Internal Diagnostics
- Run by microprocessor on internal programs
- Run by microprocessor on commands and I/O
- Power-up diagnostics
- Continuous monitoring

Operational Status Readout
- English language display of status

Controls System Features
- New “Compact” receiver with diagnostic display module
- New “Compact pneumatics interface with analog valves for throttle/brake
- For use with any of the Hubbell transmitters, see Catalog 31.300

Compact Receiver
- Proven rf module and micro I/O module from radio crane control
- New “E-Stop” board
- New plug-in output interface cards
- Frequency: 72–76 or 450–470 MHz FM
- NEMA 12 enclosure – 24” h x 24” w x 12” d

Compact Pneumatic Interface
- Very compact manifold/valve assembly
- Analog valves for throttle and train-line brake control
- Analog pressure indicators
- NEMA 12 enclosure – 24” h x 24” w x 12” d
**Outline Drawings**

Receiver Cabinet
- Weight — 90 lbs.
- Alternate Mtg Position
- Cast Hinges With Removable Hinge Pins
- Shown With Door Removed

Pneumatic Cabinet
- Weight — 110 lbs.
- 4.13

**Specifications**

Supply Voltage ....................... 12VDC, 24VDC, 36VDC or 72VDC
Internal Power Requirements .......... +11.9–13.1VDC & +4.5–6.5VDC, 24 VDC
Operating Temperature ............... –22°F (~–30°C) to 140°F (~60°C)

Radio Receiver
- Frequency Range ..................... 72–76 MHz or 450–470 MHz
- Channel Availability ................. as required by user
- Frequency Stability .................. ±5 ppm
- Sensitivity ........................... 1 µV @ 20 dB quieting
- Data Reception ...................... compatible with Hubbell transmitters
- Modulation .......................... Manchester II (bi-phase)
- Baud Rate ............................ 4800 bps
- Message Format ..................... preamble, sync, start flag, address, control, CRC check code

Control Section
- Single board computer consisting of 80C31 controller, 64k EPROM, EPLD containing circuits for bi-phase decoding

DC Output Section (Electro-mechanical relays)
- Panel mounted mother-board to accommodate 4 plug-in relay boards, each with 6 output relays, for a maximum of 24 ac output relays and 12 sense inputs
- Indicators .............................. LED on each output
- Feedback Sensing ..................... opto-isolated input from: AIR PRESSURE, THROTTLE, BRAKE, FORWARD, REVERSE relay outputs
- Relays ................................. Standard PC board relays
- Output Rating ....................... 115/230V ac, 50/60 Hz, 5A resistive; 12/24V dc, 5A resistive
- Isolation .............................. 5000V

DC Output Section (Stepped analog outputs)
- Panel mounted mother-board to accommodate 4 plug-in boards, each with 1 analog output
- Indicators .............................. LED on each of 8 levels
- Output Rating ....................... 0–10V dc, 20mA, in 8 steps
- Isolation .............................. 5000V

“E-Stop” Board
- Plugin PC board (plugs into motherboard of DC Output Section in place of 1 electro-mechanical relay board)
- Indicators .............................. LED on each of 5 inputs and 1 output
- Inputs ................................ 5 inputs, optically isolated
- Isolation .............................. 5000V

Control Relays (DIN Rail Mounted)
- Individual control relays, as required for locomotive functions.
- NEMA P300 DC Inductive Rating ....... 5A Continuous at 250VDC Max.
- 138VA Make & Break Max.

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