



# EI, EIO INTRINSICALLY SAFE VALVES

## Definitions

$C_a$  : Maximum Allowed Capacitance

$I_{sc}$  : Maximum Output Current

$V_{oc}$  : Maximum Output Voltage

$C_i$  : Maximum Internal Capacitance

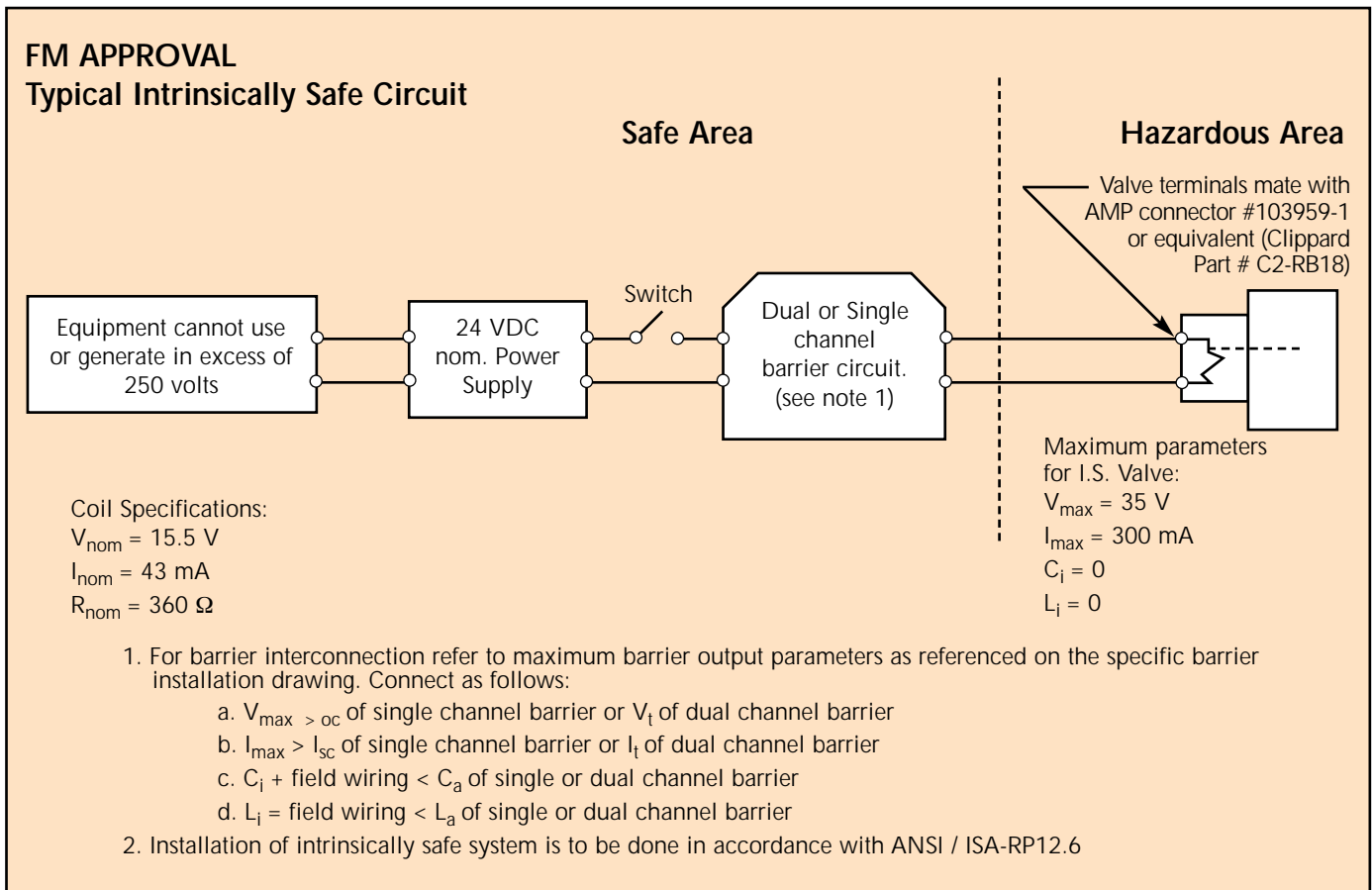
$L_a$  : Maximum Allowed Inductance

$V_{max}$  : Maximum Input Voltage

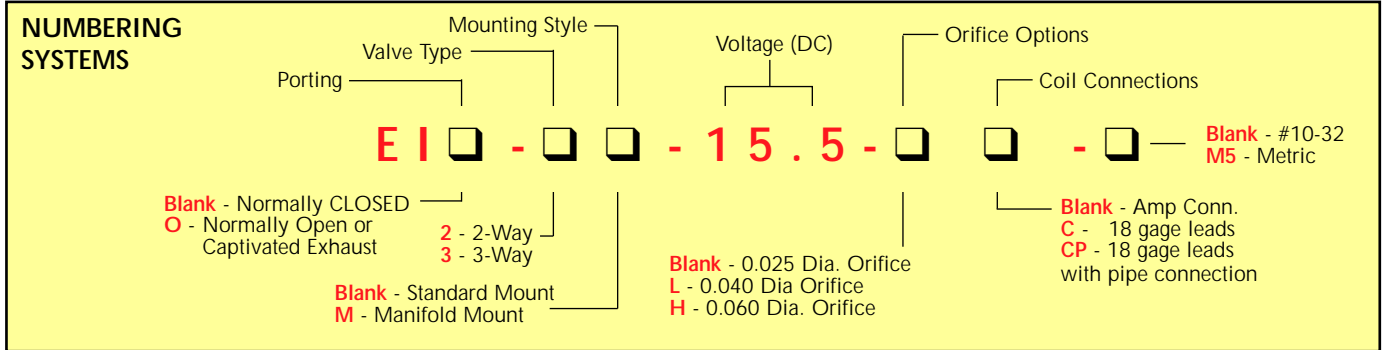
$I_{max}$  : Maximum Input Current

$L_i$  : Maximum Internal Inductance

$V_t$  : Voltage Total



# EI, EIO INTRINSICALLY SAFE VALVES



## Increase Flow

**High Flow Valves** Models 2020 and 2021 high flow valves are piloted 3-way valves that work with EI/EIO intrinsically safe valves as well as EV/ET 3-way valves. They are designed to be mounted on EI/EIO manifold valves. Outputs from the EI/EIO will actuate the valve and produce outputs up to 22 scfm at 100 psig. Piloted 3-way valves are also available as R-481 and R-482.

Solenoid/Modular Valve:  
(Electrical Parameters)  
 $U_{max} = 28\text{ V}$   
 $I_{max} = 93.3\text{ mA}$   
 $P_{max} = 0.653\text{ W}$   
 $C_{eq} = 1.0\text{ pF}$  (opened circuit)  
 $L_{eq} = 157\text{ H}/\Omega$

**EVB Booster Valve** Clippard EVB-3 booster valve mates with manifold mounted EI/EIO valves and manifolds to provide increased flow. Direct piloting from Clippard EI/EIO valves provides a flow of up to 6.1 scfm at 100 psig.

## What is Intrinsic Safety?

An intrinsically safe system is one in which all electrical devices and their associated circuits are designed such that they can neither arc nor spark with sufficient energy to ignite the hazardous substances around which they are being used. Put another way, the energy stored from the inductance of the circuit components must be unable to generate a spark or arc at the circuits open point during current circulation that is capable of igniting the hazardous materials present when they are in a fuel/air mixture that is most favorable for ignition.

## What is Entity approval?

According to INTRINSIC SAFETY standards, there is no requirement for authorized laboratory certification of system-wide intrinsic safety if the designer can determine, with certainty, that the physical and electrical parameters of every system component has been met sufficient to ensure that system-wide intrinsic safety has been maintained.

An "Entity Approval" is documentation stating that a device is intrinsically safe in specified hazardous atmospheres if the stated physical and electrical conditions contained in the approval are met. By meeting the requirements of "Entity Approvals" on all components of a system, the designer can more easily document that system-wide intrinsic safety has been maintained.

The Clippard EI-EIO series valves hold the Entity Approvals listed and supporting documentation is available to our customers.



# EI INTRINSICALLY SAFE NORMALLY CLOSED VALVES

## EI - □ □ - 15.5 - □

Standard Mount

Manifold Mount



**Type:** 2-Way or 3-Way Poppet, Normally Closed

**Medium:** Air (40 micron filtration)

**Temperature Range:** 30° - 180°F

**Input Pressure:** 28 Hg. Vac to 105 psig; 0-7 bar  
28 Hg. Vac to 50 psig (L); 0-3.5 bar  
28 Hg. Vac to 25 psig (H); 0-1.8 bar

**Air Flow:** 0.6 scfm @ 100 psig; 17 l/min @ 7 bar  
0.5 scfm @ 50 psig (L); 14 l/min @ 3.5 bar  
0.45 scfm @ 25 psig (H); 13 l/min @ 1.8 bar

**Voltages:** 15.5 VDC

**Power Consumption:** 0.67 watt at rated voltage (0.66 watt on top three products)

**Response:** 5 - 10 milliseconds @ 100 psig

**Ports:** Inlet - #10-32 (M5), Outlet - #10-32 (M5) - on std.

**Metric:** Add -M5 to Part Number (standard mount only)

## EI - □ □ - 15.5 - □ C

Standard Mount

Manifold Mount



## EI - □ □ - 15.5 - □ CP

Standard Mount

Manifold Mount



For Cable and Connectors, see Page 187.

# EIO INTRINSICALLY SAFE FULLY PORTED VALVES



## EIO - □ □ - 15.5 - □

Standard Mount



Manifold Mount



## EIO - □ □ - 15.5 - □ C

Standard Mount



Manifold Mount



**Type:** 2-Way or 3-Way Poppet, Fully Ported

**Medium:** Air (40 micron filtration)

**Temperature Range:** 30° - 180°F

**Input Pressure:** 28 Hg. Vac to 105 psig; 0-7 bar  
 28 Hg. Vac to 50 psig (L); 0-3.5 bar  
 28 Hg. Vac to 25 psig (H); 0-1.8 bar

**Air Flow:** 0.6 scfm @ 100 psig; 15 l/min @ 7 bar  
 0.5 scfm @ 50 psig (L); 15 l/min @ 3.5 bar  
 0.45 scfm @ 25 psig (H); 14 l/min @ 1.8 bar

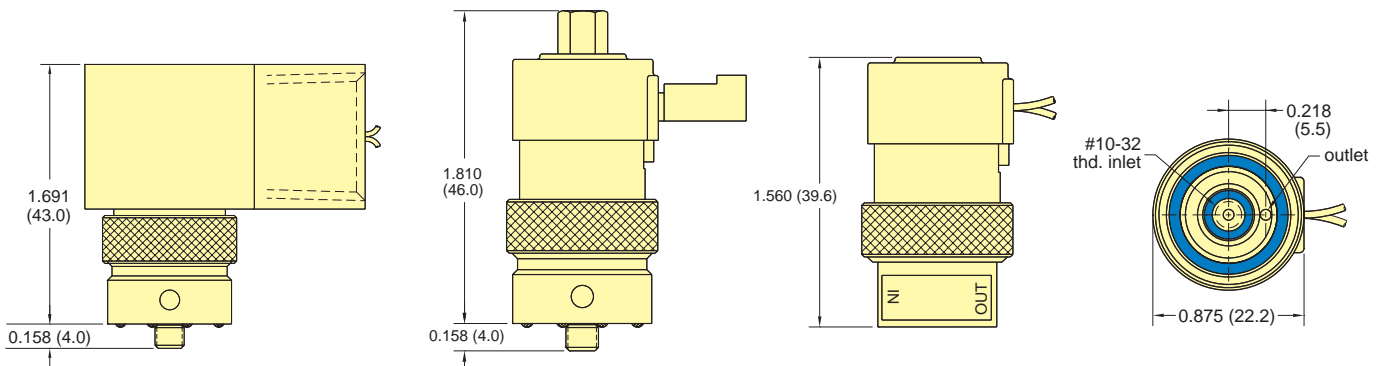
**Voltages:** 15.5 VDC

**Power Consumption:** 0.67 watt at rated voltage

**Response:** 5 - 10 milliseconds @ 100 psig

**Ports:** Inlet - #10-32 (M5), Outlet - #10-32 (M5) - on std.

**Metric:** Add -M5 to Part Number



For Cable and Connectors, see Page 187.

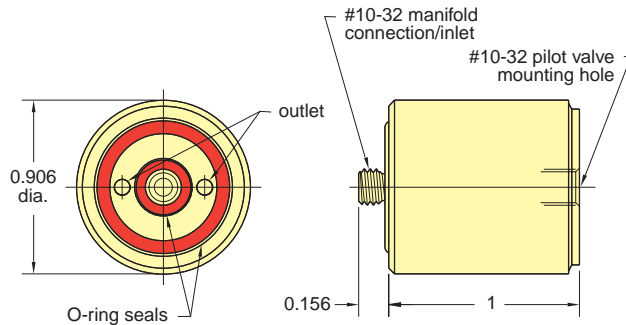


# EV, ET, EC SERIES ACCESSORIES

## EVB-2

EC, EV and ET Piloted 2-Way Valve, Manifold Mount

**Electronic Valve Booster** Amplifies the flow capacity of EC, EV and ET type valves by over twelve times. Manifold style electronic valves mount onto booster body, which, in turn, mounts on Clippard manifolds.



**Type:** 2-Way Normally Closed, Pressure Piloted Valve

**Medium:** Air

**Input Pressure:** 20 to 150 psig

**Air Flow:** 6.1 scfm @ 100 psig

**Response:** 20 milliseconds at 20 psig  
13 milliseconds at 100 psig

**Mounting:** Mounts to manifold

**Ports:** Inlet and outlet through manifold

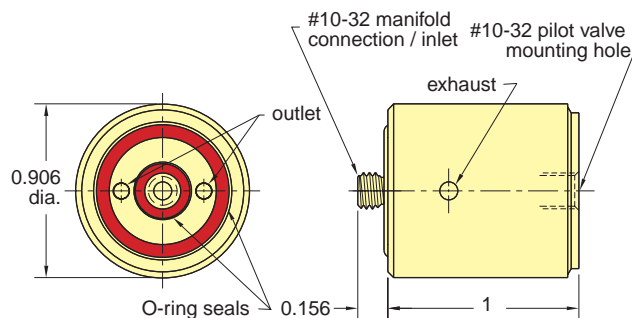
**Materials:** Nickel plated brass, acetyl, stainless steel and Buna-N

**Additional Note** Use only normally closed 3-way pilot valves in conjunction with EVB-2

## EVB-3

EC, EV and ET Piloted 3-Way Valve, Manifold Mount

**Electronic Valve Booster** Amplifies the flow capacity of EC, EV and ET type valves by over twelve times. Manifold style electronic valves mount onto booster body, which, in turn, mounts on Clippard manifolds.



**Type:** 3-Way Normally Closed, Pressure Piloted Valve

**Medium:** Air

**Input Pressure:** 20 to 150 psig

**Air Flow:** 6.1 scfm @ 100 psig

**Response:** 20 milliseconds at 20 psig  
13 milliseconds at 100 psig

**Mounting:** Mounts to manifold

**Ports:** Inlet and outlet through manifold

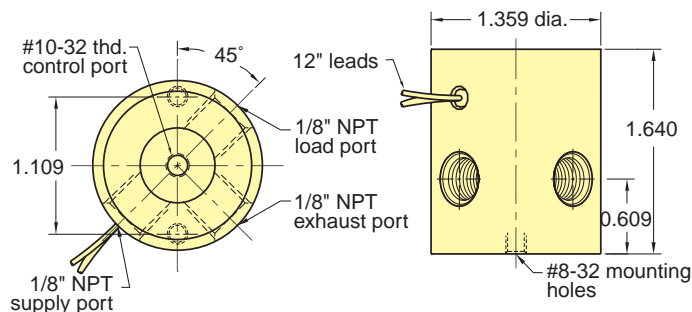
**Materials:** Nickel plated brass, acetyl, stainless steel and Buna-N

**Additional Note** Use only normally closed 3-way pilot valves in conjunction with EVB-3

## 2013 - □

Electronic Fluidamp

Low-power DC solenoid solid state output signals can be directly converted to high pressure pneumatic power without amplification



**Type:** 3-Way Normally Closed, Electronic Valve

**Medium:** Air

**Input Pressure:** 30 to 100 psig

**Air Flow:** 22 scfm @ 100 psig

**Bleed Flow:** 0.10 scfm @ 100 psig

**Filtration:** 10 micron

**Frequency Response:** 50 Hz @ 100 psig  
70 Hz @ 30 psig

**Ports:** 1/8" NPT female

**Switching Speed:** 10 milliseconds

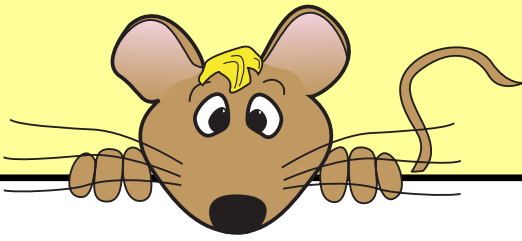
### Electrical Data

**Continuous Overload:** 350% @ 25°C ambient  
250% @ 50°C ambient

**Power Consumption:** Less than .50 watts at rated voltage (80 ma. @ 6V,  
40 ma. @ 12 V, 20 ma. @ 24V)

**Leads:** 28 gauge stranded P.V.C. insulated

**Standard Options:** 2013-6 6 volts DC  
2013-12 12 volts DC  
2013-24 24 volts DC



# EV, ET, EC SERIES ACCESSORIES



## 2020/2021

### High Flow EC, EV and ET Piloted 3-Way Valves

Designed to be piloted by a Clippard EC, EV and ET manifold mount electronic valve. Output from the EC, EV and ET actuates the valve to produce outputs up to 22 scfm at 100 psig. Combines low wattage, long life and cool running of the EC, EV and ET valves with quick response and high flow of Clippard "Fluidamp" type valves. The 2020 and 2021 are identical in all respects except one. The 2020 has an external #10-32 port for the pressure supply to the EC, EV, and ET electronic pilot valve.

**Type:** 3-Way Normally Closed, Pressure Piloted Valve

**Medium:** Air

**Input Pressure:** 30 to 100 psig; 2.1 to 6.9 bar

**Pilot Pressure:** (2020) 60% of supply pressure, minimum

**Air Flow:** 22 scfm at 100 psig/620 l/min @ 6 bar

**Response:** Approximately 20 milliseconds

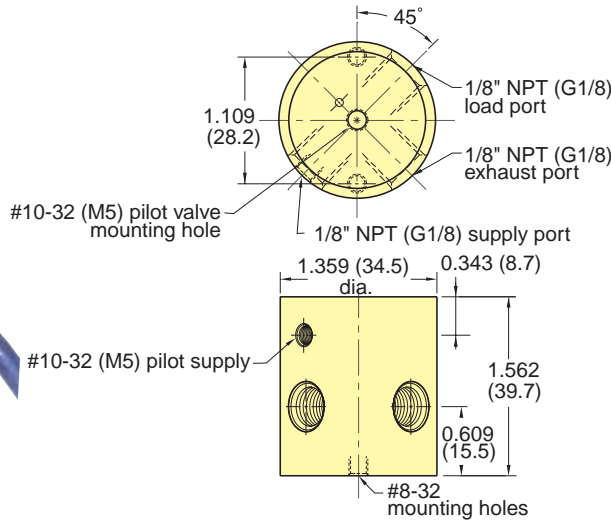
**Mounting:** Mounting holes provided

**Ports:** Inlet and outlet, exhaust 1/8" NPT Pilot supply on 2020 is #10-32 female

**Materials:** Anodized Aluminum, Stainless Steel and Buna-N

**Additional Note** Use only normally closed 3-way pilot valves in conjunction with 2020/2021

**Option:** Add -MG for Metric Version



### Specialized Manifolds

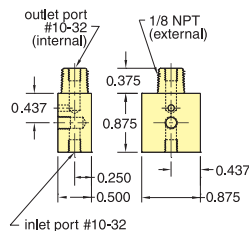


**Material:** Nickel plated brass

**Use:** Mount EC, EV and ET valves to any 1/8" NPT supply port

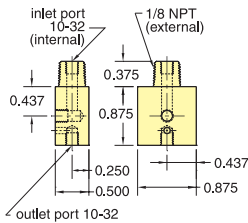
#### 15490-1 and 15490-1-MR (metric).

#10-32 (M5) Inlet  
1/8" NPT (R1/8) Outlet



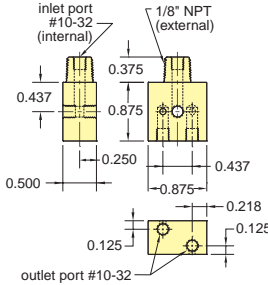
#### 15490-2 and 15490-2-MR (metric).

1/8" NPT (R1/8) Inlet  
#10-32 (M5) Outlet



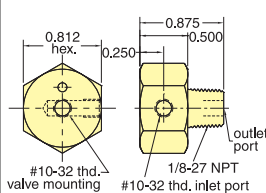
#### 15490-3 and 15490-3-MR (metric) Dual Supply.

1/8" NPT (R1/8) Inlet  
#10-32 (M5) Outlet



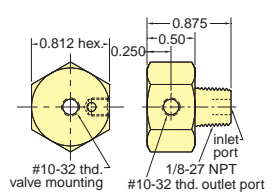
#### 15491-1 and 15491-1-MR (metric).

#10-32 (M5) Inlet  
1/8" NPT (R1/8) Outlet



#### 15491-2 and 15491-1-MR (metric).

1/8" NPT (R1/8) Inlet  
#10-32 (M5) Outlet





# EV, ET, EC SERIES MANIFOLDS

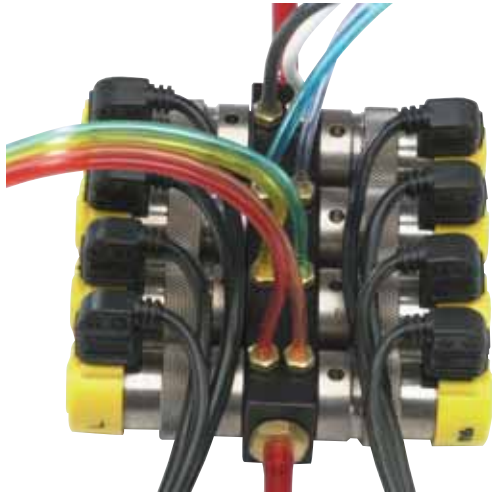
## 1548 □ - □

Multi-Valve Manifolds

Construction: Black anodized aluminum



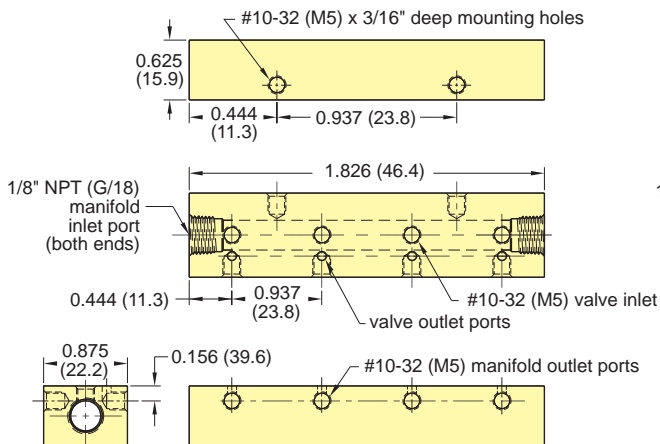
Order No.	# of Valves	"A"	"B"
15481-4	4	1.875"	3.750"
15481-4-M5	4	42.6 mm	95.3 mm
15481-6	6	3.750"	5.625"
15481-6-M5	6	95.3 mm	142.9 mm



Eight ET valves mounted on a 15482-8

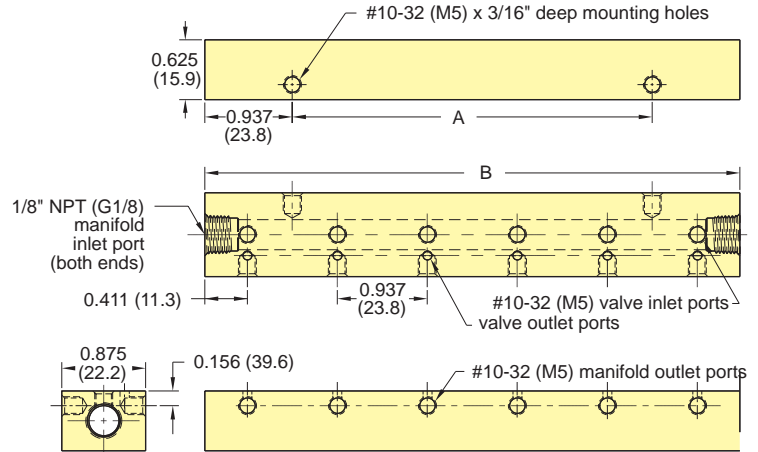
### 15481-2 & 15481-2-M5 (Metric)

Mounts two valves on one side only



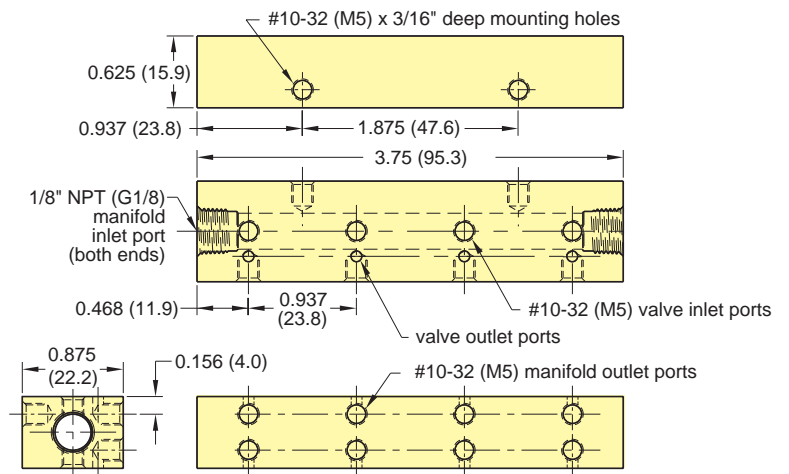
### 15481-4 & 15481-4-M5 (Metric) 15481-6 & 15481-6-M5 (Metric)

Mounts six valves on one side only



### 15482-8 & 15482-8-M5 (Metric)

Mounts eight valves, four each on opposite sides



### 15482-12 & 15482-12-M5 (Metric)

Mounts twelve valves, six each on opposite sides

