

## MVC5000 SERIES

MVC5000 PARV  
Digital Controller

- Compact Design
- High Resolution Analog (16 bit)
- Touchscreen Interface
- NEMA 4X Housing
- DCS and Modbus Compatible
- Universal Power Supply

### DESCRIPTION

The MVC5000 is a highly integrated process controller which adds decentralized automation to distributed flow control devices.

The MVC ships factory programmed to automatically control an open/close actuator or operate a dual variable PID loop. Both programs operate on industry standard 4-20mA, discrete, and Modbus RTU control signals.

### ASME Section I Power Actuated Relief Valve Configuration "PARV"

In the "PARV" configuration, the MVC5000 operates as a sophisticated digital pressure switch. While continuously monitoring process pressure through a high precision ADC, the MVC5000 automatically operates a power actuated relief valve according to the user's programmed set pressure and blow down criteria. This configuration can be used to control ASME and non-ASME capacity certified PARVs. The PARV configuration also includes provisions for DCS and manual override.

### Custom Configurations

Hundreds of other configurations may be factory programmed to meet the requirements of unique applications. Consult the factory for program options.



### FEATURES

- » High contrast OLED Touchscreen Display
- » 16 bit Analog Channels (4-20mA I/O)
- » Modbus RTU
- » 17 point DCS dry contact I/O
- » Auto/Man functionality
- » Local/Remote Control
- » Universal Isolated Power Supply

### APPLICATIONS

- » Power-Actuated Pressure Relief Valve
- » Flow Control
- » Process Controls
- » Process monitoring
- » Condition monitoring



# MIGHTY CONTROLLER

## ELECTRICAL

Parameter	Description	Value	Units
<b>Input Voltage</b>	Acceptable power supply voltage range.	85-265 VAC (50/60Hz) 120-340 VDC	Volts
<b>Supply Input Isolation</b>	Power Supply Input Isolation Resistance	100M $\Omega$ / 500VDC / 25°C / 70% RH	M $\Omega$ Volts %RH
<b>Surge Protection</b>	EMC Immunity Details	Compliance to EN61000-4-2,3,4,5,6,8,11, EN55024, heavy industry level (surge L-N:1KV) criteria A, 500mA Fused	kV mA
<b>Power</b>	Maximum power consumed by the MVC5000 during operation.	12W Max.	Watts

## TERMINALS

Parameter	Power Terminal	Control Terminals
<b>Wire Size</b>	14-22 AWG (18 AWG recommended)	16-30 AWG (20 AWG recommended)
<b>Wire Voltage Rating</b>	600 V	600 V
<b>Voltage Rating</b>	300 Vrms	300 Vrms
<b>Current Rating</b>	25A	8A
<b>Pitch</b>	5.0 mm	3.5 mm
<b>Temperature</b>	-40 to 105°C	-40 to 115°C
<b>Screw Torque</b>	3.0 lb-in	2.0 lb-in

## DISCRETE I/O

Parameter	Description	Value	Units
<b>Input Quantity</b>	Number of discrete inputs	8	ea.
<b>Output Quantity</b>	Number of discrete outputs	6	ea.
<b>Input Types</b>	Input hardware type	24VDC Isolated	Volts
<b>Output Types</b>	Output hardware type	4 x Relay , 2 x 24VDC Sourcing	
<b>Input Impedance</b>	Nominal impedance to ground	4.7k $\Omega$	k $\Omega$

## DCS & RELAY SPECIFICATIONS

Parameter	Description	Value	Units
<b>Switching Voltage</b>	Max. relay contact switching voltage	250Vac, 220VDC @ 100W	Volts
<b>Switching Current</b>	Max. relay contact switching current	2A	Amps
<b>Contacts</b>	Contact material	Silver alloy with Gold Plating	

## ANALOG I/O

Parameter	Description	Value	Units
<b>Input Quantity</b>	Number of analog inputs	2	ea.
<b>Output Quantity</b>	Number of analog outputs	1	ea.
<b>Input Dynamic Range</b>	Maximum electrical signal range.	4mA - 20mA	mA
<b>Output Dynamic Range</b>	Maximum electrical signal range.	4mA - 20mA	mA
<b>Input Resolution</b>	Smallest measurable analog increment.	0.0015% of Full Scale	%
<b>Output Resolution</b>	Smallest producible analog increment.	0.0015% of Full Scale	%

## ENVIRONMENTAL

Parameter	Description	Value
<b>Material</b>	Housing material	Copper Free Aluminum or 316 Stainless Steel
<b>Temperature</b>	Operating temperature range	-40°C to 80°C
<b>Altitude</b>		2,000 m
<b>Humidity</b>	Relative Humidity	10% to 90% RH (Noncondensing) <sup>Note 1</sup> 10% to 85% RH (Noncondensing) <sup>Note 2</sup>
<b>Ingress Protection</b>	Environmental rating	NEMA 4X, IP66/68 for Outdoor Use

## NETWORK

Parameter	Description	Value
<b>Virtual Layer</b>	Communication protocol	Modbus RTU
<b>Physical Layer</b>	Wired physical connection	RS-485 (twisted pair, CAT5 or better)
<b>Role</b>	Device role	Master or Slave
<b>Application</b>	Network implementation usage	Remote Control Station and General SCADA

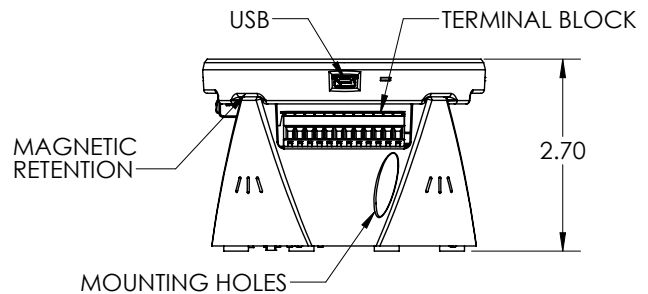
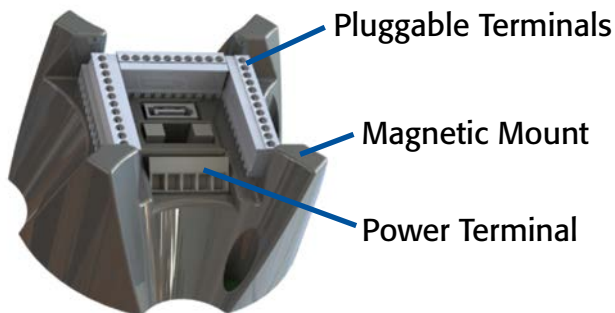
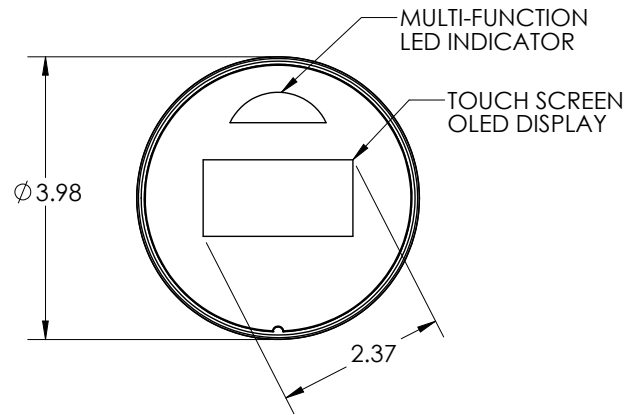
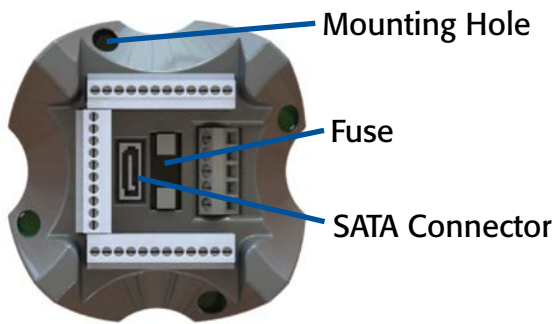
Note 1: Rated at 25°C

Note 2: 85% Rated at 40°C



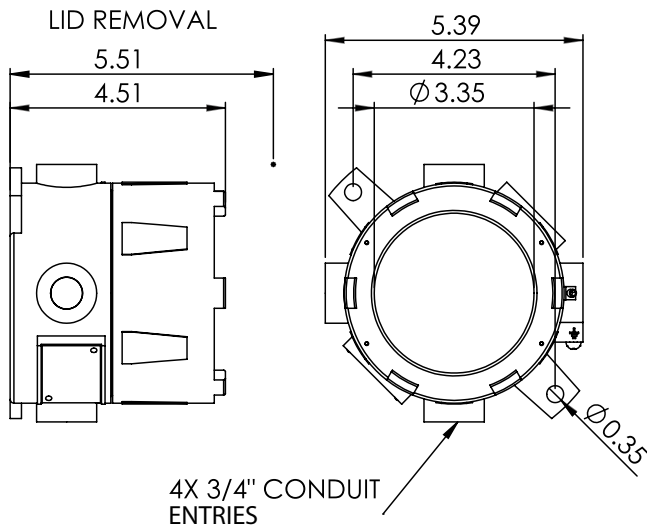
# MIGHTY CONTROLLER

## Mechanical Details



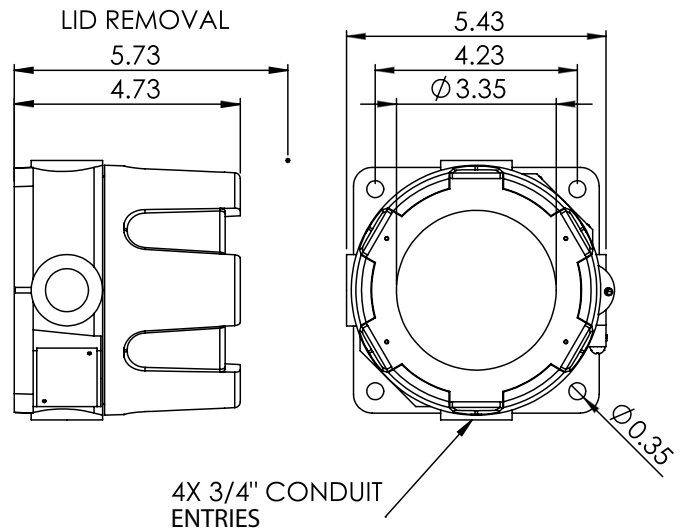
# Dimensions

## STAINLESS



4X 3/4" CONDUIT ENTRIES

## ALUMINUM



4X 3/4" CONDUIT ENTRIES

### STAINLESS STEEL ENCLOSURE

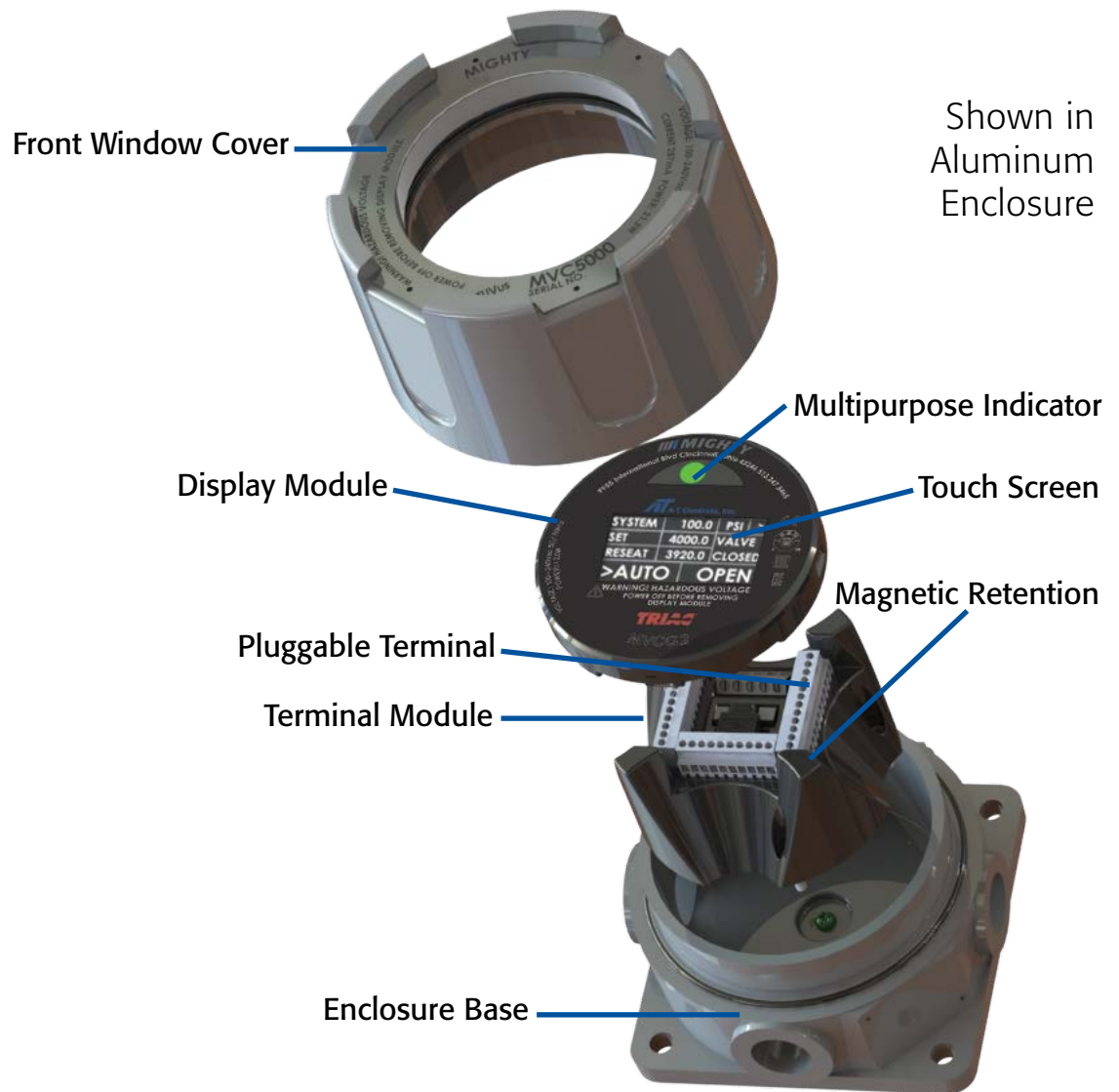
### ALUMINUM ENCLOSURE





# MIGHTY CONTROLLER

## Bill of Materials



### SPECIFICATIONS

### OPTIONS

<b>Enclosure Material</b>	Aluminum	316 Stainless Steel
<b>Operating Temperature</b>	-40°C to 80°C	-40°C to 80°C
<b>Ratings</b>	NEMA 4X, IP66/IP68	NEMA 4X, IP66/IP68
<b>Altitude</b>	2,000 m	2,000 m

## NEMA 4X LOCAL PANEL

The MVC-5000 optional NEMA 4X local station provides the operator with a local interface when controller access is limited. AUTO or OPEN mode via a local 3 position maintained switch. The center switch position allows for the absence of local command so that the DCS can take control of the device. In the event of a local/DCS command conflict, the following hierarchy applies:

### Controller Hierarchy

#### NON-ASME

##### Local Priority Mode

- Local ON/OFF Button
- Local Touchscreen
- Local Switch Box
- Remote DCS
- Remote Control Station

##### Remote Priority Mode

- Local ON/OFF Button
- Remote DCS
- Remote Control Station
- Local Touchscreen
- Local Switch Box

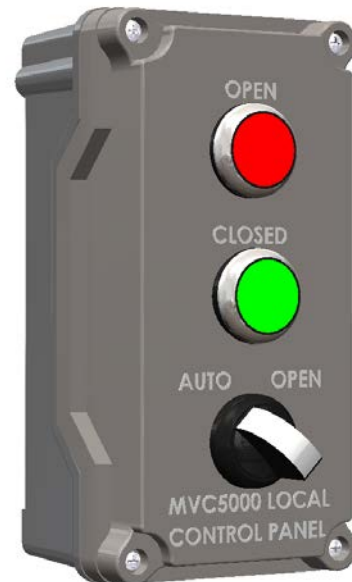
#### ASME

##### Local Priority Mode

- Auto Mode Override on Pressure Trip
- Local Touchscreen
- Local Switch Box
- Remote DCS
- Remote Control Station

##### Remote Priority Mode

- Auto Mode Override on Pressure Trip
- Remote DCS
- Remote Control Station
- Local Touchscreen



### OPERATOR STYLE

In addition to the pictured selector switch and indicators, the local panel may be configured with key lock switches, illuminated pushbuttons, potentiometers, or push buttons.

The local panel connects to one of the MVC's 4 conduit hubs via an integral cable gland and separately supplied flexible cable.





# MIGHTY CONTROLLER

## GEN 2 SUMMARY

The next generation MVC5000 controller builds on the success of generation 1 and improves in several key areas. Every new feature is motivated by field feedback and incremental improvement objectives. Improvements and changes from Gen 1 to Gen 2 are as follows:

- » Gen 2 is fully backward compatible with Gen 1
- » Extended Temperature Range: From -20C/52°C to -40/80°C
- » Wider Input Voltage Range: 100-240Vac to 85-264 / 120-370Vdc certified
- » Higher Power Relays: 60W to 100W
- » Improved Wiring Access: Terminals raised 1.25"
- » Short-Circuit Protection
- » IBR and ASME Sec. 1 Certified Compliance
- » Smaller Enclosure: 6" to 5"
- » Segregated Remote Panel and DCS Inputs (Remote panel and DCS may now operate simultaneously).
- » Units and ASME type are now touchscreen configurable
- » Improved Delivery

## How to Order

Series	
MVC5000	Generation 2 MVC Digital Controller

Sample Part Number:

**MVC5000 - 23011**

Software Configuration	
23	Gen 2 PARV Software (NON-ASME Sec. 1) <i>standard</i>
24	Gen 2 PARV Software (ASME Sec. 1)

Switch Box	
0	Without Switch Box ( <i>standard</i> )
1	OPEN/CLOSE Switch Box with 3 position maintained selector switch
2	Local Control Station with 2 Indicating lamps and 1 3-position switch

Enclosure Material	
1	Epoxy Coated Copper Free Aluminum ( <i>standard</i> )
2	Stainless Steel

Certifications	
1	Standard Safe areas - cTUVus, CE, CB Scheme, NEMA 4X, IP66/68
2	Explosion Proof ( <i>call factory for availability</i> ) CSA, ATEX & IECEx Explosion Proof Certified NEMA 4X, IP66/68

Miscellaneous Options	
Blank	No Options <i>Standard</i>

\*Call for Options



**A-T Controls, Inc.**