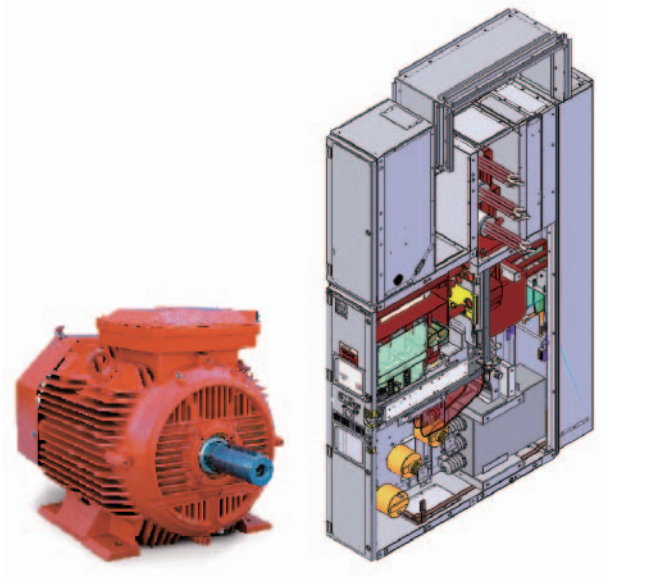
Product Leaflet

ZVC High Efficiency Motor Starter
Designed To Order, Arc-proof, Air-insulated, Modular, Efficient Motor Starter for Standard Motors

- ✓ Increase motor circuit efficiency
- ✓ Saving in smaller power cable selection
- ✓ Cost effective MCC distribution system

With ease of operation, increased reliability and compact footprint, ZVC will provide your Power Process System installations with significantly lower Total Cost of Ownership.



Motor Efficiency

In an ideal world, AC motors should operate close to 95% efficiency. This is not the case in practice where standard motors dominate over high efficiency motors. High efficiency motors are costly compared to standard range.

In general, standard AC motors operate most efficiently at around 75% of full rated load, with efficiency dropping alarmingly when load is at 25% of full rated load.

Engineers' Dilemma

High efficiency can be gained by matching the motor size to the load being driven, so that the motor is driving a load that is top of the efficiency curve, i.e. 75% of full rated load. This is not practical due to design engineers having limited control over load profile and also the motor must be sized for peak load.

Technology

An easier way to improve overall efficiency is to reduce the amount of power supply delivered to the motor. This method is independent to motor construction. While efficiency and power factor are not directly related, there is a physical correlation between the two. Thus by controlling power factor, the overall efficiency of the motor circuit can be improved.

ZVC High Efficiency Motor Starter equipped with integrated capacitor unit and in-rush reactors can increase the motor circuit power factor↔efficiency up to 95%.

Benefits

The benefits of undertaking power factor compensation are many. With a corrected power factor, losses in the distribution system are largely overcome, providing increased capacity for other loads to be connected. The optimised power factor also means that excessive voltage drops which can cause overheating and premature failure of motors, are avoided leading to extended equipment life.

Power factor compensation does not change the power factor of the motor. It alters the supply power factor and reduces the total current drawn from the supply. Current reduction has the benefits of lower conductor power cable losses, smaller transformer and less costly distribution equipment.

In other words, low power factor will necessitate higher capacity circuit where the motor is used. Voltage drops on power cable will as much as double, necessitating an even higher current for the same delivered power. There are higher resistive losses in the motor as well, creating more heat and a shorter motor life.

Construction

Panel are made of high corrosive resistance Aluzinc material, with separate compartments for main bus, contactor and cable. Arc duct can be installed at the top of the panel for venting of exhaust gas.

Capacitors are fitted between contactor and motor. Interlocks between starter, earth switch and capacitor are standard feature. The capacitors energise when the motor is running as it is switched automatically by the motor starting contactor.

For special applications, e.g. motor with frequent starting, multi speed motor and soft starting motor, please contact ABB Australia for customised design.

Technical data

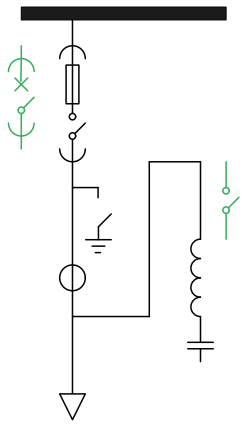
ZVC-HES		3.6kV	7.2kV	12kV
Type of construction		Metal enclosed with withdrawable line contactor or breaker		
Compartmented to IEC 62271–200		Partition class PM		
Loss of service continuity		Category LSC2A		
Internal arc classification		AFL (or AFLR with arc gas duct)		
Insulation level		3.6/10/40 kV	7.2/20/60 kV	12/28/75kV
Rated main busbar current (40°C)		Up to 4000A		
Rated normal current		Up to 630A		
Motor size		Up to 3000kW	Up to 6000kW	Up to 11000kW
		Up to 4000HP	Up to 8000HP	Up to 14000HP
Rated short time current		Up to 50kA		
Arc fault withstand current		Up to 50kA		
Tested according to		IEC and AS standards		
Overall dimensions	H [mm]	1800 / 2200 / 2400 / 2595		
	W [mm]	325 / 975	650 / 975	1300 / 1450 / 1650
	D [mm]	1340 / 1554		

The above data are not limiting values.

Design Features

- Integrated inrush reactor, capacitor and isolating contactor (optional).
- Direct connection to UniGear switchgear panels.
- Wall standing. Front power cable access. Design for rear cable acess available as option.
- Safe, all operations behind closed doors.
- Earth switch viewing window.
- Integral interlock fault make earth switch.
- Full range of type test to IEC/AS standards.
- Can be designed for Indoor or Outdoor installations
- Can be equipped with motor racking mechanism.
- Racking mechanism proven for 10000 operations.
- Built-in control logic between starter, earth switch and capacitor status
- Minimise site work by maximising factory installation, cabling and test

Single Line Diagram



Industry Trend

Energy conservation is of interest these days and most engineers "know" inefficient motors have inherently low power factor that can mean waste of electrical energy. Many questions are asked about the low power factor of existing induction motors and how to increase the efficiency.

The imperative in industry to cut energy costs is good news for manufacturers of high efficiency motors. However, the projected efficiency gains from using machines will not be achieved if motor circuit and supply problems that existed before they were installed are not resolved. One of the most common of these is low power factor.

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1VGA671059 – Rev. A, November 2010