

**TRAFFIC CONTROL SIGNAL AND DEVICE MATERIALS – ADVANCED
TRANSPORTATION CONTROLLER CABINET.
(REV 2-13-24)**

SUBARTICLE 995-4.2.9 is deleted and the following substituted:

995-4.2.9 Electrical: For AC voltage supplied vehicular traffic signal assemblies, electrical conductors for LED signal modules must be a minimum of 36 inches in length. Each lead from the LED module must be terminated with insulated slide-on terminals. The conductors must be color coded to identify the color of the module as follows:

1. White must identify the neutral lead.
2. Red circular signals must be identified with a red lead, yellow circular signals with a yellow lead, and green circular signals with a green lead.
3. Red arrows must be identified with a red and black tracer lead, yellow arrows with a yellow and black tracer lead, and green arrows with a green and black tracer lead.

Low voltage vehicular traffic signal assemblies must be compatible with the output electrical characteristics of the Model 2202 High Density Switch Pack/Flasher Unit described in ATC 5301 v02.02 Section 6.2. Electrical conductors for LED signal modules must be a minimum of 36 inches in length. Each lead from the LED module must be terminated with insulated slide-on terminals.

For DC voltage supplied signal assemblies, the conductors must be color coded to identify the color of the module as follows:

1. Black must identify the negative lead.
2. Red circular signals must be identified with a red lead, yellow circular signals with a yellow lead, and green circular signals with a brown lead.
3. Red arrows must be identified with a red lead, yellow arrows with a yellow lead, and green arrows with a brown lead.

SUBARTICLE 995-5.4 is deleted and the following substituted:

995-5.4 Electrical: For AC voltage supplied pedestrian signal assemblies, wiring and terminals must meet the size, insulation, and length of the current ITE Pedestrian Traffic Control Signal Indicators LED specification. Wires must not have bare wiring exposed where wires are secured.

The AC voltage supplied pedestrian signal must include a terminal block containing a minimum of three circuits, each with two noncorrosive screw-type terminals. Each terminal must accommodate three No. 18 AWG conductors and be labeled for ease of identification. The terminal block must not be obstructed and be visible when the housing is open.

Low voltage pedestrian signal assemblies must be compatible with the output electrical characteristics of the Model 2202 High Density Switch Pack/Flasher Unit described in ATC 5301 v02.02 Section 6.2. For low voltage pedestrian signal assemblies, the conductors must be color coded with orange for the hand, blue for the walking person, orange with blue stripes for the countdown (if required) and black as the negative lead.

ARTICLE 995-11 is expanded by the following new Subarticle:

995-11.8 Advanced Transportation Controller (ATC) Cabinet: ATC cabinets include all terminals and facilities necessary for traffic signal control and meeting the following requirements:

ATC 5301 v02.02 Advanced Transportation Controller (ATC) Cabinet Standard Version 02, March 18, 2019.

The ATC Cabinet standard defines the following two versions:

High Voltage (HV) version fulfills the need for operation on traditional 120 VAC service voltage to control 120 VAC low power (non-incandescent) signal heads

Low Voltage (LV) version fulfills the need for operation on 48 VDC alternate power sources, such as battery and solar, to control low voltage DC signal heads.

The ATC cabinet housing shall meet the NEMA traffic signal controller cabinet or the Type 170 traffic signal controller cabinet housing requirements with base sizes shown in Table 995ATCC-1 and Table 995ATCC-2:

NEMA TS2 Controller Cabinet NEMA TS 2 2021

Type 170 Cabinets CALTRANS TEES 2020

Table 995 ATCC-1 NEMA-Style Cabinet Sizes		
Size	Width	Depth
3	24" - 27"	15" - 17"
4	24" - 27"	16" - 18"
5	30" - 34"	16" - 18"
6	44" - 49"	24" - 27"
7	44" - 49"	24" - 27"

Table 995 ATCC-2 CALTRANS TEES Cabinet Sizes		
Housing Type	Width	Depth
1	24.25"	30.25"
2	24.25"	20.25"
3, 4	44.5"	28"

995-11.8.1 Documentation: Documentation shall meet the requirements of Standard Subarticle 995-11.2.1.

995-11.8.2 Police Panel Switches: For all cabinets, the police panel shall have the following:

- AUTO/FLASH switch
- MANUAL ON/OFF switch
- Manual Jack

995-11.8.3 Service Panel: All terminals and facilities on panels must be clearly identified using permanent silk-screened text.

- AUTO FLASH
- SIGNALS ON/OFF
- STOP TIME ON/OFF

995-11.8.4 Doors and Locks: For HV NEMA and LV NEMA cabinets, the doors and locks shall meet the requirements of Standard Subarticle 995-11.2.4.

For HV Type 170 and LV Type 170 cabinets, the doors and locks shall meet the requirements of CALTRANS TEES Chapter 6 Sections 2 and 8.

For all cabinets, the doorframes shall be double flanged out on all 4 sides and shall have the strikers hold tension on and form a firm seal between the door gasketing and the frame. The dimension between the door edge and the enclosure external surface when the door is closed and locked shall be 0.156 (+/- 0.08) inch.

995-11.8.5 Ventilation: For HV NEMA and LV NEMA cabinets, the ventilation shall meet the requirements of Standard Subarticle 995-11.2.6.

For HV Type 170 and LV Type 170 cabinets, the ventilation shall meet the requirements of CALTRANS TEES 6.2.4.

995-11.8.6 Shelves: For HV NEMA and LV NEMA cabinets, the shelves shall meet the requirements of Standard Subarticle 995-11.2.7. Provide an aluminum drawer shelf with a storage compartment. The storage compartment must have telescoping drawer guides for full extension. The compartment top must have a non-slip plastic laminate attached.

For HV Type 170 and LV Type 170 cabinets, the shelves shall meet the requirements of Standard Subarticle 995-11.3.3. RS-232 connector for communications to the C2S port is not required.

995-11.8.7 Mounting Hardware: For HV NEMA and LV NEMA cabinets, the mounting hardware shall meet the requirements of Standard Subarticle 995-11.2.8.

For HV Type 170 and LV Type 170 cabinets, the mounting hardware shall meet the requirements of CALTRANS TEES Chapter 6 Sections 2 and 8.

995-11.8.8 Cabinet Light and Receptacle: For HV NEMA and LV NEMA cabinets, the cabinet light shall meet the requirements of Standard Subarticle 995-11.2.9.3.

For HV and LV NEMA cabinets, the receptacle shall meet the requirements in Standard Subarticle 995-11.2.9.3.

For HV Type 170 and LV Type 170 cabinets, the cabinet light shall meet the requirements of Standard Subarticle 995-11.3.5.

For HV Type 170 and LV Type 170 cabinets, the power distribution unit shall meet the requirements of CALTRANS TEES 6.4.3.

995-11.8.9 Wiring: For all cabinets, the wiring shall meet the requirements of ATC 5301 v02.02 Chapter 12.

995-11.8.10 Electrical: For HV NEMA cabinets, meet the requirements of Standard Subarticle 995-11.2.9.

For HV Type 170 cabinets, meet the requirements of Standard Subarticles 995-11.3.14.1 and 995-11.3.14.2.

995-11.8.11 Electrical Isolation: For HV Type 170 cabinets, within the circuit of any device, module, or PCB, electrical isolation shall be provided between DC logic ground, equipment ground and the AC- neutral conductor. They shall be electrically isolated from each other by 500 M Ω , minimum, when tested at the input terminals with 100 Volts DC.

For HV NEMA cabinets, the resistance between AC neutral and logic ground shall exceed 10 megaohms. Within the controller unit, the logic ground shall not be connected to AC neutral or earth ground. Earth ground shall not be connected to AC neutral or logic ground. AC neutral shall not be connected to logic ground or earth ground.

995-11.8.12 Surge Protection: The HV NEMA cabinets shall meet the requirements of Standard Subarticle 995-11.2.9.8 and the HV Type 170 cabinets shall meet the

requirements of Standard Subarticle 995-11.3.6. For AC outputs, the cabinet shall meet the requirements of ATC 5301 v02.02 Chapter 11.

995-11.8.13 Cabinet Rack: If required, the cabinet shall include a standard 19 inch EIA/TIA equipment rack. Clearance in the rack between the rails shall be 17-3/4 inches. The rack shall be yellow zinc plated 10 gauge steel, tapped with #10-32 holes on standard EIA spacing.

995-11.8.14 Swing-out Rack Assembly: If required, provide Type 170 cabinets with a pullout and rotatable rack assembly as well as an interface panel mounted on the top of the rack assembly and attached to the top shelf. Meet the requirements of Standard Subarticle 995-11.3.10.

995-11.8.15 Sunshield: If required, sunshields must be mounted with tamper resistant hardware to standoffs that provide an air gap a minimum of one inch between the exterior cabinet walls and the sunshields. Sunshield standoffs located on the roof of the cabinet must be welded to the cabinet body. Construct sunshields of 0.125 inch thick 5052-H32 aluminum sheet with corners that are rounded and smoothed for safety. Sunshields are not included in the housing dimensions.

995-11.8.16 Generator and Auxiliary Power Connection: Provide a generator and auxiliary power connection as required by Standard Subarticle 995-11.6.

995-11.8.17 Slots: Slots include mechanical mounting hardware and electrical connectors necessary to house interchangeable modules.

995-11.8.17.1 Serial Interface Unit (SIU) Slot: The Serial Interface Unit Slot shall meet the requirements of ATC 5301 v02.02 Section 7.1.

995-11.8.17.2 Cabinet Monitor Unit (CMU) Slot: The Cabinet Monitor Unit Slot shall meet the requirements of ATC 5301 v02.02 Section 7.2.

995-11.8.17.3 IN Slot: The IN Slot shall meet the requirements of ATC 5301 v02.02 Section 7.3.

995-11.8.17.4 OUT Slot: The OUT Slot shall meet the requirements of ATC 5301 v02.02 Section 7.4.

995-11.8.18 Interfaces: Interfaces connect cabinet elements including the IN/OUT slots, controller unit, CMU, and cabinet control switches.

995-11.8.18.1 SIU IN/OUT Interface: The SIU IN interface and the SIU OUT interface shall meet the requirements of ATC 5301 v02.02 Section 8.1.

995-11.8.18.2 SB#1/SB#2 Interface: Serial Bus #1 (SB#1) and Serial Bus #2 (SB#2) shall meet the requirements of ATC 5301 v02.02 Section 8.2.

995-11.8.18.3 SB#3 Interface: The Serial Bus #3 (SB#3) shall meet the requirements of ATC 5301 v02.02 Section 8.3.

995-11.8.18.4 CC Interface: The Cabinet Control (CC) interface shall meet the requirements of ATC 5301 v02.02 Section 8.4.

995-11.8.18.5 Output Termination Functionality: The Output Termination Functionality shall meet the requirements of ATC 5301 v02.02 Section 8.5.

995-11.8.19 Protocols: The protocols described are Serial Bus #1 (SB#1), Serial Bus #2 (SB#2), and Serial Bus #3 (SB#3). The SB #1 shall consist of four interface links (TXD ± and RXD ±, TXC ± and RXC ±) conforming to the requirements of the TIA-485-A, SB#2 shall be dedicated to gathering preprocessed data from the Cabinet Smart Input Devices resident in the input functionalities. SB #3 is used by the CMU2212 to communicate with the 2202 HDSP/FU and the model 2220 ADU.

995-11.8.19.1 SB#1 Communications Protocol: The Serial Bus #1 Communications Protocol shall meet the requirements of ATC 5301 v02.02 Section 9.1.

995-11.8.19.2 SB#2 Communications Protocol: The Serial Bus #2 Communications Protocol shall meet the requirements of ATC 5301 v02.02 Section 9.2.

995-11.8.19.3 SB#3 Communications Protocol: The Serial Bus #3 Communications Protocol shall meet the requirements of ATC 5301 v02.02 Section 9.3.

995-11.8.20 Environmental Requirements: Ensure equipment meets all requirements of ATC 5301 v02.02 Section 11.

SUBARTICLE 995-12.1 is deleted and the following substituted:

995-12.1 General: Traffic controller accessories must meet the industry standards in Table ATCC 995-3.

Table ATCC 995-3 Traffic Controller Accessory Standards	
Device	Standard
Conflict Monitor	NEMA TS1-1989, Section 6
Malfunction Management Unit	NEMA TS2-2021, Section 4
Power Supply	NEMA TS2-2021, Section 5.3.5
Load Switch	NEMA TS2-2021, Section 6.2
Flasher	NEMA TS2-2021, Section 6.3
Bus Interface Unit	NEMA TS2-2021, Section 8
Model 206L Power Supply Unit	CALTRANS TEES, 2020, 3.4
Model 208 Monitor Unit	CALTRANS TEES, 2020, 3.5
Model 210 Monitor Unit	CALTRANS TEES, 2020, 3.6
Power Distribution Assembly	CALTRANS TEES, 2020, 6.4.3
Input File	CALTRANS TEES, 2020, 6.4.4
Serial Interface Unit (Model 2218)	ATC 5301 v02.02, Section 6.1
High Density Switch Pack/Flasher Unit (Model 2202-HV)	ATC 5301 v02.02, Section 6.2
High Density Switch Pack/Flasher Unit (Model 2202-LV)	ATC 5301 v02.02, Section 6.2
Cabinet Monitor Unit (Model 2212-HV)	ATC 5301 v02.02, Section 6.3
Cabinet Monitor Unit (Model 2212-LV)	ATC 5301 v02.02, Section 6.3
Auxiliary Display Unit (Model 2220)	ATC 5301 v02.02, Section 6.5
Flash Transfer Relay Unit	ATC 5301 v02.02, Section 8.5.2.3
Cabinet Power Supply (Models 2216-24-HV, 2216-2412-HV, 2217, 2248)	ATC 5301 v02.02, Section 6.4

Ensure all traffic controllers perform all specified functions during and after being subjected to the environmental testing procedures described in NEMA TS-2, Sections 2.2.7, 2.2.8, and 2.2.9. Ensure all traffic controller accessories for ATC cabinets meet the requirements of ATC 5301 v02.02 Section 11.

SUBARTICLE 995-17.2.14 is expanded by the following new Subarticle:

995-17.2.14.3 Advanced Transportation Controller Cabinet Blank

Out Sign Power: Blank Out Signs must be compatible with the output electrical characteristics of the Model 2202 High Density Switch Pack/Flasher Unit described in ATC 5301 v02.02 Section 6.2.

Do Not Use Without CO Specs Authorization