setting time.

Layout and digit positions are shown in [Figure 4-48](#).

Figure 4-48: Setting Clock and Calendar



- 1 Press **6**, **0**, and then press **ENTER** to access this CC.

FC1: Set Dispenser Time

Dispenser time is set in 24 hour format. Programmer enters the time in terms of hours and minutes. If time programming is not done before, then time will default to 12:00. The following table shows the display assignments for setting the time:

Main Volume Display
HHMM

FC2: Set Dispenser Date

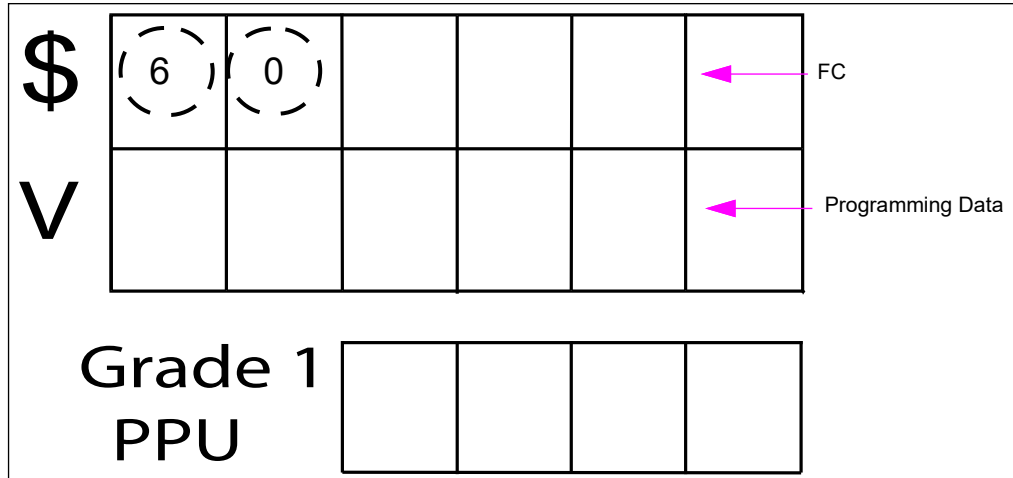
Date is programmed by entering month, day, and year in that order. If the date is not programmed before, then default date will be shown as 010100 (January 1, 2000). The following table shows the display assignments for setting the time:

Main Volume Display
MMDDYY

FC3: Set Dispenser Daylight Savings Time Mode

Daylight Savings Time is used in many areas of the USA, Canada, and Mexico based on rules dictated by regional and national governments. This FC will set the use of automatic daylight savings time adjustment based on rules as of January 2014 for USA, Canada, or Mexico. The default setting for this option is disabled.

Figure 4-49: Setting Daylight Saving Time Mode



The following table shows the values for the Daylight Savings Time programming:

Option	Daylight Savings Time
1 (Default)	Disabled
2	USA
3	Canada
4	Mexico

CC62: Two-wire Remapping Grade

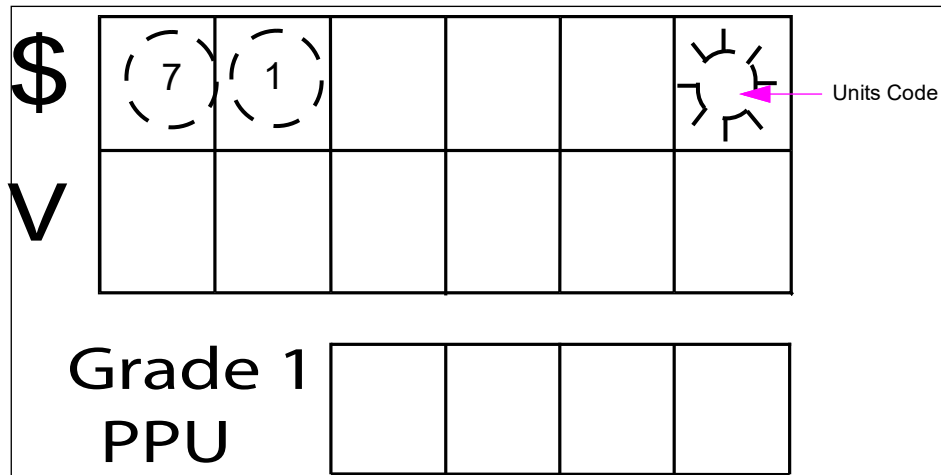
Not available on AtlasX.

Level Three CCs

CC71: Set Volume Units

Layout and meaning of each digit position for this programming feature are shown in Figure 4-50.

Figure 4-50: Setting Volume Units



- 1 Press 7, 1, and then press **ENTER** to access this CC.
- 2 Select volume unit code (1-5) using the following table:

Volume Units Code	Unit Type
1 (Default)	U.S. Gallons
2	Liters
3	Imperial (UK)Gallons
4	Reserved
5	Hawaii Gallons

- 3 Press **ENTER**.

CC72

Not available on AtlasX.

CC73: Set/Display Money Totals

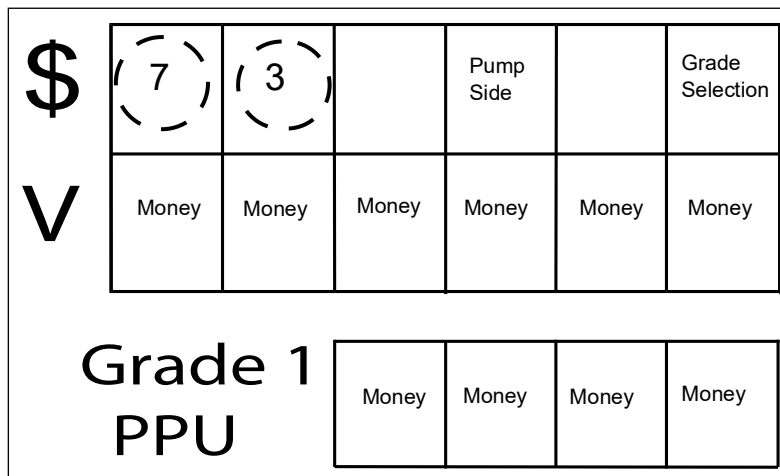
Allows programmer to read and set money totals. Initially, displays will show zeros in all locations.

Note: This function can only be performed at first initialization of dispenser and before total flow exceeds 250 volume units.

After totals of a grade reach 250 volume units that cannot be reset, only grades used in dispenser will accept money totals. Note that the position of decimal point in totals values will depend on earlier programmed location of decimal point in the dispenser display. Layout and meaning of each digit position for this programming feature are shown [Figure 4-51](#).

Layout and digit positions are shown in [Figure 4-51](#).

Figure 4-51: Money Totals Display



- 1 Press 7, 3, and then press **ENTER** to access this CC.
- 2 Select side (1 or 2) and press **ENTER**.
- 3 Select Grade (1 for AtlasX) and press **ENTER**.
- 4 Set or Display Money Total.
- 5 Press **ENTER**.

CC74: Set/Display Volume Totals

Allows the programmer to read and set volume totals. Initially, for a new pump controller board, displays will show zeros in all locations.

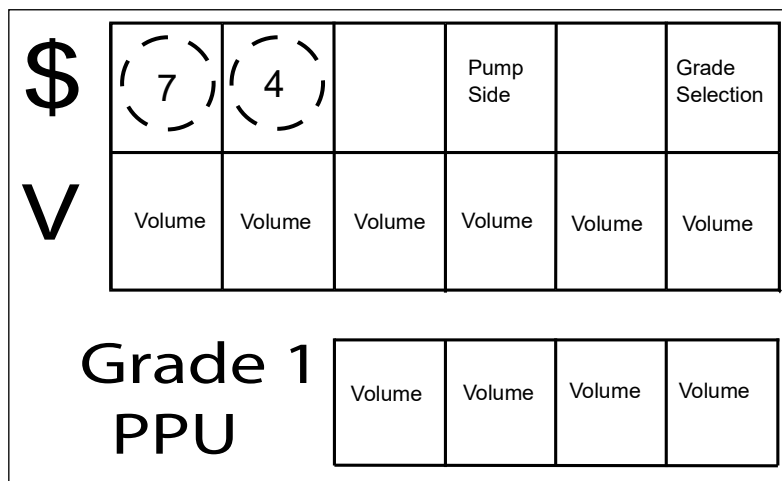
Note: Function can only be performed at first initialization of the dispenser and before the total flow exceeds 250 volume units.

After totals of a grade reach 250 volume units, they cannot be reset. Only grades used in the dispenser will accept volume totals.

Note: Position of decimal point in totals values will depend on earlier programmed location of decimal point in the dispenser display.

Layout and meaning of each digit position for this programming feature are shown in [Figure 4-52](#).

Figure 4-52: Volume Totals Display

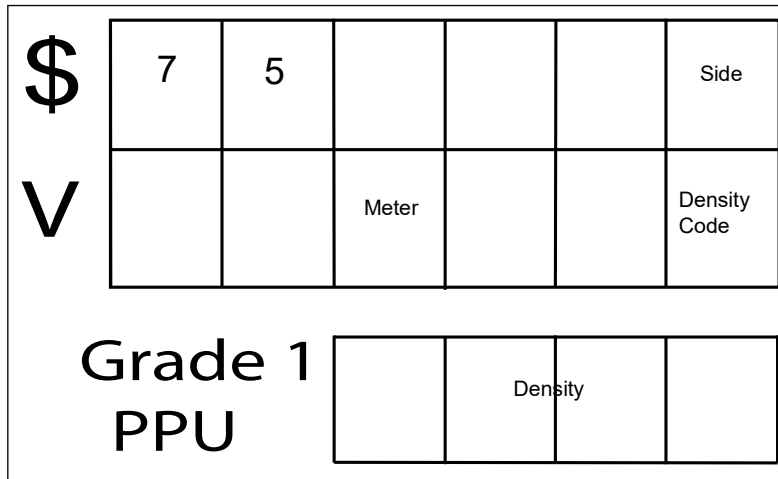


- 1 Press 7, 4, and then press **ENTER** to access this CC.
- 2 Select side (1-2) and press **ENTER**.
- 3 Select Grade (1 for AtlasX) and press **ENTER**.
- 4 Set or Display Total.
- 5 Press **ENTER**.

CC75: Set Fuel Density (ATC Only)

Allows programmer to set density of fuel to be dispensed under ATC. Values can be set to 730 for gasoline and 840 for diesel fuel. Only the number of meters that exist (sensed by dispenser controller software) are shown. In this mode, meters can be cycled repeatedly pressing **ENTER**. Layout and meaning of each digit position for this programming feature are shown in [Figure 4-53](#).

Figure 4-53: Setting the Fuel Density



- 1 Press **7, 5**, and then press **ENTER** to access this CC.
- 2 Select side (1-2) and press **ENTER** to accept side.
- 3 Select Meter and press **ENTER** to accept meter.
- 4 Select Density (1 or 2).

The following tables shows the allowed fuel density:

Density Codes	Fuel Density
0 - NOT PROGRAMMED (DEFAULT)	N/A
1 - GASOLINE	730
2 - DIESEL	840
3 - DEF	1087
4 - ETHANOL	785

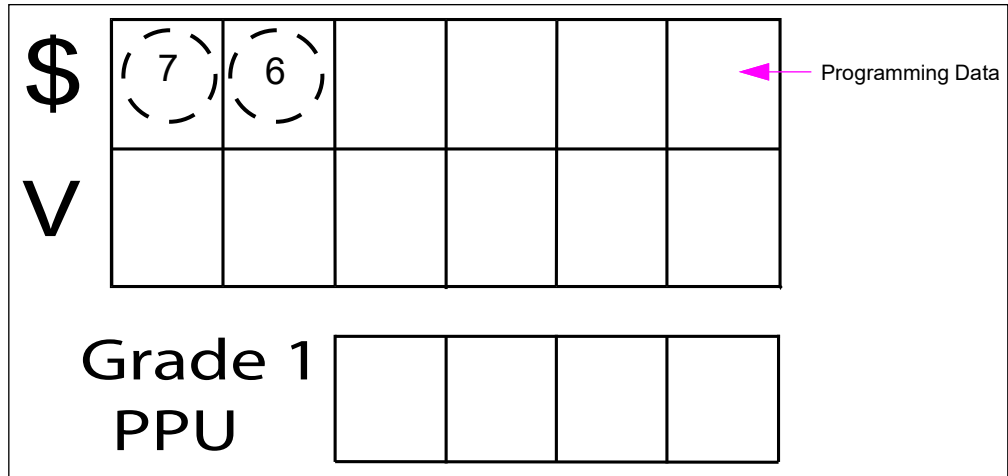
- 5 Press **ENTER** to accept density.

CC76: Money Rounding Display Method

This programming function allows the programmer to select the rounding method for the dispenser. The DEFAULT is selection 0, 'Nearest.001'. This CC is protected by the security switch. Without the switch being open, the unit will double beep and prevent entering a new value. All changes will be logged into the Regulatory Log.

The layout and digit position meaning for this programming feature is as shown in [Figure 4-54](#).

Figure 4-54: Selecting the Rounding Method



- 1 Press 7, 6, and then press **ENTER** to access this CC.
- 2 Enter the programming information based on table:

Volume Units Code	Unit Type
0 (DEFAULT)	Nearest 0.001
1	Nearest 0.005 (Kuwait)

Rounding table for Option 2 (Only applies if CC42, FC1 is set to 4 - xxx.xxx format):

Calculated Amount	Display/Reported Amount
xxx.x00	xxx.x00
xxx.x01	xxx.x05
xxx.x02	xxx.x05
xxx.x03	xxx.x05
xxx.x04	xxx.x05
xxx.x05	xxx.x05
xxx.x06	xxx.x10
xxx.x07	xxx.x10
xxx.x08	xxx.x10
xxx.x09	xxx.x10
xxx.x10	xxx.x10

CC77: Change PIN Code

PIN Codes are a security feature. Changing PIN Codes from default can enhance station security. Revised PIN Codes must be safely stored by the station and ASC such that they can be accessed, as required. They must not be misplaced or lost because a “cold coldstart” is required to reset the code.

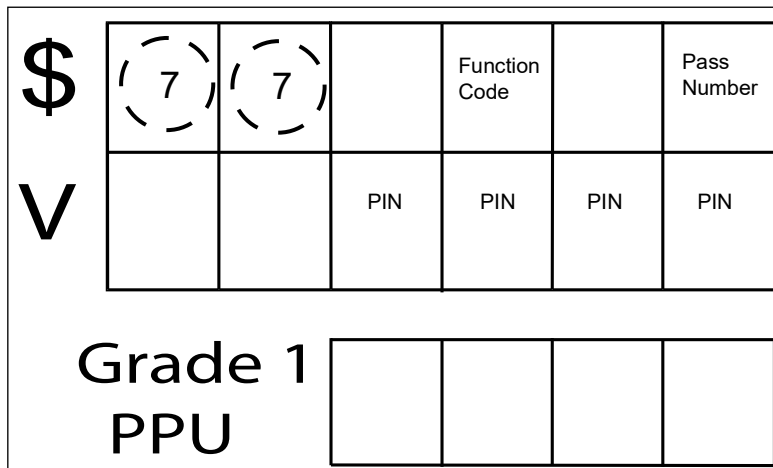
*Note: PIN Code **must** be entered twice.*

This CC allows the programmer to set new PIN Codes for entry into the four different programming levels. When accessed, all codes are shown as “- - -”. Entering new digits for new codes changes the display, as they are entered. Display does not show actual PIN digit, but shows “0” to denote that a number was entered. Same PIN Code must be entered twice for it to be allowed.

First pass at entering a PIN Code is signaled by “1” appearing in the Pass Code display. Second pass is signaled by “2” appearing in the Pass Code display. Acceptance of a PIN Code is signaled by “3” appearing in the Pass Code display. A “0” in the Pass Code display indicates that the PIN Code was not accepted.

Four FCs are provided for changing each programming level PIN Code. All FC/PIN Code change operations have identical procedures. Default selection after entering into CC77 is for FC1 – change level one PIN Code. Layout and meaning of each digit position for this programming feature are shown in [Figure 4-55](#).

Figure 4-55: Changing the PIN Code



The following table shows the FCs available for this CC:

FC	Option
1 (Default)	Change PIN Code - Level 1
2	Change PIN Code - Level 2
3	Change PIN Code - Level 3
4	Change PIN Code - Level 4

- 1 Press 7, 7, and then press **ENTER** to access this CC.
- 2 Program/assign new PIN Code.
- 3 Press **ENTER** to accept new PIN Code.

Change PIN Codes – FCs 1- 4

PIN Code levels correspond to FCs in CC77 (for example, FC1 for Level 1, 2 for Level 2, and so on). Note that all PIN Code assignments work the same.

Keypad Programming: New PIN Code

- Select Level (1-4) for code change.

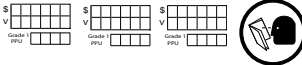


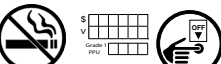
Notes: 1) If Level 1, no selection is required as Level 1 is the default.

- ENTER – accept level PIN Code for change.
- Enter PIN Code.
- ENTER – complete first pass, pass number now shows 2.
- Re-enter PIN code.
- ENTER – complete second pass.

2) If pass number display shows value of “0”, it indicates that first and second PIN Code entries did not agree. Press **F1** to start PIN Code entry sequence from the beginning. If the new code is entered correctly twice, pass number display will display a value of 3 to indicate the acceptance of new PIN Code.

Electronic Calibration

⚠ WARNING

You are working in a potentially dangerous environment of flammable fuels/vapors and high voltage.

Fuel and its vapors may ignite, leading to serious injury or death. Fire, explosion, or electrical shock can result in severe injury or death if you do not follow safety procedures.

When calibrating AtlasX units, run keypad cable over door and close door, allowing keypad to be suspended on unit and accessed from outside for all procedures done with power applied or where there is a possibility of fuel or fuel vapor presence.

All meters must be calibrated before the dispenser functions. If all meters are not calibrated, dispenser will display “Not Calibrated” EC when the dispenser is placed in operation.

⚠ CAUTION

Before you proceed, read and understand “Purging Air from System” on [page 7-10](#). Operating the unit with air in the system can cause damage to meter from overspeed.

The unit must be properly configured to CC71 before calibration. After completing calibration, the W&M switch must be sealed per local authority. All replacement meters must be calibrated after installation and testing.

To calibrate the pump/dispenser, see [Electronic Calibration Steps](#) on [page 7-27](#).



CC80: Set Maximum Flow Rate

This option allows user to select maximum flow rate allowed per grade. If flow rate value entered is larger than hydraulics maximum capable flow rate, maximum hydraulic flow rate will flow. Default value flow rate is 10 Gallons per Minute (GPM) per grade for U.S. and 40 Liters per Minute (LPM) per grade for Europe.

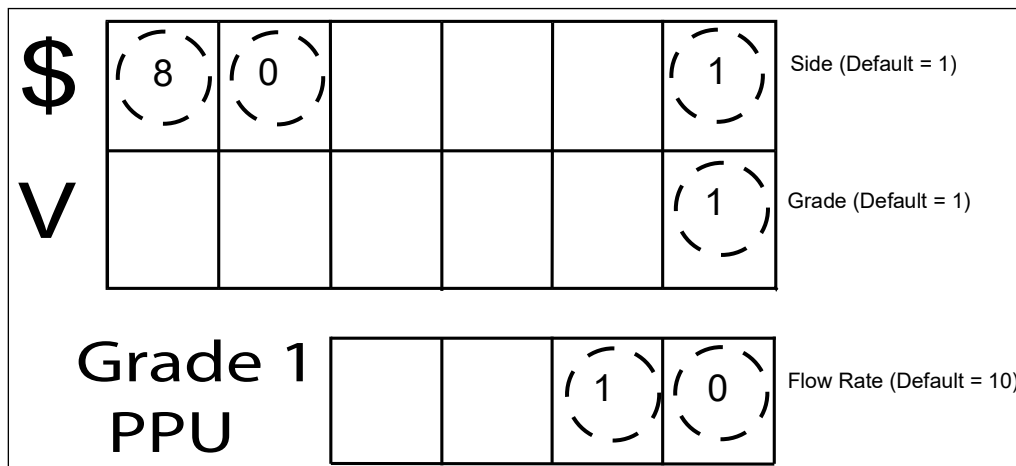
This function works properly only with proportional flow control valves. It does not work properly with 2-stage AC valves like those on AtlasX. For AtlasX, the flow rate should be set to 98. If flow rate must be restricted, an external flow restrictor must be used.

The following table shows available options for this FC:

Selection	Option
1 or 2	Side
1	Grade
01-98	Flow: units per minute/grade

Layout and meaning of each digit position for this programming feature are shown in [Figure 4-56](#).

Figure 4-56: Layout and Digit Position for the Programming Feature



- 1 Press **8**, **0**, and then press **ENTER** on the manager keypad.
- 2 Select side (1 or 2) and press **ENTER**.
- 3 Select Grade (1 for AtlasX) and press **ENTER**.
- 4 Select Flow Rate [01 to 98 (Default = 10)] and press **ENTER**.

CC82: Setting Prover Can Size

Note: For calibration procedures for AtlasX, refer to “Electronic Calibration Steps” on page 7-27.

Prover Can size is set to default to a preset number based on the type of volume units entered. For these defaults, refer to the following table. CC82 is used if an unusual prover Can size is required.

When changing the VUT, enter the programming mode in the usual manner, except that the W&M calibration switch must be turned “ON” before entering CC82 and switched “OFF” before exiting this programming mode to make the changes effective.

If Volume Unit Is Set to	Prove Can Size Defaults to
U.S. gallons or Imperial gallons	5 gallons
Liters	20 liters

Figure 4-57: Setting Prover Can Size

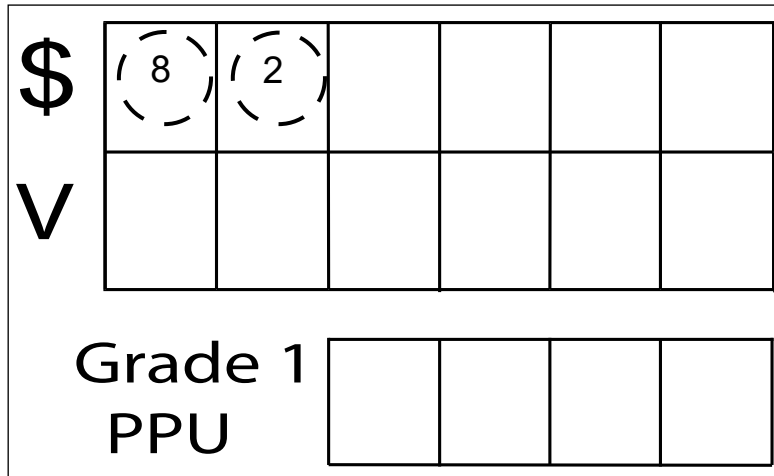
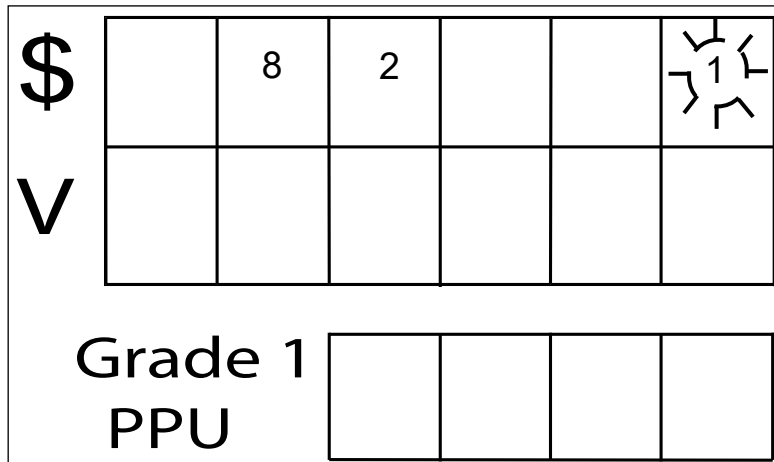


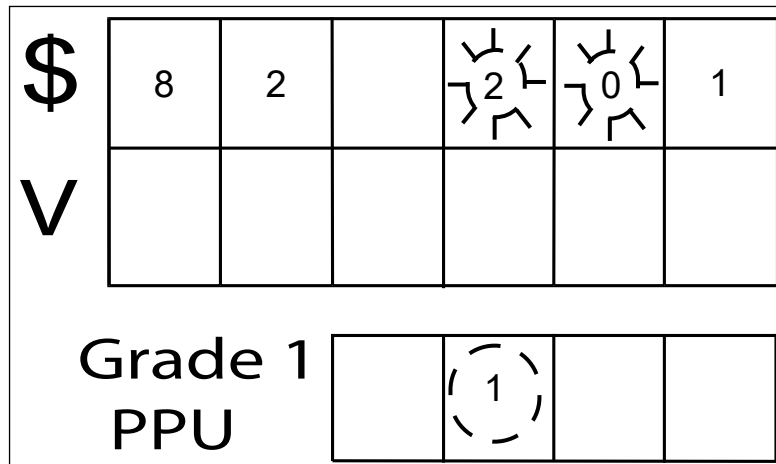
Figure 4-58 shows CC82 and unit side 1.

Figure 4-58: CC82 and Unit Side 1



- 1 Enter the prover Can size. The default value is “0”. It is required to enter a volume from 1 to 999 to proceed to the next step. In this example, the prover Can size is 20 U.S. gallons. Current volume unit is selected in CC71 and reported in the Unit code field, shown as “1” in [Figure 4-59](#).

Figure 4-59: Inserting prover Can Size



The following table shows the volume units and their codes:

prover Can Volume Units	Unit Codes
No Units Programmed (Default)	0
U.S. gallons	1
Liters	2
Imperial gallons	3

- 2 Press **ENTER** to accept the default or press **2** to select side 2. Then, insert the calibration side. Default value is “1” as shown in [Figure 4-61](#) on [page 4-64](#).

CC83: Set Alternative Fuel Mode

This function allows the programmer to enable alternate fuel modes. This CC is protected by the security switch. Without the switch being open, the unit will double beep and prevent entering a new value. All changes will be logged into the Regulatory Log.

When set to natural gas, this mode has two features.

- 1 When the **ENTER** key is pressed, the number in the volume display is multiplied by the factor detailed in the following table based on setting in CC83.

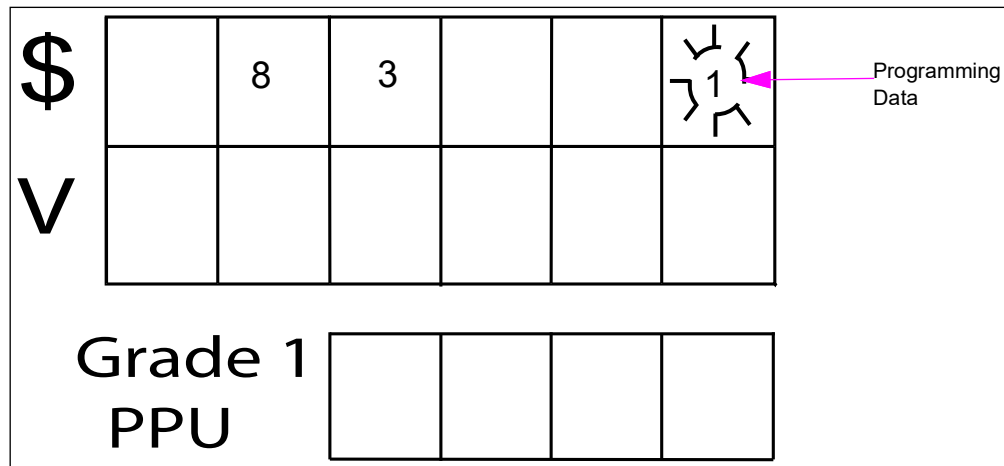
Type	Conversion	Factor
GGE	Pounds (lbs.)	5.66
GGE	Kilograms (kg)	2.567
GLE	Pounds (lbs.)	1.693
GLE	Kilograms (kg)	0.768

- The valve feedback signal is ignored to allow for third-party valve control hardware. For simulator testing, this means that the valve type defaults to DIGITAL VALVE and simulators with proportional valve will not work properly with this feature enabled.

When set to DEF (UREA), this mode has the following four features:

- The proper input on the VaporVac port is monitored for “frozen” status which indicates that the hydraulic system is currently unable to operate properly.
- Enables the display of EC31 (Pump Frozen), which also prevents the dispenser from responding to two-wire polls even if in two-wire mode. EC31 is only cleared when the frozen status is removed.
- Assigns the slowdown value for DEF to 0.020.
- Does not require a fuel density setting for DEF if ATC is in use. However, CC75 can be set to DEF to force ATC to ignore the DEF grade.

Figure 4-60: Setting Alternate Fuel Mode



To program, proceed as follows:

- Press **8**, **3**, and then press **ENTER** to access this CC.
- Enter programming data in the table:

Alternate Fuel Mode	Setting
Standard Fuel (Default)	1
Third-party Fuels	2
DEF	3
Diesel + DEF	4
Third-party CNG/LNG with GGE to Pounds	5
Third-party CNG/LNG with GGE to Kilograms	6
Third-party CNG/LNG with GLE to Pounds	7
Third-party CNG/LNG with GLE to Kilograms	8

- Press **ENTER** to accept programming.

Level Four CCs

Level 4 provides configuration level commands that are performed by the factory to initialize dispenser and configure software to match dispenser hardware. Under certain conditions, an ASC may have to perform these commands to repair or convert a dispenser.

Note: Improper dispenser configuration will result in display of applicable configuration ECs when pump is placed in normal operation.

Programming Level	Security PIN Code	CC Range
Level 4	0128	84-99

- Press **ENTER** after making selection in all levels.
- Press **F1** to perform additional programming.
- Press **F2** to exit programming.

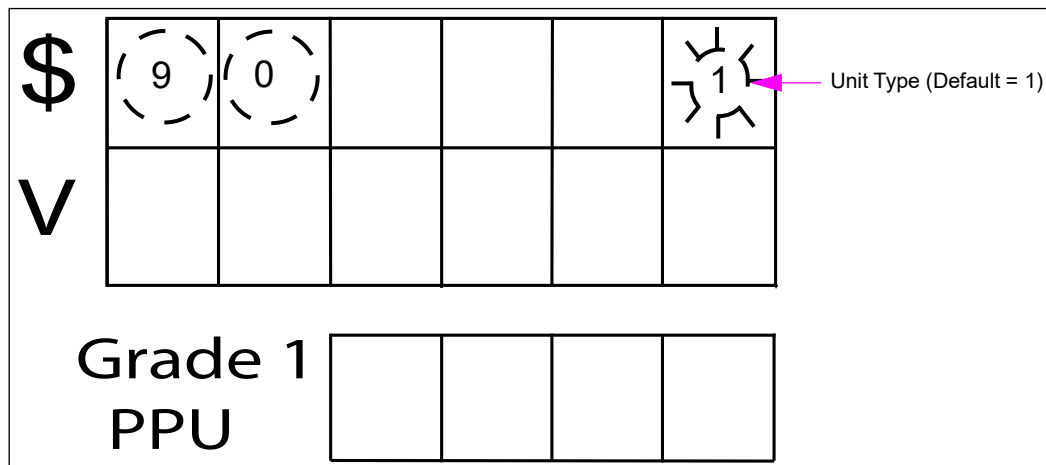
CC84: Set Pulser Type

Not available on AtlasX.

CC90: Set Unit Type

Function allows programmer to set unit type for dispenser.

Figure 4-61: Setting Unit Type



Unit type assignment is based on a numeric code as shown in the following table:

Unit Type Assignment Table

Unit Code	Unit Type
1 (Default)	1 Grade, 1 Hose MPD
2	2 Grade, 2 Hose MPD
3	3 Grade, 3 Hose MPD
4	4 Grade, 4 Hose MPD
5	2 Grade, 1 Hose MPD
6	3 Grade, 1 Hose MPD
7	3 Grade, 1 Hose + 1 MPD
8	3 Grade, 3 Hose Blender
9	3 Grade, 3 Hose Blender + 1
10	AtlasX
12	2 Grade, 1 Hose Blender
13	3 Grade, 1 Hose Blender
14	4 Grade, 1 Hose Blender
15	5 Grade, 1 Hose Blender
16	2 Grade, 1 Hose Blender + 1
17	3 Grade, 1 Hose Blender + 1
18	4 Grade, 1 Hose Blender + 1
19	5 Grade, 1 Hose Blender + 1
20	2 Grade, 1 Hose Blender + 2 Grade 1 Hose Blender
21	3 Grade, 1 Hose Blender + 2 Grade 1 Hose Blender
22	2 Grade, 1 Hose Blender + 1 + 1
23	3 Grade, 1 Hose Blender + 1 + 1
24	2 Grade, 1 Hose Blender + 2 Grade 2 Hose Blender
25	3 Grade, 1 Hose Blender + 2 Grade 2 Hose Blender
26	Reserved
64 (NF0)	3 Grade + 2 Grade
65 (NF1)	3 Grade + 1 Grade + 1 Grade
66 (NF2/4)	3 Grade + 1 Grade + 1
67 (NF6)	3 Grade + 1 Grade + 1 Grade + 1
68 (NF7)	4 Grade + 1 Grade + 1
69* (NF8)	3 Grade + 1 + 1 Grade, which reserves "+1" for diesel.
<i>Note: Unit Code 64-69 Universal Multi-Hose Blender.</i>	
<i>* Denotes 2 of 4 product blending versus 2 of 3 product blending.</i>	

- 1** Press **9, 0**, and then press **ENTER** on the manager keypad.
- 2** Select Unit Type **10** and press **ENTER**.

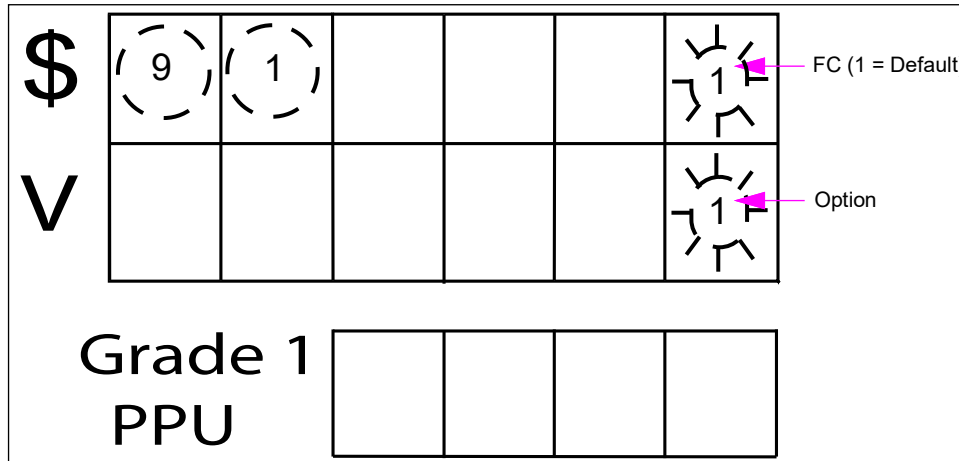
CC91: Select Installed Options

Note: Self-configuring.

Allows the factory, and under certain circumstances, a field programmer, to install optional equipment in the dispenser. FCs under this command are used to enable/disable dispenser options. By default, all options are not installed. Entry into CC91 will default to FC1. The dispenser will generate an event log for improperly configured options.

Layout and meaning of each digit position for this programming feature are shown in [Figure 4-62](#).

Figure 4-62: Selecting the Installed Options



- 1 Press **9**, **1**, and then press **ENTER** on the manager keypad.
- 2 Select FC (1-49) and press **ENTER**.

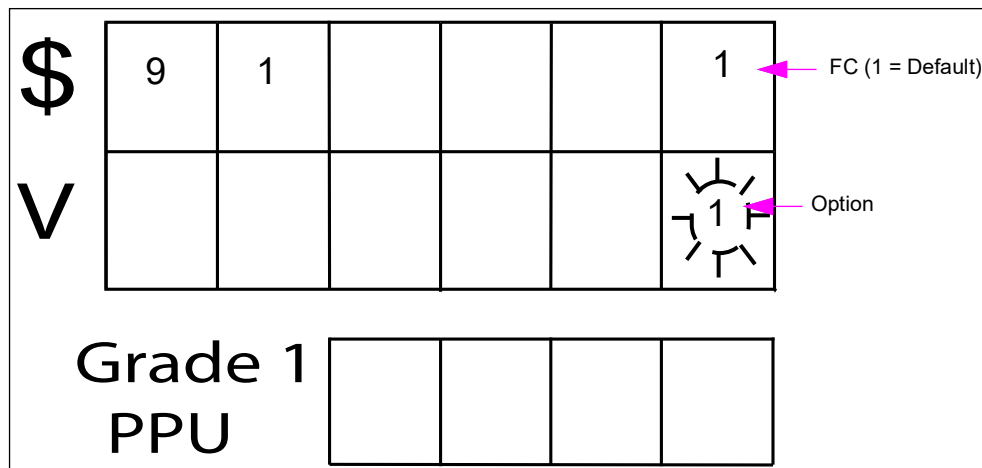
FC and Option Selection Table

FC	Dispenser Option Description	Option Selections
1 - Default	Preset Type	Not available on AtlasX.
2	Push-to-start	Not available on AtlasX.
3	Vapor Recovery	Not available on AtlasX.
5	Push-to-stop Button	Not available on AtlasX.
6	ATC	1 = Disabled (Default) 2 = Enabled
7	Grade Select Function	Not available on AtlasX.

FC	Dispenser Option Description	Option Selections
8	Miscellaneous Protection Method (PCN5 Required)	1 = Standard (Default) 2 = Mexico Protection (NOM-185) 3 = Reserved 4 = OIML Protection (OIML R117) 5 = NCWM/MC Category 3 <i>Note: First, set CC91 FC47 PC Serial Communication Protocol to RTP (Option 3), and then set CC91FC8 Protection Method to Category 3 (Option 5). RTP must be set before Category 3 can be activated. Option 5 is allowed only if CC 91.47 = 3.</i>
11	Totalizer Function	1 = Not Installed 2 = Totalizer per Meter/Side 3 = Totalizer per Inlet
12	Nozzle Activated	1 = Disabled (Default) 2 = Enabled
26	Operation Mode Protection	1 = Disabled (Default) 2 = Security Switch Required for Changing Operation Mode
30	Pulser Error Reporting	1 = Persistent Major Error (Default) 2 = Major Error 3 = Medium Error
31	Unauthorized Flow Error Reporting	1 = Minor Error (Default) 2 = Medium Error 3 = Medium Error with Two-wire Offline
32	South Korea Roundup Method This FC can only be used in conjunction with the money or volume roundup feature in CC22.	Not available on AtlasX.
33	Price Change Method OIML Price Change Method performs a 5 second Delay at next transaction start to ensure price is Displayed for a minimum of 5 seconds before Transaction fuel flow starts.	1 = USA Price Change Immediate Method (Default) 2 = OIML Price Change Immediate Method
34	Door Switch Mode	Not available on AtlasX.
37	Door Switch Reporting <i>Note: Only available when Door Switch Method Enabled.</i>	Not available on AtlasX.
38	Door and Hydraulics Panel Alarms <i>Note: Only available when Door and/or Hydraulics Panel Switch Methods are enabled and FC 37 and 42 are NOT set for logging/information only. To silence alarm (but retain the error) enter the level 4 PIN Code.</i>	Not available on AtlasX.
39	DEF/ARLA/AdBlue Cold Weather Warning <i>Note: Only available for DEF/ARLA/ AdBlue dispensers.</i>	Not available on AtlasX.
40	Log Language	1 = English (Default) 2 = Spanish 3 = French
41	Hydraulics Panel Switch Monitoring	Not available on AtlasX.

FC	Dispenser Option Description	Option Selections
42	Hydraulics Panel Switch Reporting <i>Note: Only available when Hydraulics Panel Switch Monitoring Enabled.</i>	Not available on AtlasX.
45	Special Option for Door Security <i>Note: Only allowed for Persistent Door Switch Reporting Options.</i>	Not available on AtlasX.
47	PC Serial Communication Protocol (PCN5 Required) <i>Note: Laptop Tool does not communicate in Real Time Protocol.</i>	1 = ZMODEM Protocol* 2 = ZMODEM Protocol with alarm 3 = Real Time Protocol <i>Note: To activate W&M Category 3, set CC91 FC47 PC Serial Communication Protocol to RTP (Option 3) first, and then set CC91 FC8 Protection Method to Category 3 (Option 5). RTP must be set before Category 3 can be activated. Laptop Tool does not communicate in Real Time Protocol.</i>
49	Nozzle Guard time	5* - 60 seconds

Figure 4-63: Selecting the Option Code



3 Select Option Code and press **ENTER**.

FC6: ATC

FC6 allows the programmer to enable or disable the Encore ATC feature. If used, the dispenser must have the ATC hardware set and temperature probes installed for proper operation.

FC8: Miscellaneous Protection Method

FC8 allows the programmer to select methods for special pump security operation when Omnia board option is added.

FC11: Totalizer Function

FC11 allows to programmer to program and select the configuration and method of use for electro-mechanical totalizers. Regardless of function, electronic totals stored in the PCN are not affected. If International Organization of Legal Metrology (OIML) security is used in the Miscellaneous Protection Method, totalizers are required to be installed for proper pump operation.

FC12: Nozzle Activated

FC12 allows the programmer to enable the nozzle activated pump handle setting. A nozzle activated pump handle eliminates the need for a physical pump handle. When a customer removes the nozzle, the pump handle will automatically be set. This option is need for internal timeouts actions.

FC26: Operation Mode Protection

FC26 allows the programmer to set protection for the operation mode setting. When enabled, this will require the security switch to be unsealed an opened to change the operation mode from Two-wire to Standalone.

FC30: Pulser Error Reporting

FC30 allows the programmer to set the function of the standard pulser error, EC20. When set to 1 (default), an EC20 on any grade will show EC20 in the PPU of the entire side of the dispenser. This error will be persistent and will refresh after each reboot until F1, pin code and F2 is entered at the manager keypad to clear the error. When set to 2, a standard Major error is used. This will EC20 in every PPU of the affected side until reboot. A reboot clears the error until it is redetected. When set to 3, a standard Medium error is used that will be cleared at the end of transaction when the nozzle is replaced.

FC31: Unauthorized Flow Reporting

FC31 allows the programmer to set the function of the authorized flow error 5049. When set to 1 (default), an unauthorized flow detection will go unreported to the dispenser and will only be logged for information in the event log. When set to 2, an unauthorized flow error will be reported as a normal medium error. When set to 3, the detections will act like option 2 except that two-wire will go offline for 10 minutes.

FC33: Price Change Method

FC33 allows two similar but slightly different methods for price change processing. The default of 1 performs of an immediate price change when a price change occurs. When set to 2, this performs an immediate price change, but a 5 second delay occurs after lamp test to ensure the customer has seen prices as required by OIML. This will occur on the first transaction for each grade after a price change occurs.

FC40: Log Language

FC40 is used to set the log language.

When set to 1 (default), English.

When set to 2, Spanish.

When set to 3, French.

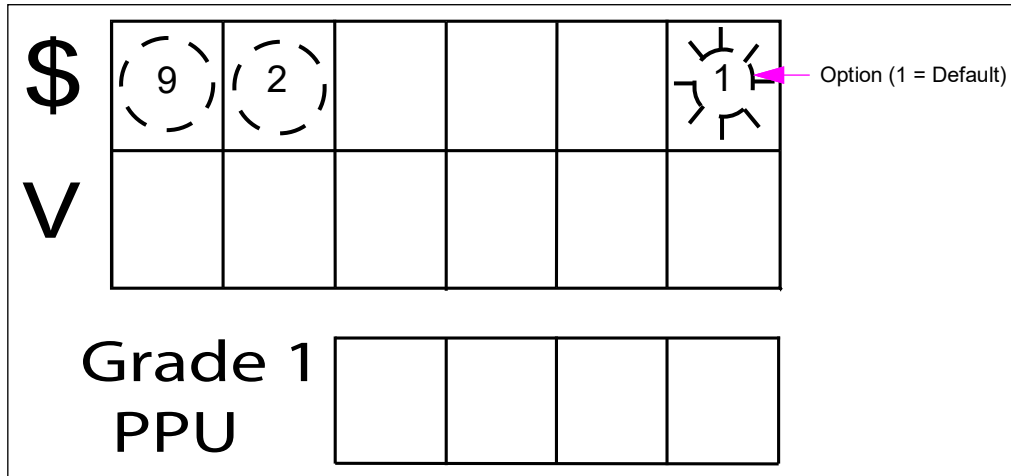
FC47: PC Serial Communication Protocol

FC47 allows the programmer to select methods on how the PCN5 board will handle remote management connectivity when Omnia board option is added.

CC92: Set Side Exists

This option allows setting up for single-sided operation. Default is for both sided operation. Layout and meaning of each digit position for this programming feature are shown in Figure 4-64.

Figure 4-64: Setting up for Single-sided Operation



- 1 Press 9, 2, and then press ENTER on the manager keypad.

Option	Sides Active
1 (Default)	Both Sides
2	Side 1 Only
3	Side 2 Only

- 2 Select FC (1-3) and press ENTER.

CC93: Set Cash/Credit at Dispenser

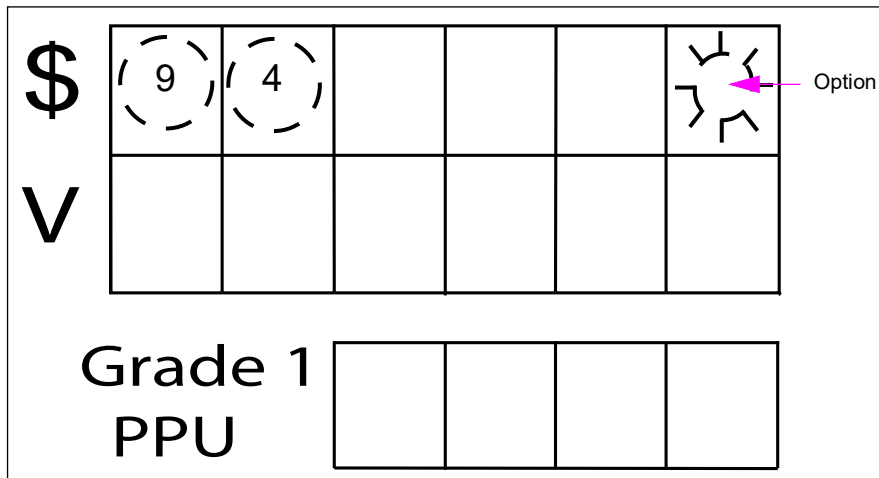
Not available on AtlasX.

CC94: Set Zero PPU Option

When this option is enabled, the dispenser is allowed to dispense fuel with a zero PPU. Default is “DISABLED”, meaning that the dispenser will not deliver fuel if any PPU is set to zero.

This CC is commonly used when a dispenser is not being used for retail sales. Layout and meaning of each digit position for this programming feature are shown in [Figure 4-65](#).

Figure 4-65: Setting Zero PPU Option



- 1 Press **9**, **4**, and then press **ENTER** on the manager keypad.

Selection	Option
1 (Default)	Disabled
2	Enabled

- 2 Select Option (1 or 2) and press **ENTER**.

CC96: Set Select Feature

This CC allows the programmer to select the appropriate feature set for the dispenser. The only functionality currently dependent on this setting is the operation of the blinking LEDs (as opposed to blinking PPU) for ‘S’ models. This CC is protected by the security switch. Without the switch being open, the unit will double beep and prevent entering a new value. All changes will be logged into the regulatory log.

Figure 4-66: Setting Features

\$	9	6				Option
V						
Grade 1 PPU						

- 1 Select Feature Set CC.

Figure 4-67: Selecting Feature Set CC

Keypad: 96 - Program Feature Set

\$	9	6				
V						
Grade 1 PPU						

Keypad: Enter

\$	9	6				1
		P	P	P		-
V						
Grade 1 PPU						

- 2 Select the desired feature set.

The following table reports the side code meaning:

Feature Set	Code	Display
AtlasX/Encore 500	1	" 500 -"
Encore 500 S	5	" 500 5"
Encore 700 S	7	" 700 5"

Note: Code 1 for AtlasX/ E500 is the default value for new units.

The F1 key will allow additional programming or the F2 key may be used to exit programming.

CC98: Inlet Assignment Per Grade (Multi-Hose Universal Blender)

Not available on AtlasX.

Additional Manager Functions for AtlasX

Unit Totals Retrieval Convention

Totals Examples

For both \$TOTAL and VOL TOTAL keys, press **ENTER** to toggle between grade and side selection.

Non-resettable Money and Volume Totals

The dispenser maintains a set of non-resettable totals for each dispensed fuel grade. These totals reflect total money and volume since dispenser installation time. The following are keypad and display examples for viewing dispenser non-resettable money and volume totals.

Money and Volume Totals

Use the \$ TOTAL key to retrieve money totals for each fuel grade. This and the VOL TOTAL key do not require a Security PIN Code. Use the CLEAR key to exit money totals mode. The "1" shown in the leftmost \$ display indicates that this total is a non-resettable money total. The VOL TOTAL displays the volume for the grade selected. Volume for both sides of the unit can be viewed. Use the CLEAR key to exit the volume total mode. This convention comes from the Advantage series product line and is maintained here for ASC and site manager familiarity.

Programming DEF Dispensers

CCs

CC54

There is no slowdown programming capability for the DEF portion of the unit. A fixed 0.2 gallons is used.

CC82

Calibration prover Cans are typically set to 50 gallons for Ultra-Hi units. When calibrating a DEF meter, this must be set to 5 gallons (20 liters). If you do not reset the prover Can size, then the calibration will be inaccurate. Ensure that you return the calibration prover Can to 50 gallons for Ultra-Hi units after calibrating the DEF meter. Anytime you calibrate the DEF, you must temporarily revert the can size to 5 gallons (20 liters).

During purging, if the Coriolis meter does not have a reasonably high calibration factor installed, the DEF hose will start and stop flow rate repeatedly. This is because 10 GPM flow control valve of the dispenser turns the valve on and off to control flow rate, even if the real flow rate is well below 10 GPM. To prevent the issue, program the flow control to a number similar to the Ultra-Hi (CC80).

CC83

Programming and calibration of the DEF dispenser is similar to the standard dispensers. CC83 must be programmed for the DEF dispenser. The CC83 is programmed for alternate fuel types where option 1 is not programmed, option 2 is natural gas, option 3 is DEF only, and option 4 is DEF+1 (Not available on AtlasX). Option 3 must be programmed for DEF units.

CC91: FC12

For DEF units, CC91, FC12 must be set to Option 1 (not installed).

5 – Electronic and Electrical Components

Introduction

Purpose

This section provides information regarding the electronics and electrical components within pumps and dispensers. This information consists of applicable data on connections, settings, test points, and functional descriptions. Printed Circuit Assembly (PCA) controls the hydraulics, monitors fuel delivery, computes, displays, and stores transactional information. These electronic components interface with the POS devices and support payment options. The term PCA and Printed Circuit Boards (PCBs) are used interchangeably in this document.

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to GOLD.

This section was last updated in June 2025.

Topics in This Section

Topic	Page
Introduction	5-1
Electronics Highlights	5-2
About Service Procedures	5-3
Working on Electronic and Electrical Components	5-4
PCAs	5-6
Heater (DEF Only)	5-48
Electronic/Mechanical Registers and Electro-Mechanical Totalizers	5-50
Pulsers	5-52

How to Use This Section

For location and listings of topics contained in this section, refer to “[Topics in This Section](#)”. To find information on specific components, use the above table.

Electronics Highlights

8800/9800 Series Electronic Units

AtlasX 8800/9800 series Electronic units are discussed in this section. The electronics manages all the common functions for a low hose compact dispenser such as sales control, maintenance, preset ATC functions, electro-mechanical totalizers, and other options. The Omnia board option manages remote connectivity through the customer's network and to the Insite360/HUB server. Omnia with the DCM3 board option is used on AtlasX electronic series units to connect Ethernet® communications Over-Legacy-Cable (OLC). When connected to a BRCM2 (Back Room Communications Module), which enables Ethernet communications to be transmitted over twisted wire pair, the same wire pair that is used for current loop communications to the pump.

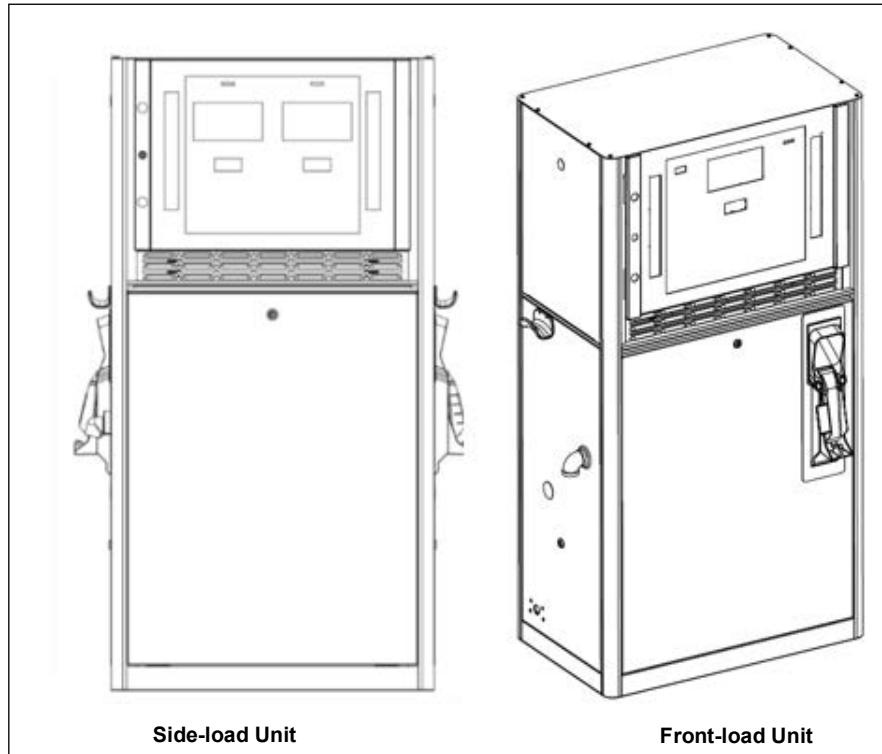
System and Component Overview

In this section, cautions and warnings for electronic components will be addressed. Extreme care must be taken while using explosive vapors or liquids, which may be present around the dispensing equipment. These vapors can be ignited by flames, electrical arcs, or static electricity discharges. An electrical shock hazard exists when working with this equipment. An electrical discharge can cause injury, ignite vapors, or damage sensitive electronic components. All safety precautions and requirements must be strictly followed.

About Service Procedures

Figure 5-1 shows an example of a Front-load and Side-load AtlasX 8800/9800 unit. The nozzle boot is located either on the front or side of the unit.

Figure 5-1: AtlasX 8800/9800 Units- Side-load and Front-load







Working on Electronic and Electrical Components

Explosive vapors or liquids are present in and around the fuel dispensing equipment, which can be ignited by open flames, electrical arcs, or static electricity discharges.

A potential shock hazard exists when working with this equipment. Electricity discharges can cause injury and damage sensitive electronic components. Follow all precautions and requirements.

⚠ WARNING

-  Read and follow all precautions and requirements before performing any inspection and/or maintenance in a potentially dangerous environment of flammable fuels, vapors, and high voltage.
-  Fire, explosion or electrical shock could result in severe injury or death if safety procedures are not strictly followed.
-  Do not smoke and prevent open flames in the pump area.
-  Promptly clean up spills or debris in the pump area.



Preparing for Service

To prepare for service, proceed as follows:

- Barricade the working area.
- Shut off all power from units with electronic components to be serviced. Shut off power from the associated connected devices, for example, STP. Multiple disconnects may be required.
- Use extreme caution during any observation or testing procedure that requires power to be applied to the unit.
- To prevent damage from Electrostatic Discharge (ESD) to electronic components or ignition of flammable fuels or vapors, follow all precautions and requirements.

Preventing ESD

⚠ WARNING

-  Ground wrist strap is required
-  Use IC extractor

PCAs and ICs are sensitive to ESD. ESD can damage electronic parts.

While removing PCAs or handling ESD sensitive parts:

- Touch an unpainted metal surface to discharge any static electricity build-up.
- Use a wrist strap connected to a grounded metal frame or chassis.
- Place the removed PCAs or ICs on a grounded anti-static mat.
- Use an IC extractor tool to remove the undergirded circuits.
- Place all PCAs you plan to return for credit or repair in anti-static bags.

Hazardous Materials

Some components inside electronic enclosures may present a health hazard if not handled correctly. Always clean your hands after handling the equipment. Do not hold or place any equipment in your mouth.

WARNING

The area contains a chemical known to the State of California to cause cancer.

WARNING

The area contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Replaceable Batteries

Some PCBs contain replaceable batteries. Insert all the batteries correctly.

WARNING



There is danger of explosion if batteries are incorrectly replaced. Only replace batteries with the same or equivalent type of batteries recommended. Dispose of the used batteries as per battery manufacturer's instructions. Ensure that you replace the batteries in the correct polarity position to avoid damage to the equipment.

Replacing Fuses

CAUTION

To ensure equipment protection and maintenance of safe operation, always use the correct replacement fuse. Using an incorrectly sized or type fuse may cause equipment damage. The type of fuse is also very important. Some fuses even with the same amperage rating are designed to respond differently to over current and so on.

Helpful Service Information

Some boards include information that helps in correct or faster servicing. Be aware of the following found on many boards:

- Cable connectors are labeled with the destination of the cable.
- Test points are clearly labeled and recessed to facilitate the use of meter probes.
- Test point labels indicate an acceptable electrical range. For example, 4.8-5.2 VDC.
- LED Status Code: Refer to the LED Status description included with PCA information.

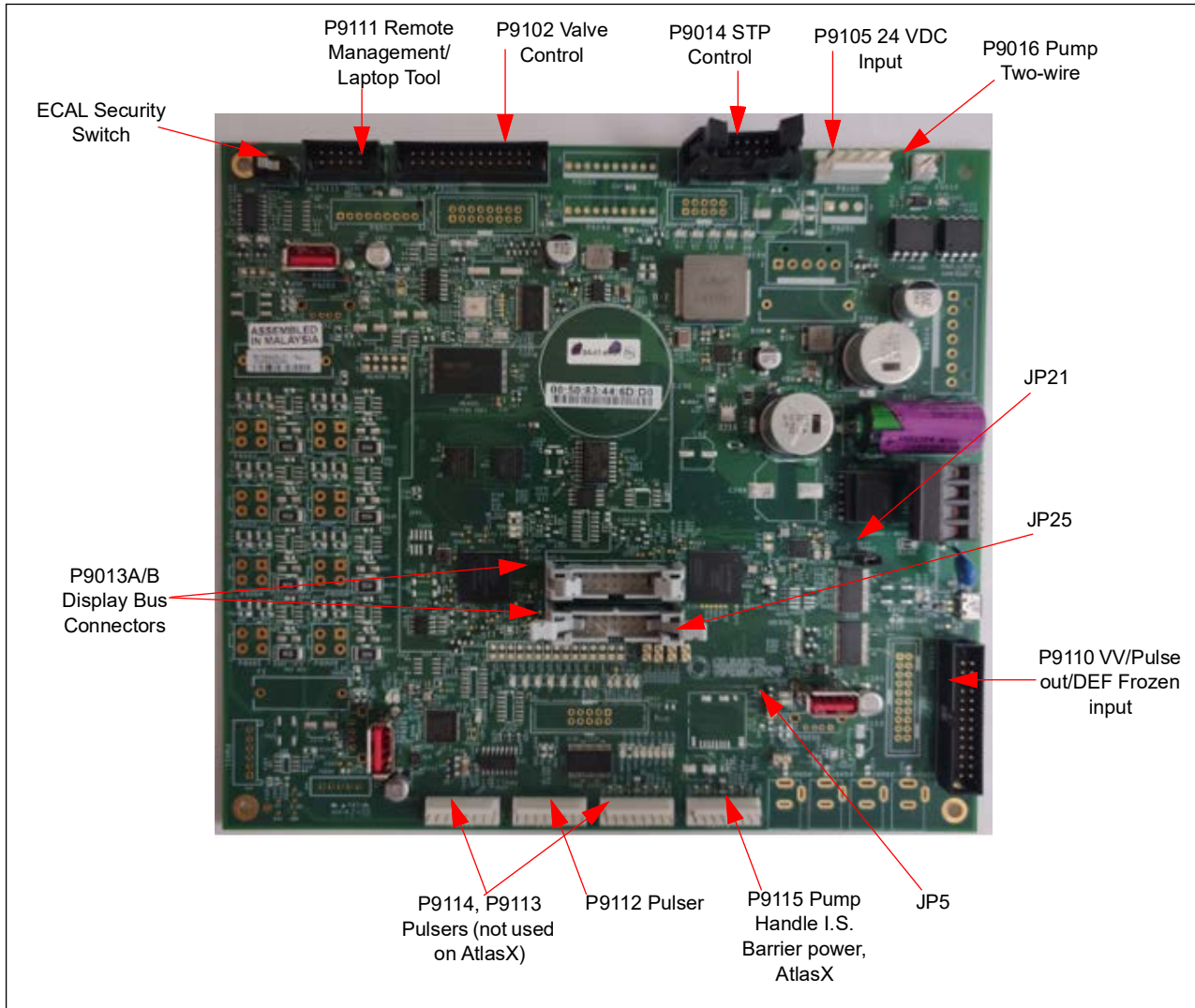
PCAs

This section provides information specific to PCAs.

Pump Control Node 5 (M18446A101), Replacement Part# M19203A501

The Pump Control Node 5 (PCN5) is used on AtlasX electronic series units to control fueling operations. The PCN provides the main processing power for system. It performs all totals calculations, processes handle switch information and pulser input, and stores W&M data. The PCN has LEDs for each STP output, and interfaces directly with the STP control on the power supply board [M07121A004, see “M07555A004 Power Supply” on page 5-24 and for valve driver board, see “Ultra-Hi Interface PCA (M08223A001)” on page 5-20]. The PCN interfaces with the Combi display (M17206A001) and ATC I.S. barrier-Tmeter PCA (M18983A001) through the display bus. It uses the ATC PCA to supply information to adjust the metered volume to a predetermined standard temperature.

Figure 5-2: Pump Control Node 5 (M18446A101)



The (M18446A101) PCN requires PCN software version 06.0.28 or later and has an Ethernet and USB connections for future enhancements. Once these enhancements are available, specs and procedures will be made available. The non-field replaceable lithium battery maintains level 1 and level 2 programming. The board is mounted on a new bracket with improved Calibration Switch Mounting Bracket. This new bracket supplies earth ground connection to the PCN (two lower mounting holes are secured with screws, see note).

Figure 5-3: Securing the Earth Ground Connection to the PCN



Note: When replacing PCN 4+ with PCN5, the new PCN 5 bracket must be used. All boards (except PCN 4+) on the PCN 4+ bracket must be moved to the new PCN 5 bracket. If replacing PCN 5 board and re-using the existing PCN5 bracket, the two lower mounting holes must be secured with screws to maintain the earth ground connection to the PCN.

Board Connections and Cables

Connector#	Through Cable	To PCA	At Connector#
P9014	M19407A001 or M06968A001	M07121A004 Power Distribution PCA	P1301
P9102	M00549A001	M08223A001 Ultra-Hi Interface PCA	P1201
P9105	M05547A007	M07121A004 Power Distribution PCA	P1402
P9016	M02993A007 or M02993A008 or M11961A007	POS/FCC or M15778B216 PRIME Panel or M15758A002 Omnia PCA	J402 or J402A J402DC or P303
P9110	M00549A001	M19206A001 Pulse Out PCA	P1110A
P9111	M15241A002 or PC serial	M15758A002 Omnia PCA or for Technician use.	P315
P9112	M15182A002	E500 Combined Pulser	
P9115	M05105A004 or M05105A005	M19409A001 Pump Handle I.S. Barrier Assy.	JPH
P9013A	M18923A002	M17206A001 Combi Display PCA, Side A	P6415
P9013B	M18923A002 or M18923A004	M17206A001 Combi Display PCA, Side B or M18983A001 ATC-I.S. Barrier-Tmeter PCA	P6415 or P3109

Jumpers

Jumper Number	Setting	Label	Function
JP5	Open (out)	COLDSTART	Installed as a part of coldstart procedure, should be removed otherwise.
JP19	Open (out)	TEST	Not used
JP21	Closed (in)	BATT ENABLE	Required for RTC to maintain time.
JP22	Open (out)	A	Not used
JP23	Open (out)	B	Not used
JP24	Open (out)	C	Not used
JP25	Open (out)	D	Installed as a part of NV Data backup procedure, should be removed otherwise.

Status LEDs and Function

These LEDs are controlled by the boot loader.

LED	Name	Boot Loader Status Indication
D14	RUN	<ul style="list-style-type: none"> • ON - Normal Operation • OFF - No Board Power
D15	SPI EN	<ul style="list-style-type: none"> • ON - Normal Operation • OFF - No Board Power
D83	PORT 1	<ul style="list-style-type: none"> • OFF - Normal Operation • ON – Port Connected to Device
D85	PORT 3	<ul style="list-style-type: none"> • OFF - Normal Operation • ON – Port Connected to Device
D87	PORT 5	<ul style="list-style-type: none"> • OFF - Normal Operation • ON – Port Connected to Device
D90	FAULT* PORT 1	<ul style="list-style-type: none"> • OFF - Normal Operation • ON – Port Disconnected from Device
D92	FAULT* PORT 3	<ul style="list-style-type: none"> • OFF - Normal Operation • ON – Port Disconnected from Device
D97	FAULT* PORT 5	<ul style="list-style-type: none"> • OFF - Normal Operation • ON – Port Disconnected from Device
D159	HW FAIL	<ul style="list-style-type: none"> • OFF - Normal Operation • ON – Board is Locked Out

Note: After the application has loaded via USB, this LED turns ON for all ports and remains ON until power is removed.

These LEDs are controlled by the application.

LED	Name	Pump Application Status Indication
D13		OFF – FPGA Programming Done. ON – FPGA Programming in Progress
D89	SUSPEND	OFF - Normal Operation ON – USB Hub in Suspend Mode
D102	2W RXD	Blinking when receiving data from current loop communications.
D103	2W TXD	OFF - when current is present ON - solid if no current is present Blinking when transmitting data to current loop communications.

LED	Name	Pump Application Status Indication
D105	2W REV	OFF - Two-Wire connected correctly ON - Two-wire connected backwards
D108	VR TXD	Blinking when transmitting data to the Display Bus.
D109	VR RXD	Blinking when receiving data from the Display Bus.
D112	ZC TXD	Blinking when transmitting data to PC/Omnia
D113	ZC RXD	Blinking when receiving data from PC/Omnia
D122	G1	OFF - STP1 OFF ON - STP1 ON
D123	G2	OFF - STP2 OFF ON - STP2 ON
D124	G3	OFF - STP3 OFF ON - STP3 ON
D125	G4	OFF - STP4 OFF ON - STP4 ON
D126	VALVE ENABLE	OFF - Valve Signals Disabled (Software/Hardware Problem) ON - Valve Signals Enabled
D127	LED A	OFF - Not Used
D129	LED B	OFF - Not Used
D131	LED C	OFF - Not Used
D133	LED D	OFF - Side 1 Handle Down ON - Side 1 Handle Up
D135	LED E	OFF - Side 2 Handle Down ON - Side 2 Handle Up
D128	PF WARN	OFF - Normal Operation ON - 24VDC Going Away
D132	24V	OFF - Not Used
D134	DC IN	OFF - DC IN voltage not present ON - DC IN voltage present
D136	5V	OFF - 5V voltage not present ON - 5V voltage present
D138	3.3V	OFF - 3.3V voltage not present ON - 3.3V voltage present
D140	1.8V	OFF - 1.8V voltage not present ON - 1.8V voltage present
D142	1.0V	OFF - 1.0V voltage not present ON - 1.0V voltage present
D137	HEARTBEAT (HB)	Flashes steadily at rate of "ON" one half second, "OFF" one half second during normal operation. Flashing begins 15-20 seconds after power-up. Not Flashing (Steady ON or OFF) – System Failure (Software/Hardware issue).
D139	I360 CON	OFF - Not Used
D141	I360 ACT	OFF - Not Used
D143	ATG CON	OFF - Not Used
D144	ATG ACT	OFF - Not Used
D145	IOT CON	OFF - Not Used
D146	IOT ACT	OFF - Not Used
D158	SYSRESET	OFF - Not Used

LEDs Boot-Up Status and Activity PCN5

When power is applied it takes approximately 40 seconds for PCN5 to boot up fully. The table below describes the status and activity of the LEDs during this process provided no faults occur.

LED	Name	Boot-Up Status/Activity Indication
D13		Turns ON for approximately 5 seconds. (FPGA being programmed) then turns OFF.
D14	RUN	Both turn and remain ON.
D15	SPI EN	
D134	DC IN	
D136	5V	
D138	3.3V	Turn and remain ON.
D140	1.8V	
D142	1.0V	
D126	VALVE ENABLE	Turns ON after approximately 5 seconds and remains ON. (FPGA has been programmed*).
D127	LED A	
D129	LED B	Roughly 30 seconds after power is applied, this group of LEDs turns ON (The pump application has started). They remain on for approximately 5 seconds after which LED A, LED B, and LED E Turn OFF. A few seconds later LED C and LED D turn OFF.
D131	LED C	
D133	LED D	
D135	LED E	

Note: With PCN5, there is a new Error Code E16 - Field Programmable Gate Array (FPGA) not programmed. This error is exceedingly rare and would most likely occur on reboot or a power cycle. The way to clear the error is to power cycle the PCN5.

Test Points

Figure 5-4: Test Points

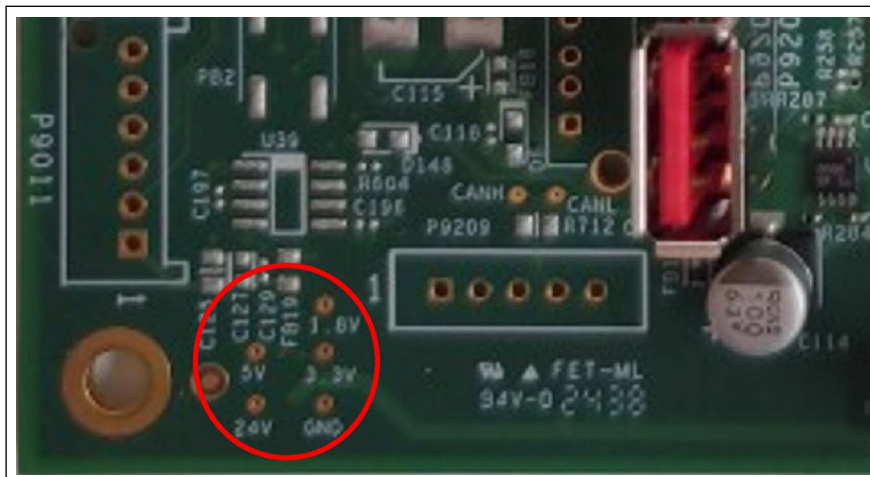
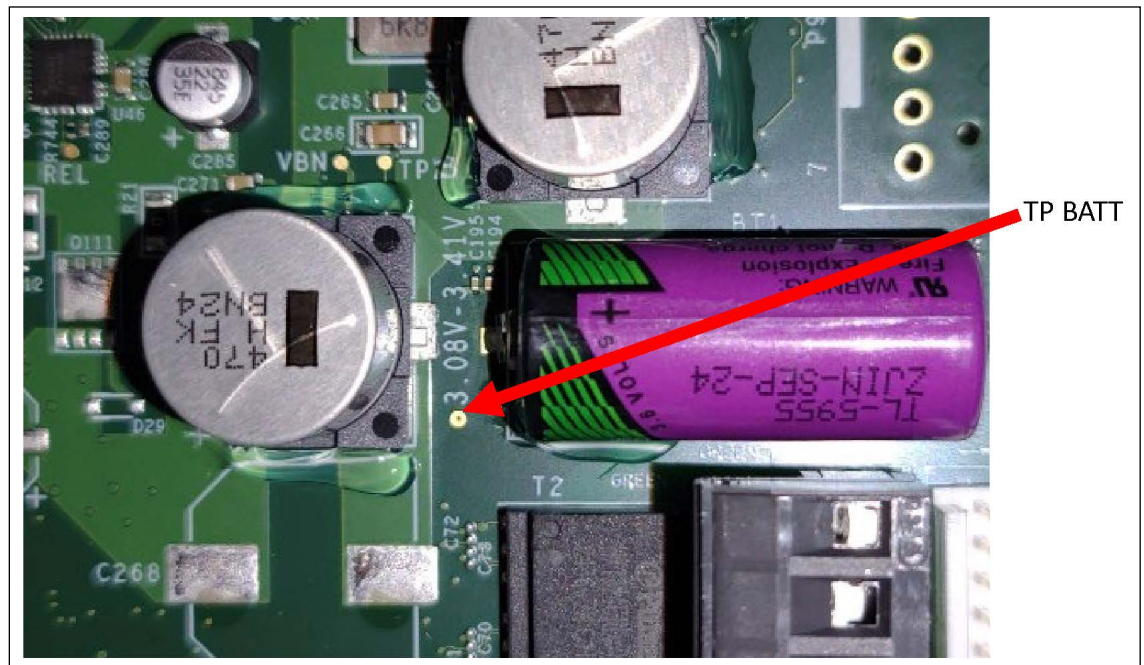


Figure 5-5: Test Point Range



Test Point	Range
TP BATT	3.08 to 3.41 VDC
TP 1.8V	1.7 to 1.9 VDC
TP 24V	22.8 to 25.2 VDC
TP 5V	4.75 to 5.25 VDC
TP 3.3V	3.14 to 3.46 VDC
TP GND	DC Ground

PCN5 Replacement Process

This process is applicable only when the PCN4+ Display Bus version is being replaced.

- 1 If applicable or possible, record the Pump Totals. They can be re-entered later in the process.
- 2 Isolate or disconnect the 2-wire (if applicable).
- 3 Remove power from the dispenser.
- 4 Unseal the security/W&M switch.
- 5 Disconnect all cables from the PCN4+/bracket assembly.
- 6 Remove the PCN4+/bracket assembly from the unit.
- 7 Remove the Ultra-Hi interface board and pulse out board (if present) from the PCN4+/bracket assembly.
- 8 Attach the Ultra-Hi interface board and pulse out board (if present) to the new PCN5/bracket assembly.

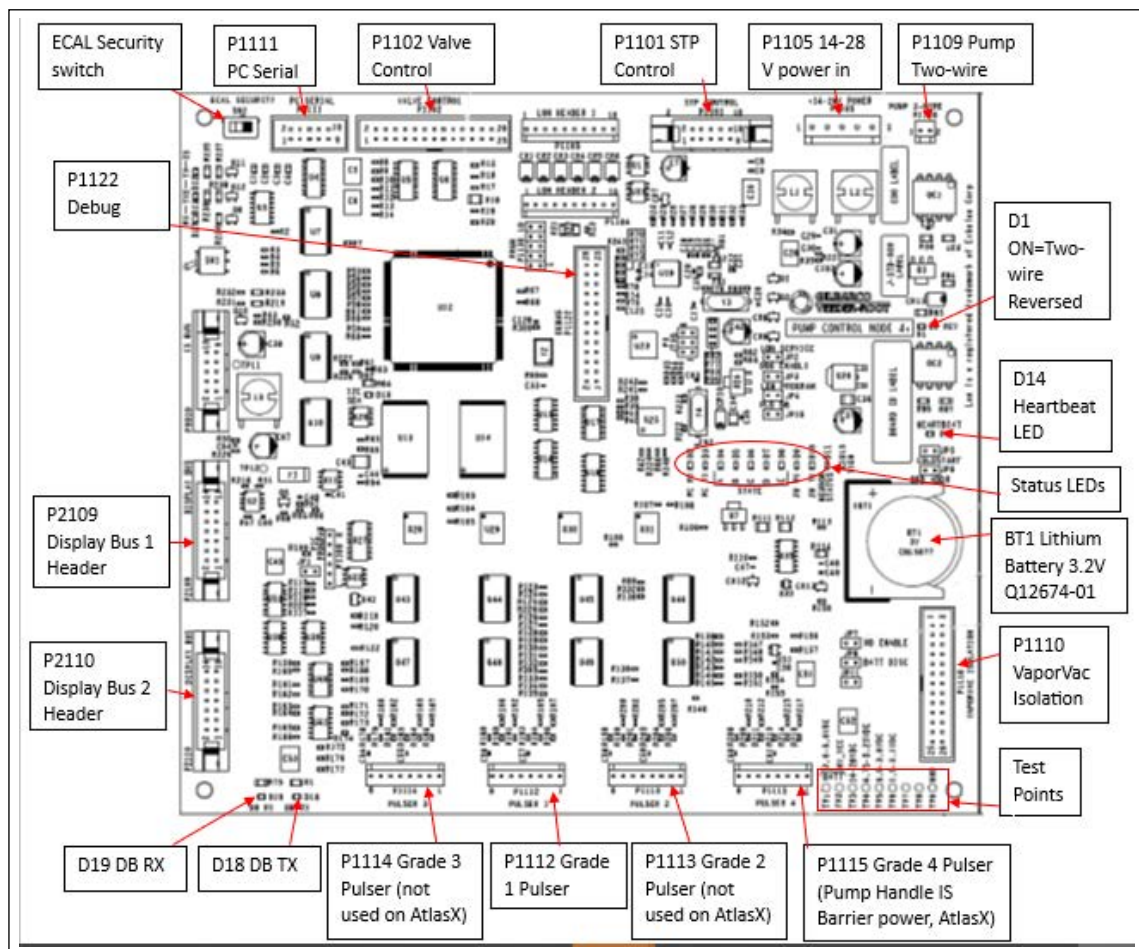
- 9** Install the new PCN5/bracket into the unit.
- 10** Re-connect all cables disconnected previously.
- 11** Place jumper on JP25 (D) on the new PCN5.
- 12** Turn ON/OPEN the security/W&M switch by sliding it forward.
- 13** Restore power to the dispenser.
- 14** Wait for the PCN5 to boot up fully (zeros showing on the main display along with error 5056 code flashing on the Grade 1 PPU). E1 may be displayed on the Money Pane of the MV Display.
- 15** Remove power on the dispenser.
- 16** Remove jumper from JP25 (D) and restore power to the dispenser.
- 17** Wait for the PCN5 to boot up fully.
- 18** Turn OFF/CLOSE the security/W&M switch by sliding it backward.
- 19** Enter Pump Totals if applicable.
- 20** Re-connect the 2-wire (if applicable).
- 21** Test the dispenser for proper operation and communication.
- 22** Seal the security/W&M switch or if necessary, notify your local W&M office that the seal has been removed and needs to be replaced.

Pump Control Node 4+ (M18666A001)

The Pump Control Node 4+ is used on AtlasX electronic series units to control fueling operations. It performs all totals calculations, processes handle switch information and pulser input, and stores W&M data. The PCN interfaces directly with the STP control on the power supply board [M07121A004, see “M07555A004 Power Supply” on page 5-24 and for valve driver board, see “Ultra-Hi Interface PCA (M08223A001)” on page 5-20]. The PCN interfaces with the Combi display (M17206A001) and ATC I.S. barrier-Tmeter PCA (M18983A001) through the display bus. It uses the ATC PCA to supply information to adjust the metered volume to a predetermined standard temperature.

The M18666A001 PCN requires PCN software version 5.0.39 or later. The PCN provides the main processing power for system. The lithium battery on this board maintains level 1 and level 2 programming.

Figure 5-6: Pump Control Node 4+ (M18666A001) PCN4+



- Notes: 1. P1122 is not used in the field.
2. P1110 is used for the pulse-out option and for security switches.

Board Connections and Cables

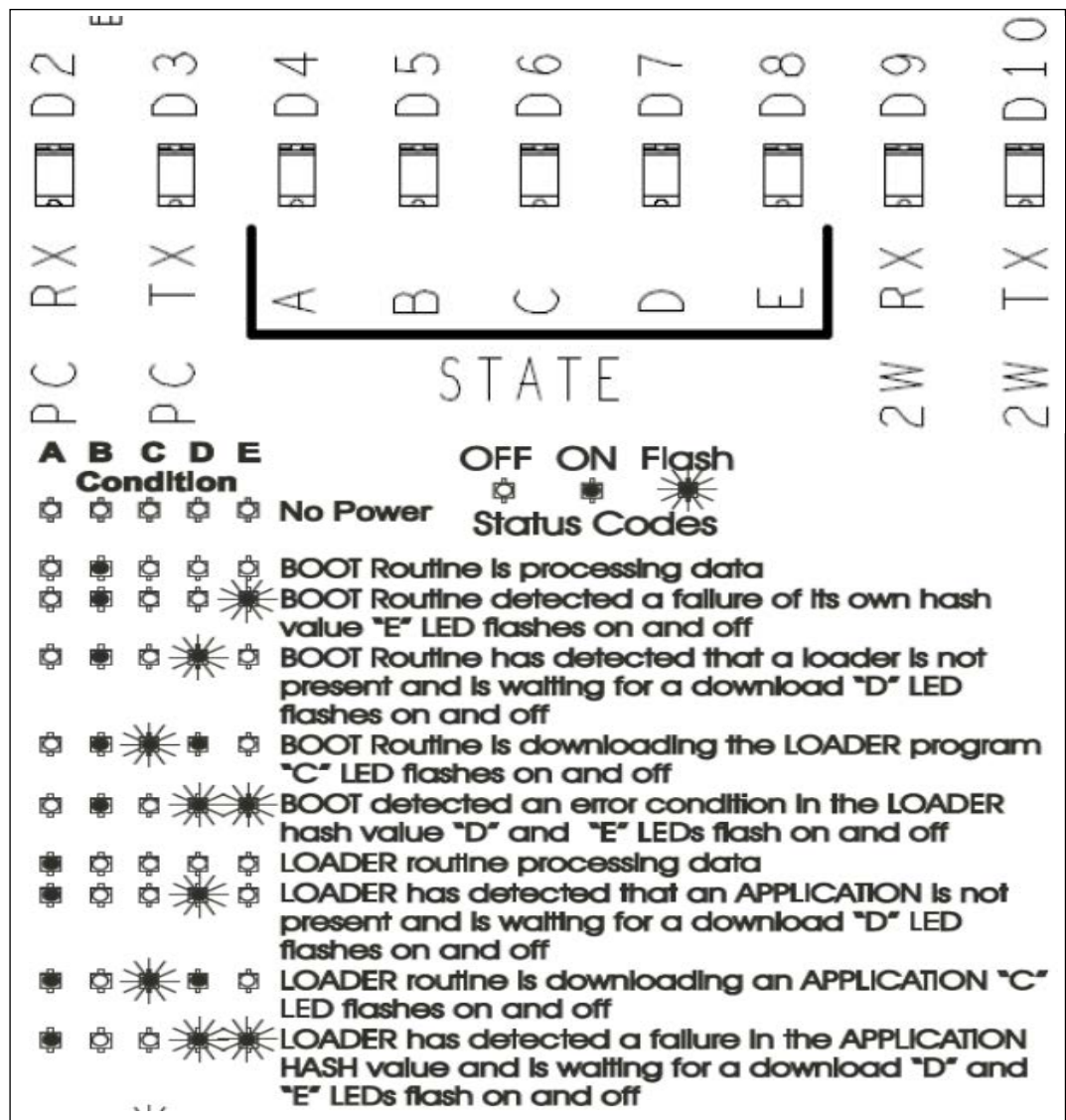
Connector#	Through Cable	To PCA	At Connector#
P1101	M19407A001 or M06968A001	M07121A004 Power Distribution PCA	P1301
P1102	M00549A001	M08223A001 Ultra-Hi Interface	P1201
P1105	M05547A007	M07121A004 Power Distribution	P1402
P1109	M02993A007	POS/FCC or M15778B216 PRIME Panel	J402 or J402A
P1110	M00549A001	M19206A001 Pulse Out PCA	P1101
P1111	PC serial	For Technician use.	
P1112	M15182A002	E500 Combined Pulser	
P1115	M05105A004 or M05105A005	M19409A001 Pump Handle I.S. Barrier Assy.	JPH
P1122		Not Used	
P2109	M18923A002	M17206A001 Combi Display PCA, Side A	P6415
P2110	M18923A002 or M18923A004	M17206A001 Combi Display PCA, Side B or M18983A001 ATC-I.S. Barrier-Tmeter	P6415 or P3109

Status LEDs and Function

LED	Name	Status Indication
D1	2W REV	On solid if two-wire loop is reversed
D2	PC RX	Blinking when receiving data from PC
D3	PC TX	Blinking when transmitting data to PC
D4	STATE A	Off when application is running properly
D5	STATE B	Off when application is running properly
D6	STATE C	Blinking if PCN is unable to communicate with display PCA
D7	STATE D	On solid when handle on Side 1 is off-hook
D8	STATE E	On solid when handle on Side 2 is off-hook
D9	2W RX	Blinking when receiving data from current loop communications
D10	2W TX	<ul style="list-style-type: none"> • Off when current is present • On solid if no current is present • Blinking when transmitting data to current loop communications
D12	IS TX	Not used
D13	IS TXE	Not used
D14	HEARTBEAT	Flashes steadily at rate of "on" one half second, "off" one half second during normal operation. Flashing begins 15-20 seconds after power-up.
D17	IS RX	Not used
D18	DB TX	Blinking when transmitting data to the Display Bus
D19	DB RX	Blinking when receiving data from the Display Bus

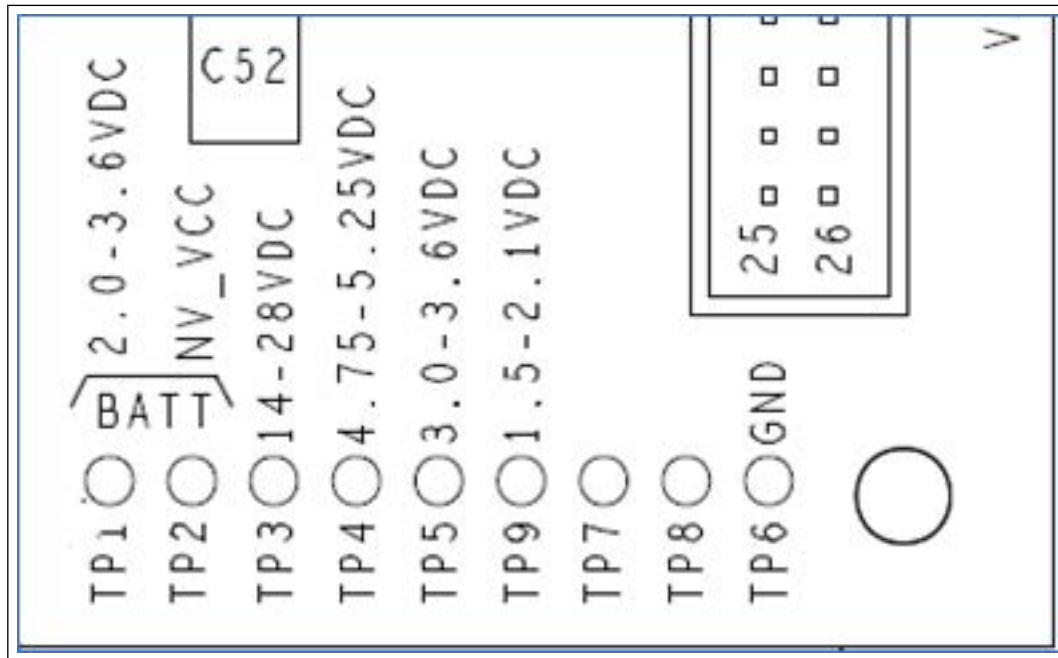
State LEDs (Initialization)

Figure 5-7: State LEDs



Test Points

Figure 5-8: Test Points



Test Point	Range	Where used
TP1	2 to 3.6 VDC	Battery Voltage
TP2	2 to 3.6 VDC	Memory Voltage
TP3	14 to 28 VDC	Input Voltage
TP4	4.75 to 5.25 VDC	Logic Voltage
TP5	3.0 to 3.6 VDC	Logic Voltage
TP6	DC Ground	Ground for DC Voltages
TP9	1.5 to 2.1 VDC	Logic Voltage

Jumpers

Jumper Number	Setting	Label	Function
J2	Open (out)	LON SERVICE	Not used
J3	Open (out)	DBG ENABLE	Used during software development & testing
J4	Open (out)	LON PROGRAM	Not used
J5	Open (out)	COLDSTART	Used to clear level 1 & 2 programming
J6	Open (out)	BRD ADDR	Not used in current application
J7	Closed (in)	WD ENABLE	Enable watch-dog timer
J8	Open (out)	BATT DISC	Used to clear NVRAM contents without disconnecting the on-board battery*

Jumper Number	Setting	Label	Function
J10	Open (out)	PLD DB	Used during circuit board repair
J11	Open (out)		Resets the PCN

*Use the following sequence to clear NVRAM:

- 1 Turn power off.
- 2 Install jumper.
- 3 Turn power on.
- 4 Wait 2 seconds.
- 5 Turn power off.
- 6 Remove jumper.

WARNING

Data will be erased. Use only if advised to do so by service technician.

Service Tips

- The coldstart jumpers only reset the processor of Level 1 and Level 2 programming.
- The redundant storage is only maintained in the pump board and the A-side M17206 display board. There is a procedure for replacing the PCN 4+ (M18666A001) board in order to retain data.
- The pump two-wire transmit (TX) LED may flash under certain circumstances when the PCN 4+ is not transmitting.

Retaining Data While Replacing Pump Boards

As a means of retaining calibration and configuration data, this data is stored redundantly in nonvolatile memory. Redundant storage of this data allows for automatic, reliable, and quick retrieval in the event of a PCN or Pump Display failure or replacement thereby minimizing service time.

With the Display Bus protocol, calibration and configuration data is only stored in two locations. The PCN is the primary storage location and A-side Pump Display is the secondary location.

In the event the PCN is replaced, it is important to follow the procedure below to minimize the risk of losing calibration and configuration data. If the below procedure is not followed, the PCN nonvolatile data will not be overwritten by the Pump Display nonvolatile data.

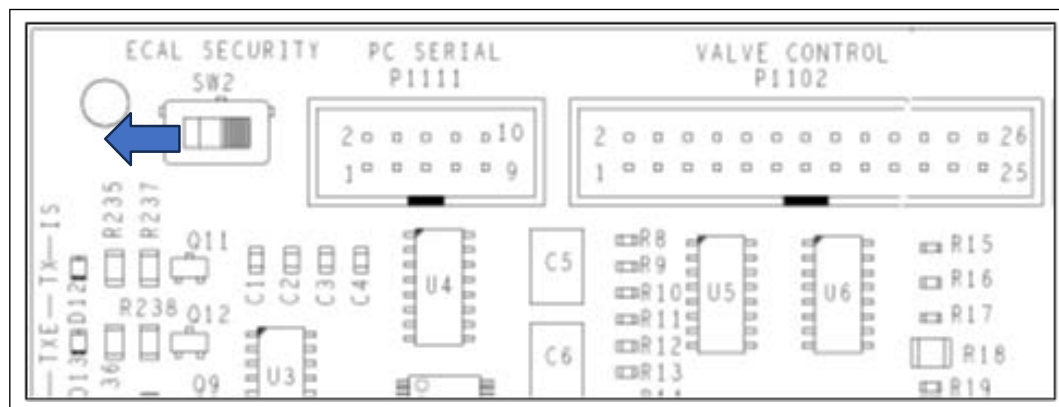
IMPORTANT INFORMATION

The below process must be followed in the exact sequence shown in the steps below. If this process is not followed, there is a risk of losing calibration.

To replace a Pump Control Node 4+ (M18666A001) connected to M17206 display board, proceed as follows:

- 1 If applicable, record the Pump Totals which can be re-entered later in the process.
- 2 Retrieve the “WhoAreYou” file for later reference, if needed.
- 3 If using two-wire communication to FMS System or AtlasX PRIME, isolate the two wires from the POS or disconnect from OrPAY 1000.
- 4 Disconnect the power from the dispenser.
- 5 Unseal the security/W&M switch.
- 6 Disconnect all the cables from the PCN board and remove it from the mounting bracket.
- 7 Remove the battery from the new PCN board and set it aside (it will be re-installed later).
- 8 Wait at least 30 seconds, then replace the battery.
- 9 Attach the new PCN board to the mounting bracket.
- 10 Re-connect all the cables disconnected previously.
- 11 Turn ON/OPEN the ECAL/security switch by sliding it as shown below (It will be necessary to slide security bracket up to allow switch to be moved).

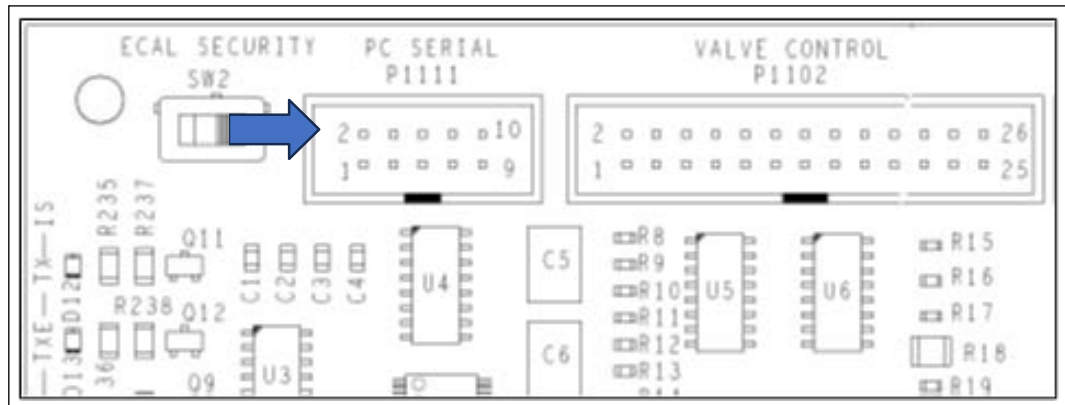
Figure 5-9: Turning On/Opening the ECAL/Security Switch



- 12 Restore power to the dispenser.
- 13 Wait for the PCN board to boot up fully (zeros showing on the main display along with error 5056 code flashing on the Grade 1 PPU).
- 14 Remove then restore power on the dispenser.
- 15 Wait for the PCN board to boot up fully.

- 16 Turn OFF/CLOSE the ECAL/security switch by sliding it in the opposite direction.

Figure 5-10: Turning Off/Closing the ECAL/Security Switch

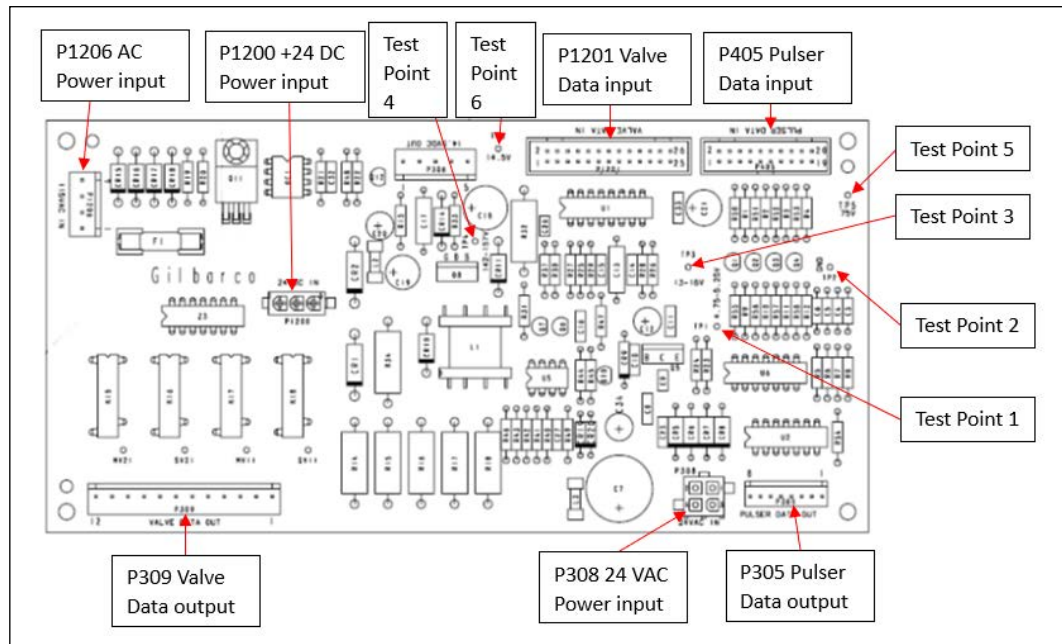


- 17 Enter Pump Totals, if applicable.
- 18 Refer to “WhoAreYou” file to verify configuration settings, if necessary.
- 19 Re-connect the two wires.
- 20 Test the dispenser for proper operation and communication.
- 21 Seal the security/W&M switch or if necessary, notify your local W&M office that the seal has been broken and needs to be repaired.

Ultra-Hi Interface PCA (M08223A001)

When used in an AtlasX High-Flow or DEF unit, the Ultra-Hi Interface PCA (M08223A001) connects with the Pump Control Node and valves. The interface receives +5 VDC from the Pump Controller PCA and supplies 120 VAC for the valves. When used in an AtlasX Ultra-Hi unit, the Ultra-Hi Interface also converts the 24 VDC it receives from the power supply to 75 VDC for pulsers. And this board also interfaces the pulsers to the PCN in AtlasX Ultra-Hi units.

Figure 5-11: Ultra-Hi Interface PCA (M08223A001)



Board Connections and Cables

Connector#	Through Cable	To PCA	At Connector#
P1206	M04406A011	M07121A004 Power Distribution PCA	P1
P1200*	M05107A003	M07121A004 Power Distribution PCA	P1300 or P1300A
P1201	M00549A001	M18666A001 Pump Control Node 4+ PCA	P1102
P405*	M02279A002	T19301-G1 I.S. Barrier PCA	P115
P305*	M03755A001	M18666A001 Pump Control Node 4+ PCA	P1112
P308*	M00672A010	Earth Ground	
P309	M04850A012 or M04850A014	Solenoid Valves	A8, A14, B8, & B14

*Used on Ultra-Hi units only.

Test Point	Range	Where used
TP1	4.75 to 5.25 VDC	DC voltage for on-board relays, logic voltage for pulser inputs on Ultra-Hi units
TP2	DC Ground	Ground for DC Voltages
TP3	13 to 16 VDC	Part of circuit that generates 75 VDC for pulsers connected to I.S. Barrier board (T19301-G1) in Ultra-Hi units

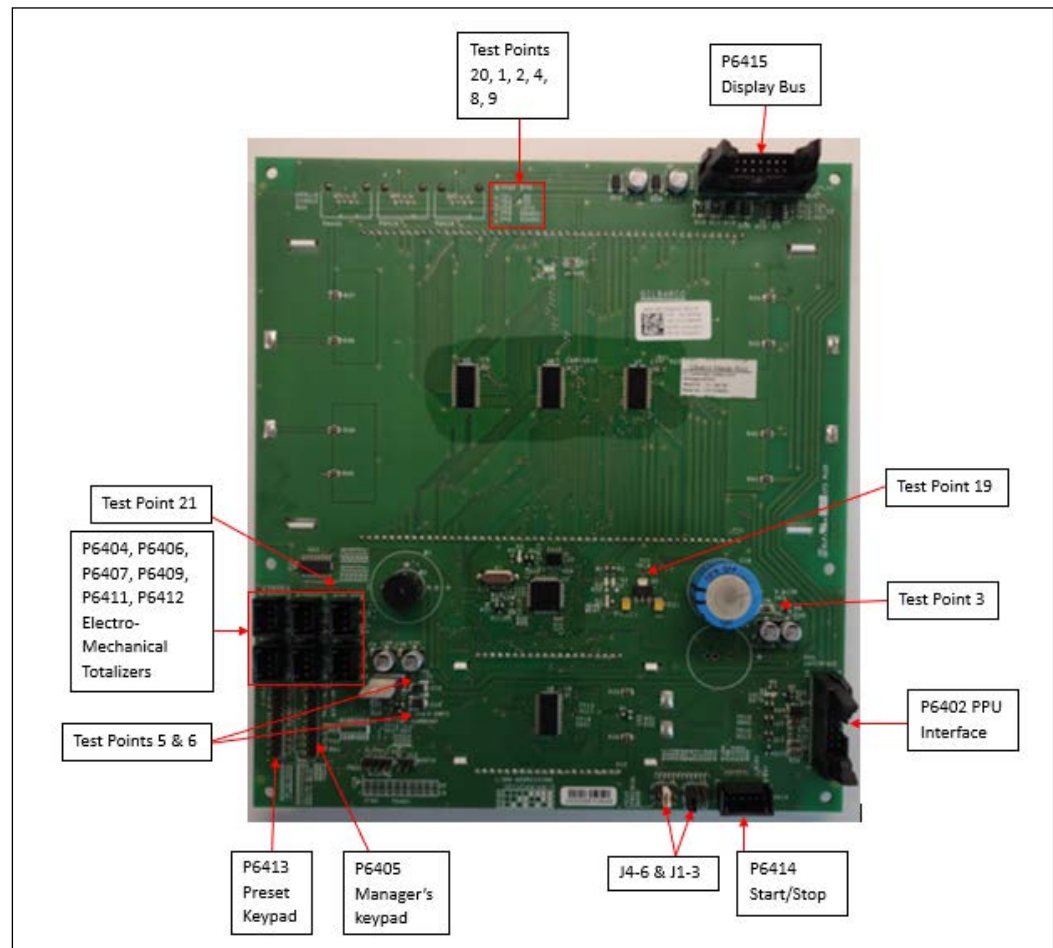
Test Point	Range	Where used
TP4	142 to 157 VDC	Part of circuit that generates 75 VDC for pulsers connected to I.S. Barrier board (T19301-G1) in Ultra-Hi units
TP5	75 VDC	Voltage for pulsers connected to I.S. Barrier board (T19301-G1) in Ultra-Hi units
TP6	14.5 VDC	Not used in AtlasX
MV11	99 to 126.5 VAC*	Drives stage 1 of solenoid on side 1
SV11	99 to 126.5 VAC*	Drives stage 2 of solenoid on side 1
MV21	99 to 126.5 VAC*	Drives stage 1 of solenoid on side 2
SV21	99 to 126.5 VAC*	Drives stage 2 of solenoid on side 2

*When active.

Combi Display 6-6-4 PCA (M17206A001)

The Combi Display 6-6-4 board is used on AtlasX electronic series units. This board displays transaction information to the customer, maintains a backup of the pump data, drives totalizers, and serves as an I/O gathering point by interfacing manager's keypad and pump handle status to the display bus. Transaction information and PPU/error codes are displayed on two LED backlit LCD displays. The on-board beeper provide audio for alarms and feedback for the manager's keypad inputs. Totalizer cables connect directly into this board. This board provides +5V connection for the satellite indicator board.

Figure 5-12: Combi Display 6-6-4 PCA (M17206A001)



Board Connections and Cables

Connector#	Through Cable	To PCA	At Connector#
P6415	M18923A002	M18666A001 Pump Control Node 4+ PCA	P2109 or P2110
P6414	M05105A004 or M05105A005	M19409A001 Pump Handle I.S. Barrier Assembly	JPH
P6405	M06116A002 M13448A001	Manager's Keypad Assembly	MGR KEYPAD
P6406	M00455A007	Electro-Mechanical totalizer	
P6402	M10699A008	M19060A001 E700 Satellite Indicator PCA	P2201
P6413		Not Used	
P6404 P6407 P4609 P6411 P6412		Not Used	

Status LEDs and Function

LED	Name	Status Indication
D1	HEARTBEAT	Flashes steadily at rate of "on" one half second, "off" one half second during normal operation. Flashing begins a few seconds after power-up.
D2	TX	Blinking when transmitting data to PCN on the display bus
D3	RX	Blinking when receiving data from PCN on the display bus
D4	I2C2	PPU data - Will blink randomly under normal operation
D5	I2C1	Display data - Will blink randomly under normal operation

Test Points

Test Point	Range	Where used
TP1	DC Ground	Ground for DC Voltages
TP2	4.75 to 5.25 VDC	Logic Voltage from the display bus
TP3	4.7 to 5.05 VDC	Display Voltage used to power LCD displays and drivers
TP4	14 to 28 VDC	Input Voltage from the display bus
TP5	13 to 16 VDC	Logic Voltage
TP6	11.6 to 14.6 VDC	EM Totalizers Voltage
TP19	3.0 to 3.6 VDC	Logic Voltage
TP20	DC Ground	Connected to DC ground via the display bus connection at the PCN
TP21	0 to .3 VDC (when active)	EM Totalizer drive line

Multiple test points not shown in the table above are used for PC board testing and repair.

Jumpers

Jumper Number	Setting	Label	Function
J1	See Below	A0	Addressing board on display bus
J2	Open (out)	A1	Addressing board on display bus
J3	Open (out)	A2	Addressing board on display bus
J4	Open (out)	TEST	Puts display in self-test mode when closed (in)
J5	Closed (in)	PROTOCOL	Set board for AtlasX display bus protocol
J6	See Below	BAUD	Set display to "silent" mode*

Jumper Number	Setting	Label	Function
*For pumps/dispensers with multiple displays for the same hose (side-load singles or duals), there will be more than one display on the bus with the same address. This is so that the same data can be displayed on each side of the unit. However, if both displays were to communicate on the display bus at the same time, that communication would fail. To avoid this issue, one of the displays must be set for "silent" mode. In "silent" mode, the display receives and displays the data but does not communicate back to the PCN. As a result, displays set for "silent" mode will not relay data such as pump handle input and manager's keypad input back to the PCN. Those inputs must be connected to the "active" display.			

Address Settings

Display	J1 (A0)	J6 (BAUD)
Side A Active	Open (out)	Open (out)
Side A Silent	Open (out)	Closed (in)
Side B Active	Closed (in)	Open (out)
Side B Silent	Closed (in)	Closed (in)

Self-Test Mode

When J4 is installed, the display will enter self-test mode. In this mode, the display board displays numbers and turns the backlighting off & on. It will continue to display and toggle the backlight until the J4 jumper is removed.

Note: All other jumpers must be removed for self-test. J4 should be the only jumper installed.

M07555A004 Power Supply

Note: This power supply is not used in AtlasX satellite dispensers.

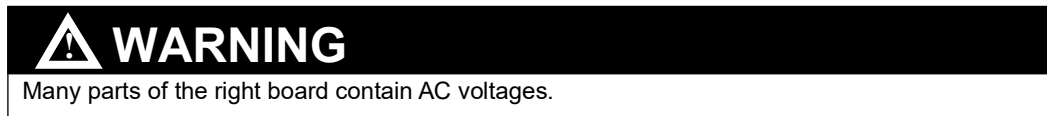
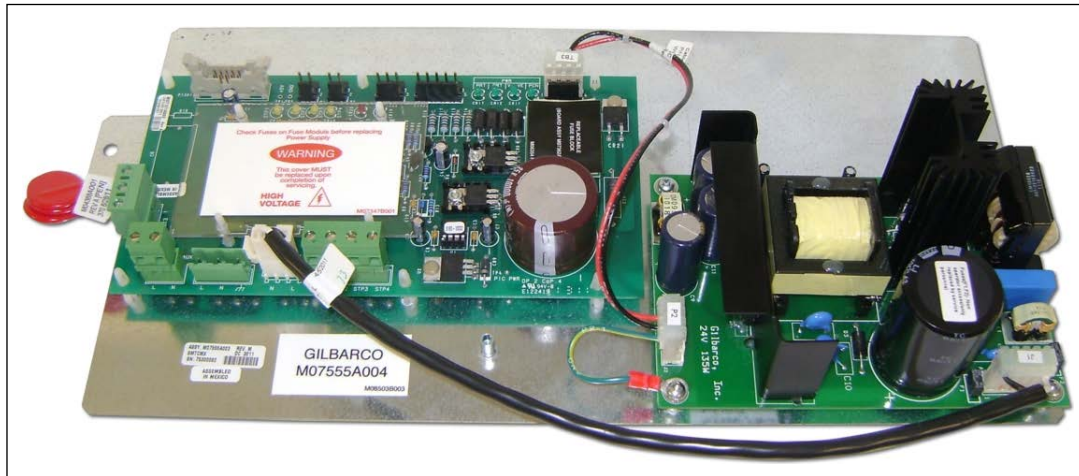


Figure 5-13: M07555A004 Power Supply



The power supply uses the line voltage of 110-240 VAC and modifies it to supply power to the dispenser system. It converts the line voltage to 24 VDC and sends it to the M07121 Power Supply Board. The power supply board produces most of the remaining voltages needed by the system. The power supply does provide limited power conditioning and protection as well. A set of varistors provide power filtering and will even burn out if a severe surge occurs.

The following are additional capabilities:

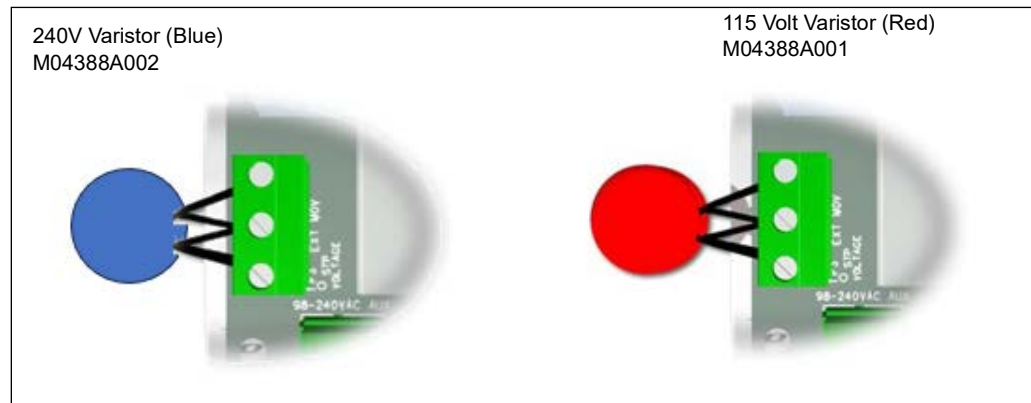
- Four relays are used to switch the line voltage to STP relay box(es), activating the STPs.
- The power supply has a bank of LED indicators to assist in troubleshooting.
- A replaceable fuse block to help get the power supply up and running in case the one in use is defective and needs to be replaced.

Varistors

Varistors provide limited filtering and protection to the line voltage.

In case of an extreme surge or lightning strike, they may even be destroyed. Even if they are destroyed, the power supply may still be functional. The power supply should be replaced, however, the power supply and the dispenser electronics are no longer protected because the power supply could have been damaged by the surge.

Figure 5-14: Varistors



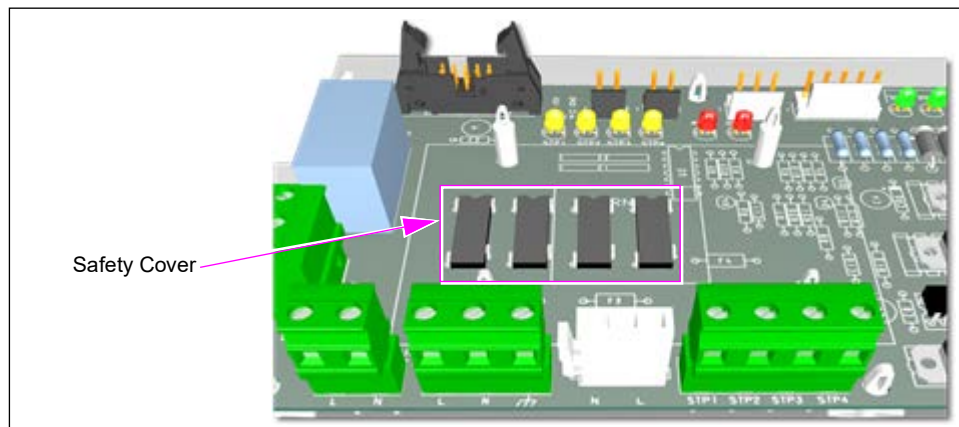
STP Relays

The four STP relays K1-K4 are used to switch the low current line voltage signals to activate the STP relays for up to four grades (only the first two are used on AtlasX).

With this power supply, the relays are replaceable. They are also protected by a resettable fuse (PTC).

If the LED for the STP in question illuminates, but there is no 110 VAC on the corresponding lead, this usually indicates shorted or grounded wiring. Ensure to verify both before replacing the relay or power supply.

Figure 5-15: STP Relays



Note: In Figure 5-15 the safety cover has been removed. This is for demonstration purpose only. The safety cover should never be removed.

Fuse Block (M07362A002)

The function of the Fuse Block is to protect +24 VDC from damage in the event of a circuit short or overload condition. The Fuse block contains the following four fuses to protect the 24 VDC outputs:

- Two Printer Outputs (PRT connections, not used on AtlasX)
- Valve Driver Board
- PCN

The PWR LEDs (CR10-12, CR17) indicate each 24 V output.

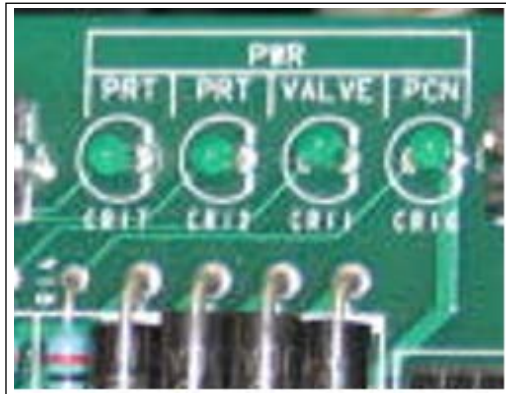
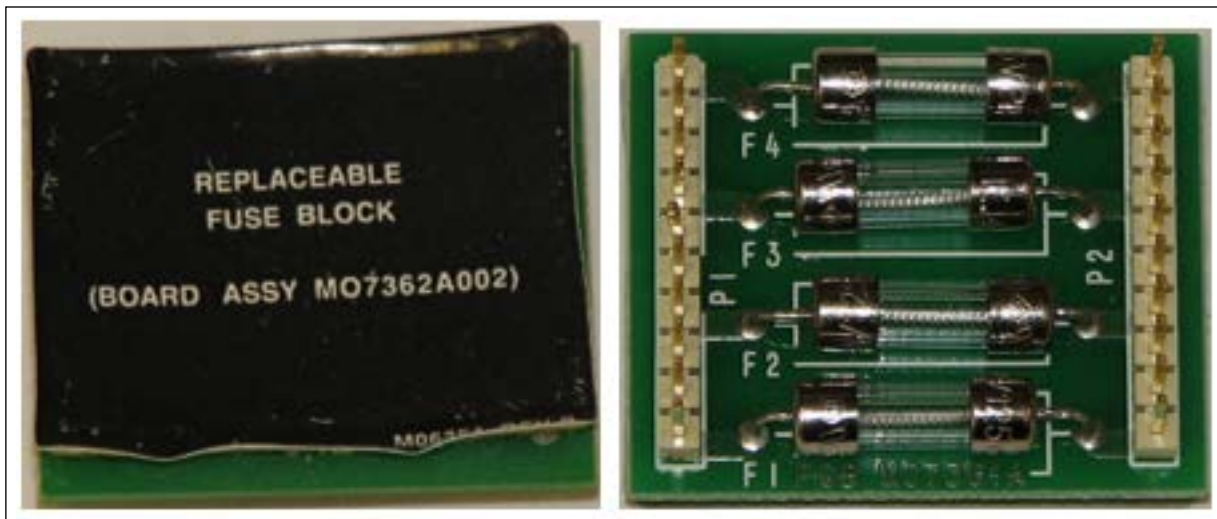


Figure 5-16: Fuse Block PCA (M07362A002)



To replace the fuse on the fuse block, proceed as follows:

- 1 Shut off all breakers that supply power to the unit.
- 2 Remove FB1.
- 3 Install new FB1 (M07362A002).
- 4 Re-apply power to the unit.

Note: The fuse block must be replaced as an entire assembly. Fuses cannot be replaced individually.

Service Tips

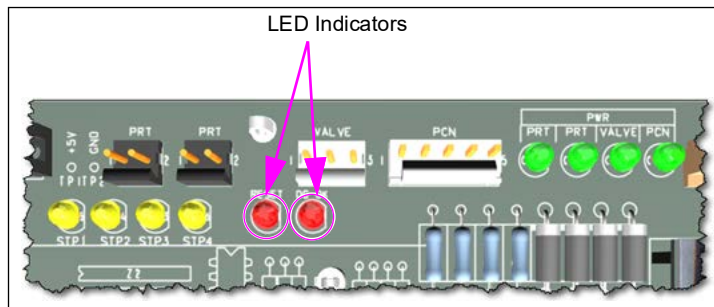
The following is the list of service tips for Fuse Block PCA (M07362A002):

- The Fuse Block Assembly is symmetrical. It does not matter which connector (P1 or P2) plugs into the connectors on the power supply board, as long as the pins on the Fuse Block PCA are aligned with the connectors on the power supply board. If the pins become offset, there will be no voltage outputs.
- As the Fuse Block PCA is symmetrical if one of the fuses is open, it is possible to pull out the Fuse Block, turn it around 180 degrees, and plug it back into the power supply board, provided not all +24 VDC outputs are being used. Before this is done, determine what caused the fuse to open and rectify the issue.

LED Indicators

The reset LED should light up as the dispenser is powered down. This is part of the “power fail warning”, and if it is not lighting up when power is removed, memory and software lockups can occur.

Figure 5-17: LED Indicators



The DC OK LED actually is a status indicator of the +24 V. As long as the +24 V is above some minimum threshold, the LED is off. When the +24 V sags below the minimum threshold, the LED turns on until the supply voltage goes away completely. When the DC OK LED stays on solid, it is an indication that there is or was an issue with the +24 V source or a problem in the comparator circuit.

STP Indicators

The LEDs for the STP circuits indicate that the signal from the pump control node is available for that circuit. It does not indicate line voltage output to the STP relay. If the indicator for STP1 is on, this means the pump control node signal is getting to the power supply not that the line voltage is being sent to the STP relay. This must be tested using a VOM from the STP connector to AC neutral. The LEDs are arranged in the same order as the relay and connector lead they service (see [Figure 5-18](#) on [page 5-28](#)).

Figure 5-18: STP Indicators

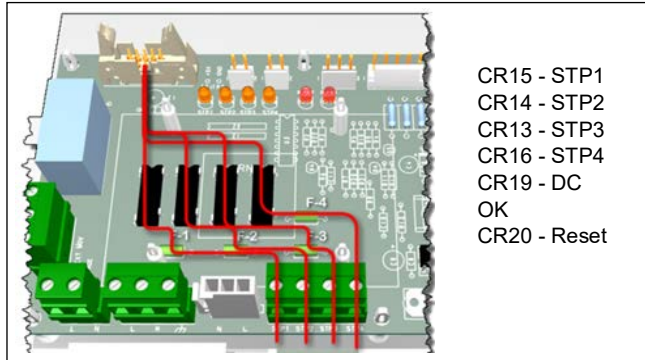
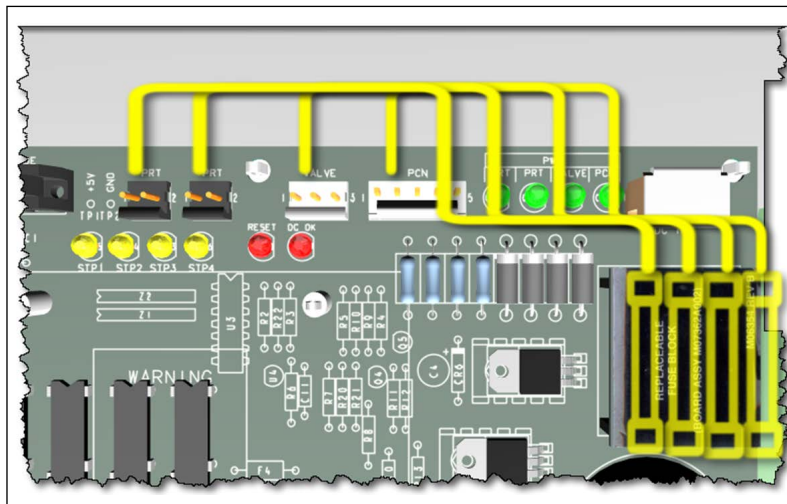


Figure 5-19: 24 VDC Indicators and Fuses



The power LEDs are an indication that the 24 VDC to both of the printer connectors, the valve driver board connector, and the pump control node connector is good. The LEDs are lined up in order with the connector it services and the fuse that protects that circuit.

The following table lists the spare parts details:

Part Name	Part Number
AC Distribution Connector, 2 Position	M04379B002
AC Input Connector, 3 Position	M04379B003
115 VAC Output Cable, 3 Position	M07648A003
24 VDC Input Cable, 3 Position	M07648A004
STP Connector, 4 Position	M04379B004
Replaceable Fuse Module	M07362A002
Replaceable Red Varistor (115 V)	M04388A001
Replaceable Blue Varistor (230 V)	M04388A002
Power Supply Board	M07121A004

M07555A004 Power Supply with M08223A001 Ultra-Hi Interface Board (Ultra-Hi Units Only)

The M07555A004 power supply ties the 24 VDC ground directly to the dispenser chassis. When using the M07555A004 power supply, you must use the M08223A001 interface board for the Ultra-Hi dispenser along with it. Failure to do so can cause the F1 fuse to open/blow on the T19301 I.S barrier board.

Troubleshooting Tips

When measuring DC voltage from chassis ground to DC ground with power applied to the unit, the reading should be approximately 0 VDC. There should be no voltage potential difference between chassis ground and board ground. Even with J405 connector on the interface board is disconnected, the reading is still 0 VDC.

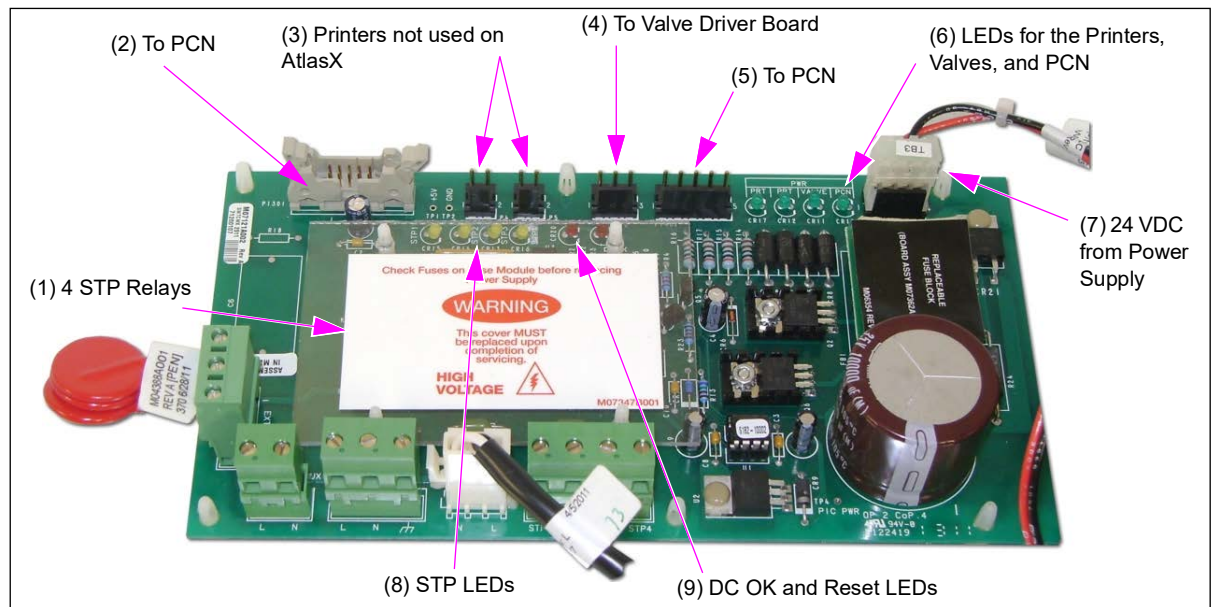
When measuring DC voltage from chassis ground to +5 V with the J405 connector disconnected, the reading should be approximately 5 V. If reading displayed is not +5 V, then you have a problem downstream between the interface board and the pulsers.

If you need to replace the IS barrier board, you should always try to find the source of the short first, otherwise you may end up replacing several boards needlessly.

⚠ WARNING

Never substitute a larger fuse in place of the F1 on the IS barrier board. This would violate UL requirements, and possibly induce a hazardous condition.

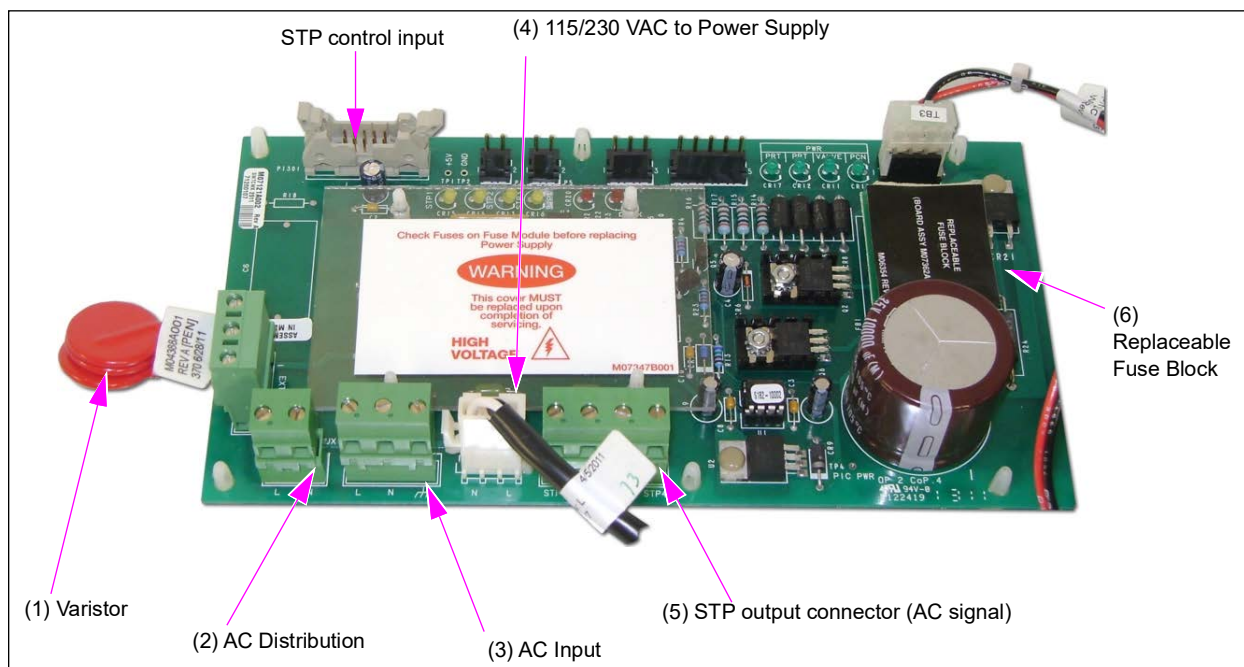
Figure 5-20: M07555A004 Power Supply Board - 1



Item	Part Name	Description
1	STP Relays	Switches low current line voltage signals to activate the STP relays for up to four products (AtlasX only uses 2). <i>Notes: 1) Never remove the cover over the relays. 2) The relays are protected by PTC fuses.</i>

Item	Part Name	Description
2	Connector to PCN	Carries low level STP signal from the PCN to the power supply board to control the STPs.
3	Printers (A and B Side)	24 VDC feed and return (not used on AtlasX)
4	Connector to Valve Driver Board	24 VDC feed (used on Ultra-Hi units)
5	Connector to PCN	24 VDC feed to PCN and power fail line.
6	LEDs for the Printers, Valves, and PCN	LEDs indicate 24 V available for the printers (CR12 and 17, not used on AtlasX), valves (CR11), and PCN (CR10).
7	24 VDC from Power Supply	24 VDC from power supply.
8	STP relay control input signaling LEDs for each STP (CR13, CR14, CR15, and CR16)	The relay is bad if the AC control turns on, but no AC goes to the STP output connector.
9	DC OK LED and Reset LEDs	<ul style="list-style-type: none"> DC OK (CR19 on green) indicates the 24 VDC from the M10996A001 power supply to the power supply board is present. The DC OK LED actually is a status indicator of the +24 V. As long as the +24 V is above some minimum threshold, the LED is off. When the +24 V sags below the minimum threshold, the LED turns on until the supply voltage goes away completely. If the DC OK LED stays on solid, it is an indication that there is or was an issue with the M10996A001 power supply or a problem in the comparator circuit. Reset LED (CR20 on red) indicates the dispenser has been powered down.

Figure 5-21: M07555A004 Power Supply Board - 2



Item	Part Name	Description
1	Varistor	Replaceable Varistor [M04388A001 130V (red) or M04388A002 275V (blue)] provides limited filtering and protection for the line voltage.
2	AC Distribution	AC Distribution Connector/2-position (M04379B002) hot and neutral only, the earth connection is made to the chassis through a ring terminal.
3	AC Input	AC Input Connector/3-position (M04379B003).

Item	Part Name	Description
4	Connector to Power Supply (M10996A001)	115/230 VAC to the Power Supply/3-position (M07648A003).
5	STP Drive Outputs	STP Connector/4-position (M04379B004).
6	Replaceable Fuse Block	Replaceable fuse module (M07362A002). <ul style="list-style-type: none"> Used on the M07121A004 power supply PCA. Contains four fuses that protect the 24 VDC outputs. Two printer outputs (not used on AtlasX), 1 for valve output and 1 for the pump control node. LEDs to show each 24 VDC output (on green when +24 VDC output is present). After following proper troubleshooting steps everything checks ok, always check the appropriate fuse on the power supply board. Do not replace the entire power supply for a blown fuse.

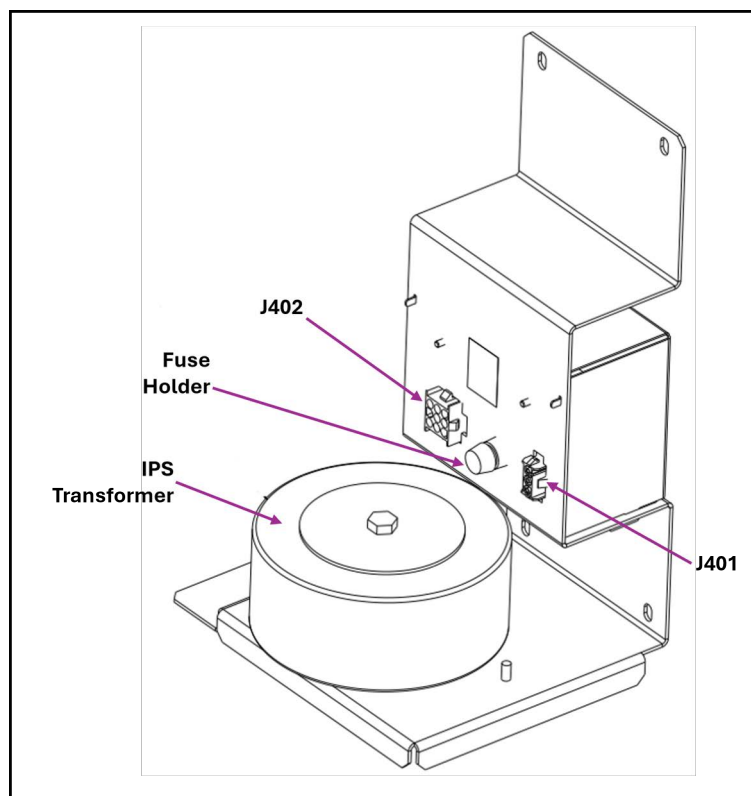
The following table provides part details for ordering the parts:

Part	Part #
Power Supply	M07555A004
Power Supply Board	M07555A003
Power Supply Assembly	M10996A001

International Power supply Assembly (IPS) - M20411A001 (HF, UHF, and Warm Weather DEF only)

The international power supply converts 230VAC power into 115VAC power. This assembly is used for the 230VAC 50/60 Hz powered dispenser and pumping units. A 5 ampere slow blow fuse equal to Q10131-04 to be used (pre-assembled with the unit).

Figure 5-22: IPS Assembly - M20411A001



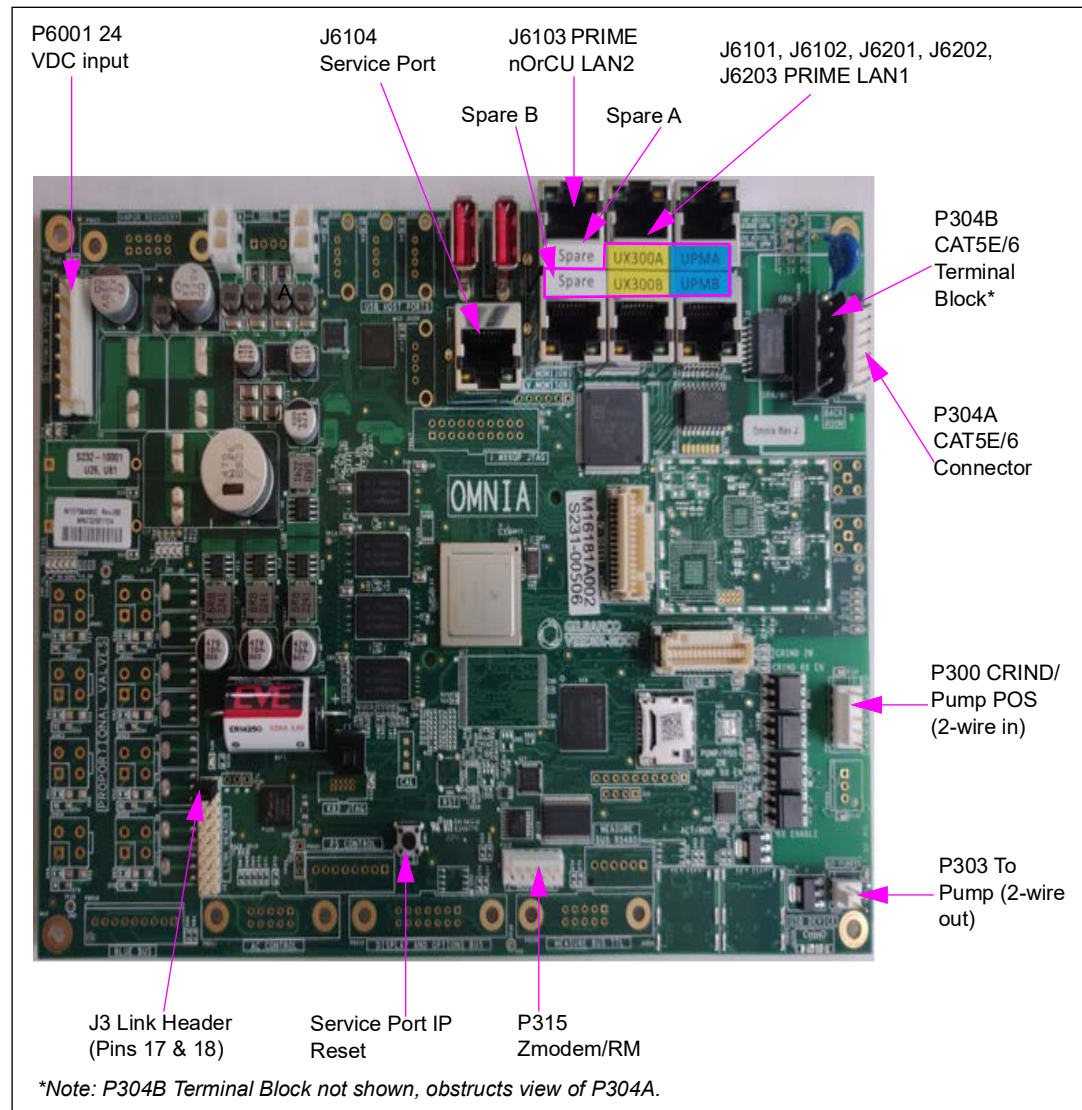
Type	Connector #	Through Cable	To PCA or Cable	At Connector
Pump Mode	J401	P401 - M20514A001	M04850A012 Cable	J2
	J402	P604 – M20514A001	M07121A004 PCA	P2
Dispenser Mode	J401	P401 - M20514A002	M07121A004 PCA	P1
	J402	P604 – M20514A002	M08223A001 PCA M19406A001 Cable M04218A004 Cable	P1206 P605 P606

Omnia PCA (M16181A002)

The Omnia PCA inside the dispenser serves the following purposes:

- Creating a LAN within the dispenser, so that the IP addresses of the Ethernet connected devices inside the dispenser are no longer exposed on the site Wide Area Network (WAN).
- Functioning as a router and firewall, only exposing select devices to the forecourt.
- The configuration of the forecourt IP address is performed on a single web page.
- Running two-wire proxy applications that allow connection from the POS or Fuel Management System to the pump.
- Allows the pump serial interface to run through the Omnia board. The Omnia manages the pump through TCP.
- Omnia manages the remote connection to the Insite360 server.

Figure 5-23: Omnia (M16181A002) PCA



Omnia Connections and Cables

Connector#	Through Cable	To PCA	At Connector#
P6001	M07973A007	M05547A007 +24VDC Power Cable	J305
J6104	Standard CAT5 Modular Cable	Service PC	Ethernet Port
J6103	Q13850-01	M15778B206 nOrCU Assembly	LAN2
J6101, J6102, J6201, J6202, J6203	M05189A018 or Q13850-03 or Q13850-01	M20276A001 AtlasX CAT5 adapter PCA M15778B216 PRIME Panel M15778B206 nOrCU Assembly (if present)	JL1A, JL2A LAN LAN1
P304A	M05189A016 or M14080A005 or M05189A018 or M14080A004	Q13241-01 CAT-5 Modular Coupling M20276A001 AtlasX CAT5 adapter PCA M15724A001 DCM3 (Dispenser Comm Module)	L3 JL3A J17

Connector#	Through Cable	To PCA	At Connector#
P300	M02993A008 or M11961A007	M04850A12 or A014 or M11277A003 AC Cable/ Conduit Assemblies M5189A011, A16, or A018 DC Conduit Assy.	J402 J402DC
		M15724A001 DCM3 (Dispenser Comm Module)	J21
P303	M02993A008 or M11961A007	Pump Control Node PCA	P1119 or P9016
P315	M15241A002	Pump Control Node PCA	P1111 or P9111

Omnia Jumpers

Jumper Number	Setting	Label	Function
J3, Pins 17, and 18	Closed (in)	Link Header	The battery jumper on the Omnia PCA (must be installed).

Omnia Status LEDs and Function

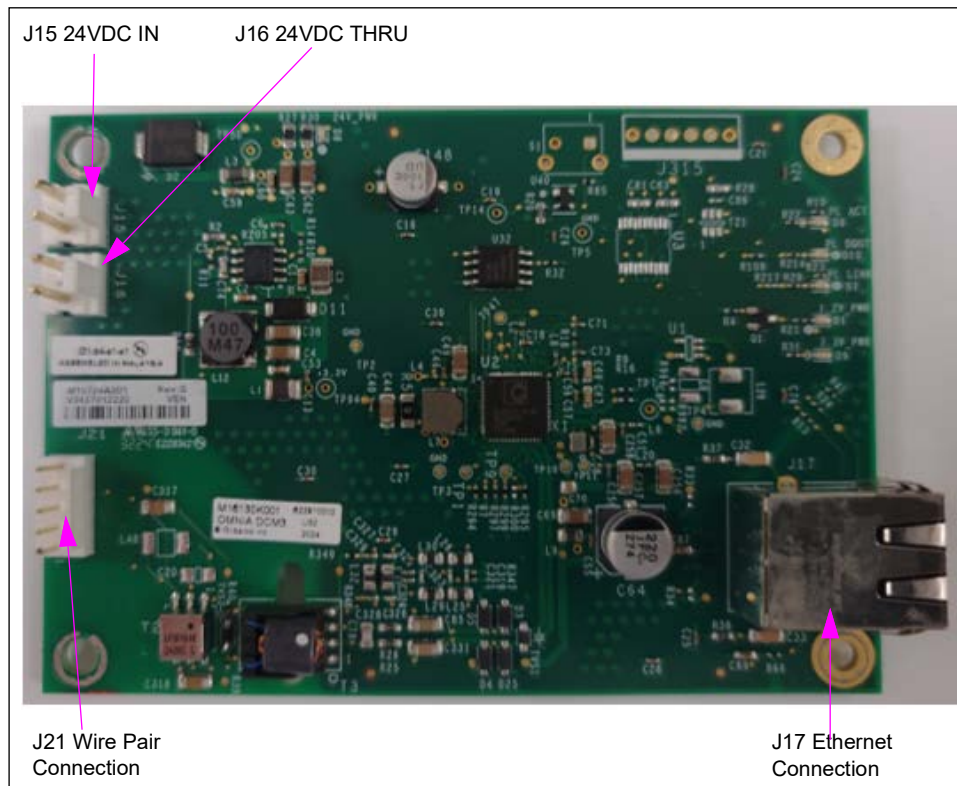
LED	Name	Status Indication
D7	1.5V PG	ON - 1.5VDC is present.
D8	1.1V PG	ON - 1.1VDC is present.
D17	1.1V	ON - 1.8VDC is present.
D18	1.35V	ON - 1.35VDC is present.
D19	(No Label)	OFF - Hardware failure.
D20	(No Label)	OFF - Hardware failure.
D22	24V	ON - 24VDC is present.
D23	5VUSB	ON - 5VDC is present for USB ports.
D24	5V	OFF - Hardware failure.
D25	5VPS	ON - 5VDC is present.
D26	3.3V	ON - 3.3VDC is present.
D37	CRIND 2W Rx	OFF - Not used in AtlasX.
D38	CRIND 2W Tx	OFF - Not used in AtlasX.
D39	CRIND Rx EN	OFF - Not used in AtlasX.
D134	(No Label)	OFF - Not used in AtlasX.
D45	PUMP/POS 2W Rx	Blinking when Omnia receiving 2-wire pump data from POS/FMS.
D47	PUMP/POS 2W Tx	Blinking when Omnia transmitting 2-wire pump data to POS/FMS.
D49	PUMP Rx EN	OFF - Boot cycle ON - Enables POS/FMS-to-Pump data on Omnia.
D53	PUMP 2W Rx	Blinking when Omnia receiving 2-wire pump data from pump.
D56	PUMP 2W Tx	Blinking when Omnia transmitting 2-wire pump data to pump.
D57	RX ENABLE	OFF - Boot cycle ON - Pump-to-Omnia receiver is enabled.
D142	PUMP 2W REV	ON - Two-wire connection to the pump is reversed.
D58	ACT/MOC	OFF - Normal Operation for AtlasX. ON - Board is configured for the MOC protocol.
D73	7.5V PG	ON - 7.5VDC is present.

Note: LEDs D28 - D32 are defined in Omnia Maintenance through USB section later in this document.

DCM3 [(Dispenser Communications Module, (M15724A001)]

The DCM3 is used on AtlasX electronic series units to connect Ethernet communications Over-Legacy-Cable (OLC). When connected to a BRCM2 (Back Room Communications Module), they enable Ethernet communications to be transmitted over twisted wire pair, the same wire pair that is used for current loop communications to the pump. This allows the distance of Ethernet communications (CAT5 normally 280 feet) to be extended to up to 2600 feet depending on the gauge of the wire pair. The field wiring can be run through the AC conduit (requires BRCM2), eliminating the need for a DC conduit (except in Canada) that is required for CAT-5 wiring.

Figure 5-24: Dispenser Communications Module 3



DCM3 Connections and Cables

Connector#	Through Cable	To PCA	At Connector#
J15	M07746A006	M07973A007 Power/Reset Cable	J511
J16	-	Currently not Used on AtlasX	-
J17	M14080A004	M16181A002 Omnia PCA	P304A
J21	M11961A007 or M11961A008	Omnia PCA AC/DC Conduit Assembly	P300 J402 or J402DC

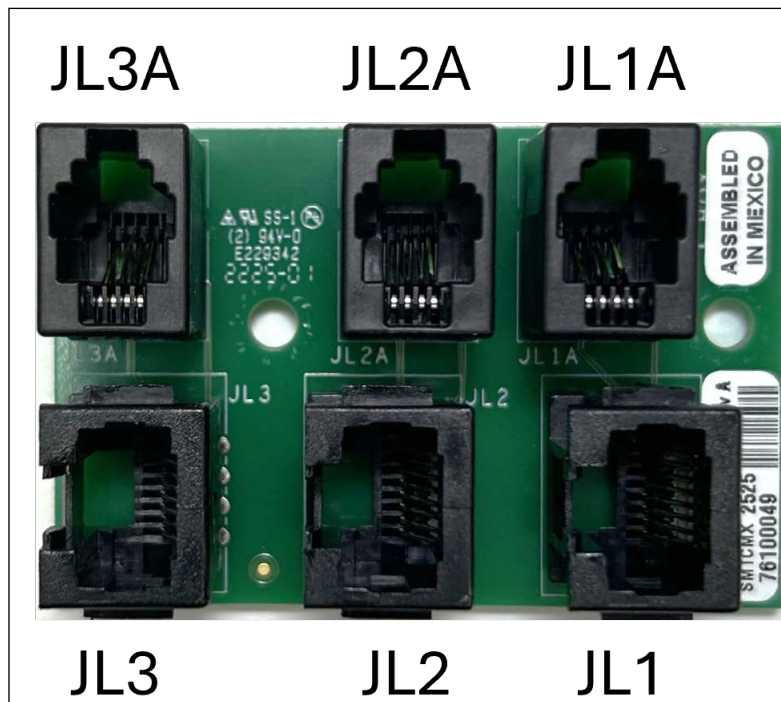
DCM3 Status LEDs and Function

LED	Name	Status Indication
D1	1.2V	ON – 1.2VDC is present
D6	ACT	Blinks when there is Ethernet activity
D7	LINK	ON – Connection between DCM3 and BRCM2 OFF – Loss of connection between DCM3 and BRCM2
D8	24V_PWR	ON – 24VDC is present
D9	3.3V	ON – 3.3VDC is present
D18	BOOT	OFF – Normal Operation ON – BOOT

CAT-5 Adapter PCA (M20276A001)

The CAT-5 adapter PCA, placed inside the J-box and mounted with the DC shield bracket, serves as an interconnection board for Ethernet®-connected devices inside the dispenser to the external LAN networks. The 4-pin CAT5 connectors PL1A, PL2A, and PL3A of the DC conduit cables M05189A017/M05189A018 are to be connected to JL1A, JL2A, and JL3A on the board, respectively. The JL1, JL2, and JL3 connectors are 8-pin RJ-45 headers for the LAN cables from the field wiring.

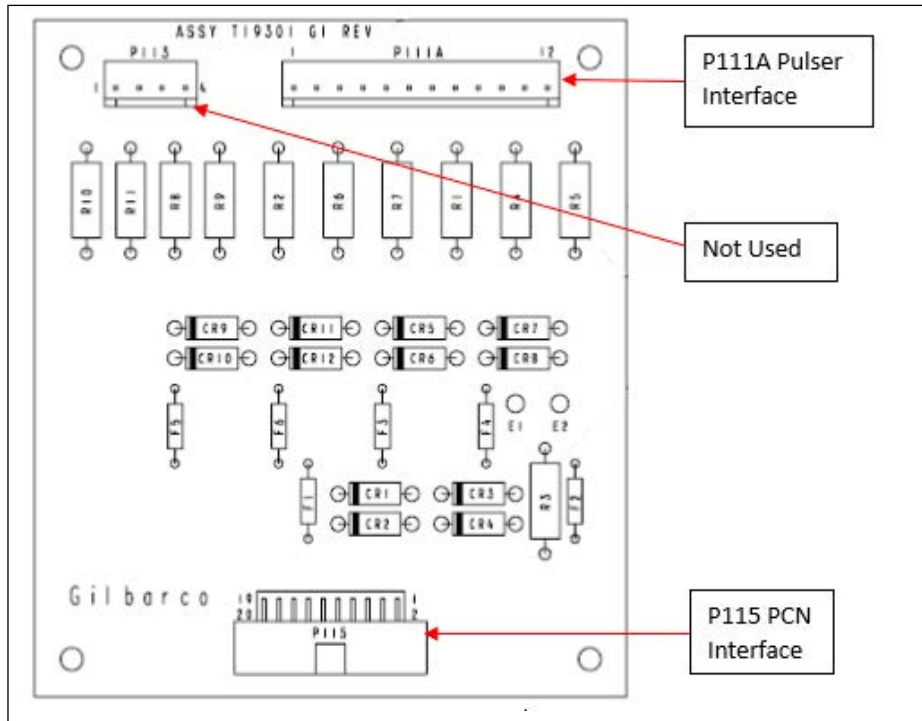
Figure 5-25: CAT-5 Adapter PCA (M20276A001)



I.S. Barrier PCA (T19301-G1)

The I.S. Barrier PCA is used to supply intrinsically safe power to and receive data from the pulsers on an AtlasX Ultra-Hi dispenser. This board and connections to it must be enclosed in a metal enclosure as part of the intrinsically safe requirement.

Figure 5-26: I.S. Barrier PCA (T19301-G1)



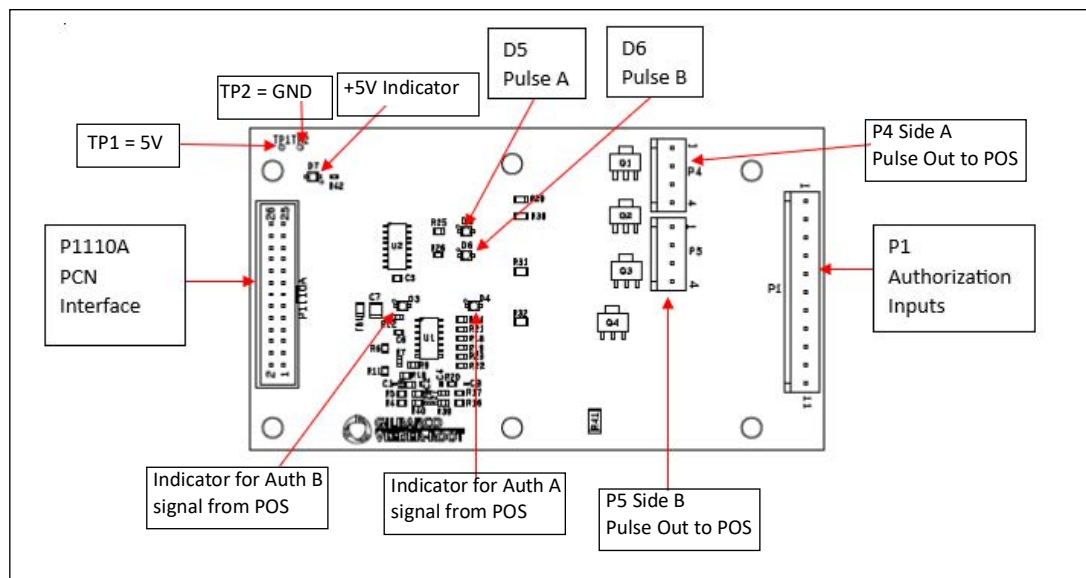
Board Connections and Cables

Connector#	Through Cable	To PCA	At Connector#
P111A	M02337A001	K93809 Pulsar assembly	J27A and/or J27B
P115	M02279A002	M18666A001 Pump Control Node 4+ PCA	JPH
P113		Not Used	

Pulse Out PCA (M19206A001)

The Pulse Out PCA is used to give the pump/dispenser the ability to emulate a mechanical register unit. This board accepts a 115 or 230 VAC input that is required to authorize a transaction while the unit is in Pulse Out mode. This board also supplies a DC pulse output that indicates the quantity of product dispensed. The DC pulse output must run in a separate conduit away from AC power control lines. The DC pulse output is supplied with dual isolated outputs for each hose. D5 and D6 show the state of the pulse out signal. Each blink indicates a pulse. In pump idle state, D5 and D6 may be on (solid) or off. The only crucial thing is to ensure that D5 blinks during side A’s transaction and D6 blinks during side B’s transaction. The output ratio can be selected via a configuration setting in the software (see CC 19, FC 2). The available output ratios for gallons are 1:1, 10:1, 100:1, 250:1, and 500:1. The available output ratios for liters are 1:1, 10:1, and 100:1. If error code 6047, the pulse out board is detected but not set (see “CC19: Set AtlasX Related Options” on page 4-12).

Figure 5-27: Pulse Out PCA (M19206A001)



Board Connections and Cables

Connector#	Through Cable	To PCA	At Connector#
P1	M19406A001	M04850A012 Main AC Conduit	J400
P1110A	M00549A001	M18666A001 Pump Control Node 4+ PCA	P1110
P4	M05189A0011	Pulse out connections Side A	J-box
P5	M05189A0011	Pulse out connections Side B	J-box

Status LEDs and Function

LED	Name	Status Indication
D3	AUTH B	Lit when authorization input for side B has been applied.
D4	AUTH A	Lit when authorization input for side A has been applied.
D5	PULSE A	Blinking when pulses are being generated for Side A deliver.
D6	PULSE B	Blinking when pulses are being generated for Side B deliver.
D7	+5V	Lit when +5 VDC is present at the board.

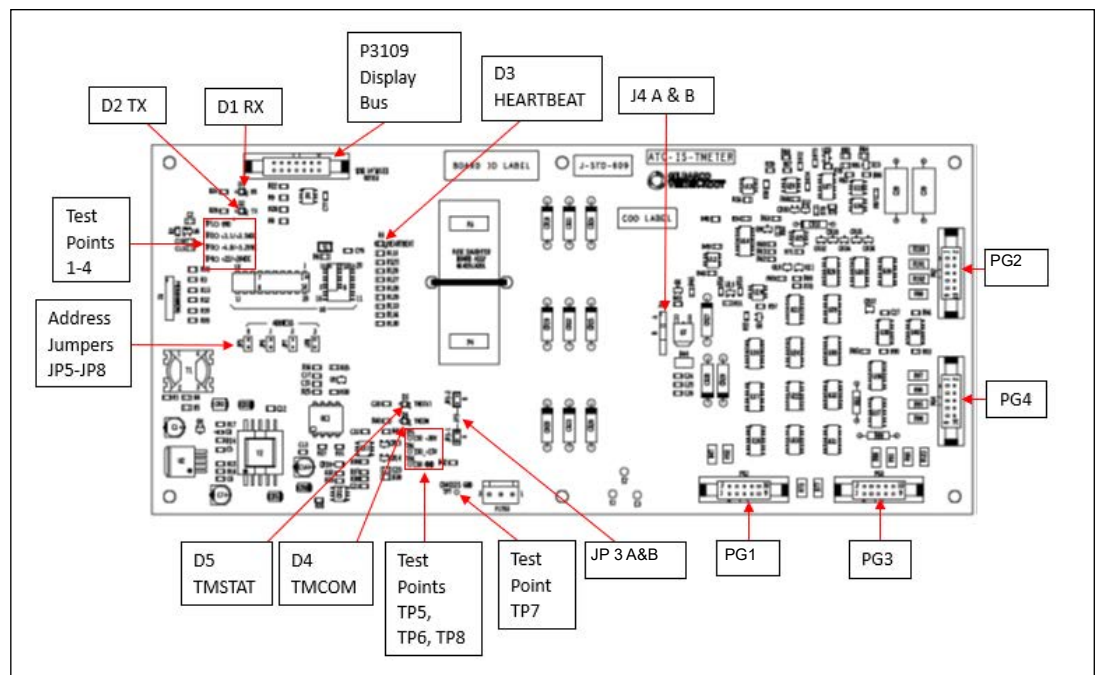
Test Points

Test Point	Range	Where used
TP1	4.75 to 5.25 VDC	Logic Voltage
TP2	DC Ground	Ground for DC Voltages

ATC-I.S. Barrier-TMeter PCA (M18983A001)

The ATC-I.S. Barrier-TMeter PCA is used to interface fuel temperature probes to the PCN. This board receives data input from the probes via the intrinsically safe connection. The probe data is then analyzed, and the measured fuel temperature calculated from the data is sent to the PCN via the display bus. This board and probe connections to it must be enclosed in a metal enclosure as part of the intrinsically safe requirement.

Figure 5-28: ATC-I.S. Barrier-TMeter PCA (M18983A001)



Board Connections and Cables

Connector#	Through Cable	To PCA	At Connector#
P3109	M18923A004	M18666A001 Pump Control Node 4+ PCA	P2109 or P2110
PG1 thru PG4	M14203A002	Q13131-02 RTD Probe Assembly	PTP1 thru PTP4

Status LEDs and Function

LED	Name	Status Indication
D1	RX	Blinking when receiving data from PCN on the display bus
D2	TX	Blinking when transmitting data to PCN on the display bus
D3	HEARTBEAT	Flashes steadily at rate of "on" one half second, "off" one half second during normal operation. Flashing begins a few seconds after power-up. Indicates ATC CPU is operating.
D4	TMCOM	Blinking when receiving temperature data. If this is not blinking insure JP3A, JP3B, JP4A, and JP4B are installed.
D5	TMSTAT	Lit when probes are connected. On indicates that power is available for the right side of the board.

Test Points

Test Point	Range	Where used
TP1	DC Ground	Ground for DC Voltages
TP2	3.1 to 3.5 VDC	Logic Voltage
TP3	4.8 to 5.2 VDC	Input Voltage from the display bus
TP4	22 to 26 VDC	Input Voltage from the display bus
TP5	29.5 to 30.5 VDC	Isolated Supply Voltage
TP6	14.6 to 15.3 VDC	Isolated Supply Voltage
TP7	Chassis Ground	Chassis Ground
TP8	ISO DC Ground	Ground for DC Voltages 30 and 15

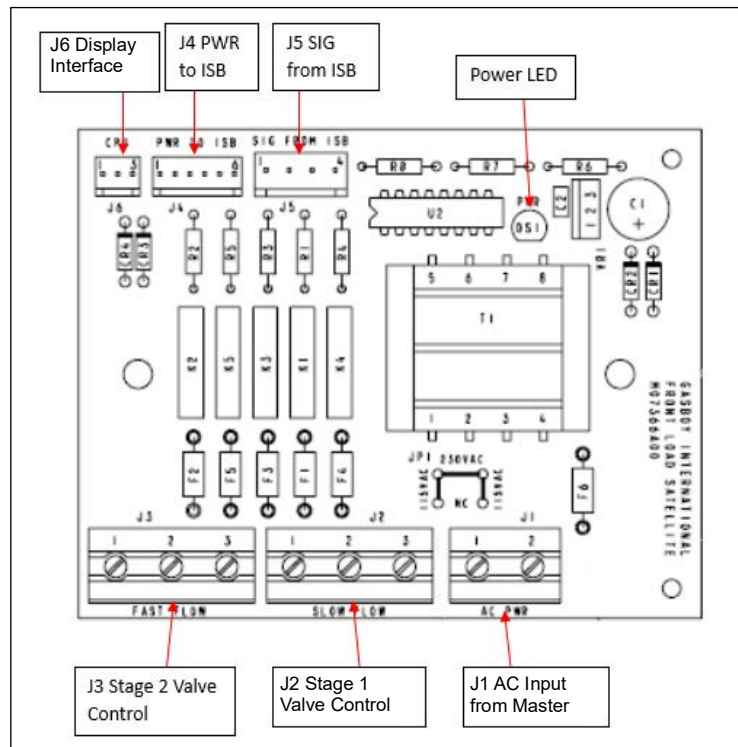
Address Setting

JP5 (ADDR0)	JP6 (ADDR1)	JP7 (ADDR2)	JP8 (ADDR3)
Closed (in)	Open (out)	Closed (in)	Closed (in)

Front Load Satellite Control PCA (M07366A001)

The Front Load Satellite Control PCA is used to interface the satellite pump handle input and valve control in a satellite dispenser or combo unit (TW3). This board receives input from the master dispenser and pump handle I.S. Barrier. It controls the valve in the satellite and depending on wiring, also controls the valve in the master.

Figure 5-29: Front Load Satellite Control PCA (M07366A001)



Board Connections and Cables

Connector#	Through Cable	To PCA	At Connector#
J1	Field Wiring	M08223A001 Ultra-Hi Interface PCA	P309
J2	Field Wiring	Satellite valve stage 1 and/or M02370A001 Transformer Satellite Assembly	J-box or P404
J3	Field Wiring	Satellite valve stage 2	J-box
J4		M19409A001 I.S. Barrier 9800 Fr. Ld.	J9/P4
J5		M19409A001 I.S. Barrier 9800 Fr. Ld.	J4/P5
J6	M07424A003	M17206A001 Combi Display PCA, Side A	P6414

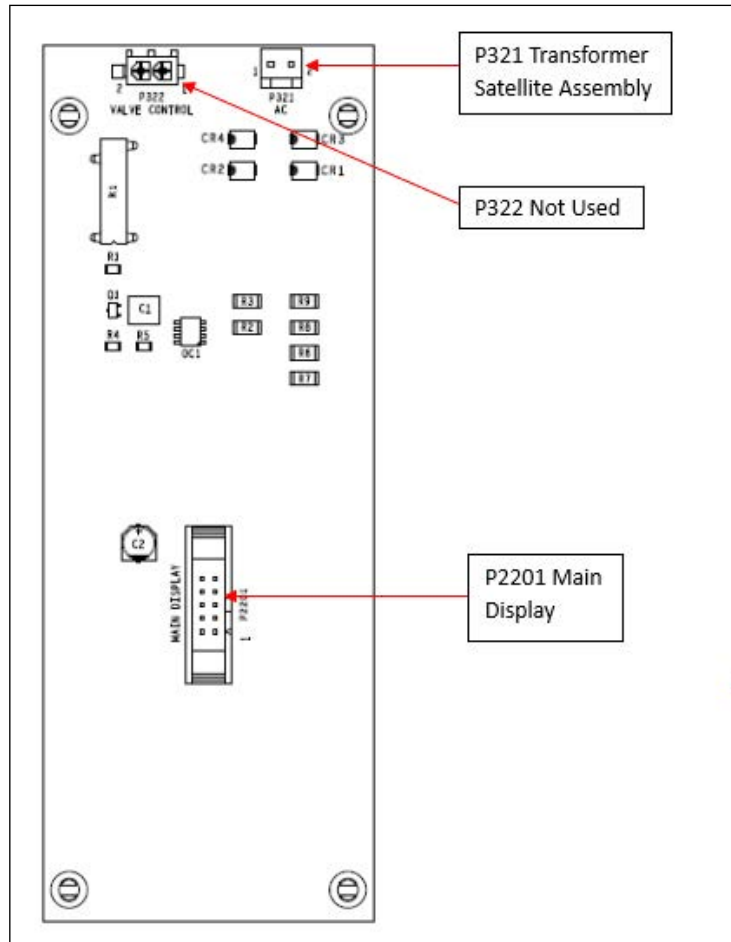
Status LEDs and Function

LED	Name	Status Indication
DS1	PWR	Lit when AC power is received from the master

E700 Satellite Indicator PCA (M19060A001)

The E700 Satellite Indicator PCA is used to indicate satellite status. This board receives input from the satellite via the Transformer Satellite Assembly to the Front Load Satellite Control PCA. When the satellite is active, the LEDs will be lit.

Figure 5-30: E700 Satellite Indicator PCA (M19060A001)



Board Connections and Cables

Connector#	Through Cable	To PCA	At Connector#
P321	M02371A001	M02370A001 Transformer Satellite Assembly	PSEC
P2201	M10699A008	M17206A001 Combi Display PCA	P6402

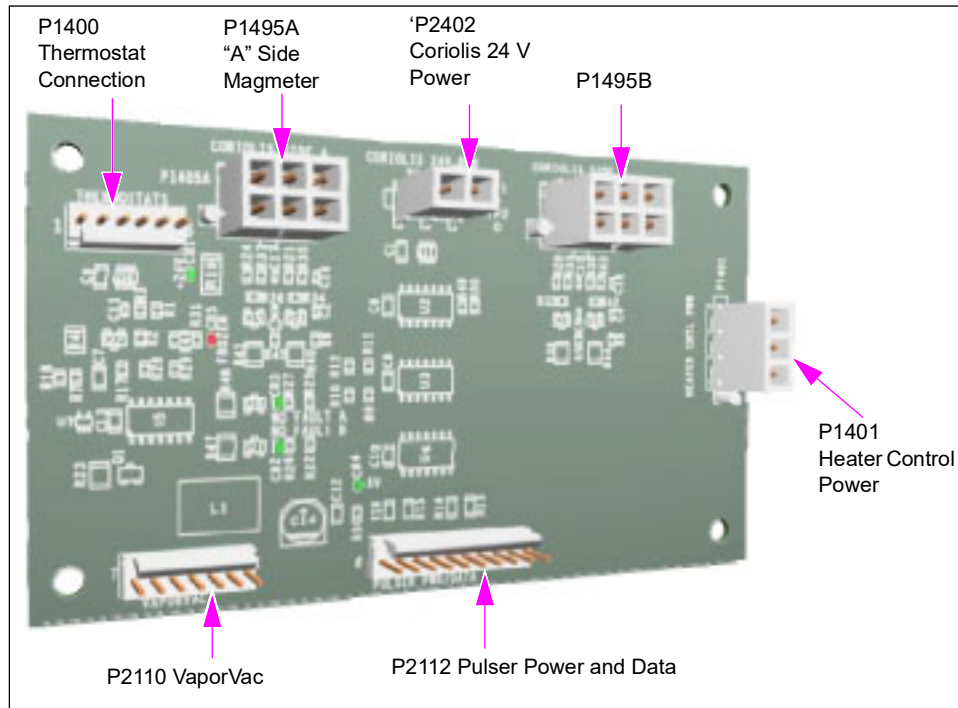
Status LEDs and Function

LED	Name	Status Indication
D1 - D8	-	Lit when AC power is received from the satellite

Coriolis Meter Interface Board (M10030A001)

The Coriolis Meter Interface Board interfaces the Magmeter and Pump PCN, as well as to the Frozen Sensor. The meter receives a 24 V input from the 24 V power supply and supplies 5 VDC logic power to the Temperature Control Board. The interface board can handle up to two Meter inputs. However, only Side A is used on an AtlasX dispenser.

Figure 5-31: Coriolis Meter Interface Board

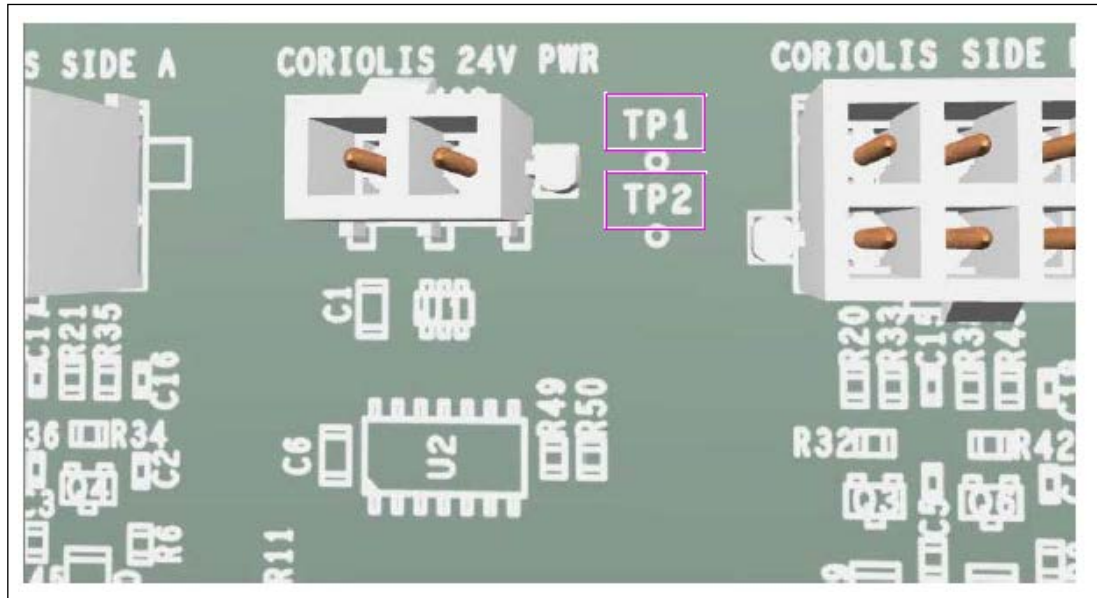


The Magmeter contains electronics within the meter that monitor the function of the meter and create pulses in proportion to the volume of flow through the meter. A Coriolis Interface Board provides power to the meter as well as accepts pulses and diagnostic data from the meter that are processed and directed to the standard PCN. Additional functions of the Meter Interface Board are to provide power to the Heater Control Board and to accept input from the Pump Frozen Sensor.

Service Tips

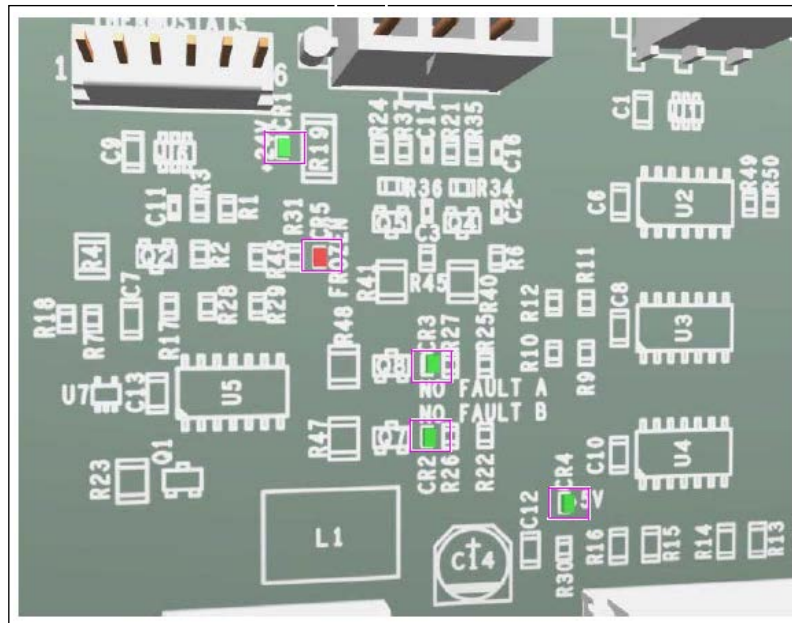
- TP1 and TP2 on the board can be used to verify if the 24 VDC power input is correct (see [Figure 5-32](#)).

Figure 5-32: TP1 and TP2 on Coriolis Meter Interface Board



- Although the board supplies logic power to the Temperature Control Board, it does not monitor board's performance or state. If the Temperature Control Board is inoperative, check the Coriolis Meter Interface Board and cables between the boards for transference of 5 VDC.
- Pulser-related error codes could be caused by this board in addition to the cables to and from the board, as well as the Magmeter or occasionally the PCN.
- Side A and Side B Coriolis Meter inputs have the same jack, so ensure that you connect the correct meter to the jack on the board. AtlasX dispensers use Side A only.
- Several diagnostic LEDs exist on the board. They provide valuable troubleshooting information. Check the LEDs first before replacing a board as the fault may not be with the board.

Figure 5-33: Diagnostic LEDs on Coriolis Meter Interface Board

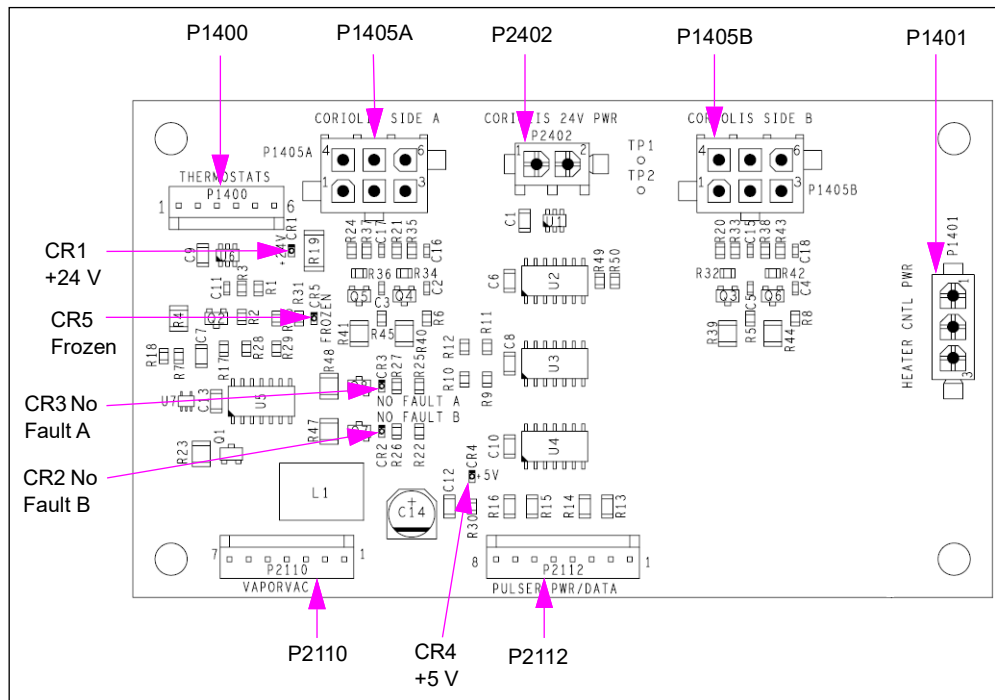


The functions of Coriolis Interface PCA are as follows:

- Provides +24 VDC power to the Magmeter.
- Provides +5 VDC power to the Temperature Control PCA (M14100A001).
- Provides an interface to the Pump Frozen Sensor and sends signals to the PCN, if the unit is frozen.
- Provides Magmeter Pulser data to the PCN.
- Provides the following diagnostic data:
 - If CR1 LED is On, it indicates that +24 VDC power supply is enabled.
 - If CR2 LED is On, it indicates that the Magmeter for Side B is enabled (not used on AtlasX units).
 - If CR3 LED is On, it indicates that the Magmeter for Side A is enabled.
 - If CR4 LED is On, it indicates that +5 VDC power supply is enabled.
 - If CR5 LED is On, it indicates that the pump is frozen.

Figure 5-34 shows Coriolis Interface Board (M10030A001).

Figure 5-34: Coriolis Interface Board [M10030A001 (AtlasX DEF Only)]



PCA Connections and Cables (Cold Weather DEF)

Connector #	Through Cable	To Assembly	At Connector #
P1400 (6)	M04114A015	Temperature Sensor (Frozen) (M10131A008)	PTRMF (3)
P1401 (3)	M04114A015	E2 Temperature Control Board (M14100A001)	P1301A (10)
P1405A (6)	M04114A015	DEF Magmeter (M16502B001)	J1501A/B (6)
P1405B (6)	Not used		
P2110 (7)	M10059A006	M18666A001 Pump Control Node 4+ PCA	P1110 (26)
P2112 (8)	M10060A004	M18666A001 Pump Control Node 4+ PCA	P1112 (8)
P2402 (2)	M07141A002 to M05547A007	M07121A004 Power Distribution	P1402 (3)

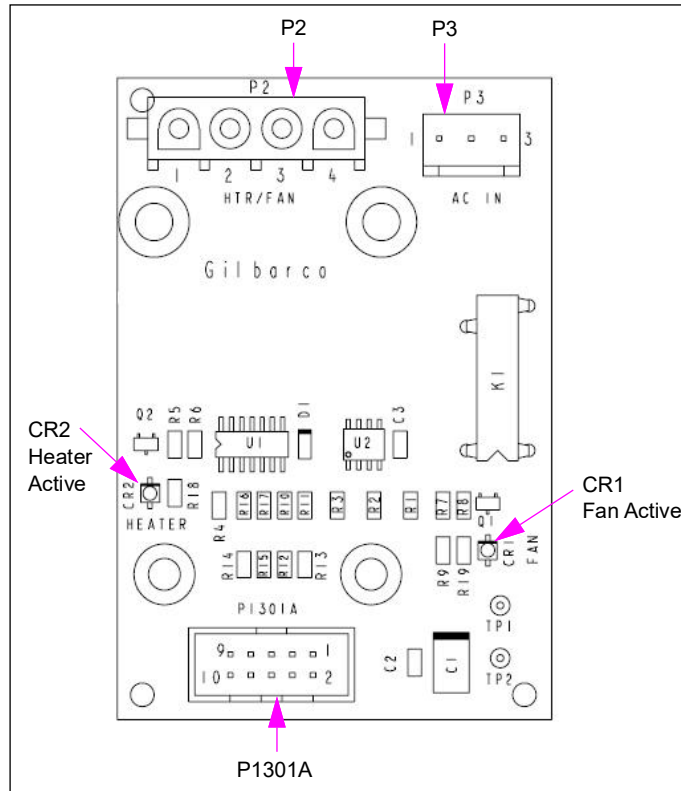
PCA Connections and Cables (Warm Weather DEF)

Connector #	Through Cable	To Assembly	At Connector #
P1400 (6)	Jumper	Pins 5 and 6	
P1401 (3)	Not used		
P1405A (6)	M04114A008	DEF Magmeter (M16502B001)	J1501A/B (6)
P1405B (6)	Not used		
P2110 (7)	M10059A006	M18666A001 Pump Control Node 4+ PCA	P1110 (26)
P2112 (8)	M10060A004	M18666A001 Pump Control Node 4+ PCA	P1112 (8)
P2402 (2)	M07141A002 to M05547A007	M07121A004 Power Distribution	P1402 (3)

E2 Temperature Control Board [M14100A001 (AtlasX Cold Weather DEF Only)]

Figure 5-35 shows E2 Temperature Control Board (M14100A001).

Figure 5-35: E2 Temperature Control Board (M14100A001)



Functions of Temperature control PCA are as follows:

- Provides 120 VAC to fan and heater.
- Monitors the heater sensor and cabinet temperature to control heater and fan.
- Provides the following diagnostic data.
 - If CR1 LED is on, it indicates that the fan is ON.
 - If CR2 LED is on, it indicates that the heater is ON.

Heater (DEF Only)

DEF Heating System (Cold Weather DEF Units Only)

The Temperature Control Board (M14100A001) receives logic voltage from the Coriolis Interface Board and 120 VAC power supply for the heater and fan from heater feed line voltage. A Heater Sensor is located within the DEF cabinet. It monitors the temperature of the cabinet and is connected to the Temperature Control Board. There is also a second sensor on the Temperature Control Board and it must be below 100° F (38° C). Within the approximate range of 40 °F (4 °C) to 45 °F (7 °C) or lower, the Temperature Control Board activates the fan and heater to maintain the temperature within the cabinet. The heater circuit will activate and deactivate depending on the temperature within the cabinet. The sensor, heater, and fan are located within the DEF cabinet. The Temperature Control Board is located within the electronic cabinet.

When the DEF freezes, it can cause extensive damage to hydraulic components, hence the DEF hydraulics cabinet is heated. The Service Technicians must be aware of the following important information regarding DEF freezing:

- The heater is turned on when the sensor detects a temperature of approximately 43 °F (6 °C) in the cabinet. It will commonly cycle on and off and may not run at all times during cold weather. To test the system, verify that the temperature of the Temperature Control Board is less than 100° F (38° C). With the power on, unplug the cabinet Heater Sensor. The two LEDs (CR1 and CR2) on the Temperature Control Board should light, and the fan and heater should also turn on. Plug the Heater Sensor back in and the LEDs should turn off [unless the temperature of the sensor is less than 43° F (6° C)]. Electronic circuit coolant spray can be used on the cabinet heater sensor (not the frozen sensor which is attached to the piping) to test the sensor operation. The LEDs on the Temperature Control Board should light when the temperature of the sensor drops below 43° F (6° C).
- Damage incurred due to freezing of components when there is power loss in cold weather is not covered under warranty. If power to the dispenser is lost during cold weather and temperature is below 20 °F (-6 °C) or if there are possibilities to drop below 20 °F (-6 °C), then the customer must call an ASC immediately to the site to drain fluid from the following components to avoid serious damage to the components:
 - Meter
 - Breakaway and Hose
 - Nozzle
 - Check Valve
 - Dispenser Filter

Similar service may be required for any tank vault and intermediate plumbing components, as required by the tank system manufacturer. ASCs must respond very quickly to such customer requests.

- If the unit freezes, it will be required to thaw all components and repair the damage that may have occurred. Units can be thawed using a non-flame heating device for areas where no boards or electronic connections are present. DEF is non-flammable or explosive. However, before using electrical heating devices, ensure that such devices or their power cords are not in the hazardous vicinity near diesel, gasoline, or other fueling equipment containing hazardous vapors or liquids. To determine any hazardous zone involved, monitor the equipment closely for leaks when the lines are pressurized, refer to *MDE-5692 AtlasX Fuel Systems Installation Manual*.
- Meter damage during a freeze may occur and can only be detected by performing calibration checks. For additional information, refer to “DEF Magmeter” on [page 6-38](#).

The insulated cabinet is critical for the proper performance of the heating system. Never remove the insulation from any area or damage it during service. Such removal can cause the system to freeze. If insulation drops or is disturbed from its original area, reglue using a quick curing outdoor compatible adhesive.

PCA Connections and Cables (Cold Weather DEF)

Connector #	Through Cable	To Assembly	At Connector #
P2 (4)	M12261A002 to M07233A009	Heater/Fan Assembly (Q13254-05)	J2 (4)
	M12261A002	AC Power Input	AC J-box (3)
P1301A (6)	M04114A015	Coriolis Interface (M10030A001)	J1401 (3)
		Temperature Sensor (M10131A006)	PTRMH (3)

This assembly mounts directly to a Solid-state Relay (Q11008-02).

Electronic/Mechanical Registers and Electro-Mechanical Totalizers

About Displays

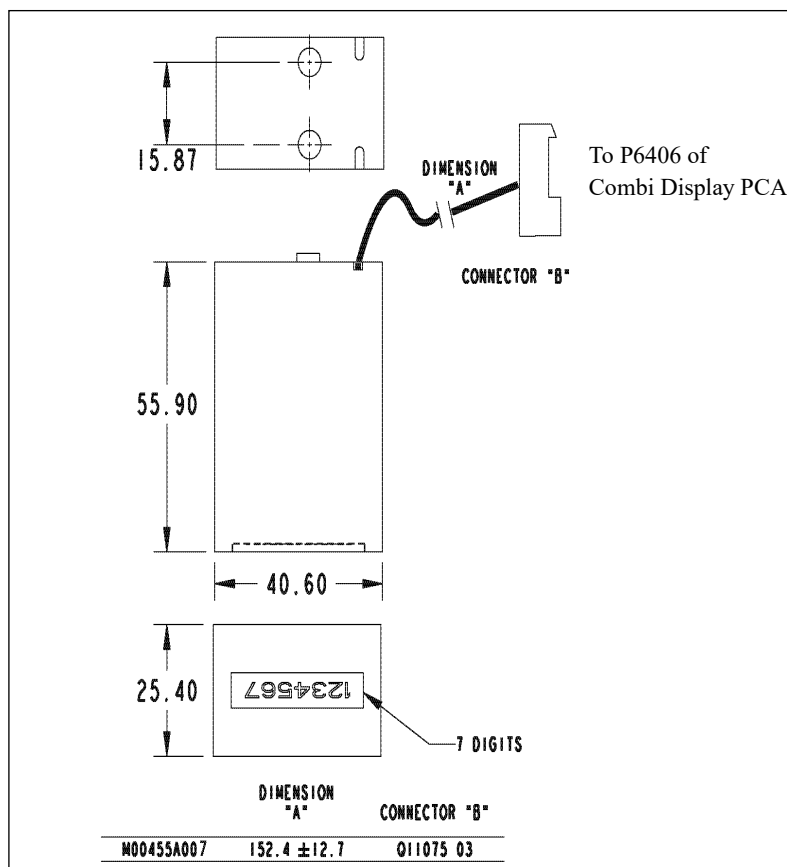
Depending on the configuration, AtlasX units may have electronic or mechanical registers or totalizers. Totalizers provide a cumulative total similar to the odometer reading on a vehicle. The display provides the customer with information about the total cost and total volume of the fuel dispensed. PPU displays the PPU information to the customer.

Electro-Mechanical Totalizer

An electro-mechanical totalizer is used for Electronic units. This replaces the cable-driven accumulative totalizer for Electronic units. This totalizer is driven off the Combi Display Boards on the 8800/9800 series.

Figure 5-36 shows details of the Electro-mechanical Totalizer (M00455A007). In the electronic layout of AtlasX pumps, there are two electronic totalizers, one each for Side A and Side B. The totalizers are connected to P6406 connector on the Combi Display PCA, one on side A and one on side B.

Figure 5-36: Electro-mechanical Totalizer [M00455A007]



Service Tips

- Totalizers can be set to operate per side only in AtlasX.
- Programming of CC91, FC11 is required to set the functionality.
- Certain problems can be indicated by error codes.

Figure 5-37: Main V-R Computer Register

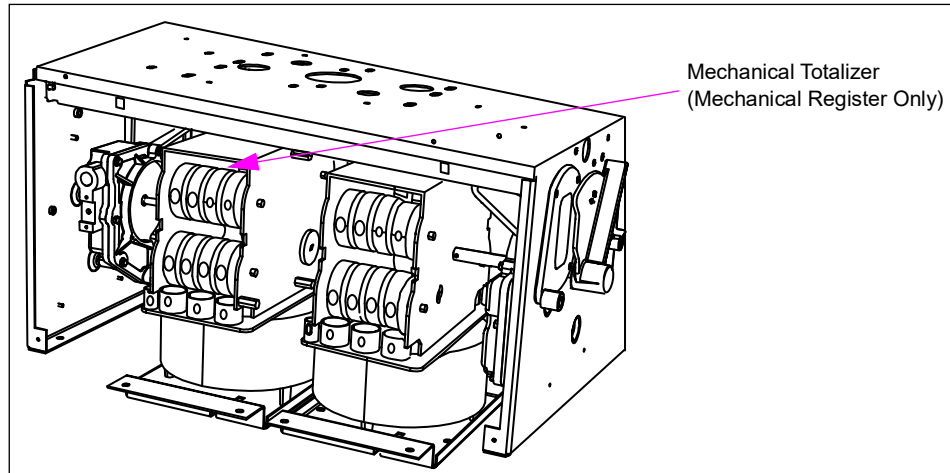
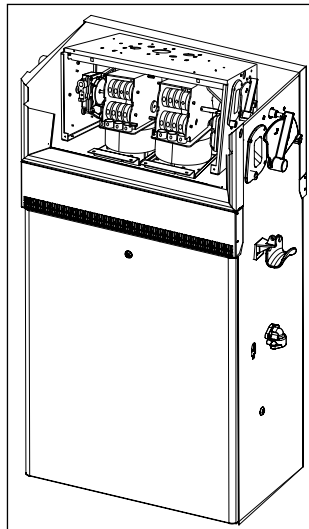


Figure 5-38 shows the main V-R Computer of the Mechanical Register unit located in the side-mounted AtlasX unit.

Figure 5-38: Main V-R Computer



Pulsers

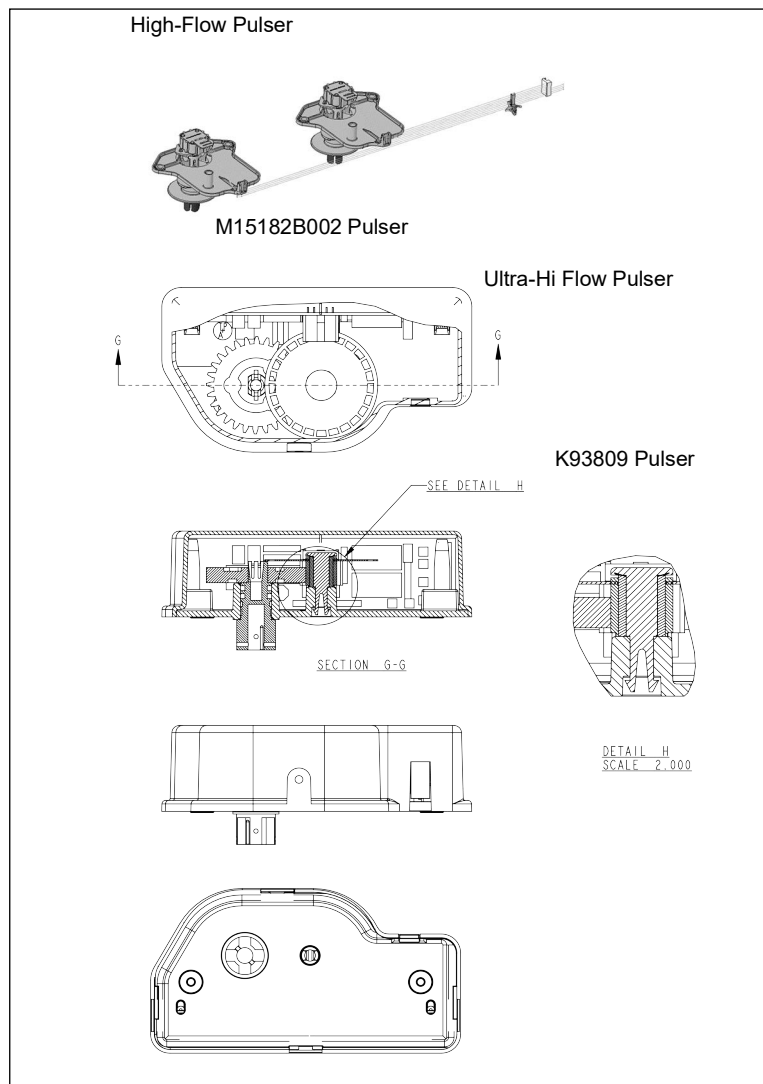
Read and follow all safety precautions in “[Read This First](#)” on [page 1-1](#). Warnings and cautions appear throughout this section and must be regarded with utmost vigilance. Follow OSHA lockout/tagout procedures.

For DEF units, the pulser is part of the DEF Magmeter. Refer to “[DEF Magmeter](#)” on [page 6-38](#).

About Pulsers

A pulser converts meter rotations to Pulse Per Gallon (PPG) (or liter) for use in some units by way of the controller board or mechanical gear/reed switch system. Program the unit to scale pulses for specific applications. For example, standard gallonage units use 1000 pulses per gallon. For other conversion factors, refer to “[Pump Programming](#)” on [page 4-1](#).

Figure 5-39: Pulser Assemblies

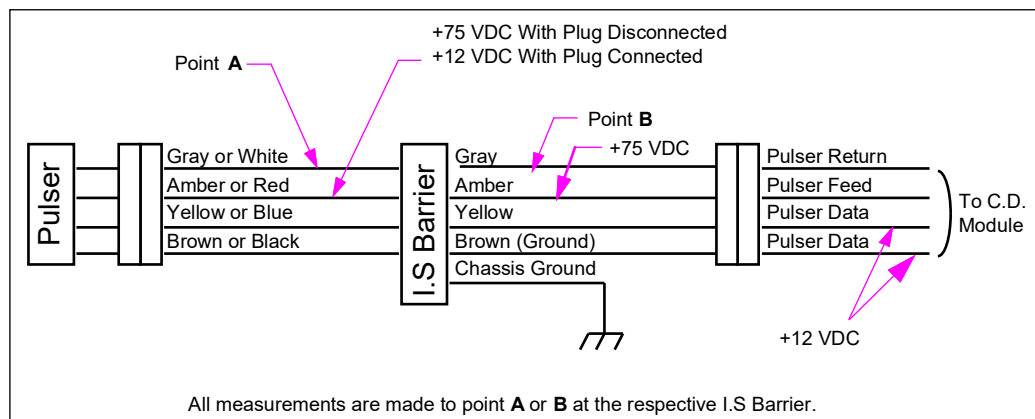


Testing Pulsers and I.S. Barriers (Ultra-Hi Units Only)

Voltage is limited to 12 VDC in the pulser. An I.S. Barrier is used to limit the current. Test the pulser by substitution and proceed as follows:

- 1 Unplug the pulser and plug in a known, good pulser.
- 2 Rotate the pulser and watch displays for the count.
- 3 Test the I.S. barrier by substitution, or disconnect it and check the I.S Barrier with an Ohmmeter.
- 4 Measure 10,000 Ohms + or - 20% from gray to gray, yellow to yellow, brown to brown, and amber to amber.
- 5 Always read a low resistance from the green wire to the case.
- 6 Measure between each wire. Meter must indicate an open.

Figure 5-40: Pulser and I.S Barrier Test Points



Pulser Drive Assembly

This section explains about the pulser drive assembly.

Special Note for Canadian Installations

An O-ring is used on the shaft in Canadian installations. If squealing is noted, lubricate the O-ring with silicone grease. When replacing a meter, align the lower drive collar to the meter shaft to reduce the potential for binding.

Service Tips

- Event Logs can be used to identify a specific pulser during troubleshooting pulser errors such as 20, 5047, 5049, and 5050. Pulser locations are designated by ePulserX.

To determine the location of the pulser, refer to the following table:

Pulser Name	Side of Unit	Product Pulser
ePulser1	1	1
ePulser5	2	1

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6 – Hydraulic/Mechanical Components

Introduction

Purpose

This section provides information regarding hydraulic systems and fuel handling mechanical components contained within Gasboy AtlasX units. It includes specific safety information, typical testing procedures, information on related components and common service procedures.

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to GOLD.

This section was last updated in December 2024.

Topics in This Section

Topic	Page
Introduction	6-1
Hydraulic and Mechanical Highlights	6-2
General Service Procedures	6-6
Purging Air from System	6-10
Measuring Flow Rate	6-14
Measuring Pressure and Vacuum	6-15
Meter Calibration	6-24
Electronic Calibration Steps	6-27
Meters	6-30
Filters and Strainers	6-39
Hanging Hardware	6-43
Pumping Unit	6-54
Pump Motor	6-62
Valves	6-73
Vapor Recovery Stage 2 Balance Type	6-73
Mechanical Computers	6-74
DEF Nozzle	6-75

How to Use This Section

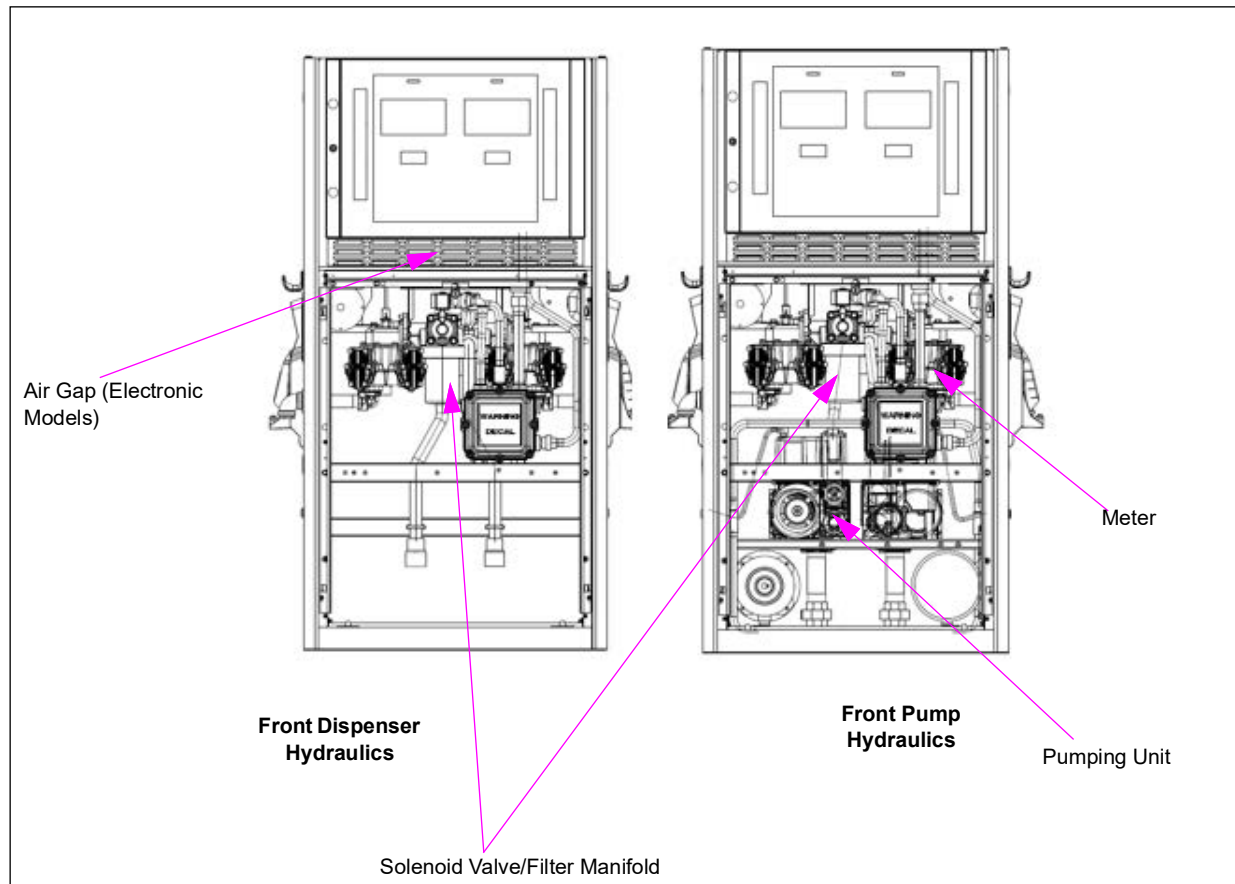
For the list of topics contained in this section and their respective locations, refer to “[Topics in This Section](#)”. Use this list to obtain information regarding specific components.

Hydraulic and Mechanical Highlights

Gasboy AtlasX parts with major changes in structure and appearance have the following new hydraulic features. These features will be shared, where required, by Mechanical or Electronic and Commercial or Retail units:

- CFT meter
- A new manifold and valve assembly
- A new pumping unit

Figure 6-1: Pump and Dispenser Hydraulics-Standard Models



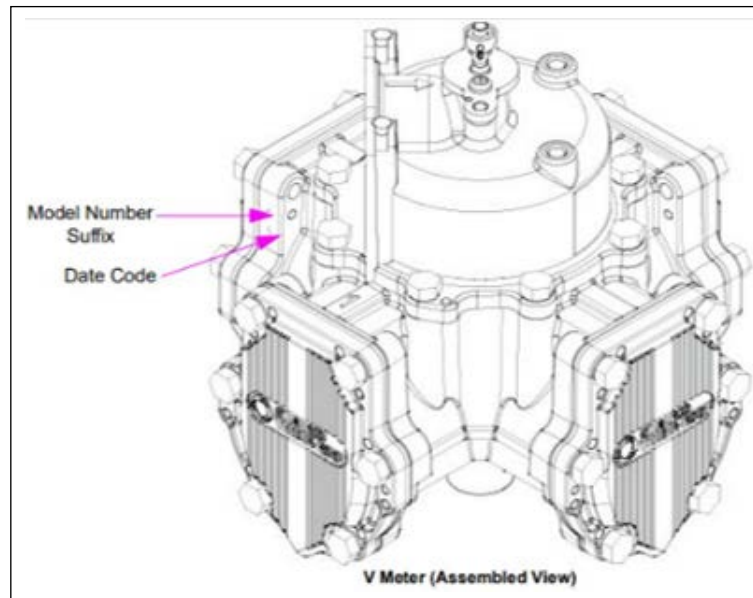
2-Stage Solenoid Valve

The Gasboy AtlasX Pump has a standardized 1-inch 2-stage solenoid valve. If the valve hydraulics require service, the service technician can remove the diaphragm without removing the coil or conduit connections. The valve and filter adapter are built into the manifold.

Meter Assembly

The four-piston positive displacement flow through the CFT Meter increases resistance to fuel contamination with a top inlet, bottom outlet, and self-cleaning central chamber. For information on Magmeter, refer to “DEF Magmeter” on page 6-38.

Figure 6-2: V Meter



Item #	Description	Current Part	Previous Part	Quantity
1	V Meter Assembly	T19976-V10	-	(see Note 1)
	• Meter Piston Cup Kit	K96659-01	-	(see Note 3)
	• Master Seal Service Kit	M08182K001		(see Note 2)

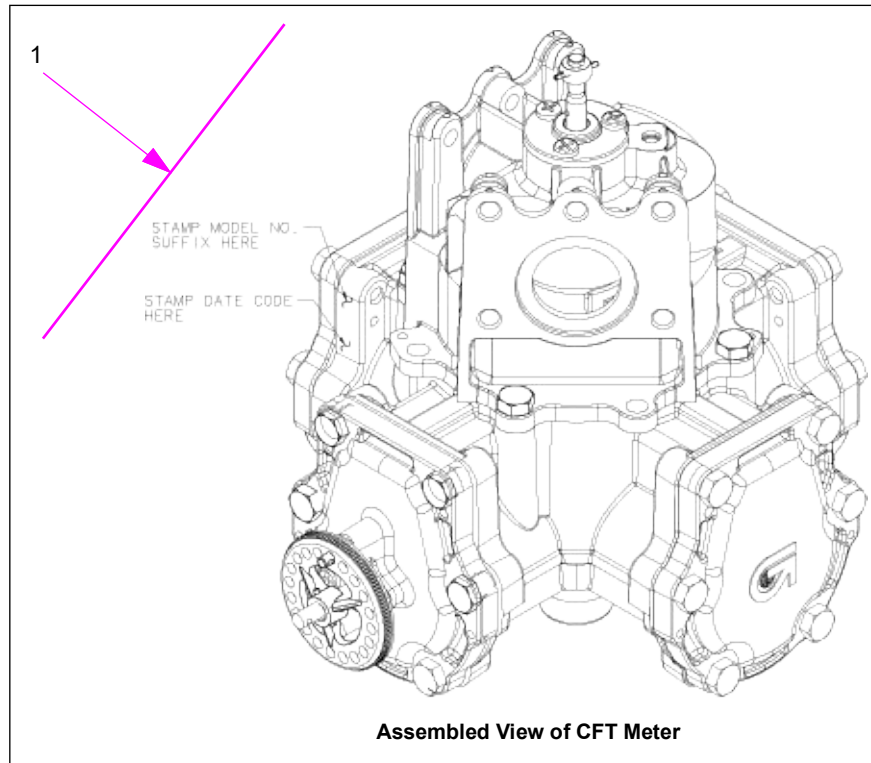
Notes:

1. V Meter is ordered only as an assembly.
2. MDE-3892 Meter Master Seal Service Kits (M08182K001) Installation Instructions provide information on how to install the Meter Master Seal Service Kit. The kit provides materials and instructions for the complete change-out of all seals as a major rebuild.
3. Meter Piston Cup Kit (K96659-01) contains 35 piece formed piston cups (N21252).

CFT Meter

The four-piston positive displacement flow through the CFT Meter increases resistance to fuel contamination with a top inlet, bottom outlet, and self-cleaning central chamber. For information on Magmeter, refer to “DEF Magmeter” on page 6-38.

Figure 6-3: CFT Meter



Item #	Description	Current Part	Previous Part	Quantity
1	CFT Meter Assembly - Mechanical Computer Models, Gallons (<i>Spare Parts item</i>)	T20150-G6	-	(see Note 1)
	CFT Meter Assembly - Mechanical Computer Models, Liters (<i>Spare Parts item</i>)	T20150-G7	-	(see Note 1)
	Master Seal Service Kit	M08182K001		(see Note 2)

Notes:

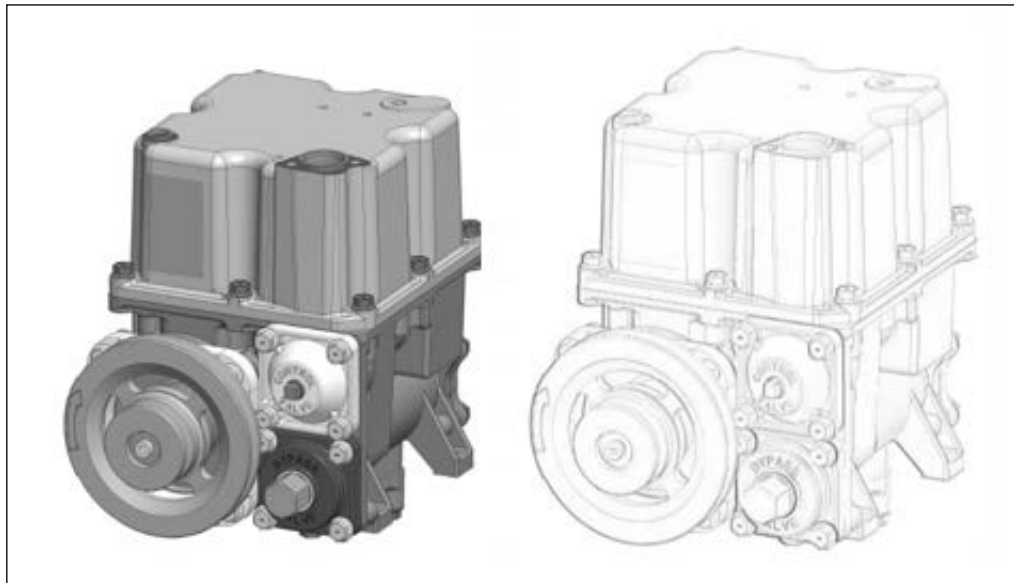
1. CFT Meter is ordered only as an assembly.
2. MDE-3892 C+ Meter Master Seal Service Kit Installation provides information on how to install the Meter Master Seal Service Kit (M08182K001). The kit provides materials and instructions for the complete change-out of all seals as a major rebuild.

Pumping Unit

GPU+ M09593A102 (2024 Onwards)

AtlasX utilizes GPU+ pumping unit, an internal gear pump with a robust design that no longer requires vane service over life of unit. Units have built in air elimination, pressure relief, and strainer. The kits are available with internal inlet check valve. For more information, refer to *MDE-5662 Gear GPU+ Operation and Service Manual*.

Figure 6-4: Typical Pumping Unit



Item #	Description	Current Part	Previous Part	Quantity
1	Global Pumping Unit	M09593A102	-	1 per Grade

Air Gap (Electronic Units Only)

The air gap for Gasboy AtlasX units is located between the hydraulics and electronics of the unit. This air gap removes fumes before getting into the electronics and lowers the classification of the electronic platform area (see [Figure 6-1](#) on [page 6-2](#)).

Performance Concerns with M09593A102 Pumping Units

In cases of extreme inlet conditions or excessive power runs, pumping performance may be too loud or power drawn may be too high. The following parts can be ordered to improve either or both:

- 60 Hz power - Motor Pulley R18900-30 and use existing belt R06711-39
- 50 Hz power - Motor Pulley R18900-34 and belt R06711-39

General Service Procedures

Read and follow all safety precautions in “[Read This First](#)” on [page 1-1](#). Warnings and cautions appear throughout this section and must be regarded with utmost vigilance. Follow OSHA lockout/tagout procedures.



Working on Hydraulic Components

Gasboy AtlasX dispensers receive pressurized fuel from an STP while pumps generate pressure using a self-contained pumping unit. The potential hazard of fluid spray or leak exists when working on the hydraulic system. Ensure that proper service procedures and safety precautions are followed. For additional information, refer to “[Servicing Hydraulic Components](#)” on [page 6-7](#).



⚠ WARNING

Read all safety information and wear all the required safety equipment.



This is a potentially dangerous environment of high voltage and flammable fuel-vapors. Fuel-vapors may ignite. Fire, explosion, or electrical shock can result in severe injury or death, if safety procedures are not strictly followed.


No cigarettes or open flames must be allowed near pumps or dispensers.



Ground the nozzle and prover Can to prevent static discharge. Do not place prover Cans on ungrounded surfaces such as plastic truck liners.


Static electricity may be present before or while dispensing the fuel. A spark between the container and nozzle may occur. Fire or explosion may result, causing serious injury or death.

Always wear proper eye protection while servicing the hydraulic system. Take appropriate steps to contain any spraying or draining fuel. The residual pressure present may result in fuel spray in the unit. Release pressure through the nozzle.

Do not attempt to use the Manager Keypad with the electronics cabinet open in any situation where power has been applied and fuel vapors are present or potentially present.

When you calibrate AtlasX series units, run the keypad cable over the door and close the door. This allows the keypad to be suspended on the unit and can be accessed from outside for all procedures done with power applied or possibility of fuel or fuel vapor presence.

Always clear area of debris or spills.

Servicing Hydraulic Components

To service the hydraulic components, proceed as follows:

Before Beginning

Before beginning the service, proceed as follows:

- 1 Ensure that the unit is not pressurized with fuel. For dispensers, close and test shear valves. Refer to [“Shear Valves”](#) on [page 6-71](#).
- 2 Isolate the unit at the interface box (2-wire communication units only).
- 3 Shut off power to the unit. If the unit is a dispenser, shut off power from the involved STPs. Use the OSHA lockout/tagout procedures at the station’s STP and dispenser breakers.
- 4 Open the nozzle into an approved container to bleed of the pressure. Some residual pressure may remain.

CAUTION

Wear eye protection for hydraulic service, where fluid lines or containing parts are serviced.

- 5 Record the totals before you continue with the service procedures.
- 6 Continue with the required service procedures.

After Repairing

After repair, proceed as follows:

- 1 In the interface box, place the unit in normal operation. Power-up the unit.
- 2 Purge air and check for leaks after replacements or rebuilds. Refer to [“Purging Air from System”](#) on [page 6-10](#).
- 3 Verify if the unit is operating properly.
- 4 Record the totals after the service and provide the totals (before and after) to the station, if fuel was dispensed.

Servicing Seals, O-rings, and Gaskets

When opening or disassembling hydraulic components that have been in service for more than two years, replace all of the disturbed seals. Failure to replace the degenerated or old seals could result in leaks.

Note: Universal Seal Kit (M05559K001) contains proportional quantities of material types commonly replaced during service. Use of this kit is recommended.

To service seals, O-rings, and gaskets, proceed as follows:

- 1 Inspect the seals for excessive swelling, hardening, softening, and other degradation.
- 2 Clean and inspect sealing surfaces before replacing or installing seals, O-rings, or gaskets.
Note: Always use AtlasX-approved O-rings and gaskets.
- 3 Replace the parts, as required.
- 4 Use a small amount of silicone grease to retain O-ring seals in position during assembly and to improve durability of dynamic seals. Ensure that the seal remains in position and does not drop out of its location in case of a blind assembly (seal cannot be seen easily).

Pipes and Hydraulic Plumbing

Follow these procedures when you work on piping:

- Use UL-approved pipe sealants suitable for the fuel involved for pipe threads. Follow the sealant manufacturer's recommendations for use. Avoid any sealants that may become hard over time.
- Always clean and inspect pipe threads before applying the sealant. Do not apply sealant to dirty, oily, or wet threads. Do not apply sealant to the first two threads.
- Do not tighten or disturb joints during or after the sealant has set.
- Do not use Teflon tape. Teflon tape fragments may cause unit failure.
- Do not excessively tighten any component during installation or assembly. Excessive tightening may cause damage to the part.
- Torque fittings to the correct pounds. Refer to [“Torque Specifications”](#) on page 6-9.
- Always check for leaks after service.

Service Hints

Follow these hints for servicing the pump and hydraulic plumbing:

- Slow or no flow can be due to several causes. A less common issue that can happen at times is that the flow path through the plumbing can be completely or partially plugged. If more common issues such as valves, filters, strainers, meters have been found to be OK, check for plumbing obstructions.
- Always use sealants suitable for the fuel involved. Some fuels, especially diesel, may wash away general purpose sealants.

Torque Specifications

Ensure that you follow these recommendations when working with fasteners on pumps and dispensers:

- Never use a metric fastener in place of an Society of Automotive Engineers (SAE) or non-metric fastener and never use an SAE fastener in place of a metric fastener. The device may suffer damage.
- To prevent failure, always use the same or higher grade of materials for load bearing devices. For example, structural and hydraulic device bolts.

The following tables provide general torque guidelines for plated steel screws and bolts, pipe plugs, and tube fittings:

Screws and Bolts (Plated)

Thread	Recommended Torque	
	in-lbs	Newton Meters (Nm)
M4	10-12	1.1-1.3
M5	25-35	2.8-4.0
M6	36-40	4.1-4.5
M8	120-140	13.6-15.8
M10	150-170	16.9-19.2

Pipe and Tube Fittings

Thread	Recommended Torque	
	in-lbs	Nm
1/8-inch National Pipe Thread (NPT)	10-12	13.6-16.3
1/4-inch NPT	22-25	29.8-33.9
3/8-inch NPT	30-35	40.7-47.5
1/2-inch NPT	35-40	47.5-54.2
3/4-inch NPT	45-55	61.0-74.5
1-inch NPT	70-80	94.9-108.4
1-1/2-inch NPT	150-180	203-244

Flanged and Compression Tube Fittings

Pipe	Recommended Torque	
	in-lbs	ft-lbs
1/8-inch	40 - 45	
1/16-inch	49 - 55	
1/4-inch	58 - 65	
5/16-inch	72 - 80	
3/8-inch		9 - 10
1/2-inch		19 - 21
5/8-inch		26 - 29
3/4-inch		38 - 42
7/8-inch		49 - 54

Self-contained Pumping Units

Unit	Recommended Torque	
	in-lbs	Nm
Pump head (tightened in star pattern)	200	23
Strainer cover	150	17
Rear cover	200	23

Meter Bolts

Bolt (In Order)	Recommended Torque	
	in-lbs	Kg-meters
1 Cylinder cover gasket	130 ± 10	1.50 ± 0.12
2 Piston and connecting bar	35 ± 5	0.40 ± 0.06
3 Shaft seal cap	25 ± 5	0.30 ± 0.06
4 Lower bearing housing	75 ± 10	0.90 ± 0.12
5 Packing retainer	20 ± 5	0.25 ± 0.06
6 Body cover	130 ± 10	1.50 ± 0.12

Purging Air from System

WARNING

- Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.
- Fire and explosion could result in severe injury or death.
- Test and close the involved shear valves. Shut off power to the unit.
- Remove the parts slowly. Collect fuel in approved containers.
- Clean up all spills promptly.

About Purging System

Purge air from the hydraulic system properly. Failure to properly purge air from the system can damage components and result in inaccurate calibration and fuel delivery. Purge air from the system for new installations or when fluid containing parts of the hydraulic system are serviced.

Purging Product Lines (New Installations)

To purge the product lines, proceed as follows:

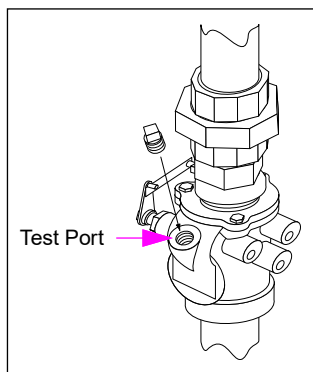
Amount to Purge at Nozzle

Use the following table to determine the amount of fuel that is to be dispensed when purging the unit through the nozzle. Use an appropriately-sized prover Can:

For	Pump This Amount
Start-ups (installing new systems)	35* gallons (132.5 liters) per hose

**Applies to the amount purged through the dispenser hydraulics after purging the underground plumbing of air.*

Figure 6-5: Typical Shear Valve and Test Port



To purge all air from lines and pumps/dispensers for new installations, proceed as follows (see [Figure 6-5](#)):

- 1 Shut off all power to the STP involved.
- 2 Start with the unit farthest from the tank and then move to units that are closer to the tank.
- 3 Use a UL-approved sealant and connect a fuel-resistant hose and petcock valve to the shear valve test port for dispensers. Leave the valve closed.
- 4 Place the end of the hose into an approved container.
- 5 Restore power to the STP. Activate the STP for the line being purged.
- 6 Open the mechanical valve and purge the product lines slowly, until a steady stream of fuel is observed.
- 7 After purging, shut off power to the STPs and remove the line and petcock valve from the shear valve.

- 8 Remove the hose from the test port.

CAUTION

Wear eye protection and exercise caution by removing the hose slowly with a cloth or by other means, to prevent fuel spray. Fuel under pressure may remain in the product lines.

- 9 Reinstall the plug using a UL-approved pipe sealant suitable for the fuel involved.
- 10 Open the shear valve and restore power.
- 11 Check for leaks during purging (see [Figure 6-6](#) on [page 6-13](#)).

Purging Pumps and Dispensers (With Fuel in Product Lines)

To purge the pumps and dispensers, proceed as follows:

Using Nozzle to Purge Unit

Use the following procedure for units that have their product lines purged of air or have not been drained. Begin purging by partially opening the nozzle until fuel is observed at the nozzle, after which you can open the nozzle further to finish purging.

CAUTION

Purging through a fully open nozzle on a unit with air in product lines can damage the meter due to overspeed.

Damage resulting from overspeed is not covered by warranty.

Amount to Purge at Nozzle

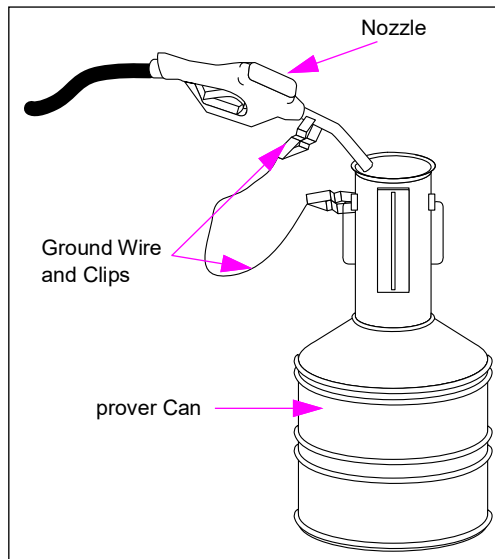
Use the following table to determine the amount of fuel that is to be dispensed when purging the unit through the nozzle. Use the appropriately-sized prover Can:

For	Amount to Pump
Major services (changing meters, pumping units, and others)	25 gallons (94.6 liters) per hose
Minor services (changing filters, strainers, and others)	10 gallons (37.9 liters) per hose
Start-ups (installing new systems)	35 gallons (132.5 liters) per hose

- 1 Lift the nozzle handle of the hose being purged.
- 2 Place the nozzle in the approved container (see [Figure 6-6](#) on [page 6-13](#)).

- 3 Open the nozzle slowly until a constant stream of fuel is observed. Dispense the amount of fuel depending on the service being done, as shown in the table.

Figure 6-6: Dispensing into prover Can (Purge)



- 4 Return the nozzle to the nozzle boot.
- 5 Empty the approved container into the appropriate product tank.
Note: The purged amount will not be reflected in the electronic totals.

Performance Concerns with M09593A102 Pumping Units

In cases of extreme inlet conditions or excessive power runs, pumping performance may be too loud or power drawn may be too high. The following parts can be ordered to improve either or both:

- 60 Hz power - Motor Pulley R18900-30 and use existing belt R06711-38
- 50 Hz power - Motor Pulley R18900-34 and belt R06711-38

Purging Air in DEF Systems

Because of the meter's sensitivity to aeration of the fluid, it is suggested when first purging the unit of air to temporarily install a standard AtlasX pulser to the PCN 4+ Board for the first purged (farthest from tank) DEF Magmeter. The standard AtlasX High-Flow pulser is shown in [Figure 5-39](#) on [page 5-52](#).

To install a standard AtlasX High-Flow pulser, proceed as follows:

- 1 Remove power to the unit.
- 2 Disconnect the pulser data connection at the PCN 4+ P1112 connector and connect a standard AtlasX pulser.
- 3 Restore power and activate the dispensing position.
- 4 Slowly hand spin the pulser to allow air to be purged through the system with the nozzle activated.

- 5 Purge the air, following the normal procedures, until DEF with minimal air is being dispensed and the CR3 LED on the meter interface board is lit.
- 6 Deactivate the dispenser and remove power to the unit.
- 7 Remove the temporary pulser and replace with the data connector (J1112 of M10060A004 cable) from the meter interface board.
- 8 Restore power.
- 9 Complete the purging operation as per standard practice.
Note: The Strainer must be cleaned after performing the purging operation.

WARNING

Do not substitute the pulser while power is being supplied to the unit. Lethal voltages exist within the dispenser and damage to the unit could occur if certain critical steps are not followed. It is recommended that only Gasboy-certified ASCs, who are trained in the service and operation of AtlasX dispensers perform this procedure.

All the error codes in the DEF unit are identical to the standard AtlasX 8800/9800.

Measuring Flow Rate

WARNING



Static electricity may be present before or during dispensing of fuel. A spark between container and nozzle may occur.

Fire or explosion may result causing serious injury or death.



Ground the nozzle to the prover Can to prevent static discharge. Place the prover Can directly on the ground and not on any insulated surface.

While dispensing fuel into a container, ensure that proper equipment and procedures are being used to eliminate the hazard of fuel vapors that can be ignited from static discharge or other sources. Maintain contact between the nozzle tip and prover Can during all fueling procedures, or use a grounding clip while dispensing the fuel. Return the dispensed fuel to the proper storage tank.

Use the appropriately-sized prover Can.






- For standard flow units, use at least a 5-gallon prover Can.
- For high gallonage units, use at least a 25-gallon prover Can.
- Start with all displays reading zero (0).

To measure the flow rate, proceed as follows:

- 1 Dispense fuel at full flow for 15 seconds (1/4 of a minute) into an approved container. Stop the fuel flow. Clean up any spills promptly.
- 2 To calculate gallons or liters per minute, multiply the volume dispensed by four. For example, 5 gallons x 4 = 20 gallons per minute.

Measuring Pressure and Vacuum

⚠ **WARNING**

- 
 - Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.
- 
 - Fire and explosion could result in severe injury or death.
- 
 - Test and close the involved shear valves. Shut off power to the unit.
- 
 - Remove the parts slowly. Collect fuel in approved containers.
- 
 - Clean up all spills promptly.

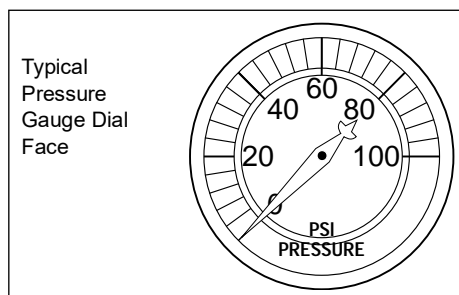
Using Pressure Gauge

Use pressure gauges and vacuum gauges to test pumps and dispensers when:

- Flow rate is too low
- Motors fail prematurely or stall (pump only)
- Units take a long time to prime (pump only)
- Units are noisy (pump only)

The use of a combined vacuum and pressure gauge eliminates the requirement to carry more than one gauge.

Figure 6-7: Typical Pressure Gauge Dial



If gauge readings are erratic, it indicates that the gauge needle pulsations must be snubbed. The following are recommended:

- Always use accurate, calibrated gauges. Using a gauge snubber or a dampened gauge helps prevent gauge damage and to obtain a more accurate reading. Liquid filled gauges that dampen readings can also be used.
- Use gauges that have appropriate scales for reading in Pounds per Square Inch [PSI (scale 0-100 psi)] for pressure and 0-30 Hg (inches of mercury) for vacuum.

Pressure Measuring Locations on Unit

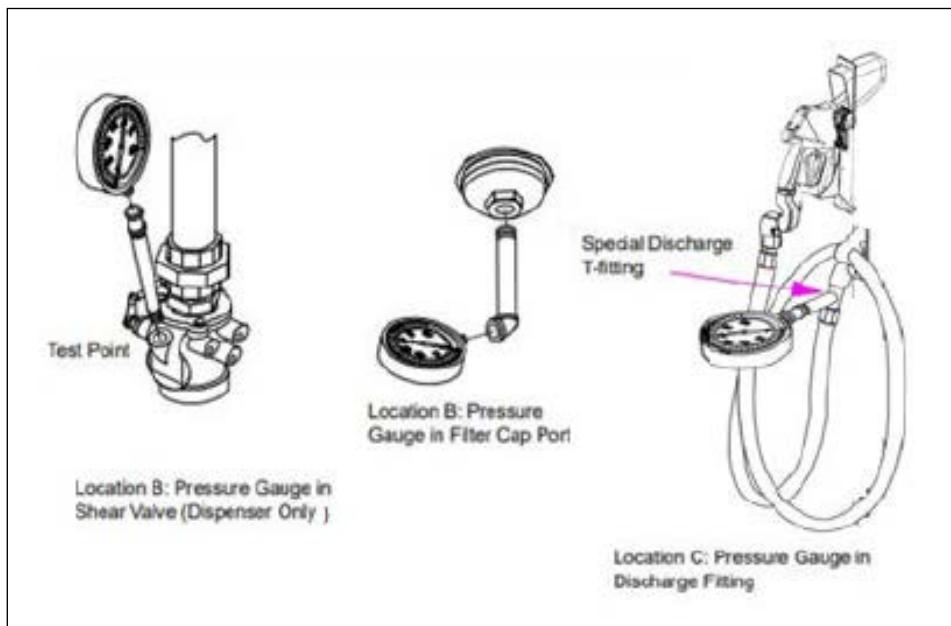
This section provides information about the pressure measuring locations on unit.

For Dispensers

Install the pressure gauge at any one of the following locations (see [Figure 6-8](#)):

To Check	Insert the Pressure Gauge in the
Inlet pressure (pressure available to dispenser)	Shear valve test port (location A)
Filter cap port pressure (pressure available at filter)	Special filter cap port fitting (location B)
Discharge pressure (pressure available to hanging hardware)	Special discharge fitting (location C)

Figure 6-8: Typical Pressure Gauge Installations



Measuring STP Pressure for Dispensers

To measure STP pressure for dispensers, proceed as follows:

- 1 Shut off power to the STP.
- 2 Verify if the dispenser and STP have been deactivated.
- 3 Always use eye protection. Install the gauge at the shear valve test port (see [Figure 6-8](#) on [page 6-16](#)), Location A.
- 4 Turn on power to the STP.
- 5 Activate the handle. Do not pump fuel.
- 6 Read the psi reading on the gauge. The operating pressure depends on the STP horsepower. For exact performance values, consult the manufacturer.

Note: The pressure at the dispenser inlet will reduce when the dispenser is dispensing fuel. Pressure drop of more than a few psi may indicate an inadequately sized STP, underground restrictions, inadequately sized plumbing, or a defective STP.

- 7 For a representation of model STP performance, refer to the following table. STPs with more or fewer stages vary from the information in the following table:

Note: More stages usually mean higher pressure capability. Variable speed STPs can be set to different pressures. Do not rely on this chart for the exact values.

STP Horsepower	Operating Pressure			
	Gasoline		Diesel	
1/3 HP	26 psi	76 kg-cm ²	30 psi	88 kg-cm ²
3/4 HP	30 psi	88 kg-cm ²	34 psi	99 kg-cm ²
1-1/2 HP	30 psi	91 kg-cm ²	35 psi	102 kg-cm ²
2 HP	41 psi	120 kg-cm ²	46 psi	134 kg-cm ²
3 HP	31 psi	91 kg-cm ²	35 psi	102 kg-cm ²
5 HP	38 psi	111 kg-cm ²	43 psi	126 kg-cm ²

For Self-contained Pumps

See [Figure 6-8](#) on [page 6-16](#) (Locations B and C).

To measure pressure for pumps, proceed as follows:

- Install the pressure gauge to the discharge side at a test port on the special filter cap (Location B).
- Install the pressure gauge downstream at the nozzle or other locations, as required (Location C).

Measuring Pressure Drop for Pumps and Dispensers

Use the Pressure Drop test to check the specific groups of parts (meters, shear valves, filters, and others). An exceptionally high pressure drop for a specific flow rate indicates that a part is clogged or defective.

To measure the pressure drop for pumps and dispensers, proceed as follows:

- 1 Shut off power to the unit. Multiple disconnects may be required.
- 2 Ensure that the pump/dispenser handle is in the Off position. For pumps, shut off power to the motor and pump using lockout/tagout procedures. While measuring a dispenser, close and test the shear valve. Place the nozzle in an approved container. Lift the pump handle and squeeze the nozzle slowly to bleed of the pressure.
- 3 Wear eye protection and then install pressure gauges. For locations, see [Figure 6-8](#) on [page 6-16](#).
 - For pumps, install pressure gauges at the pumping unit discharge test port and the discharge special T-fitting (location C).
 - For dispensers, install the pressure gauge at the shear valve test port (location A) or filter cap port (location B) and at the discharge special T-fitting (location C).
- 4 Restore power to the unit. Open the shear valve on dispensers. Lift the pump handle to the On position. Activate the nozzle and pump fuel at full flow into an approved container.
- 5 Measure the flow rate and read and record the psi reading on both gauges. Return the pump handle to the Off position.
- 6 Calculate the pressure drop (difference between the psi readings). For an example of desirable range, see [Figure 6-9](#) on [page 6-19](#).
- 7 Ensure that the pump handle is in the Off position. If the unit is a dispenser, close the shear valve. Place the nozzle in an approved container. Lift the pump handle to the On position. Squeeze the nozzle to bleed the pressure. Return the pump handle to the Off position.
- 8 Shut off power to the unit.
- 9 Remove pressure gauges, restore the unit to original condition, purge air, check for leaks, and return the unit to operation.

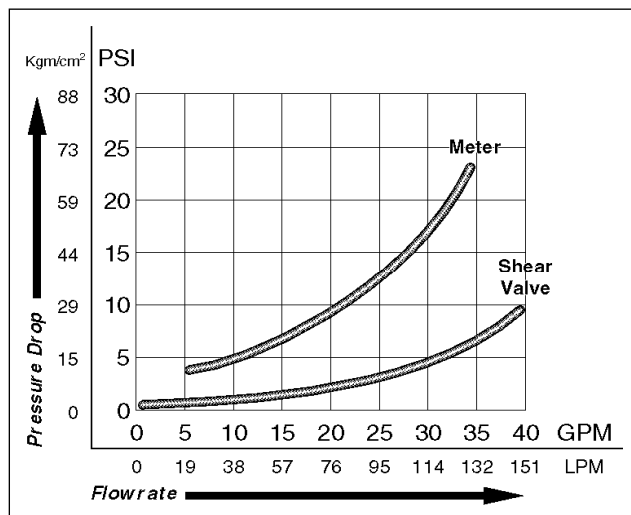
Analyzing Pressure Drop for Pumps and Dispensers

Pressure drop across components increases as the total flow rate increases.

- For dispensers, Total System Pressure Drop = Product Lift from bottom of STP to the dispenser base + Pressure Drop through external piping + Pressure Drop through dispenser including hose and nozzle.
- Pressure Drop through external piping segments varies depending on the sizes and types of piping used. It is also affected by the number, sizes, and types of fittings used.

If the total System Pressure Drop at the total flow rate is less than the STP pressure at that flow rate, the system will develop the required flow rate.

Figure 6-9: Graph for CFT Meter and 1-1/2-inch Shear Valve



Determining if Components Are Faulty

To determine if the components are faulty, proceed as follows:

- 1 Always check and replace the filter and strainer before performing this test.
- 2 Determine the dispenser pressure at the inlet and flow rate with the nozzle wide open.
Note: If the pressure at the base of the dispenser is substantially lower, it indicates that the dispenser is functioning correctly.

- 3 Compare the observed flow rate to the chart and actual inlet pressure for the dispenser model being checked. If the flow rate is low relative to the pressure, it is likely that a dispenser or hanging hardware problem exists. If the readings are similar to the specification, it is likely that the dispenser is working properly and it is a **system** problem.

Measuring Pressure and Vacuum Test Chart

Pressure at shear valve or filter cap with no flow	Maximum pressure capability of the STP
Pressure at shear valve with full flow	Actual capability of STP and in-ground piping to supply pressure at maximum flow rate
Pressure at shear valve or filter cap minus pressure at hose at full flow	Pressure drop across dispenser meter and valve at maximum flow rate
Pressure at shear valve or filter cap minus pressure at hose at no flow	Maximum pressure available to force fuel through meter and valve
Pressure at hose at full flow	Pressure drop across nozzle and hose at full flow

Use this table to evaluate the probable cause of dispenser low flow rate.

Low Flow Rate Symptom	Probable Causes
Observed pressure drop across the meter and valve is more than a few psi higher than indicated in the charts	Flow restriction or defective pump/dispenser component, assuming that the filter is new
Observed and expected pressure drop across the pump/dispenser components is close to specification	Hanging hardware or dispenser pressure supply (STP) problem upstream or issue with pumping unit/installation for pumps
Observed pressure at the hose and nozzle during full flow is too high	Undersized or defective hanging hardware
Pressure at the dispenser inlet or pumping unit is too low at full flow	Undersized or defective STP/piping to dispenser or pumping unit hardware or installation problem





Reaching Required Flow Rate

Suggested methods for achieving the required flow rate are:

- Correct and replace the faulty components
- Use a larger STP or manifolded STP
- Use larger inlet piping to the pump or dispenser
- Use less restrictive hoses and nozzles
- Reduce the maximum lift of product from the tank
- For a pump, reduce the maximum lift of product from the tank and minimize feed line lengths

Measuring Vacuum for Pump

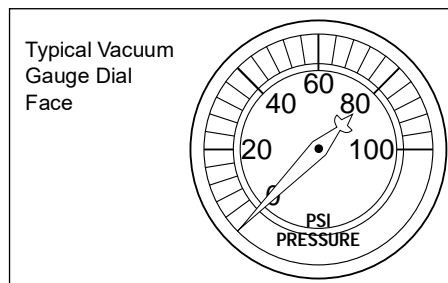
⚠ WARNING

-  • Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.
-  • Fire and explosion could result in severe injury or death.
-  • Remove the parts slowly. Collect fuel in approved containers.
-  • Clean up all spills promptly.

About Vacuum Readings

Use vacuum readings to determine if the pumping unit has the ability to move the product from the storage tank to the pump. Inability to pull a vacuum may indicate that air is entering the system. Use vacuum gauges that read in inches of mercury (scale 0-30 Hg.).

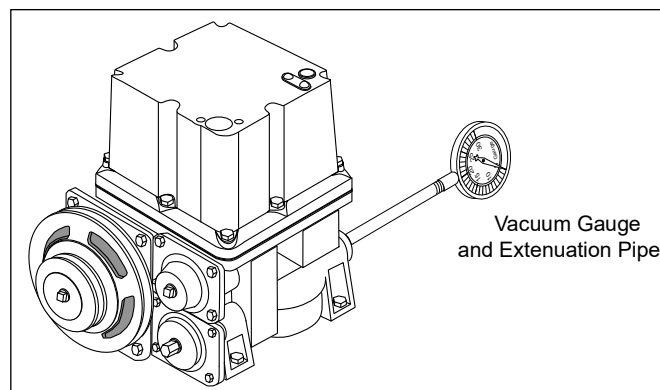
Figure 6-10: Vacuum Gauge



Measuring Dry Vacuum for Pump

Use this test to determine the priming ability of a self-contained pumping unit (only run the test if priming problems exist). Always follow all safety warnings and cautions.

Figure 6-11: Vacuum Gauge Port on Pumping Unit



To measure dry vacuum for pumps, proceed as follows:

- 1 Shut off power to the unit. Multiple disconnects may be required. Use OSHA lockout/tagout procedures.
- 2 Drain-off all fuel from the Pumping Unit - Global. Use an approved container. Refer to [“Draining the Pumping Unit”](#) on [page 6-55](#). Clean up any spills promptly.
- 3 Plug the pumping unit inlet. Use a flat rubber disc between the union halves or use a pipe plug in the lower half of the inlet union.
- 4 Check the belt tension between the pump and motor. Refer to [“Setting Belt Tension”](#) on [page 6-64](#).
- 5 Restore power to the unit.
- 6 Read the vacuum gauge. Newly installed units must read 8 inches Hg (mercury) or above. Older units (about 1,000 hours of service) must read approximately 4 inches Hg.
- 7 After the testing is complete, shut off power at the circuit breaker.
- 8 Remove the gauge and install the plugs that may have been removed earlier using UL-approved pipe sealant suitable for the fuel involved.
- 9 Remove the inlet plugs and reconnect the inlet plumbing securely.
- 10 Restore power and check for leaks.

Measuring Wet Vacuum and Pressure for Pump

This test is useful when the flow output is low. Always follow all safety warnings and cautions.

To measure wet vacuum and pressure for pumps, proceed as follows:

- 1 Shut off power to the unit.
- 2 Check the belt tension between the pump and motor. Refer to [“Setting Belt Tension”](#) on [page 6-64](#).
- 3 Install pressure and vacuum gauges.
- 4 Restore power and operate the unit with both pressure and vacuum gauges attached. Use an approved container to collect fuel. Clean up any spills promptly.
- 5 Record the discharge pressure with the nozzle opened fully and then with the nozzle closed.
- 6 Record the vacuum pressure with the nozzle opened fully and then the nozzle closed.
- 7 Record the flow rate with the nozzle opened fully.
- 8 Compare readings with [“Acceptable Range Tables”](#) on [page 6-23](#).

Acceptable Range Tables

The values listed in the following tables are approximate and may vary depending on site conditions, the hanging hardware used, age of units, and other factors. Flow rate for a standard gallonage is based on 5/8-inch hoses, 3/4-inch swivels, and unleaded gas. Flow rate for high gallonage is based on 1-inch hoses and OPW7H Nozzle.

Acceptable Ranges (Pumps) - Standard and High-Flow Rate Units

Pump Configuration	Full Flow - All Nozzles Open			By-pass - Nozzles Closed	
	Inlet Vacuum (in hg)	Discharge Pressure (in psi)	Flow Rate (gpm)	Inlet Vacuum (in hg)	Discharge Pressure. (in psi)
One Pumping Unit per Hose:					
Standard Flow	4 - 10	15 - 30	10 - 13	4 - 7	20 - 35
High-Flow	6 - 12	25 - 40	18 - 24	5 - 8	28 - 45
One Pump Unit per Two Hoses:					
Standard Flow	4 - 10	20 - 35	17 - 20	4 - 7	22 - 38

Acceptable Ranges - Metric Measure

Note: This range is for both hoses running.

Pump Configuration	Full Flow - All Nozzles Open			By-Pass - Nozzles Closed	
	Inlet Vacuum (cmhg)	Discharge Pressure bar	Flow Rate lpm	Inlet Vacuum cmhg	Discharge Pressure bar
One Pumping Unit per Hose:					
Standard Flow	10.2 - 25.4	1.0 - 2.1	37 - 50	10.2 - 17.8	1.3 - 2.4
High-Flow	15.2 - 30.5	1.7 - 2.8	68 - 90	12.7 - 20.3	1.9 - 3.1
One Pump Unit per Two Hoses:					
Standard Flow	10.2 - 25.4	1.3 - 2.4	64 - 76	10.2 - 17.8	1.5 - 2.6

Probable Causes of Low Flow Rate for Pumps

Use the following table to determine the causes of low flow rate:

Low Flow Rate Symptom	Probable Causes
The open nozzle vacuum reads high, pressure reads low, and closed nozzle pressure is normal.	<ul style="list-style-type: none"> • Check valve sticking, closed, or partially closed • Pumping unit strainer dirty • Supply line obstructed or restricted • Spring loaded check valve in supply line • Storage tank air vent plugged • Undersized supply line for unit • Tank too far or too deep (no further than 50' away and 10' deep) • Vapor lock (very low to no flow)
The open nozzle vacuum reads low or normal, pressure reads high, and closed nozzle pressure is normal.	<ul style="list-style-type: none"> • Hose crushed • Nozzle defective • Meter binding • Discharge piping obstructed • Filter dirty • Bypass valve defective or sticking • Regulator or check relief valve defective or sticking • Solenoid valve defective • Meter check valve defective or sticking
The open nozzle vacuum reads low and pressure reads low; closed nozzle vacuum reads low and closed nozzle pressure reads normal.	<ul style="list-style-type: none"> • Belt slipping • Pump operating below specified RPM rate • Pumping unit parts worn out • Sump float valve malfunctioning • Leak in supply line between tank and pump or at union • Relief valve stuck open
Surging or hesitation occurs.	<ul style="list-style-type: none"> • Supply line check valve defective • Leak in supply line that traps air • High spots in supply line • Bad solenoid valve (uncommon symptom)
Motor stalls or burns out.	<ul style="list-style-type: none"> • Relief valve sticking • Motor defective • Low voltage or defective wiring • Debris in pump • Broken pump elements

Meter Calibration

WARNING

- Wear eye protection.
- Fire and explosion could result in severe injury or death.
- Remove the parts slowly. Collect fuel in approved containers.

About Calibrating Meters

All meters, even factory calibrated meters, must be checked for accuracy.

Your W&M Agency requires accurate meter calibration. Calibrate every meter under actual service and installation conditions, as per the *Application Programming Interface (API) Manual of Petroleum Measurement Standards*. Check prover Cans periodically for accuracy.

- Before calibration, properly purge air from the system if the unit is new or has just undergone hydraulic service. Air in the system affects calibration accuracy. Refer to [“Purging Air from System”](#) on [page 6-10](#). After completing calibration, obtain the local W&M seal. All replacement meters must be calibrated after installation and testing.
- Use a 5-gallon prover for flow rates under 20 gpm (75 lpm). If you use larger than 5-gallon prover Cans, the calibrating adjustment changes.
- For delivery rates over 20 gpm (75 lpm), use a prover Can equal to or larger than the system flow (flow produced in one minute with the nozzle wide open).

Notes: 1) Calibrating with a small prover Can causes inaccurate test results. Never use an under-sized prover Can for calibration purposes.

2) When calibrating AtlasX DEF dispenser, a special prover Can must be used when dispensing the Urea product.

- National Institute of Standard and Technology (NIST) Handbook 44 permits these operating tolerances:

- Plus or minus 3-cubic inches ‘acceptance tolerance’ (typically at the time of installation).

- Plus or minus 6-cubic inches ‘maintenance tolerance’ (typically 30 days after installation).

Note: W&M requires meters to be calibrated as close to zero as possible.

- Local W&M authorities requirements may differ from *Handbook 44*.
- Calibrate the meter within its rated flow range. Meter calibration must remain at the same setting and within the acceptable tolerance for both high and low flow rates.

IMPORTANT INFORMATION

In new systems, **all meters** must be checked for accuracy after purging air from the system. Air in the system affects calibration accuracy.

CFT Meter Calibration Adjustment for High-Flow and Mechanical Register Models

If calibration is required, remove the restraint (seal wire from locking pin) on the calibration wheel located on each meter. Each adjacent pin hole represents 2/3-cubic-inch (0.011 liter) variance for a 5-gallon (18.9 liter) measure. Moving the calibration wheel counterclockwise by one pin hole adds 2/3-cubic-inch of fuel (0.011 liter) in the prover Can, while turning the calibration wheel clockwise by one pin hole creates a negative 2/3-cubic-inch of fuel in the prover Can.

Note: It is the owner’s responsibility to notify the local W&M officials if their inspection is required before the unit is put into service.

IMPORTANT INFORMATION

Local or state regulations frequently require testing and calibrating units at both fast and slow-flow nozzle settings. If required in your area, adjust settings such that both fast and slow-flow readings are in compliance. For guidance, consult your local regulatory agency.

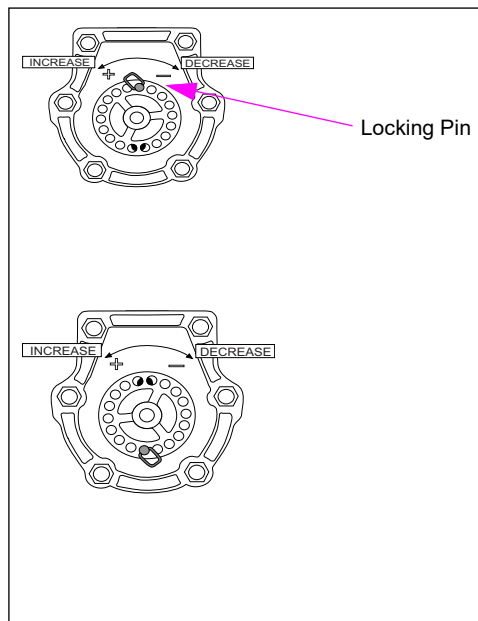
Setting Calibration

Located on the side of each meter is a calibration wheel for setting the calibration.

To adjust the meter, proceed as follows:

- 1 Check the meter by delivering the product into an appropriately-sized prover Can. If the amount in the prover Can does not match with the display (within a tolerance), proceed with the remaining steps to calibrate the meter.
- 2 Remove the seal wire from the locking pin.
- 3 Remove the locking pin and turn the wheel to adjust the measurement. Moving the pin to one adjacent hole position changes the calibration by $2/3$ -cubic-inch per 5 gallons dispensed. To change by half this amount, use the alternate locking pin hole on the opposing side of the calibration wheel.

Figure 6-12: Setting Calibration



- 4 Turn clockwise to decrease the amount of fuel being delivered to the prover Can (previously over-dispensed).
- 5 Turn counter-clockwise to increase the amount of fuel delivered to the prover Can (previously under-dispensed).
- 6 Check the calibration. If the calibration is not correct, repeat steps 4 through 5. If the calibration is correct, proceed to step 7.
- 7 After the calibration is complete, reinstall the locking pin and secure with a seal wire.

AtlasX (Gallon Unit of Measure)

All AtlasX meters must be checked for calibration before placing them in service or on service replacement. Air-purging of new units or serviced meters is required before calibration.

Causes of Known Calibration Problems

- Bad meter (worn piston cup, internal valve not seating, or calibrating wheel in wrong location).
- Bad pulser.
- O-rings leaking on inner VaporVac vapor return hose.
- Leaking meter check valve (product is leaking back through another meter, causing other meters to turn backwards).
- Internal leaks or thermal contractions, causing a void in the hose. W&M may take readings that come up short in the morning when it is cooler, but will pass in the afternoon after warming up. Use the Hose Pressurization option.

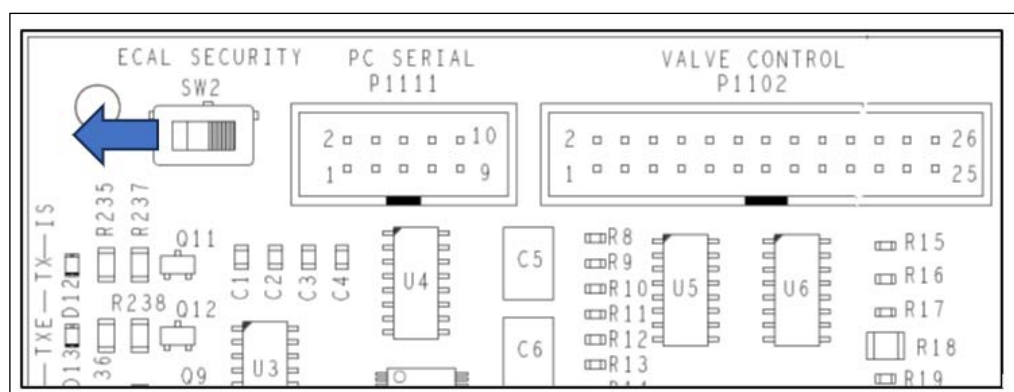
Electronic Calibration Steps

Current AtlasX units are pre-calibrated at the factory, but calibration must be verified during installation. Verify calibration after recalibrating unit. A unit type (CC 90) and volume units (CC 71) must be programmed into a unit before it can be calibrated. Ensure that the Can size in CC 82 matches calibration Can being used. Purge a minimum of 35 gallons for new units, 25 gallons after major dispenser service (meter replacement and so on), or 10 gallons for minor service (filter change, hose change, and so on) prior to any calibration verification or recalibration.

To set calibration, proceed as follows:

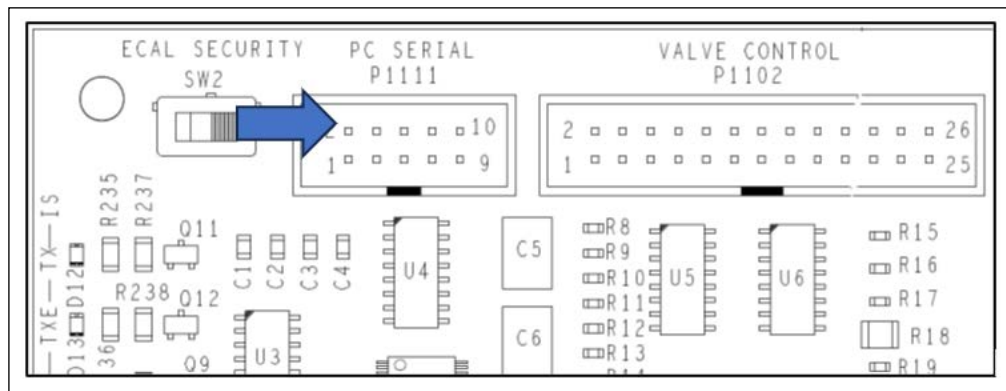
- 1 Connect Manager's keypad to the Combi display board (P6405).
- 2 Remove nozzle and lift lever of hose (meter) to be calibrated.
- 3 Dispense product in calibration can exactly to the zero mark.
- 4 Do not hang up nozzle. Turn ON/OPEN the ECAL/security switch by sliding it as shown in [Figure 6-13](#) (It will be necessary to slide security bracket up to allow switch to be moved).

Figure 6-13: Setting Calibration



- 5 Wait for a double beep.
- 6 Lower pump handle lever & hang up nozzle.
- 7 Turn OFF/CLOSE the ECAL/security switch by sliding it in the opposite direction.

Figure 6-14: Setting Calibration



- 8 Enter the level 4 PIN code. You **do not** need to press **F1**.
- 9 Press **ENTER** and wait for a double beep.

For dual units, repeat steps for second side. The meter is now calibrated. The ECAL/security switch should be sealed.

Notes: 1) The above method will not be affected if steps 6 and 7 are reversed.

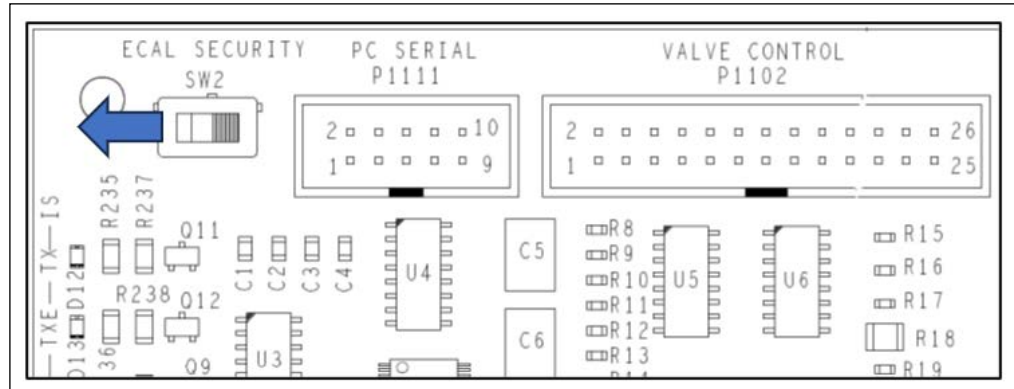
2) For Automatic Temperature Compensation (ATC) units, gross volume can be displayed on the money display by pressing 7 on the manager keypad in retail units.

3) Electronic totals ARE updated when this method is used.

Error code 26 on the Price Per Unit (PPU) display means a unit does not have a calibration factor. If error code 26 is displayed, use the following procedure:

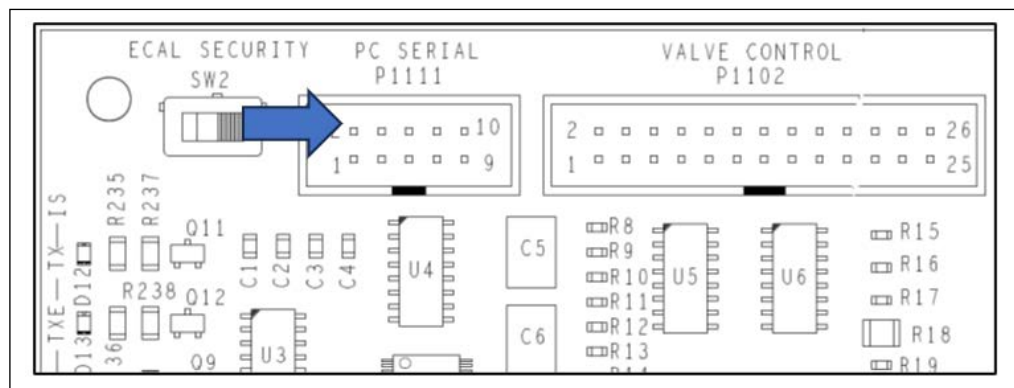
- 1 Turn ON/OPEN the ECAL/security switch by sliding it as shown in [Figure 6-15](#) on [page 6-29](#) (It will be necessary to slide security bracket up to allow switch to be moved.) The Price per Unit (PPU) displays contain the number of days since the last calibration for each meter. The Least Significant Digit (LSD) of money contains the Volume Unit Type (1 = USG, 2 = Liters) and the 3 Most Significant Digits (MSD) of money contain the calibration Can size. Alternate Can size can be programmed in CC 82.

Figure 6-15: Setting Calibration



- 2 Enter the level 4 PIN code.
- 3 Remove nozzle and lift lever of hose (meter) to be calibrated.
- 4 Dispense product in calibration can exactly to the zero mark. The volume display will show number of uncalibrated pulses.
- 5 Lower pump handle lever and hang up nozzle.
- 6 If calibrating a dual unit, calibrate the second hose (meter) by repeating the steps 3 through 5.
- 7 If all meters have been calibrated, turn OFF/CLOSE the ECAL/security switch by sliding it in the opposite direction.


Figure 6-16: Setting Calibration








The meter(s) are now calibrated. The ECAL/security switch should be sealed.

Note: Electronic totals are not updated when this method is used.

Meters

 **WARNING**

-  • Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.
-  • Fire and explosion could result in severe injury or death.
-  • Test and close the shear valves involved. Shut off power to the unit.
-  • Remove the parts slowly. Collect fuel in approved containers.
-  • Clean up all spills promptly.

About Meters

For Gasboy AtlasX Ultra-Hi units, refer to [“Replacing Cylinder Cover and Gasket \(Cylinder Cover Leaks\)”](#) on [page 6-33](#). Gasboy does not recommend a major field overhaul of these meters. Suggested repairs are related to fixing external leaks. The only serviceable parts on the meter are gaskets and seals. Most repairs require removing the meter from the unit.

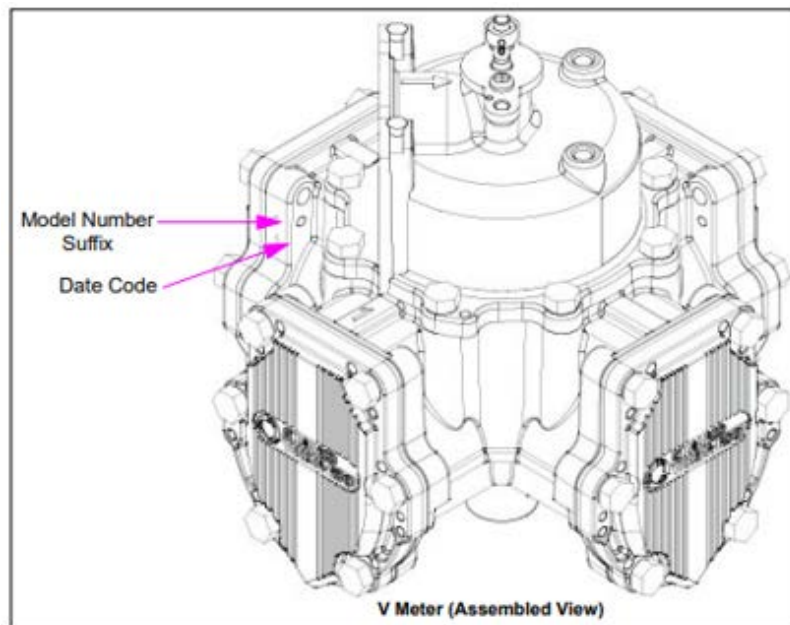
Model and Date Codes

The model number is stamped on each meter. Refer to [“V Meter, T19976-V10 Date and Model Code Location”](#) on [page 6-31](#).

Piston Meters

AtlasX High-Flow units use four-piston, positive displacement piston meters, where the fluid is pushed into a cylinder which causes the opposing piston to push a similar cylinder of fluid out. Two sets of two pistons are used and timed using cam and piston connecting bars to convert the piston movement into a rotation of the meter output shaft. The meter has a flow path that discharges the product from the center chamber on the bottom of the meter. This configuration reduces water and contaminants from building up in the meter and prevents meter freeze-ups from water accumulation in the meter during very cold weather, resulting in longer meter life.

Figure 6-17: V Meter, T19976-V10 Date and Model Code Location



Service Tips

- Purge air from the system before performing a calibration. Air in the system affects the accuracy of the calibration. Refer to [“Purging Air from System”](#) on [page 6-10](#).
- Place an approved pan under the meter during repairs to collect the residual fuel.
- Replacing the top quad ring requires the use of a special tool that is included in the replacement seal kit. The tool protects the new seal during installation over the drive pin across the hole in the shaft.
- It is not cost effective to rebuild a meter. If a meter exhibits problems, install a new meter.
Note: Meter tops must be returned for warranty coverage.
- Remove and replace the meter using metric tools.
- Inspect all gaskets when the unit is Off during repairs. Replace the meters, as required.
- Some meter bolts are difficult to access. A 13-mm universal socket makes installation and removal easier.
- For calibration procedures, refer to [“Meter Calibration”](#) on [page 6-24](#).
- After calibrating a meter, always ensure that it is properly sealed at the calibrating wheel to avoid tampering.

- After a drive-off, inspect the meter for leaks.
- Non-use of filters and strainers can significantly reduce meter life.
- Abnormally low pressure and flow rate can cause the meter to stall.
- Meter failure may be indicated by a significant change in calibration from high to low flow rate, excessive calibration spread, or meter stall at low-flow.
Note: Other problems may also cause the same symptoms.
- After replacing the meter, always purge the system of air (refer to [“Purging Air from System”](#) on [page 6-10](#)) and recalibrate the unit.
- Calibration problems are not always caused by a bad meter. Meter check valves, leaking nozzles, binding pulsers, defective pistons, or internally leaking vapor recovery hose can also result in calibration problems.
- A top shaft seal kit to prevent leakage at extremely cold temperatures is available.

Repairing CFT Meters

This section provides information for repairing CFT meters.

Before You Begin

Before beginning the repair, proceed as follows:

- 1 Read and follow the procedure in [“Servicing Hydraulic Components”](#) on [page 6-7](#).
- 2 After following power-down procedures, open the nozzle into an approved container to bleed pressure. Some residual pressure may remain.
- 3 Continue with the required meter service procedures.

Removing/Replacing Gasboy CFT Meters

To remove/replace the Gasboy CFT meter, proceed as follows:

- 1 Disconnect the pulser drive on electronic models or the computer drive on mechanical models, from the meter output shaft.
- 2 Support the meter when removing the bolts.
- 3 Remove the discharge line flange and inlet line flange bolts.
- 4 Remove the meter bracket bolts.
- 5 Remove the meter.
- 6 Perform required service on the meter.
- 7 Inspect and clean the manifold or inlet, and discharge line mounting surfaces.
- 8 Install the new inlet and discharge flange O-rings.
- 9 Bolt the meter to the inlet and discharge flanges.
- 10 Bolt the meter to mounting brackets.
- 11 Replace the pulser drive or computer drive.

After Repairing Meters

After the repair is complete, proceed as follows:

- 1 Open shear valves (dispensers only).
- 2 Restore power to the unit and STP. In D-Box, place the unit in normal operation.
- 3 Purge air and check for leaks. Refer to “[Purging Air from System](#)” on [page 6-10](#).
- 4 Calibrate the meter.

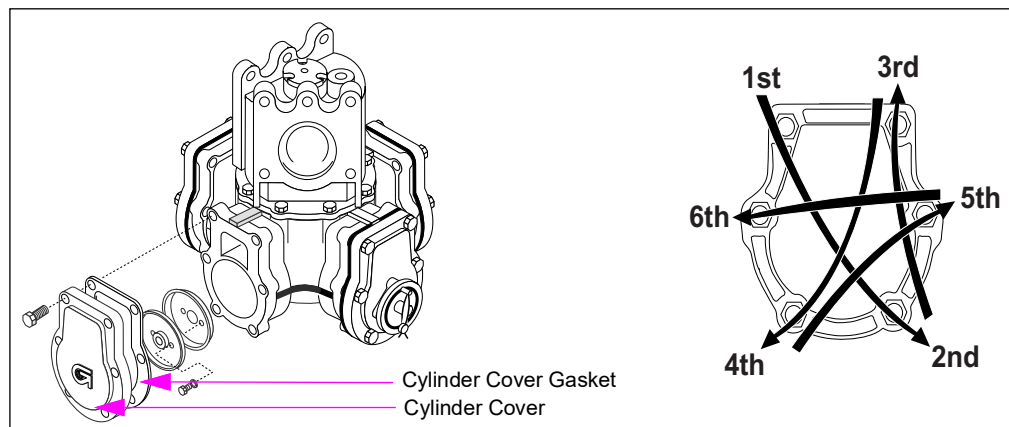
Replacing Cylinder Cover and Gasket (Cylinder Cover Leaks)

Note: Cork gaskets may show some staining. Replace the gaskets only when you note dampness or pooling of fuel.

To replace the cylinder cover and gasket, proceed as follows:

- 1 Follow steps 1 to 3 in “[Before You Begin](#)” on [page 6-32](#).
- 2 Remove the cylinder cover.
- 3 Scrape the old gasket and clean the surface.
- 4 Install the new gasket. Replace the cylinder cover.
- 5 Torque all bolts in sequence as shown in [Figure 6-18](#).

Figure 6-18: Replacing Cylinder Cover and Gasket



- 6 Follow the steps in “[After Repairing Meters](#)”.

Replacing O-rings (Body and Cover Leaks)

Note: Always use Gasboy-approved O-rings and gaskets.

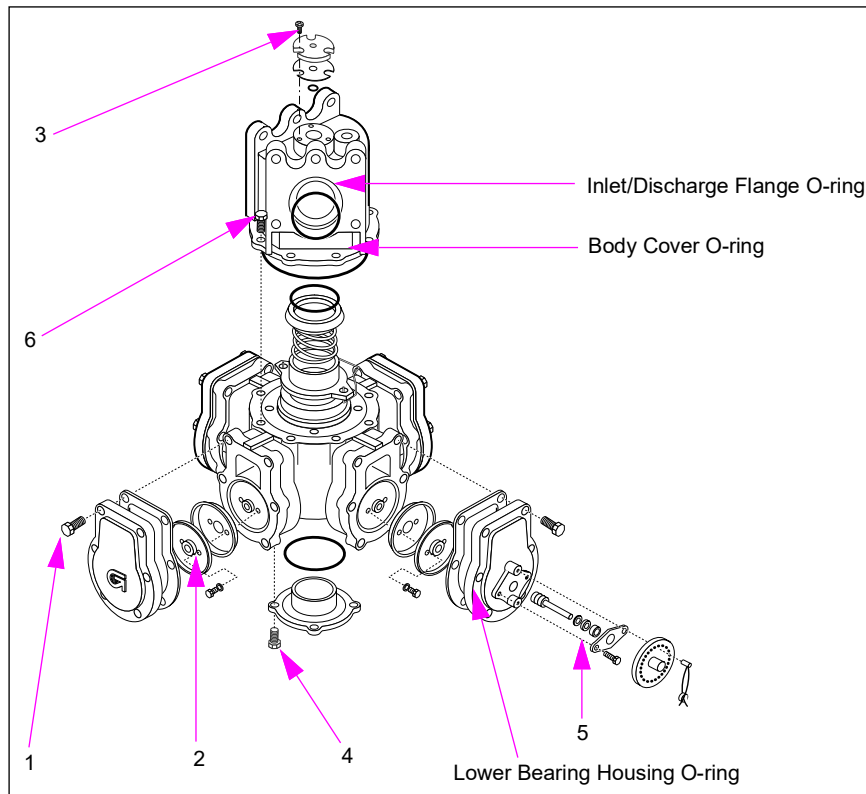
Replace the following O-rings for obvious leaks or during “off unit” repair:

- Inlet/Discharge Flange O-ring
- Body/Cover O-ring
- Valve Seal O-ring
- Lower Bearing Housing O-ring

To replace the O-rings, proceed as follows:

- 1 Follow steps 1 to 3 in “Before You Begin” on page 6-32.
- 2 Remove the body cover and lower bearing housing.
- 3 Remove the O-ring(s) and install a new one(s). Lubricate the O-ring(s) with silicone grease. Ensure that the O-ring is in the groove before tightening the cover(s).
- 4 Install the cover(s). Torque all meter bolts.
- 5 Follow the steps in “After Repairing Meters” on page 6-33.

Figure 6-19: Replacing O-rings

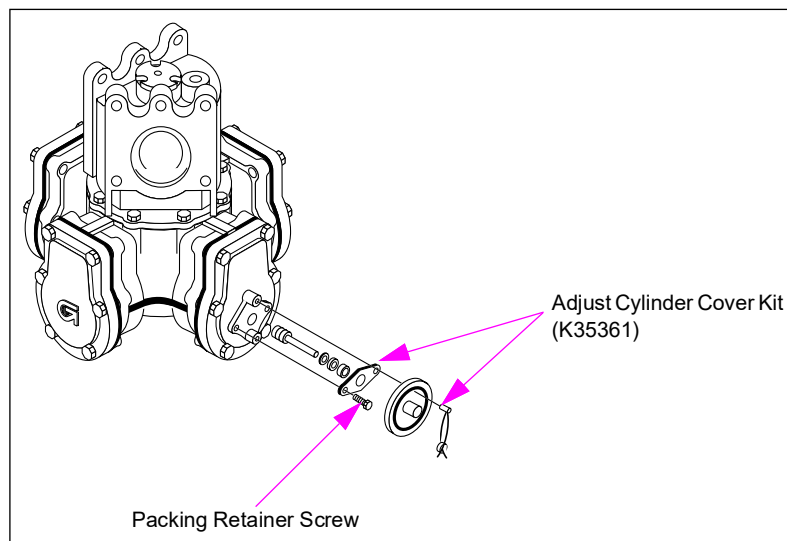


Bolt Number	Bolt	Meter Bolt Torque	
		in -lbs	Kg -meters
1	Cylinder Cover Gasket	130 ± 10	1.5 ± 0.12
2	Piston and Connecting Bar	35 ± 5	0.4 ± 0.06
3	Shaft Seal Cap	25 ± 5	0.3 ± 0.06
4	Lower Bearing Housing	75 ± 10	0.9 ± 0.12
5	Packing Retainer	20 ± 5	0.25 ± 0.06
6	Body Cover	130 ± 10	1.5 ± 0.12

Calibrating Wheel Parts Repair

- Replace the damaged parts or when you note an obvious leak.
- Use new seals on reassembly.
- Use steel screws for packing the retainer and do not overtighten.

Figure 6-20: Calibrating Wheel Parts Repair



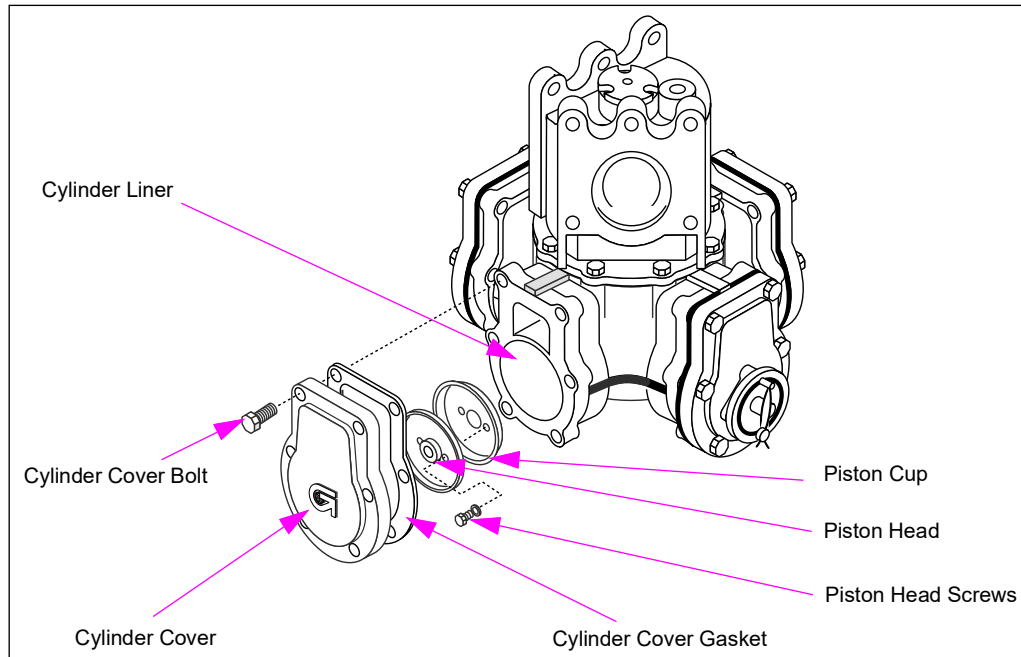
Replacing Piston Cups

To replace the piston cups, proceed as follows:

- 1 Follow steps 1 to 3 in “Before You Begin” on page 6-32.
- 2 Remove the cylinder cover. Remove the old gasket and clean the surface. Refer to “Replacing Cylinder Cover and Gasket (Cylinder Cover Leaks)” on page 6-33.
- 3 Examine the cylinder liner for scoring. If it is scored, replace the meter.
- 4 Remove the piston head screws, and then remove the piston head and cup.
- 5 Install the new piston cup with the cup opening facing outward. Spray oil on the piston cup before closing.
- 6 Reinstall the piston head. Torque screws and apply Loctite™ 510.

- 7 Install the cylinder cover with the new gasket. Torque all meter bolts.
- 8 Follow the steps in “After Repairing Meters” on page 6-33.

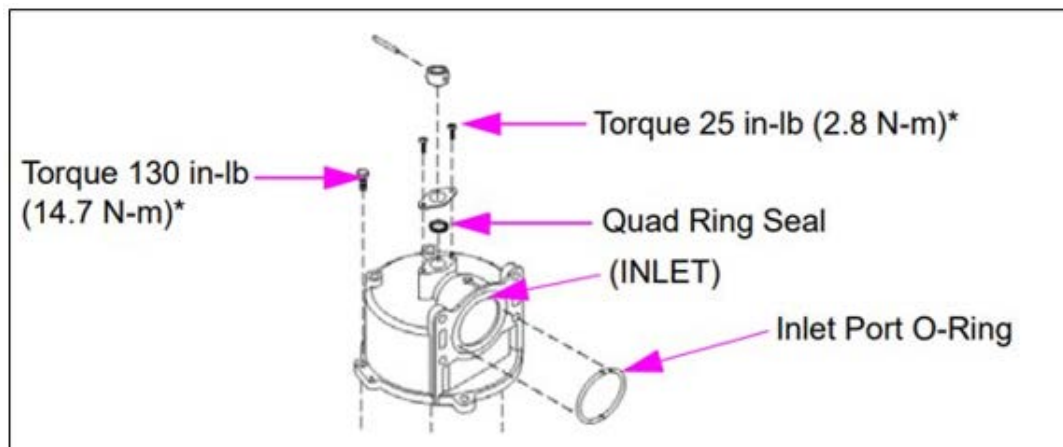
Figure 6-21: Replacing Piston Cups



Removing/Replacing Shaft Seal and Gasket (Upper Seal Leaks)

Replace the shaft seal and gaskets when leaks are obvious. Use the Gilbarco Seal Installation Tool Kit (M08182K001). Before disassembly, inspect the seal cap and output shaft for wobble. Replace the meter, if the shaft wobbles.

Figure 6-22: Shaft Seal and Gasket



- 1 Follow steps 1 to 3 in “Before You Begin” on page 6-32.
- 2 Remove the pulser, gears, and connecting shafts (if you cannot access the seal cap, remove the meter).

- 3 Lightly sand burr on the shaft (near holes).
- 4 Disassemble the seal cap. Do not scratch the shaft.
- 5 Remove all old seals and gaskets, and clean the surface.
- 6 Install the new seal (use installation tool) lubricating lightly with silicone grease. Do not twist or roll the shaft seal.
- 7 Install the new gasket with the seal cap.
- 8 Torque all screws (locking screws is recommended).
- 9 Follow the steps in [“After Repairing Meters”](#) on [page 6-33](#).

Liquid Controls (LC)/Total Control Systems (TCS) Meters

Service Tips

- Remove and replace the meters using metric tools.
- Place an approved pan under the meter during repairs to collect the residual fuel.
- Inspect all gaskets during off-unit repairs. Replace the meters, as required.
- Some meter bolts are difficult to access. A 13-mm universal socket makes installation and removal easier.
- Non-use of strainers can significantly reduce the meter life.
- Meter failure may be indicated by a significant change in calibration from high to low flow rate, excessive calibration spread, or meter stall at low flow.
Note: Other problems may also cause the same symptoms.
- After replacing a meter, always purge the system of air (refer to [“Purging Air from System”](#) on [page 6-10](#)) and recalibrate the unit.
- Calibration problems are not always caused by meters. Dispenser check valves and leaking nozzles may also cause calibration problems.

Removing/Replacing LC/TCS Meters

Note: This meter is used on Ultra-Hi models only.

To remove/replace the LC/TCS meter, proceed as follows:

- 1 Follow steps 1 to 3 in [“Before You Begin”](#) on [page 6-32](#).
- 2 Disconnect the pulser.
- 3 Remove the four bolts from the discharge casting.
- 4 Remove the four bolts on the inlet.
Note: Support the meter while removing the bolts.
- 5 Remove the meter.
- 6 Perform the required service on the meter.
- 7 Inspect and clean the inlet and discharge line mounting surfaces.

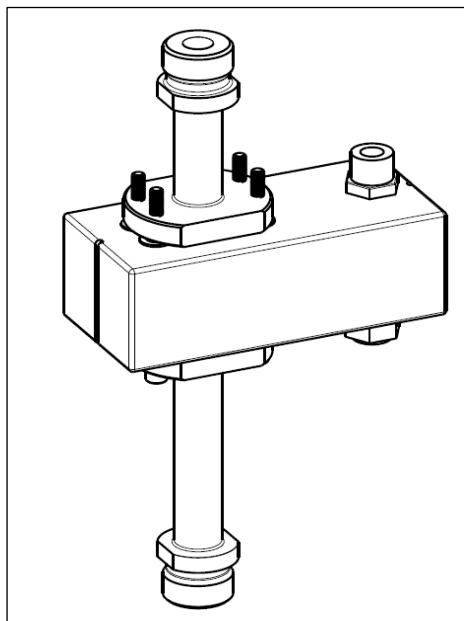
- 8 Install the new inlet and discharge gaskets.
- 9 Replace the meter.
- 10 Bolt the meter to the inlet.
- 11 Bolt the meter to the discharge casting.
- 12 Reconnect the pulser.
- 13 Follow the steps in [“After Repairing Meters”](#) on [page 6-33](#).

DEF Magmeter

The Magmeter is Certified MI-005 (liquids other than water) and has a high strength ceramic flow tube available with Explosion safety certificate.

When purging the air from the meter during installation, temporarily connect a standard AtlasX High-Flow pulser to the PCN 4+, as the dispenser will generate an Error Code 20 until the fluid is present inside the meter. This is done by disconnecting the cable plugged into the P1112 PULSER connector on the PCN 4+ PCA (M18666A001). Then, connect the standard AtlasX pulser (M15182B002) to P1112 connector on the PCN 4+ PCA. When dispensing DEF, spin the pulser manually to initiate full flow. Dispense fluid until all the air is purged from the system and CR3 is lit on the Coriolis Meter Interface board. If this is not done, an Error Code 20 will be generated by the dispenser. Ensure that you turn off power to the dispenser before disconnecting the output between the Coriolis Meter Interface Board and PCN when connecting or disconnecting the temporary pulser and Coriolis Meter Interface Board.

Figure 6-23: AtlasX DEF Magmeter



Filters and Strainers

CAUTION

To prevent fueling problems and to minimize the dispenser down-time due to damage to valves and motor, never operate a unit without the use of a filter or strainer.

WARNING



- Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.



- Fire and explosion could result in severe injury or death.



- Test and close the shear valves involved. Shut off power to the unit.



- Remove the parts slowly. Collect fuel in approved containers.

- Clean up all spills promptly.

About Filters

A noticeably slower flow rate usually indicates a dirty filter or clogged strainer. Slow flow or no flow rate can also result, when water has passed through water alert type filters. Alert the owner or operator, if water is in the tank.

For efficient operation and long life of pumps and dispensers, replace the fuel filters and clean the strainers regularly.

- After 50,000 gallons (189,000 liters) or one month for new installations.
- Every 300,000 gallons (1,134,000 liters) or six months thereafter.

Notes: 1) Harsh environments, including old corroded steel fuel storage tanks, may require change of filters and strainers to be cleaned more frequently.

2) Conversions from non-alcohol to alcohol-enhanced fuels typically results in frequent filter changes due to the cleansing effect of alcohol in tanks and piping.

Always use the Gasboy-recommended filters (standard, water alert, and high capacity).

Filter Description	Part Number	Patroclear Part Number
Filter Fuel, 10M, Particulate Only	M08005B010	40510PE - AD
Filter Fuel, 30M, Particulate Only	M08005B030	40530P - AD
Filter Fuel, 10M, Water Alert	M08007B010	40510W - AD
Filter Fuel, 30M, Water Alert	M08007B030	40530W - AD
Manifold Strainer	R19457	N/A
Filter Cap & Gasket H-Cap Painted Black	R18896-G2	N/A

Notes: 1) Water alert filters are for use with gasoline, ether-blended fuels, and diesel fuel. They are not for use with alcohol-blended fuels.

2) Alcohol monitor filters are for use with ethanol-blended fuels containing up to 20% ethanol. They are not for use with any other fuels.

3) Manifold strainers also require the use of a filter or filter cap.

4) The Fuel Filter option listed here are for protection of the dispenser components. The fuel filter options listed here are not sufficient for filtering the aviation fuel.

Servicing Filters

This section explains about servicing the filters.

Before Removing Filters

Before removing the filters, proceed as follows:

- 1 Use OSHA lockout/tagout procedures.
- 2 Close the shear valve (dispensers only). Refer to “[Shear Valves](#)” on [page 6-71](#). Check the operation of the valve. Multiple shear valve closures may be required. Shut off all power to pumps.
- 3 Bleed pressure (dispensers only):
 - a. Lift the operating handle and authorize the unit.
 - b. Place the nozzle in the approved container.
 - c. Close the nozzle.
 - d. Shut off the operating handle.
- 4 Shut off the associated STP circuit breakers (dispensers only). Multiple STP disconnects may be required.
- 5 Shut off the dispenser circuit breaker.
- 6 Shut off all power to the unit.

Removing Filters

WARNING

• Servicing filters without shutting off power properly and ensuring that the appropriate valves are closed may result in fuel discharge or spray. Any involved STPs with power still applied can be energized from another unit resulting in fuel pressure in the product lines for the unit you are working on. Pumping units with power applied could also be accidentally energized. Commonly, retightening of the filter under pressure will not stop fuel flow as the seal can be blown out of the sealing position during tightening.

• Fire and explosion could result in severe injury or death.

• Ensure the following:

- Wear eye protection
- Test and close the involved shear valves

- Shut off power to the pump, dispensers, and any involved STPs
- Remove the parts slowly. Collect fuel in approved containers.
- Clean up all spills promptly

Use an approved container to collect the residual fuel. Use gasoline/fuel-approved absorbent materials to mop up the spilled fuel. Use Gasboy-approved fuel collectors, if applicable. Be careful of any residual fuel. Always follow all safety warnings and cautions.

To remove the filters, proceed as follows:

- 1 Slowly turn the filter counterclockwise. Use a filter wrench to loosen the filter, if required.
- 2 Drain the removed filter into an approved container and dispose of properly. Do not dispose of filters and fuel soaked absorbent materials in trash cans. Follow local, state, and national code requirements for disposal. Use of a fuel catch-cup or pan is recommended.

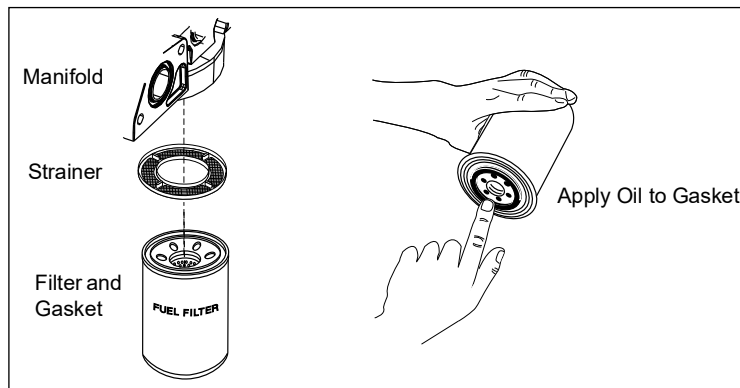
- 3 Remove and clean the strainer. Refer to “Servicing Strainers” on page 6-42.

Installing New Filters

To install the new filters, proceed as follows:

- 1 Read and follow the instructions printed on the new filter.

Figure 6-24: Coating Filter Gasket



- 2 Install a cleaned or new strainer, inserting the cupped side into the filter manifold. Ensure that it is fully inserted.
- 3 Coat the new filter gasket with a thin film of clean oil as shown in Figure 6-24 on page 6-41.
- 4 Attach the filter to the hydraulic manifold and turn the filter clockwise until the gasket contacts the base. Then, hand-tighten an additional half turn.
- 5 Restore power to the unit.
- 6 Open the shear valve on dispensers.
- 7 Lift the nozzle hook and authorize the pump.
- 8 Check for leaks.
- 9 Bleed air by dispensing 10 gallons (40 liters) into an approved container for each hose involved.
- 10 Check for leaks again.

Service Tips

- Only hand-tighten the filter. Do not use a filter wrench to tighten.
- A light coating of oil on the gasket helps the seal to seat properly and allows for easier release at the time of removal.
- Use of a filter and strainer is required to ensure warranty. Units that do not use filters will commonly experience reduced life of hydraulic components. Use of only strainers for very cold weather and diesel fuels is acceptable. However, filters must be used when warm weather returns. The use of only a strainer will not ensure long life of hydraulic components.

About Strainers

Strainers are installed between the manifold and filter to trap larger particles leaving the fine filtering to be done by the filter element. The strainer helps to prolong filter life by preventing premature filter clogging. Strainers can also help reduce the frequency of filter change, resulting from fungus and slime conditions. Always reinstall or replace the strainer.

DEF Strainer

Filtration is required to protect the nozzles and valves. The earlier versions of the dispenser relied completely on a filter tank system. The later versions of the dispenser have a strainer. The 100-micron strainer and assembly is compatible with DEF. The strainer must be cleaned after the first air purging and calibration to ensure good flow rates. Refer to [“Purging Air from System”](#) on page 6-10.

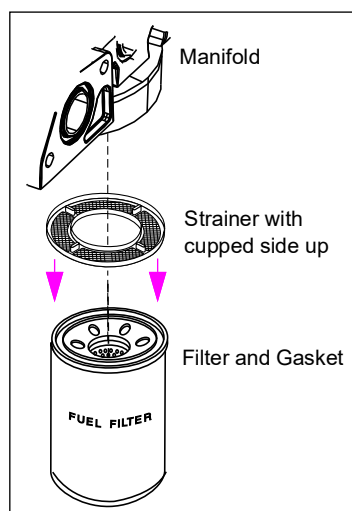
Servicing Strainers

This section explains about servicing the strainers.

Cleaning/Replacing Hi-flow Filter Strainer

[Figure 6-25](#) shows the Hi-flow filter and strainer assembly.


Figure 6-25: Filter and Strainer Assembly








Service Tips

- Strainers commonly help reduce the frequency of filter change.
- Strainers can be cleaned with denatured alcohol. Replace the strainer if it is damaged or partially clogged and not cleanable.
- Always check/clean the strainer, when replacing a filter.
- Ensure that you note the orientation of the tabs when reinstalling the strainer (see [Figure 6-25](#)).

Hanging Hardware

 **WARNING**

-  • Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.
-  • Fire and explosion could result in severe injury or death.
-  • Test and close the shear valves involved. Shut off power to the unit.
-  • Remove the parts slowly. Collect fuel in approved containers.
-  • Clean up all spills promptly.

About Hanging Hardware

Hanging hardware is the component that is attached to the outlet casting. This includes hoses, nozzles, swivels, spacer hose, and breakaways. The hanging hardware is tested for leaks and electrical continuity. The hanging hardware may be manufactured by companies other than Gasboy. Ensure that you follow all manufacturer's recommendations.

DEF units require special hanging hardware that is compatible with DEF fluid. Do not use standard gasoline or diesel hardware for DEF units.

Hoses and Flow Restrictors

This section explains about the hoses and flow restrictors.

Inspecting Hoses

Check hoses regularly (at least once a week or on complaint) for leaks and damage. Inspect and replace the hose assembly, as required. The following conditions may contribute to damage or problems:

- Twisting and curling puts unusual stress on hose parts.
- Repeated flexing of the hose in the same spot can cut, tear, or split the hose cover.
- Flattened hoses from vehicle drive-over can cause restricted flow and hose reinforcement damage.
- A soft spot is a sign of internal damage to the hose reinforcement. Reinforcement may appear through the cover.
- Loose or cracked hose couplings can cause fuel spills.
- Hose bulges are a sign of pressurized gasoline pushing against the cover. A full rupture could occur at any time.
- Use of Teflon tape for NPT hose ends may result in damage to the dispenser outlet casting during assembly.
- Reuseable hose end couples are generally not recommended as improper repair/assembly can cause leaks, lack of continuity, or hose separation.
- Use of excessively long hoses may create a trip hazard for customers. Use hose retrievers, hose reels and so on, to eliminate trip hazards.

⚠ WARNING

- Breakaways for low hose units must be attached close to the nozzle end, where the hose clamp of the retriever is attached between the breakaway and the pump/dispenser hose outlet casting.
- An improper location of the hose clamp may prevent the hose breakaway from working properly.
- Severe injury, death, or equipment damage may result from a vehicle drive-off where the hose breakaway fails to operate properly.

Hose Retrieval Mechanisms

Hose retrieval mechanisms must be operational or a trip hazard may occur.

Hose Retriever Tensioning

The following are the instructions for Hose Retriever Tensioning:

- 1 Remove the cover from the retractor and pull out the cable until tension is present on the retriever reel assembly (about 3-4 feet) (see [Figure 6-26](#)).

Figure 6-26: Adjusting the Reel Tension



- 2 While holding the retriever reel in this location, pull in the slack in the cable inside the unit and wrap the loose cable around the hose reel counterclockwise two or three times (see [Figure 6-27](#)).

Figure 6-27: Wrapping the Cable









- 3 Release the reel and test tension.
- 4 Ensure that the hose is fully supported by the retriever reel. The hose clamp should return to the grommet when the hose is pulled. If more tension is needed, repeat step 1 and step 2 on [page 6-44](#).
- 5 After tension has been adjusted, replace the cover.

The instructions for Hose Retriever Tensioning are now complete.



Replacing Hoses

Do not use soft-wall hoses. They can cause the unit to register with the nozzle closed when the nozzle hook is first raised. Always use UL-approved hoses designed for the fuel being dispensed. Read and follow all safety precautions. Follow OSHA lockout/tagout procedures.

 WARNING	
	• Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.
	• Fire and explosion could result in severe injury or death.
	• Test and close the shear valves involved. Shut off power to the unit.
	• Remove the parts slowly. Collect fuel in approved containers.
	• Clean up all spills promptly.

To replace a hose, proceed as follows:

- 1 On dispensers, close the shear valve (refer to “[Shear Valves](#)” on [page 6-71](#)). Check for proper shear valve operation. Units may require multiple shear valve closures.
- 2 Shut off power to the unit and associated STPs. Multiple STP disconnects may be required. Use OSHA lockout/tagout procedures.
- 3 Drain the nozzle and hose into an approved container.
- 4 Remove the nozzle, swivel, whip hose, and breakaway first and then, the hose clamp.
- 5 Remove the hose.

 WARNING	
	Wear eye protection as residual pressure may exist in the hose during disassembly and may cause fuel spray.

- 6 Use a UL-approved pipe sealant on hose coupling with NPT threads. Follow all these recommendations:
 - Ensure that you follow the manufacturer’s instructions for installation and proper torque.
 - Do not use Teflon tape. Teflon tape on these components can cause damage during assembly or installation and defeat the conductive property of the hanging hardware and cause nozzles to malfunction.
 - Do not apply sealant to the first two threads of any hose coupling.
 - Do not use sealant on hose end couplings using O-ring seals, such as those found with coaxial vapor recovery hoses (a light coating of silicone grease is advised to allow the O-rings to seat and seal properly).
 - Assemble the clamp to the hose to ensure proper retrieval and minimum trip hazard, then the hose to the breakaway, then to the whip hose and swivel, and finally to the nozzle. Always attach the hose assembly by rotating the hose and coupling. Screw the coupling in securely. Do not overtighten.

Note: Install padded or contoured plastic hose clamps and retractor cables properly. In all instances, do not install hose retractor clamps downstream of the breakaway.

- 7 Check the hose hanging hardware for continuity. Refer to “[Testing Hose and Hanging Hardware Continuity](#)” on [page 6-50](#). Replace any components, if required.
- 8 Restore power to the unit. Open the shear valve for dispensers.
- 9 Check for leaks.
- 10 Bleed system of air. For more information, refer to “[Purging Air from System](#)” on [page 6-10](#).
- 11 Check for leaks again.

Flow Restrictors

Flow restrictors are the devices used for pumps and dispensers to reduce flow rates. Commonly, they are used for vapor recovery applications and to limit the maximum flow to 10 gpm, as per certain US national regulations. They are commonly used as a separate device attached between the hose outlet casting and hose. For more details, refer to the manufacturer's installation and service information.

Breakaway Valves

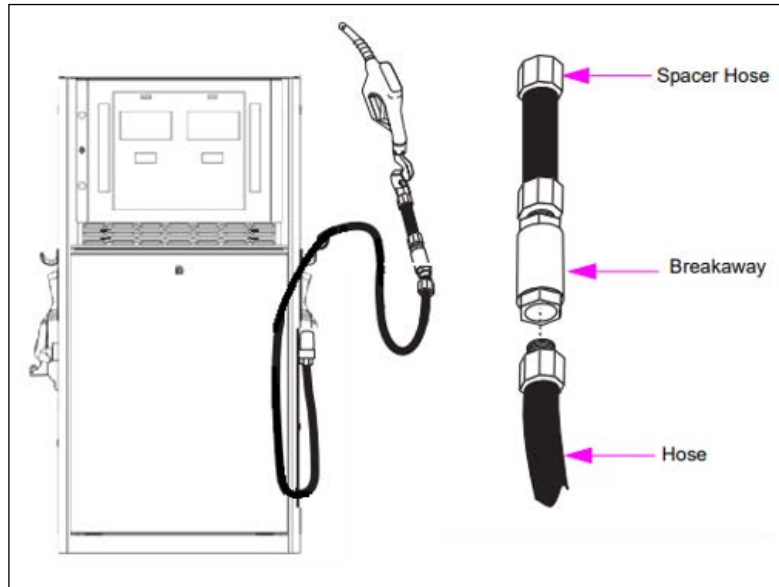
Emergency breakaway couplings help protect against fuel spill, fire hazard, and equipment damage. The breakaway valve stops significant fuel drainage from the dispenser during drive-offs, if the nozzle or hose loop catches on the vehicle. Always use UL-listed breakaways.

- For proper operation of the breakaway, always bolt the pump or dispenser securely to the island. For pumps and dispensers, refer to Gasboy AtlasX installation instructions.
- Some breakaway manufacturers require testing of pumps or dispensers for pull strength before installing the device. Follow the manufacturer's instructions.
- A hose retriever clamp must never be installed between the breakaway and nozzle.
- When installing a breakaway, always use a wrench on breakaway hex or wrench flats only.
- Always use a UL-approved pipe sealant suitable for the fuel involved for connections, except on the O-ring fittings. Never use Teflon tape.
- Some breakaways are reusable. For inspection and reuse, follow the breakaway manufacturer's instructions.

Note: Do no reuse resettable breakaways beyond the number of allowed resets listed by the manufacturer.

- Periodically and after all drive-off occurrences, check the breakaway hoses and couplings for hose continuity. Refer to “Testing Hose and Hanging Hardware Continuity” on page 6-50.

Figure 6-28: Typical Breakaway



Replacing Breakaways

To replace a breakaway, proceed as follows:

- 1 Close and test the shear valve. The unit may require multiple shear valve closures. Also, refer to the manufacturer’s instructions.
- 2 Shut off power to the unit and associated STPs. Use OSHA lockout/tagout procedures.
- 3 Drain the nozzle and hose into an approved container. Clean up any spills promptly. Wear eye protection. Be prepared for any residual pressure that may still exist in the hanging hardware.
- 4 Check for damage to the nozzle, especially the spout and threads.
- 5 If the repair or replacement is the result of a drive-off, inspect the unit for structural, meter, and piping damage. Repair or replace the damaged components, as required.
Note: Meters, piping, and connections may leak after a drive-off.
- 6 Replace the breakaway if it is not of the reusable type.
- 7 Restore power to the unit and open the shear valves.
- 8 Authorize the nozzle and check for leaks in the hose and plumbing, especially the meter and filter.

- 9 Purge the system of air. For more information, refer to [“Purging Air from System”](#) on page 6-10.
- 10 Perform a hose continuity test. Refer to [“Testing Hose and Hanging Hardware Continuity”](#) on page 6-50.

Resetting Breakaways

Note: Not all breakaways can be reset. Consult the supplier or manufacturer of the breakaway used.

To reset a breakaway, proceed as follows:

- 1 Close and test the shear valve. The unit may require multiple shear valve closures. Also, refer to the manufacturer’s instructions.
- 2 Shut off power to the unit and associated STPs. Use OSHA lockout/tagout procedures.
- 3 Check for damage to the nozzle, especially the spout and threads.
- 4 If the repair or replacement is the result of a drive-off, inspect the unit for structural, meter, and piping damage. Repair or replace the damaged components, as required.
Note: Meters, piping, and connections may leak after a drive-off.
- 5 Check for damage to the breakaway valve and seals before reassembly. Follow the manufacturer’s instructions.
- 6 Follow the manufacturer’s instructions for cleaning and lubricating seals and valve ends.
- 7 Follow the manufacturer’s instructions for recoupling.
- 8 Restore power to the unit and open shear valves.
- 9 Authorize the nozzle and check for leaks in the hose and plumbing, especially the meter and filter.
- 10 Purge the system of air. For more information, refer to [“Purging Air from System”](#) on page 6-10.
- 11 Perform a hose continuity test. Refer to [“Testing Hose and Hanging Hardware Continuity”](#) on page 6-50.

Service Tips

- Do not reuse a separated breakaway if any part appears damaged.
- Some brands of breakaways require lubrication every six months. Others require only periodic visual inspections. Follow the manufacturer’s recommendations.
- Inspect the breakaway for leaks at least once a week or on complaint of a leak.
- If the breakaway separates without a drive-off occurring, do not reuse. The breakaway may be defective, having been reset excessive number of times, or have an inadequate rating for the application. If multiple breakaways have this issue, first suspect inadequate rating for the application.

- Consult the manufacturer for the maximum number of times you can reset a breakaway. Some breakaways cannot be reset.
- A protective sleeve supplied by the manufacturer is recommended to avoid damage to the dispenser and to improve appearance.










Testing Hose and Hanging Hardware Continuity

Perform an electrical continuity check when installing hoses after a drive-off and for periodic preventive maintenance. The STP check valve or pump regulating valve must maintain the operating pressure to perform this test. The following procedure tests the continuity of the hanging hardware (that is, hose, nozzle, swivel, breakaway, and hose casting). Hose and hardware continuity tests are not required for DEF units.

Note: Testing of an unpressurized hose may lead to false conclusions in determining if a defect exists or not.

⚠ WARNING

Read and follow all hazardous zones requirements.

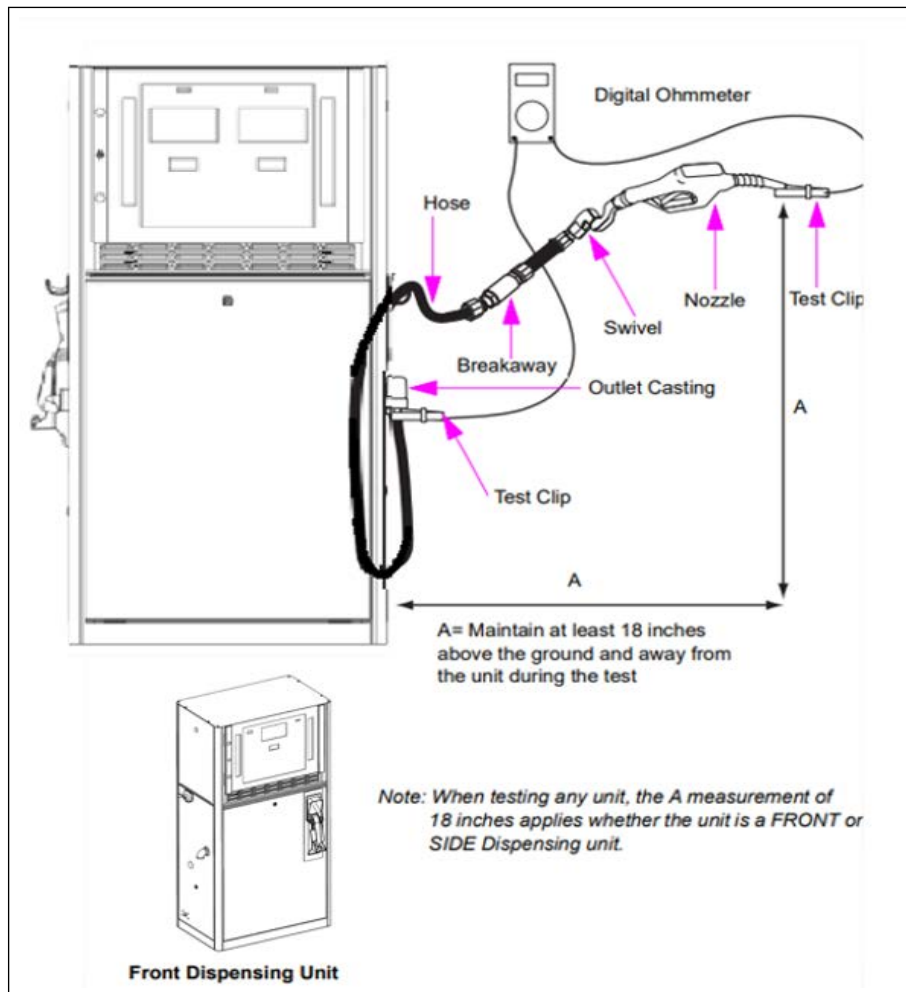
 	<p>You are working in a potentially dangerous environment of flammable fuels/vapors. Fuel and its vapors may ignite, leading to serious injury or death.</p>
 	<p>Fire, explosion, or electrical shock could result in severe injury or death if you do not follow safety procedures.</p>
 	<p>Ensure that you correct any safety hazards and barricade the area. Follow the manufacturer's instructions for the safe use, operation, and maintenance of the testing equipment.</p>
 	<p>Use only a low voltage digital Ohmmeter. Do not turn the tester On until the connections are made. Turn the tester Off before disconnecting test clips. Do not test continuity if there is spilled fuel, leaking components, or fuel vapors present in the area.</p>
	<p>Hanging hardware without the proper electrical continuity rating presents a risk of igniting fuel vapors.</p> <p>Injuries or death may result if hose continuity is not maintained.</p>

Use approved procedures to test for hanging hardware continuity. For additional information, refer to PEI/RP400-02 in addition to the equipment and component manufacturer's instructions.

To test the hose and hanging hardware continuity, proceed as follows:

- 1 Ensure that there is no liquid fuel or flammable vapor present. Clean up, as required.
- 2 Lift the nozzle hook and authorize the unit to pressurize the hose.
- 3 Lower the nozzle hook, shutting the unit off.

Figure 6-29: Testing Hanging Hardware Continuity



- 4 Connect one probe to the nozzle spout and the other probe to the fuel outlet fitting at the outlet casting, or other component grounded with the unit frame (see [Figure 6-29](#) on [page 6-51](#)). For the probe to read properly, the contact surface must be clean and free from fuel or other contamination.
 - Use test leads that are at least 3 feet long (1 meter) and equipped with insulated clips.
 - Typical meter test clips are not suited for direct attachment to the hanging hardware. Use an appropriate clamping device to ensure good contact.
 - Keep the nozzle at least 18 inches above the ground and 18 inches away from the dispenser during this test.
 - Wear insulating gloves if the hanging hardware component is handheld during test, or use an insulated device to support the nozzle. For additional information, refer to PEI/RP400-02.

- 5 To test the continuity, turn on the meter to conduct the test.
 - Measure the resistance while flexing and moving the hose and nozzle into various positions that could be reasonably expected during fueling.
 - Keep good electrical contact between probes and contact locations.

- 6 UL330 states that resistance must not exceed 70,000 Ohms per foot (233,000 Ohms per meter). If the test reading complies, this indicates that the hanging hardware has passed the continuity test.

If test readings exceed 70,000 Ohms per foot:

- If you are testing on sheet metal or other locations in the pump or dispenser, perform the continuity test instead, between the J-box and the end of the nozzle.
- Check the contact surface for corrosion, dirt, or film. If required, polish the test probe location with emery cloth to ensure that there is good contact. Do not polish appearance parts such as sheet metal and so on.
- If no problem exists, isolate the defective part by performing continuity tests between and across the hose, nozzle, swivel, breakaway, and hose casting. Replace any part if the resistance exceeds the manufacturer's recommended maximum limit.
- Do not use components if the test reading shows an open circuit or any other defect.

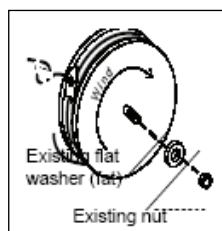
Internal Hose Retrievers and Clamps



Read and follow all safety precautions as outlined in [“Read This First”](#) on [page 1-1](#). Use OSHA lockout/tagout procedures.

Check hose retrievers regularly for frayed or broken cables and cables wrapped around hoses. Check retriever reels for free movement and lubricate, if required.

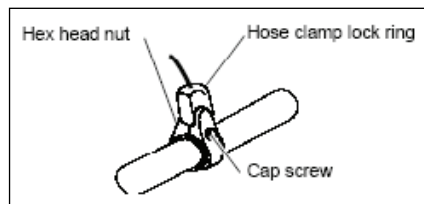
Replacing Retriever Reels, Cables, and Hose Clamps



To replace the retriever reels, cables, and hose clamps, proceed as follows:

- 1 Install hose onto the pump/dispenser.
- 2 Allow hose to assume a natural coiled shape while holding the hose upright on the island.
- 3 If retriever reel does not have the cable, connect the cable to the reel.
- 4 Load the retriever reel to the required spring force.
- 5 Assemble the reel to the reel hanger.
- 6 Thread the cable from the reel through the cable grommet, and then through the hose clamp lock ring.
- 7 Tie a knot and insert into the cable end.
- 8 Slide the cable end into the hose clamp lock ring. 1-inch hoses use metal clamps instead of plastic hose clamps.
- 9 Install a retriever clamp at the top of the loop. Attach a hose clamp lock ring (cable end) to the hose clamp. Use a cap screw and hex head nut to secure. Do not overtighten. Always use appropriately-sized, padded, or contoured plastic clamps for hoses. Under-sized clamps will damage the hose cover.

Figure 6-30: Replacing Retriever Reels, Cables, and Hose Clamps



- 10 With the retriever cable fully extended, ensure that there is some slack on the hose. Do not allow coaxial hoses to touch the ground when retracted and hanging.

Pumping Unit



WARNING



- Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.



- Fire and explosion could result in severe injury or death.



- Shut off power to the unit.



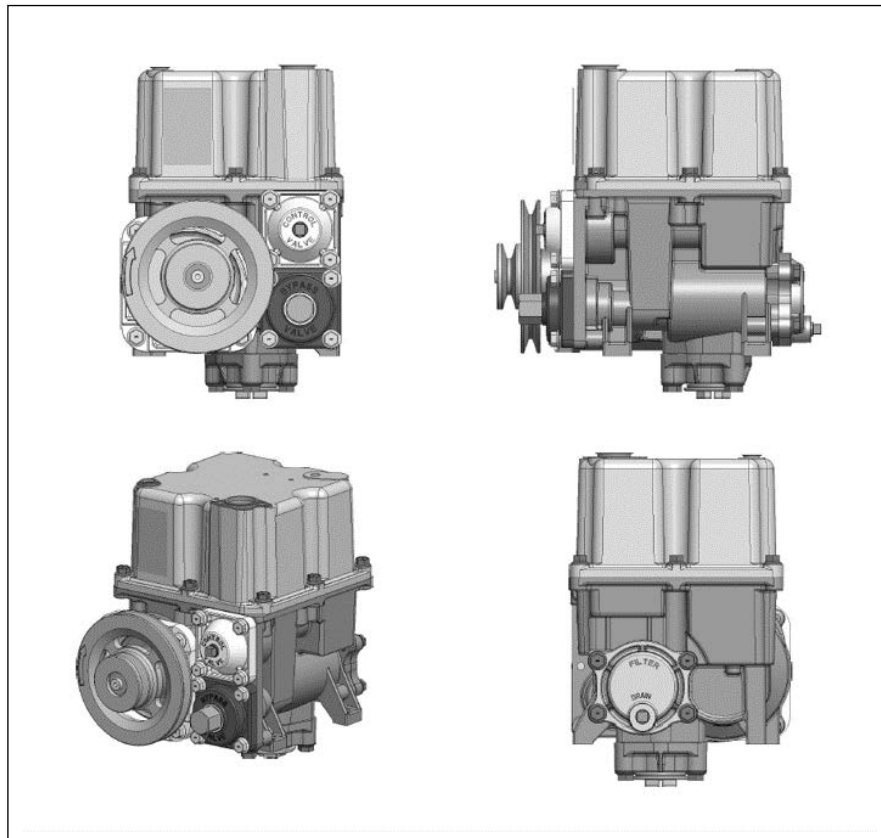
- Remove the parts slowly. Collect fuel in approved containers.

- Clean up all spills promptly.

About Pumping Unit

Self-contained Gasboy AtlasX units use the Pumping Unit made of aluminum and sealing surface that may get damaged while working on an inappropriate surface.

Figure 6-31: Pumping Unit (Four Views)



General Pumping Unit Service Procedures

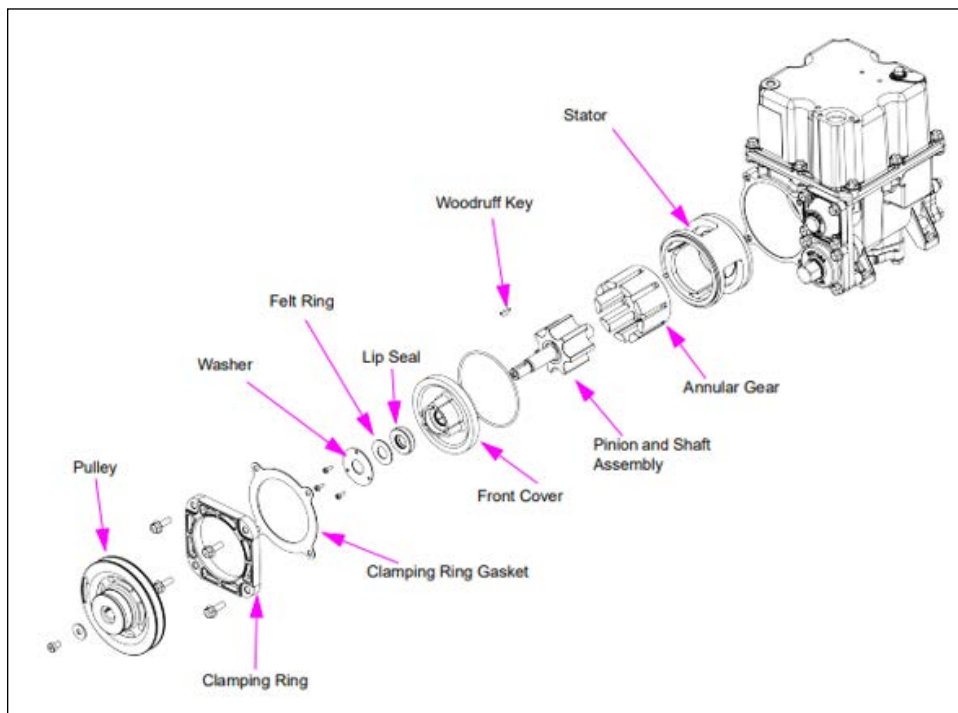
This service manual contains basic service procedures for the Pumping Unit.

Note: For additional Pumping Unit service information, refer to MDE-5662 Gear GPU+ Operation and Service Manual.

Draining the Pumping Unit

Draining the pumping unit to some extent is required while opening the unit for servicing the strainer, or removing the bypass or control valves.

Figure 6-32: Pumping Unit Servicing



To drain the bulk of the fluid from the pumping unit, proceed as follows. Residual fluid may remain in the pumping unit.

To drain the Pumping Unit, proceed as follows:

- 1 Put an approved tray in place to collect the fuel.
- 2 The pumping unit contains up to 0.5 liters (1.1 pints or 0.53 quarts) of fluid.
- 3 If sump drainage is required, the plug on top, right, and rear of the pumping unit casing may be removed.
- 4 Manually turn the pumping unit pulley counterclockwise to aid fluid removal.
- 5 Properly dispose of all fluid drained from the pumping unit.
- 6 After the pumping unit is drained, replace all plugs using a non-hardening UL-approved pipe sealant suitable for the type of fluids being used.

Note: Do not use Teflon tape.

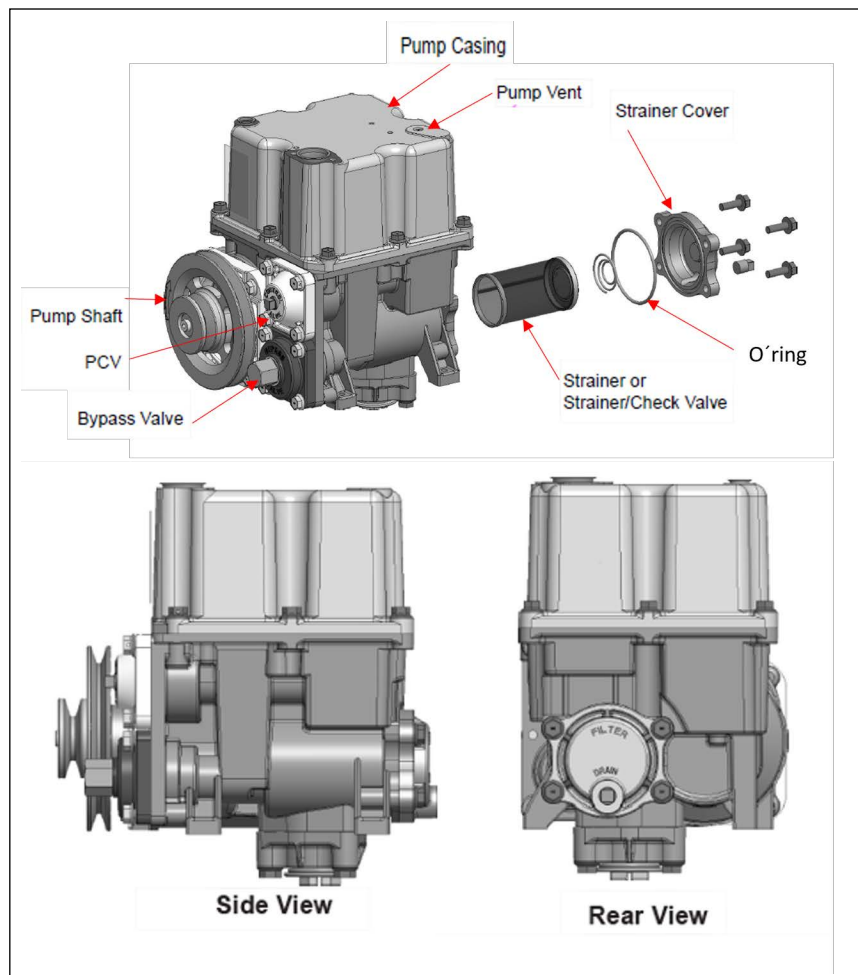
Servicing Strainer Check Valve

This section explains about servicing the strainer check valve.

Removing Strainer (or Strainer/Check Valve)

Check valves (if equipped) are to be replaced only if the pumping unit is experiencing frequent loss of prime, indicating that the check valve is not functioning. A check valve must be installed when a tank check valve is not available. Always use a strainer with the pump. Failure to use a strainer may cause premature pumping unit failure and may void warranty. The strainer must be kept clean to ensure proper operation and to extend the life of the pumping unit.

Figure 6-33: Strainer Check Valve



CAUTION

The Inlet Strainer Check Valve is required on all TW1M pumps for proper operation. If the pumping unit is replaced on these models, you must also install an Inlet Check Valve Kit (M09593K207). Failure to include an Inlet Strainer Check Valve on these models will result in reduced flow rate and fuel discharge from the adjacent pump sump vent.

To remove the strainer/strainer check valve, proceed as follows:

- 1 Lower the pumping unit fluid level by removing the plug located in the lower part of the strainer cover. Remove the four hex nuts holding the cover in place.
Note: Removing the plug allows air to enter (see Figure 6-33 on page 6-56).
- 2 Remove the strainer cover. Inspect the gasket for damage. If the gasket is damaged, discard the gasket and replace it with a new gasket.
- 3 Carefully pull out the strainer. Keep the strainer in a horizontal position to avoid contaminating the pumping unit with strainer debris. It may be required to use a small tool to gently hook the inside of the metal strainer end cap.
- 4 If the pumping unit contains an inlet check valve assembly, remove the inlet check valve. Inspect the area for cracked or otherwise damaged gaskets. Replace any worn or damaged gaskets.
- 5 Remove the strainer from the bore located behind the check valve assembly. Inspect the strainer for damage. Clean and/or replace the strainer, if required.

Installing Strainer Check Valve

To install the strainer check valve, proceed as follows:

- 1 If the unit is equipped with the check valve option, insert the dome strainer into the bore.
- 2 Clean any debris from the check valve and carefully inspect the gaskets.
- 3 Insert the check valve assembly or strainer support into the corresponding pumping unit bore (see Figure 6-33 on page 6-56). Press the assembly squarely over the receiving cylindrical surface until the gasket seats over the surface and holds the assembly in position.
- 4 Insert a new or cleaned strainer into the bore, over the check valve assembly.
- 5 Clean any debris from the strainer cover and install a new gasket.
- 6 Install the strainer cover. Hand-tighten and keep the cover parallel to the casing face. Torque the screws to 150 lbs-in (17 Nm). Do not overtighten as it may cause damage.
- 7 Replace the plug in the hole of the strainer cover.
Note: Use a UL-approved sealant suitable for the fuel involved.

Service Tips

- Clogged strainers must be frequently cleaned using denatured alcohol. If damaged or permanently clogged, replace the strainer.
- If check valves are sticking, it may cause reduced flow rate. If stuck open, check valves cause the loss of unit prime.
- It is a good service practice to replace the strainer cover gasket when servicing the strainer or check valve. This will help avoid subsequent leaks.

Servicing Pressure Control Valve (PCV)

This section explains about servicing the PCV.

Removing PCV

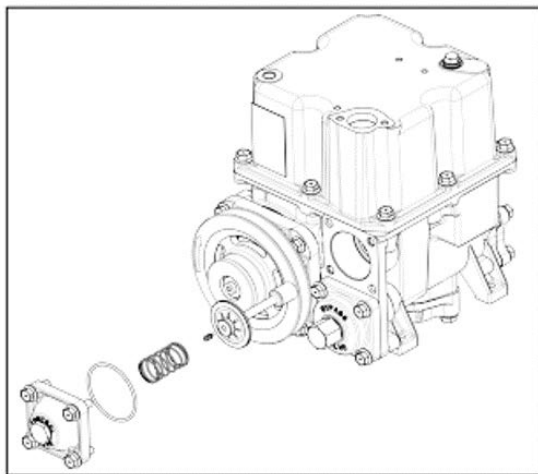
The purpose of the PCV is to apply a slight back pressure to the pumping unit, to prevent it from pumping air through the meter (for example, during a dry tank situation). Meters will meter air as well as fluid.

Excessive wear or a sticking PCV can cause improper pump performance, including flow loss, excessive or low discharge pressure, or metering of air under a dry tank condition.

To remove a PCV, proceed as follows:

- 1 Drain the pumping unit. Refer to “[Draining the Pumping Unit](#)” on [page 6-55](#).
- 2 Remove the snap ring (see [Figure 6-34](#)).

Figure 6-34: PCV



- 3 Turn the valve cover outward or counterclockwise using a 16-mm socket wrench until it is completely removed.
Note: The cover is held on by bolts and not screwed in.
- 4 Remove the spring and valve.
- 5 Remove the valve from the bore using needle nose pliers.

Installing PCV

To install a PCV, proceed as follows:

IMPORTANT INFORMATION

Modification of the PCV or failure to correctly install all components of the PCV will **void** any regulating agency recognition applicable to this pump.

- 1 Inspect the valve for damage or excessive wear. Replace the valve, if required.
Note: The valve must move in and out of the valve bore freely, with only minor resistance. If it does not, check for burrs or contamination in the bore or on the valve.
- 2 Install the PCV in the reverse order of removal (see [Figure 6-34](#) on [page 6-58](#)).
- 3 Apply a thin coat of grease on the cover of the gasket to prevent the gasket from being damaged during installation.
Note: Replacement of the gasket is recommended if the gasket has not been replaced during previous service, and is older than six months or shows signs of deterioration.

Service Tips

- PCVs normally fail from excessive wear or sticking.
- Symptoms of failure may be reduced flow rate, reduced pressure, or metering of air with a dry tank.
- The plug in the cap can be removed and a discharge pressure measurement can be taken, using a gauge at that point. The gauge will measure the pressure downstream from the control valve. A stuck valve will result in lower pressure.

Servicing Bypass/Pressure Relief Valve (PRV)

The PRV functions to prevent excessive pressure from being built up internally within a pumping unit. Excessive pressure can cause overheating during idling, motor stalling, or premature motor failure. Low factory pressure settings can cause low flow rate. Relief settings are set for normally anticipated operation with the unit style, and must not be changed from factory settings.



WARNING



- Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.



- Fire and explosion could result in severe injury or death.



- Test and close the shear valves involved. Shut off power to the unit.



- Remove the parts slowly. Collect fuel in approved containers.
- Clean up all spills promptly.

Service Tips

- Adjustment of pressure in the PRV is not recommended normally. A lower adjustment can result in low flow rates. A higher adjustment can result in premature motor failure.
- While inspecting or installing PRVs, avoid introducing contamination into the unit.
- PRVs normally fail only from excessive wear, especially at the seat or in the valve bore area, or sticking from defective parts or contamination. Low flow, high pressure (motor failures and so on), overheating, or noise can result in PRV failure.
- Replace the external seals while inspecting or servicing the valve, if the seals are more than six months old or appear degraded.
- Units that are idle for excessive time with the motor running and no fuel being dispensed may overheat resulting in vapor lock and so on. Use pump time-outs (Electronic units) or lower pressures to reduce this possibility.
- When the pumping unit is operating at full speed, the discharge pressure must not exceed 50 psi (3.5 bar) with any discharge restriction (fully open to fully close discharge). If the pressure exceeds 50 psi (3.5 bar), refer to the following table:

Cause	Solution
Bypass/PRV is stuck operating at full open position.	Replace the valve.
Excessive voltage to the motor.	Measure proper input voltage to the motor.

Optimizing Adjustment on Pump Bypass Preload

It is not recommended to alter the bypass adjustment from the factory setting. However, if the flow rate is low, and other means of increasing flow rate, such as cleaning filters have been performed, adjustments can be made if the motor amperage is low.

- 1 Connect an amp probe to a power leg of the motor.
- 2 Operate the unit at full flow and in bypass, and record the amperage.
- 3 If the amperage is found to be substantially below the rated amperage, bypass adjustment can be made using the following procedure.

Note: Before making adjustments, ensure that the motor has been switched off.

To optimize the bypass preload, proceed as follows:

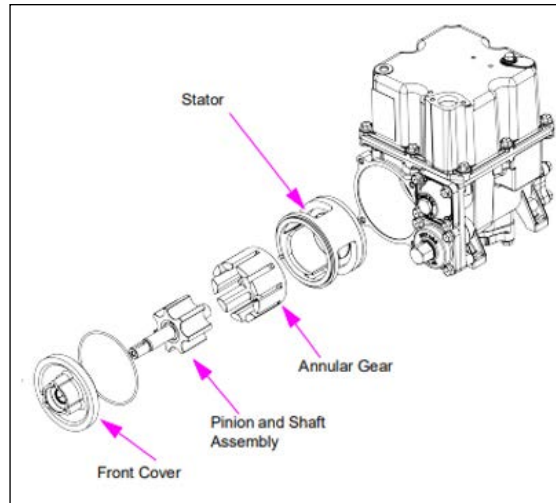
- 1 Remove the adjustment cap on the pumping unit.
- 2 If the amperage from the initial test is low, turn the adjustment screw clockwise and increase the preload (and the flow rate and motor load).

Note: If the initial bypass voltage is below 205 V for a 220 V system, or below 100 V for a 110 V system, then the wiring is insufficient to handle full motor loads. In such a case, the maximum amperage must be set to a maximum of 4.9 A on a 220 V system and 9.5 A on a 110 V system.
- 3 Run the unit and check the amperage at full flow and at bypass (both must be checked to verify proper loading on the motor).
- 4 Adjust the screw to obtain amperage just below the maximum setting noted on the motor faceplate.
- 5 Replace the adjustment cap. Disconnect the amp probe and replace the J-box cover.

Servicing Rotor and Shaft Assembly

The rotor and shaft assembly is the heart of the pumping unit. It creates the flow and pressure supplied by the pump.

Figure 6-35: Rotor and Shaft Assembly



WARNING



- Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.



- Fire and explosion could result in severe injury or death.



- Test and close the shear valves involved. Shut off power to the unit.



- Remove the parts slowly. Collect fuel in approved containers.

- Clean up all spills promptly.

Service Tips

- The normal failure mode for pumping elements is excessive wear. Occasionally, a seizure in the bore can result. Wear/seizure can result in either lower or very low flow, or less commonly motor stalling, and very occasionally noise.
- If the pumping elements appear with minimal wear and the symptom is noise or low flow, usually there is an installation issue starving the pump or an issue with the Bypass/PRV, Control Valve, or a component downstream.
- Avoid introducing contamination into the unit while inspecting or replacing the pumping elements, including the rotor and shaft. Always use the strainer provided and ensure that it is not clogged.
- Some pumping elements have grooves in the blades manufactured, on purpose. While replacing the blades, always install new blades in the same orientation.
- A shot of clean oil in the bore after replacing the pumping elements will aid in priming and initial start-up.
- Excessive belt tension may cause failure of the pumping elements or bearings.

Pump Motor

About Electric Motor for Self-contained Pump Units

This section explains about the electric motor for self-contained pump units.

Motor Loads

The following chart shows the maximum running amperage that can be expected for the pump motor, unless noted otherwise:

Model	Motor Rating	
	115 V 50/60 Hz 1PH	230V 50/60 Hz 1PH
8853G,9853G,9153G	13 A	6.5 A

Thermal Overload

Most motors have a thermal overload switch to open the circuit automatically if the motor is overheated or drawing excessive current. When the switch cools, it activates and turns the motor back on. Motors do not require a manual reset.

If overload shut-off occurs frequently:

- Check the motor wiring for proper voltage selection (110/230/240) see “[Motor Voltage Selection Wiring](#)” on [page 6-63](#) and refer *FE-371 AtlasX Dispenser Field Wiring Diagram* to confirm correct wiring is used based on voltage input power source.
- Check for free pump and motor shaft rotation.
- Check the Pump Bypass Valve and relief pressure setting.
- Check the belt tension.
- Check the line voltage during operation with the nozzle closed and then with the nozzle open. Low or high voltages (greater than +/- 10%) can cause overheating or premature failure.
- NFPA requires explosion-proof motors. Only use an AtlasX-specified explosion-proof motor for replacement.

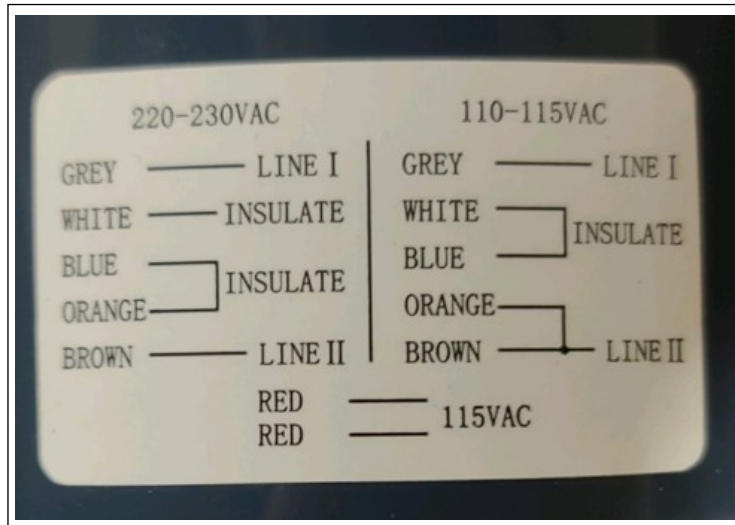
Service Tips

- Frequently, low voltages during operation can result when the PRV is set to too high a pressure, or wiring to the motor is inadequately sized for the motor load.
- Premature motor failures are usually caused by continuous operation at too low a voltage or high pressure setting at the PRV.

Motor Voltage Selection Wiring

The single-phase motor supplied with AtlasX can operate with either 220/230 VAC or 110/115 VAC to give the motor ability to match the supplied AC voltage. Refer to the motor label (Figure 6-36) for the correct wiring to match the supplied AC voltage. Also, see *FE-371 Field Wiring Diagram AtlasX*. In case of 110/115 VAC supplied, the “LINE II” on the label would be the neutral. For the pump motor control/motor relay drive (two red 20 AWG wires), either wire can be connected to the AC Hot or to the AC Neutral (see Warning below).

Figure 6-36: Motor Voltage Selection Wiring



WARNING

The AC voltage applied across the pump motor control/motor relay drive (two red 20 AWG wires) must not exceed 120 VAC, or else the motor will be damaged.

Belts and Pulleys

The following information is required to inspect and service the belts and pulleys:


Inspecting Belts and Pulleys


Check belts and pulleys every time you inspect or change belts. Replace them if any of these conditions exist:

- Excessive wear in the pulley grooves, on the pulleys, belts, excessive pulley-to-shaft clearance, or excessive bearing play
- Cracks or linear separations in the belt
- Frayed belts or excessively worn belts

Service Tips

- Excessive belt tension can cause motors or the pumping unit to fail prematurely.
- Excessively low belt tension can cause premature belt failure, noise or pulley failure as well as reduced flow rate.

 **WARNING**



Belts and pulleys can pinch fingers and hands.

Injuries may result. Avoid placing fingers or hands between belts and pulley.

Never apply power while fitting the belt to the pulley.

Setting Belt Tension

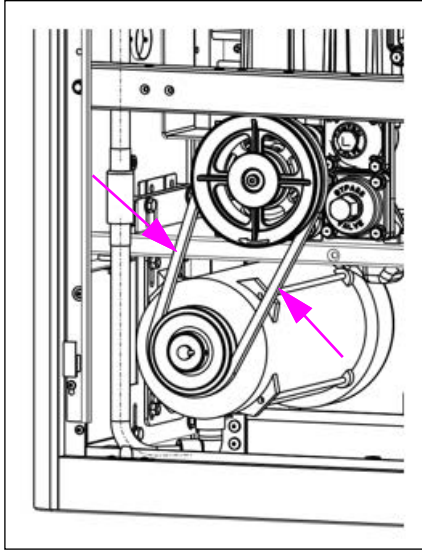
Overtightened belt tension can cause both pump and motor bearing to excessively wear out and lead to premature failures. Loose belts result in low flow, pulley and belt failures, or noise. Use the following rating of belt tension: 45-55 lbs (200-244 Newtons).

Do not run the motor to install the belt. The belt is tight during assembly. Some belts have arrows marked on them to show the direction of rotation. While replacing the belts, ensure that the arrows point in the direction of rotation.

Belt Adjustment

If no tension gauge is available, push the belt in as shown in [Figure 6-37](#). If there is more than 1-inch of play on one side of belt, tighten it.

Figure 6-37: Adjusting Belt



Inspecting Pulleys

Check every time you inspect or change the belts. Replace if these conditions exist:


- Excessive wear in grooves, excessive pulley-to-shaft clearance, or excessive bearing play, cracks, and so on.






Adjusting Belt

To adjust the belt, proceed as follows:

- 1 Loosen the two shoulder bolts at the bottom of the motor deck plate.
- 2 Loosen the two screws that attach the top of the deck plate with the upward flange on the pump mounting plate.
- 3 Lift the motor to loosen the belt.
- 4 To tighten the belt, insert a large screwdriver or crowbar between the motor and pump mounting plate, and push down in front, forcing the motor downward.
- 5 The Expansion Union will permit upward or downward adjustment with the conduit attached.
- 6 After you have achieved the proper belt tension, tighten the two upper screws, and then the bottom shoulder bolts.

Valves

 **WARNING**

-  • Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.
-  • Fire and explosion could result in severe injury or death.
-  • Test and close the shear valves involved. Shut off power to the unit.
-  • Remove the parts slowly. Collect fuel in approved containers.
-  • Clean up all spills promptly.

Flow Control Valves regulate the flow rate. Check valves at the manifold and meter help keep the meter full of fuel. Manifold and Meter PRVs also help relieve excessive pressure due to thermal expansion, which could damage parts or make nozzles difficult to open.

Solenoid Valves

Solenoid valves use a solenoid coil to open or close a valve. Valves of this type are either fully open or fully closed. Servicing consists of replacing the coil, valve body, or board supplying voltage to the valve. For Gasboy units, the voltage of the solenoid must match whatever voltage is being supplied to the CD Module Feed input. Gasboy Ultra-Hi and DEF units use the 115 VAC solenoid. If the solenoid requires replacement, ensure that you replace with the correct voltage solenoid.

Gasboy AtlasX units have solenoid valves either built into the manifold, or as components in the discharge piping line.

AtlasX models 8853, 9153, and 9853 have a 1-inch 2-stage solenoid valve built into the manifold. For service, refer to [“Solenoid Valve and Filter Manifold”](#) on page 6-68.

All AtlasX dispenser models that can have internal piping for feeding a satellite use a solenoid valve in the discharge piping line. These models are 8850, 9850, and 9153 or 9853 with an “S” suffix. For repair or replacement of these valves, read this section.

Rebuilding or Replacing

Labor cost for your area may determine your service philosophy. High labor costs favor parts replacement. The difficult removal of a part from a unit favors a partial rebuild in the unit. Gasboy recommends the following services for average or lower than average labor costs:

For Valves	Recommended Service
Less than two years old	Use a repair kit (replace spring, diaphragm, and O-rings)
More than two years old or high usage	Replace the valve

To rebuild or replace a solenoid valve, proceed as follows:

- 1 Close and test the shear valves for dispensers.
- 2 Shut off power to the unit and for any involved STPs in the dispensers. Use OSHA lockout/tagout procedures.
- 3 Open the nozzle into an approved container to bleed of any pressure. Some residual pressure may remain.
- 4 Check the disconnected valve coils for continuity. If the coil is bad, replace the coil.
- 5 Replace any valves, if they are defective.
- 6 Use a UL-approved sealant required for fuels while replacing valves. Do not use Teflon tape. Teflon tape debris may cause the valve to malfunction.
- 7 Clean the valve area. Do not introduce contamination into the valve or piping.
- 8 Install valves with the flow arrow in the proper direction.

Service Tips

If no magnetic field or power exists, the following are likely problems:

- Power from the valve driver board
- Cable problem

If power exists, the following may be likely problems:

- Coil
- Valve body

Solenoid Valve and Filter Manifold

WARNING

- Wear eye protection. Residual pressure and entrapped fuel may still be present and may drain or spray while removing the parts.
- Fire and explosion could result in severe injury or death.
- Test and close the shear valves involved. Shut off power to the unit.
- Remove the parts slowly. Collect fuel in approved containers.
- Clean up all spills promptly.

About Valve and Filter Manifolds

The Valve and Filter manifold connects to the meter inlet and provides filtration upstream of a built-in 1-inch 2-stage solenoid valve. Filters must be selected and changed as per “[Filters and Strainers](#)” on [page 6-39](#). The valve diaphragm and coil are the serviceable parts. Use Gasboy recommended kits for valve repair. Follow the instructions provided in the kit.

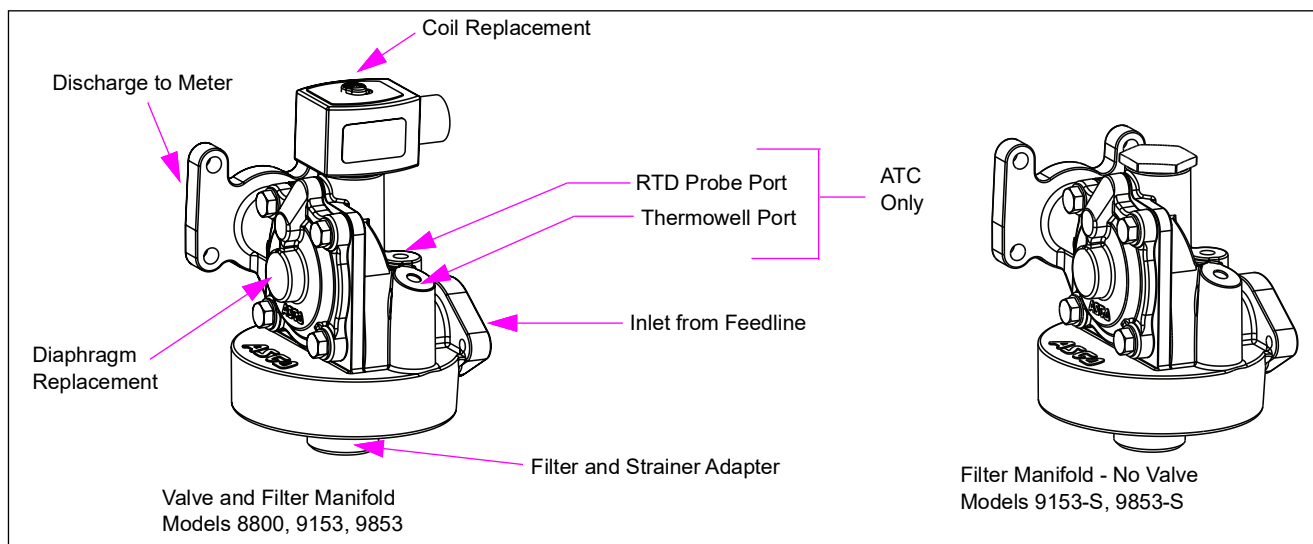
Recommended Solenoid Valve Repair Kits

Kit Description	Kit No
ASCO Diaphragm Repair Kit	M04607K010
ASCO Coil Replacement Kit - 110/120V	M04607K012
ASCO Coil Replacement Kit - 220/240V	M04607K013

The manifold also provides probe and thermowell ports for the ATC option.

There is also a no-valve manifold used on models that have a piping to satellite provision. This provides filtration, but there is a separate valve downstream of the meter.

Figure 6-38: Valve and Filter Manifold



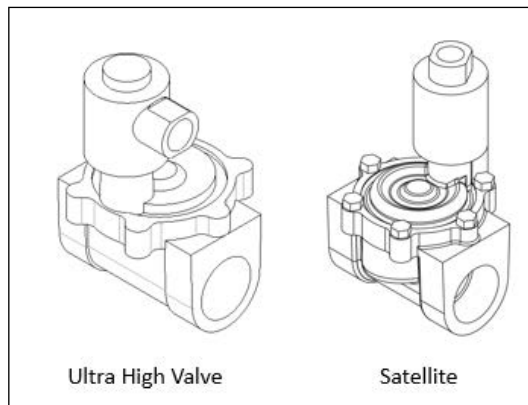
Service Tips

While reinstalling the strainer, always install it with tabs pointing downwards. Hand-tighten the filter and do not use a wrench.

Solenoid Valves for 8850, 9850, and 9X53 with Satellite Outlet Piping

Figure 6-39 shows the solenoid valve with satellite outlet piping for 8850, 9850, and 9X53 models.

Figure 6-39: Solenoid Valves with Satellite Outlet Piping



Troubleshooting

Problem	Recommended Solution
No flow or slow or fast flow	Check the valve power and then hydraulic parts (diaphragm, spring, core, and so on)
Pulsing flow	Check the hydraulic part of the valve
Missed Preset	Check the hydraulic part of the valve and unit firmware
Delivery is indicated but nozzle is closed	Check the valve diaphragm, STP check valve, or use of softwall hose

Rebuilding or Replacing

Labor cost for your area may determine your service philosophy. High labor costs favor replacement. Difficult removal from unit favors partial rebuild in the unit. Gasboy recommends the following services for average or lower than average labor costs:

For Valves	Recommended Service
Less than two years old	Use a repair kit (replace spring, diaphragm, and O-rings)
More than two years old or high usage	Replace the valve

Service Steps



Read and follow all safety precautions as outlined in “[Read This First](#)” on [page 1-1](#) and at the start of this section.

To service solenoid valves, proceed as follows:

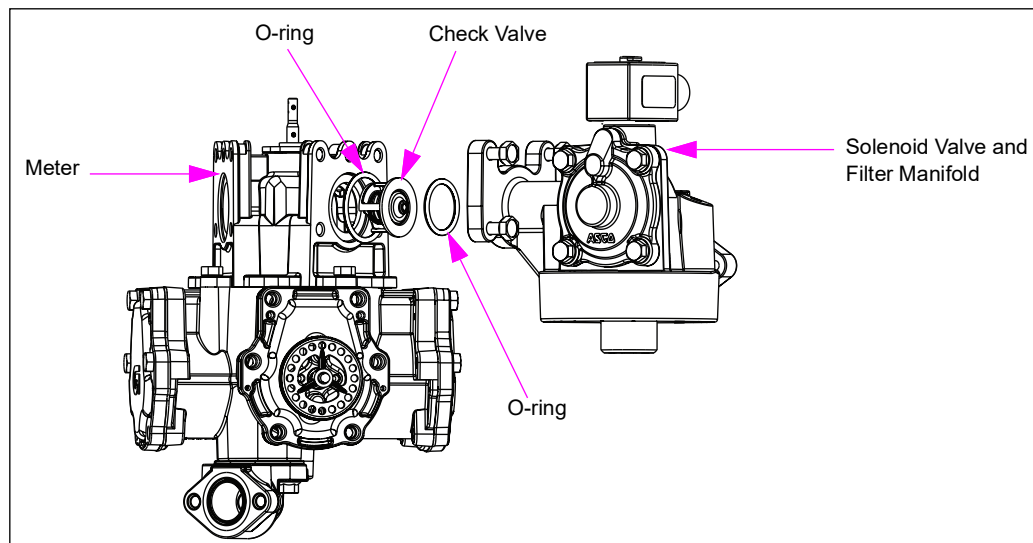
- 1 Power up and check power to the valve.
- 2 Shut off power to the unit. Check the disconnected valve coils for continuity.
 - Resistance across coils is 200-500 Ohms (approximately) for most single-stage valves.
 - Two-stage valves have two coils with two different resistances, 200 and 500 Ohms (approximately).

- 3 Replace the valves and/or coils if readings are out of tolerance.
- 4 Use UL-approved sealant (as required) while replacing the valves.
Note: Do not use Teflon tape.
- 5 Clean the valve area. Do not introduce contamination.
- 6 Install valves with the flow arrow in proper direction.
Note: Two-stage valve torque specifications on Hexagonal Head bolts is 130+/- 10-inches lbs.

Meter Check Valve

This section explains about servicing the meter check valve.

Figure 6-40: Check to Meter Orientation



Potential Problems

The following are the potential meter check valve problems:

- Damage to hydraulic parts can occur from thermal expansion or driving over a hose, if the valve is inoperative.
- If a valve sticks open, a sale may register when you first turn the nozzle hook on with the nozzle closed. Check STP check valves for problems.
- Stuck valve can cause reduced flow rates
- Leaks
- Calibration problems

Service Steps

The following are the steps for servicing the meter check valve:

- Check valves are not rebuildable. Replace any defective check valves.
- Wear eye protection while replacing any check valve.

To service valves, proceed as follows:

- 1 Close and test the shear valves for dispensers.
- 2 Shut off power to the unit and any involved STPs. Use OSHA lockout/tagout procedures.
- 3 Open the nozzle into an approved container to bleed pressure. Some residual pressure may remain.
- 4 Use a Gasboy AtlasX repair kit to replace the check valve.
- 5 Inspect the metallic seat of the valve body for damage or uneven seating surfaces.
- 6 Clean any contamination from the valve body interior.
- 7 Torque bolts properly. Refer to “[Torque Specifications](#)” on [page 6-9](#).

Shear Valves

Shear valves have a section of the valve that is designed to break from an impact to the unit. Shear valves cut off the flow of fuel from the product piping if the impact or fire causes the shear valve linkage to trip. Single poppet shear valves only stop fuel at the product piping. Double poppet shear valves also stop fuel from draining out of the dispenser.



CAUTION

Improper wrench technique may damage the shear valve and lead to leaks. Excessive force applied to the shear valve during fitting and tightening may damage or weaken the shear section of the valve. Always use two wrenches; one wrench to hold the valve above the shear line and another wrench to apply force to the fitting.

UL requires all dispensers to use shear valves. Follow these recommendations while installing or servicing shear valves:

- Read and follow the shear valve manufacturer’s service instructions.
- Ensure that there is free movement of the linkage.
- Lubricate the valve linkage as per the manufacturer’s instructions.
- Follow the manufacturer’s recommendations while installing the valves first.
- Shear section of valves must be flush with top of islands.
- Do not mount the valve upside down.
- Rigid cross member and mountings are important devices for proper operation of the system. Anchor shear valves rigidly.
- Inspect the valves every six months. Ensure that the valve linkage is free and clear from any debris, conduit, piping, or any other obstruction. Lubricate the linkage with SAE 10W motor oil.
- Gasboy highly recommends that you always use the double-poppet shear valve instead of single-poppet when replacing valves. Use of double-poppet shear valves may require some internal plumbing changes in older units. Double-poppet shear valves prevent fuel from draining from the unit, which has been knocked off the island.
- Do not use pliers to open or close shear valves. Reduce the pressure if the valve does not open easily. For proper tools and procedures, refer to the shear valve manufacturer’s instructions.

Figure 6-41: Typical Shear Valve Linkage

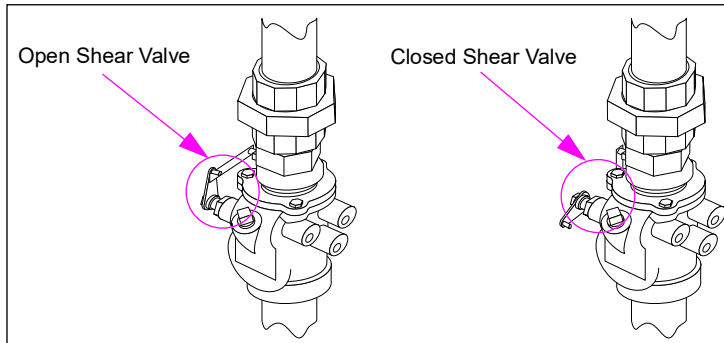
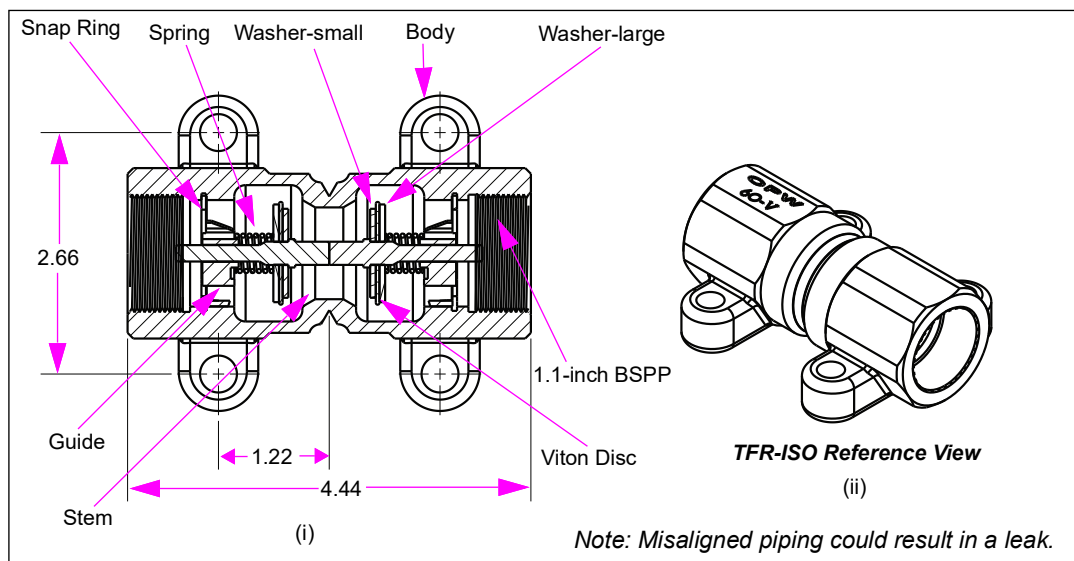


Figure 6-42: OPW Shear Valve for 8862/9862GX DEF Unit



Inspecting Shear Valves

⚠ WARNING

Always confirm proper operation of the shear valve before performing the hydraulic service that requires the shear valve to be closed. In some instances, a shear valve may outwardly appear closed but could actually be open.

To inspect a shear valve, proceed as follows:

- 1 Close the shear valve. Authorize the hose at the console, as required.
- 2 Lift the operating handle.
- 3 Place the discharge nozzle in an approved container.
- 4 Squeeze the nozzle operating lever. If the flow continues after several seconds, it indicates that the valve is defective.
- 5 Repair or replace the valve.

- 6 Place a few drops of SAE 10 W motor oil or equivalent on the valve body shaft after testing. Open and close the valve by hand several times. Place the valve back in service.

T-52A Pressure Regulator Valve Option

The Model T-52A PRV is a unique control valve developed for use with suction-type island dispensers. It can be used for above ground storage tank installations or in booster systems, with a submersible pump in an underground storage tank.

The standard Model T-52A PRV is designed for temperatures up to -13°F (-25°C). A T-52A cold option is available for applications, where the valve must operate in temperatures between -13 °F to 40 °F (-25 °C to -40 °C). The T-52A-Cold Valve is not for use with methanol/ethanol applications.

Vapor Recovery Stage 2 Balance Type

Stage 2 Balance Type Vapor Recovery uses a coaxial hose and nozzle with bellows to remove vapors. A liquid evacuation device (Venturi or Co-Vent®) installed in the coaxial hose, removes liquid splashback from the vapor hose passage.

- Vapor Recovery hoses must never touch the ground when nozzle is at rest in the dispenser.
- Promptly replace the damaged hoses, nozzle bellows or face seals.
- Inspect parts daily.

Troubleshooting



Read and follow all safety precautions as outlined in “[Read This First](#)” on [page 1-1](#).

The following table lists possible problems and their causes:

Problem	Possible Causes
Meter runs on without leaking.	<ul style="list-style-type: none"> • A leaking inner hose O-ring. • Inner hose leak. • Leaking hose Venturi or Co-Vent check valve.
Venturi or Co-Vent does not drain hose.	<ul style="list-style-type: none"> • Leaking hose or O-ring. • Leaking Venturi or Co-Vent check valve. • Improperly positioned Venturi or Co-Vent pick-up (must be near the normal low drape of the hose). • Hose installed upside-down.
Nozzle clicks-off prematurely.	<ul style="list-style-type: none"> • Trap in underground plumbing. • Trap at dispenser plumbing (do not use rubber hose). • Restricted vent at tank. • Bad nozzle. • Topping off of tanks by customer. • Defective Venturi or Co-Vent.

Mechanical Computers

Although the mechanical computers used in Gasboy pumps are carefully adjusted and lubricated at the factory before shipment, they require (as do all mechanical parts) occasional cleaning and lubrication when in service. The intervals at which this must be done vary with conditions of operation. Under normal conditions, service of computers is required only twice a year, or after each 100,000 gallons (378,000 liters) delivered.

Shut off and lockout the AC power to the pump. It is easier to clean and oil the mechanical computer if you remove it from the pump. Clean the mechanical computer with compressed air and wipe all accessible parts (such as figure wheel drums) with a clean cloth.

Note: Always wear protective safety goggles or glasses while using compressed air.

Never use solvents, such as gasoline or kerosene, as this will be trapped in many of the inaccessible bearings and dissolve the new lubricant when it is applied.

A light, non-acid type oil (SAE 10) is recommended as it gives maximum protection in varying temperatures. The oil must also be acid-free so that it will not cause corrosion of the cast metal parts. A long handled, fine lettering brush is very convenient for applying the oil to all bearings and shafts and for applying light, non-fluid oil (grease with body similar to that of chassis lubricant) to bevel-type gears.

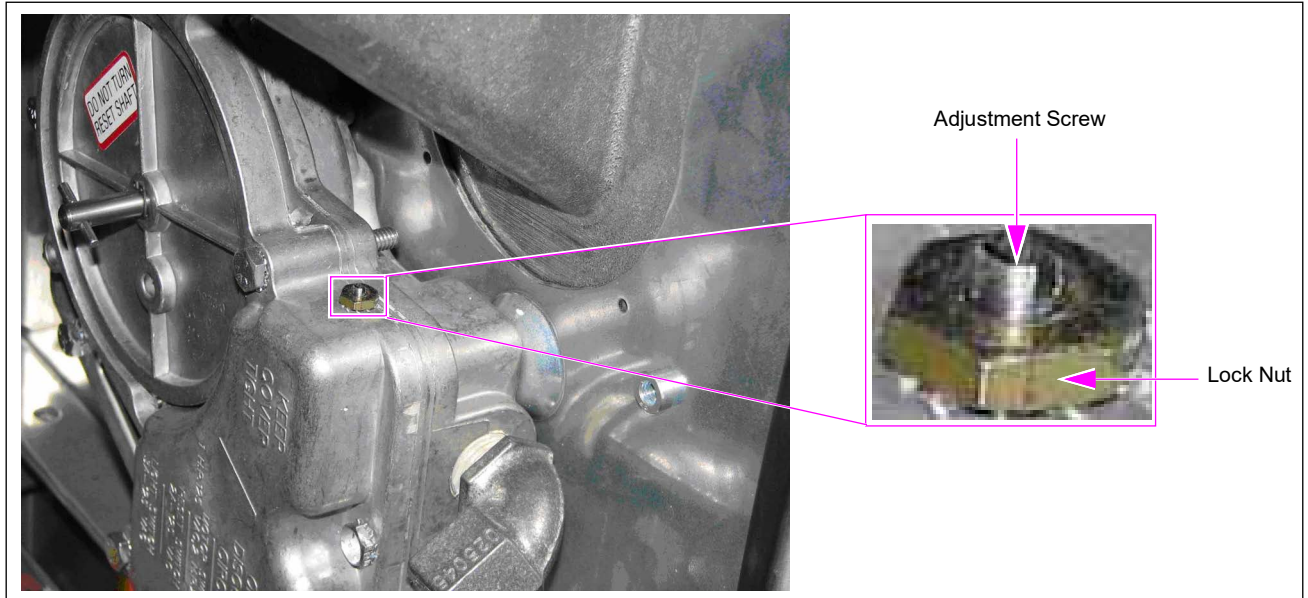
Power Reset External Adjustment (Mechanical Units)

If the pump or remote dispenser unit fails to reset or shut-off properly, the reset motor must be adjusted. To adjust, proceed as follows:

- 1 Loosen the lock nut on the adjusting screw and back screw out until it stops.
- 2 Move the reset lever to the ON position.
- 3 Turn adjustment screw in until reset motor starts.
- 4 Advance adjustment screw an additional 1/2 to 3/4 turn. Hold screw in this position and tighten the lock nut.

- 5 Move the reset lever to the OFF position, and then back to the ON position to verify if the reset motor operates properly. The reset coupling must make one revolution and stop.

Figure 6-43: Power Reset for Pump or Remote Dispenser Unit



DEF Nozzle

The DEF nozzle is designed to dispense DEF. No other nozzle type is currently approved. The DEF nozzles are manufactured by OPW, Elaflex (Elaflex Slimline ZVA), or Catlow.

- The nozzle is a non-vapor recovery nozzle. Conventional performance and troubleshooting procedures for non-vapor recovery nozzles are also applicable to the DEF nozzle.
- In addition to fluid compatibility, some nozzles require a ring magnet to be slipped over the spout to dispense DEF. Normally this ring magnet is part of the construction of the vehicle DEF tanks. It helps to prevent DEF from being dispensed into the diesel tank that will result in severe damage to the engine. The technician must have a ring magnet or its equivalent to dispense DEF through the nozzle during tests. The test ring magnet (M10656B001) is available from Gilbarco.
- The nozzle handle also contains the activation magnet that is part of the pump handle system.
- The nozzle can freeze if the cabinet heater fails, power is lost, or the nozzle door does not drop down completely during cold weather. The nozzle must be checked for leaks and operation after thawing.

Nozzle Door Mechanism (Cold Weather Units Only)

The Nozzle Door Mechanism protects the nozzle, hose and breakaway from freezing by retrieving the components into the heated cabinet and covering them with a drop down door.

- The door mechanism must drop down completely without assistance to cover the nozzle, and so on when holstered. For cold environments if this does not happen, the nozzle, hose and breakaway may freeze. If the door does not close on its own, repair is required.
- When using the nozzle always maintain control manually of the nozzle as the hose retriever could pull the nozzle out of the tank, prover or other receptacle.
- Missing or damaged curtains must be replaced.
- Curtains must close completely to ensure heat is retained in the nozzle vicinity or nozzle freezing may occur during very cold weather.

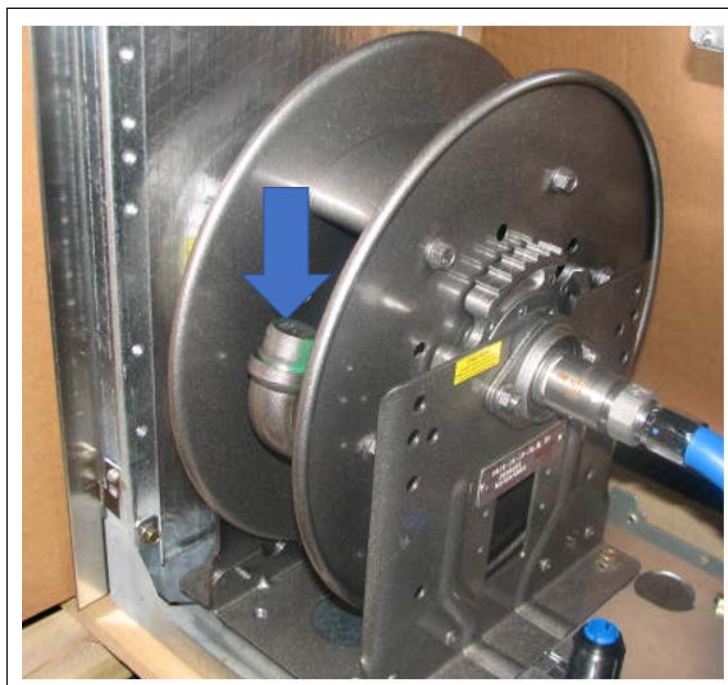
Hose Reel Tension Adjustment for AtlasX Cold Weather DEF

This section provides instructions for adjusting the reel tension on an AtlasX Cold Weather DEF dispenser.

Before beginning, please read and understand these instructions. Ensure that the spring tension is relaxed. Add a piece of tape to the disc edge from where the hose connection is made. This will make it easier to track turns of the reel. To adjust the hose reel tension, proceed as follows:

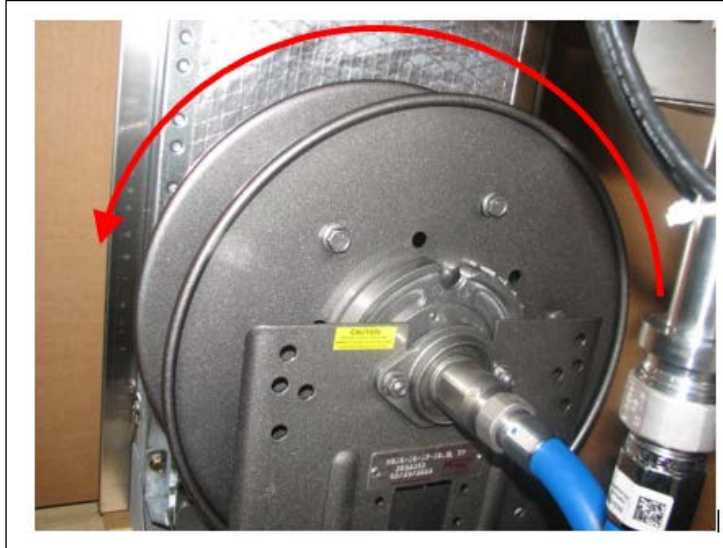
- 1 Attach the hose to the hose reel outlet.

Figure 6-44: Hose Reel Cold Weather DEF Dispenser



- 2 Wind all the hose onto the reel by rotating the reel in the direction that does not add tension or torque to the reel spring. Keep track of the number of turns required to store the hose (for the standard cold weather DEF hose [M10226B103], about 3 turns [11 ft hose] are required).

Figure 6-45: Winding Hose on the Reel



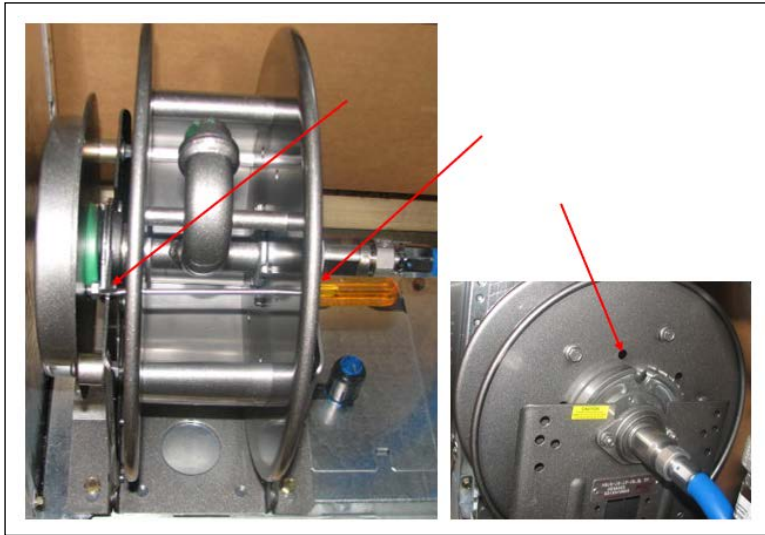
- 3 Subtract the number of turns needed to store all the hose on the reel from 17, the recommended max turns for this reel. For the standard cold weather DEF hose (M10226B103), it will be 14 pre-tension turns.
- 4 Secure the end of the hose to prevent it from being damaged and to make it easier to turn the reel.

Figure 6-46: Securing the End of the Hose



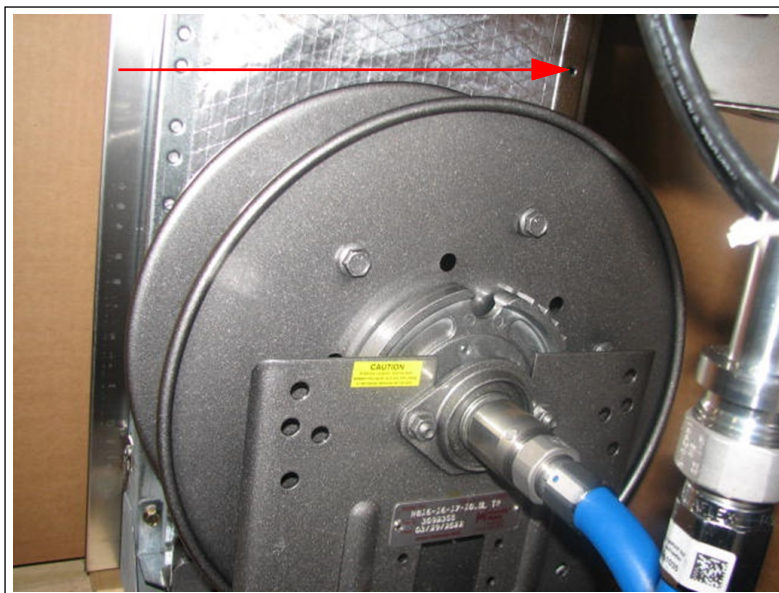
- 5 In the next step, it will be necessary to secure the reel from turning once tension has been added. This can be done by placing a long (5-1/2 inches or longer) screwdriver into the holes on the reel. Ensure that the screwdriver is long enough to catch on both side of the reel. **Do not insert the screwdriver at this time.**

Figure 6-47: Securing Reel



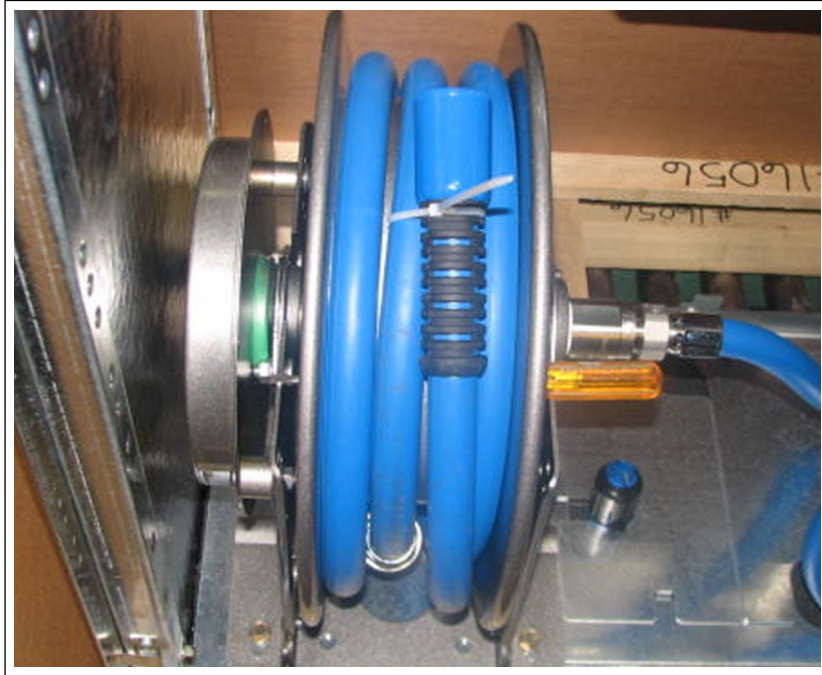
- 6 Carefully begin to turn the reel in unwind direction (opposite direction used to install the hose). You will be adding tension to the reel. Be careful not to let go of the disc edge until the proper number of turns have been added and reel has been secured.

Figure 6-48: Turning the Reel in Unwind Direction



- 7 Add the total number of pre-tension turns (14 for the standard DEF hose, 17 minus the number of turns to store the hose). Insert the screwdriver into the reel and ease the reel back until it clamps the screwdriver in place.

Figure 6-49: Adding the Total Number of Pre-Tension Turns



- 8 Install the lower panel in the front side of the dispenser.
- 9 Feed the hose through the roller assembly on the lower panel and install nozzle. If hose adjustment is needed, do not forget to remove the screwdriver, turn the reel as needed, and re-insert the screwdriver to secure the reel.
- 10 Place nozzle into nozzle boot.
- 11 While holding the disc edge, remove the screwdriver and slower to allow the reel to come to rest. The spring tension is now set to its maximum level (4.6 ft-lbs. of torque).

If the tension is too great, it will be necessary to allow the reel to wind (direction shown in step 2 on [page 6-77](#)) one or more revolutions until it is set to the preferred tension.

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7 – Troubleshooting Tables

Introduction

Purpose

This section provides information regarding troubleshooting AtlasX pumps/dispensers.

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to GOLD.

This section was last updated in May 2025.

Topics in This Section

Topic	Page
Introduction	7-1
Troubleshooting Tables (Electronic Units)	7-3
Theory of Operation	7-12

How to Use This Section

Example

A customer calls and says, “I don’t have any displays on one side of the pump.”.

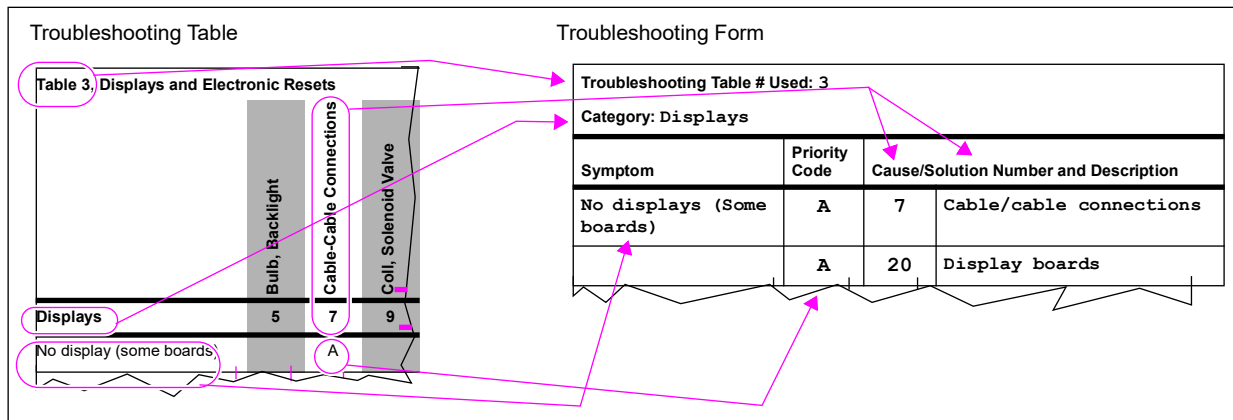
- 1 Write down the following information while talking to the customer:

Request this Information	Example
Store number and location	Store number 1234; 211 Any Street
Pump or Dispenser type	Gasboy/AtlasX
Model number	
Serial number	
Options on the unit	
Hose number(s) involved	
Symptoms found	No displays on one side of unit
Any history information	No history of other problems on this unit

- 2 At the site, verify the above information.
- 3 Identify the symptoms: Is there no display on one side of the pump/can the valves be heard opening and is the fuel being delivered? Investigate for other symptoms and conditions.

- 4 Refer to “[Troubleshooting Tables \(Electronic Units\)](#)” on page 7-3. The list will help you categorize your problem/symptom. For this example, refer to “[Table 3: Electronic Displays, Electric Reset, and Calibration](#)” on page 7-6 since the display is not working.
- 5 List your symptoms on a Troubleshooting Form (refer to “[Sample Troubleshooting Form](#)” on 7-3). List the symptoms in the order of priority. Refer to “[Priority Codes](#)” on page 7-4. A troubleshooting sample is shown in [Figure 7-1](#).

Figure 7-1: Troubleshooting Example



- 6 If you require further assistance, contact Technical Support at 1-800-444-5529. You must have the following information:
 - Your technician number
 - Equipment model and serial numbers
 - Site area code and phone number
 - Site name
 - All symptoms and related conditions
 - History of problem including the attempts that have been made to solve the problem

Priority Codes

For all letters shown in the following table, the issue has been reported to be involved in at least some of the cases. Always investigate earlier letters (A and so on) first. Letters toward the other end of the scale have been reported less frequently, but can still be an issue. Avoid repeating the same repair if the symptoms remain *unchanged* after attempting the fix.

Priority Code	Likelihood
A	Highly likely or easy to check
B	Likely
C	Possible, some locations only
D	Not likely
E	Remote
No entry	Not previously reported

Table 1: Communications to Console

	Cable Connection Wet	Cable-Cable Connections, Disconnected	Controller/Console	Pump Control Node Board	Customer/Cashier Error	Data Wire Length/D-Box Type	Data Wires	D-Box	D-Box Switch Settings	D-Box Wrong for Application	Firmware	Ultra-Hi Interface Board	Master Reset Required	Power Supply, Main	Power to Unit, Missing	Programming, Console	Programming, Unit	Switch/Power, Pump Handle	Programming Unit	PCN Board	Pulser	Pulser Output PCB
Communications	3	4	5	201	7	502	8	501	503	504	9	204	904									
False calls at console	A	B	C	C								B						A		C		D
No communication with controller: multiple units		C	A		E	C	D	D	B	C		E				D	D		B			A
One unit		C	A	B	E	C	D	D	B		E	A	E	D	C	D	D		B	B	B	C
Pulser Output Incorrect (missing)																			A	B	C	A

Table 2: Fuel Delivery (All Units)

	2	7	9	10	14	26	27	28	29	31	34	35	39	44	45	46	50	51	52	55	58	61	62	66	77	78	79	84	90	97	98	100	106	107	110	111	112	113		
	Alcohol MTBE % Too High (Affecting Components)	Cable-Cable Connection	Coil, Solenoid Valve	Contact/Reset Relay/Power Supply Board	Pump Control Node Board	Filter (Water Alert) Tripped	Filter/Strainer/Check Valve Clogged	Firmware	Firmware, Check Version	Fuel contaminated (Affecting Components)	Hose (V.R) O-ring	Hose (V.R), Fuel In Vapor Section	Ultra-HI Interface Board	Leak Detector Tripped	Leak in Unit (Hydraulic)	Linkage or Mechanical Computer	Master Reset Required	Meter Locked/Frozen/Bad	Misalignment/Binding	Motors/Belts/Pulleys	Nozzle (Contaminated, Damaged, Bad)	Piping (Inlet) Conditions	Power (External) Grounding	Power Supply, Main	Programming, Unit	Pulser	Pumping Unit	Relay or STP	Service Procedure (Poor)	Switch/Power, Pump Handle	Tank Out of Product	Temperature Low (Diesel)	Valve (Solenoid) Hydraulics	Valve/Meter Check	Valve, Shear	Valve, STP/Dispenser/Line Check	Vapor Line Back Pressure	Vibration/Bad Mounting	PCN Board	
Delivery, Product	C										A				B					A													B	B		B		D		
Flow registered with nozzle closed (at turn-on)	C				E						A	E		D						A				C															D	
Flow registered with nozzle closed (continuous)	C									A	A																													D
Improper nozzle shut-off									A	A											A				C													C		
Meter calibration	C								B	B				B				A	B						D	C	D		C					B						
No flow with display reset (all hoses, one unit)		A	C	B	B								B				E		D		C						C												B	
No flow with display reset (one hose, one unit)		A	A	C	B								B				E	C	D	D	B	E			E	D						B	B						B	
No flow, no display reset (one hose, one unit)		C		B		D	D						B										D	D	C				A										B	
No flow, no display reset (multiple Hoses, one Unit)		A		C		D	D						B										D	D	C				A										B	
Product delivered, but not registered		D		B									C		B		C	C							D	A													B	
Product delivered with handle off	C	C	B	C									B																B			A							B	
Pulsating flow (surging or pulsing)	B															D		B	C		C						D					A								
Slow-flow (one hose)	B	A	D	C	A			C					B					D	E	D	E					E				C	B	E							C	
No flow with reset (all hoses same grade at station)			A	A																								A	B	A										
Slow-flow with reset (all hoses, same Device)					B								A															B	A		C				B					
Flow stall at slow speed														D	B		A	A									C	B	B											

Table 3: Electronic Displays, Electric Reset, and Calibration

	Service Procedure (Poor)	Meter	Meter Check Valve	Pulser	Cable-Cable Connection	Coil, Solenoid Valve	Contact/Reset Relay/Power Supply Board	Controller/Console	Pump Control Node Board	Display board	Jump Jack Settings (Display)	Master Reset Required	Misalignment/Binding	Motors/Belts/Pulleys	Power Supply, Main	Power to Unit Missing	Programming, Unit	Reset Levers/Springs	Reset Motor/Gear Box	Switch/Power, Pump Handle	Temperature Low (unit not warmed up)	Valve Solenoid (Hydraulics)	PCN Board	Linkage or Mechanical Computer	Totalizer Bad	Display PCB	Mechanical Computer Bad
					7	9	10	13	14	20	41	50	52	55	66	68	77	85	86	96	98		46				
Displays (Electronic)																											
Displays Don't Come On Immediately					C					D											A						
Error Codes. Refer to "Table 4: Error Codes 10-44" on page 7-8 .																											
Flickering Displays (all boards)					A		D			B					C						C		D				
Flickering displays (one board)					A					A																	
Incorrect digit(s), garbled display					A				B	A		B									C		B				
Incorrect prices on display boards					B		D	C	C	A							A						C				
No backlight, both boards					B										B												
No backlight, one board					A																						
No display (all boards)					B				D	E		D			C	B					C						
No display (some boards)					A				D	A		C									B						
Electronic Totalizers																											
Not Incrementing					A												B						C		B	B	
Electric Reset					7	9	10	13	14	20	41	50	52	55	66	68	77	85	86	96	98		46				
Handle won't stay on/off																	A										
No reset													C		A		B	B	B					C			B

	Service Procedure (Poor)	Meter	Meter Check Valve	Pulsar	Cable-Cable Connection	Coil, Solenoid Valve	Contact/Reset Relay/Power Supply Board	Controller/Console	Pump Control Node Board	Display board	Jump Jack Settings (Display)	Master Reset Required	Misalignment/Binding	Motors/Belts/Pulleys	Power Supply, Main	Power to Unit Missing	Programming, Unit	Reset Levers/Springs	Reset Motor/Gear Box	Switch/Power, Pump Handle	Temperature Low (unit not warmed up)	Valve Solenoid (Hydraulics)	PCN Board	Linkage or Mechanical Computer	Totalizer Bad	Display PCB	Mechanical Computer Bad
Reset motor runs, no return to zero												B					B	B	B				C				
Reset OK, valves/motor not on					C	B	B							C					A		C						
Resets continually												B					A		C								
Calibration																											
Calibration does not hold (repeat tests)	B	A	A	D								B															B
Calibration does not hold (few months)	B	C	A	D																							D

Table 4: Error Codes 10-44

		Cable/Cable Connection	Pump Control Node Board	Customer/Cashier Error	Display Board	Firmware	Ultra-Hi Interface Board	Master Reset Required	Normal Operation as Programmed	Programming Unit	Power Cycle Required	Programming, Unit	Pulser	Temperature Low
No	Description	7	14	16	20	28	39	50	61	69	77	78	80	99
Retail Electronic Units														
20	Pulser fail, single	B	C				B						A	
21	Pulser fail, all	B	A				B						C	
23	Grade assignment changed		B								A			
24	Conversion factor changed		C					B			A			
25	Two-wire/Standalone mode changed		B								A			
26	No conversion factor table		B								A			
27	Side A, two-wire ID changed		B								A			
28	Side B, two-wire ID changed		B								A			
29	Pump timeout error			B					A		B	B		
31	Totals data error		C					A			B			
32	Pulser count error	B	C				B					A		
33	Heaters on at power-up	B	C											A
35	Configuration data error							A			A			
36	Unit type code changed		B							A	B			
37	PIN code 1 changed		C							A	B			
38	PIN code 2 changed		C							A	B			
39	Cash/credit option changed		C							A	B			
41	Side exists option changed		B							A	A			
42	PPU options changed		C					B		A	A			
44	Pump handle on at power-up		C				B							

Table 5: Handle Responses, Leaks, Noise, and Presets (All Units)

	Alcohol MTBE % too High	Cable/Cable Connection	Contact/Reset Relay/Relay Board	Pump Control Node Board	Customer/Cashier Error	Dispensers (number of) On STP Relay	Firmware	Firmware, Check Version	Ultra-Hi Interface Board	Master Reset Required	Meter Locked/Frozen/Bad	Misalignment/Binding	Motors/Belts/Pulleys	Nozzle	Piping (Inlet) Conditions	Power (External)/Grounding	Power Supply, Main	Power to Pump Missing	Programming, Unit	Pumping Unit	Relay, STP	Sealing Compounds/Seals	Service Procedure (Poor)	Switch/Power, Pump Handle	Torque (proper tightness)	Valve Solenoid Hydraulics	Valve, Inlet Pressure Regulating	Vibration/Bad Mounting	PCN Board	Reset, Electronic/Mechanical
Handle Responses	2	7	10	14	16	19	28	29	39	50	51	52	55	58	61	62	66	68	77	79	84	89	90	97	101	106	108	113		
No response/Reset, displays OK (all hoses)		C		B			D	D	B	A						D	D		C											B
No response/Reset, displays OK (one hose)		A		C					B										B					A					C	A
No response/Reset, garbled displays		C		B			D	D		A						D	D												B	
No response/Reset, no displays		B		B			D	E		B						E	C	A											B	
Leaks	2	7	10	14	16	19	28	29	39	50	51	52	55	58	61	62	66	68	77	79	84	89	90	97	101	106	108	113		
Meter	B										A												A	C		A				
Piping (general)	B																						A	B		A				
Sump overflow																B					A							B		
Noise (Audible)	2	7	10	14	16	19	28	29	39	50	51	52	55	58	61	62	66	68	77	79	84	89	90	97	101	106	108	113		
Chattering STP relay			B			A			D													B								
Noisy meter											A	D																	C	
Noisy pumping unit													C		A						B							C	A	
Buzzer on continuously		C		B					B																					
Noisy valve																										A				
Presets	2	7	10	14	16	19	28	29	39	50	51	52	55	58	61	62	66	68	77	79	84	89	90	97	101	106	108	113		
Missed presets (complete miss)	C		B	C	B			C	B											B						A			C	
Small over-run	B		D	C				C	C		B	C		C						A						A			C	
Small under-run	C		D	C				C	C		B	C		C						A						A			C	

Table 6: Repeated Problems and STPs

	Air Trapped in Underground Piping	Alcohol/MTBE (First use)	Cable/Cable Connection	Connector/Reset Relay/Power Supply Board	Pump Control Node Board	Crossphasing/Isolation Circuit	Fuel Contaminated	Gasboy AtlasX Supplied Parts required	Ultra-Hi interface Board	Leak (Underground)	Lubrication	Misalignment/Binding	Power (External)/Grounding	Programming, Console	Programming, Unit	Relay, STP	Reset, Electrical/Mechanical	Service Procedure (Poor)	STP	Switch/power, Pump Handle	Temperature Low (Diesel)	Valve, STP/Dispenser/Line Check	Vibration/Bad Mounting	Water Intrusion Possible	Wiring Error	PCN Board	Programming, Unit	
Repeated Problems	1	3	7	10	14	15	31	32	39	43	49	52	62	76	77	84	87	90	93	97	100	111	113	114				
Displays								A																				
Filter replacement/clogged		B					A														C				A			
Filter replacement/cracked																						A	B					
Hydraulic interface board replacement			B			A		D										B										
Indicator lamps								A																	C			
Leak detector tripping	B									A					B								A				B	
Locks											A	B													C			
Same board replacement			B					B					C					A							C			
STPs	1	3	7	10	14	15	31	32	39	43	49	52	62	76	77	84	87	90	93	97	100	111	113	114				
STP not activated (multiple units)			C			B									D	A			A							C		
STP not activated (one hose)			B	B	C			A							B					B							C	C
STP not activated (one unit)			B	B	A	B		B																			A	
STP stays on (multiple)				B	B	B		B								A											B	
STP stays on (one)			B	B				A																				
Wrong STP turns on			A											A	A											B		

Operating the Satellite Dispenser

To operate the satellite dispenser, proceed as follows:

- 1** Provide AC power (115 or 230 VAC) to the submersible feed and slow flow/reset motor feed. If a submersible starter relay is used, AC power (115 or 230 VAC) must be supplied to the input contacts of the submersible starter relay.
- 2** Dispense the product.
- 3** At the master dispenser, the register displays the total volume. If an optional pulser kit (mechanical) or pulse out kit (electronic) is installed, it supplies pulses that may be recorded by an external monitoring system.
- 4** The fueling transaction continues to run until the user turns off the dispenser handle.

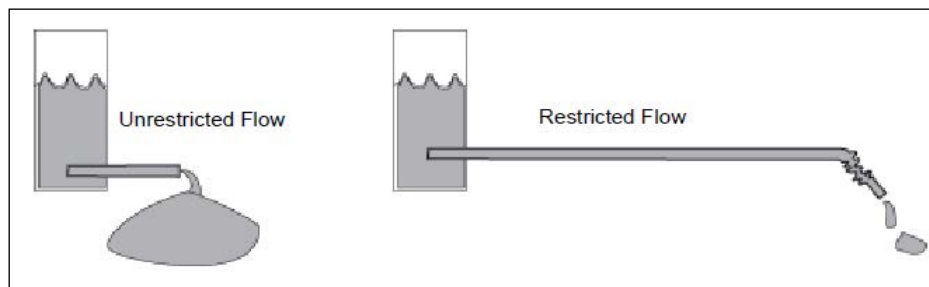
Theory of Operation

Understanding Flow Rate

Flow rate is the number of gallons dispensed per minute. In the United States for retail applications, flow rate for gasoline dispensing devices is limited to 10 GPM. Flow rate may be affected by restrictions such as distance to the output, damage, and leaks in the line. These restrictions may reduce the flow rate.

For example, in [Figure 7-2](#), the left container has minimal restrictions, therefore a greater flow rate. The right container has many restrictions, therefore a lower flow rate.

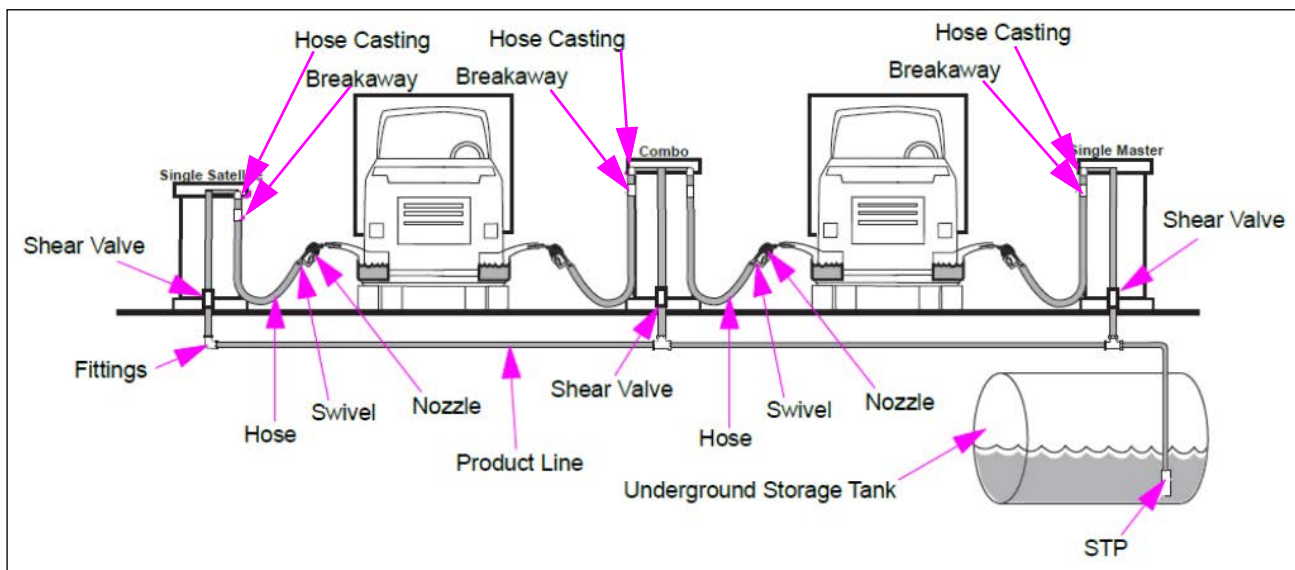
Figure 7-2: Rate Examples



Flow Rate Restrictors

Each site's configuration has a number of restrictors that may affect the flow rate. [Figure 7-3](#) shows a typical site and its possible restrictors.

Figure 7-3: Flow Rate Restrictors



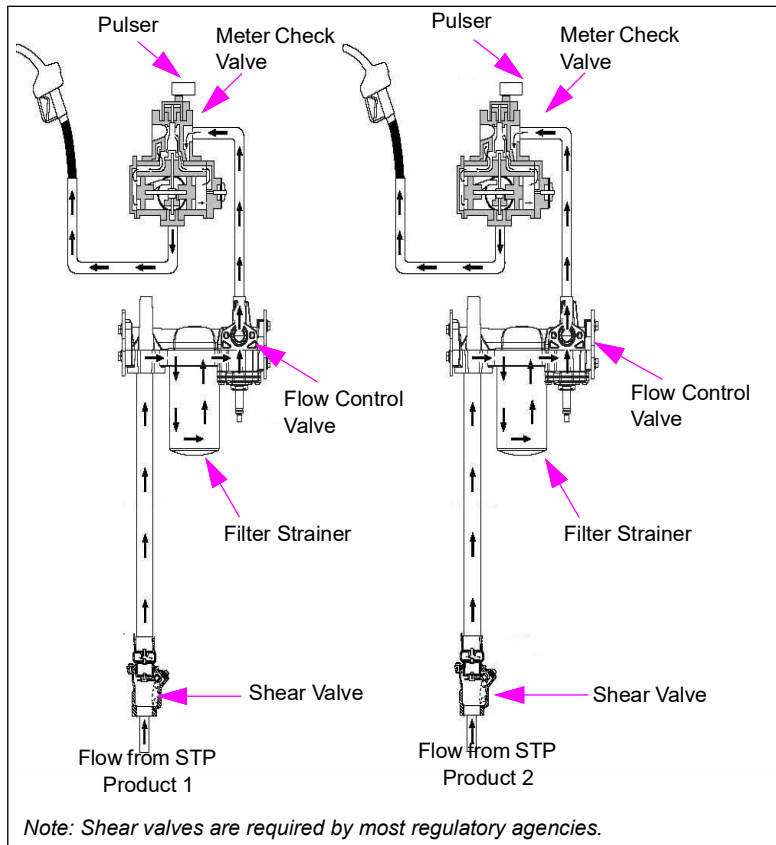
The following table identifies the possible restrictions [Figure 7-2](#) on [page 7-12](#) in that may affect the site's flow rate:

Possible Restrictions	Reason for Restriction
Hose casting	Size and type of hose casting
Breakaway	Type and number of breakaways
Nozzle	Type of nozzle
Swivel	Type of swivel
Hose	Size and length of hose
Shear valve	Size and type of shear valve
Dispenser model	Type of dispenser (i.e., High vs. Ultra-Hi vs. master, satellite, combo, pump vs. dispenser, and so on).
Fittings	Number of fittings
Pipes	Size and length of pipe run
STP	Horsepower and output of STP
Check valves	Number of valves
Underground tank	Burial depth
Other flow considerations	Number of units dispensing per STP
Optional in line flow restrictors to limit maximum flow rate	External to the unit, provided by installer or station owner.

How a Standard Dispenser Works

Following section outlines how a standard dispenser works.

Figure 7-4: How a Standard Dispenser Works

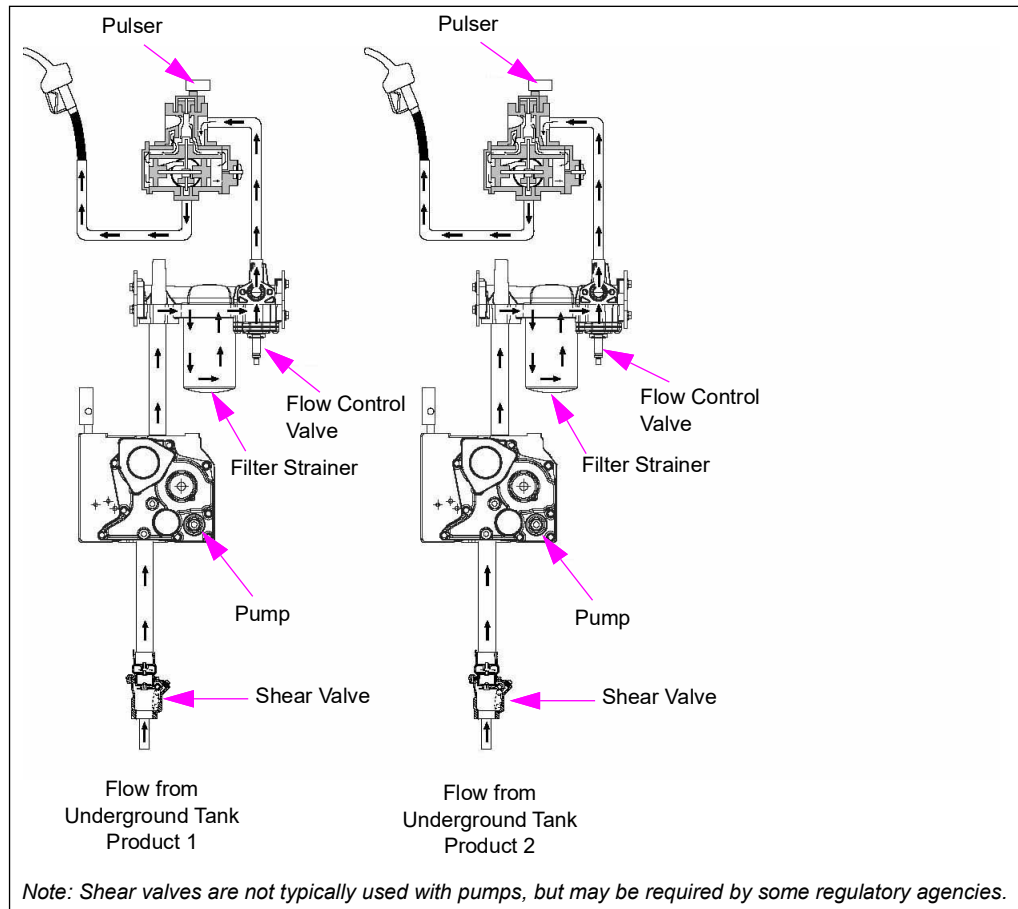


- 1 Fuel passes through a shear valve and enters the dispenser.
- 2 Fuel flows through a strainer and filter.
- 3 Filtered fuel passes through a flow control valve.
- 4 Fuel flows through a meter check valve and the meter measures fuel flow.
- 5 Fuel is discharged through the nozzle.

How a Self-contained Pumping Unit Works

The following section outlines how a self-contained pumping unit works.

Figure 7-5: How a Self-contained Pumping Unit Works



- 1 For aboveground tanks, a pressure regulator valve (model 52) is used at the base of the unit. Occasionally, shear valves are used for this as well as other applications.
- 2 Fuel enters through the pump inlet pipe, passing through a strainer or strainer/check valve located in the pumping unit.
- 3 Maximum pressure is regulated by the bypass valve, which recirculates fuel within the pumping unit.
- 4 The pump has an air separation system built within the pumping unit.
- 5 The sump separates air from the fuel, prevents air return to the pump when sump fuel level is low, and prevents air from passing through the nozzle and being metered when the underground tank is dry.
- 6 Air separated fuel flows back to the pump.

- 7 Air-free fuel flows out of the pump discharge line through a filter.
- 8 Fuel then flows through the flow control valve.
- 9 Fuel flows through a regulating (check/relief) valve. This valve keeps the meter full of fuel and helps relieve excessive pressure that can damage parts.
- 10 The meter measures fuel flow.
- 11 Fuel is discharged through the nozzle.

How a Master/Satellite - Ultra-Hi Dispenser Works

These models are for applications requiring higher flow rates. A master meters the product and controls the satellite. This configuration can deliver up to 60 GPM. These units are available in the following formats:

- Standalone unit without a satellite
- Master unit that combines a standalone unit with piping to direct flow to the satellite
- Master satellite combo combines a master and satellite combination within the same unit

Note: Actual flow rate depends on the installation and accessories used. Some local codes do not allow simultaneous operation of master and satellite.

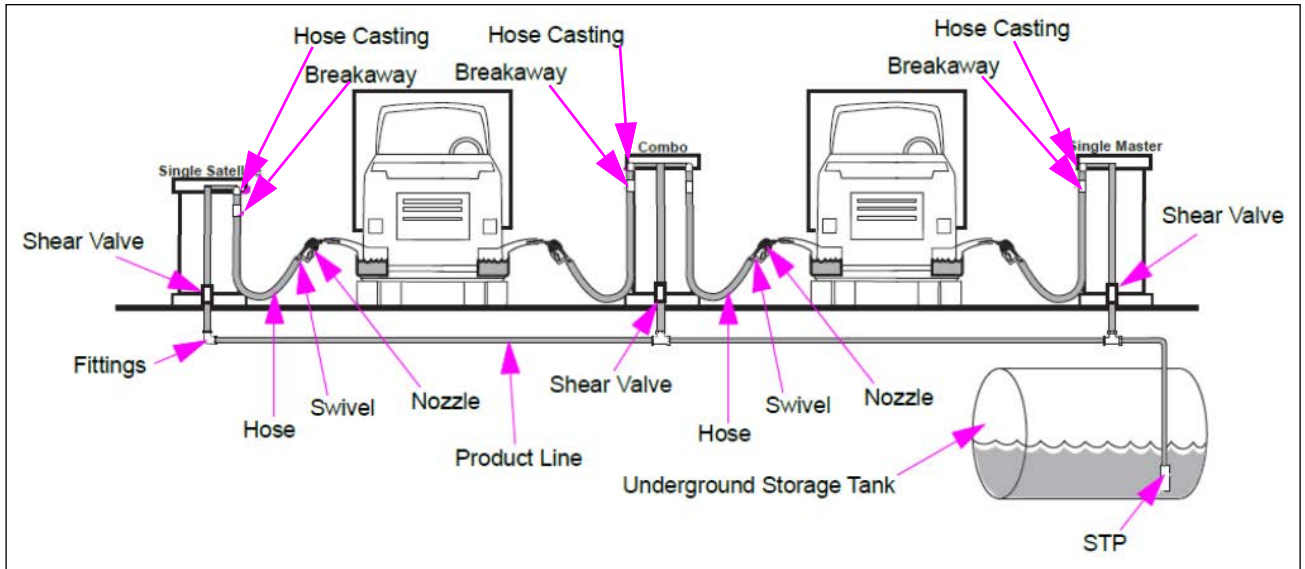
Unit Descriptions

Master - Piping in the master is teed before the master’s solenoid valve, to send product to the satellite. This arrangement allows for a higher flow rate in the master and satellite units, when operating simultaneously.

IMPORTANT INFORMATION
To determine what type of operation is allowed in your area, refer to NFPA 30A, local, and state regulations.

Satellite - The satellite unit operates in conjunction with a master unit which meters the fuel. It contains minimal electronics and hydraulics- consisting of a shear valve, solenoid valves, hose, and nozzle. A combo unit is a master for a remote satellite unit and is satellite for a remote master or another combo unit.

Figure 7-6: Various AtlasX Ultra-Hi Configurations



Types of Operation

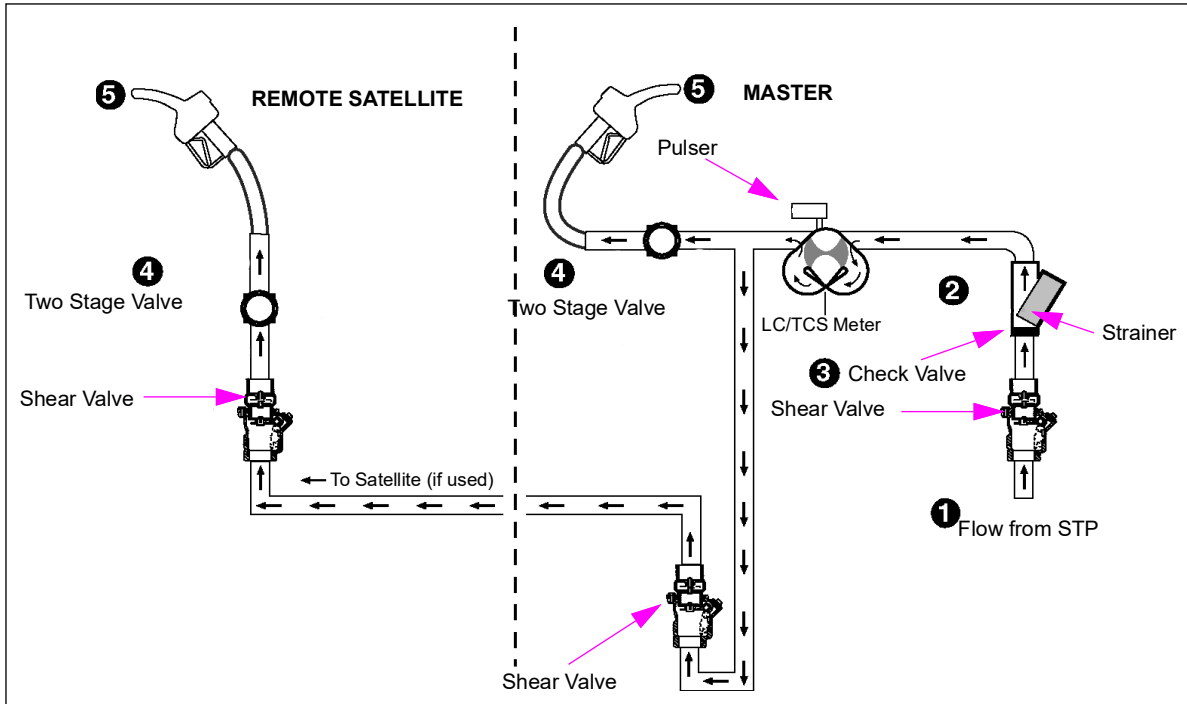
- **Simultaneous Operation** - Allows customer to fuel saddle-tank vehicle with master and satellite unit at same time.
Note: Some regulatory agencies require a physical barrier to prevent access to another fueling vehicle, if simultaneous operation is possible.
- **Independent Operation** - Allows customer to fuel a saddle-tank vehicle only one side at a time.

Master and Remote Satellite Piping

A Master and remote satellite system is shown in [Figure 7-7](#) on [page 7-18](#).

Note: The numbers in [Figure 7-7](#) on [Figure 7-7](#) correspond to the following numbered steps.

Figure 7-7: Master/Remote Satellite Fuel Flow Schematic



Operation

- 1 Product passes through a shear valve and enters the dispenser.
- 2 Product flows through a check valve and strainer.
- 3 Product flows through a LC or TCS meter.
- 4 Metered product passes through a two stage valve, and/or through piping to the satellite.
- 5 Product flows through the remote satellite through a shear valve, solenoid valves, and then to the nozzle.
- 6 Fuel is discharged through the nozzle.

How ATC Works

The Automated Temperature Compensation (ATC) option is used only when the country or region requires it, primarily the Canadian market. The ATC option measures the temperature of the dispensed products and compensates for changes in product volume due to changes in fuel temperature to a standard defined temperature. The ATC option uses the following components:

- ATC probes (senses fuel temperature).
- ATC Meter Manifold (manifold contains the thermal test well and ATC probe).
- ATC-I.S. Barrier-TMeter PCA used to interface ATC probes to the PCN.

In an ATC equipped unit, fuel temperature is monitored through a thermocouple probe commonly integral to the manifold or optionally in close proximity. This temperature is compared against a predetermined “Standard” temperature for the country or region involved. The ATC equipment gathers and processes temperature information and sends it to the PCN. The PCN adjusts the pulse count to reflect the pulse count that would have occurred if the fuel was metered at the “Standard” temperature. If fuel being metered is hotter than the standard temperature, pulse count is reduced. If fuel being metered is colder than the “Standard” temperature, pulse count is increased. Adjustment changes as the fuel temperature into the meter changes.

AtlasX ECs

ECs (E1 - E11) are displayed on the Main Money display.

ECs (20 - 5614) that open on the PPU display when an error occurs are useful in diagnosing problems with the pump/dispenser.

E1 - E12

Code	Description	Level
E1	Database Corrupted	Super Major
E2	Flash Corrupted. Press F1/F2 to clear.	Super Major
E3	LON configuration error	Super Major
E4	One or more tasks not started	Super Major
E5	Coldstart was forced	Super Major
E6	Redundant data storage error	Super Major
E8	Data base changed, set as default the new values	Super Major
E10	Software updated, Security Switch NOT ON	-
E11	Software DSS changed, Security Switch NOT ON	-
E12	Restore Calibration from Door Node	-

0 - 50

Code	Description	Level
20	Pulser connected and product is not mapped	Super Major
20	Pulser Disconnected/Error	Super Major
24	Volume unit type not set	Major
26	Pump not calibrated	Major
27	Two-wire ID changed side A	Undefined
28	Two-wire ID changed side B	Undefined
29	Valve not open	Medium
30	VaporVac power supply or cabling failure	Not used on AtlasX
31	DEF dispenser lines frozen	-
33	Push-to-Stop activated	Not used on AtlasX
35	Configuration data error	Medium
37	Pin code 1 changed	Undefined
38	Pin code 2 changed	Undefined
39	Cash/Credit option changed	Not used on AtlasX
41	Side exists option changed	Undefined
42	Fill/Authorization Timeout	Undefined
44	Pump handle on at power up	Medium
50	Two-wire communications lost (disconnected)	Minor
100	Running Flash Check Failure	-

4000 - 4999

Code	Description	Level
4320	Valve configured for, but not responding	Super Major
4321	Valve stuck	Super Major
4322	Valve board not responding	Super Major

5000 - 5025

Code	Description	Level
5024	ATC enabled	Undefined
5025	ATC disabled	Undefined

5026 - 5099

Code	Description	Level
5047	Reverse flow detect	Medium
5049	Unauthorized flow detected	Medium
5050	Invalid Pulser-Pulser Pattern does not fit profiled meter	Medium
5056	Transaction started with Security Switch ON	-
5071	VaporVac board detected, but option not set*	Minor
5091	ATC option set, but ATC Node not detected	Super Major
5092	ATC node present, but not configured	Minor
5098	T-Meter Not Connected	Super Major

**This error code will also be displayed when pulse out board is detected, but pulse out has not been enabled.*

5100 - 5121

Code	Description	Level
5101	ATC T-Meter pulse train not detected	Super Major
5111	Door Node Communication Failure	Super Major
5115	Door Node Download Error	Medium
5116	Door Node software download incomplete	Medium
5118	PPU Board Communication Failure	Major

5126 - 5199

Code	Description	Level
5151	Door Node not addressed correctly	Major

5378 - 5724

Code	Description	Level
5378	Door Node configuration not received	Major
5413	Zero PPU set, but not allowed	Medium
5414	Display Type Mismatch	-
5416	Display Type Changed	-
5417	Door Node 5 firmware not compatible w/ PCN software	Major
5600	Fuel density not programmed	Super Major
5601	ATC temperature out of range	Medium
5602	Door Node Software updated, Security Switch NOT ON	Minor
5603	ATC Node Software updated, Security Switch NOT ON	Minor
5606	ATC Node Communication Failure	Super Major
5607	Door Node Communication Failure	Super Major
5721	Door Opened	-
5722	Door Closed	-
5723	Hydraulics Panel Opened	-
5724	Hydraulics Panel Closed	-

EC31

EC31 indicates that the DEF may be frozen. If an EC31 is initiated, the dispenser will become disabled and remain disabled until a warmstart occurs. Inform the station that the DEF may be frozen (so that they are alert), if the error code is displayed at very low temperatures. Also, to prevent further damage or a DEF spill, immediately contact the ASC.

Operating the Satellite Dispenser

To operate the satellite dispenser, proceed as follows:

- 1** Provide AC power (115 or 230 VAC) to the submersible feed and slow flow/reset motor feed. If a submersible starter relay is used, AC power (115 or 230 VAC) must be supplied to the input contacts of the submersible starter relay.
- 2** Dispense the product.
- 3** At the master dispenser, the register displays the total volume. If an optional pulser kit (mechanical) or pulse out kit (electronic) is installed, it supplies pulses that may be recorded by an external monitoring system.
- 4** The fueling transaction continues to run until the user turns off the dispenser handle.

8 – Wiring and Configuration

Introduction

Purpose

This section provides information regarding the wiring and configuration associated with AtlasX pumps/dispensers.

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to GOLD.

This section was last updated in July 2025.

Topics in This Section

Topic	Page
Introduction	8-1
Cable Block Diagrams	8-1
AtlasX Hydraulics, Bezel, and Door Configurations	8-37

Cable Block Diagrams

Block Diagram AtlasX M19569

Figure 8-1: Product Notes

1.	FOR STANDARD PRIME UNITS, SEE FIGURES 8-13, 8-14, and 8-15. FOR UNITS WITH OMNIA, SEE FIGURES 8-16 and 8-17. FOR UNITS WITH PRIME & OMNIA VIA CAT-5/ETHERNET CONNECTION, SEE FIGURES 8-18, 8-20, 8-22, and 8-24. FOR UNITS WITH PRIME & OMNIA VIA ETHERNET OVER-LEGACY-CABLE (OLC) CONNECTION, SEE FIGURES 8-19, 8-21, 8-23, and 8-25. FOR UNITS WITH INTERNATIONAL POWER SUPPLY, SEE FIGURES 8-34, 8-35, AND 8-36.
2.	ALL UNITS EXCEPT TW3, J9/P4 & J4/P5 CONNECTORS ARE NOT USED. CABLE SHOULD BE BUNDLED & TIE WRAPPED. ON TW3 UNITS, J9/P4 & J4/P5 ARE CONNECTED TO THE SATELLITE CONTROL BOARD. JPH IS NOT USED.
3.	J6414B IS NOT PRESENT ON THE SINGLE PUMP HANDLE CABLE M05105A005.
4.	ELECTRO-MECHANICAL TOTALIZER FOR GRADE 2 CONNECTS TO P6406 ON THE SIDE B DISPLAY PCA.
5.	FOR PRIME WITH nOrCU & OMNIA, ETHERNET COMMUNICATIONS TO nOrCU IS PASSED THRU OMNIA. TO SEPARATE, UNPLUG CABLE FROM LAN2 ON nOrCU & CONNECT CAT-5 COMMUNICATIONS CABLE TO LAN2 (EX: CONDUIT CABLE OR CABLE TO OTHER DEVICE).
6.	M05189A011 IS THE DEFAULT DC CONDUIT ASSEMBLY. M05189A016 REPLACES IT WHEN CAT-5 COMMUNICATION IS USED WITH PULSE OUT. M05189A018 REPLACES IT WHEN PRIME IS USED. FOR DEF UNITS, M11277A004 IS THE DEFAULT DC CABLE. Q13850-06 IS ADDED WHEN CAT-5 COMMUNICATION IS USED WITH PULSE OUT. FOR DEF UNITS, M05189A017 REPLACES BOTH (M11277A004 & Q13850-06) WHEN PRIME IS USED.
7.	CANADA AND OTHER COUNTRIES DO NOT ALLOW ROUTING COMMUNICATION WIRES IN THE AC CONDUIT.
8.	M18923A003 CABLE IS ONLY PRESENT ON DUAL SIDE-LOAD UNITS.
9.	M12261A002 CABLE IS ONLY PRESENT ON COLD WEATHER DEF UNITS.
10.	IF PRESENT, M13982A002 LED LIGHT STRIP TERMINATION WILL CONNECT TO EITHER P500A OR P500B OF M13980A002 DEPENDING ON UNIT CONFIGURATION.

Figure 8-2: High-Flow Unit, No STP Relays

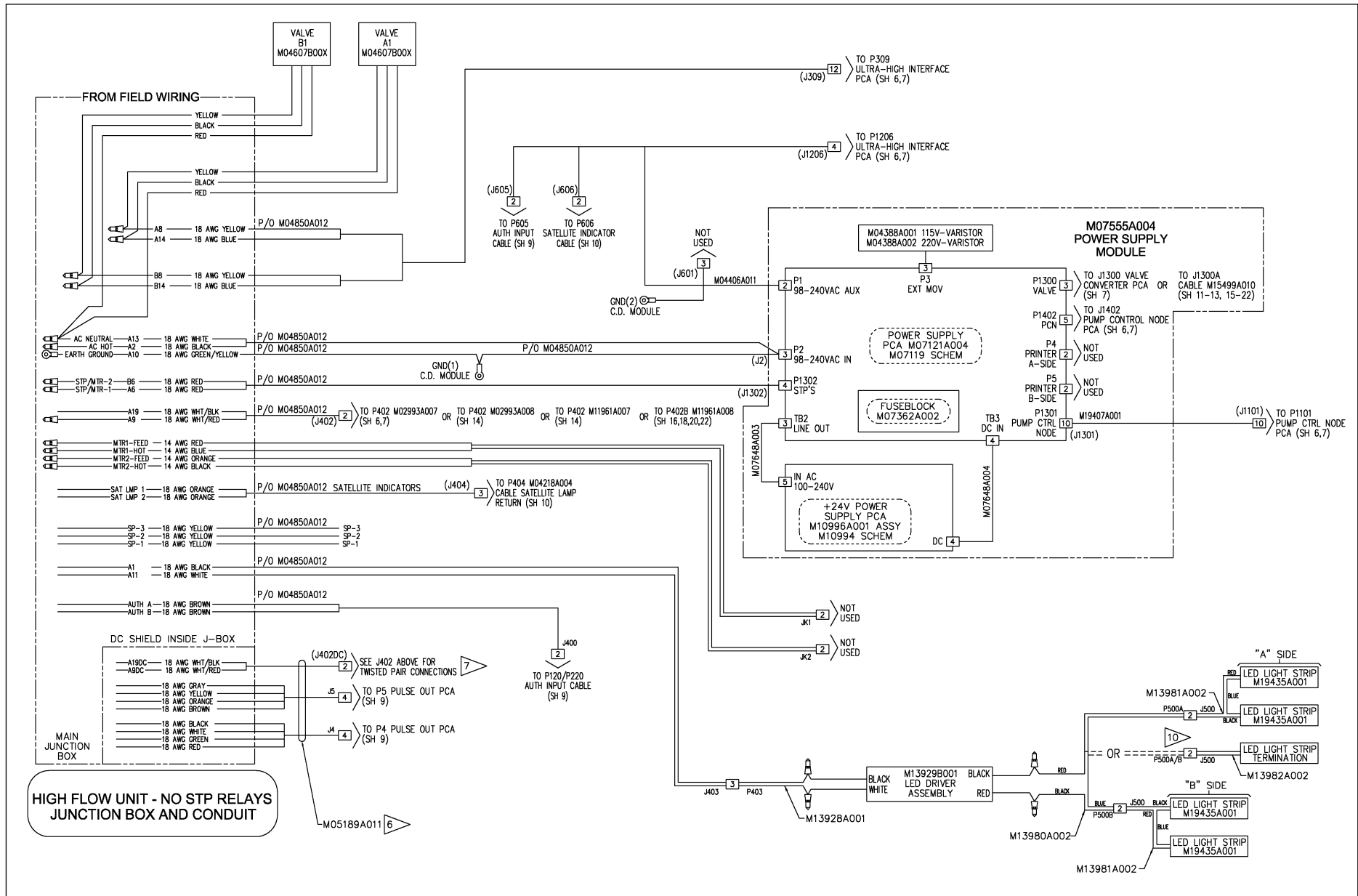


Figure 8-3: High-Flow Unit, STP Relays

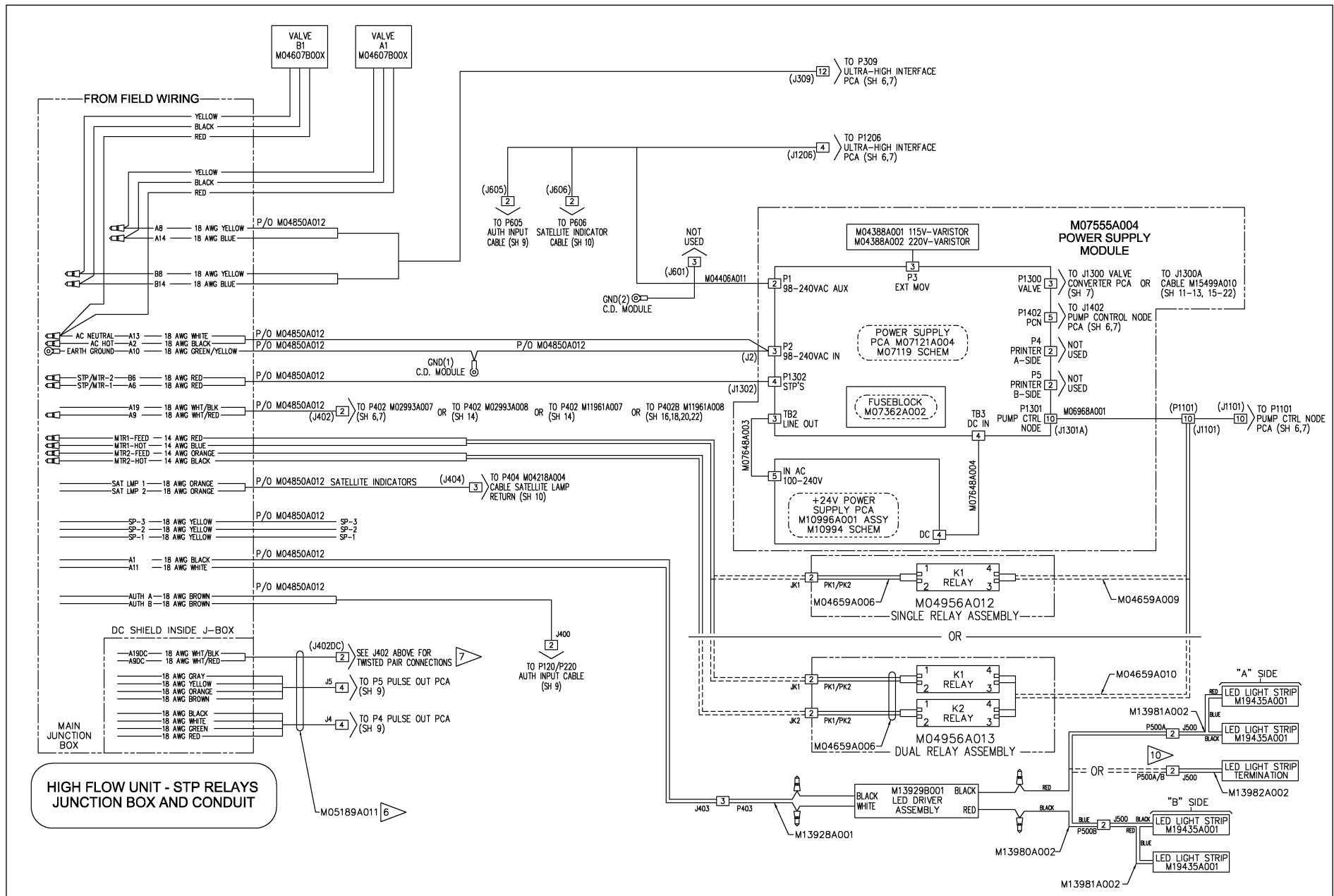


Figure 8-4: UH Combo Unit, No STP Relays

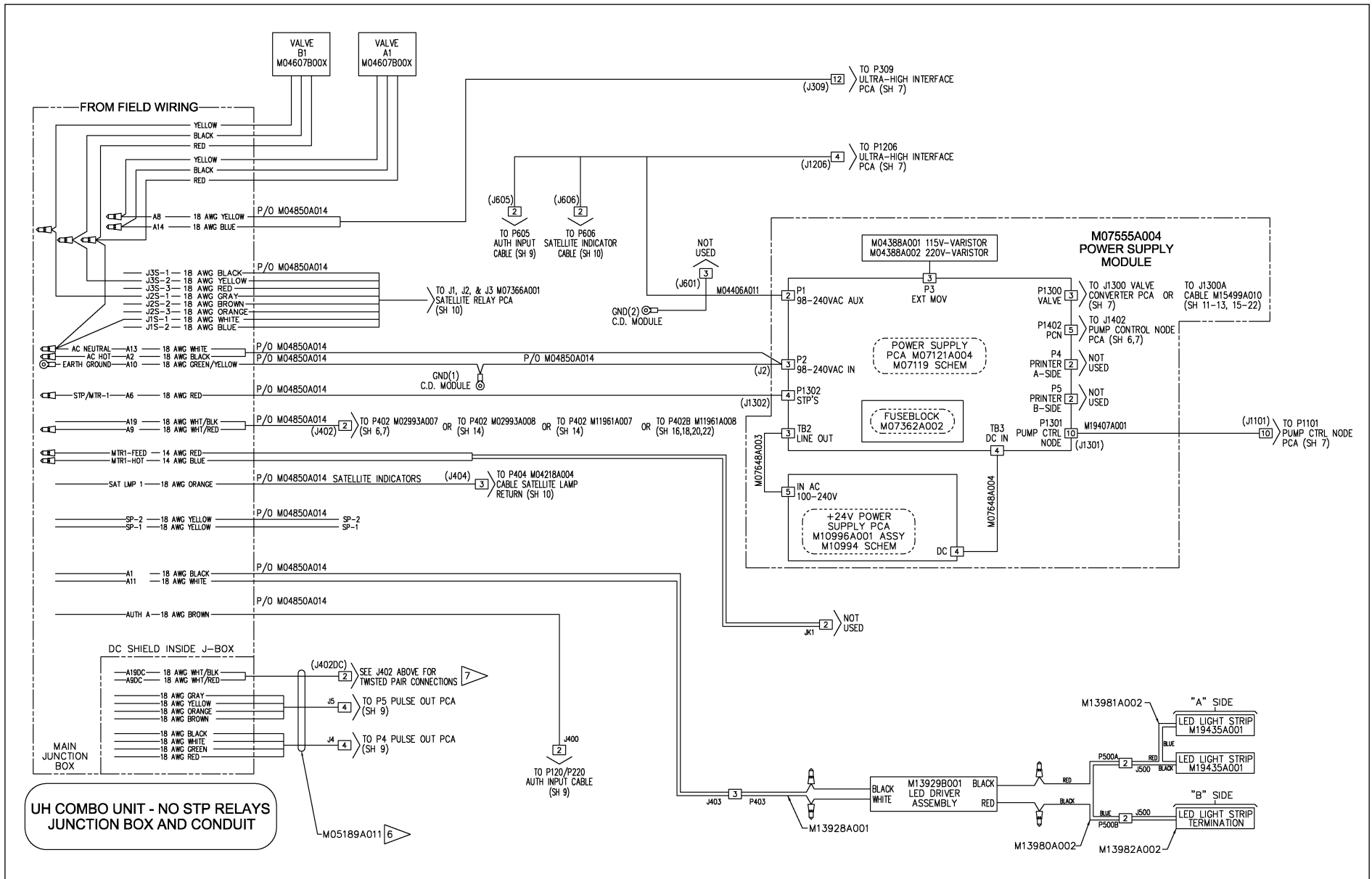


Figure 8-6: High-Flow Base Electronics (PCN4)

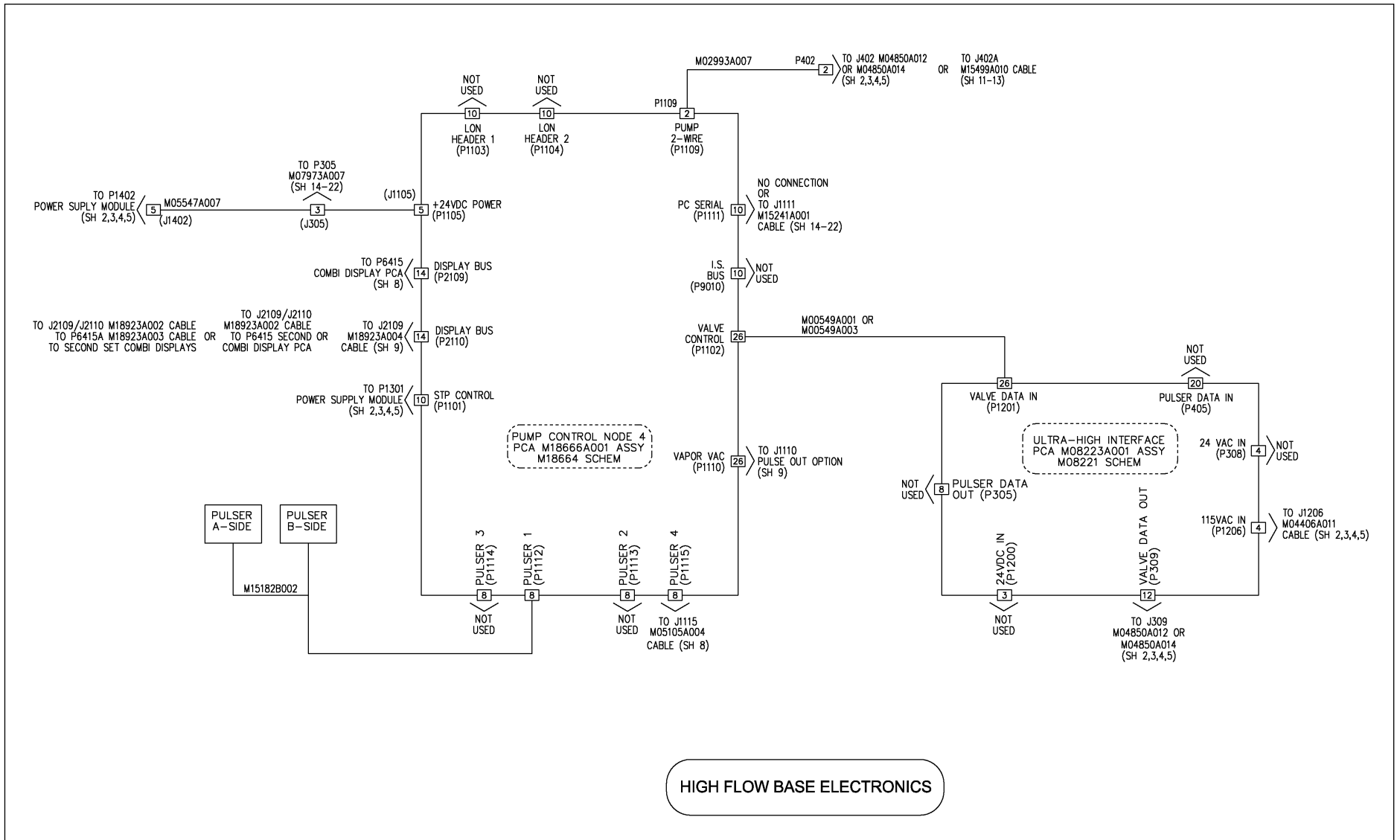


Figure 8-7: High-Flow Base Electronics (PCN5)

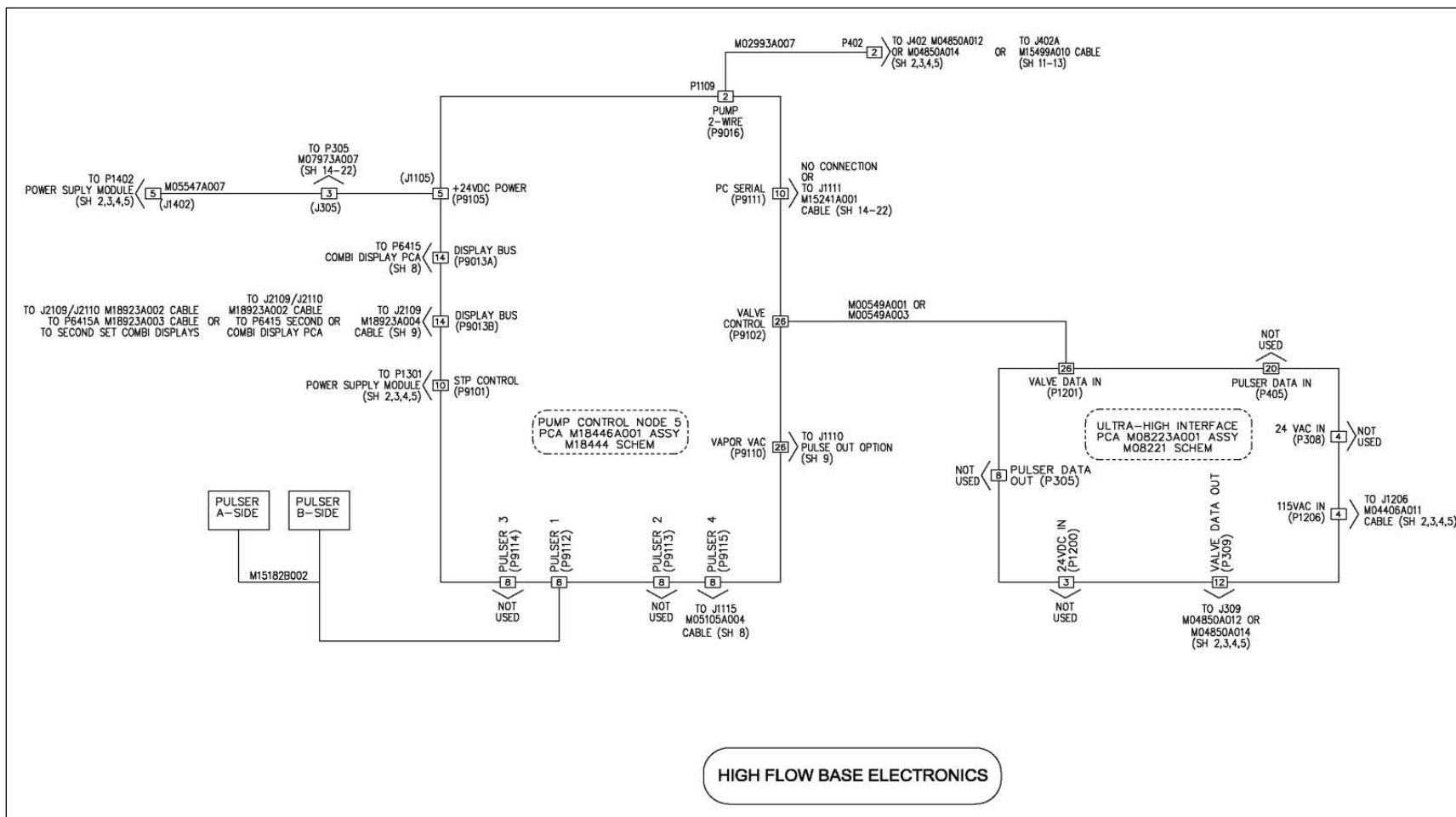


Figure 8-8: Ultra-Hi Base Electronics (PCN4)

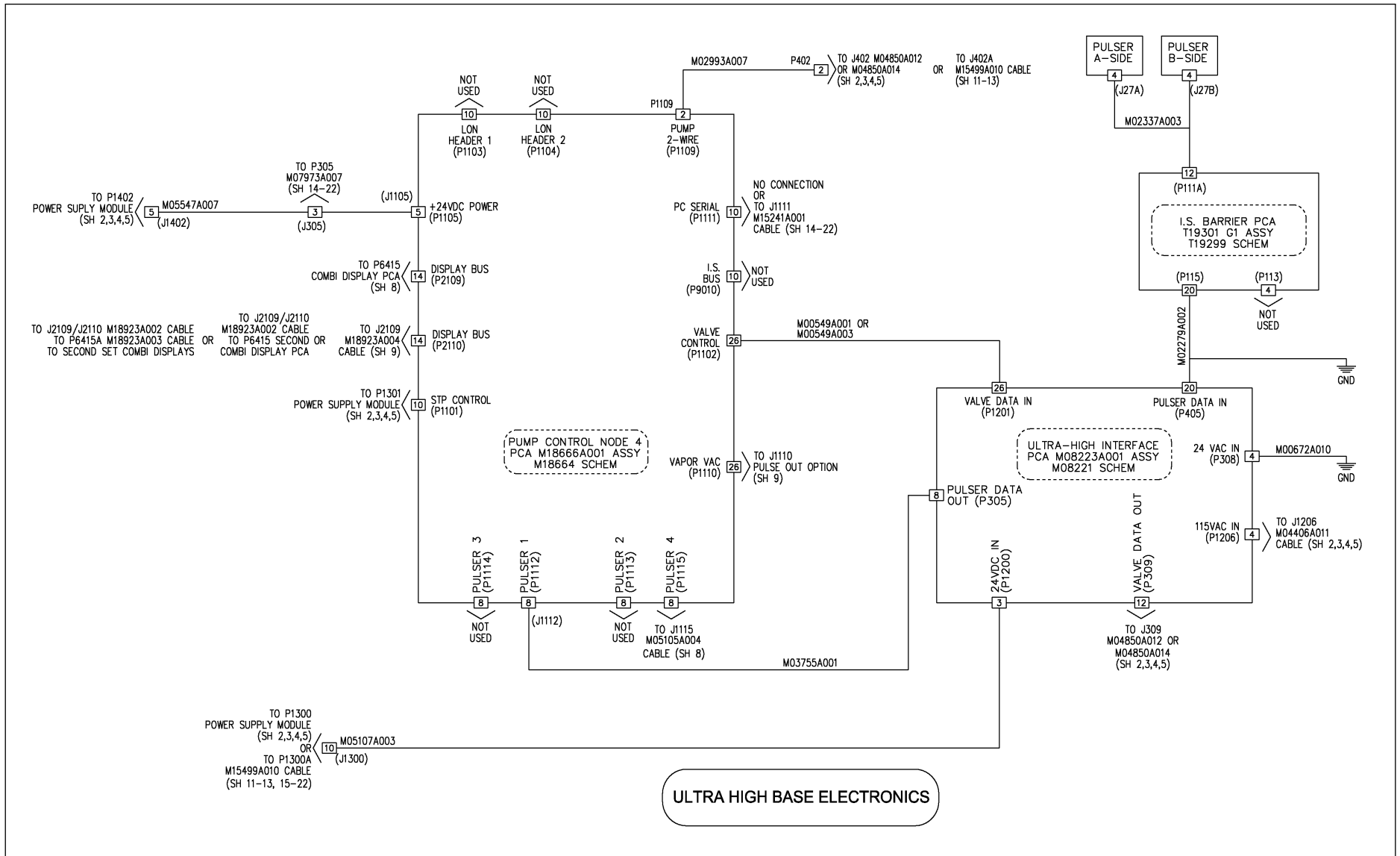


Figure 8-10: Base Display Electronics

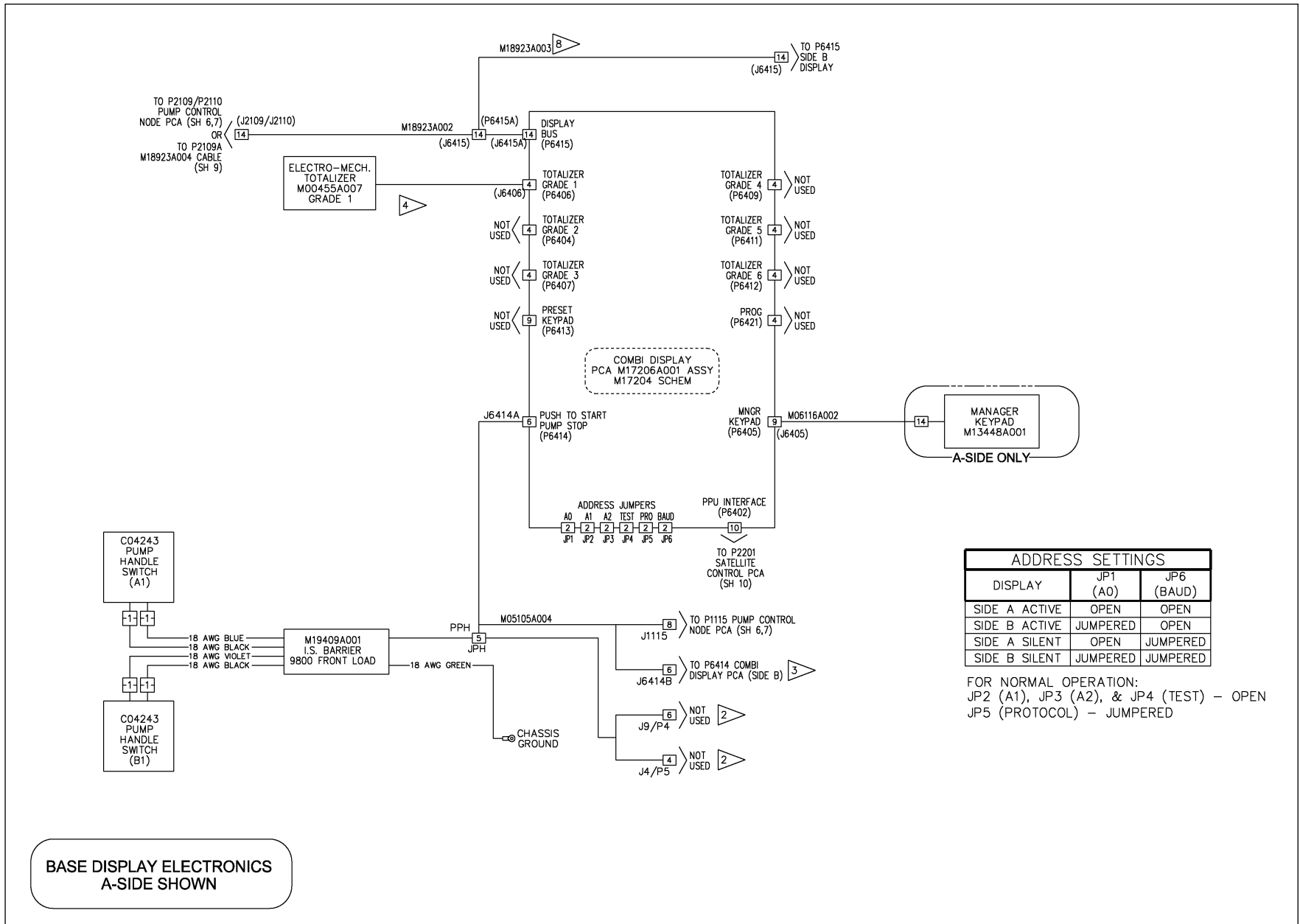


Figure 8-11: Pulse-Output and ATC Option

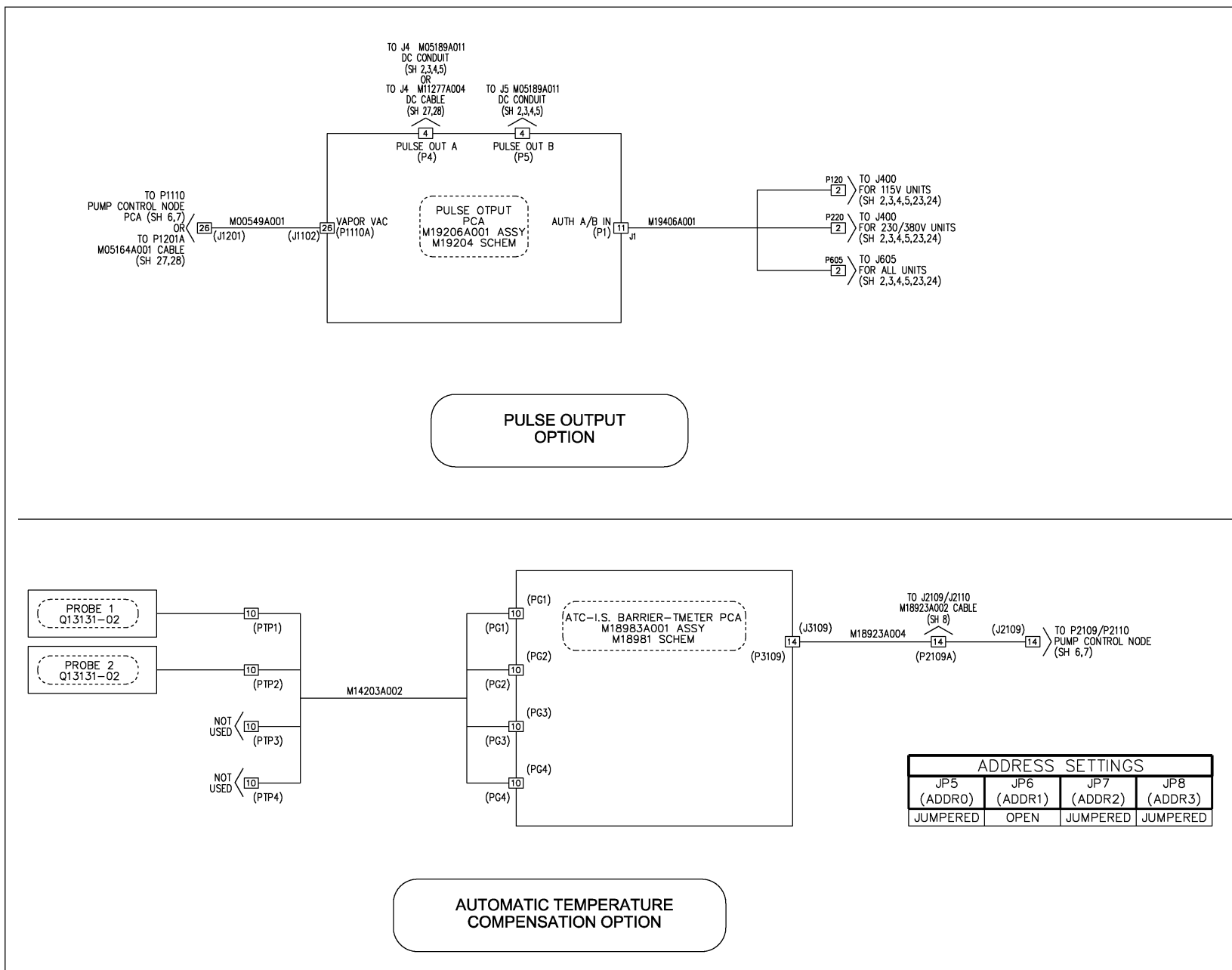


Figure 8-12: Satellite Indicator Option and Master/Combo with Valve Control Option

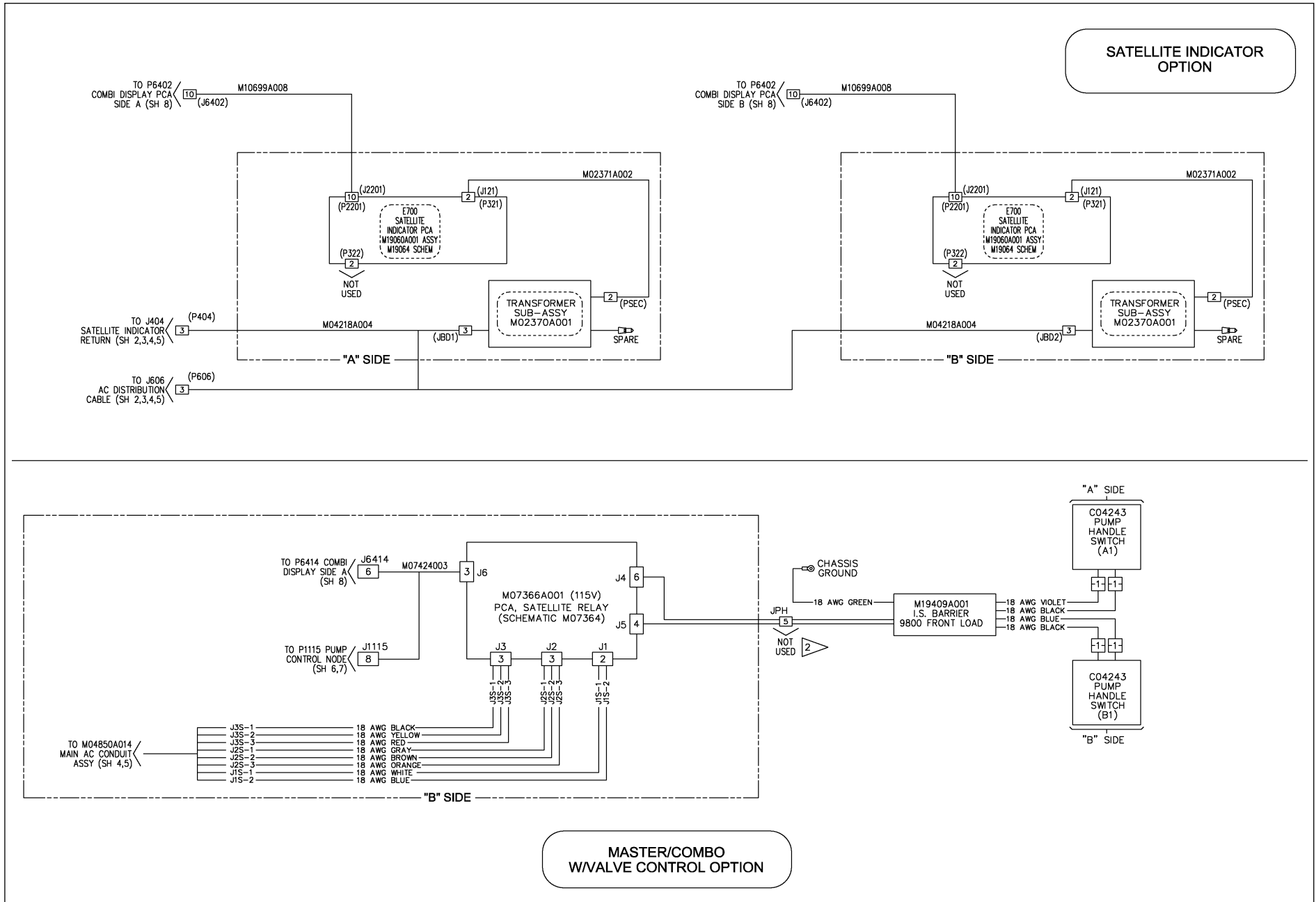


Figure 8-13: ORPAK PRIME, with and without nOrCU

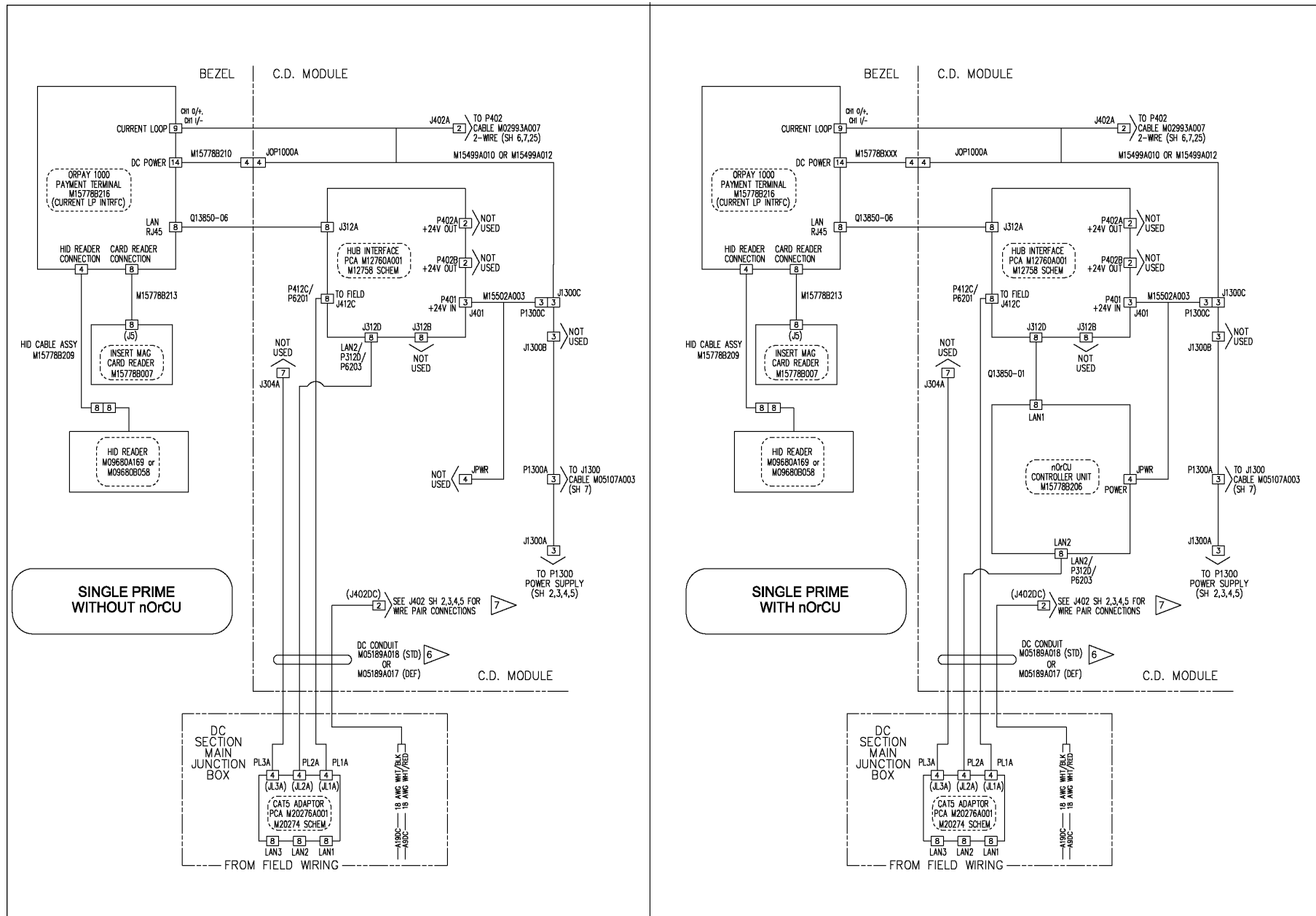


Figure 8-15: Dual Orpak PRIME Option with nOrCU

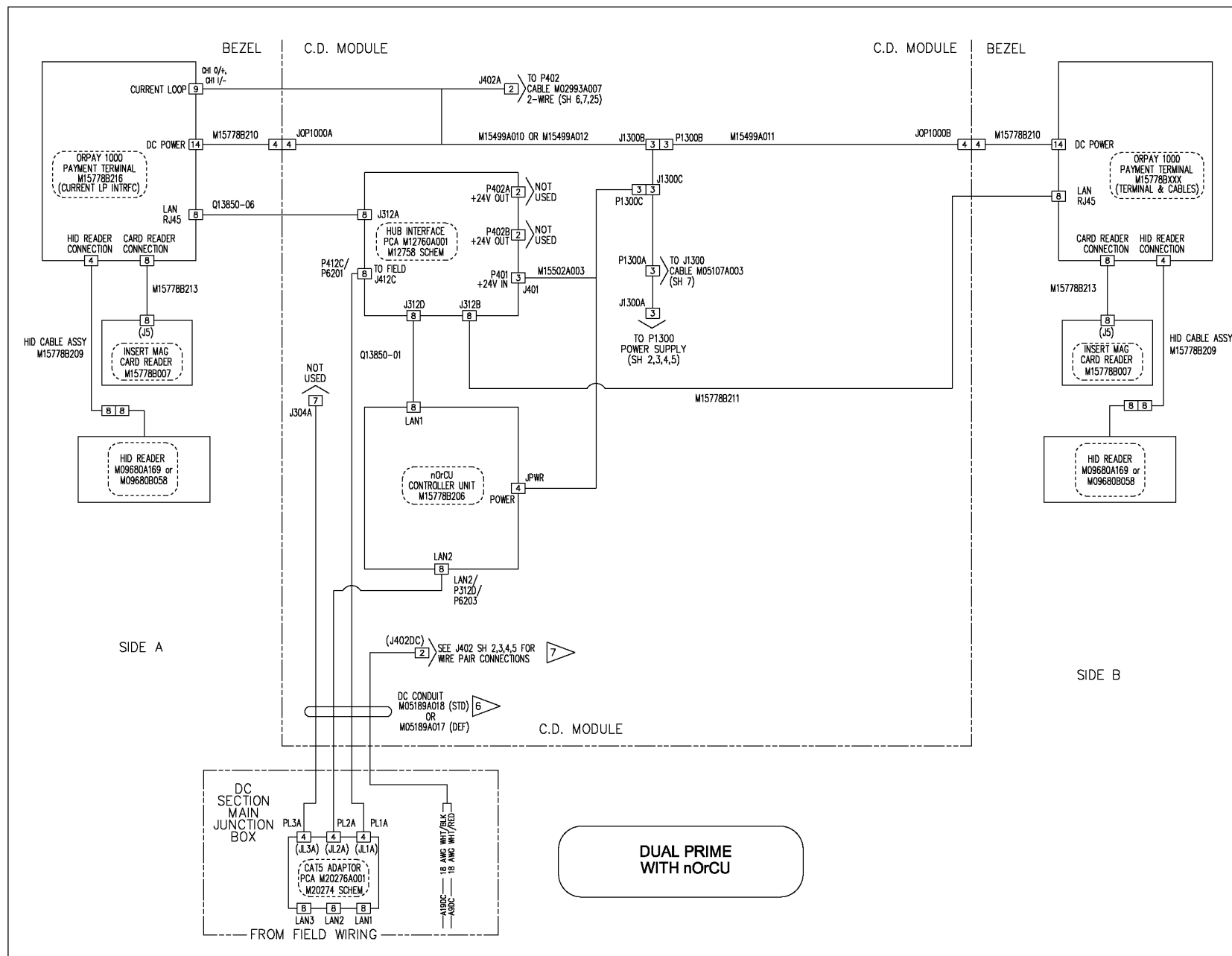


Figure 8-16: Pump with 2-wire and Omnia with CAT-5/OLC Connection

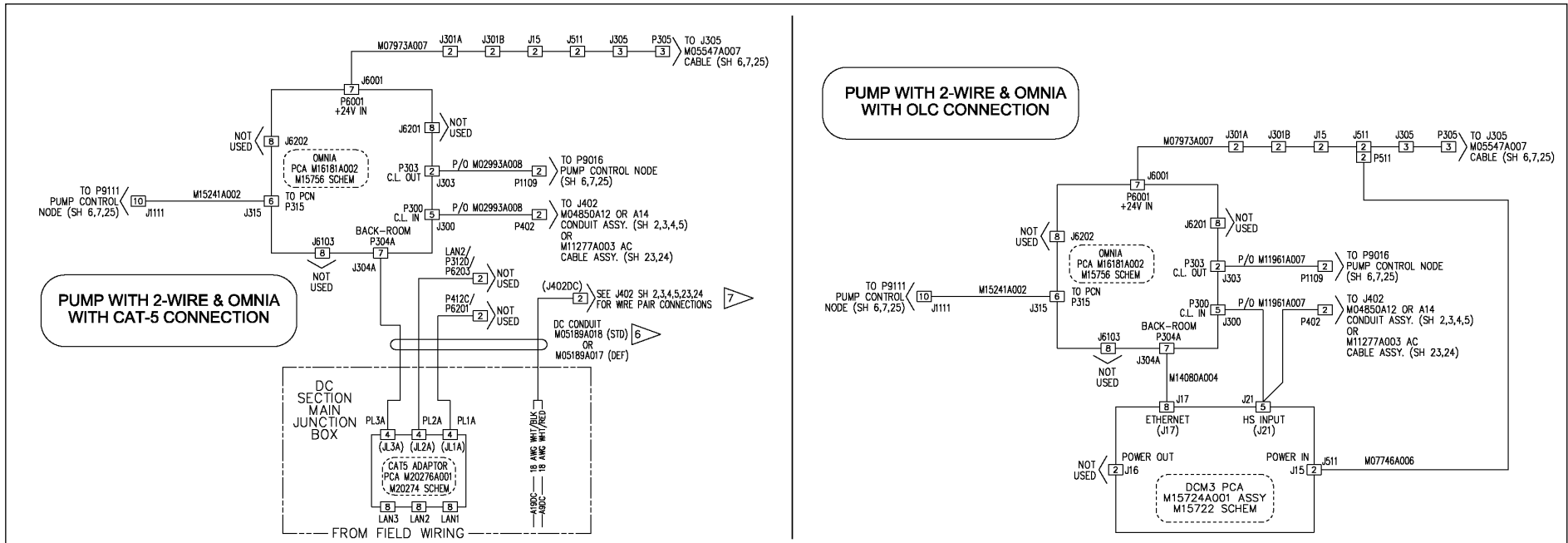


Figure 8-17: Pump with Pulse Out and Omnia with CAT5/OLC Connection

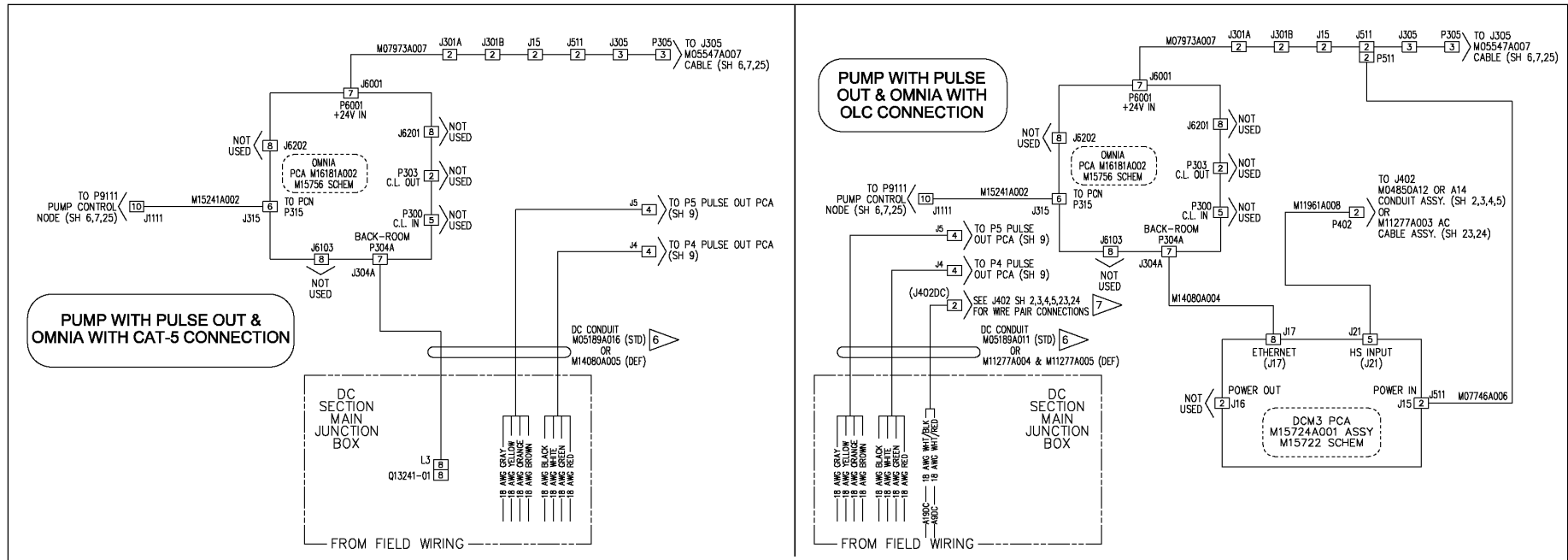


Figure 8-18: ORPAK PRIME Option with Omnia and CAT-5/Ethernet Connection without nOrCU

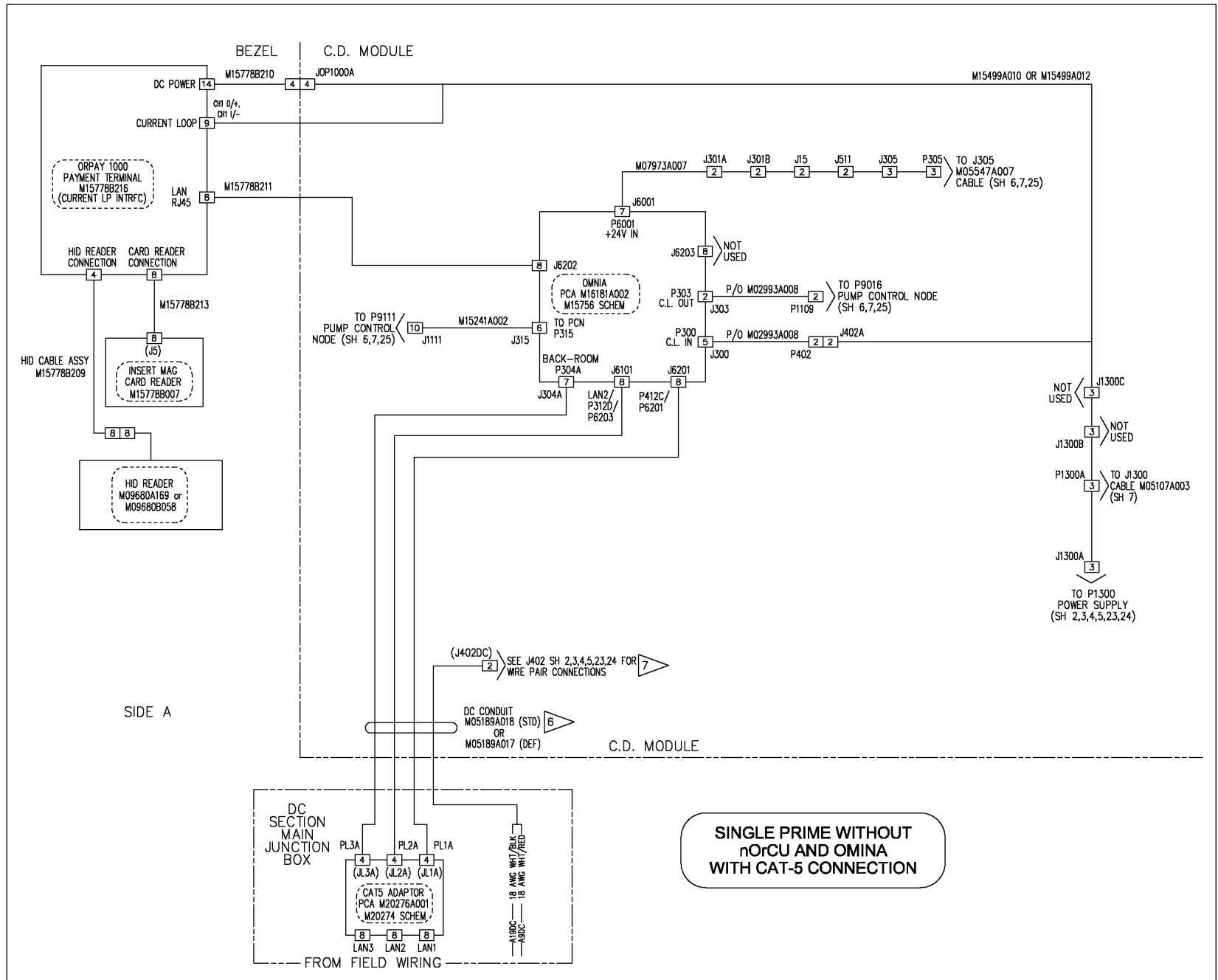


Figure 8-19: ORPAK PRIME Option with Omnia and High Speed Connection without nOrCU

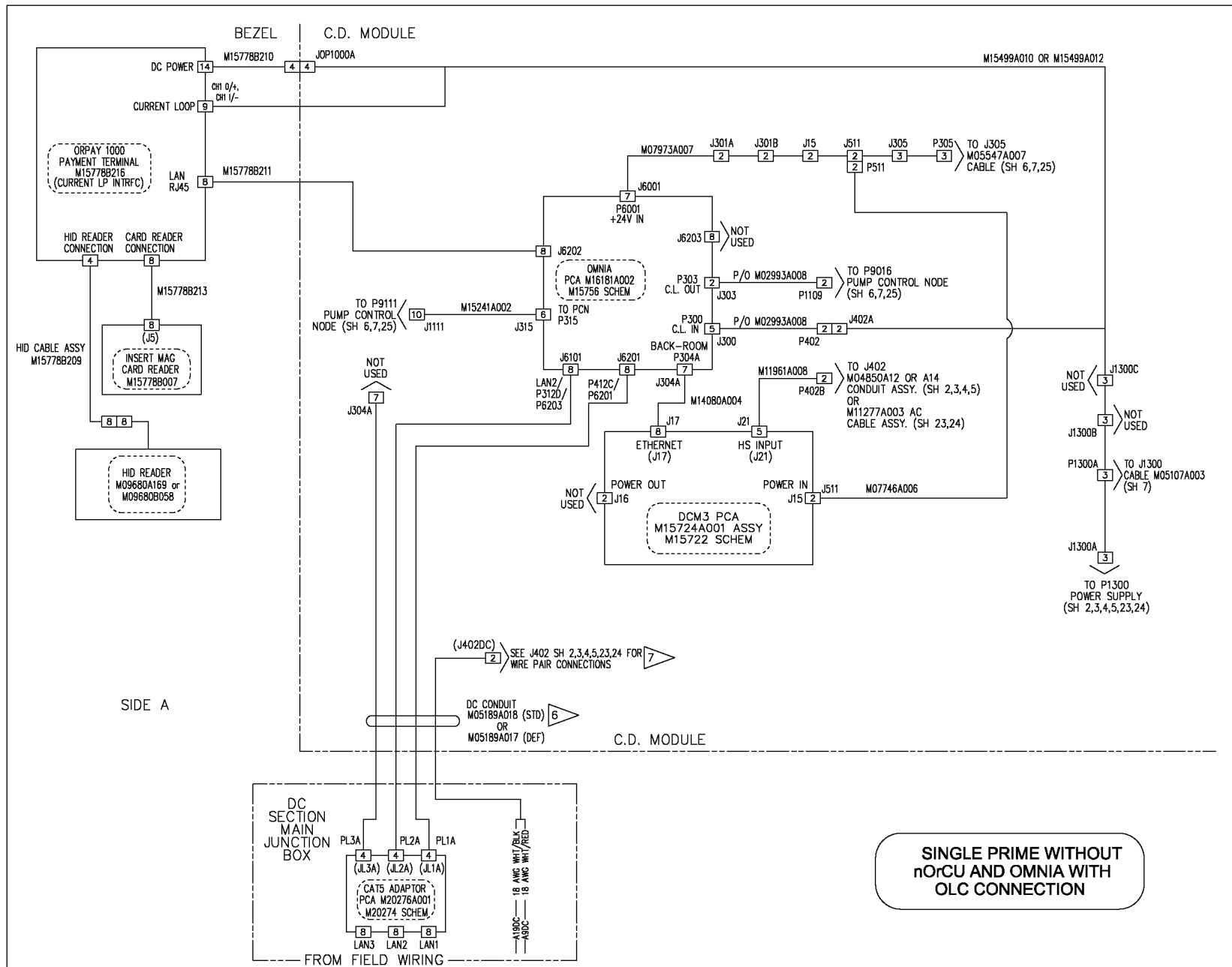


Figure 8-20: Dual ORPAK PRIME Option with Omnia and CAT-5/Ethernet Connection without nOrCU

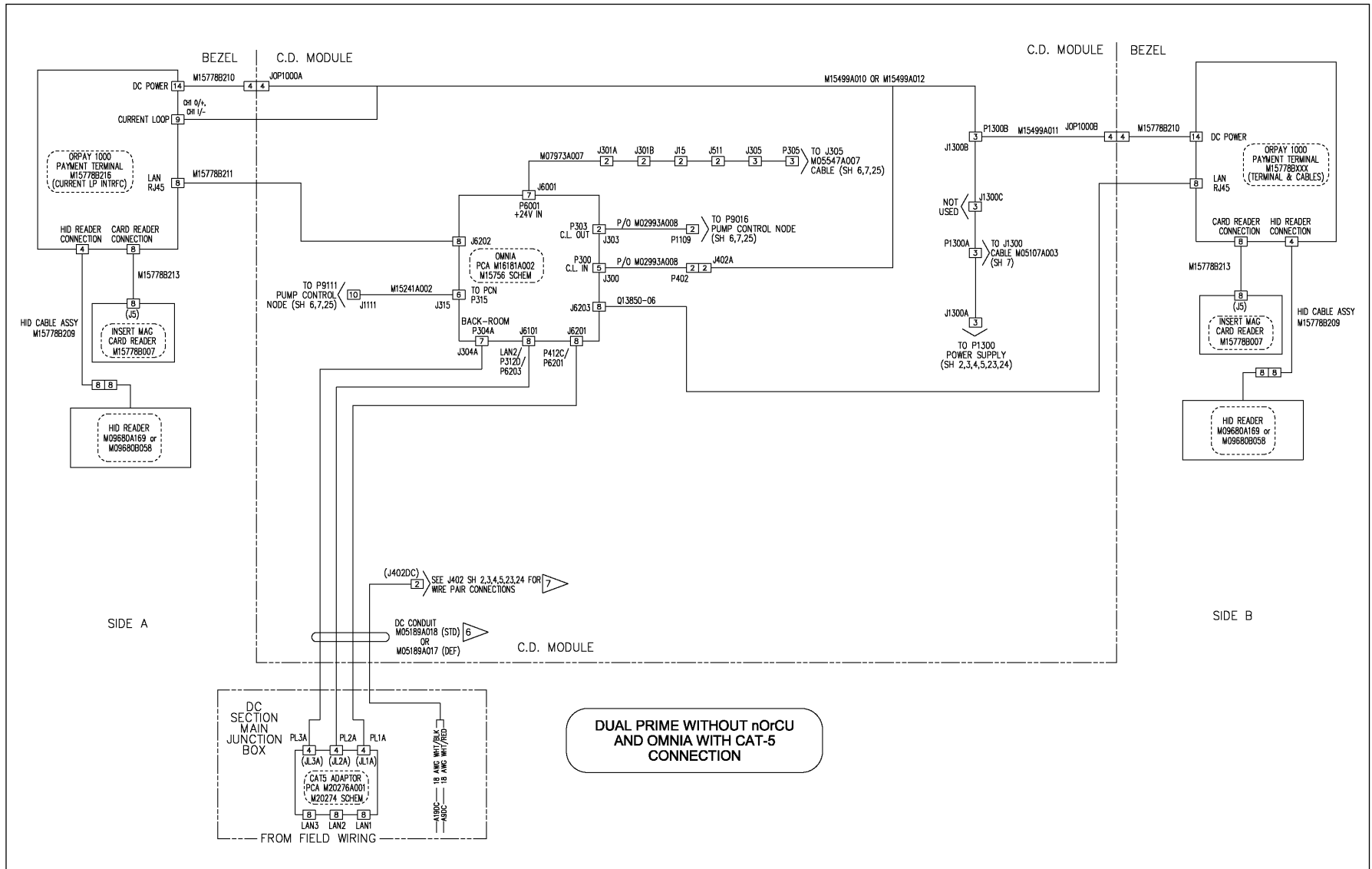


Figure 8-21: Dual ORPAK PRIME Option with Omnia and High Speed Connection without nOrCU

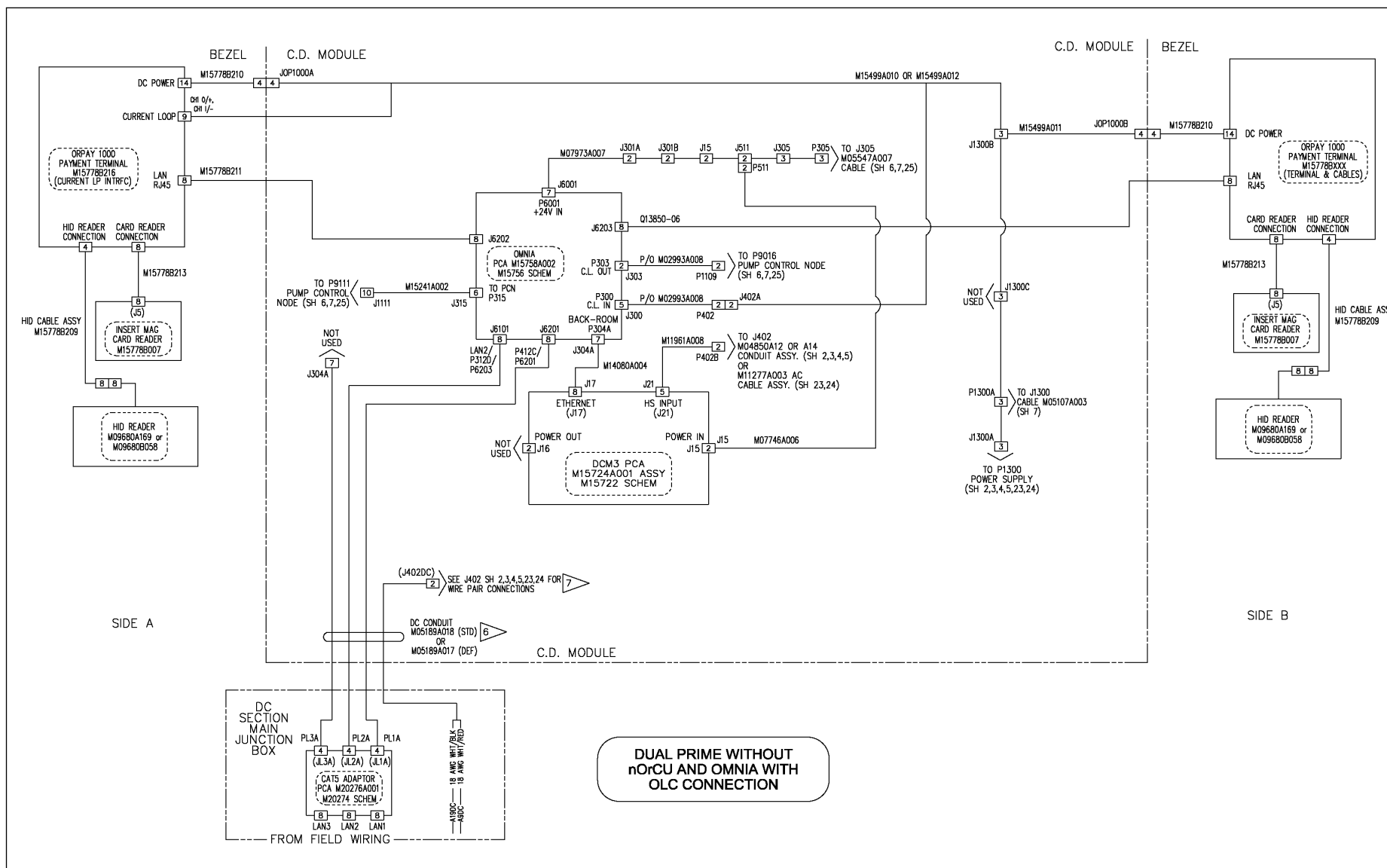


Figure 8-22: ORPAK PRIME Option with Omnia, CAT-5/Ethernet Connection, and nOrCU

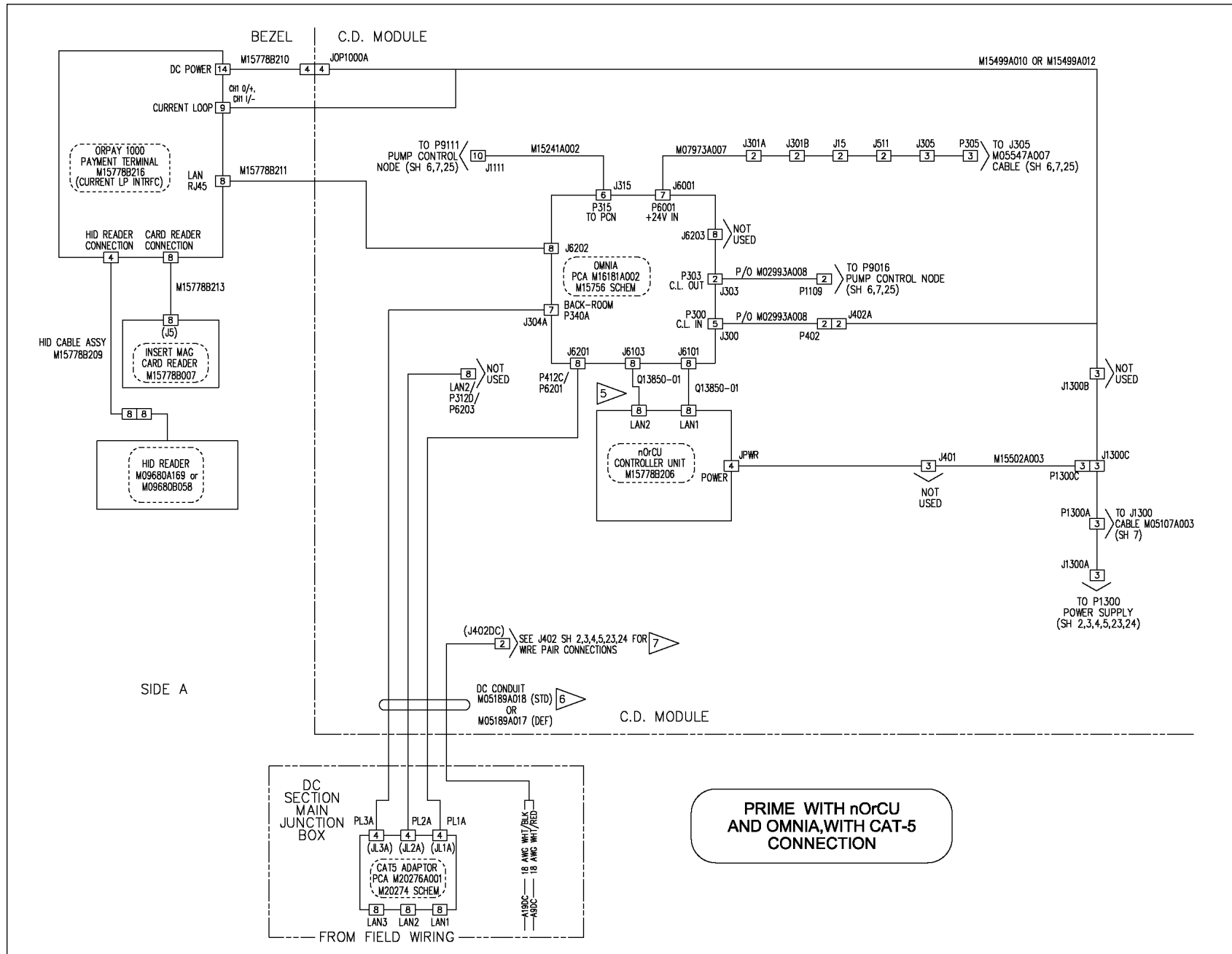


Figure 8-23: ORPAK PRIME Option with Omnia, High Speed Connection, and nOrCU

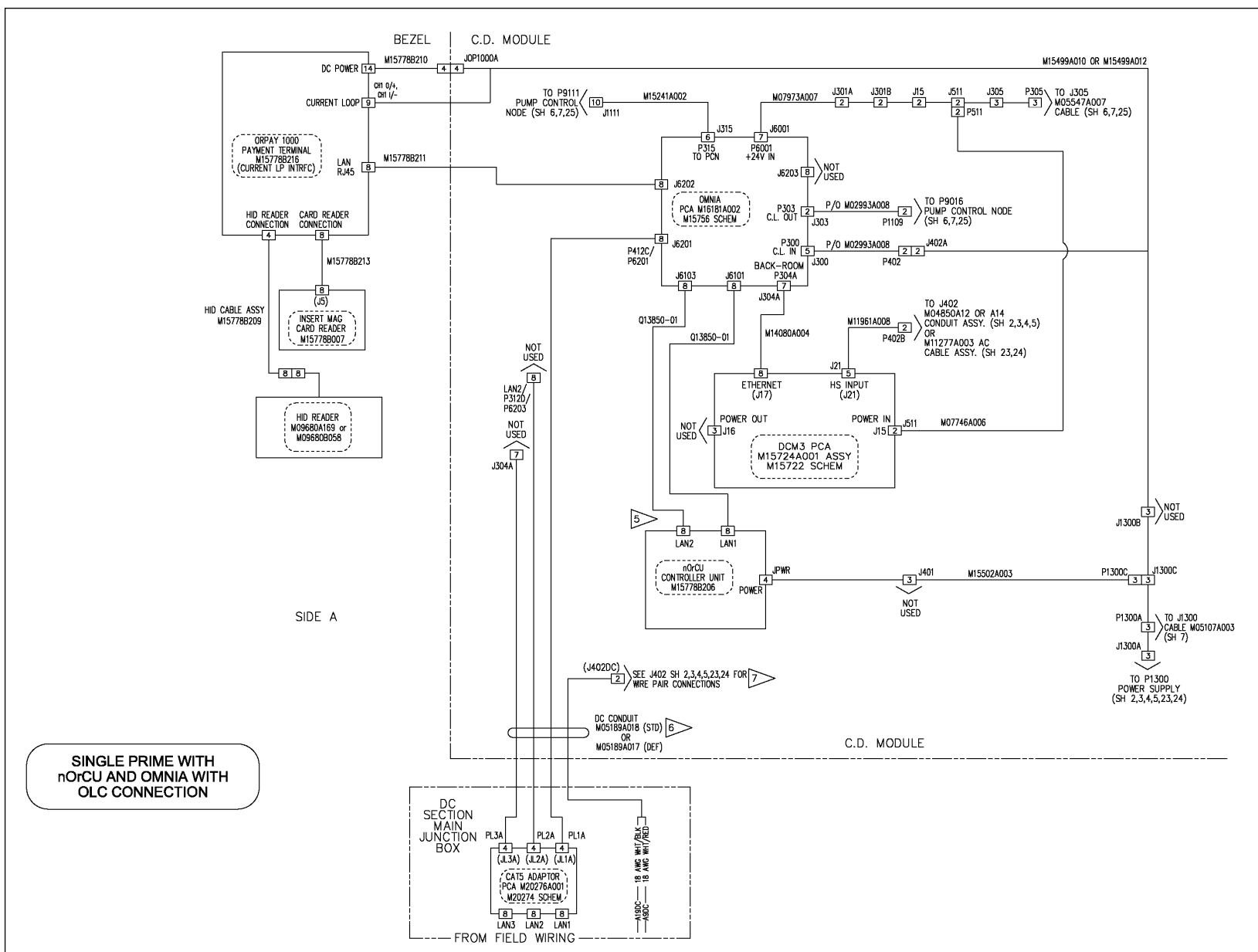


Figure 8-24: Dual ORPAK PRIME Option with Omnia, CAT-5/Ethernet Connection, and nOrCU

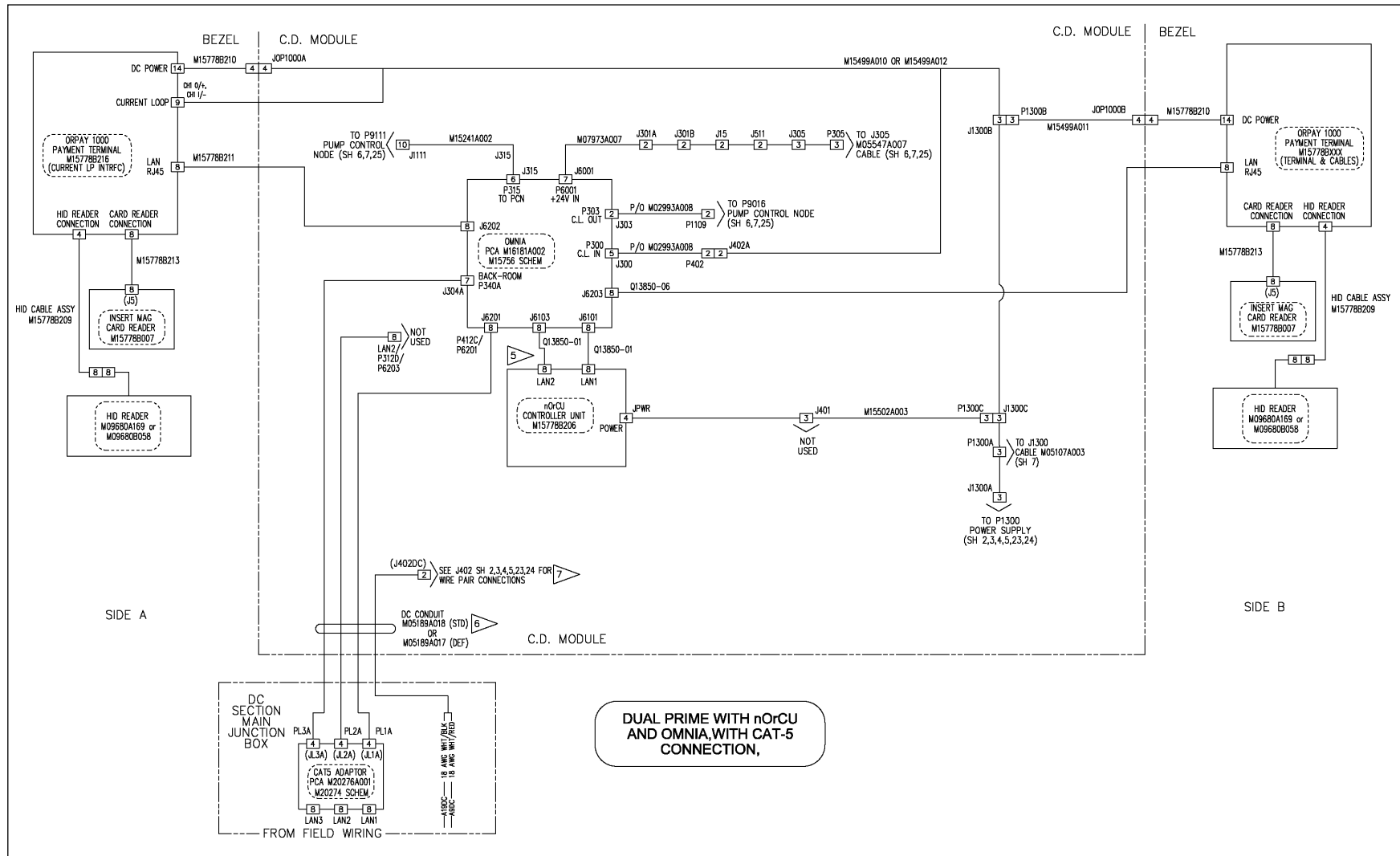


Figure 8-25: Dual ORPAK PRIME Option with Omnia, High Speed Connection, and nOrCU

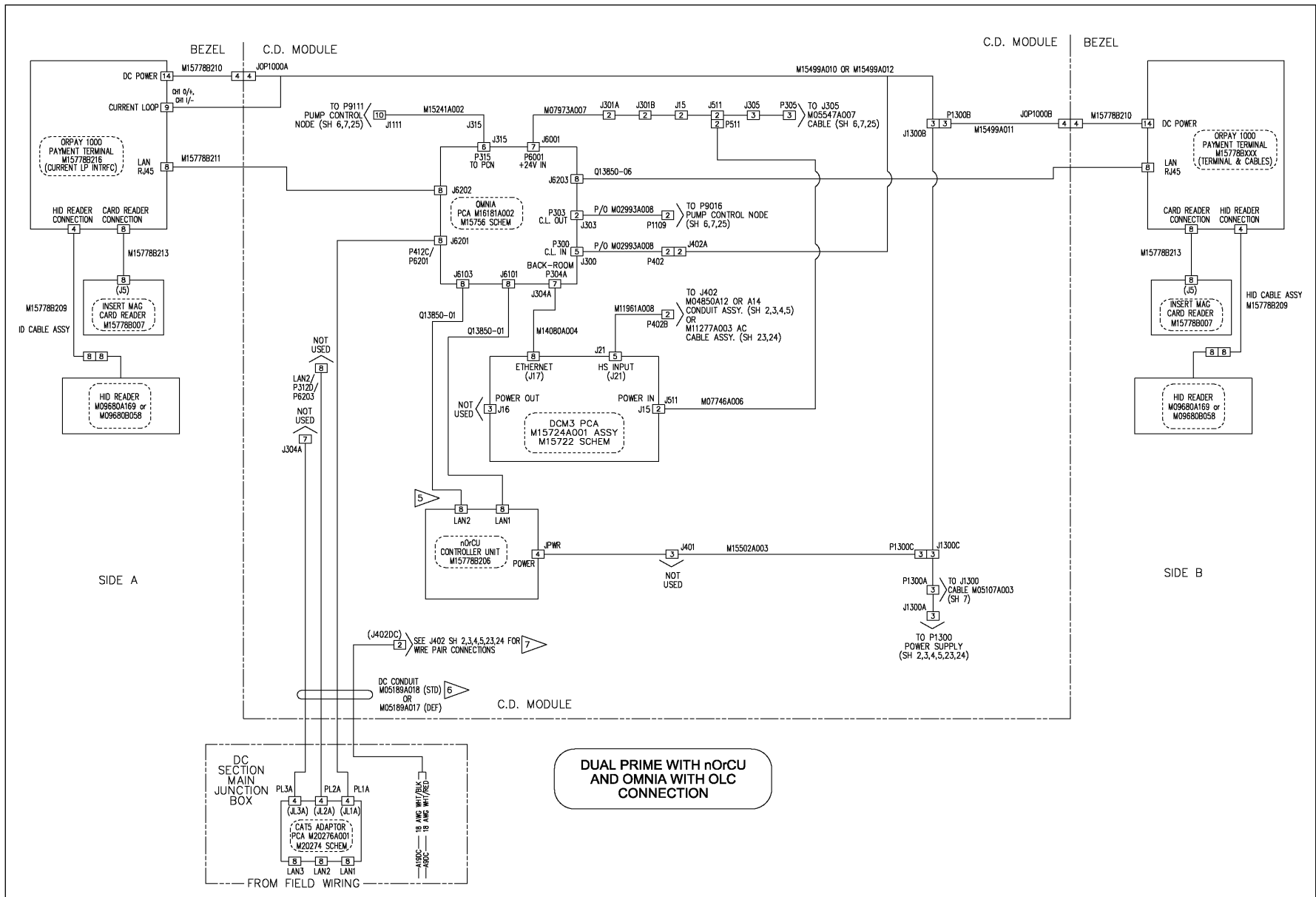


Figure 8-26: DEF Unit - No STP Relays, J-box, and Conduit

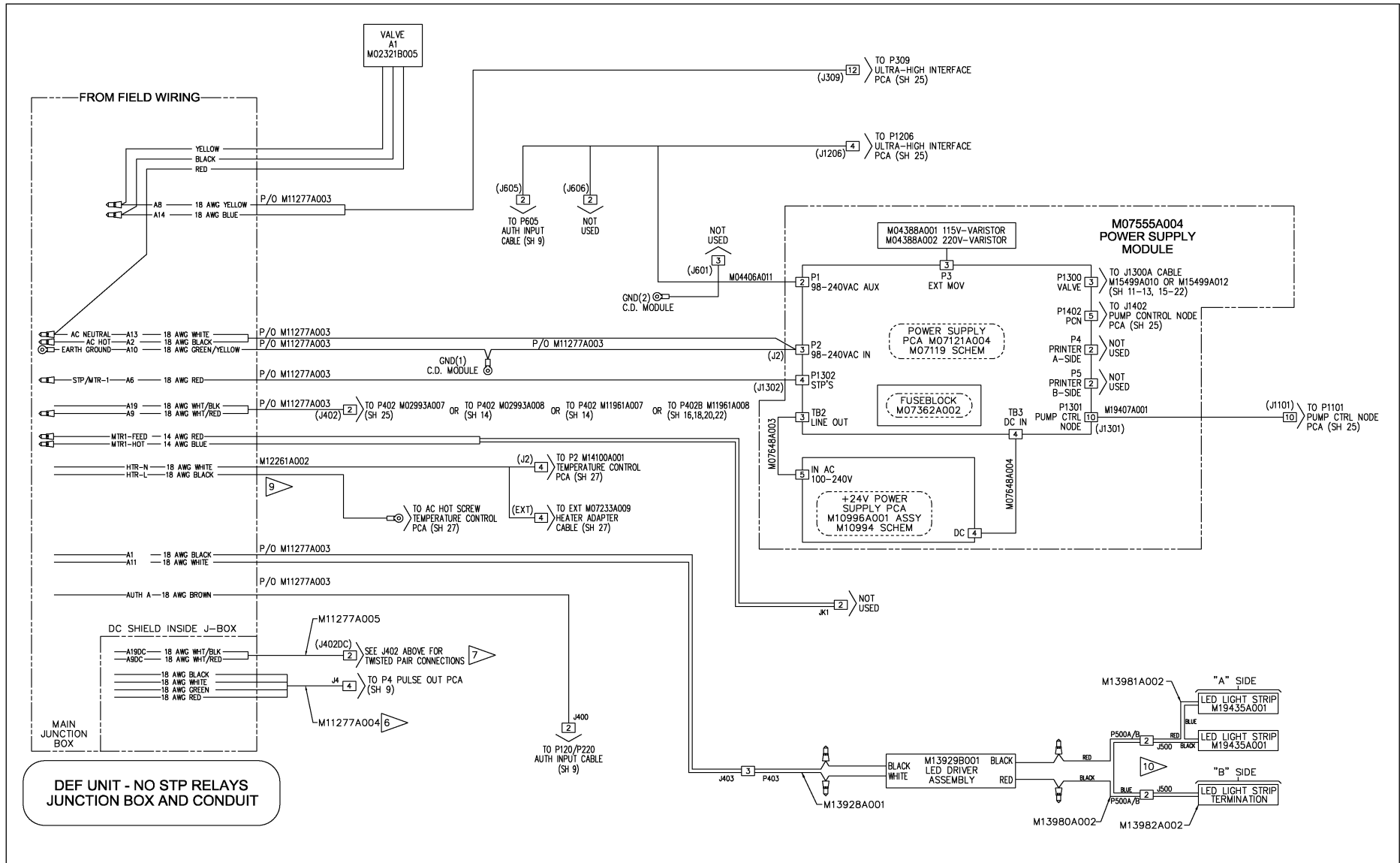


Figure 8-27: DEF Unit - STP Relays, J-box, and Conduit

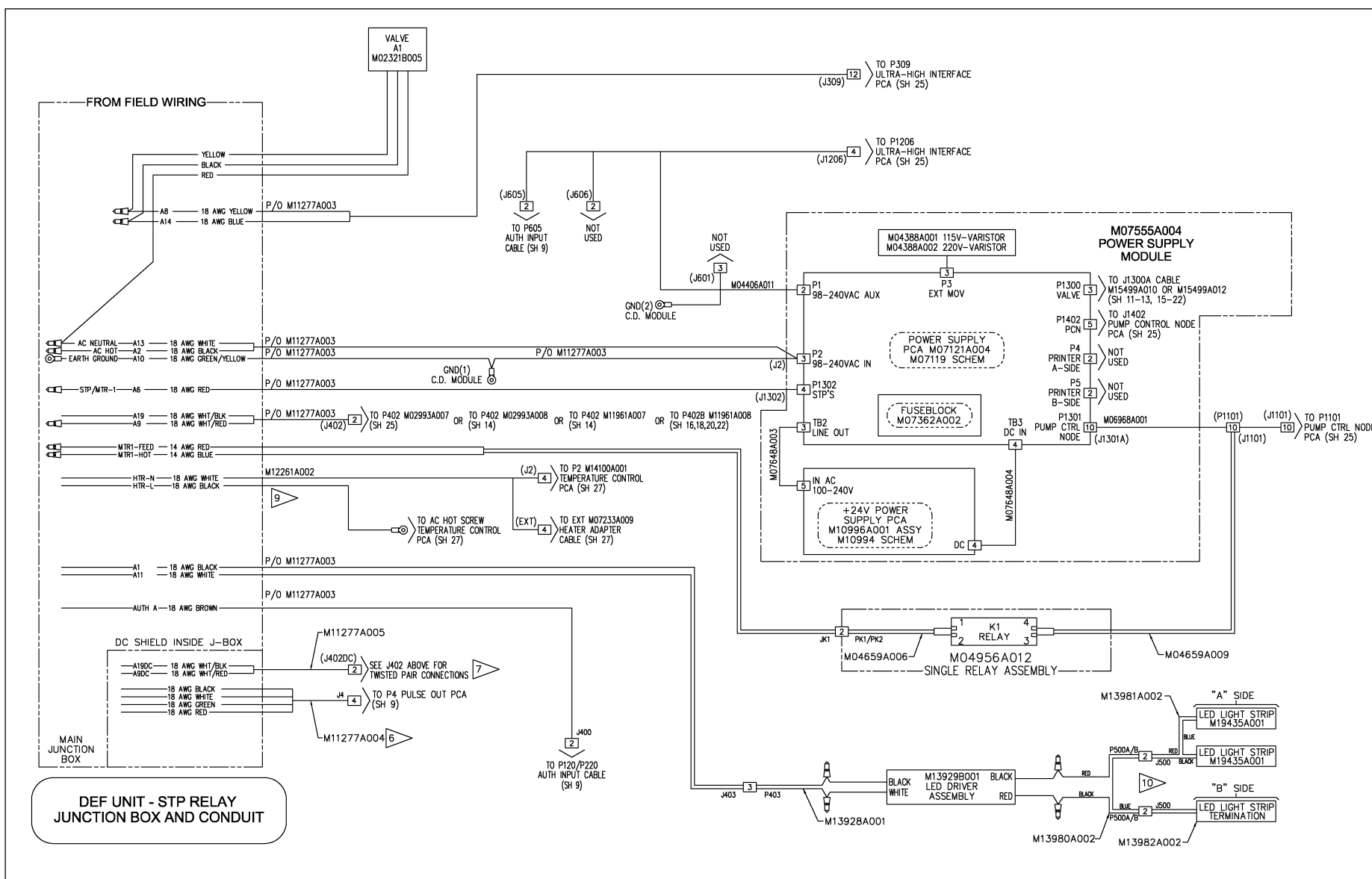


Figure 8-29: DEF Base Electronics (PCN4)

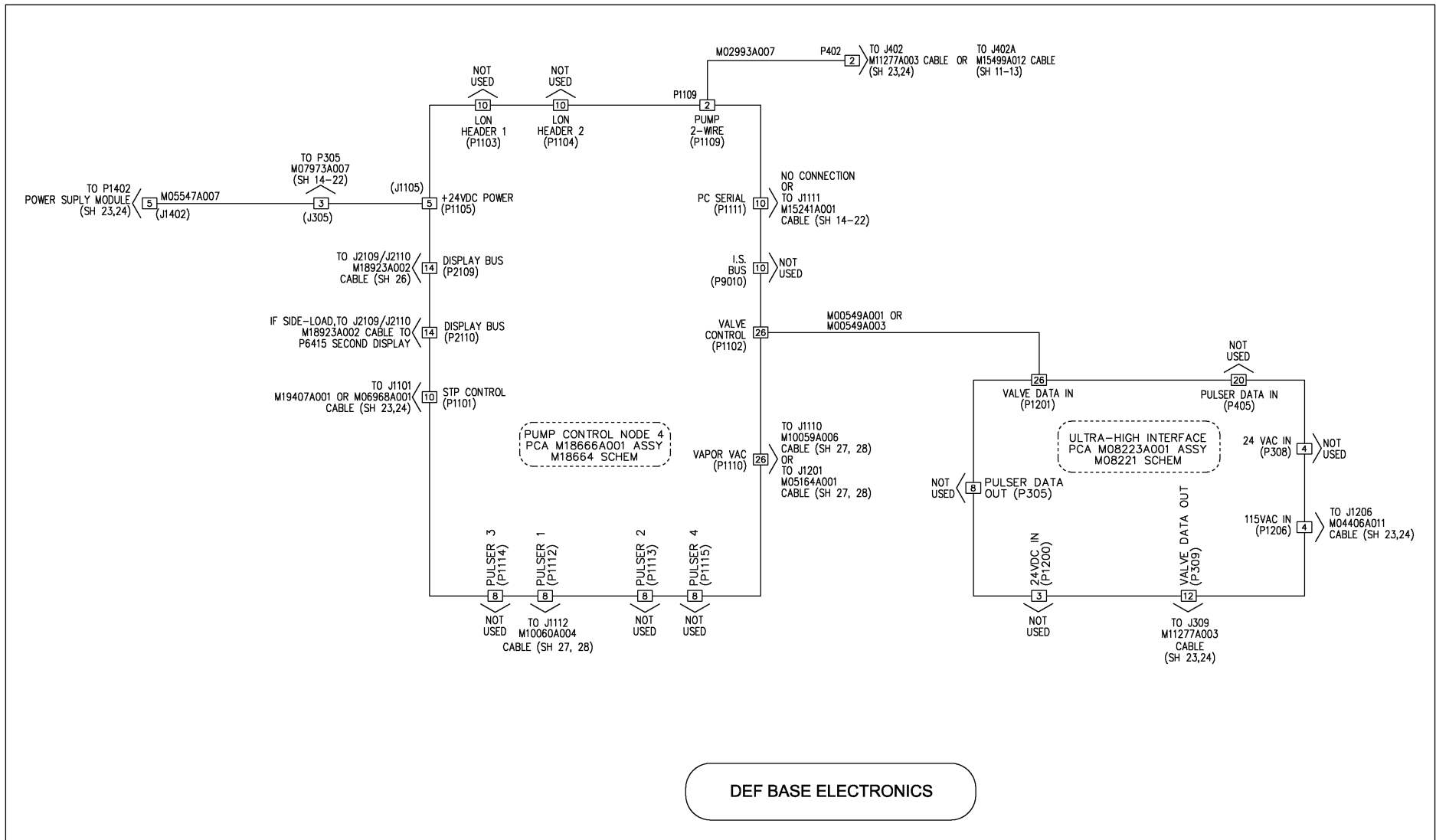


Figure 8-30: Base Display Electronics for WW and CW DEF

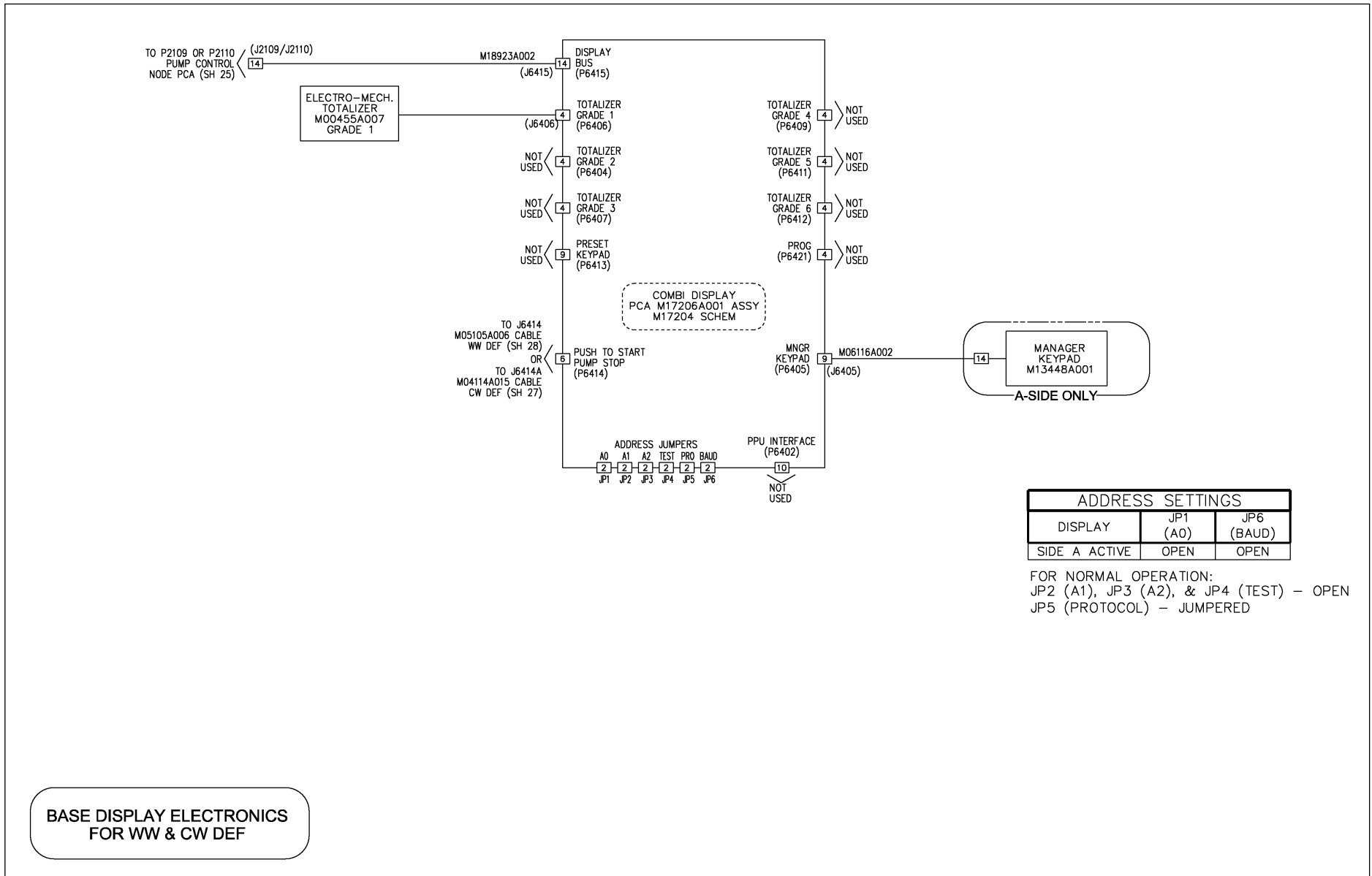


Figure 8-31: Cold Weather DEF Unit

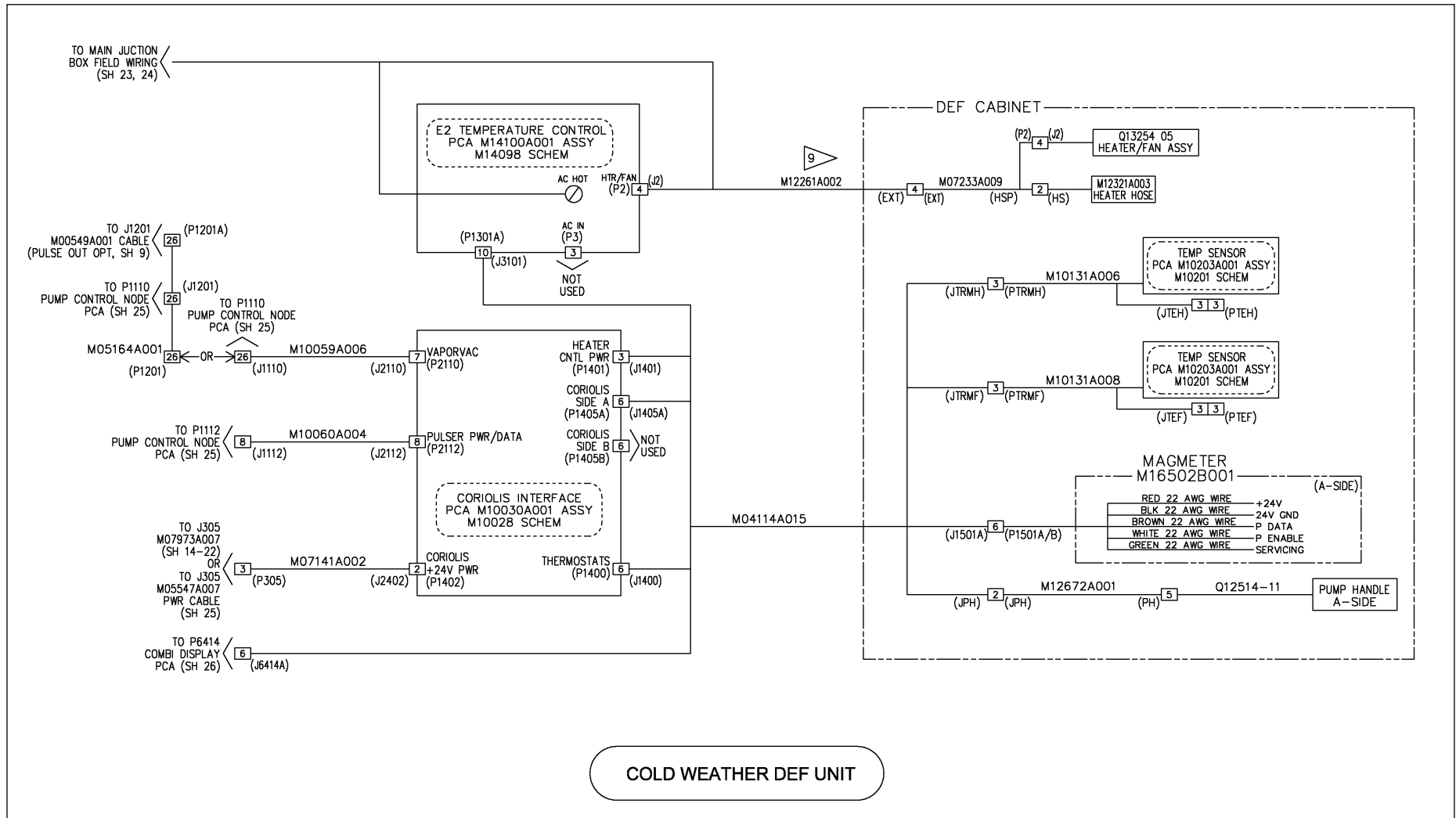


Figure 8-32: Warm Weather DEF Unit

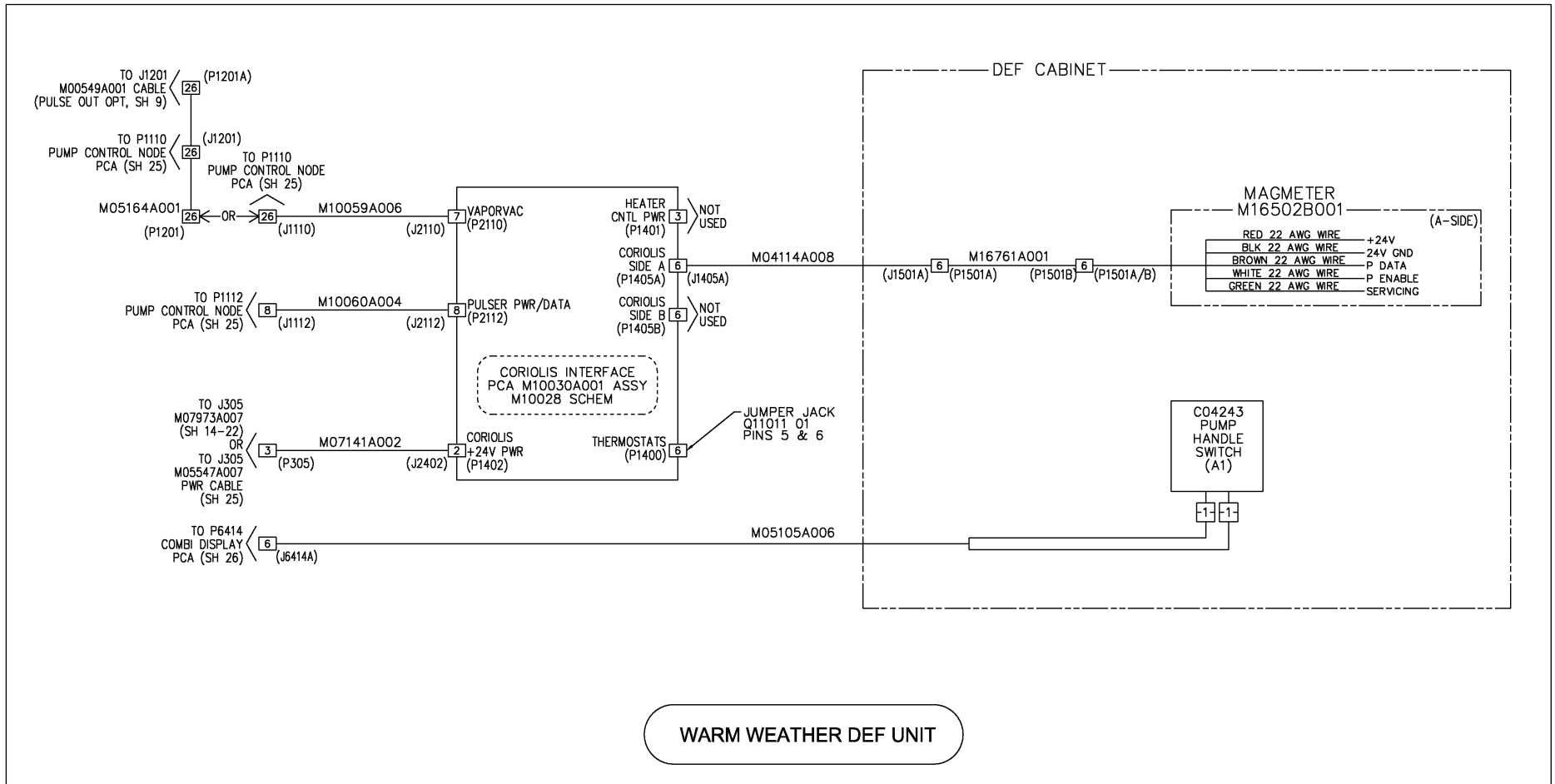


Figure 8-33: Single Satellite Unit

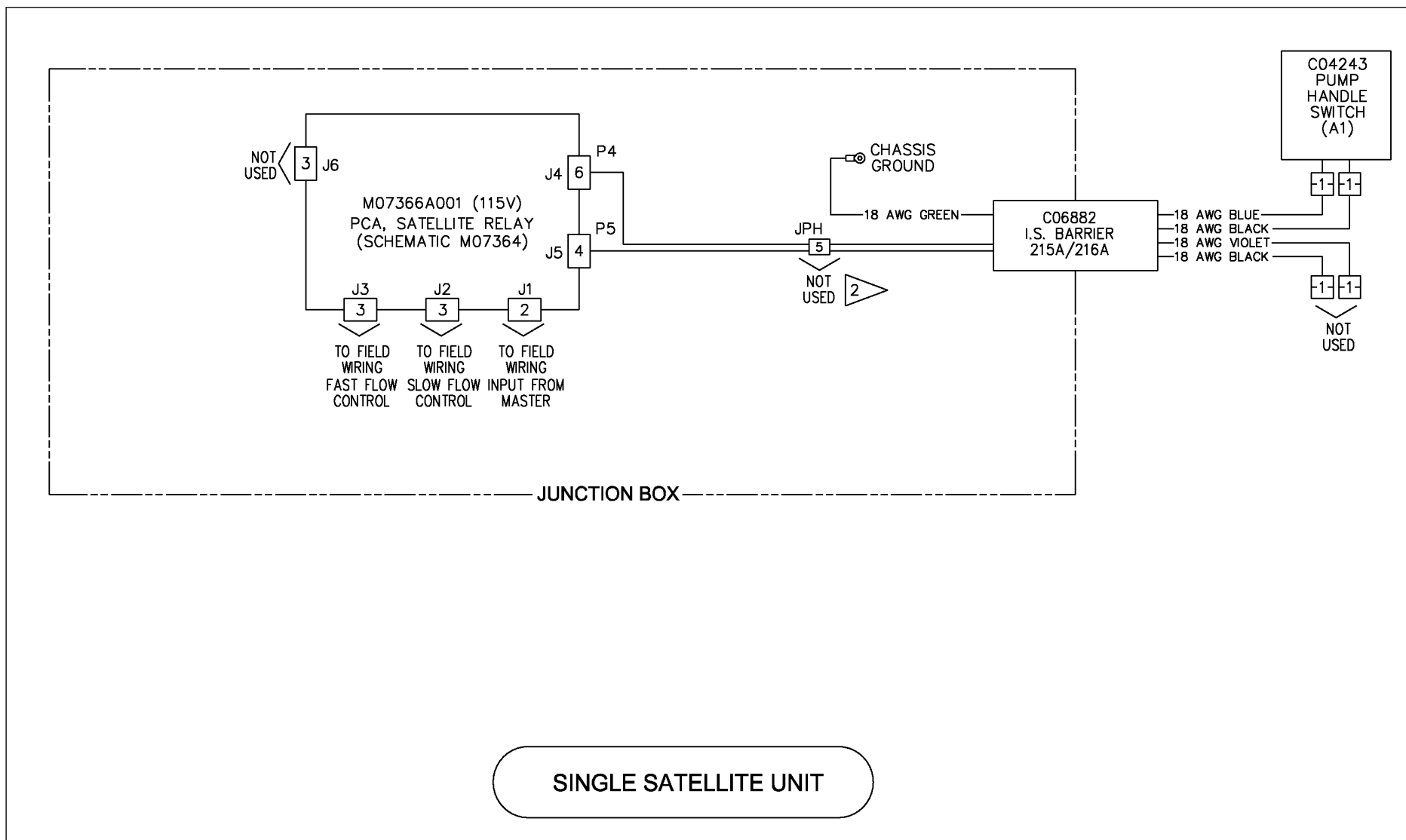
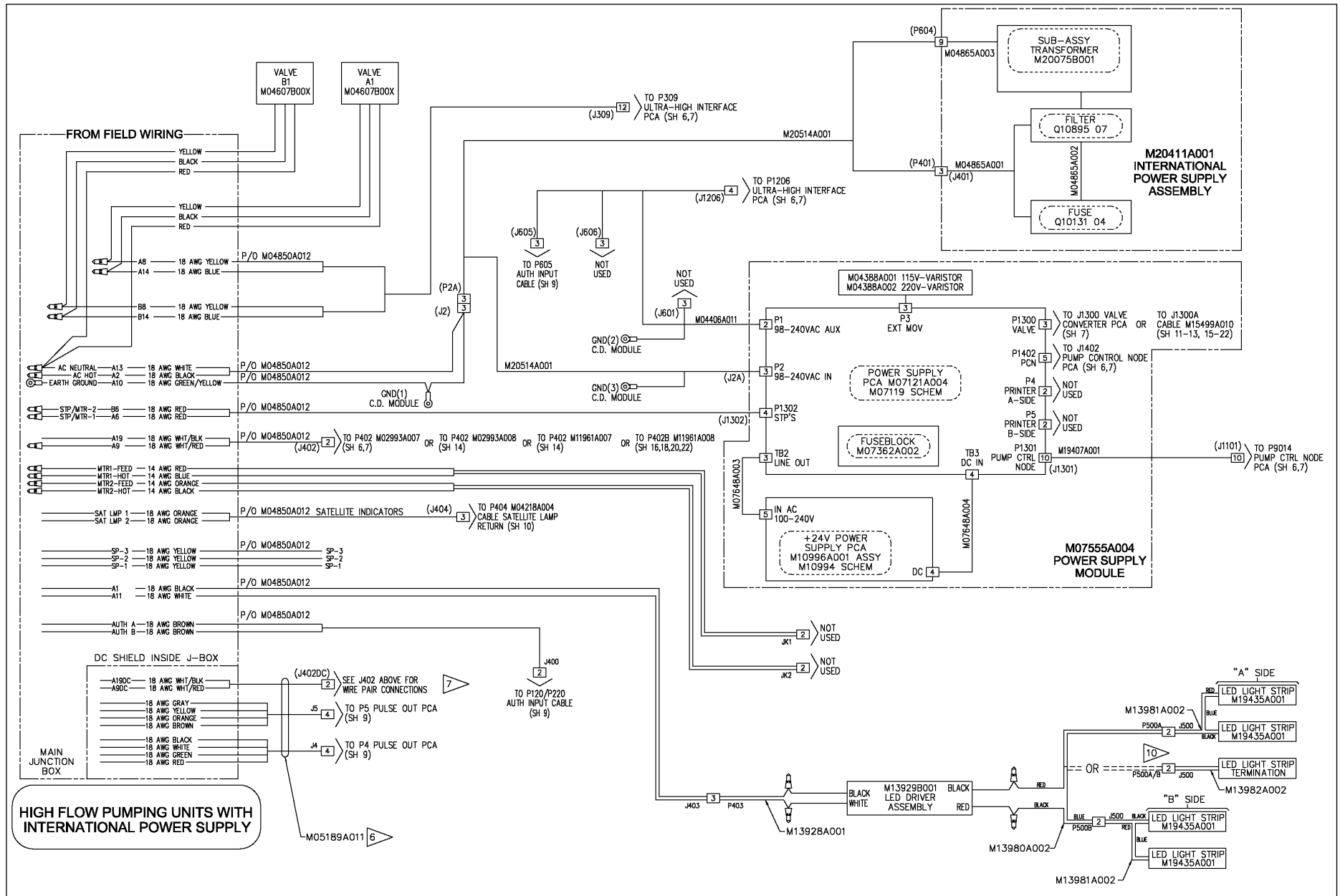


Figure 8-34: High-Flow Pumping Units with International Power Supply (IPS)



AtlasX Hydraulics, Bezel, and Door Configurations

Figure 8-37: Mechanical Single Units

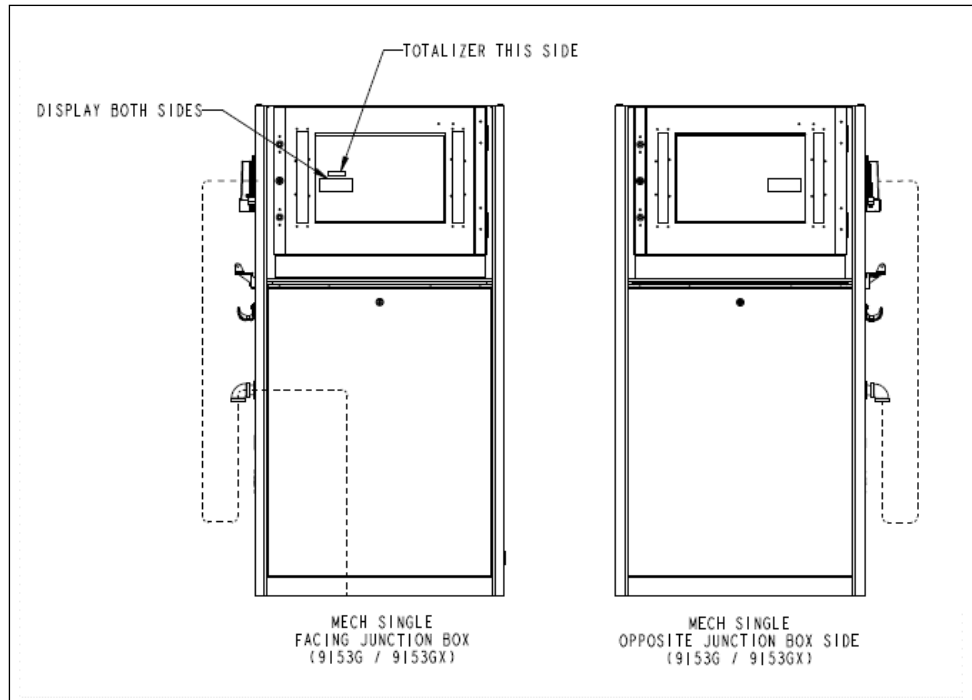


Figure 8-38: Electronic Single Side-Load Units

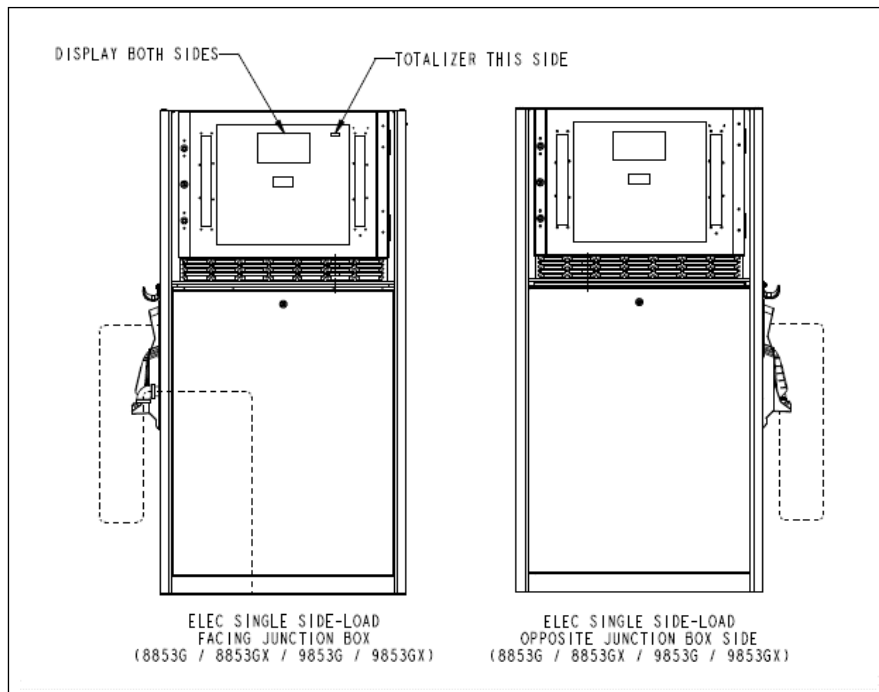


Figure 8-39: Electronic Single Front-Load Unit

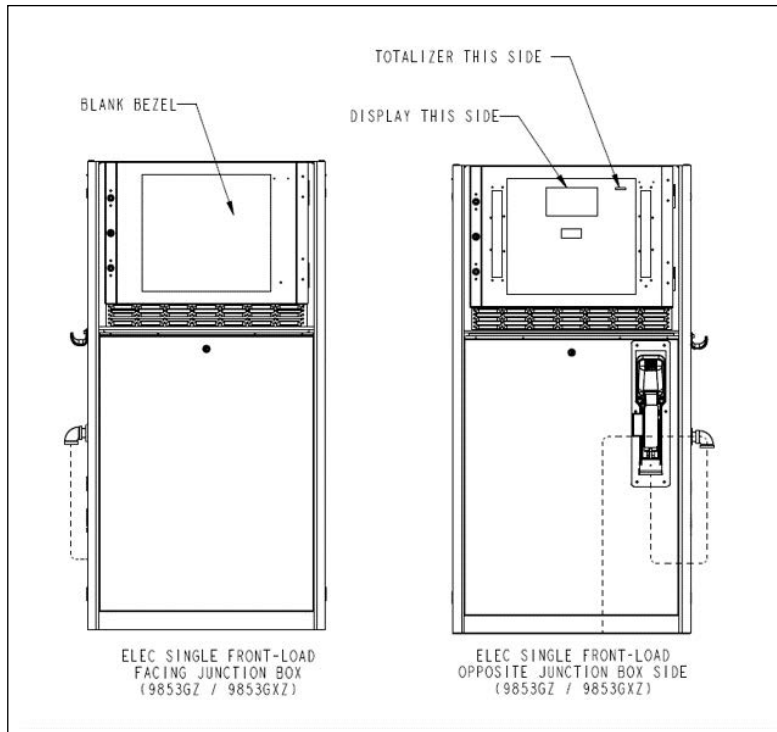


Figure 8-40: Mechanical 1-Grade 2-Hose Facing J-box

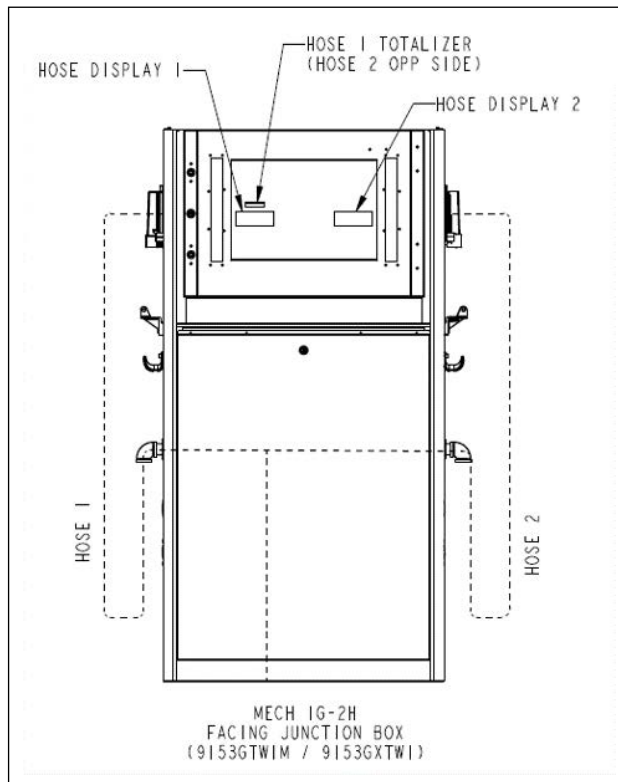


Figure 8-41: Electronic 1-Grade 2-Hose Side-Load Facing J-box

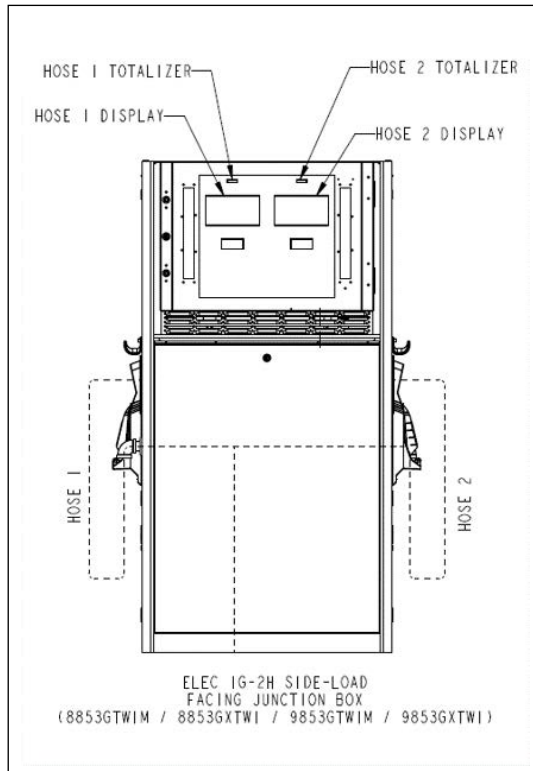


Figure 8-42: Electronic 1-Grade 2-Hose Front-Load Facing J-box

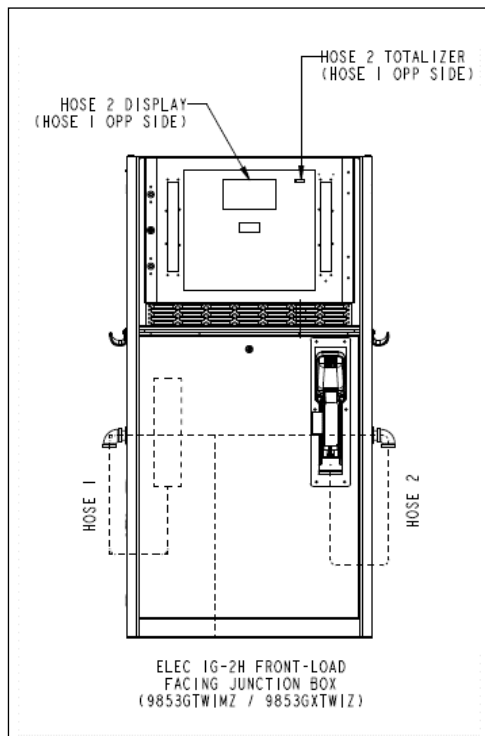


Figure 8-43: Mechanical 2-Grade 2-Hose Facing J-box

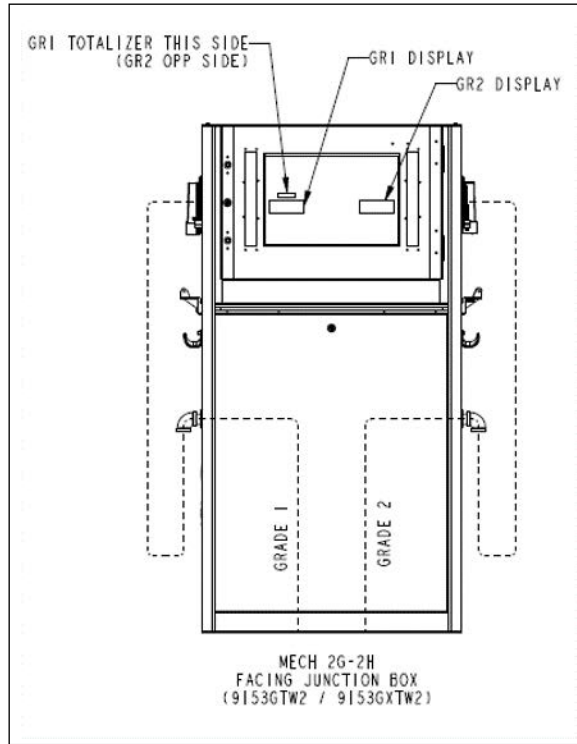


Figure 8-44: Electronic 2-Grade 2-Hose Side-Load Facing J-box

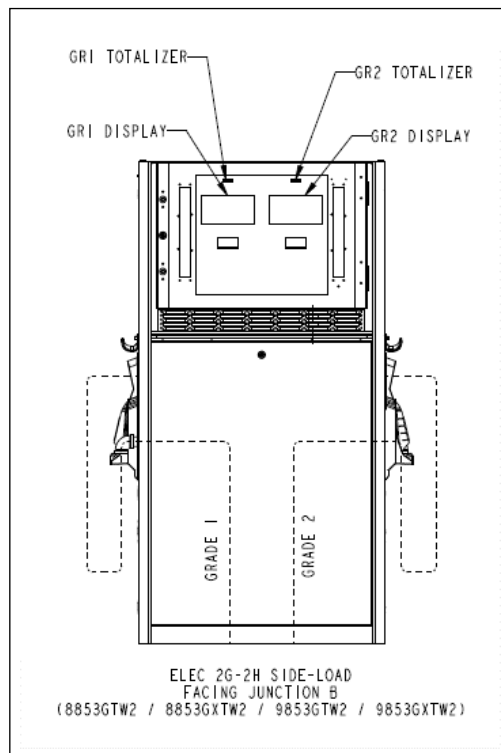


Figure 8-45: Electronic 2-Grade 2-Hose Front-Load Facing J-box

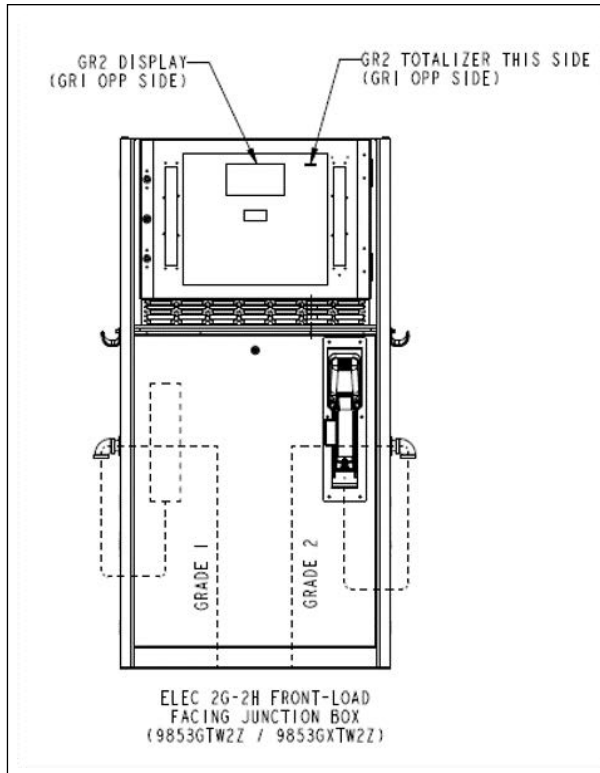


Figure 8-46: Single Ultra-Hi Unit Facing J-box

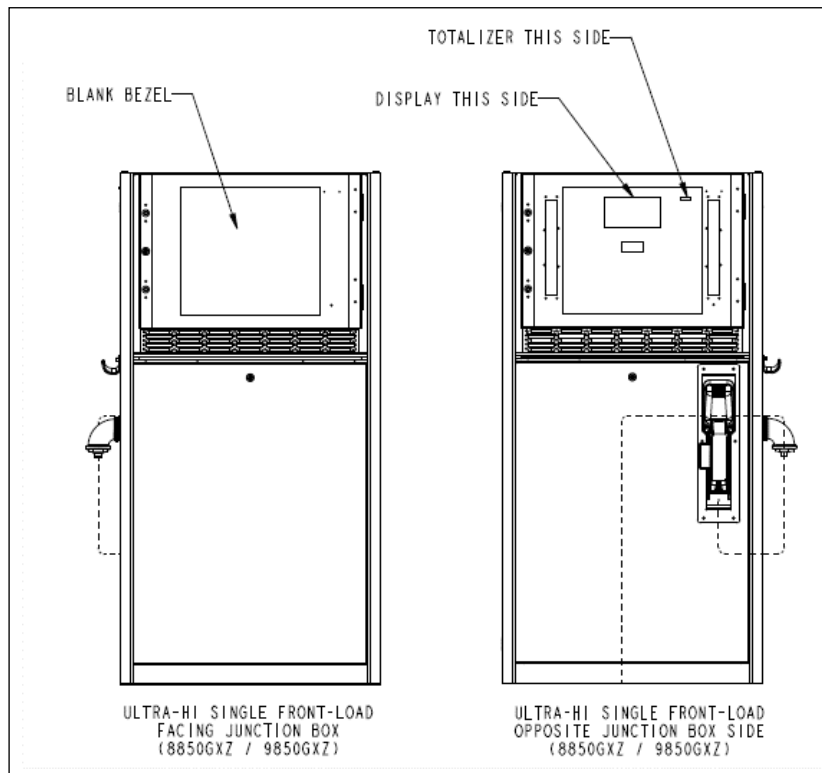


Figure 8-47: Ultra-Hi Single Side-Load Facing J-box

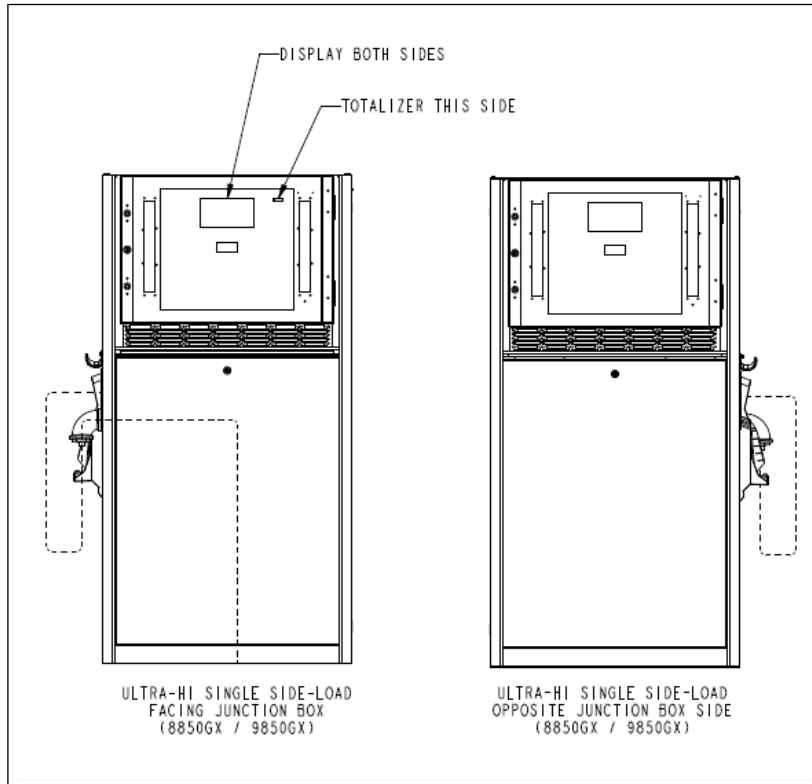


Figure 8-48: Combo Units

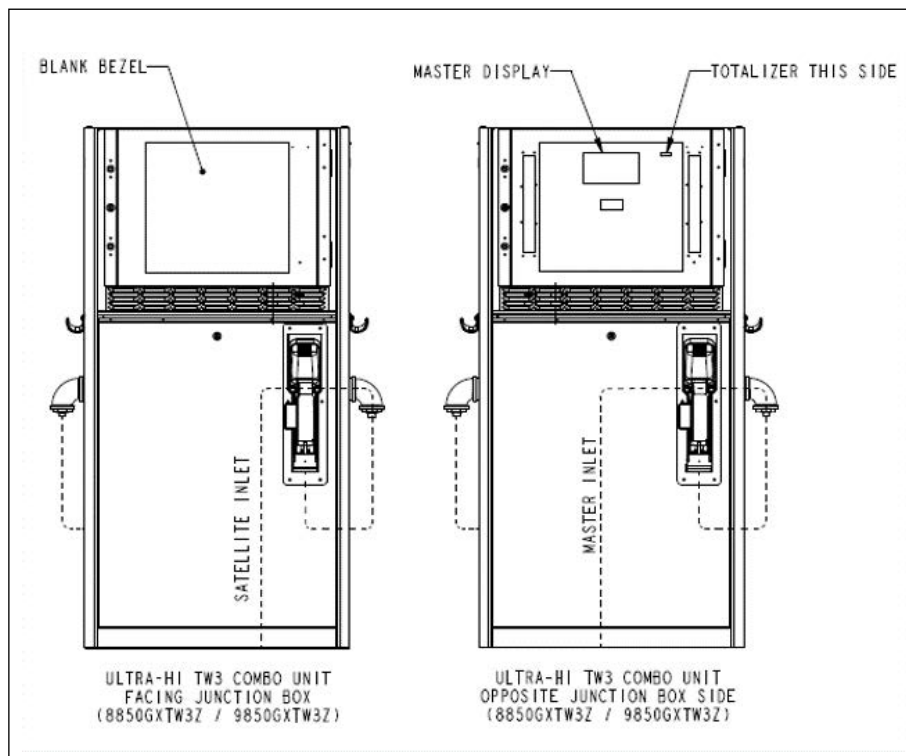


Figure 8-49: Ultra-Hi TW2 Facing J-box

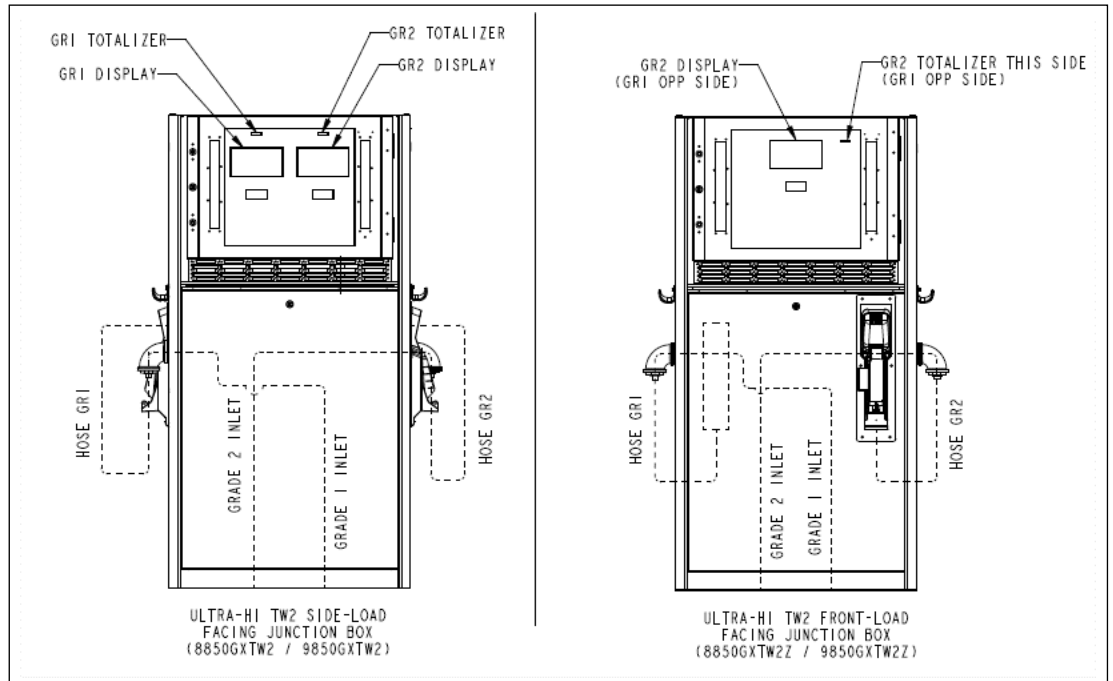


Figure 8-50: Ultra-Hi TW1 Facing J-box

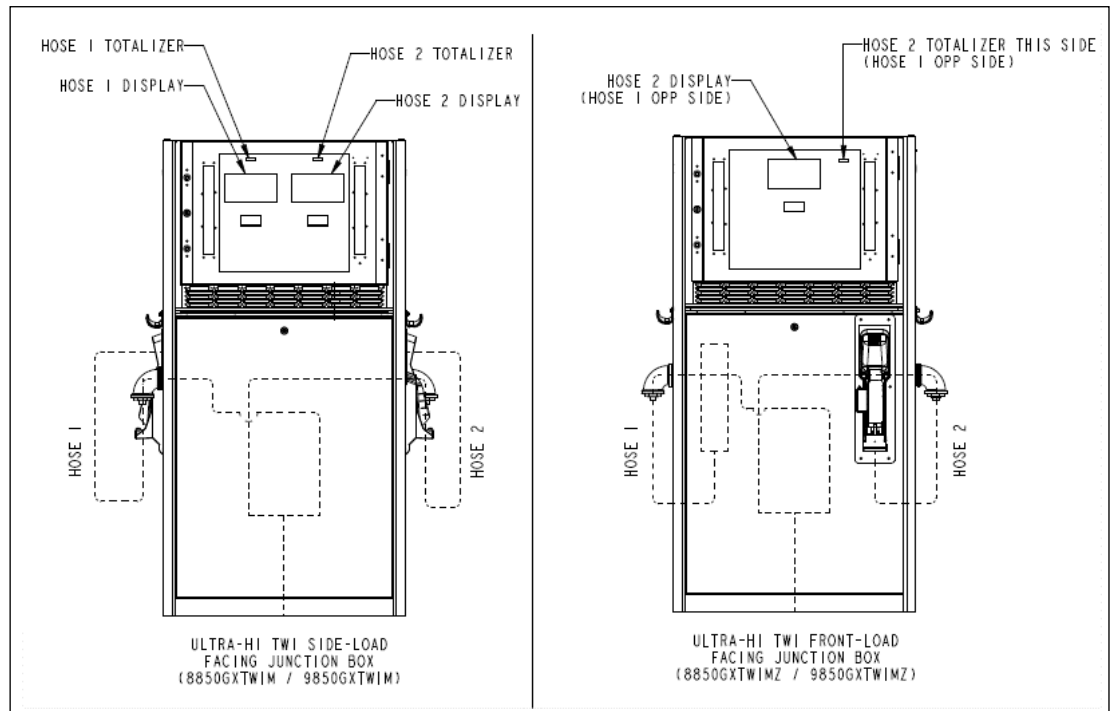


Figure 8-51: Satellite Unit

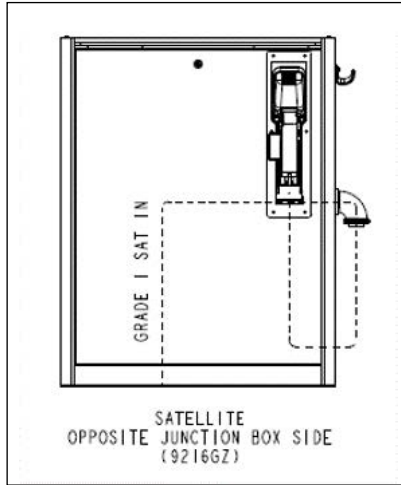


Figure 8-52: Electric CW DEF Front-Load

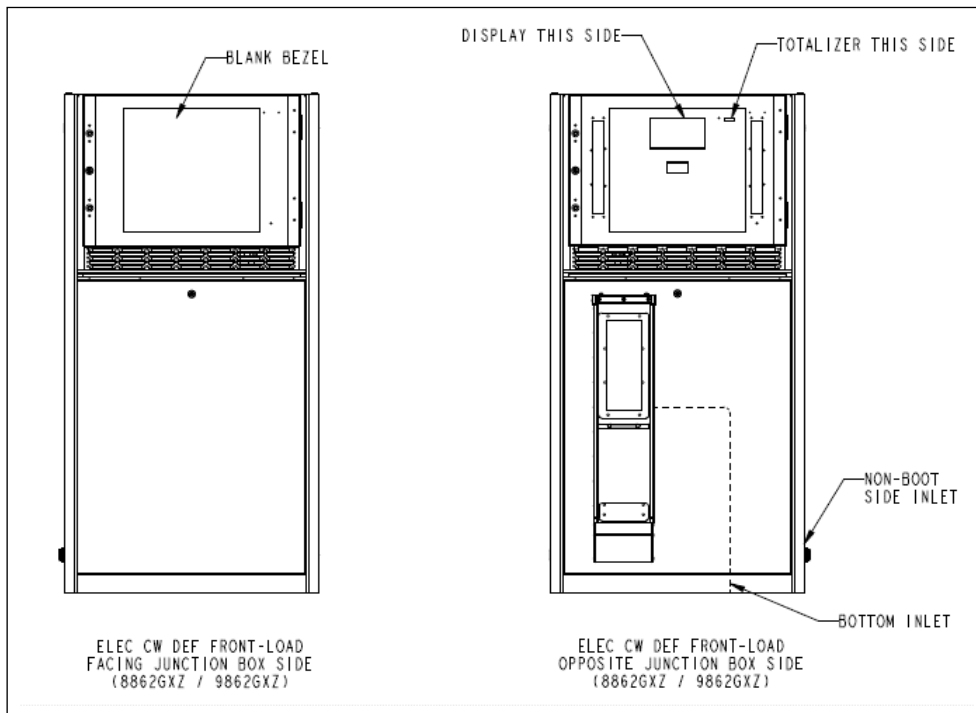


Figure 8-53: Electric WW DEF Side-Load

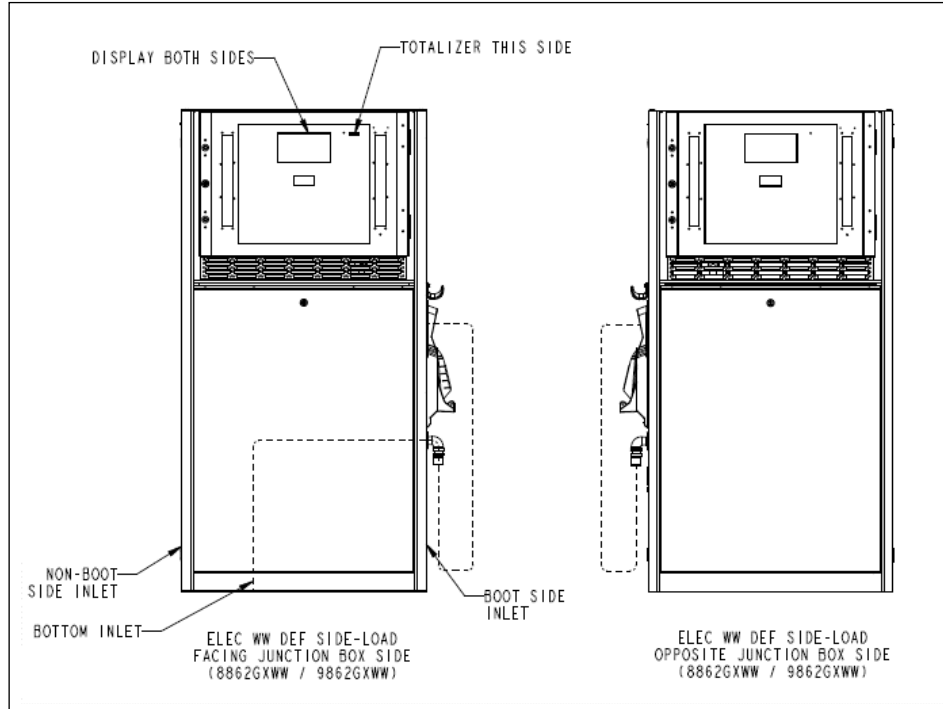
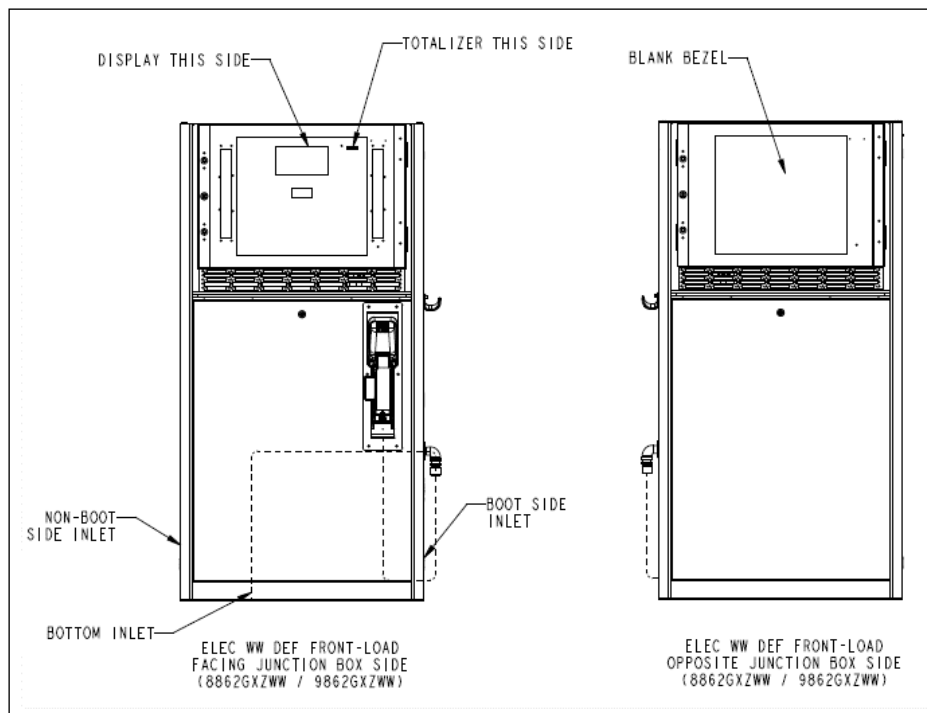


Figure 8-54: Electric WW DEF Front-Load



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9 – Preventive Maintenance and Inspection

Introduction

Purpose

This section provides information on preventive maintenance and associated inspections. Preventive maintenance is essential to prevent the unexpected downtime of units. The “[Preventive Maintenance Table](#)” on [page 9-6](#) provides maintenance recommendations.

Important Information About Releases

Sections of this manual may be released or updated independently to supply the most current data. Information about release date and version for independently released sections will be included in the section title and footer of the document. For the latest updates, refer to GOLD.

This section was last updated in June 2025.

Topics in This Section

Topic	Page
Introduction	9-1
Preventive Maintenance	9-1
Performing Inspections	9-2
Replacements and Adjustments	9-4
Preserving Finish	9-5
Preventive Maintenance Table	9-6

How to Use This Section

Discuss the suggested maintenance items with the station owner. Review the “[Preventive Maintenance Table](#)” on [page 9-6](#) to be familiar with preventive maintenance tasks you may have to perform at the site.

Preventive Maintenance

Maintenance Procedures and Parts

Gasboy AtlasX pumps and remote dispensers are designed for years of uninterrupted service. However, certain pump or dispenser parts will experience normal wear and therefore will require periodic inspections. For example, detecting fuel leaks that may occur, belt tension and belt condition, lubrication and strainer cleanliness, are all important to maintain safe and efficient unit operation. Therefore, to avoid annoying pump shut downs, a periodic preventive maintenance inspection plan must be established and followed.

Procedures requiring leak repair, shear valve maintenance, and disassembly of portions of the pump/remote dispenser must be performed by an ASC.

**WARNING**

To avoid electrical shock or hazard of an explosion or fire or a fuel spill when servicing remote pump/dispenser:

- Shut off and lockout all power to the pump/remote dispenser (in submersible pump applications, shut off and lockout power to the submersible pump and any other remote dispensers that use that submersible pump. AC power can feed back into a shut-off dispenser, when remote dispensers share a common STP or starter relay).
- Shut off and lockout all power to the remote dispenser and submersible pumps at the master panel and close and test any impact valve before performing any maintenance or service to the remote dispenser, including change of any fuel filters or strainers.
- Block the island so that no vehicles can pull up to the remote dispenser, when the dispenser is being worked on.

**CAUTION**

Moisture from rain can damage the internal components of a pump/dispenser.

Internal components exposed to moisture may not operate correctly. Do *not* open the electronics cabinet to perform any other tasks while it is raining. Exposing board to rain will void warranty for any resultant damage.

Maintenance of Vendor Supplied Parts

Certain parts of the pump/dispenser are produced by vendors for Gasboy (hoses, nozzles, and so on) and as such may have documentation different from the one that Gasboy supplies. In these cases, consult the vendor documentation for service intervals and any adjustments, if required, for your pump/dispenser.

Note: Do not rely entirely on Gasboy supplied documentation for dispenser components not manufactured by Gasboy.

Use Only Authorized Parts

The use of unauthorized parts can void your warranty, cause you to lose continuity of the Underwriters Label on the pump, cause inefficient operation, and possibly an operational hazard. Always use new gaskets and seals when servicing or rebuilding Gasboy AtlasX equipment.

Performing Inspections

This section provides instructions for scheduling two types of maintenance inspections:

- General inspections
- Component inspections

Safety Warnings

You are performing inspections and maintenance in a potentially dangerous environment of flammable fuels/vapors and high voltage. Follow all safety precautions to prevent injury when inspecting a pump/dispenser at the island.

⚠ WARNING

You are performing inspection and maintenance in a potentially dangerous environment of flammable fuels/vapors and high voltage.

Fire, explosion, or electrical shock could result in severe injury or death if you do not follow safety procedures.

Read and obey all safety precautions in this manual to prevent potential injury or death.

General Inspections

Note: For more information, refer to MDE-5695 AtlasX Fuel Systems Owner's Manual.

Perform a general inspection of each pump/dispenser as follows:

- Every week, to verify if all pumps/dispensers are operating properly
- Whenever you receive a complaint about potential unit problems

As part of the general inspection, inspect all areas for signs of damage or sharp edges. Replace any missing or damaged warning labels. Gasboy also strongly recommends that an ASC periodically inspects the equipment, as outlined in the next sub-section.

⚠ WARNING

Leaking fuel can be ignited, causing a fire or explosion.

Fire, explosion, or electrical shock could result in severe injury or death if you continue to use damaged pumps/dispensers.

If you find any leaks or damage, stop using the pump/dispenser.

⚠ WARNING

Personnel servicing a pump/dispenser can be injured if the pump/dispenser is not barricaded to all unauthorized personnel and vehicles.

If proper precautions are not taken, the person servicing the unit can be injured by a vehicle.

Before servicing a pump/dispenser, evacuate all unauthorized persons and vehicles, and then use your vehicle, safety tape, or cones as barricades.

Component Inspections

To schedule component inspections, refer to [“Preventive Maintenance Table”](#) on [page 9-6](#). The station owner must only *inspect* for problems. For safety reasons, several tasks in the [“Preventive Maintenance Table”](#) on [page 9-6](#) including all repairs, must be performed only by an ASC. To determine the tasks performed by an ASC, refer to the column entitled [“Who Performs the Inspection/Repair”](#) on [page 9-6](#).

⚠ WARNING

The pump/dispenser contains pressurized flammable fuel and lethal voltages.

Servicing a Gasboy AtlasX unit incorrectly could result in severe injury or death.

Do *not* attempt to service Gasboy AtlasX pumps/dispensers yourself and do *not* allow untrained personnel to service Gasboy AtlasX pumps/dispensers. Only Gasboy AtlasX-trained ASCs must service a Gasboy AtlasX unit.

⚠ WARNING

Leaking fuel can be ignited, causing a fire or explosion.

Fire, explosion, or electrical shock could result in severe injury or death if you continue to use damaged pumps/dispensers.

If you find any leaks or damage, stop using the pump/dispenser.

⚠ WARNING

Improperly installed or maintained equipment can create a hazard.

Improperly installed or maintained equipment could cause a fire, explosion, or electrical shock.

For any component not supplied by Gasboy AtlasX (for example, hoses and nozzles), consult and follow the installation and maintenance instructions provided by the manufacturer.

Replacements and Adjustments

Filter/Strainer Replacement

If the unit is equipped with a strainer and filter, check and change it at regular intervals (refer to “[Preventive Maintenance Table](#)” on [page 9-6](#)). A dirty strainer and/or filter in a pump or remote dispenser will cause a slower delivery rate. To ensure that you replace the strainer and filter required with the one designed for your model, refer to the accessories section of your parts manual. Always use a drip pan and absorbent material directly below the filter when removing the cartridge, to prevent contamination of both soil and electrical components within the cabinet. This service must not be performed by untrained individuals.

Special Setup Required for Aircraft Fueling

⚠ WARNING

Aircraft fuel is incompatible with Gasboy AtlasX pumps/dispensers.

Do *not* use Gasboy AtlasX pumps/dispensers for aircraft fuel.

Adjusting Belts (Suction Pumps Only)

With proper care, belts will give exceptionally good service. A loose or overtightened belt not only cuts down dispensing speed due to slipping, it also results in excessive wear of pump and/or motor bearings causing premature failures. Refer to “[Preventive Maintenance Table](#)” on [page 9-6](#). This service must not be performed by untrained individuals.

Preserving Finish

Preserving Finish of Fueling Equipment

Nearly all gasoline pumps are installed outdoors where their surfaces are subject to weather conditions. As a result, it is required to give the finish a reasonable amount of care if an attractive appearance is to be maintained.

The finish on Gasboy AtlasX pump housings is a high-heat baked synthetic enamel, similar to that used on automobiles. The life of this finish can be lengthened several years if the painted surfaces are thoroughly cleaned with a high grade automobile polish and then protected with a coat of paste wax at regular intervals.





To prolong the life of the finish, avoid the following:




- Use of abrasive cleaners or polish.
- Use of high pressure spraying equipment.
- Use of window cleaner with ammonia on the electronic display.
- Do not wax the textured surfaces. Waxing the textured surfaces can damage the units by adversely affecting the appearance of units.
- Do not use cleaners containing ammonia on display windows.





To retain the unmarked finish on stainless steel, occasional cleaning is required. In corrosive atmospheres, such as coastal areas, a more frequent cleaning schedule is required. Under ordinary conditions, washing with detergent or soap and water followed by a clean water rinse is sufficient. If hard water is used, the surface must be wiped dry with a soft clean cloth to prevent the formation of water spots. Marks or spots such as grease, oily fingerprints, and smudges, which resist soap and detergents, must be removed with a stronger cleaner. Do not use ordinary steel wool as iron particles may adhere to the surface and cause corrosion. Care must be taken in choosing a cleaner as cleaning compounds or powders that contain abrasives can scratch the mill-rolled metallic finish. Exercise care so that the polishing is done along the lines in the steel and never across them. After cleaning, an application of paste wax is recommended to protect the surface and prolong the interval between cleaning.




Preventive Maintenance Table




Components	Recommended Frequency	Recommended Maintenance	Who Performs the Inspection/Repair
Stainless steel sheathing and lower doors	Once every three months (once a month in harsh environments)	For stains on stainless steel, use a cleaner specifically formulated for cleaning stainless steel. Gasboy recommends Bar Keepers Friend®. Ensure that you thoroughly rinse off the cleaner.	Owner - Inspect/Repair and test
Hoses, swivels	At least once a week or if a customer complaint arises	<ol style="list-style-type: none"> 1 Inspect each hose for leaks, abuse, and excessive wear. 2 Inspect each hose, breakaway, whip hose, and vapor hose for the following wear or damage: <ul style="list-style-type: none"> • Bulges reinforcement showing • Cracks - Soft spots • Damage - Tears • Flattened spots - Weaknesses • Holes - Wear through <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>⚠ WARNING</p> <p>Leaking fuel can be ignited, causing a fire or explosion.</p> <p>Fire, explosion, or electrical shock could result in severe injury or death if you continue to use damaged pumps/dispensers.</p> <p>If you find any leaks or damage, stop using the pump/dispenser.</p> </div> <ol style="list-style-type: none"> 3 Ensure that vapor recovery hoses do <i>not</i> touch the ground, when the nozzle is seated properly in the nozzle boot. 4 For any additional inspections required, consult the manufacturer. If repair is required, call an ASC to make the repairs. 	Owner - Inspect
Hose Retrievers	Once a week or if a customer complaint arises	<ol style="list-style-type: none"> 1 Inspect hose retrievers for frayed or broken cables. 2 Inspect hose retrievers for cables wrapped around hoses. 3 If repair is required, call an ASC to make the repairs. <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>⚠ WARNING</p> <p>The pump/dispenser contains pressurized flammable fuel and lethal voltages.</p> <p>Servicing a Gasboy AtlasX unit incorrectly could result in severe injury or death.</p> <p>Do <i>not</i> allow untrained personnel to service Gasboy AtlasX pumps/dispensers. Only Gasboy AtlasX-trained ASCs must service a Gasboy AtlasX unit.</p> </div>	<ul style="list-style-type: none"> • Owner - Inspect • ASC only - Repair and Test

Components	Recommended Frequency	Recommended Maintenance	Who Performs the Inspection/Repair
Nozzles and boot area	Once a week or when notified about a potential problem	<ol style="list-style-type: none"> Inspect nozzles for the following wear or damage: <ul style="list-style-type: none"> • Damage • Leaks • Loose nozzle spouts • Missing parts, such as retainer springs and splash guards 	<ul style="list-style-type: none"> • Owner - Inspect • ASC only - Repair and test
<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>Leaking fuel can be ignited, causing a fire or explosion.</p> <p>Fire, explosion, or electrical shock could result in severe injury or death if you continue to use damaged pumps/dispensers.</p> <p>If you find any leaks or damage, stop using the pump/dispenser.</p>			
<ol style="list-style-type: none"> Inspect vapor recovery boots (bellows) for proper seal and damage. Consult the nozzle manufacturer for additional inspections, if required. If repair is required, call an ASC to make the repairs. 			
<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>The pump/dispenser contains pressurized flammable fuel and lethal voltages.</p> <p>Servicing a Gasboy AtlasX unit incorrectly could result in severe injury or death.</p> <p>Do <i>not</i> allow untrained personnel to service Gasboy AtlasX pumps/dispensers. Only Gasboy-trained ASCs must service a Gasboy AtlasX unit.</p>			
Leaks, external	Once a week or when notified about a potential leak	<ol style="list-style-type: none"> Inspect the following for any signs of damage or leaks, such as cracks, cuts, wear, or flattening: <ul style="list-style-type: none"> • Breakaways • Couplings • Hose outlet castings • Hoses • Nozzles • Swivels Review the documentation provided by the manufacturer of each component. If a leak is found, stop using the pump/dispenser and make arrangements to repair the leak. 	
<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>Leaking fuel can be ignited, causing a fire or explosion.</p> <p>Fire, explosion, or electrical shock could result in severe injury or death if you continue to use damaged pumps/dispensers.</p> <p>If you find any leaks or damage, stop using the pump/dispenser.</p>			
Leaks, external (continued)			
<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>The pump/dispenser contains pressurized flammable fuel and lethal voltages.</p> <p>Servicing a Gasboy AtlasX unit incorrectly could result in severe injury or death.</p> <p>Do <i>not</i> allow untrained personnel to service Gasboy AtlasX pumps/dispensers. Only Gasboy AtlasX-trained ASCs must service a Gasboy AtlasX unit.</p>			


Components	Recommended Frequency	Recommended Maintenance	Who Performs the Inspection/Repair
Displays (Electronic units)	Once a week	<ol style="list-style-type: none"> 1 Inspect the displays for proper reading of all digits. 2 Verify if the displays are properly backlit. 	<ul style="list-style-type: none"> • Owner - Inspect • ASC only - Repair and test
Breakaways	Once a week or after drive-offs	<ol style="list-style-type: none"> 1 Inspect breakaways for secure connections to the hose and for any leaks. 2 For units with hose retrievers, position the breakaway coupling between the retriever connection to the hose and the nozzle. The breakaway whip hose must be attached to the nozzle. 3 For any additional required inspections, consult the breakaway manufacturer. 4 If repair is required, call an ASC to make the repairs. 	<ul style="list-style-type: none"> • Owner - Inspect • ASC only - Repair and test
<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>Leaking fuel can be ignited, causing a fire or explosion.</p> <p>Fire, explosion, or electrical shock could result in severe injury or death if you continue to use damaged pumps/dispensers.</p> <p>If you find any leaks or damage, stop using the pump/dispenser.</p>			
<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>The pump/dispenser contains pressurized flammable fuel and lethal voltages.</p> <p>Servicing a Gasboy AtlasX unit incorrectly could result in severe injury or death.</p> <p>Do <i>not</i> allow untrained personnel to service Gasboy AtlasX pumps/dispensers. Only Gasboy AtlasX-trained ASCs must service a Gasboy AtlasX unit.</p>			
Warning tags and operating instructions	Once a week	Inspect for and replace all missing, damaged, or unreadable warning tags or operating instructions.	<ul style="list-style-type: none"> • Owner - Inspect • Owner or ASC -Replace
Hose continuity	Once a monthVerify if the hose continuity (including breakaway whip hose) complies with the hose manufacturer's requirements.	Verify if the hose continuity (including breakaway whip hose) complies with the hose manufacturer's requirements.	<ul style="list-style-type: none"> • ASC only - Inspect and Repair
<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>Spilled fuel and fuel vapors may be present in or around the pump or dispenser.</p> <p>A spark can ignite the fuel or its vapors. Testing for hose continuity incorrectly could result in severe injury or death. Refer to Petroleum Equipment Institute PEI publication RP-500.</p> <p>Use only approved methods and instruments. Do <i>not</i> allow untrained personnel to service the Gasboy AtlasX pumps/dispensers. Only Gasboy AtlasX-trained ASCs must service a Gasboy AtlasX unit.</p> <p>Hoses and end connections must be completely dry before checking for continuity.</p>			

Components	Recommended Frequency	Recommended Maintenance	Who Performs the Inspection/Repair
Leaks, internal	Once a month, after a drive off, or as notified about a potential leak	<ol style="list-style-type: none"> Whenever possible, Gasboy recommends shutting off power to the unit before performing these inspections. Block off the pump/dispenser to prevent customers from operating the pump/dispenser during inspection. Remove the lower panels slowly and carefully. Inspect all hydraulic connections and seals, including the following: <ul style="list-style-type: none"> Meters Valves If wetness or dripping fuel is found, stop using the pump/dispenser, and make arrangements for repairing the leak. <i>Note: Some staining of parts around seals is normal and does not necessarily indicate a leak.</i> Monitor the repaired components closely during subsequent inspections. 	<ul style="list-style-type: none"> Owner - Inspect ASC only - Repair and test
<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>Gasoline or other fuels can damage the eyes.</p> <p>Fuel sprayed into the eye can burn the eye tissue.</p> <p>To prevent potential injury, wear eye protection when performing these inspections.</p>			
Leaks, internal (continued)		<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>Leaking fuel can be ignited, causing a fire or explosion.</p> <p>Fire, explosion, or electrical shock could result in severe injury or death if you continue to use damaged pumps/dispensers.</p> <p>If you find any leaks or damage, stop using the pump/dispenser.</p>	
		<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>The pump/dispenser contains pressurized flammable fuel and lethal voltages.</p> <p>Servicing a Gasboy AtlasX unit incorrectly could result in severe injury or death.</p> <p>Do <i>not</i> allow untrained personnel to service Gasboy AtlasX pumps/dispensers. Only Gasboy AtlasX-trained ASCs must service a Gasboy AtlasX unit.</p>	
Filter change and strainer cleaning	<p>New Installations - After 50,000 gallons (200,000 liters), or after one month</p> <p>After the first filter change - Every 300,000 gallons (1.0 million liters), every six months, or when the fuel delivery rate significantly slows</p>	<p>Replace the filters and clean the strainers regularly. An ASC must perform these tasks. DEF strainers must be cleaned after purging and calibration during start-up. Else, clean when the flow rate drops noticeably. Replace strainers that are permanently clogged.</p>	
		<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>The pump/dispenser contains pressurized flammable fuel and lethal voltages.</p> <p>Servicing a Gasboy AtlasX unit incorrectly could result in severe injury or death.</p> <p>Do <i>not</i> allow untrained personnel to service Gasboy AtlasX pumps/dispensers. Only Gasboy AtlasX-trained ASCs must service a Gasboy AtlasX unit.</p>	

Components	Recommended Frequency	Recommended Maintenance	Who Performs the Inspection/Repair
Inspect and lubricate shear valves	Every six months	To check valve operation, perform the following tasks: <i>Note: Shear valves are typically used only on the dispensers. If you have pumps, consult your installer to determine if they were installed on your pump.</i>	<ul style="list-style-type: none"> • ASC only - Inspect, repair and test
<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>The pump/dispenser contains pressurized flammable fuel and lethal voltages.</p> <p>Servicing a Gasboy AtlasX unit incorrectly could result in severe injury or death.</p> <p>Do <i>not</i> allow untrained personnel to service Gasboy AtlasX pumps/dispensers. Only Gasboy AtlasX-trained ASCs must service a Gasboy AtlasX unit.</p>			
<ol style="list-style-type: none"> 1 Trip the valve. 2 Authorize the hose at the console, if required. 3 Lift the operating handle. 4 Place the discharge nozzle in an approved container. 5 Squeeze the nozzle operating lever. If flow continues after several seconds, the valve is defective. 6 Place a few drops of SAE10 oil on the valve body shaft. 7 Open and close the valve with a wrench several times. 8 Place the valve back in service. 9 An ASC must make any required repairs. 			
Pump pulleys, belts, and belt tension	Every six months or if a squealing noise occurs during unit operation	<ol style="list-style-type: none"> 1 Shut off power to the unit. 2 Inspect belts for fraying/cracks. 3 Inspect pulleys for excessive wear in grooves and excessive bearing play. 	<ul style="list-style-type: none"> • Owner - Inspect • ASC only - Repair and test
<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>Failure to shut off power to the unit before servicing could result in injury.</p> <p>Failure to shut off power could create a hazard, such as electrical shock.</p> <p>Shut off power to the unit before servicing as power could allow the unit to be operated while servicing the pulleys or belts.</p>			
<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>Self-contained pumps have a pinch point between the belts and the pulleys.</p> <p>Severe injury could occur if part of the body is pulled into the pinch point.</p> <p>To prevent injury while inspecting self-contained units, do not place your hands near the belts, pulleys, or motors. Shut off power before servicing the unit. Do not operate the unit with the door removed.</p>			

Components	Recommended Frequency	Recommended Maintenance	Who Performs the Inspection/Repair
Nozzle hooks and shafts	Every six months	<ol style="list-style-type: none"> 1 Lubricate with silicone spray, if required. 2 Check for damage. 3 Verify if the locking tab locator is not broken (The locking tab locator helps hold the nozzle in the nozzle boot and enables the station owner to lock the nozzle boot with a clasp padlock). 4 If repair is required, call an ASC to make the repairs. 5 An ASC must make any required repairs. 	<ul style="list-style-type: none"> • Owner - Inspect • ASC only - Repair and test
<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>The pump/dispenser contains pressurized flammable fuel and lethal voltages.</p> <p>Servicing a Gasboy AtlasX unit incorrectly could result in severe injury or death.</p> <p>Do <i>not</i> allow untrained personnel to service Gasboy AtlasX pumps/dispensers. Only Gasboy AtlasX-trained ASCs must service a Gasboy AtlasX unit.</p>			
Mechanical computers	Every six months	Lubricate well. Refer to Veeder-Root manuals for lubrication points.	ASC only
<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>The pump/dispenser contains pressurized flammable fuel and lethal voltages.</p> <p>Servicing a Gasboy AtlasX unit incorrectly could result in severe injury or death.</p> <p>Do <i>not</i> allow untrained personnel to service Gasboy AtlasX pumps/dispensers. Only Gasboy AtlasX-trained ASCs must service a Gasboy AtlasX unit.</p>			
Door locks	Every six months or if the door locks become difficult to open and close	Lubricate with a graphite lubricant or lock oil. Follow the manufacturer's instructions. Do <i>not</i> over-lubricate. Use a rag to wipe any excess lubricant that may drip.	Owner
Tank	Every month	Monitor water levels in the tank with an electronic tank monitor or water detection pasted on the tank measuring stick.	Owner - Inspect
Water in dispenser/Pit box	After every fuel tank fill-up	<p>Remove with explosion proof sump pump.</p> <ol style="list-style-type: none"> 1 Gasboy recommends shutting off power to the unit before performing these inspections and process. 2 Block off the pump/dispenser to prevent customers from operating the pump/dispenser during procedure. 3 Access and insert the sump pump into the tank and draw off the water. 	<ul style="list-style-type: none"> • Owner - Inspect • ASC only - Repair and test
<div style="background-color: black; color: white; padding: 5px;"> WARNING</div> <p>The water in the pit box could contain gasoline or a flammable fluid.</p> <p>Use of an electrical pump directly in the pit box could result in a fire or explosion.</p> <p>Do not use an electrical pump unless explosion proof. A mechanical hand pump is recommended.</p>			

Components	Recommended Frequency	Recommended Maintenance	Who Performs the Inspection/Repair
Wash pump/dispenser	As required <i>Note: Gasboy recommends more frequent cleaning for pumps/dispensers located in salty or corrosive environments, such as near the ocean or near pollution sources.</i>	<p>Clean with automobile cleaning products. Clean plastic surfaces with water and mild detergent. Do <i>not</i> wash with a hose. Do not use window cleaners with ammonia on electronic display windows.</p> <p>Adhere to the following guidelines while washing pumps/dispensers:</p> <ul style="list-style-type: none"> • Clean and protect your equipment with automobile cleaning and protection products. • Clean plastic surfaces and polycarbonate graphics with a solution of water and mild detergent. • Use a soft cloth, paper towel, or sponge to clean displays separately. Window cleaners are preferred. <p>Wash pumps/dispensers by hand, or use a hose nozzle set to a fine gentle spray.</p>	Owner

 **CAUTION**

Moisture can damage the internal components of a pump/dispenser.

Internal components exposed to moisture may not operate correctly or fail. Water damage of electronic components where pressurized hoses are used during cleaning is not covered by warranty.

Do not use a pressure washer to clean the pumps/dispensers.

Index

Numerics

8800 series 4-8
9100 series 4-3

A

Alert symbol 2-1

B

Barricading 2-1

C

Caution warnings 2-1
CC20
 Set PPU Values 4-14
CC22
 Set Preset Types and Values 4-14
CC24
 Set Operations Mode 4-15
CC25
 Set Volume Allocation 4-16
CC28
 Change First Level PIN 4-18
CC31
 Set Money Allocation 4-19
CC42
 Set Decimal Point Options 4-21
CC43
 PPU Blinking Options 4-23
CC45
 Set Lamp Test Time 4-24
CC46
 Set Comma/Decimal Point 4-24
CC47
 Set Reported Money Size 4-25
 Set Two-wire Options 4-25
CC48
 Zero Previous Transaction 4-41
CC49
 STP Controls 4-42
CC51
 Set Main Beeper 4-44
CC52
 Set VaporVac Alarm 4-44
CoC 3-1
Cold Start 1-6
Cold Weather DEF 5-45
Combo Unit 8-34, 8-35
Command Code 1-6
Commercial Pumps 1-13

D

Danger warnings 2-1
DEF 1-6
Dispenser 1-6
Draining
 Safety Information 1-7
Dual Hose 1-6

E

E85 1-6, 1-9
Electrical
 Shut-off 2-1
Emergency
 Electrical shut-off 2-1
 Procedures 1-7
 see also Safety Information
Evacuation 2-1
Explosions
 Preventing 2-1

F

FC1
 Set Money Decimal Point Position
 for Display 4-21
 Set Reported Money Size 4-25
 Set STP Pre-start 4-43
FC2
 Set Reported Volume Format 4-28
 Set STP Control 4-43
 Set Volume Decimal Point Position
 for Display 4-22
FC3
 Set PPU Decimal Point Position for
 Calculations (Canada
 Only) 4-22
FC4
 Set PPU Decimal Point Position for
 Display 4-22
 Set Status Response Format 4-29
FC8
 Preset Mode Without Pump Stop 4-
 37
FC9
 Remote Preset Display 4-39
 Set STP Side Mapping 4-43
FEOT/PEOT 4-29
Fires
 Preventing 2-1

G

Gasboy FMS 3-3

Gaskets

 Safety Information 1-7
Gasoline 1-8
Glossary 5-49
Grade 1-6
Grounding

I

IMPORTANT 6-54
IS Barriers
 Testing 5-52

J

J-box 1-15
Junction Boxes
 Safety Information 1-7

L

Level 1 4-12
Level 2 4-12

M

M00053 Power Supply Board 24VDC 5-
 49
M00455A003 5-49
M00549A001 5-37
M04114A007 5-45
M04388A001 5-25
M04388A002 5-25
M04920B003 6-5
M09593A102 6-5
M10030A001 5-42
M12261A002 5-48
M15724A001 5-35
M16181A002 5-32
Manager Keypad 1-6, 4-8
Master Reset 4-11
Monetary Sale 1-11
Money Display 1-6
Money Totals 4-10, 4-73

O

Option Code 1-6

P

Phone Numbers, Important 1-2
Problems
 see Assistance
 see Testing
 see Troubleshooting

Product 1-6
Programming Errors 4-8
Prover Can 1-6, 1-8
Pulsers
 Testing 5-52

R

R06711-39 6-5
R18900-30 6-5
R18900-34 6-5
Replacing
 Parts 1-2
Retail unit 3-4
Rubber gloves 1-8

S

Safety Information
 Alert symbol 2-1
 Barricading 2-1
 Emergency electrical shut-off 2-1
 Evacuation 2-1
 NFPA regulations 2-1
 Preventing explosions and fires 2-1
 Regulations 2-1
 Replacement parts 2-1
 Safety symbols 2-1
 Shut-off 2-1
 Signal words 2-1
 Warning words 2-1
Safety symbols 2-1
Serial Number 1-12
Shut-off 2-1
 Emergency electrical 2-1
Signal words
 Safety 2-1
Spare Parts 1-2
STP 1-13
Suffixes 1-14

T

T20150-G6S 6-4
T20150-G7 6-4
Telephone Numbers, Important 1-2
Testing
 IS Barriers 5-52
 Pulsers 5-52
Totals Examples 4-10
Two-wire 1-6

U

U.S. gallons 3-4
UL 87A 1-9

V

Volume Display 1-6
Volume Totals, Displaying 4-55

W

W&M 3-1
Warm Weather 1-14
Warning words 2-1
Warnings 2-1
Warranty Information 1-2

Z

ZModem 4-25

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