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***Specifiers**: Click on the ¶ icon in the WORD toolbar to reveal detailed instructions*

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# SECTION 28 31 00
# FIRE DETECTION AND ALARM

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Section Includes:
1. Napco Commercial Gem–C Firewolf Fire System, UL Listed intelligent addressable fire alarm system with multiplexed signal transmission. The System supplied under this specification shall utilize independently addressed, input/output modules and power supply(s) as described in this specification. This system has been specified using the Napco Gemini-Commercial Firewolf Series (Napco Gem C FW) Fire Alarm control panel and related devices with NAC power supply(s), with supported devices listed.
2. Additional Devices:
    a. Napco C Series Gemini Fire-Alarm addressable control with capacity up to 255 devices including wireless. Per NFPA 72 UL864 9th Ed., UL 985, FDNY, CSFM approved.
    b. Support up to 32 AH battery backup @ 24VDC
    c. Addressable Analog Photoelectric Smoke detectors with auto-drift compensation & maintenance alert
    d. Addressable Analog Heat detectors
    e. Addressable Analog Photoelectric Duct smoke detectors
    f. Manual addressable fire-alarm pull stations
    g. Addressable modules for conventional & legacy devices
    h. Addressable SLC Loop Isolator optional for required applications
    i. Built in Synch/Strobe/Horn module on each NAC for Notification appliances
    j. Supports up to (255) Wireless Fire Devices for addressability of all devices
    k. Supports up to (4) on-board NAC circuits 6.5A capacity
    l. Supports up to (5) remote NAC expander modules, providing a maximum of (24) NAC circuits
    m. Supports from one to seven GEMC-FK1 Fire Keypads anywhere on the buss
    n. Support Conventional Zone modules
    o. Support Conventional Zone Expander
    p. Support up to (96) Outputs
    q. Onboard Digital Alarm Communicator Transmitter, Dual Line
    r. Optional TCP/IP reporting
    s. Support System Printer

### 1.2 REFERENCES

A. National Fire Protection Association (NFPA):
1. NFPA 70; National Electrical Code - The standard for the safe installation of electrical wiring and equipment in the United States.
2. NFPA 72; National Fire Alarm and Signaling Code.
3. NFPA 90A; Standard for the installation of Air Conditioning and Ventilating systems.

B. Underwriters Laboratories, Inc. (UL):
1. UL 864; Standard of safety for access control system units.

## 1.3 SUBMITTALS

A. Submittals and drawings shall also be approved by Authorities Having Jurisdiction (AHJ) simultaneously or prior to submitting them to the Architect. Shop Drawings shall be prepared by persons with the following qualifications:
   1. Trained and document certified by manufacturer in fire-alarm system design.
   2. NICET-certified fire-alarm technician, Level II minimum.

B. Product Data: Product Data sheets with the printed logo or trademark of only one manufacturer of all the equipment. Indicated in the documentation shall be the type, size, rating, style, and catalog number for all items proposed to meet the system performance detailed in this specification. The proposed equipment shall be subject to the approval of the Owner's representative and (AHJ).

C. Shop Drawings: Include plans, elevations, sections, details and attachments to other work.

D. Wiring diagrams shall indicate internal wiring for each device and the interconnections between the items of equipment with all wire runs, conductors & length of wire.

E. Provide a clear and concise description of operation that gives in detail, the information required to properly operate the equipment and system.

## 1.4 QUALITY ASSURANCE

A. Qualifications
   1. Manufacturer:
      The manufacturer shall have a minimum of ten years experience in the production of Fire and Intrusion Detection equipment.
   2. Installer:
      The installer shall be authorized by the manufacturer.

## 1.5 DELIVERY, STORAGE & HANDLING

A. Determine and coordinate the openings for delivery and installation of equipment.

B. Storage and Protection:
   1. Hardware received, but not installed shall be placed in secured storage. Control handling to prevent losses and delays before and after installation.

## 1.6 WARRANTY

A. Provide the services of a factory trained and qualified technician to perform all system software modifications, upgrades or changes during the one year warranty period. Response time of the technician to the site shall not exceed [insert time]hours.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

A. List of approved manufacturers:
   1. Napco Intrusion and Fire
      333 Bayview Ave.
      Amityville, N.Y. 11701
      Phone (631) 842-9400
      Fax (631) 789-9292

## 2.2 ASSEMBLY

A. The control panel shall be Napco C Series Gemini Fire-Alarm addressable control with capacity up to 255 devices hardwired or wireless. The system shall be designed specifically to provide one or two Addressable SLC Loop Controllers for fire detection application. The control panel shall include all required hardware, software and system programming to provide a complete and operational system designed to support herein:
   1. GEMC-FW-32KT 32 point GEM-C fire kit commercial control*
   2. GEMC-FW-32CNVKT 32 point GEM-C fire kit commercial conventional control*
   3. GEMC-FW-128KT 128 point GEM-C fire kit commercial control**
   4. GEMC-FW-255KT 255 point GEM-C fire kit commercial control**
   5. *Enclosure for use with 32KT above (16" X 14.25" X 5.2") one SLC, steel painted red. Fits between enclosure studs on 16" centers. NEMA-1.
   6. ** Enclosure for use with 128KT or 255KT, as above (24" X 14.25" X 5.2")
   7. 4 ampere GEMA-PSV4A-R or 7 ampere GEMA-PSV7A-R power supply
   8. [1][ 2] GEMC-FW-SLC Fire Loop Module(s)
   9. [1][2][3][4][5][6][7] GEMC-FK1 LCD Fire Red Fire Keypad(s)
   10. GEMC-F8ZCPIM Conventional 8-zone, 2-wire fire input module
   11. [1][2][3][4] GEMC-EZM8 8-point expansion module(s)
   12. GEMC-NL- MOD Internet reporting module
   13. [quantity] FWC-FSLC-SMK Addressable-Analog photo-electric smoke detector(s)
   14. [quantity] FWC-FSLC-HEAT Addressable-Analog heat detector(s), adjustable temp range
   15. [quantity] FWC-FSLC-SMK6B 6" base for smoke & heat detector(s), (not an addressable device). See above smoke & heat detectors
   16. [quantity] FWC-FSLC-DUCT Addressable-Analog photo-electric Duct smoke detector(s) with integral base-enclosure.
   17. [quantity] FWC-FSLC-EZM1 Addressable SLC 1-zone conventional expansion module(s) (counts as only one address on SLC loop, Max of 1)
   18. [quantity] FWC-FSLC-EZM2 Addressable SLC 2-zone conventional expansion module(s), (counts as only one address on SLC loop. Max of 1) (only one of either EZM1 or EZM2)***
   19. [quantity] FWC-FSLC-CZM Addressable SLC single module(s) for Dry Contact Device
   20. [quantity] FWC-FSLC-RM2 Addressable SLC 2-output module(s), (counts as only one address on SLC loop.
   21. [quantity]FWC-FSLC-ISO Addressable SLC short circuit module(s), special for Class A, Style 7 applications
   22. [quantity] FWC-FSLC-SOM1 Addressable SLC fire supervised output module(s), Used for elevator recall, HVAC shutdown, or added NAC w/ power supply.
   23. [quantity] FWC-FSLC-PULL Addressable SLC Fire Pull Station(s)
   24. [1][2][3][4] GEMC-REVC Gemini Commercial Wireless (255) point RF receiver expansion module
   25. [quantity] GEMC-WL-SMK Wireless Addressable photo-electric smoke detector(s)
   26. [quantity] GEMC-WL-HEAT Wireless Addressable heat detector(s) 135 deg.
   27. [quantity] GEMC-WL-WD2 Wireless Addressable 2-input module(s) to supervise Flows, tampers, legacy devices, etc
   28. [quantity] FWC-FSLC-PROG2 Tool for Address-Program of SLC devices
   29. GEMC-NAC7S Remote 4-output NAC extender on any one output.
   30. GEMC-12V2APS-CF 12VDC power supply for fire buss, remote supervised.
   31. GEMC-FPRINT parallel printer module. GEMC-RM3008 8-form 'C' relay output module.

33. GEMC-RS232 RS232 adapter for serial output from panel.
34. GEMC-OUT8 PGM output module for 8-open collector PGM outputs.

B. System Printer:
1. Utilize optional on site dot matrix, parallel printer with GEMC-FPRINT printer module. This will provide a printout of the following events: On receipt of signal, print alarm, supervisory, and trouble events. Identify zone, device, and function. Include type of signal (alarm, supervisory, or trouble) and date and time of occurrence. Differentiate alarm signals from all other printed indications. Print system reset events, including the information for device, location, date, time and a historical log of events.

C. Notification Appliances:
1. All Audio Visual appliances shall be of the same manufacturer as the Fire Alarm Control Panel or as recommended by the manufacturer to insure compatibility between the appliances and the control panel. Verify that the installations of the A/V appliances are completed in accordance with the manufacturers' instructions. Candela requirements are to be met in all locations. Any appliances, which do not meet the above requirements, and are submitted, for use must show written proof of they are compatible for the purpose intended. All appliances shall be UL listed Fire Protective Service for use with this panel.
2. Visual Devices: Provide wall or ceiling mounted base [red][white] with clear strobes and screw terminals. Strobes shall provide a smooth light distribution pattern field selectable candela 15 cd, 30 cd, 75 cd, and 110 cd flash output rating. Ceiling mounted devices shall have selectable candela settings of 15cd, 30cd, 75cd and 95cd, or 95cd, 115cd, 150cd, and 177cd. All strobes shall be synchronized by the internal NAC or remote power supplies.
3. Audible Devices: Provide low profile wall mounted A/V horns at the locations shown on the drawings. The horn shall provide approx. 95 dBA sound output at 10 ft. when measured in reverberation room per UL-464. The horn shall have a selectable steady or synchronized temporal output. The horn shall mount in a 1-gang electrical box.
4. Audible/Visual Device: Provide low profile wall mount horn/strobes at the locations shown on the drawings. The horn/strobe shall provide an audible output of approx. 95 dBA at 10 feet when measured in reverberation room per UL-464. Strobes shall provide synchronized flash outputs as described above. Separate screw terminals shall be provided for wiring for each device. Low profile horn/strobes shall mount to one-gang electrical box.
5. Magnetic Door Holders Description: Units are designed for wall or floor mounting as indicated and are complete with matching doorplate. Mount as manufacturer recommends for a durable installation. Electromagnet requires no more than 3 W to develop 25-lbf holding force. Wall-Mounted Units shall fit flush mounted unless otherwise indicated. Rating: 120-V ac, 24-V ac or dc.EXECUTION

## 3.1 INSTALLATION

A. Comply with NFPA 72 and NEC requirements for all installed devices. Identify system components, wiring, cabling and terminals. Comply with requirements for identification specified in Division 16 Section Electrical. Install framed instructions in a location visible from fire-alarm control unit acceptable to the (AHJ)

B. Equipment Mounting: Install fire-alarm control unit at 72 inches Above Finished Floor (AFF) with tops of cabinets not more than 72 inches above the finished floor.

C. New components shall be capable of merging with existing system configuration without degrading the performance of either system. Existing system must be made compatible with any new devices by interface.

D. Smoke and Heat Detector Spacing: Smooth ceiling spacing shall not exceed 30 feet or as required in NFPA 72. Spacing of detectors for irregular ceiling construction, and for high ceiling areas shall be determined according to Appendix A or B in NFPA 72. Locate duct detectors no closer than 3 feet from air-supply diffusers or return-air openings. Locate detectors not closer than 12 inches from any part of a lighting fixture.

E. Duct Smoke Detectors: Comply with NFPA72 and NFPA90A. Install sampling tubes so they extend the full width of duct. Install one Remote Alarm & Test indicator unit directly beneath each duct detector.

F. Install Notification Appliance Devices between 80 and 96 inches on the wall (AFF). Verify that each strobe unit complies with candela requirements for the application.

G. Remote Keypad Annunciators: Install with top of panel not more than 56 inches above the finished floor.

## 3.2 FIELD QUALITY CONTROL

A. Identification:
1. Provide label identification for each device not commonly identified or as requested by the (AHJ). This includes 120vac power source with panel label and exact location inside the fire alarm and NAC panels.

B. Grounding:
1. Verify that all panels are properly grounded for compliance with NEC & local code.

## 3.3 CLOSEOUT ACTIVITIES

A. Refer to Division 01 “Closeout Procedure’s” section or sections for activities related to the close out procedures including operations manuals, maintenance, demonstration, and training requirements.

B. Demonstration & Testing:
1. Field tests shall be witnessed by Architect, Engineer and (AHJ). Prior to performing the final test, require a certified service representative to inspect, test, and adjust all components, assemblies, and equipment installations, including all connections to verify the system integrity.
2. Perform Final Tests for the (AHJ). Utilize a certified service representative factory trained on this equipment to perform all testing for the authorities. Verify each and every device is tested on full AC power and on DC backup power for authorities. Conduct a complete visual inspection of all devices and controls.

C. Maintenance Test and Inspection:
1. Perform tests and inspections listed for weekly, monthly, quarterly, and semi-annual periods as prescribed in NFPA 72. Use forms developed for initial tests and inspections. Annual Test and Inspection: During the one year warranty period and after, each year perform a complete test of the fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections or as currently complying. Detector Sensitivity Testing: Each year the contractor is to perform detector sensitivity testing and provide a downloaded report to the Owner after cleaning & any re-calibration is performed. Should any detector fall outside of its sensitivity window, the system will automatically indicate a device trouble for that address. Engage a factory trained service representative to train the Owner's maintenance personnel to perform minimal

adjustments, operation, and basic maintenance of the fire-alarm system between certified authority inspections.

D. Training:

1. The contractor shall conduct training courses for personnel designated by the owner. Training shall cover the maintenance and the operation of the Fire and Intrusion detection equipment.

**END OF SECTION**