

INSTALLING, OPERATING AND MAINTAINING

THE MODEL D280

S-SHAPED CURVE BOARD

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S-SHAPED CURVE BOARD

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SECTION ONE GENERAL INFORMATION

INTRODUCTION

Thank you for purchasing an IPC Automation elevator control. At IPC we are committed to designing and manufacturing high quality motion controls that meet or exceed our customer's needs.

This manual provides the information that you will need in order to properly install, operate and troubleshoot the Model D280 S-Shape Curve Board.

Please read this manual completely before attempting to install or operate your new control.

If you have any questions regarding the operation of this control please contact IPC Automation.

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SAFETY

There are certain fundamental warnings, which must be kept in mind at all times. These warnings include:

WARNING:

THE S-SHAPE CURVE BOARD SHOULD BE IN-STALLED, ADJUSTED AND SERVICED BY QUALIFIED ELECTRICAL MAINTENANCE PER-SONNEL FAMILIAR WITH THE CONSTRUC-TION AND OPERATION OF ALL EQUIPMENT IN THE ELEVATOR SYSTEM: PERSONAL IN-JURY AND/OR EQUIPMENT DAMAGE MAY OC-CUR IF INDIVIDUALS ARE NOT FAMILIAR WITH THE HAZARDS RESULTING FROM IM-PROPER OPERATION.

WARNING:

THE USER IS RESPONSIBLE FOR CONFORMING WITH THE NATIONAL ELECTRICAL CODE WITH RESPECT TO MOTOR, CONTROLLER AND OPERATOR DEVICE INSTALLATION, WIRING AND START-UP. THE USER IS ALSO RESPONSIBLE FOR UNDERSTANDING AND AP-PLYING ALL OTHER APPLICABLE LOCAL CODES WHICH GOVERN SUCH PRACTICES AS WIRING PROTECTION, GROUNDING, DISCON-NECTS AND OVER CURRENT PROTECTION.

WARRANTY

Standard conditions of sale for the company include a Statement of Warranty, which covers the control equipment. This Statement of Warranty covers all new equipment.

The D280 S-Shape Curve Board has been designed as a standard product to meet the general criteria for providing a S-Shaped reference signal to be used in conjunction with an elevator control. IPC does not warrant that the control will meet all application requirements, codes, and safety standards.

Q.C. TESTING

Quality is an important factor of each phase of the manufacturing and development process. Each unit must pass rigorous quality tests prior to shipment. This assures that you receive only those controls that meet our demanding quality standards.

STORAGE

Please take the following precautions if it should be necessary to store the Model D280 control for any length of time.

- Store the control in a clean, dry (non-corrosive) environment, which is protected from sudden variations in temperature and high levels of moisture, shock and vibration.
- The ambient temperature where the control is to be stored should be maintained between zero and 65 degrees Centigrade.
- The control should be stored in the original package in order to protect from dust and dirt contamination.

SECTION TWO GENERAL DESCRIPTION

INTRODUCTION

The Model D280 is designed to provide a complete S-shaped reference signal. This signal is then used as the command input reference used by a solid state control. The Model D280 is fully compatible with any solid state control designed to accept a low-level DC input reference signal.

CONTROL SPECIFICATIONS

INPUT SUPPLY:	+15v DC regulated 2%, 50mA -15v DC regulated 2%, 50mA
OUTPUT:	Zero to +10VDC (UP) Zero to -10VDC (DN)
RUN SIGNAL	+15VDC(5mA logic level signal) Zero volts DC (STOP)

ADJUSTMENTS

The Model D280 uses four turn adjustment potentiometers for all of the adjustable parameters, which affect the S-Shaped curve.

SPEED POT	ADJUSTABLE % OF FULL SPEED	RANGE OF INPUT REF. VOLTAGE(*)
SP1	0 - 15%	0 - 1.5 VDC +/- 0.2V
SP2	0 - 25%	0 - 2.5 VDC +/- 0.2V
SP3 - SP5	0 - 100%	0 - 10.0 VDC +/- 0.2V
HI	FIXED	10.0 VDC +/- 0.2V

SPEED SETTINGS

(*) Measured at TB3 pin 21 when the corresponding speed contact is closed.

ACCELERATION AND DECELERATION RATES

The Model D280 is factory set with the **J1** Jumper in the 1-2 position. This configuration provides two acceleration rates (ACC1, ACC2) and three deceleration rates (DCC1, DCC2, DCC3).

If the J1 jumper is moved to the 2-3 position, the ACC2 pot changes function to become a fourth deceleration pot. In this position there are four deceleration rates (DCC1, DCC2, DCC3, ACC2) and only one acceleration rate (ACC1).

The range for each acceleration or deceleration potentiometer is 10 seconds with the potentiometer fully counterclockwise to one second with the potentiometer fully clockwise.



Standard Position:

ACC2 pot functions as a second acceleration potentiometer



Extra DECEL Position:

ACC2 pot functions as a fourth deceleration potentiometer

S-SHAPED CURVE TRANSITIONAL KNEE SETTINGS



The S-Shape of the output pattern is controlled by potentiometers P1 through P4. When the potentiometers are turned fully counterclockwise, the curve will be very smooth. When the potentiometers are turned fully clockwise, the curve will be very sharp. These adjustments will have more effect when the acceleration or deceleration rates are slow and will have less effect when the acceleration or deceleration rates are fast.

Potentiometer	Setting	Transition
P1 through P4	Fully counterclockwise	very smooth, slow
P1 through P4	Fully clockwise	very sharp, fast

DEAD ZONE TIME DELAY

The DEAD ZONE TIME DELAY potentiometer, R54, allows the control reference output signal at TB2-9 to ramp to zero speed during the interval when the UP/DN signal is dropped and the mechanical brake is set. The time delay circuit will delay the signal at TB2-10 from going to zero when the UP/DN signal is dropped. With R54 fully counterclockwise the signal at TB2-10 will remain high (+15V) for 0.5 seconds after the UP/DN signal has dropped. With R54 fully clockwise the signal at TB2-10 will remain high (+15V) for 10 milliseconds.

WARNING:

THE OUTPUT VOLTAGE AT TB2-10 IS A RUN OR STOP LOGIC LEVEL ONLY. THE USE OF THIS OUTPUT IS NOT REQUIRED TO PROP-ERLY OPERATE THE D280 CONTROL. DO NOT ATTEMPT TO USE THE OUTPUT SIGNAL AT TB2-10 AS A VOLTAGE SOURCE DRIVER BE-CAUSE THE OUTPUT WILL SOURCE A MAXI-MUM CURRENT OF 5MA. OVERLOADING THIS OUTPUT MAY RESULT IN FAILURE OF THE CONTROL.

SECTION THREE INSTALLATION AND START UP

INTRODUCTION

The following section contains hook up notes and drawings for the Model D280 S-Shaped Curve Board. The hook up notes refer to the connection drawing in the back of this manual.

WARNING:

THE "S" SHAPE CURVE BOARD SHOULD BE INSTALLED, ADJUSTED AND SERVICED BY QUALIFIED ELECTRICAL MAINTENANCE PER-SONNEL FAMILIAR WITH THE CONSTRUC-TION AND OPERATION OF ALL EQUIPMENT IN THE ELEVATOR SYSTEM: PERSONAL IN-JURY AND/OR EQUIPMENT DAMAGE MAY OC-CUR IF INDIVIDUALS ARE NOT FAMILIAR WITH THE HAZARDS RESULTING FROM IM-PROPER OPERATION.

WARNING:

THE USER IS RESPONSIBLE FOR CONFORMING TO THE NATIONAL ELECTRICAL CODE WITH RESPECT TO MOTOR, CONTROLLER AND OP-ERATOR DEVICE INSTALLATION, WIRING AND START-UP. THE USER IS ALSO RESPONSI-BLE FOR UNDERSTANDING AND APPLYING ALL OTHER APPLICABLE LOCAL CODES, WHICH GOVERN SUCH PRACTICES AS WIRING PROTECTION, GROUNDING, DISCONNECTS AND OVER CURRENT PROTECTION.

HOOK UP NOTES

SPEED SELECT CONTACTS

The configuration shown in the hook up diagram is one of the many possible methods for selecting the parameters. Contacts must be arranged to select only one speed input at a time. Simultaneous input selection may overload the circuit board power supplies.

ACCELERATION OR DECELERATION RATE

If only one acceleration or deceleration rate is required, relay contacts can be eliminated and appropriate jumpers added.

POTENTIOMETERS P1 THRU P4

P1, P2, P3, P4 respond as follows: Clockwise - curve knees become sharp Counter Clockwise- curve knees become smooth

POTENTIOMETERS SP1 THRU SP5 AND HI

These potentiometers provide six preset speeds as follows:

SP1	0 - 1.5 volts +/- 0.2V
SP2	0 - 2.5 volts +/- 0.2V
SP3 thru SP5	0 - 10 volts +/- 0.2V
HI	10 volts +/- 0.2V

ACCELERATION RATES (POTS ACC1 & ACC2)

Acceleration ramp time: Full Counter Clockwise Full Clockwise - approx. 10 secs. - approx. 1 sec.

DECELERATION RATES (POTS DCC1 THRU DCC3)

Deceleration ramp time: Full Counter Clockwise Full Clockwise - approx. 10 secs. - approx. 1 sec.

NOTE: The S-Shaped Curve Board is factory preset with two acceleration and three deceleration potentiometers. If a fourth deceleration potentiometers is desired, the ACC2 pot may be used by switching the mini-link connector at J1 from J1-1 & J1-2 to the J1-2 & J1-3 position.

OUTPUTS

The reference signal at TB2-9 is a bi-directional reference signal. The signal will be positive in the UP direction and negative in the DOWN direction. The reference signal is a zero to 10 volt S-Shaped signal.

An additional RUN signal at TB2-10 provides a +15V RUN signal and a zero volt STOP signal (no direction). The maximum output current is 5 mA.

WARNING:

THE OUTPUT VOLTAGE AT TB2-10 IS A RUN OR STOP LOGIC LEVEL ONLY. THE USE OF THIS OUTPUT IS NOT REQUIRED TO PROP-ERLY OPERATE THE D280 CONTROL. DO NOT ATTEMPT TO USE THE OUTPUT SIGNAL AT TB2-10 AS A VOLTAGE SOURCE DRIVER BE-CAUSE THE OUTPUT WILL SOURCE A MAXI-MUM CURRENT OF 5MA. OVERLOADING THIS OUTPUT MAY RESULT IN FAILURE OF THE CONTROL.

RUN CONTACTS (DIRECTION)

Only one direction may be enabled at a time. If control is to run in one direction only, the relays may be eliminated and a jumper added in their place.

SUPPLY VOLTAGE

The Model D280 requires both positive and negative 15-volt regulated supplies in order to operate. These supplies must be fully regulated and capable of supplying 50 mA of current. The minimum input supply voltage for the Model D280 to operate properly is positive and negative 12.5 volts. Operating the control at lower input voltages will cause erratic results.

DEAD ZONE TIME DELAY

The DEAD ZONE TIME DELAY potentiometer, R54, allows the control reference output signal at TB2-9 to ramp to zero speed during the interval when the UP/DN signal is dropped and the mechanical brake is set. The time delay circuit will delay the signal at TB2-10 from going to zero when the UP/DN signal is dropped. With R54 fully counterclockwise the signal at TB2-10 will remain high (+15V) for 0.5 seconds after the UP/DN signal has dropped. With R54 fully clockwise the signal at TB2-10 will remain high (+15V) for 10 milliseconds.

WARNING:

THE OUTPUT VOLTAGE AT TB2-10 IS A RUN OR STOP LOGIC LEVEL ONLY. THE USE OF THIS OUTPUT IS NOT REQUIRED TO PROP-ERLY OPERATE THE D280 CONTROL. DO NOT ATTEMPT TO USE THE OUTPUT SIGNAL AT TB2-10 AS A VOLTAGE SOURCE DRIVER BE-CAUSE THE OUTPUT WILL SOURCE A MAXI-MUM CURRENT OF 5MA. OVERLOADING THIS OUTPUT MAY RESULT IN FAILURE OF THE CONTROL.