



ACPAK [®]

AC EXTRUDER DUTY PACKAGE

If you have a relationship with a motor rewind shop,
you have a problem, not a solution provider!

MINIMIZE RISKS and trust someone who does this for a living!

LOCATIONS



MANUFACTURING AND SALES

DALLAS HEADQUARTERS

440 Wrangler Drive, Suite 100
Coppell, TX 75019
Toll Free: (877) 222-0915
Phone: (972) 906-7445
Fax: (972) 906-7430

SALES AND SERVICE

HOUSTON OFFICE

10055 Regal Row, Suite 190
Houston, TX 77040
Toll Free: (877) 222-0915
Phone: (832) 681-9933
Fax: (972) 906-7430

www.integratedcontroltech.com

SYSTEM FEATURES



EFFICIENT THERMAL DESIGN

- No Need for Air Conditioner
- Longer Component Life
- 70% Reduction in Heat

COURTESY WIRING PANEL

- Pre-Wired Blower Starter
- Control Transformer
- Drive Control Connections

DOOR MOUNTED DRIVE INTERFACE

- No Need to Open Door
- Monitor Drive Status
- View Alarms

INDUSTRY LEADING DRIVES

- Yaskawa GA800
- No Need to Upsize HP
- No Isolation Transformer
- PF Correction Not Needed

RELIANCE RPM-AC MOTOR*

- Fits in Old DC Space
- Can Mount Under the Barrel
- Less Power Consumption
- Better Insulation
- Better Speed Regulation
- Filter Kit Included



ARC FLASH OPTION

- Remotely Mounted Breaker
- No Power in Panel
- LED/Probe Verification

COVERED LINE REACTOR

- Eliminates Iso-Transformer
- Reduces Heat Losses
- Limits Energy Losses



FEATURE COMPARISON

3-Year warranty on Drive System / 2-Year on Motor
 About 1000 ACPAKs are running on extruders
 Thermally designed to not require AC or heat exchanger
 Covered line-reactor and blower filter kit included
 Blower motor starter standard in design
 Pre-engineered design with ARC flash option
 Control Terminations remote from Power Leads

ICT
ACPAK



SYSTEM
INTEGRATOR



DRIVE
MFG



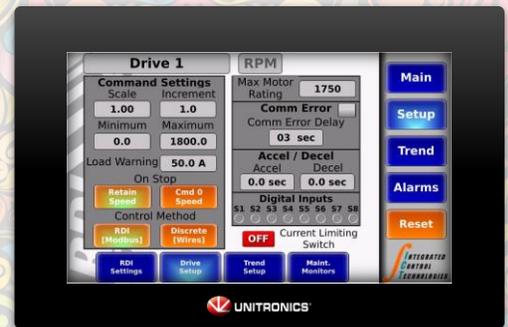
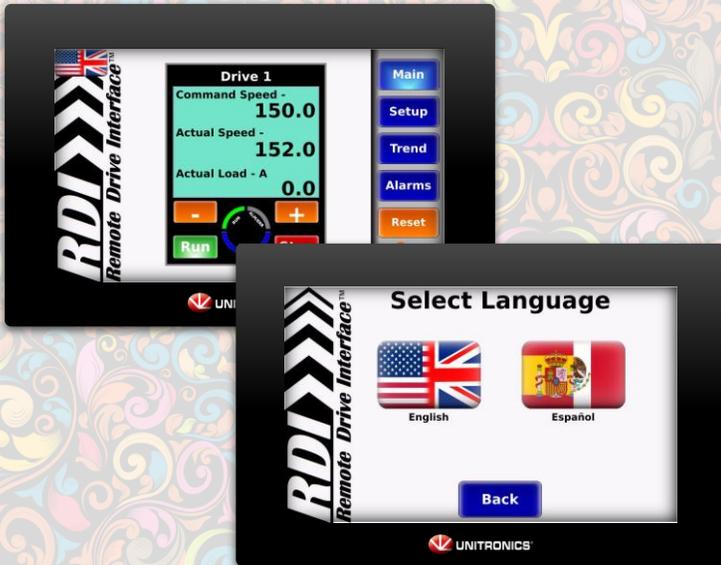
RDI REMOTE DRIVE INTERFACE

REMOTE DRIVE INTERFACE

- Replaces Old Gauges
- Works as Monitor or Control
- English or Spanish Readout
- Enclosure Door Option with Arc-Flash

SCALE READOUT AND EASY SETUP

- Convert to Line Speed Readout
- Set Accel and Decel Rates
- Set Load Warning Levels

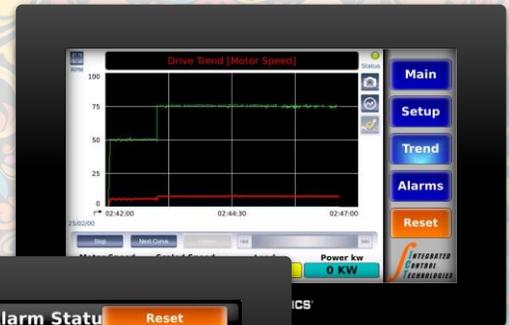
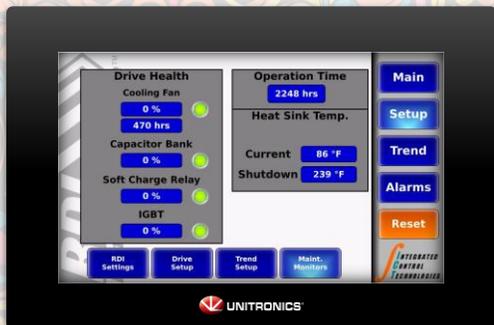


DRIVE HEALTH MONITOR

- Identify Components Remaining Life
- View Heatsink Temperature
- Set Programmatic Current Limit
- View Operating Lifetime of the Drive

REALTIME TRENDING AND ALARMS

- Trend the Speed and Current
- Trend Energy Consumption
- Maintain Alarm Log and History



RETURN ON INVESTMENT

UTILITIES

Improve Efficiency 10% (KW)

- Reduce Kwh

Improve Power Factor (KVAR)

Decrease Current Draw (KVA)

- Reduce Peak Demand Charges

10 YEAR ENERGY CONSUMPTION

DC MOTOR

AC MOTOR



■ KW

■ Peak KW

250HP Example



MAINTENANCE LABOR

No More DC Brushes to Replace

Eliminate Overtime Repair Hours

No Removal of The DC Motor For Rewind

REPAIR/REPLACEMENT

Pay Less for an AC System Than a DC Motor

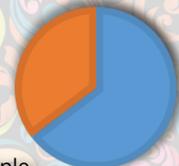
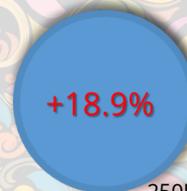
There is No Commutator to Turn Down

No More Last Minute Motor Rewinds

ACQUISITION COST OF PRODUCTS

DC MOTOR ONLY!

AC DRIVE & MOTOR



250HP Example

MAINTENANCE LABOR

No More DC Brushes to Replace

Eliminate Overtime Repair Hours

No Removal of The DC Motor For Rewind

RETURN ON INVESTMENT IN YEARS

1

2

3



DC Rewind < 1 Year

FAQ: When Converting from DC to AC Drives



There are some great benefits in converting from a DC motor and drive to an AC on an extruder. Converting to AC improves efficiency reducing utility costs as well as reduces downtime resulting from both scheduled and unscheduled maintenance. Making a mistake can be costly, therefore having a good understanding of what needs to be considered in an upgrade is important. The following is a list of common questions asked when considering an upgrade:

Do I need to oversize my AC drive?

No. You do not need to oversize the drive and motor when converting to AC, as long as you are using the right drive and motor and you are not over-exciting the field of the DC motor to increase torque. AC Vector Motors have a wider (CTSR) constant torque speed range (1000:1) as compared to DC motors (10:1). This indicates that it can maintain torque at lower speeds without overheating. Also, AC Vector motors usually have a constant blower fan with filter similar to DC mounted opposite the shaft-end of the motor.

Are AC drives rated the same as DC drives?

No. DC drives are all “Heavy Duty Rated” for applications such as extruders. AC Drives are both “Normal Duty” and “Heavy Duty” rated. Normal Duty is for pumps and fans and has a 110% overload capacity for one minute, while Heavy Duty is for applications such as extruders which has an overload capacity of 150% for one minute. Therefore, be sure to request AC drives with a Heavy Duty rating of the horsepower that you require.

Do I need tach feedback?

No. The speed regulation of a DC drive is 0.5% with a DC tach, while the speed regulation of an AC drive in Open Loop Vector is 0.2%. Although, an encoder is required on applications associated with web and tension control such as primary and secondary nips or application requiring high precision such as medical tubing.

Can I put the AC drive in the same enclosure as my DC drive?

Doubtful. Just because it fits, does not make it a good idea. AC drives have different heat ratings than DC and the drive may overheat in the same enclosure. This is especially true in applications that are greater than 100 horsepower. The watt loss of the drive can be obtained from the manufacturer to determine if there is appropriate cooling.

What specifications are important when installing an AC drive in a new enclosure?

The enclosure should be a NEMA 12 free-standing flange disconnect enclosure with a circuit breaker. There should be ample room for an AC line reactor and blower motor starter. It is also a good idea to have the keypad operator mounted on the door. If the heatsink is not extended out the back of the enclosure, it will require air-conditioning. A good solution is a pre-engineered drive package such as the ACPAK from Integrated Control Technologies.

Is there a limit of how far away I can mount the AC drive from the motor?

Yes. Distances greater than 150 feet require special provisions to ensure motor reliability which will increase the cost of installation. It is best to mount the drive close to the motor instead of in a control room that is too far away.

Can I increase throughput?

Maybe, this is more dependent on your mechanics such as your gearbox and screw than the drive and motor. If the gearbox and screw can take the additional torque and speed, then it is possible to increase the horsepower proportional to the speed resulting in more throughput.

FAQ: When Converting from DC to AC Drives (Cont'd)

Can I use my existing meters for speed and load display?

Doubtful. Only if it is a newer DC drive that uses 0-10VDC as an output for speed and load. Older DC drives use shunt resistors and the meters would not be compatible. If the meters need to be changed, a good option would be the Remote Drive Interface (RDI) from Integrated Control Technologies.

Is there a physical difference in the size of the AC motor and DC motor?

Yes. This is especially true when using a NEMA frame motor. The overall height of the motor as well as the shaft height will be greater resulting in the need to lower the base. A good solution would be the Reliance RMAC motor which is built in a frame similar to that of a DC motor, reducing the amount of physical work required in a conversion..

Does the motor require special bearings in a belted application?

Yes. Roller bearings are required for belted applications above 75 horsepower as opposed to the standard ball bearings.

What are bearing currents and can they reduce the life of bearings?

Yes. Bearing currents can reduce the life of bearings in an AC motor. They are caused by stray magnetic flux that induces a voltage on the shaft which discharges through the bearing causing pitting. These currents can be mitigated by using such things as the AEGIS shaft-grounding rings, an extruder duty motor from ICT or the G7 drive from Yaskawa.

Should I remove my isolation transformer?

Yes. DC drives require isolation transformers, while AC drives only require AC line reactors. Removing the isolation transformer will increase floor space and reduce kW.

What problems will I run into if I wait until my DC motor fails before converting to AC?

An emergency conversion will always cost more than one that is planned. In addition, there may not be product availability, especially if it is a larger horsepower that requires an enclosure. In such situations, Integrated Control Technologies stocks extruder drive packages and motors through 500 horsepower available for shipment within 24 hours.

What is the best AC drive to use in a conversion?

If the criteria is the best availability, highest quality, least failures with good pricing, we recommend the Yaskawa AC drive. It is manufactured outside of Chicago and used by many extruder manufacturers and is considered a standard by many within the plastics industry.

Can I replace my 1150 RPM DC motor with a 1750 RPM AC motor?

No. While the HP of the drive remains the same, the torque necessary to turn the shaft is based upon the following formula:

$$\text{TORQUE} = \frac{\text{HP} \times 5250}{\text{SPEED}}$$

Example Comparing 200HP Drive paired with different motors

$$\text{TORQUE} = \frac{\text{HP} \times 5250}{\text{SPEED}} = \frac{200 \times 5250}{1150} = \mathbf{913.04 \text{ ft-lbs}}$$

$$\text{TORQUE} = \frac{\text{HP} \times 5250}{\text{SPEED}} = \frac{200 \times 5250}{1750} = \mathbf{600 \text{ ft-lbs}}$$



IMPORTANT