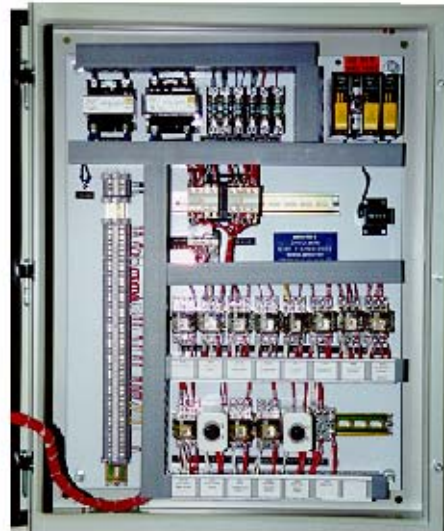


DAIMLERCHRYSLER TECHNICAL CENTER UNIVERSAL DOOR INTERFACE SYSTEM CATALOG NO. CU2DFI



THE ULTIMATE RELAY LOGIC CONTROL SYSTEM DESIGNED SPECIFICALLY FOR THE AUBURN HILLS TECHNICAL CENTER.

***One Standard Control Panel Operates All Types of Doors
As of November 1999, over 230 units are in operation in the Auburn Hills Facility***

This control system is designed to standardize the operation of all motorized door inside the DaimlerChrysler Headquarters & Technical Center. It's unique design enables Building Management the flexibility to offer each tenant any control options they like without special modifications to the control panel.

The basic interface system is installed on the door, providing standard Open, Close, Stop pushbuttons functions, as well as the standard reversing door edge. Once the tenant moves in, the desired accessories are installed by building management per the tenant's requirements.

This system is endorsed by the facilities Electrical Trades. The graphics display inside the panel as well as the push to test diagnostic system enables a tradesman familiar with the panel to diagnose any door problems by visual inspection of the panel.

The interface system is designed to operate sectional doors, rolling steel doors, fabric doors, sliding door, folding doors, gates, grilles, glass doors, etc., with single speed, two speed, variable speed AC motors, as well as DC motors.

This control panel is UL & CSA Listed.

Standard features built into the interface system include:

- **U/L Listed** - 508A
- **CSA File** SA1500-31786-3
- **NEMA 12** Enclosure
- Size 30" High x 24" Wide x 8" Deep
- **Powder Coated Finish** blends in with building colors and does not need painting.
- **Lockable** rotary fused disconnect
- **Touch Safe** High Voltage Disconnect Switch
- Class J **Rejection type fuses** in disconnect
- Pushbuttons & Pilot lights - 22MM size
- Open-Close-Stop Pushbuttons located on panel face.
- **Keyed** selector for **Automatic/Off/Manual** operation included on panel face.
- **Reversing Edge Tripped and Reset pilot light** located on panel face.
- **Overload Tripped pilot light** on panel face.
- Prepared for **120 V & 24 V accessories**
- Transformers have **fused Primary & Secondary** circuits.
- Prepared for Plug In **Timer to Close**
- **Spare Terminals** provided for up to 3 remote stop pushbuttons.
- Pre-wired for all types of remote open devices.
- Pre-wired for all type of reversing devices, with fail safe wiring design.
- Pre-wired for single button activation systems.
- **Delay Reverse Circuitry** fixed at 1.5 sec.
- Circuitry designed for **easy visual diagnostics**. Each limit switch and accessory drives a push-to-test pilot light relay, enabling the electricians to visibly see conditions of inputs without any test equipment.
- Basic control circuitry and components remain the same with **various motor styles**. Design incorporates control of single speed, two speed, variable frequency, DC drives, without changing the basic control circuit. All basic diagnostics remain the same.
- Seven Digit Non-Resettable **cycle counter**.
- Prepared for two door **vestibule interlocking**
- Contacts for activating **door heater** standard.
- Contacts for **remote door indication**, such as door fully open or closed standard.
- **Class 20 Motor overloads** standard, with output wired to pilot light on panel face, indicating tripped condition.
- **Remote brake operation** is included where required for either standard braking or instantaneous braking.
- Provisions for DC braking.
- Provisions for **Thru-Beam or Retro-Reflective** photo-eyes
- Pre-wired block for plug-in **loop detector**.
- Concrete loop terminals **pre-wired**.
- Prepared to two, three or four wire reversing edges.
- Prepared for **Motor Run timer**
- Prepared for **advance open limit switches**
- **Snow limit** switch provisions included.
- Prepared for all type of **hand chain & crank** disconnects.
- Prepared for **break-away** door system interlocks.
- Plug in socket for **headlight sensor** activator

Standard accessories for the control panels include:

- Automatic Timer to Close - Plug in timer automatically closes the door after a set time period. This is turned on and off by the standard Auto / Hand keyed selector switch.
- Card Reader / Security Connections for Existing Building Security System. Terminals are provided so the existing Thorn security system can tie into and control the door system.
- Loop Detectors - standard panel is prepared for one Shrokman 120 VAC plug in self tuning loop detector.
- Remote 3 button stations- standard panel is prepared to accept two remote push button stations without modification.
- Radio Controls - prepared for Shrokman Single Button, Two Button & Three Button radio control receivers. Sequence of operations varies via terminal connections inside the control panel.
- Pull Cords - terminals provided for two separate sequences.
- Motion Sensors - provisions provided to have the motion sensors operate for standard automatic operation or as safety only devices.
- Vehicle Presence Sensor - unique system senses presence of vehicles in opening. System in most cases does not sense pedestrians.
- Headlight Sensor - Mounted on the door, this unit activates the door by flashing the headlights on any vehicle. This is a plug in accessory.
- Smart Post - Guard posts that include photo-eyes and presence sensors for automatic opening or safety.

DOOR TYPES CURRENTLY BEING OPERATED BY THE CU2DFI CONTROL SYSTEM:

Rolling Steel Fire Doors
Rolling Steel Service Doors
Sectional Overhead doors
Sliding Doors
Megadoor Vertical Lifting Fabric
M & I Fabric Doors
Gate Operators

MOTOR TYPES:

Single Speed (Standard)
Two Speed (Option)
Inverter Motors (Option)
DC (Option)

MAIN LINE VOLTAGE: 460 Volts

PHASE: 3 Phase

MOTOR SIZE: 1/3 TO 5 H.P.

BRAKE: Full Voltage (std) & prewired for remote braking - standard or instantaneous.
DC (Option)

LIMIT SWITCH REQUIREMENTS:

1 (QTY) Normally Closed Open Limit Switch
1 (QTY) Normally Closed Close Limit Switch
Prepared to accept as standard:
N.C. Advance Open Limit
N.C. Advance Close Limit

REVERSING EDGE REQUIREMENTS

Electric - 2 wire, 3 wire, 4 wire (Standard)
Pneumatic - 2 wire N.O. or N.C.

UNIVERSAL DOOR CONTROL PANEL
FOR USE ON ALL MOTORIZED DOORS.

CHRYSLER CORPORATION
AUBURN HILLS CORPORATE HEADQUARTERS
AUBURN HILLS, MICHIGAN

SECTION 08370
POWER-OPERATED DOOR CONTROLS

PART 1 - GENERAL

1. REFERENCES

- 1 - NFPA 70 - National Electrical Code (NEC).
- 2 - NFPA 79 - Electrical Standard for Industrial Machinery
- 3 - UL 508A - Underwriters Laboratories Inc.
- 4 - IEC 529, IEC 947-1
- 5 - CSA - C22.2 Special Industrial Control Assemblies

1.02 SUBMITTALS

- Submit manufacturer's catalog information regarding the application of this special control panel.
- Shop Drawings
 - Submittals to include wiring schematics as well as riser diagrams for each type of door used in the facility, including dimensions and wiring diagram for each type of operator.
 - All accessories that can be wired into the system must be included in the submittal.
 - Submittals must include wiring diagrams for each type of motor operation listed below.
- Maintenance Instructions
 - Submit maintenance and troubleshooting instructions for control panels.
 - Provide training classes for Chrysler personnel on application and use of control panels.

PART 2 - PRODUCTS

MANUFACTURERS: Advanced Systems Inc., Industrial Door Division, Birmingham, Michigan 248-647-2331
Control panel shall be designed to operate all types of upward acting doors used in the facility, and incorporate circuitry that enables the tenant in each area to modify the operation of the door system without completely wiring the control panel. The design shall incorporate expansion capabilities for various types of motors and drive accessories. Relay Logic panels shall include pilot light diagnostics for all internal components.

2.01 CONTROL EQUIPMENT

- **POWER**
Control panels shall be prepared for connection to a 460V Three Phase power source.
- **ENCLOSURE** - Hammond 2R30248 or owner approved equal.
NEMA 12 rated, "Design Line" style enclosure, 30" high x 30" wide x 8" deep.
Doors must be designed to be easily removed and interchanged.
Compression stops installed to insure optimum gasket performance.
Minimum of two slotted quarter turn oil-tight latches secure the door, with a minimum of one key lock installed in the top latch position. Key lock to match existing control panel keying.
Cover and enclosure are phosphatized, primed and finished.
Enclosure will have expansion room for additional motor circuitry required for two speed motors, Variable frequency drives, as well as special motor braking systems.
- **DISCONNECT** - Bussman CF30 with BDH99 Handle or owner approved equal.
Disconnect rating - 30 AMP, with Class J Rejection Fuses.
NEMA 12 rated Pistol handle.
Handle is lockable with three padlocks
30 AMP double break contacts
provide terminal shrouds & fuse covers for "touch-sage" protection.
- **DISCONNECT FUSING** - Bussman "Low-Peak Yellow" Fuses or owner approved equal.
Provide main fusing in disconnect for proper operation per NEC & UL.
Dual-Element, Time-Delay -- 10 Seconds (minimum) at 500% rated current.
Interrupting rating - 300,000A RMS SYM. (U.L.)
- **TRANSFORMERS** - Square D Type K or owner approved equal.
Machine tool grade transformers.
10 year transformer warranty.
Minimum 150 VA for 120 VAC circuitry
Minimum 100 VA for 24 VAC circuitry.
One side of the transformer shall be grounded.
- **TRANSFORMER FUSING** - Bussman Products
Provide 600 V rated fusing for transformer primary circuits.
Provide 250V rated fusing for all transformer secondary circuits.
- **MOTOR CONTACTORS** - Square D / Telemecanique D-Line or owner approved equal.
Contacts rated 5 HP at 460 VAC
AC3 rating - 9 amps, AC1 rating 20 AMPS
24 VAC coil voltage, with coil wire insulation rated at 180 degree centigrade.
Top Mounted Auxiliary Contacts
Insulation Voltage - 1000 V
IP 20 Fingersafe Terminal Protection.

- **THERMAL OVERLOAD RELAYS** - Square D / Telemecanique D-line or owner approved equal.
Adjustable overload to be sized per motor application.
Mounted directly below motor starter.
Separate Stop and reset functions with switchable manual or automatic reset.
Trip test button on the front cover with protected lockable indicator.
Manual/auto reset selector and setting dial cover can be sealed against tampering from original setting.
Provide isolated NO and NC contacts (600 V Insulation) for wiring to “Overload Tripped” pilot light on panel face.
- **CONTROL RELAYS** - Square D Type KU - Spade Terminals
Provide relay with Manual Operator to speed circuit testing, allowing the relay to be manually switched to simulate normal operation.
Provide Neon Internal Pilot Light indication to show when the relay is energized.
Industry Standard wiring and pin arrangements.
10 AMP Contact Rating
- **TIMERS** - Square D - Class 9050 - Type JCK
Provide Timers as required in the control system to make door operate as required.
Contact Rating - 10 AMP
DPDT Contacts (2 NO and 2 NC)
Transient Protected.
- **AUXILIARY SOCKET FOR LOOP DETECTOR** - Square D - Class 9050
Provide an 11 pin socket, prewired for installation of loop detector.
- **PUSH BUTTONS** - Square D -XB series 22MM
NEMA 4 - 4X rating
Color per NFPA 79
Metallic guard around operator head
- **PILOT LIGHTS** - Square D - XB2 - 22 MM
NEMA 4 - 4X rating
Push-to-Test type
Metallic guard around operator head
- **SELECTOR SWITCHES** - Square D - XB2 - 22MM
NEMA 4 - 4X rating
Metallic guard around operator head
- **WIRING DUCT** - Gould - Gray - 1” x 3” with round holes.
- **TERMINAL BLOCKS** - Square D - Class 9080
600 V - 50 AMP Rating
“Touch-Safe” Design

- **WIRE**

Colors per NFPA 79

Black - Line, load, and control circuits at line voltage.

Red - AC control circuits at less than line voltage.

Blue - DC control circuits.

Yellow - Interlock control circuits supplied from an external power source.

Green - Equipment grounding conductor.

White - Grounded circuit conductor.

CONTROL SYSTEM DESIGN PARAMETERS

The control panel shall incorporate into the standard circuitry provisions to operate any upward acting door in the facility.

The control panel shall incorporate the following features.

1) **MOTOR TYPES**

- Standard control panel shall have provisions for operation of single speed 460V Three Phase motors.
- Two speed motors can be used with the addition of the required contactors, without modifying the basic secondary control circuits.
- Variable frequency drives can be substituted in the panel without modifying the basic secondary control circuits.

2) **MOTOR BRAKE SYSTEMS**

- Standard control panel shall have provisions at the terminal strip for three types of brake operations.
 - Standard solenoid or line voltage brake used on slow moving types of doors.
 - Standard DC or AC braking, used with single speed or two speed brake motors.
 - Instantaneous braking of DC or AC brake, used with single and two speed motors, as well as variable frequency drive units.

3) **RELAY LOGIC WITH DIAGNOSTICS**

- Panel design will provide visual diagnostics inside the control panel.
- Each limit switch on the drive will drive a separate relay, which has pilot light and push to test capabilities.
- Each relay will be labeled with the function, and pilot light sequence.
- Labels shall provide diagnostic functions at each position.

4) **LIMIT SWITCH DIAGNOSTICS**

- Each limit switch on the door operator shall drive a pilot indicator light, showing the limit switch condition.
- A push button inside the control panel shall enable maintenance personnel to check the operation of the limit switch without running jumper wires.
- All control panels will have provisions for five limit switches.
 - Supervision Limit Switch(Chain hoist, Break-Away, Hand Crank, Main Limit, Etc.)
 - Door Full Open Limit Switch
 - Advance Open Limit Switch
 - Advance Close Limit Switch
 - Door Full Closed Limit Switch

- 5) **REVERSING EDGE RESET AND PILOT LIGHT**
 - A Push-to-Test pilot light and reset button indicating the reversing edge has tripped shall be mounted on the face of the control panel.
 - When the reversing edge has been tripped, the door will stop, pilot light on panel face will energize, and The door will go to the fully open position. The door will remain there until the reset button located on the panel face is pressed.
 - Provide circuit design so the reversing edge circuit can be checked by pressing a test button inside the control panel..

- 6) **STANDARD AND FAIL-SAFE REVERSING EDGE CIRCUITRY**
 - Control circuitry will provide installation and operation of the standard facility reversing edges or fail safe design reversing edges via installation of one jumper wire at a terminal block location.
 - Circuitry will be such that the Pilot light and reset button on the panel face shall work for both types of edges.

- 7) **AUXILIARY PUSH BUTTONS**
 - The terminal strip shall contain provisions for at least two remote stop pushbuttons in the control circuit, as well as the panel face stop button.
 - Provisions shall be made for installation of remote open and close buttons.

- 8) **DELAY TO REVERSE CIRCUIT**
 - Each panel shall have a delay to reverse circuit with adjustable time of .1 to 1.9 seconds.
 - As the door is closing, and any reversing or activation device is activated, the door shall stop, the timer will activate and time out, and then send the door to the fully open position.
 - Circuitry shall be tied in with the brake circuitry to enable proper brake operation.

- 9) **DOOR POSITION INDICATION**
 - Provide terminals at the terminal strip to indicate the door fully open or fully closed.
 - Contacts for each position - 1 NO and 1 NC

- 10) **OVERLOAD TRIPPED PILOT LIGHT**
 - Provide pilot light indication on face of control panel to indicate when the thermal motor overload is in a tripped position.
 - Pilot light is to be push to test design.
 - Circuit design to incorporate remote reset capabilities for future expansion and tie in with remote PLC systems, such as AGV's, etc.

- 11) **MAIN CONTROL CIRCUIT VOLTAGE**
 - The main control circuit shall be operated at 24VAC to help reduce shock hazard.
 - Terminals shall be provided at the main terminal strip for access to 24 VAC for accessories.

- 12) **AUXILIARY DEVICE VOLTAGE PROVISIONS**
 - Provide a 120 VAC transformer in the circuit for accessory adaption.
 - Terminals shall be provided for access to 120 VAC power for accessories.

- 13) **HAND / AUTO SELECTOR SWITCH**
 - Provide a selector switch on the panel face for sequencing as per the "Sequence of Operations" section.

SEQUENCE OF OPERATIONS

- 1) Power on - Selector Switch in HAND position.
 - Door Fully Closed
 - Momentary contact on the Open push button sends the door to the fully open position.
 - Momentary Contact open/close devices send the door to the fully open position.
 - Automatic open/timed close devices have no effect.
 - External reversing devices have no effect
 - Door Fully Open
 - Momentary pressure on the close pushbutton starts the door closed.
 - Momentary Contact open/close devices start the door closed.
 - Automatic open/timed close devices have no effect.
 - External reversing devices have no effect
 - Door Moving Closed
 - Momentary pressure on the stop button immediately stops the door.
 - Open button has no effect
 - Momentary Contact Open/Close devices stop, delay and reverse the door to the fully open position.
 - External reversing devices stop, delay and reverse the door to the fully open position.
 - Automatic open/timed close devices have no effect.
- 2) Power on - Selector Switch in AUTO position.
 - Door Fully Closed
 - Momentary contact on the Open push button sends the door to the fully open position.
 - Momentary Contact Open/Close devices send the door to the fully open position.
 - Automatic Open/Timed Close devices send the door to the fully open position.
 - External reversing devices have no effect.
 - Door Fully Open
 - When the door reaches the fully open position, and the open limit switch is tripped, an automatic close timer is energized.
 - Momentary contact on the Close push button sends the door down.
 - Momentary Contact Open/Close devices send the door to down.
 - Automatic Open/Timed Close devices reset the automatic close timer, and the cycle begins timing from 0 seconds..
 - External reversing devices reset the automatic close timer, and the timing cycle begins timing from 0 seconds..

- Door Moving Closed
 - Momentary pressure on the stop button immediately stops the door.
 - Open button has no effect.
 - Momentary Contact Open/Close devices stop, delay and reverse the door to the fully open position.
 - External reversing devices stop, delay and reverse the door to the fully open position.
 - Automatic Open/Timed Close devices stop, delay and reverse the door to the fully open position.
 - Reversing door edge stops, delays and reverse the door to the fully open position. NOTE: The door will not automatically close until the Reversing edge reset button is pressed.

STANDARD METHODS OF OPERATIONS

The standard interface system has many sequences built in to the control panel. Below is a description and usage of many of them.

1) **Standard Control Panel Methods of Operations Descriptions Built Into the Panel**

- Open: Pushbutton on control panel face
Auto Mode Only: Automatic Open Devices
- Close: Pushbutton on control panel face
Auto Mode Only: None
- Safety Devices: Reversing Door Edge

2) **Standard Accessories Methods of Operation Description.**

- Hand Mode Open:
Remote Open Pushbutton
- Auto Mode Open:
Motion Sensor
Presence Sensor
Loop Detector
Security Provided Card Reader
Headlight Sensor
Radio Transmitter
- Hand Mode Close:
Remote Close Pushbutton
- Auto Mode Close:
Close Delay Timer

USAGE AND SEQUENCE DESCRIPTIONS

Basic Features not mentioned below.

- 1) There is a Hand/Off/Auto selector switch on the control panel face. Off turns the complete system off without turning off the power.
 - 2) Security: Each panel is prepared for:
 - An input from security enabling the door to be shut off by security when required. (Wiring from control panel to security panel should be specified in the Security Specifications and not his section)
 - A signal can be sent to security when the door is fully closed.
 - A signal can be sent to security when the power to the door control panel is turned off.
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1. Basic Door - Controlled from panel only.
 - a. Method of Operation (#).
 - 1 Ingress, 24-hour , unlocked:
 - a. Open: Pushbutton on panel face
 - b. Close: Pushbutton on panel face
 - 2 Egress: 24-hour, unlocked:
 - a. Open: Pushbutton on panel face
 - b. Close: Pushbutton on panel face
 - 3 Safety Devices:
 - a. Safety edge, contact type
 - b.
 2. Basic Door - Controlled from panel and remote 3 button station located inside secured area.
 - a. Method of Operation (#).
 - 1 Ingress, 24-hour , unlocked:
 - a. Open: Pushbutton on control panel face in secured area
 - b. Close: Pushbutton on panel face in secured area
 - 2 Egress: 24-hour, unlocked:
 - a. Open: Pushbutton on panel face & remote push button in secured area
 - b. Close: Pushbutton on panel face & remove push button in secured area
 - 3 Safety Devices:
 - a. Safety edge, contact type
 3. Basic Door - Controlled from panel and remote 3 button station located on the unsecured side.
 - a. Method of Operation (#).
 - 1 Ingress, 24-hour , unlocked:
 - a. Open: Pushbutton on control panel face in secured area & remote push button in unsecured area
 - b. Close: Pushbutton on panel face in secured area & remote push button in unsecured area
 - 2 Egress: 24-hour, unlocked:
 - a. Open: Pushbutton on panel face
 - b. Close: Pushbutton on panel face
 - 3 Safety Devices:
 - a. Safety edge, contact type
 4. Automatic Closing Door - NOTE: Building Management requires two safety devices on all doors that have any type of automatic closing.
Opens from both sides.

- a. Method of Operation (#)
 - 1 Ingress, 24-hour , unlocked:
 - a. Open: Pushbutton on control panel face in secured area
 - b. Open: Auto Mode Only: Automatic Open Devices - Loop Detector (LD) (or name other devices)
 - c. Close: Pushbutton on panel face in secured area
 - d. Close: Auto Mode Only: Close delay timer.
 - 2 Egress: 24-hour, unlocked:
 - a. Open: Pushbutton on panel face
 - b. Open: Auto Mode Only: Automatic Open Devices - Loop Detector (LD) (or name other devices)
 - c. Close: Pushbutton on panel face
 - d. Close: Auto Mode Only: Close delay timer.
 - 3 Safety Devices:
 - a. Safety edge, contact type
 - b. Photo-eyes: Thru-beam type mounted on opposite side of door on wall.

5.

Opens from inside (secured area) only.

- a. Method of Operation (#)
 - 1 Ingress, 24-hour , unlocked:
 - a. Open: Pushbutton on control panel face in secured area
 - b. Close: Pushbutton on panel face in secured area
 - c. Close: Auto Mode Only: Close delay timer.
 - 2 Egress: 24-hour, unlocked:
 - a. Open: Pushbutton on panel face
 - b. Open: Auto Mode Only: Automatic Open Devices - Loop Detector (LD) (or name other devices)
 - c. Close: Pushbutton on panel face
 - d. Close: Auto Mode Only: Close delay timer.
 - 3 Safety Devices:
 - a. Safety edge, contact type
 - b. Photo-eyes: Thru-beam type mounted on opposite side of door on wall.