Product Focus: Power Products

Power Products

Electrical power products provide safe and efficient power services for industrial and commercial use, from incoming facility power to endpoint distribution and filtering.

Power products include:

- **DC power supplies convert AC power to lower-level DC power for manufacturing and process equipment**
- **DC to DC converters provide adjustable outputs when an application requires a different DC voltage than what is readily available**
- **Transformers convert AC from one voltage to another**
- **Power distribution blocks provide a convenient, modular means to manage power wiring**
- **Electronic circuit breakers use microprocessors to provide precise setting options and short reaction times to protect delicate downstream equipment**
- **Surge protective devices protect electronic equipment from voltage spikes**
- **Power line filters reduce the effects of electrical noise or power anomalies**
- **Power outlets provide convenient power source distribution in electrical enclosures**
- **Power monitoring devices measure and display standard power parameters plus metering and harmonics**
- **Graphical panel meters provide a visual representation of an analog meter with the accuracy of a digital meter**
- **Current transformers offer a compact, cost-effective means to measure current**

DC Power Supplies

What is a power supply?

Industrial power supplies convert AC power to DC power for manufacturing and process equipment such as PLCs, HMIs, relays, sensors, actuators, and drives. Most common are linear power supplies and switching power supplies. The main difference between switching and linear power supplies is how they convert AC to DC output voltage. Switching power supplies first rectify the AC line supply and then transform it, while linear power supplies first transform the AC supply, then rectify it. Switching power supplies, intended for general use in automation, have better efficiency, less heat loss, wider input voltage ranges, and smaller size and weight. Linear power supplies have fewer harmonics and have more precise output regulation.

Considerations when selecting a power supply:

- Input voltage
- Output voltage
- Output current
- Mounting
- Environmental ratings

Input Voltage
A power supply's typical input voltage is single-phase 120-240VAC; however, some power supplies accept three-phase and even DC inputs.

Output Voltage
Power supplies have standard DC output voltages such as 5, 12, 24, and 48VDC. They usually come with an adjustment potentiometer to trim the output by approximately +/- 10%, and a built-in DC OK LED indicator and contact to provide alerts for overload conditions.

Output Current
When DC power is required, it is crucial to calculate the worst-case current draw of all devices powered from the supply. Some loads require a higher starting current which can be several times their nominal operating full-load current. For example, a capacitive load appears as a short circuit with a high current draw until the capacitor reaches full charge. When selecting a power supply, it is critical to account for this additional inrush current. Some power supplies provide short-term reserve power to handle this extra load, eliminating the need for oversized power supplies and their associated costs.

Applications with high output requirements call for power supplies that can handle power peaks. High-efficiency power supplies reduce losses, save cabinet space, and increase energy savings. Intelligent load management reliably powers equipment and protects it at the same time. Parameterizable overload behavior provides configurable current and switching modes, allowing you to tailor the power supply to meet system requirements.

Mounting
Power supplies are typically DIN-rail mounted inside enclosures; open frame and panel mount power supplies can offer more flexibility because they can easily be screw-mounted in three different orientations. Machine-mount supplies mount directly to the equipment without requiring an enclosure, even if used outdoors.

Environmental Ratings
Typical industrial DC power supplies are UL508 listed and NEC Class 2 compliant. Others offer rugged machine mount options with IP67 and NEMA 4X ratings for harsh outdoor environments. Encapsulated power supplies come in ultra-compact, low-profile housings and are ideal for space-limited applications. Power supplies that are Class 1, Div 2 rated are suitable for hazardous locations. Open frame power supplies are very cost-effective; however, they have little or no protection from the elements. They must be mounted in a suitable enclosure or have a conformal coating applied to protect them from dust, humidity, and contamination.

Overload, Overvoltage, and Thermal Protection
Many power supplies have built-in protection for transient surges, overloads, short circuits, and overvoltage. NEC Class 2 power supplies limit voltage and current output, making them less of a shock and fire hazard. Using NEC Class 2 circuits means reduced and less expensive wiring methods and over-current protection requirements.

DC Ripple
Ripple is the amplitude of the AC component that rides on a DC voltage output. A typical rating for most applications is 100mV peak-to-peak. Determine the maximum amount of ripple that any of the powered devices can tolerate and then select a power supply that meets the most stringent requirement.

DC to DC Converters
DC-to-DC converters provide reliable, overload and short-circuit protected, adjustable outputs when an application requires a different DC voltage than what is readily available. They have excellent voltage regulation, taking a varying input voltage and providing a stable output voltage. They isolate sensitive electronic equipment and can filter spikes, noise, and ripple in problem circuits.

DC Power Supplies (cont.)

Output Derating for Power Supplies

Manufacturers offer a way to extend a power supply's input voltage and temperature rating when it is run at a decreased capacity. As a result, they often publish derating curves in their specifications which illustrate the relationship between temperature or input voltage and output capacity.

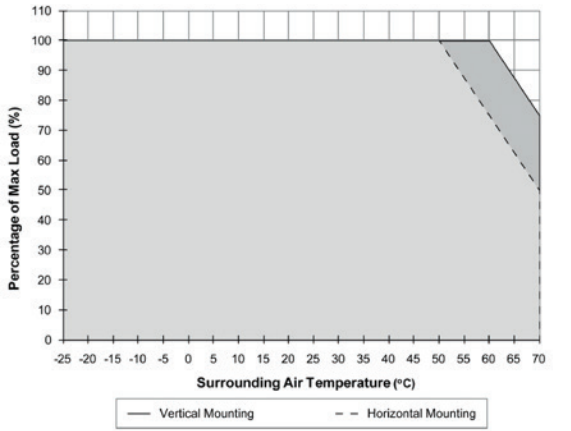
Output Load Derating vs. Surrounding Air Temperature

Power supplies have a maximum temperature threshold for 100% output capacity. It is common for manufacturers to allow a derating for temperatures above this threshold. Power supplies are affected by temperature and will fail if used above their maximum temperature rating. As a result, manufacturers provide a derating curve to show the relationship between temperature and safe output level.

The following illustration shows the derating curve for a RHINO PRO PSD24-120-L power supply. The power supply must be derated from 100% output at 50 C [122 F] to 50% at 70 C [158 F] horizontally mounted. However, if vertically mounted, it is derated from 100% at 60 C [140 F] to 75% at 70 C [158 F].

Output Load vs. Ambient Temperature

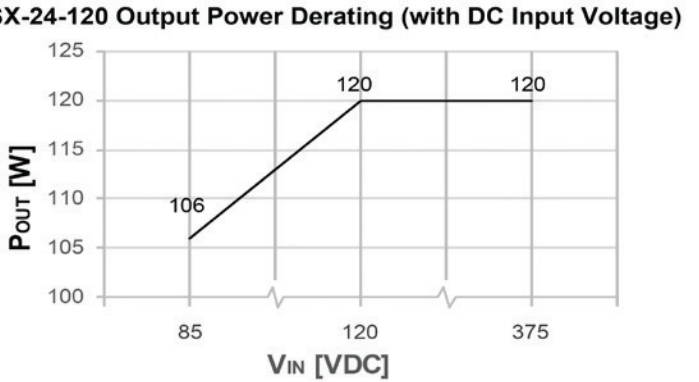
RHINO PRO PSD24-120-L Temperature Derating Curve



Output Load Derating vs. Input Voltage

A derating curve shows the relationship between the input voltage and the maximum allowable output level. Manufacturers often require derating when the input voltage falls below the minimum threshold specified. The following curve shows the derating curve for a RHINO TOUGH PSX-24-120 power when the input voltage drops below 120 VAC.

Output Load vs. Input Voltage



RHINO TOUGH PSX-24-120 Input Derating Curve

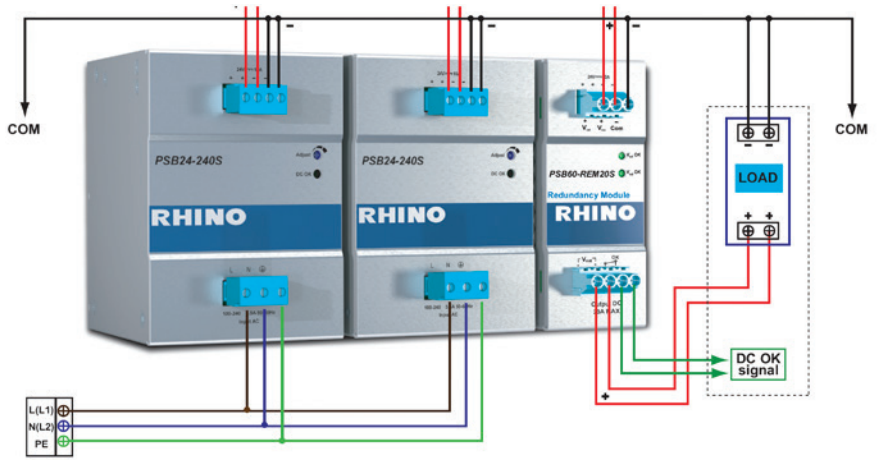
Following these derating practices will increase the life and reliability of a power supply and prevent premature failure. Consider using a power supply rated for at least twice the calculated load. This should satisfy one of the requirements if you need to have your control system UL 508 approved and will allow the power supply to operate at a lower temperature, thus increasing its life.

Dealing with Low-voltage Power Issues

When a power failure brings a manufacturing process down, it can cost thousands of dollars. Companies turn to redundancy modules, buffer modules, and battery backup systems to protect their sensitive electronic equipment from power issues.

Redundancy Modules

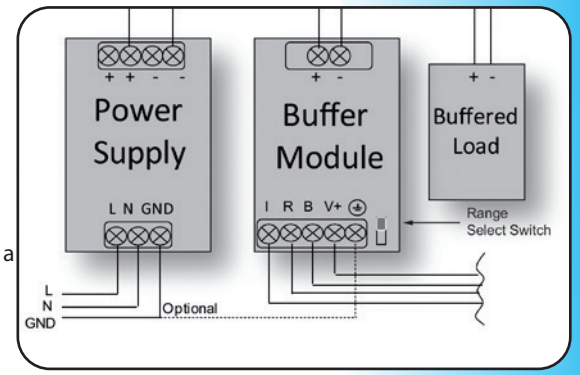
In a critical process, a power supply failure can be a serious concern, even if the facility has stable incoming power. In this case, a wise solution would be to use a redundancy module. Redundancy modules monitor parallel power supplies and switch to the backup when a failure occurs. The main drawback to using redundancy systems is they do not offer power loss protection. Redundant systems fail when the main power is lost.



RHINO PSB60-REM series redundancy module connected to two 240 W power supplies

Buffer Modules

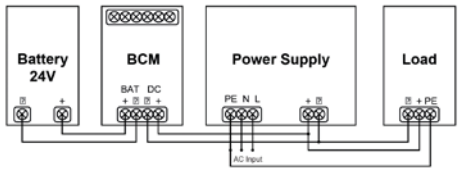
A buffer module keeps a system running smoothly, even with frequent voltage drops and brownouts. It consists of large capacitive banks that release energy when a power failure occurs. The module, installed in parallel with a power supply, provides a limited amount of backup when a power failure occurs. It is maintenance-free because there are no moving parts, and its storage capability does not deteriorate over time.



Wiring diagram for a Buffer Module connected between a power supply and load

Battery Backup System

A battery backup system is required when there are frequent power issues, especially if the process is in a remote location. It consists of a power supply, battery backup module, batteries, and optional monitoring equipment. The power supply keeps the battery charged under normal conditions, then seamlessly switches to battery operation on power loss. This system provides the most robust protection and covers the broadest range of power faults. One significant advantage is that batteries can keep the system running long enough for help to arrive.



Battery Control Module wiring diagram

As power systems grow increasingly taxed, we can depend on auxiliary protection modules to keep our processes running to their fullest potential.

Transformers

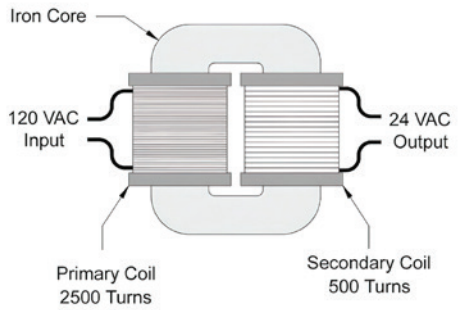


Figure 1
Basic Transformer Components

A transformer's principal function is to "transform" alternating current (AC) from one voltage to another. Transformers play a critical role in any electrical distribution system and end-use equipment such as industrial control panels. A good example is using control transformers to reduce higher line voltages to lower and safer control voltages.

Transformers have input (primary) and output (secondary) windings over an iron core. The voltage is transformed by inductively coupling the primary and secondary coils. As the voltage rises and falls in the primary coil, it creates a matching magnetic field that induces a corresponding voltage in the secondary coil.

The relationship between the input and output voltage of a transformer is directly proportional to its turns ratio. The secondary voltage equals the primary voltage multiplied by the turns ratio. For example, if a transformer has 100 turns on the primary and 50 turns on the secondary, it has a 2 to 1 ratio. Therefore, with 240 VAC applied to the primary, the secondary will produce 120 VAC, creating a "step-down" transformer. The current is inversely proportional to voltage; if this transformer has 2.5 A at 240 VAC on the primary, the secondary will deliver 5 A at 120 VAC. Ignoring losses, the power in equals the power out.

Isolation Transformers

An isolation transformer provides two distinct features. Most transformers are isolation type, where the primary and secondary coils are physically and electrically separate and isolated, even though they are magnetically coupled.

- The secondary is electrically isolated from the higher and more dangerous input voltage, providing a level of safety essential for most circuits.
- Filters high voltage transients and high-frequency noise to protect delicate electronics and downstream equipment.

Autotransformers

A voltage matching autotransformer provides an economical solution where isolation is not desired or required. These transformers are used for voltage matching where the supplied equipment requires a different voltage than what is available as standard at the install site. A typical example is when equipment designed for a 240 VAC supply is installed in a building with only a 208 VAC service. In this case, the autotransformer boosts the voltage and solves the problem quickly.

Open-Core Transformers

These transformers are the least expensive design; however, they must be installed in an enclosure to protect them from the environment and to protect personnel working close to them. Larger open-core transformers can be problematic because safety, protection from the elements, and sufficient cooling require a large, expensive enclosure.

Encapsulated Transformers

Encapsulated transformers address many of the issues associated with an open-core transformer. These transformers are made by placing the unit into a compact enclosure and filling the gaps with a thermally-efficient potting compound. This process provides several distinct advantages, including compactness, improved operator safety, superior cooling, better resistance to shock and vibration, provisions for convenient mounting, and extended life. Encapsulated transformers are typically the best choice for general-purpose, marine, and building distribution applications when considering installation and service life.

Ventilated Transformers (open core)

Ventilated transformers feature higher efficiency, which translates into increased profitability due to lower operating costs, decreased cost of ownership over the lifetime of the transformer, and reduced air conditioning costs due to lower heat emissions. Models such as HPS Sentinel G ventilated transformers are rated up to 1000VA with a standard 10kV BIL rating for increased reliability and protection against critical equipment failure, including protection against voltage spikes and other line transients.

Control Transformers (open or encapsulated)

Control transformers are an excellent choice for high-inrush applications, such as contactors or solenoid valves, requiring reliable output voltage stability.

Most control transformers are specifically designed to provide the high inrush currents required by inductive circuits, then settle back to a lower steady-state current. This surge current, caused by components switching on and off, has no adverse effect on the transformer. Article 450.3 B of the National Electric Code provides requirements for protecting transformers with fuses or circuit breakers.

Selecting a Control Transformer

Determine the following three load characteristics to select a transformer: steady-state load (sealed VA), total inrush VA, and inrush load power factor.

- The secondary steady-state "sealed" VA is the total amount of VA that the transformer must supply to the load circuit for an extended length of time. Calculate this by adding the steady-state VA of all devices in the control circuit. The VA data for the devices should be available from the manufacturers.
- The inrush VA is the VA required for a transformer to simultaneously energize all control circuit components. Obtain this inrush VA data from the device manufacturers. Also, consider starting the devices in sequence to lower the inrush current.
- The inrush load power factor is difficult to determine without a detailed vector analysis of all the control components. In the absence of such information, use a 40% power factor, if possible.

Power and Process Monitoring

Power Monitoring Equipment

Power meters are highly accurate devices that measure all the standard power parameters plus metering and harmonics. All industries are faced with the need to minimize operating and maintenance costs. In this environment, the measurement system is a key component, enabling energy quality and costs to be monitored. Power meters identify common power problems and prevent electrical incidents or even production downtime, which often generate significant financial losses or material waste. The measurement system is a key factor in identifying malfunctions within the installation, which can then lead to improved energy efficiency. They are easy to install and come with software tools to quickly create, edit and save configurations.

Graphical Panel Meters

Graphical panel meters combine the instant visual representation of an analog meter with the accuracy of a digital meter. This style of panel meter features a curved bar that provides an instant visual display, plus a digital readout for reading accuracy.

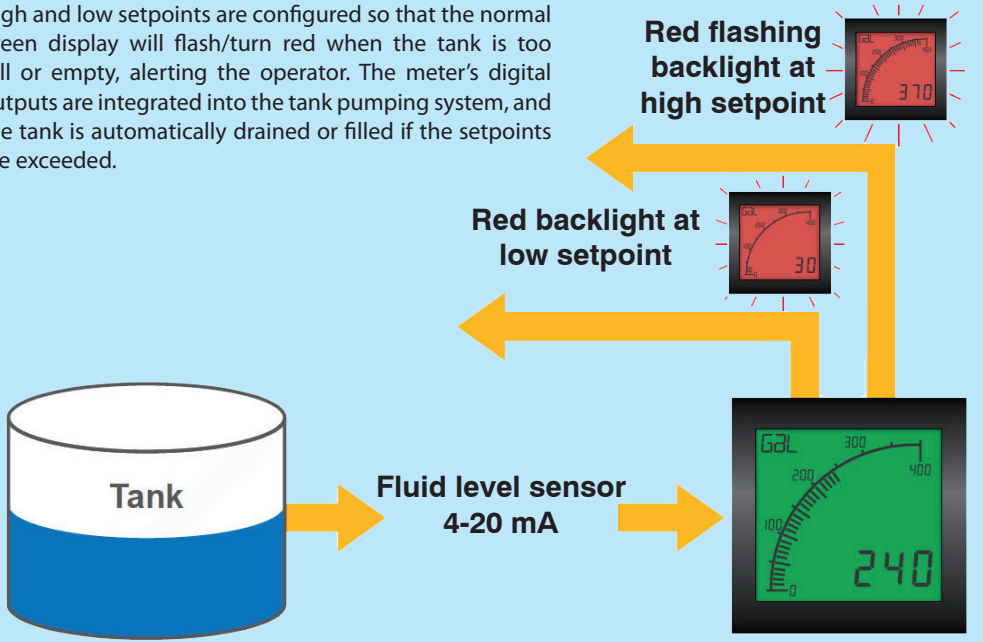
Typical models include:

- Power meters display current, voltage, or frequency
- Current meters display CT inputs as scaled current
- Rate meters display cyclic discrete inputs as frequency or cycle time, and can represent flow, motor speed, etc.
- Process meters display analog inputs as scaled process data
- Temperature meters display thermocouple inputs as temperature

Application Example: Fluid Level

An ADM series panel meter displays the volume of fluid in the tank. The 4-20 mA analog output from the fluid level sensor is scaled to gallons and the custom annunciator is set to "Gal," all via the easy-to-use software application.

High and low setpoints are configured so that the normal green display will flash/turn red when the tank is too full or empty, alerting the operator. The meter's digital outputs are integrated into the tank pumping system, and the tank is automatically drained or filled if the setpoints are exceeded.



Power Products

Power Distribution Blocks

Modular power distribution blocks provide a convenient way to manage power wiring and branching and provide tap-off points. They are suitable for industrial control panel applications requiring high SCCR ratings and meet UL508A requirements in feeder and branch circuit applications. They provide a clean installation by routing power from a single source circuit into several branch circuits, making distributing power in the electrical panel more convenient.

Electronic Circuit Protection

Electronic circuit breakers use a microprocessor to monitor and process current, and actuate semiconductor switches to provide precise setting options and short reaction times to protect delicate downstream electronics. Multi-channel circuit breakers distribute and monitor load currents over several circuits and reliably recognize overloads and short circuits, even at low over-currents with long cable lengths.

Surge Protective Devices

Surge protective devices protect electrical equipment or installations from voltage spikes by blocking unwanted voltages above a safe threshold. Voltage transients from lightning strikes or power utility operations only take a split second to damage sensitive electronic equipment. The current from a direct lightning strike can cause a surge of several 100,000 volts; surge protective devices discharge these high energies without damaging downstream equipment. Typical applications include AC power distribution, driveline filtering, and control panel protection.

Power Line Filters

Electromagnetic interference (EMI) or radio frequency interference (RFI) is unwanted electrical noise that can interfere with signaling or communication equipment. Restricting electrical noise as close to the source as possible is the best way to protect sensitive devices from EMI. For example, a drive with a 4 kHz switching frequency has many harmonic frequencies which produce problematic emissions. Power line filters offer multiple levels of protection to reduce the effects of electrical noise or power anomalies on electric/electronic equipment.

Power Outlets

Power outlets provide convenient power source distribution in electrical enclosures. Some models are simply convenience outlets while others provide multiple levels of surge and EMI/RF protection for a more robust installation to protect sensitive equipment.

Current Transformers

Current transformers offer a compact, cost-effective way to measure high primary current, producing an output proportional to the current flowing through the sensing window. They are ideal for connecting to panel displays or meters, as well as data loggers or chart recorders.

If it's in your cabinet . . .
. . . it's online at AutomationDirect.com

- Productivity®Open Arduino-compatible industrial controller
- Productivity1000 micro-modular PLCs
- Productivity2000 micro-modular PLCs
- Productivity3000 modular PLCs
- Do-more® BRX, H2 and T1H series PLCs
- CLICK® and CLICK PLUS micro brick PLCs
- Numerous I/O expansion modules available including discrete, analog, temperature and high-speed (depending on model)
- DirectLOGIC® components still available for maintaining legacy systems

Controllers

YouTube

- Distributed I/O with Modbus TCP, EtherNet/IP, Modbus RTU, DeviceNET communication options
- Various combinations of discrete (AC, DC, relay, high-speed) and analog inputs and outputs available

Universal Field I/O

CPU and I/O Comparison	AutomationDirect Productivity2000	vs.	Allen-Bradley CompactLogix
Base (if required)	$107.00 P2-04B		N/A N/A
Power Supply	$85.00 P2-02DC		$542.00 1769-PA4
CPU	$361.00 P2-550		$3,370.00 1769-L33ER
16 AC Inputs	$149.00 P2-16NA		$343.00 1769-IA16
16 24VDC Inputs	$98.00 P2-16NE3		$289.00 1769-IQ16
8 Relay Outputs	$71.00 P2-08TRS		$354.00 1769-OW8I
8 Analog Input Channels (mA)	$293.00 P2-08AD-1		$943.00 1769-IF8
ASCII Comm Module	$0.00 Built in to CPU		$851.00 1769-ASCII
Modbus RTU Comm Module	$0.00 Built in to CPU		$940.00 1769-SM2
Total Hardware Cost w/USB, Ethernet and Serial	$1,164.00		$7,632.00
Programming Software	FREE PS-PGMSW		$935.00 9324-RLD200ENE

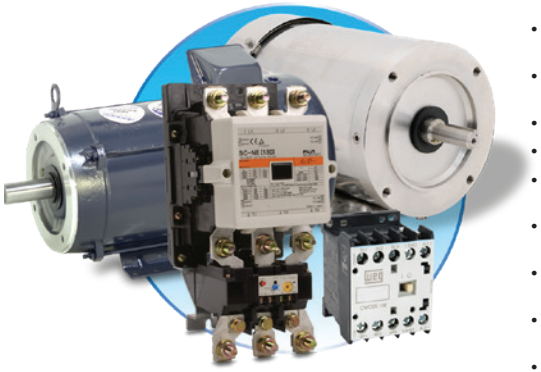
All prices are U.S. published estimated retail prices. AutomationDirect prices as of 12/07/2022.
Allen-Bradley hardware prices taken from www.wemerelectric.com 11/5/2020.
Allen-Bradley software price taken from www.wemerelectric.com 11/5/2020.

- C-more® operator interface HMI touch panels in various sizes up to 15 inches with wide screen options available
- C-more headless HMI - same functionality as C-more touch panels without display size restrictions
- C-more Micro text and touch panels - 3, 4, and 6-inch models available starting at only $101
- C-more and C-more Micro HMI design software free to download
- ViewMarq® LED message displays
- ATLAS® industrial monitors

HMI/Operator Interface

AC and DC Drives

- DURAPULSE® variable frequency AC drives up to 300hp, featuring GS20, GS20X, and GS4 series
- WEG CFW100 and CFW300 AC drives up to 5hp
- IronHorse® AC drives up to 30hp and DURAPulse GS20X drives up to 10hp availaible in a NEMA 4X enclosure
- IronHorse DC drives up to 3hp
- Cost-effective GS1 series VFDs up to 2hp
- Drive accessories
- Soft starters up to 480A



Motors and Motor Controls

- IronHorse general purpose AC motors up to 300 hp
- Stainless steel and white epoxy washdown AC motors
- Stainless steel AC motors
- IronHorse Farm Duty up to 10 hp
- IronHorse three-phase ODP motors up to 50 hp
- Marathon inverter duty AC motors up to 100 hp
- Marathon permanent magnet AC motors up to 10 hp
- Marathon single-phase AC motors up to 5 hp
- DC motors up to 2 hp
- Motor controls and contactors up to 300 hp

GO! TOP RATED BY CUSTOMERS

What our current customers think:
www.automationdirect.com/reviews

Software

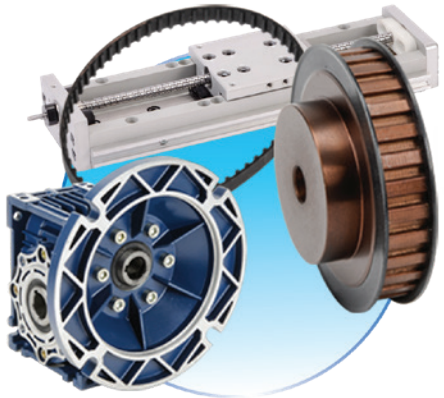
- Free PLC programming software (download)
- Free process control and measurement software (download)
- Free motion control software (download)
- Free HMI programming software (download)
- Free AC drive configuration and programming (built-in PLC) software (download)

Process

- Temperature and process controllers
- Digital and process panel meters
- PID, Batch PID, and Loop Control
- Temperature sensors and transmitters
- Pressure sensors and gauges
- Level sensors and controllers
- Flow sensors and transmitters
- Signal conditioners
- Pipeline valves
- Solenoid /media separated process pipeline valves
- Current to pneumatic (I/P) transducers
- Timer relays, counters and tachometers
- Power monitoring
- Cloud data logger with I/O
- Hour meters and counters

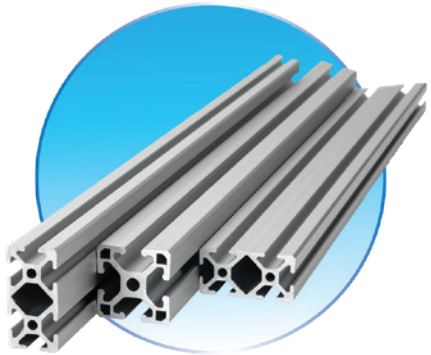
Safety

- Reer MOSAIC safety controllers
- IDEM® and Dold® safety relays
- Speed/Standstill safety relay modules
- Safety laser scanners
- Magnetic safety switches
- Magnetic coded safety switches
- RFID coded safety switches
- Light curtains from Contrinex, ReeR and Datalogic
- Two-Hand controls
- Trapped key interlocks
- Safety mats and edges
- Safety bumpers
- Intrinsically safe isolators
- Hazardous location devices



Power Transmission

- Worm gearboxes
- Helical gearboxes
- Precision gearboxes
- Shaft mount gearboxes
- Timing belts and pulleys
- Couplings and bushings
- Shafting and shaft supports
- igus polymer bearings
- GAM rack and pinions
- Linear bearings and rail



Structural Frames/Rails

SureFrame cut-to-length aluminum T-slotted rails make constructing a frame or machine easy and quick.

NO CUT CHARGES

Complete assortment of hardware and accessories to complete your slotted rail project.

You specify length and cut angles for each piece.

No cut fees.

Free 2-day delivery on all orders over $49.

Relays & Timers

- Electro-mechanical relays
- Intrinsically safe relays
- Phase monitoring relays
- Alternating relays
- Optocoupler relays
- Pump seal failure relays
- Solid state relays
- Relay sockets and accessories
- Timer relays
- Counters
- Tachometers
- Motor control relays
- Force-guided relays

Tools

- Southwire multimeters and testers
- Southwire nutdrivers
- Sensor testers
- Wera screwdrivers and torque tools
- Wera wrenches, ratchets and sockets
- Southwire and AutomationDirect pliers and stripping tools
- SapiSelco cable tie tools
- RUKO hole cutting tools
- RUKO grinders and burrs
- SapiSelco® wire ties
- Z+F Wire Crimping Tools
- AutomationDirect interchangeable die crimping tool, self-adjusting crimper and rotatable die crimpers

Servo Systems

	SureServo2 AutomationDirect Price/Part Number		Allen-Bradley Price/Part Number	
Digital Servo Drive	$383.00 SV2A-2040		$1,418.00 2098-DSD-005	
100W Servo Motor with connectorized Leads	$286.00 SV2L-201N		$712.00 TLY-A130T-HK62AA	
Breakout Board Kit for CN1 Control Interface	$128.00 Sv2-CN1-RTBO + SV2-CN1-CBL50		$347.00 2090-U3BK-D4401	
3m Encoder Feedback Cable	$60.00 SV2C-E122-03NN		$107.00 2090-CFBM6DF-CBAA03	
3m Motor Power Cable	$41.00 SV2C-PA18-03NN		$121.00 2090-CPBM6DF-16AA03	
Configuration Software	FREE SV2-PRO*		$98.90 2098-UWCPRG	

*SureServo2 Pro configuration software is a FREE download or also available on USB drive for $21.00

Complete 1-axis 100W System $898.00 $2,803.90

All prices are U.S. list prices, AutomationDirect prices as of 12/07/2022.
The Allen-Bradley 100W system consists of part numbers shown in table above with prices from www.wernerelectric.com, www.todaycomponents.com 11/5/2020.

- Imagers capable of reading 1D/2D /DPM images
- All handheld scanners are industrial grade and can read all common barcodes such as Code 128 and QR codes
- Convert code into human readable characters and transmit over communications network

Identification

- ProductivityMotion controller
- SureServo®2 drives and motors, up to 15kW
- LS-Electric® servo drives and motors up to 1kW
- Stepper and servo gearboxes
- SureStep® drives and NEMA motors
- Stepper motor linear actuators
- Leadshine® stepper drives
- Linear slides
- Koyo® encoders
- CUI Devices® Kit Encoders
- XYZ Gantries

Motion Control

- Proximity sensors
- Photoelectric sensors
- Limit switches
- Precision limit switches
- NEMA limit switches
- Laser sensors
- Color and contrast sensors
- Area sensors
- Encoders
- Current and voltage sensors
- Pressure sensors and gauges
- Temperature sensors, switches, transmitters and thermometers
- Liquid level sensors
- Flow sensors
- Ultrasonic sensors
- Fork sensors
- Linear position sensors

Sensors

Pushbuttons, Switches and Lights

- KILLARK® hazardous location control stations
- IDEM emergency stops
- Fuji®, Schmersal and Eaton metal/ plastic 22 and 30mm pilot devices
- IP69K-rated selector switches, pilot devices and pushbuttons from Schmersal
- WERMA audible devices and visual signals
- WERMA and Patlite stacklights
- IP69K-rated Patlite stacklights
- Patlite signal towers and LED lighting
- Foot switches

Communications

- Industrial managed and unmanaged Ethernet switches
- StrideLinx VPN routers and cloud services for secure remote access
- Pocket Portal IIoT remote I/O
- MQTT gateways
- Modbus gateways
- Network adapters/ converters
- Ethernet cables
- Power over Ethernet (PoE) switches

Power Products

- Acme Electric®, Hammond and Jefferson Electric® transformers
- Rhino® DC power supplies and converters
- Mersen surge protectors
- Roxburgh and Eaton line filters and surge protectors
- Roxburgh power outlets
- ACME Electric encapsulated transformers
- Edison® power distribution blocks
- Bryant® electrical plugs, connectors and receptacles, and other wiring devices
- AcuAMP® AC current transformers
- Socomec multifunction power meters
- Trumeter graphical panel meters
- Surge protection devices

Pneumatics

- Tubing, hose and fittings in a wide variety of configurations
- Air cylinders and position switches
- Solenoid valves
- Rodless air cylinders
- Modular solenoid valves (Ethernet or hardwired)
- Air preparation and air relief valves
- Pushbutton valves
- Total Air Prep (TAP) all-in-one units
- Rotary actuators and grippers
- Pressure switches, transmitters, and transducers
- Pneumatic pushbuttons and limit switches
- Electro-pneumatic systems
- Vacuum products; suction cups, ejectors, spring plungers

Water (Potable) Components

- Regulators
- Solenoid valves
- Hand valves
- Check valves
- Push-to-connect water fittings
- Tubing
- Hose
- Hose clamps

Circuit Protection

- Eaton UL 489 miniature circuit breakers
- Fuji UL 489 molded case circuit breakers
- Eaton UL1077 supplementary protectors
- Edison fuses, fuse holders and fuse blocks
- Socomec, Gladiator® and Bryant® disconnect switches
- Bryant UL 508 manual motor controllers
- Socomec manual transfer switches
- Wago electronic circuit breakers

Enclosures	AutomationDirect Wiegmann Price/Part Number	VS.	Hoffman Price/Part Number
NEMA 1 wall mount 24 x 24 x 08"	$341.00 N1C242408LP		$354.01 A-24N24BLP
NEMA 12 wall mount 20 x 16 x 08"	$430.00 N12201608		$491.96 A-201608LP
NEMA 12 free-standing mount 60 x 60 x12"	$2,915.00 N12606012		$2,849.47 A-606012LP
NEMA 4 wall mount 20 x 20 x 06"	$571.00 N4202006		$622.59 A-20H20ALP
NEMA 4X wall mount 20 x 20 x 06"	$1,016.00 SSN4202006		$1,518.12 A-20H2006SSLP
NEMA 4/12 wall mount 36 x 24 x 08"	$497.00 N412362408C		$621.03 C-SD36248

*All prices are U.S. published prices. AutomationDirect prices as of 12/07/2022. Hoffman prices are taken from www.alliedelec.com 11/5/2020. Prices may vary by dealer. Many other part numbers are available from all vendors.

Terminal Blocks and Wiring

- Electrical hook-up wire / building wire
- Konnect-It® and DINnectors® terminal block systems
- Edison power distribution blocks
- Bryant power wiring devices
- Wire duct and tubing
- Cable entry systems for enclosures
- Wire end connectors, cable glands, sanitary cable glands, connectors and fittings
- ZIPport® connectors
- Multi-wire connectors
- Sensor cables
- DYMO XTL label makers and labels
- General- and special-purpose cable ties

SCE SAGINAW CONTROL & ENGINEERING

HAMMOND MANUFACTURING

WIEGMANN

INTEGRA ENCLOSURES

AttaBox A ROBROY ENCLOSURES™ BRAND

QUADRITALIA

Enclosures

- Over 7,000 NEMA rated enclosures from Saginaw, Hammond Wiegmann, Integra, Quadrital and AttaBox
- Stainless steel, carbon steel and aluminum enclosures
- Modular enclosures
- Polycarbonate, fiberglass and PVC enclosures
- Thermoplastic ABS enclosures
- Sanitary enclosures
- Heating, cooling and climate control
- Lighting
- Wide selection of enclosure accessories

All of our cable is available cut to your specified length so you can eliminate waste and purchase only what you need -
plus it's cut for free and shipped FAST!!

Dozens of cables available including:

- Flexible Portable Cord (indoor and outdoor)
- Power Cables
- Motor Supply Cables
- Tray-rated Cables
- Control and Signal Cable
- Instrumentation Cables
- VFD and Servo Cables
- Data Communications Cables
- Thermocouple and RTD cables

Minimum lengths of 10ft unless otherwise indicated

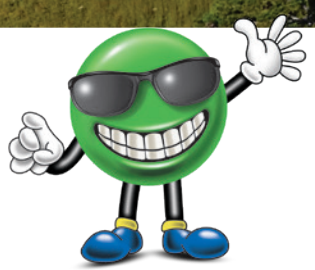
Also available . . .

Bulk Electrical Hook-up/Building Wire

AutomationDirect has a large selection of quality electrical wire in pre-spooled lengths that meets all NFPA and NEC requirements at great prices.

- MTW Machine Tool Wire
- TFFN Fixture Wire
- THHN General Purpose Building Wire

- Honest up-front pricing (no gimmicks)
- Quick delivery - order today, it ships fast!
- Top technical support as rated consistently from our customers
- FREE shipping on orders over $49



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As a privately-held efficiently run company, we take pride in serving our customers the way they want to be served - honestly and fairly. We do everything we can to accomplish this day in and day out.

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