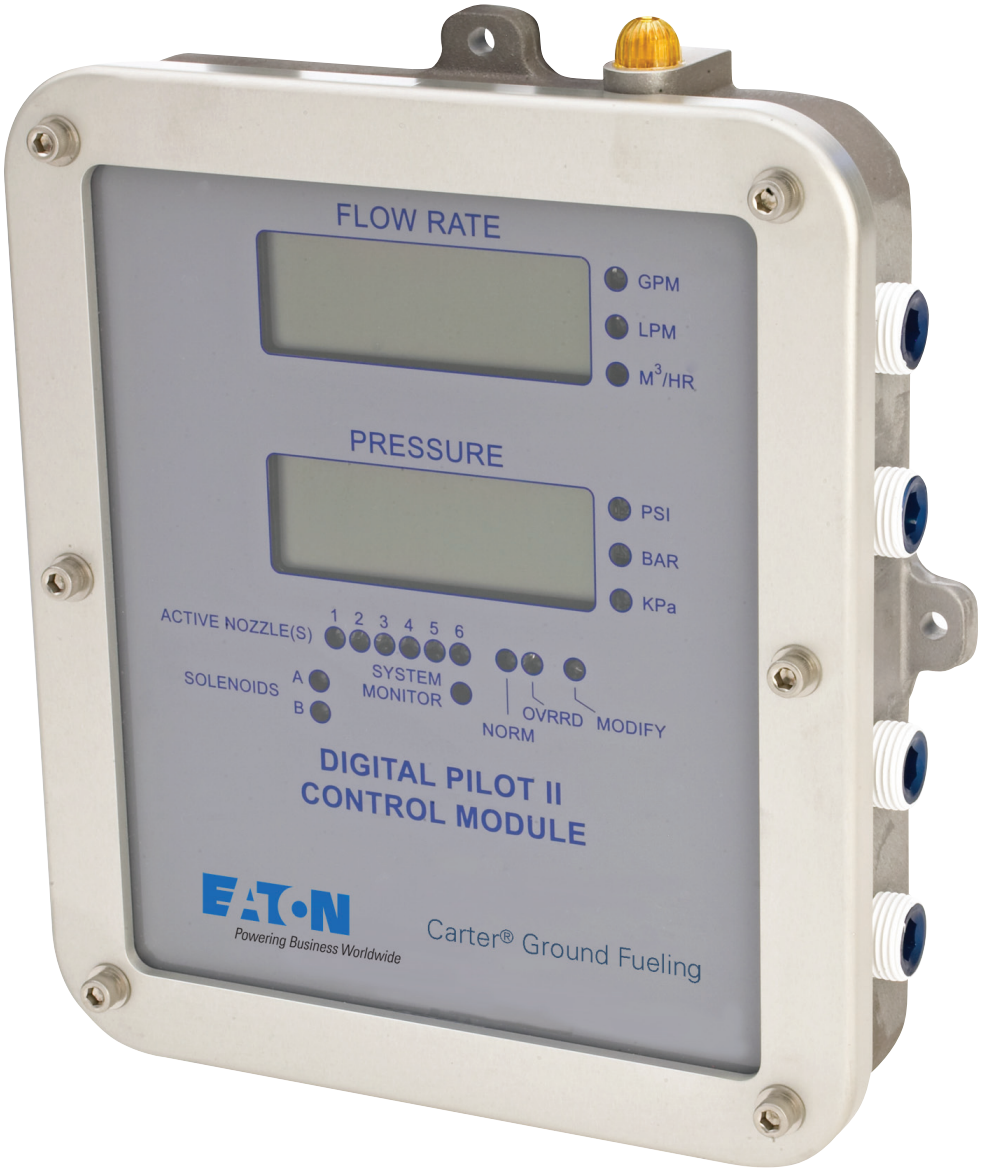
Carter®
Digital II Pressure Control System

Model 64235



Powering Business Worldwide

Design Concepts

Eaton's Carter product line of ground refueling equipment includes the Digital II Pressure Control System, which employs a patented* method of monitoring fluid pressure and controlling pressure at the aircraft. It combines two well-known technologies, as did Carter's first generation (Digital I) pressure control system. The combination of hydro-mechanical valving and a microprocessor eliminates the need for air-reference pressure, servo controls or springs to control pressure. Fuel cannot leak into the air system such as occurs in some air operated systems.

Adjustments for pressure control, rate of flow control, opening and closing times are made on a hand-held unit that is plugged into an RS232 port on the bottom of the control module. Once the calibrations and adjustments have been made, the hand-held unit can be unplugged and stored by the maintenance manager. Only one hand-held unit is required as a setup unit, regardless of the number of systems being used by an operating group. (Two hand-held units are required if two Digital II systems are used on any one vehicle). Once the hand-held unit is removed, the operator cannot make any further changes. There are no buttons or key locks on the control module, unlike the first generation Digital Pressure Control System design.

Extensive cost savings can be achieved on fuel vehicles using this system. For example, it does not require items such as air compressors, air tanks, dryers, air regulators and gauges. Hundreds of fittings, as well as exhaust valves, Synflex tubing, steel tubing and venturis are also eliminated. Because there are fewer components, labor costs for installation are also significantly reduced.

Higher flow rates can be achieved due to lower system pressure drop. Test time can also be reduced and flow meter checks can be verified quickly during any fueling operation. When the system is used on a hydrant servicer only, one fuel control line has to be run to the pressure control coupler, whereas both fuel and air lines are required on an air-operated system.

Indicator lights on the control module denote which nozzles are being used and the units of measure for the pressure settings and the rate of flow.

Remote displays can be procured to provide readouts for various locations on the vehicle. Both LCD and LED units are available depending upon your need. A master switchable remote can be used to provide individual readouts for primary and secondary systems when two control modules are used.

System Components

(Each purchased separately)

- 64235 — Control Module
- 64236 — Hand-held Calibration Unit
- 64101 — Test transducer
- 64108 — Permanent system transducer
- 64302, 64303 or 64304 — Solenoid Manifold for pressure control coupler operation
- 64902 — Digital 4-inch Pressure Control Coupler
- 64802/ 64804 — Digital 3-inch Pressure Control Coupler
- 64504 — Digital 3-inch Inline Valve
- 64505 — Digital 3-inch Bypass Valve
- 64514 — Digital 4-inch Inline Valve
- 64515 — Digital 4-inch Bypass Valve
- 64237 — LCD/64338 LED Remote Displays
- 64337 — LED switchable Remote Display

Features

- No venturi(s) required
- No air reference pressure required
- No fuel-to-air leakage
- Maximum rate of flow control standard. No rate of flow valve required.
- Displays nozzle pressure and flow simultaneously
- Indicator lights show which nozzles are being used
- Choice of LCD or LED remote displays available
- A switchable remote available on dual systems to show primary and secondary system information — also blocks out primary when secondary information is shown
- Three types of pressure and flow readouts on the module (e.g. psi, kpa, bar)
- Adjustable timer deadman — standard
- Deadman warning light on top of control box
- Error message readout to assist with trouble shooting
- Field replaceable PC boards
- System can be used with inline or bypass valves and pressure control couplers
- Cast aluminum box and cover with backlighted Lexan panel
- All calibrations done on a removable hand-held unit. No adjustments on main box.
- Six hose combinations can be individually calibrated
- Can receive inputs from two meters simultaneously
- System is programmable through an RS232 port

64237 Remote Display

* U.S. Patent. No. 5,660,198

Mating Transducers

The Digital II Pressure Control System requires the use of Eaton part number 64108 Transducer/Cable Assembly for each Model 64235 Control Module used. In addition, during the calibration or setup of the system at the test rack, one 64101 Transducer/Cable Assembly is required for each 64235 Control Module. Where a permanent test rig is available, the transducer can be left installed on the test rig at the location simulating the aircraft manifold pressure. If no test rig is available then the bottom adapter on a refueler can be setup to have a quick disconnect fitting to which the transducer can be installed during calibration. Note that in all cases, the transducer should be protected against thermal expansion. The transducer is rated for 200 psi (13.789 bar) and has a burst pressure of 300 psi (20.684 bar), but that is easily achievable by approximately 30°F (16.6°C) temperature change.

Transducer installation requires some precautions as noted in the installation instructions provided with each system.

Vehicle Mounted Transducer

The 64108 Transducer/Cable Assembly is furnished with various lengths of cable to suit the installation. The length is specified by adding a dash number equal to the desired length from 5 to 50 feet in increments of 5 feet. Example: 64108-40 has a 40 foot length of cable. The connector that mates to the transducer is provided on one end of the cable and other end is bare wire for installation into the 64235 module.

The mounting is achieved by means of a ¼ inch male NPT. The electrical connector is furnished as a part of the wiring.

Test Rig Equipment

Transducer(s) —

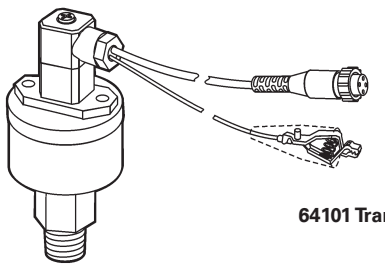
This test rig unit is furnished with 25 feet of cable and the connector to mate to the 64235 Control Module. A grounding clip is also furnished on the cable and should be attached to the test rig during calibration. One 64101 Transducer/Cable Assembly is required for calibration for each system on the vehicle for each airport. That is, if the vehicles have a single control module then only one cable assembly is required per airport. The transducer portion of the assembly can be left installed in the test rig as long as thermal expansion protection is provided. If there is no test rig and the system is calibrated by recirculating into the bottom loading system of the refueler, the transducer can be mounted to the pressure tap on the vehicle by using a dry break disconnect.

Mounting is by means of a ¼-inch male NPT.

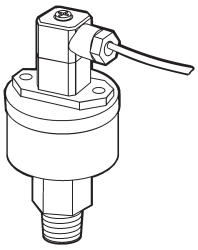
Calibration Equipment

Model 64236 Hend-Held Calibration Unit — one per vehicle system required per airport.

The Hand-Held Calibration Unit is used to calibrate the system on the test rig. It replaces all switches and operator choices previously used on the early digital system. This unit should be kept in a safe place by the station manager between calibrations and used only by authorized/trained personnel. A spare transducer cable is shipped with the 64236.



64101 Transducer/Cable Assembly



64108 Transducer/Cable Assembly

Transducer Cable for test rig

RS232 cable for calibration unit

64236 Hand-held Calibration Unit

Ordering Data

The basic part number for the Digital II Pressure Control System is 64235. This part number covers only the main control system and ancillary parts are needed to complete the system as noted in the following tables.

Single Digital II System for Refuelers — The following parts must be ordered to complete a system. Note: The required pulser is not manufactured by Eaton and must be ordered from another supplier (Veeder Root or other — see below).

PART NUMBER	DESCRIPTION	QTY	COMMENTS
64235	Digital II Control System	1	-
64236	Hand-Held calibration unit, complete with cables	1	Only one calibration unit is required per airport for this type of system
64101	Transducer for test rig	1	Required for setting up and calibration
64108	Vehicle Transducer	1	To be mounted on vehicle
64504 or 64514	3 or 4-inch Inline control valve as appropriate	1	Model 64504 — 3-inch. Model 64514 — 4-inch. See separate catalog sheet (TF100-112) for detail information
64237 or 64338	Remote Display (optional)	1	Model 64237 is LCD-type and Model 64338 is LED-type remote display. This is to be used for mounting at a remote location such as a deck.
767181 327	Veeder Root pulser	1	Mounting kit part number 0370020 009 may be required. Any brand pulser that produces pulses from 10-100 pulses per gallon/liter can be used; however, if one that produces less than 100 pulses is used, the unit will have to be calibrated.

Dual Digital II system for refuelers — The following parts must be ordered to complete a system. Note: The required pulser is not manufactured by Eaton and must be ordered from another supplier (Veeder Root or other — see below).

PART NUMBER	DESCRIPTION	QTY	COMMENTS
64235	Digital II Control System	2	—
64236	Hand-Held Calibration Unit, complete with cables	2	Only one calibration unit is required per airport for this type of system
64101	Transducer for test rig	2	Required for setting up and calibration
64108	Vehicle Transducer	2	To be mounted on vehicle
64504 or 64514	3 or 4-inch inline control valve as appropriate	1	Model 64504 — 3-inch. Model 64514 — 4-inch. See separate catalog sheet TF100-112 for detail information.
64505 or 64515	3 or 4-inch Bypass Control Valve as appropriate	1	Model 64505 — 3-inch. Model 64515 — 4-inch. See separate catalog sheet TF100-112 for detail information.
64237 or 64338	Remote Display (optional)	1	Model 64237 is LCD type and Model 64338 is LED type remote display. This is to be used for mounting at a remote location such as a deck.
64337	Switchable Remote Display (optional)	1	Model 64337 is a remote display that can be used as the primary display with the two control systems mounted out of sight of the operator. A separate 64338 would be used as the other display.
767181 327	Veeder Root pulser	1	Mounting kit part number 0370020 009 may be required. Any brand pulser that produces pulses from 10-100 pulses per gallon/liter can be used; however, if one that produces less than 100 pulses is used, the unit will have to be calibrated.

Single Digital II System for Hydrant Servicers — The following parts must be ordered to complete a system. Note: The required pulser is not manufactured by Eaton and must be ordered from another supplier (Veeder Root or other — see below).

PART NUMBER	DESCRIPTION	QTY	COMMENTS
64235	Digital II Control System	1	—
64236	Hand-Held Calibration Unit, complete with cables	1	Only one calibration unit is required per airport for this type of system
64101	Transducer for test rig	1	Required for setting up and calibration
64108	Vehicle Transducer	1	To be mounted on vehicle
64802 or 64804	Hydrant Coupler. Model 64804 has excess flow capability	1	See separate catalog sheet (TF100-125 or TF100-114) for detail information
64237 or 64338	Remote Display (optional)	1	Model 64237 is LCD type and Model 64338 is LED type remote display. This is to be used for mounting at a remote location such as a deck.
767181 327	Veeder Root pulser	1	Mounting kit part number 0370020 009 may be required. Any brand pulser that produces pulses from 10-100 pulses per gallon/liter can be used; however, if one that produces less than 100 pulses is used, the unit will have to be calibrated.

Dual Digital II system for hydrant servicers — The following parts must be ordered to complete a system. Note: The required pulser is not manufactured by Eaton and must be ordered from another supplier (Veeder Root or other — see below).

PART NUMBER	DESCRIPTION	QTY	COMMENTS
64235	Digital II Control System	2	—
64236	Hand-Held Calibration Unit, complete with cables	2	Only one calibration unit is required per airport for this type of system
64101	Transducer for test rig	2	Required for setting up and calibration
64108	Vehicle Transducer	2	To be mounted on vehicle
64802 or 64804	Hydrant Coupler. Model 64804 has excess flow capability	1	See separate catalog sheet (TF100-125 or TF100-114) for detail information
64504 or 64514	3 or 4-inch Inline Control Valve as appropriate	1	Model 64504 — 3-inch. Model 64514 — 4-inch. See separate catalog sheet (TF100-112) for detail information.
64237 or 64338	Remote Display (optional)	1	Model 64237 is LCD type and Model 64338 is LED-type remote display. This is to be used for mounting at a remote location such as a deck.
64337	Switchable Remote Display (optional)	1	Model 64337 is a remote display that can be used as the primary display with the two control systems mounted out of sight of the operator. A separate Model 64338 would be used as the other display.
767181 327	Veeder Root pulser	1	Mounting kit part number 0370020 009 may be required. Any brand pulser that produces pulses from 10-100 pulses per gallon/liter can be used; however, if one that produces less than 100 pulses is used, the unit will have to be calibrated.

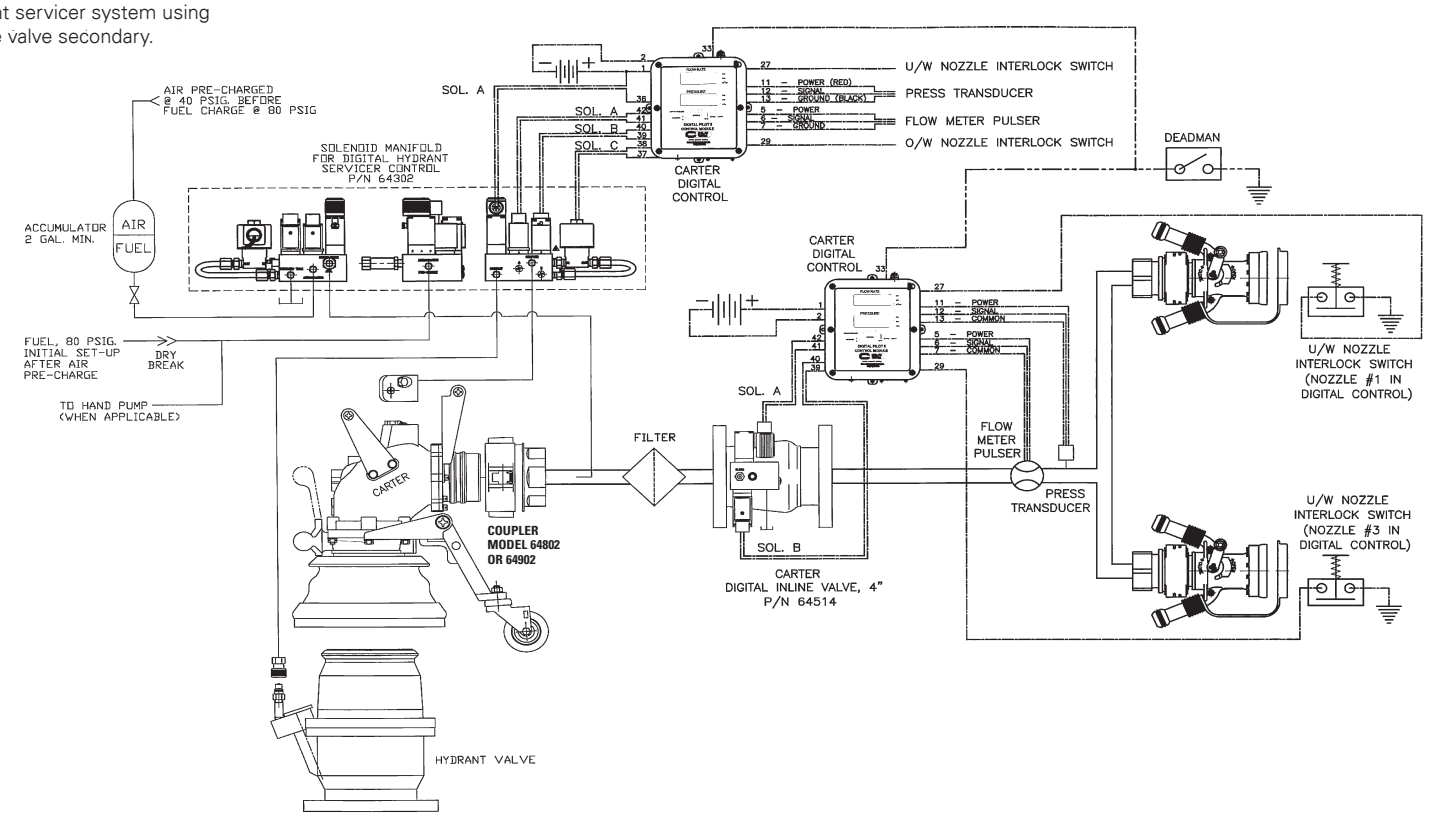
Other Items Not Furnished by Eaton

There are several items uniquely required in the Digital II System that are not furnished by Eaton. In addition to the meter pulser, the accumulator system used on servicers is furnished by the customer. This system consists of an accumulator with a usable volume of at least one gallon (4 liters), a ¼-inch check valve and a dry break disconnect as shown in the hydrant servicer system figure on page 6. This system is used to provide stored power to get the coupler to open upon activating the deadman at the beginning of each refueling. It must be initially charged to a minimum of 60 psi (4.137 bar) after the building of the vehicle and after the system has been removed for service and depressurized for any reason. Once the initial charging has been achieved, the hydrant system will keep the accumulator system charged. A larger accumulator may be required should the hydrant system pressure be less than 90 psi (6.205 bar) at any time during a refueling.

Schematics

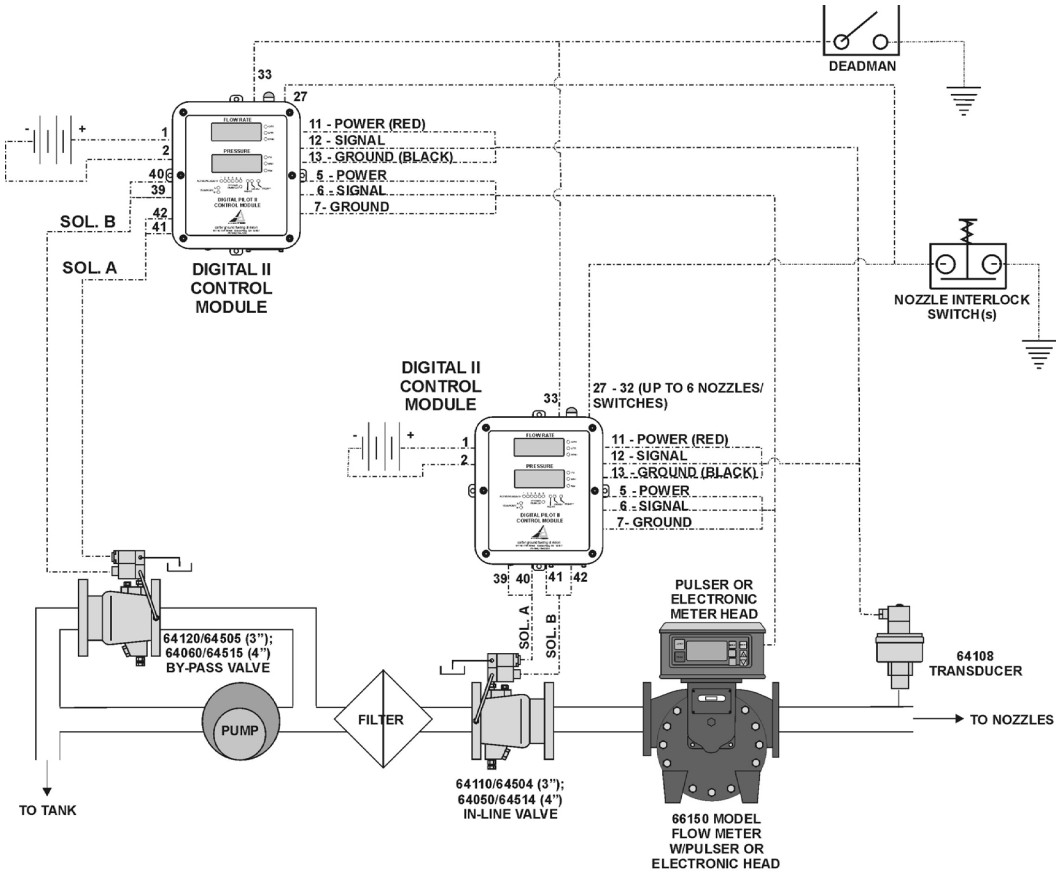
Digital II System

Typical hydrant servicer system using coupler. Inline valve secondary.



Digital II System

Typical refueler system using inline valve and bypass valve

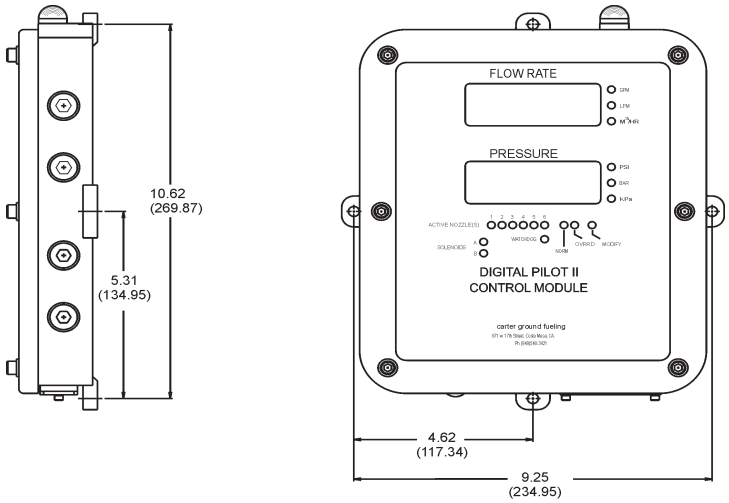


Envelope Dimensions

Dimensions shown
in inches (millimeters)

Model 64235

Digital Control Module

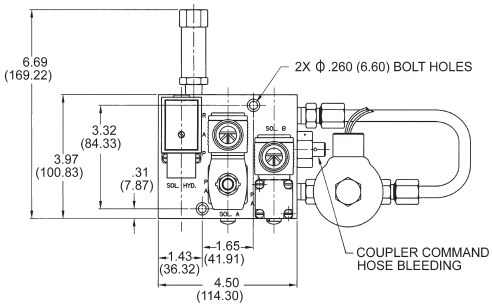


Models 64302, 64303 & 64304

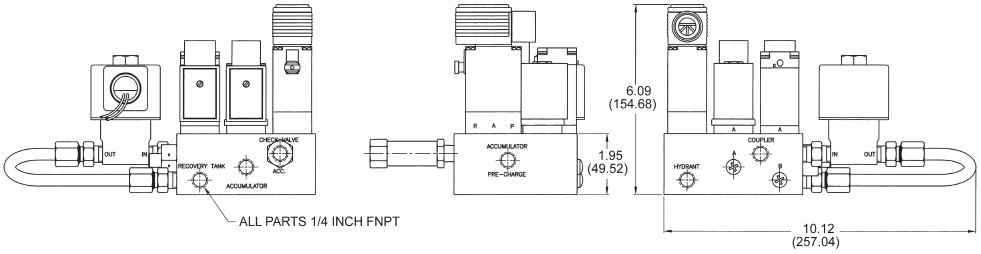
Solenoid Manifold Assemblies

Solenoid manifold assembly model is determined by hydrant servicer system design.

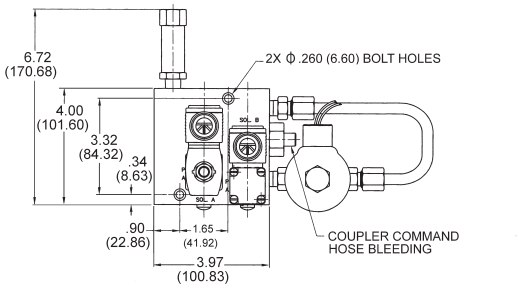
Note: Envelope dimensions of Model 64302 and 64303 are identical. There are slight differences in the ports on the manifold block.

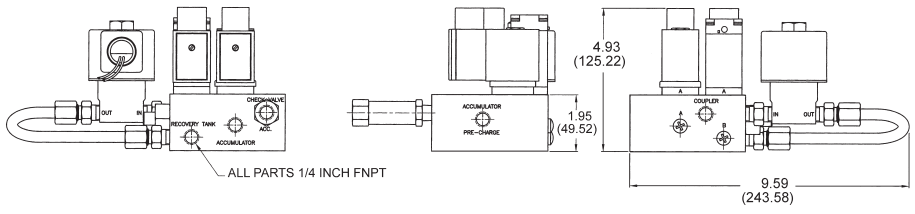


Model 64302



Model 64304





Eaton
Aerospace Group
Fluid & Electrical Distribution Division
9650 Jeronimo Road
Irvine, California 92618
Phone: (949) 452 9500
Fax: (949) 452 9992
E-mail: groundfueling@eaton.com

Powering Business Worldwide

Eaton
Aerospace Group
9650 Jeronimo Road
Irvine, California 92618
Phone: (949) 452 9500
Fax: (949) 452 9555
www.eaton.com/aerospace

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