



Series F - 09130
Linear Actuator with Position Feedback
(Type CLA)
Instruction Manual F-09136.01



SAFETY WARNINGS

(Safety symbols and terminology per ANSI Z21.)

Failure to comply in full with the following safety requirements can result in equipment damage and personal injury/death.

1. Read the entire manual to become familiar with the use and operation of this device.
2. Only qualified personnel should attempt to install, wire, commission, startup, service or operate this device.
3. This device is not suitable for use in an explosive ambient atmosphere.
4. Before working on this device, be sure that you understand the processes affected by this device completely.
5. Before working on this device, be sure that any process affected by this device is secure and safe for servicing.
6. Take appropriate precautions to avoid electric shock when working with this device near water.
7. Exercise caution while wiring or working on this device. Multiple voltage sources may be present: take appropriate precautions to avoid electric shock.

F-09130-C0 Linear Actuator w/ Potentiometer

Model Code: F-0913A – BCDE – F

Codes	Description
F-09130	Linear Actuator Base Unit
-A-	
A1	30 seconds full stroke, 75# Thrust (18.75 ft-lb)
A2	60 seconds full stroke, 150# Thrust (37.50 ft-lb)
A3	120 seconds full stroke, 300# Thrust (75 ft-lb)
-B-	
B1	1000Ω (potentiometer)
B2	135Ω (replaces obsolete CLA-157 models)
B3	4000Ω Slide wire (replaces obsolete CLA-P models)
-C-	
C0	None
C1	Isolated Auxiliary End-of-travel Switch (replaces obsolete CLA-243 models)
C2	Adjustable Start Switches (replaces obsolete CLA-242 models)
-D-	
D0	None
D1	Hand wheel
-E-	Power Requirements
E1	120 V, 50/60 Hz.
E2	240 V, 50/60 Hz.
F=C0	

Typical Model Code: F-09132-1001-C0 is a 120 V, 50/60 Hz., 60-second, 150 lb. linear actuator with a 1000Ω position feedback potentiometer.

Linkage:

Forced Draft Damper installations require, if not already present:

- (Qty.1) P/N 11372 Damper Lever Arm
- (Qty.2) P/N 26908 Clevis Assy.

Feed water & Valve Installations require, if not already present:

- (Qty.1) P/N 12677 Spring Link
- (Qty.2) P/N 26908 Clevis Assy.

SPECIFICATIONS

PHYSICAL

Power Requirements: 120 v AC or 240 v AC, 50/60 Hz.

Case Dimensions: 15.75" long x 7.5" wide x 5.75" high.

Mounting: Any position.

Motor: Commercially available stepping motor operated in synchronous mode.

Input Signal: Switched line voltage input.

Wiring Connections: Numbered terminals for power to motor and motor brake, and for alarm and control connections.

Ambient Temperature: 0 to 140F (-19 to 60C).

Finish: Wear-resistant sealed black polyurethane enamel.

Shipping Weight: 35 lbs.

APPLICATION

Travel: Six" linear travel.

Stroke Time: 30, 60, or 120 seconds.

Thrust: 75, 150, or 300 lbs. (Equivalent to 18.75, 37.5, and 75 foot-pounds with a 3" lever arm.)

Positioning Accuracy: $\pm 0.25\%$.

End Switches: High and low end switches standard.

Potentiometer: Standard 1000 ohms. Also available: 400 ohm, 135 Ω .

Handwheel: Continuous rotation type (optional).

Specifications Subject to Change

F-09130-C0 Linear Actuator w/ Potentiometer

Technical Information:

Series **F-09130 Linear Actuators** accept switched 120V (or available 230V) input from a controller with bi-directional relay outputs. **F-09130 Linear Actuators** are used for final positioning of control elements such as dampers, valves (gas, oil, water, etc.), levers (stoker, variable speed transmissions, etc.) and other similar devices. All applications use the full 6-inch stroke (travel) of the actuator. Three standard nominal stroke time vs. thrust ranges are available.

Stroke and speed ratings for linear actuators are varied by changing the drive ratio at the motor. Thrust (push-pull) ranges are stated in Pounds. Equivalent ratings are given in Foot-Pounds (torque), and has been calculated for a 3" lever traveling through 90°. Motor operation is synchronous to line frequency; for 50 Hz operation, therefore, use a 5/6 multiplier for all timings.

The synchronous motor operates at 72 rpm at 60 Hz, has a permanent magnet and coil construction, and offers impedance protection against overloads. Stall-current is the same as operating current. Braking is inherent, eliminating the need for separate mechanical braking mechanisms. A toothed timing/drive belt, coupled over toothed pulleys, ensures smooth, reliable operation. The belt and pulleys are selected according to speed and thrust requirements.

All F-09130 Linear Actuators are equipped with a position feedback potentiometer suitable for use with closed loop controls and indicators. A 1000Ω potentiometer is standard; 135 or 4000Ω potentiometers can be ordered with the product, or can replace the standard potentiometer in the field.

The optional auxiliary proof-of-travel switch permits interfacing with controls or other circuits. An optional adjustable-start switch is also available.

Mounting and Installation

Mount in any position on any flat, rigid surface free from excessive vibration. The ambient temperature limit is 140 degrees Fahrenheit (60 degrees Celsius). Refer to the dimensions drawing below for case dimensions and mounting hole locations.

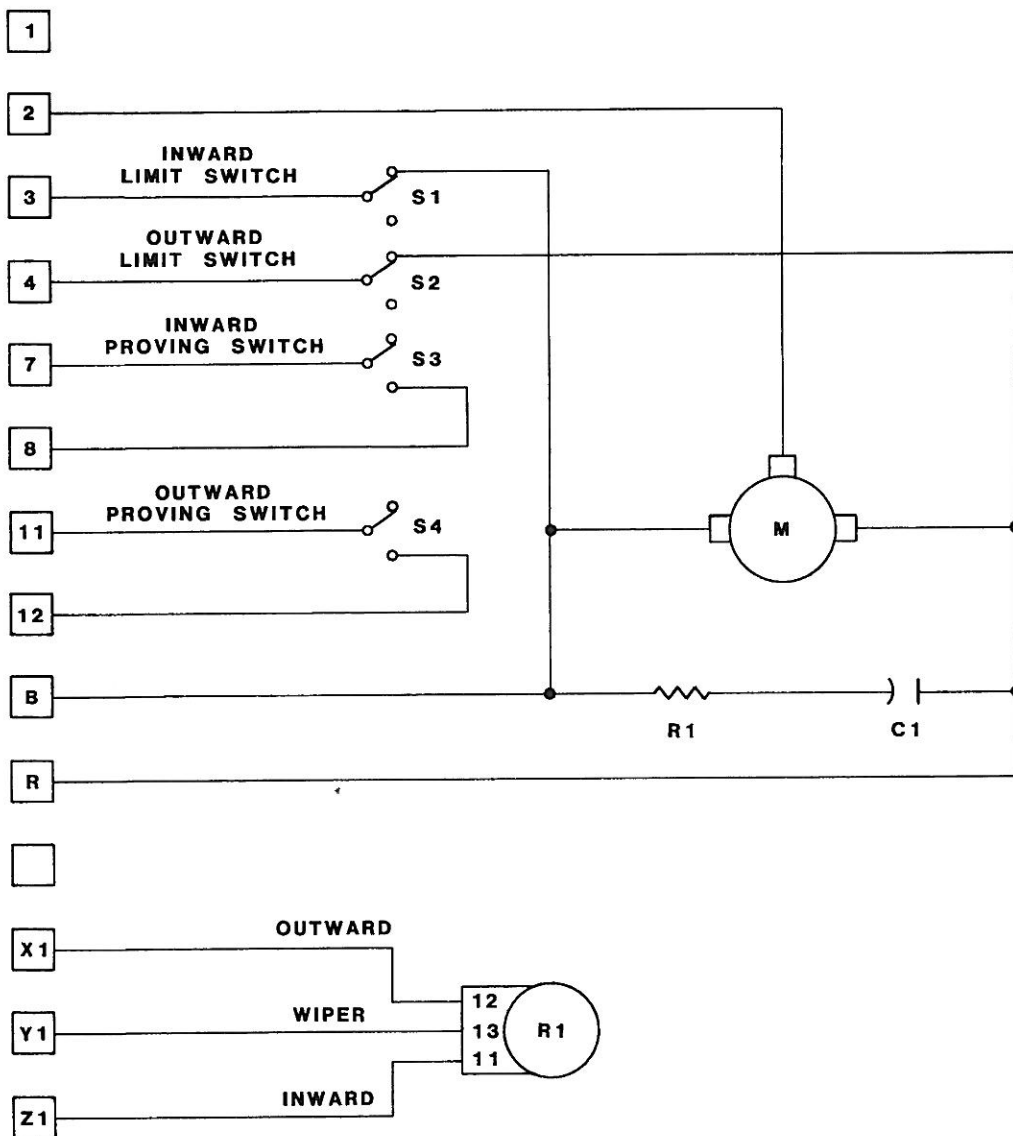
Locate the actuator to provide straight line thrust to the unit it positions. This can be accomplished by adjusting the linkage and/or the jack shaft. The linkage must be at least two feet long. For the most efficient thrust, have the linkage as long as possible.

Wiring

All wiring connections are easily accessible for maintenance. Wire according to the diagram below.

Terminal	Typical External Wiring
1	Not applicable.
2	Wire to common side of line.
3	Decrease Action: connected to the motor winding that drives the actuator thrust bar toward its retracted position. For auto/manual operation from a remote station or controller.
4	Increase Action: connected to the motor winding that drives the actuator thrust bar toward its extended position. For auto/manual operation from a remote station or controller.
7	Internally wired to the NO contact of the inward auxiliary limit switch. Contacts are closed when the thrust bar is fully retracted at low fire position. To prevent the firing unit from starting, except when the thrust bar is at the low fire position, these two terminals are externally wired to the low fire start circuit of the ignition programmer or other starting device.
8	
11	Externally wired to the NO contact of the outward auxiliary limit switch. Contacts are closed when the thrust bar is fully extended at high fire position.
12	
B	Not applicable.
R	
X1	Internally connected to the input terminals of the potentiometer. Refer to specific controller instructions for external connections.
Y1	
Z1	

F-09130-C0 Linear Actuator w/ Potentiometer



**LINEAR ACTUATOR
SERIES 9130**

NOTES:

1. TO REVERSE OPERATION, INTERCHANGE EXTERNAL WIRES TO TERMINALS 3 & 4 AND X1 & Z1.
2. EXTERNAL WIRING: USE WIRE SUITABLE FOR 75 C.
3. INPUT RATING: 120V., 60HZ., 25VA. MAX.

Operating Tips

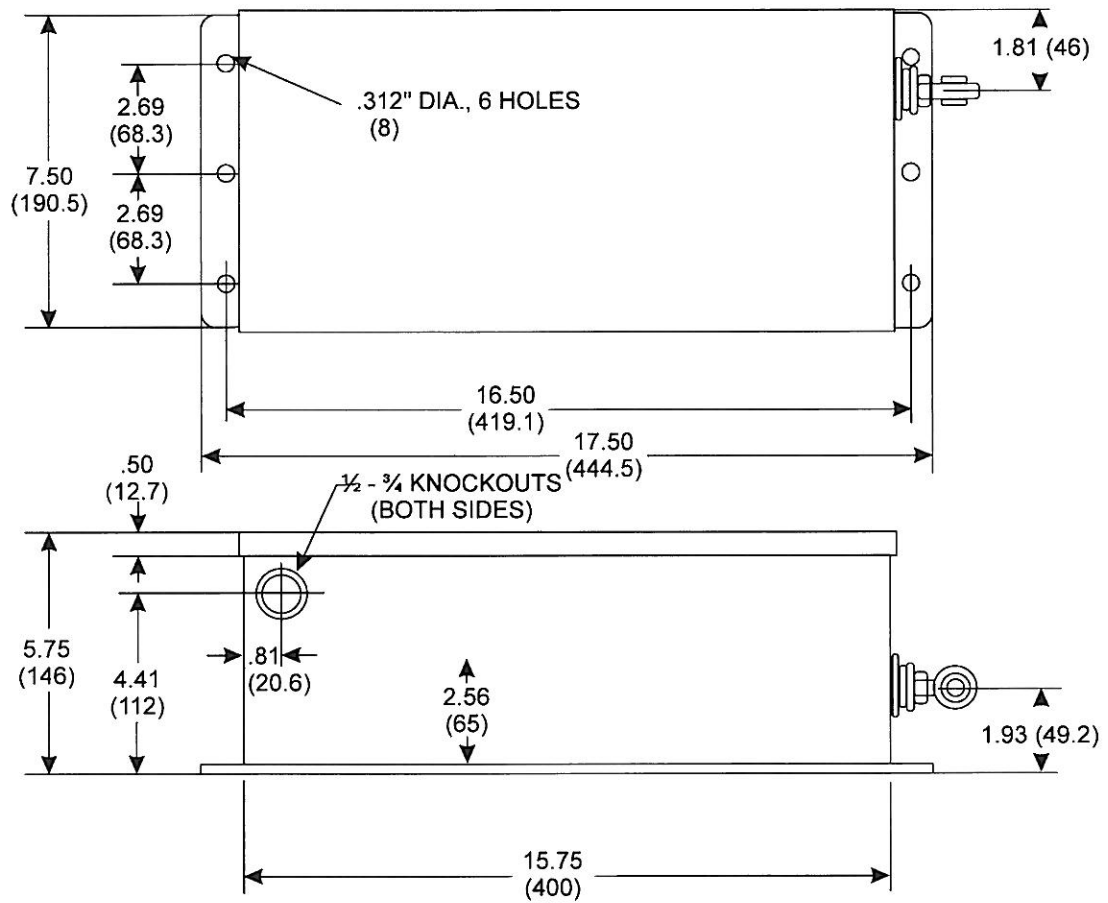
To manually check the increase/decrease operation of the actuator, put the controller or station in manual operating mode. If the actuator fails to respond in manual mode, check the field wiring.

When the actuator has cleared the manual mode check, put the controller back in automatic operating mode. If the system cannot find a balance (i.e., the actuator, which lags, goes to the endpoint of a stroke and remains there), shut the system down and refer to the specific controller bulletin.

F-09130-C0 Linear Actuator w/ Potentiometer**Replacement Parts & Accessories**

Part No.	Description
11372	Damper Lever Arm, including 2-Piece aluminum alloy casting, with bushing, bolts & nuts, suitable for 1/2" to 1.5" shafts
12677	Spring Link (for tight valve closure)
26908	Clevis Assembly, including clevis yoke & pin, threaded adjusting rod, reducing coupling & (2) 1/2-20 hex nuts (2 clevis assemblies are required)
29060	30-sec/75# or 120-sec/300# Thrust Pulley Drive Kit
29059	60-second/150# Thrust Pulley Drive Kit
28030	Pulley, Motor: 60-sec/150# or 120-sec/300#
28031	Pulley, Motor: 30-sec/75#
28018	Pulley, Drive Screw: 60-sec/150# or 120-sec/300#
28032	Pulley, Drive Screw: 30-sec/75#
29561	Drive Screw Assembly: 30-sec/75# or 60-sec/150#
29562	Drive Screw Assembly: 120-second/300# thrust
20594	Belt, Notched Drive: 60-sec/150# or 120-sec/300# thrust
24496	Belt, Notched Drive: 30-second/75# thrust
28035-008	Motor, 120 VAC, for current Model F Actuators and Model R Regulators.
28093-001	Motor, 240 VAC, for current Model F Actuators and Model R Regulators.
28055	Resistor & Capacitor Run Kit for P/N 28035-008 Motor.
28094	Resistor & Capacitor Run Kit for P/N 28093-001 Motor.
29030	Resistor & Capacitor Run Kit for retrofitted CLA-Ps with P/N 28035-011 Motor. Like P/N 28055, but fits brake area.
10467	Eyebolt, UniBall Bearing Type
12965	Limit Switch, Inward
12966	Limit Switch, Outward
13064	Spring, Torsion
13382	Adjustable Start Switch Assy. (and CLA-242)
26985	Chain, Ladder, 7-inch to Potentiometer
30128-102	Potentiometer, 1000 ohm, for 913A-BCDE-C0 units

F-09130-C0 Linear Actuator w/ Potentiometer



Series F-09130 Linear Actuator Dimensions

CUSTOMER SERVICE INFORMATION

Contacts

Hays Cleveland Sales Office

1903 South Congress Avenue

Boynton Beach FL 33426

Telephone: 561.734.9400

Fax: 561.734.8060

email: salescombustion@unicontrolinc.com

Hays Cleveland Customer Service Department

1111 Brookpark Road

Cleveland OH 44109

Telephone: 216.398.4414

Fax: 216.398.8556

email: customerservice@unicontrolinc.com

Visit us on the WEB!

<http://www.hayscleveland.com>

Repairs

Damaged or defective units may be returned to the factory for repair. However, factory authorization must be obtained before shipping whether warranty or non-warranty service is required, and all units must be shipped prepaid.

A letter of transmittal that includes the following information should accompany the returned instrument:

1. Location, type of service, and length of time in service of the unit.
 2. Description of the faulty operation of the device and the circumstances of the failure.
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3. Name and telephone number of the person to contact if there are questions about the unit.
4. Indicate whether warranty or non-warranty service is requested.
5. Attach Purchase Order for all out-of-warranty repairs.
6. Complete shipping instructions for the return of the repaired instrument.
7. Original purchase order number and date of purchase.
8. Return Goods Authorization number provided by the factory when you called.

Clearly label the shipping container:

RETURN FOR REPAIR

Model _____

RG # _____

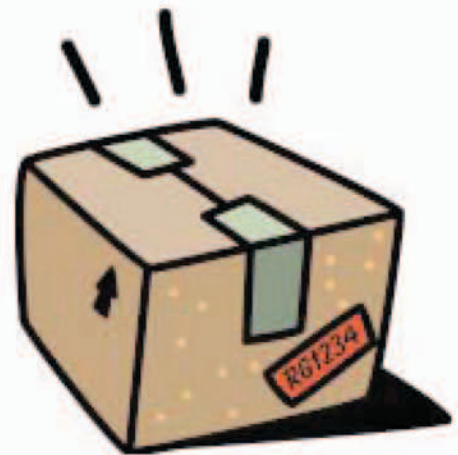
Ship prepaid to:

HAYS CLEVELAND

1111 Brookpark Road

Cleveland OH 44109-5869

216-398-4414



Please follow this procedure. It expedites handling of the returned item, and avoids unnecessary additional charges for inspection and testing to determine the problem before repairing it.

Service

A **Maintenance and Service Contract** can ensure trouble-free, economical operation of **Hays Cleveland** equipment for many years. One-time on-site service by a factory-trained service engineer can also be provided as needed. Contact Hays Cleveland for information on these service options.

Standard Terms and Conditions of Sale

TERMS OF SALE: 1% discount if paid in ten (10) days, net amount due and payable in thirty (30) days.

AGREEMENT OF SALE: Acceptance by Seller of any order placed for goods whether submitted on Buyer's purchase order form or on seller's Sales Order Acknowledgment form, shall be subject to Seller's Standard Terms and Conditions of Sale and is conditioned upon the Buyer's acceptance of these Standard Terms and Conditions.

TERMS OF CONTRACT: Any terms or conditions of the buyer's order which are inconsistent with these terms and conditions shall not be binding on the Seller and shall not be considered applicable to the sale or shipment of goods or materials. Unless buyer shall notify Seller in writing to the contrary within ten (10) days after the mailing of the Sales Contract by Seller, acceptance of the terms and conditions hereof by Buyer shall be indicated and, in the absence of such notification, the sale and shipment by Seller of the goods and materials covered hereby shall be conclusively deemed to be subject to the terms and conditions hereof.

PRICES: All prices and specifications and applicable discounts are subject to change without notice. Sales contracts which call for delivery in the future will be billed at prices in effect at the time of shipment. Shipping weights shown are approximate and subject to change without notice.

SHIPMENT AND PAYMENTS: All prices contained on the Sales Contract are F.O.B. factory in Cleveland, Ohio. No freight is allowed on any shipments. Shipments and deliveries shall at all times be subject to the approval of Seller's Credit Department, and at any time seller may require payment in advance or satisfactory security or guarantee that invoices will be promptly paid when due. If buyer fails to comply with any terms of payment, seller, in addition to its other rights and remedies, but not in limitation thereof, reserves the right to withhold further deliveries or terminate the Agreement, and any unpaid amount thereon shall become due immediately. Terms of payment shall be as set forth on the Sales Contract.

DELAYS AND DEFAULTS: Delays or defaults in delivery by Seller of the goods and materials covered by the Sales Contract shall be excused so far as the same is caused by fire, strikes, accident, governmental regulation, or any delays unavoidable or beyond reasonable control of Seller. In no event shall Seller be liable for any consequential, special, or contingent damages on account of any default or delay in delivery.

NONCANCELLATION: Orders are not subject to suspension, reduction, or cancellation, except on terms that will indemnify Seller against loss.

SPECIFICATIONS: Seller relies on specifications and other data furnished by the Buyer, an architect, contractor, or consulting engineer in all phases of the work covered by the Sales Contract. Seller shall be responsible to check quantities only. Alterations to or changes in specifications, approval of samples, changes in delivery instructions and all other instructions must be submitted in writing to Seller.

In the event Seller performs design or engineering work at the request of Buyer, an architect, contractor, consulting engineer, or representative in any phase of the work covered by the Sales Contract, Seller shall not be responsible for any damages claimed by Buyer as a result of alleged errors or defects in such design or engineering work.

WARRANTY AND LIMITATION OF LIABILITY: Seller warrants that the goods supplied by it have been manufactured in accordance with its standard manufacturing practices and conform to the contract or catalog description set forth in the order. Seller further warrants that the goods supplied by it are fit for the ordinary purpose or purposes specified in its catalog for which such goods are used when installed in accordance with Seller's recommended installation procedures. Except as stated herein, Seller makes no express warranty with respect to goods supplied by it and Seller makes no warranty that the goods are fit for any particular purpose.

When the use of materials not manufactured by Seller is suggested by Seller's recommended installation procedures or otherwise, Seller makes no express warranty with respect to such materials nor that such materials are merchantable or fit for any particular purpose.

Seller will, at its sole option, credit, repair or replace, any goods supplied by it which its examination shall disclose to its satisfaction are defective in workmanship or material and are returned to it within one year from the date of shipment and any claim not made within this period shall conclusively be deemed waived by Buyer. Credit, repair or replacement will be preconditioned upon examination of the goods by Seller, and, if requested by Seller, return of the goods to Seller at its direction and expense. No goods are to be returned to Seller without its written consent. Seller shall not be liable for any expense incurred by Buyer in order to remedy any defect in its goods. Seller shall not be liable for any consequential, special, or contingent damage or expense, arising directly or indirectly from any defect in its goods or from the use of any defective goods. The remedies set forth herein shall constitute the exclusive remedies available to Buyer and are in lieu of all other remedies.

CLAIMS: Claims for shortage of goods or for mistakes or errors in billing must be presented within forty-five (45) days from the date of shipment of goods and must state the packing slip number and container number applicable to the claim. Any claim not so presented will be conclusively deemed waived.

TAXES: Any federal taxes or other government charges on the sale, shipment, or installation of the goods or equipment covered by the Sales Contract shall be added to the price and paid by Buyer, or, in lieu thereof, the Buyer shall furnish the Seller with tax-exemption certificates acceptable to the taxing authority. The procedure also applies to duty and other similar charges on export sales. Seller is not responsible for sales and/or use tax in any state other than Ohio. The purchase made under this Sales Contract must be exempt or paid directly by Buyer. If Seller is required to pay any such tax, there shall be added to the prices quoted herein all such state and local taxes. Buyer agrees to reimburse and save Seller harmless from all such state and local taxes, including interest and penalties thereon, which may at any time be payable to any state or local government unit with respect to the sale of any goods or materials covered by the Sales Contract.

CORRECTIONS: Typographical or clerical errors contained in the Sales Contract, including prices, are subject to correction by the Seller.

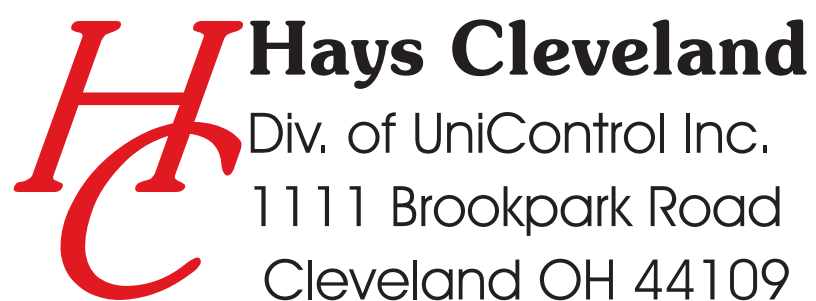
FAIR LABOR STANDARDS: All goods covered by the Sales Contract have been produced in conformity with all applicable provisions of the Fair Labor Standards Act of 1938 as amended.

RENEGOTIATION: Unless advised by Buyer in writing, Seller assumes that Buyer's order and the Sales Contract are not renegotiable under the Renegotiation Act of 1951.

APPLICABLE LAW: All questions arising out of the Sales Contract, which shall be deemed an Ohio contract, shall be governed by the laws of the state of Ohio.

EXCLUSIVE TERMS: The Sales Contract shall constitute the complete contract between the parties, and no one has authority to depart from the terms and conditions set forth therein, nor to make any representations or arrangements other than those printed thereon whether in the execution or in the performance of the Sales Contract, unless the same are written on the face of the Sales Contract or are given in writing with it or in pursuance of it, and are fully approved in writing by an officer or authorized employee of the Seller.

LIMITATION FOR SUITS: Any controversy or claim arising out of or relating to this Sales Contract or the breach thereof, must be commenced within one (1) year after the cause of action accrued.



Hays Cleveland

Div. of UniControl Inc.

1111 Brookpark Road

Cleveland OH 44109