

Hazardous location controls and apparatus

CROUSE-HINDS  
SERIES

# Getting you closer

ACE10 explosionproof  
variable frequency drives

Utilizing ABB ACS880-M04 Series VFD

**EATON**

*Powering Business Worldwide*

# An industry first... Explosionproof VFDs

Deliver installation savings, conserve energy & improve performance.



## The Class I Dilemma

Until now, a VFD couldn't be used inside a classified enclosure in Class I, Division 1 or 2 locations. The heat generated by the VFD inside the classified enclosure caused it to fail. To overcome this problem, VFDs had to be stationed in control rooms outside of the hazardous area, resulting in expensive and impractical installation costs.

But what if you could station VFDs exactly where you want them, literally mounting the drives next to motors inside Class I areas? This would provide:

- A significant reduction of construction and installation costs
- The elimination of logistical and engineering problems
- An increase in uptime

Crouse-Hinds has developed just such a solution – the ACE Series Explosionproof Variable Frequency Drive. It is the only explosionproof enclosure to safely and reliably house a VFD. This revolutionary new product features a NEMA 7 enclosure with patent pending active cooling technology, allowing a traditional VFD to be housed inside the classified enclosure without the risk of overheating.

The ACE Explosionproof VFD is rated Class I, Divisions 1 and 2 for use in the most extreme hazardous environments, and it is designed to match the high requirements of pumps, compressors, fans, separators, and mixers in the following process industries:

- Oil and gas/refineries
- OEM skid builders
- Petrochemical
- Water/waste water
- Pharmaceutical
- Food & beverage manufacturing

## The solution that drives benefits

ACE Explosionproof VFDs are the optimal choice for motor control in Class I, Division 1 and 2 locations for a number of reasons.

- **Simple and cost effective installations** – ACE Explosionproof VFDs can be installed inside hazardous areas right next to the operation, eliminating expensive, complicated installations. There is no need to run long lines of conduit and motor cable, navigate around obstacles and hazards, or build off-site control rooms in non-hazardous areas to house VFD clusters.
- **Reduced energy usage** – ACE Explosionproof VFDs allow you to adjust the motor's level of power to exactly what is needed for optimal performance, significantly lowering energy consumption.
- **Reduced downtime** – Built-in diagnostics monitor equipment information and operating conditions, bringing visibility to potential issues before they become problems. Maintenance can be proactively scheduled during non-production hours.
- **Lower maintenance costs** – The ACE Explosionproof VFDs ability to lower system speeds and loads, as well as its soft start and stop capabilities, helps eliminate water hammer effects, increase life on bearings and seals and reduce stress on the overall electrical system.





big savings, optimized performance

## Installation and energy savings

### Application

An oil refinery utilizes thousands of pumps throughout the facility, many of them in hazardous areas. In an effort to improve their bottom line, the owners would like to control the pumps with VFDs and capture the energy savings they provide.

### Problem

There is no space in the non-classified control room for VFDs. Also, the cost to engineer and install conduit and motor cable from the non-classified area to the pumps in the hazardous area is prohibitive.

### Solution

Install Crouse-Hinds ACE Series Explosionproof VFDs right next to the motor and pump, tapping into an existing 480V supply.

### Benefit

By using a VFD to optimize pump flow, significant energy savings are realized. Additionally, by installing the VFD next to the pump and motor, installation costs are greatly reduced.



protect systems and motors

## Reduced Maintenance

### Application

A waste water treatment plant wants to reduce maintenance costs by installing VFDs on their pumps to eliminate the effects of water hammer in their pipes, which causes damage to the pipe system and its appendages.

### Problem

The cost to run motor cable and conduit, coupled with the added cost of filters to mitigate the effects of Reflected Wave Syndrome (due to long cable lengths), makes installing the VFDs in a non-classified area impractical.

### Solution

Install Crouse-Hinds ACE Series Explosionproof VFD in the classified area, thereby eliminating costly installations and protecting against the possibility of reflected wave syndrome by keeping motor cable runs short. Additionally, the VFDs soft start and stop capabilities eliminate water hammer.

### Benefit

Total cost of ownership is reduced by protecting both the piping system and the motor itself with a classified solution that is easy to install.



proactively schedule maintenance

## Downtime reduction

### Application

A petrochemical plant is experiencing an unacceptable amount of downtime in critical processes, costing the facility tens of thousands of dollars per hour. The plant manager has been tasked with determining the problem and proposing a solution.

### Problem

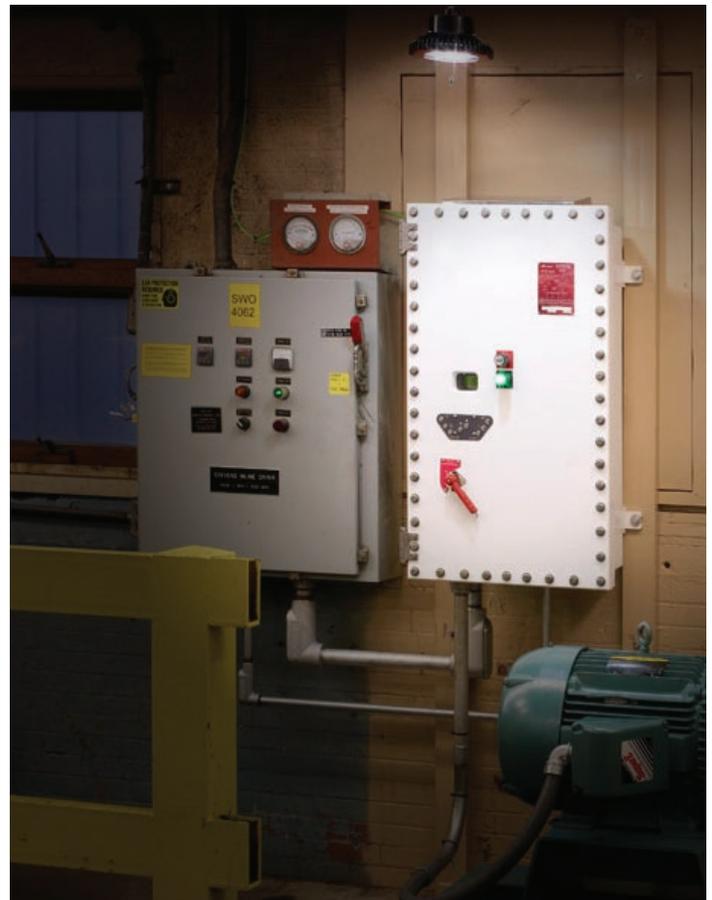
The motors throughout the facility are controlled by basic "across-the-line" motor starters and unexpected motor failure is the biggest reason for unscheduled down time.

### Solution

Installing Crouse-Hinds ACE Series Explosionproof VFDs throughout the facility will provide access to real-time equipment and process data. Employees can monitor rises in average motor current, accurately predicting imminent bearing failure.

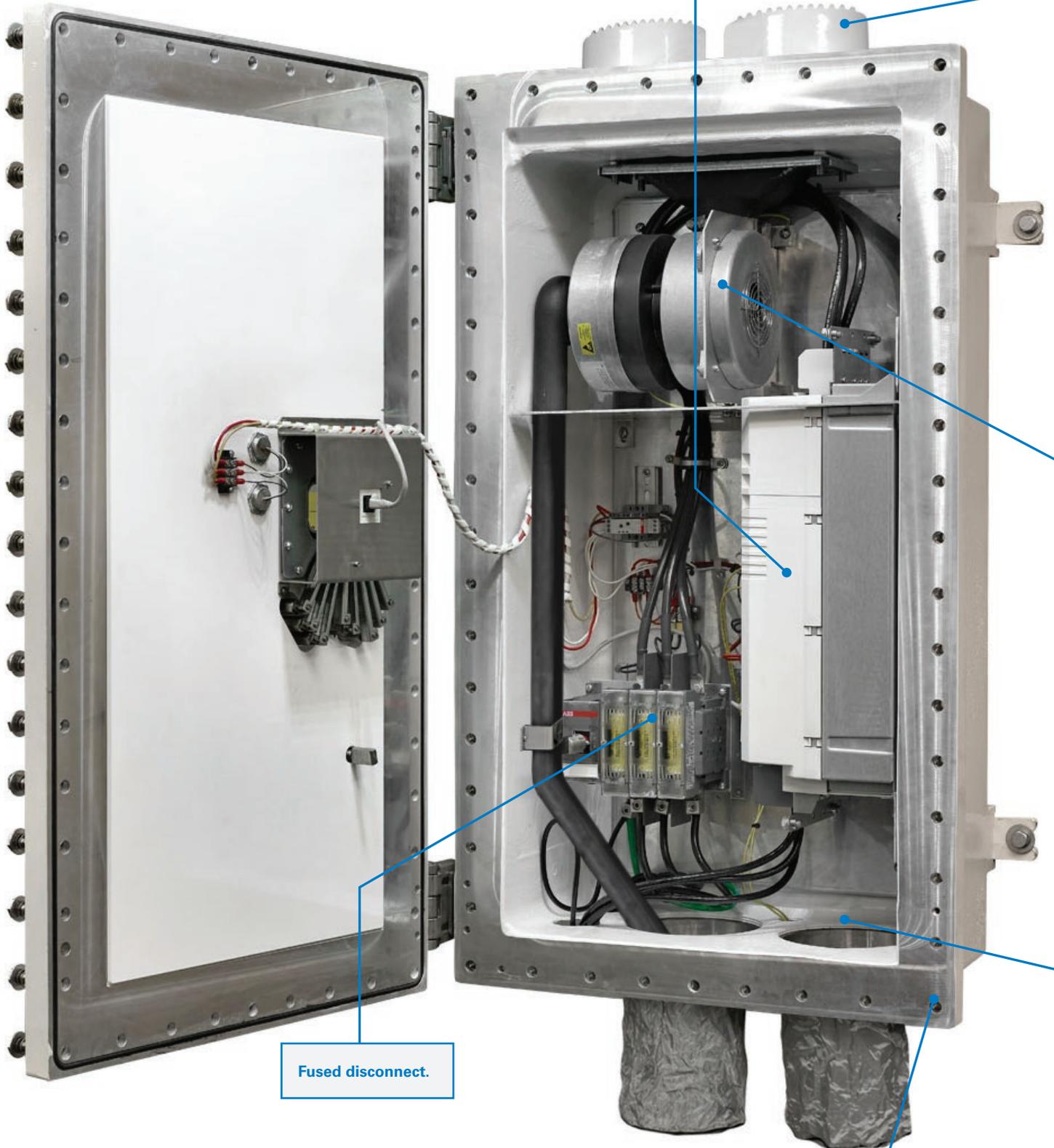
### Benefit

Using a VFD to access and analyze real-time equipment data significantly reduces plant downtime, as the plant manager is now able to proactively schedule motor change out maintenance during non-production hours.



# 1.5 to 60 HP

**Variable Frequency Drive (VFD)** in explosionproof enclosure allows installation in classified area, providing significant installation savings.



Fused disconnect.

Internal and external grounding lugs.

**Shroud\***

covering top filters maintains NEMA 4X rating.



**Stainless steel, captive, triple lead quick release spring loaded bolts** install faster and provide clear indication that the cover bolts are fully retracted from the body.

**Stainless steel hinges** provide convenient and easy access to enclosure interior.

**Explosionproof window** allows for viewing of the VFD interface module LCD screen.

**Explosionproof pilot lights** provide run, stop, and alarm indication.

**Explosionproof keypad** allows operation of VFD interface module without opening the enclosure door.

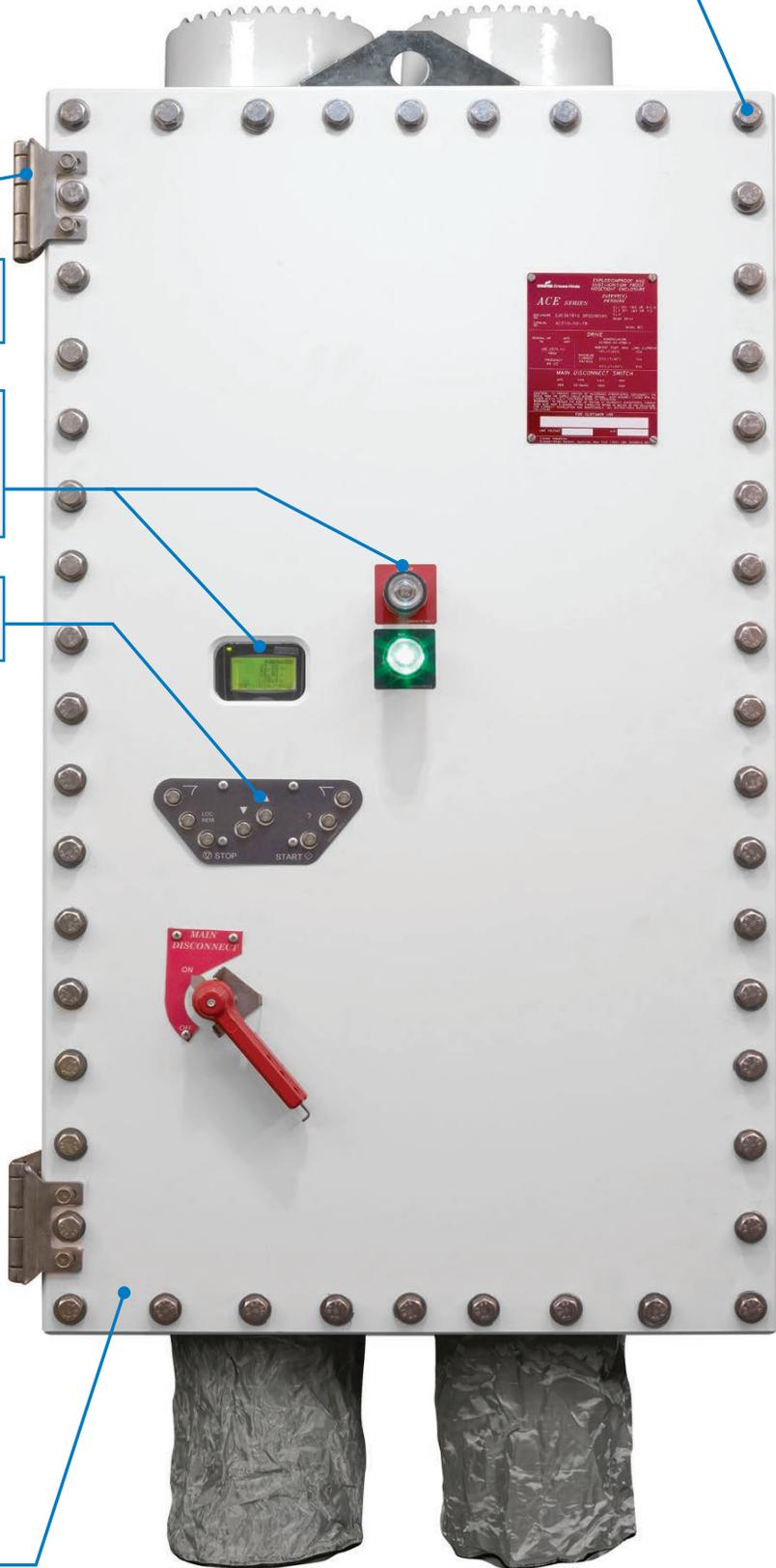
**Heavy duty blower\*** creates airflow through the enclosure, allowing VFD to operate in ambient temperatures up to 50°C.

**Filters\*** in top and bottom of enclosure allow airflow into and out of the enclosure, cooling the VFD and eliminating risk of overheating.

**Pre-filter screens\***

(not shown) eliminate clogging of the primary filters, ensuring reliable and consistent airflow. Pre-filter screens can be easily removed and cleaned without shutting down operations.

**Enclosure epoxy painted** for superior corrosion resistance.



\* Heavy duty blower, shroud, filters, and pre-filter screens not included with units containing 1.5 to 5.0 horsepower VFDs.



# Specifications

## Applications

- For speed control of pumps, compressors, fans, conveyors, separators, mixers, and other process equipment.
- Designed to meet the high reliability and safety requirements of process industries such as oil and gas, chemical and mining.

## ACE system benefits

- ACE Explosionproof VFDs are installed 'on-machine' inside the hazardous areas, eliminating expensive, complicated installations.
- There is no need to run long lines of conduit and motor cable, dig up roadways and sidewalks, navigate around obstacles and hazards or build off-site control rooms in non-hazardous areas to house VFD clusters.
- Reflected Wave Syndrome is eliminated due to short motor cable runs.

## Certifications & compliances

### UL Classified

- Class I, Divisions 1 and 2, Groups B, C, D

### cUL Classified

- Class I, Divisions 1 and 2, Groups B\*, C, D

\* 5HP and below listed for Group B

## Standards

- UL1203

## Environmental ratings

- NEMA 3, 4X, 7BCD
- Raintight
- Wet Locations
- Operating Temperature Range
- -10°C to 50°C (14°F to 122°F)

## Standard materials & finishes

- **Body and cover** – Copper-free aluminum, epoxy powder coated
- **Operating handle** – Copper-free aluminum, epoxy painted
- **Window** – Tempered soda lime glass
- **Blower** – Aluminum, natural
- **Filters** – Stainless steel, natural
- **Pre-filters** – Stainless steel, natural
- **Disconnect** – Stainless steel, natural
- **Shroud** – Copper-free aluminum, epoxy painted
- **Cover hinges, bolts, washers and springs** –Stainless Steel, natural
- **Internal brackets** – Stainless steel, natural
- **Manifold and intake** – EPDM rubber, natural

## VFD system specifications

- ABB low voltage, compact AC drives  
- ABB ACS 880-M04 Series

## Horsepower ratings

- Available from 1.5 to 60HP



# Part number configuration and replacement parts

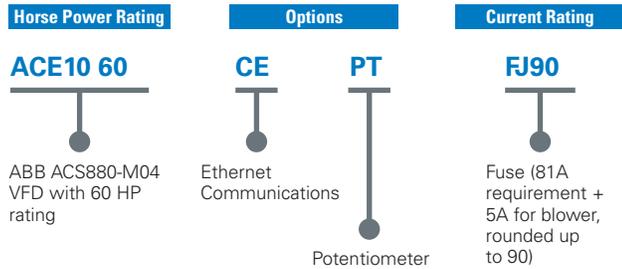
## Horse power rating

Base part number	Nominal HP (KW)	Max disconnect rating (Amps)	Disconnect fuse type	Enclosure size	Input ratings (Amps)	Max output rating (Amps)*	Power loss (Watts)	Temperature rating
ACE10 1	1.5 (1.1)	30	J	1	2.3	3.0	106	T6
ACE10 2	2.0 (1.5)	30	J	1	3.6	3.6	112	T6
ACE10 3	3.0 (2.2)	30	J	1	4.0	4.8	132	T6
ACE10 5	5.0 (3.0)	30	J	1	6.6	8.0	178	T6
ACE10 7	7.5 (5.5)	30	J	2	12.0	14.0	606	T4A
ACE10 10	10.0 (7.5)	30	J	2	16.0	18.0	674	T4A
ACE10 15	15.0 (11.0)	60	J	2	20.0	25.0	737	T4A
ACE10 20	20.0 (15.0)	60	J	2	26.0	30.0	847	T4A
ACE10 25	25.0 (18.5)	60	J	2	30.0	35.0	875	T4A
ACE10 30	30.0 (22.0)	60	J	2	42.0	50.0	1008	T4A
ACE10 40	40.0 (30.0)	100	J	2	55.0	58.0	1217	T4A
ACE10 50	50.0 (37.0)	100	J	2	65.0	72.0	1397	T4A
ACE10 60	60.0 (45.0)	100	J	2	82.0	81.0	1577	T4A

\*All models use ABB ACS880-M04 Series VFDs.

Please refer to instruction sheet for information on potential de-rating for elevated ambient, elevation or low motor noise

## Catalog number example



## Current rating for Bussmann Fuses



## Options

### Communication modules

Part number suffix	Description
CP	Profibus
CD	Devicenet
CC	CAN Open
CM	Modbus
CE	Ethernet

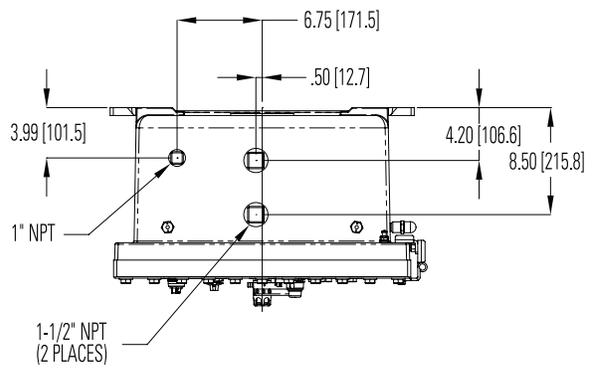
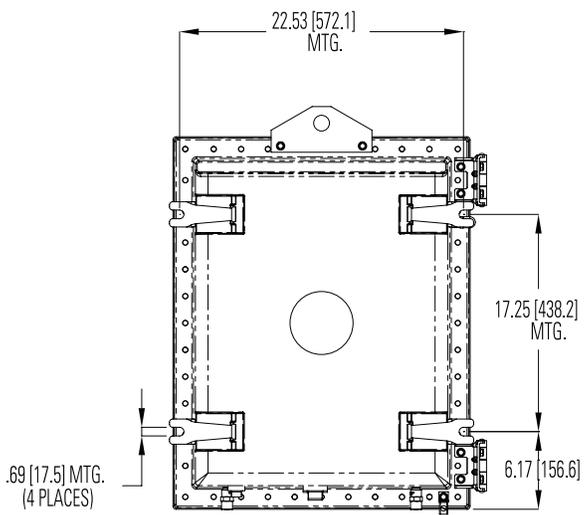
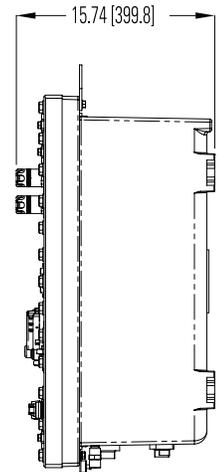
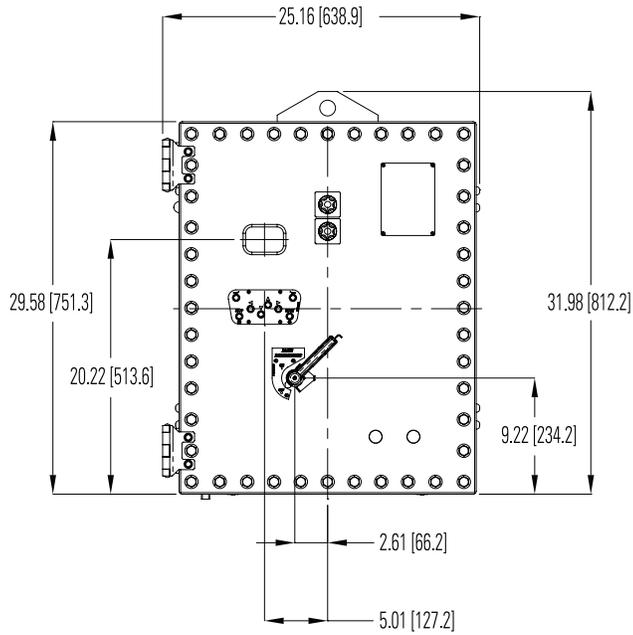
### Potentiometer

Part number suffix	Description
PT	AB 800H-UP29

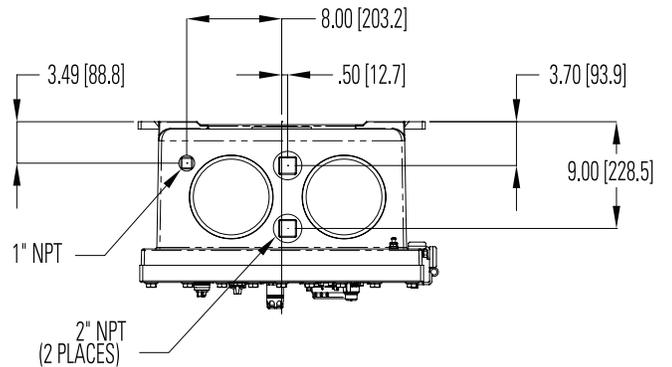
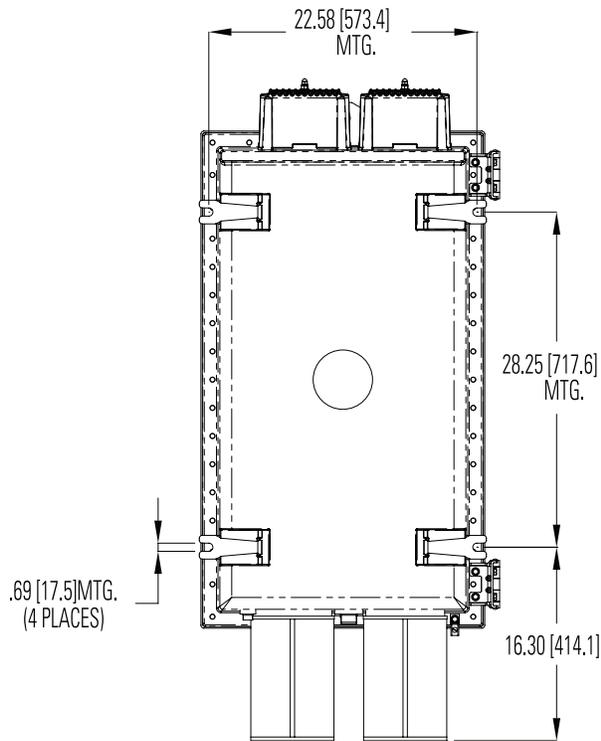
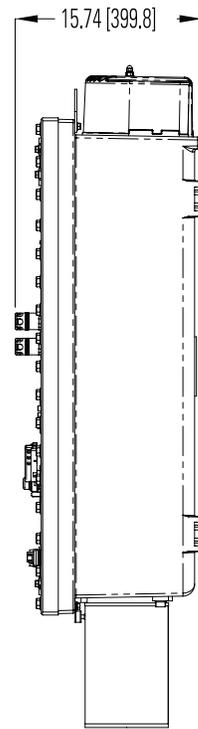
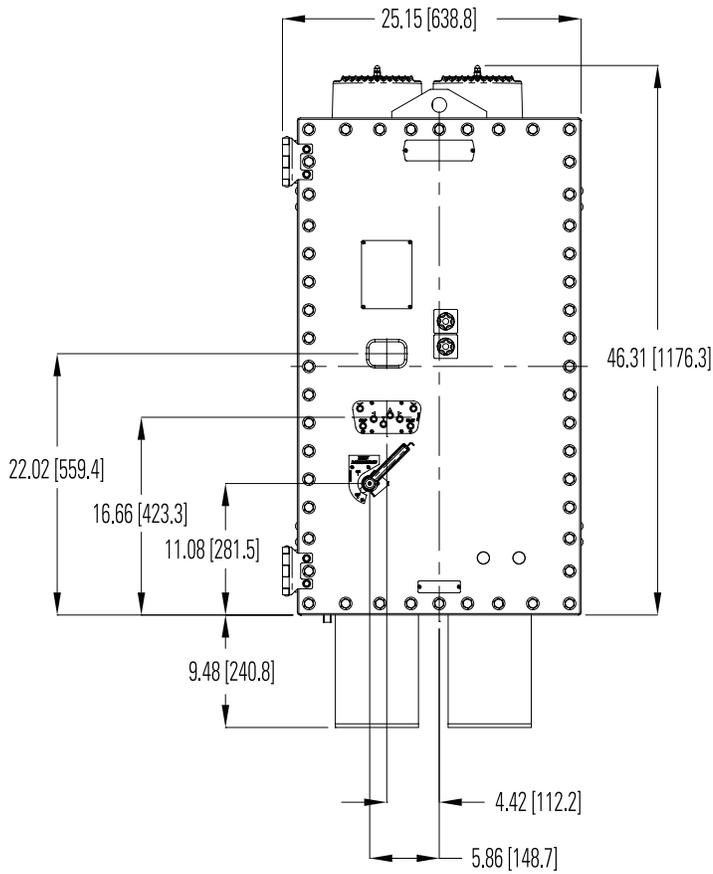
## Replacement part kits

Part number suffix	Description
ACE KIT 1	Pre-filter and hardware (1 piece)
ACE KIT 2	Filter assembly (1 piece)
ACE KIT 3	Blower, manifold and hardware (1 piece)
ACE KIT 4	Push button operator, finger and hardware (1 piece)

# Dimensions – enclosure size 1 (1.5 to 5.0 Horsepower VFDs)



# Dimensions – enclosure size 2 (7 to 60 Horsepower VFDs)







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