

The widest range of  
mission-critical interconnect  
technologies in the world

# NCi



## Nuclear-Grade Connector Series

Class 1E • 10CFR50 Appendix B

# Nuclear-Grade Connectors and Accessories

- Two new quick-disconnect connector series for newer, severe applications that may require long-term submersion: SuperNG and Mighty Mouse NG
- Two industry-standard connector series for refurbishment and retrofit projects
  - Series ITS-NG
  - Series IPT SE-NG



# NG



# Nuclear-Grade Class 1E 10CFR50 Appendix B

- Appendix B audit report available upon request
- Quality system audit complete
- Factory audit complete
- NG connector series product qualification in progress

December 14, 2018  
Glenair Italia S.p.A.  
Bologna, Italy  
2018 Audit Report

Attached is the Glenair audit report performed at the subject facility on October 24 – 25, 2018. The purpose of the audit was to evaluate your quality program, relative to the supply of nuclear safety related products pertaining to quick disconnects.

Glenair is a family owned company and has three manufacture facilities: US CA, Italy Bologna & US Chicago. The main products are (Connectors), they are manufactured in Bologna, Italy. The products covered military, transportation, aerospace & rocket and nuclear.

There were no Findings; however, five deficiencies/opportunities for improvement were identified, which are being addressed by Glenair's Internal Corrective Action Program (ICAR). No response is required because of the ICARs; however corrective actions to the ICARs/Deficiencies/Opportunities for improvement, will be evaluated during the next audit.

Overall results conclude that Glenair is effectively implementing the Glenair Quality Assurance Manual in accordance with 10CFR50 Appendix B. Glenair is extremely capable and knowledgeable, providing an elevated level of confidence in supplying the above products. The response to the audit team, and actions taken during the audit, demonstrate a high commitment in maintaining a solid quality program.

Observations:

1. Need to add contract review process, sales would need to be involved, technical service review of order.
2. Identify CC's for survey of suppliers. Technical evaluation to identify the Critical Characteristics, list of personnel attending review and review / approval.
3. Review purchase order requirement as stated in section 5.2 of the checklist.
4. FMEA identifying characteristics, Reviewed O-ring RPN# Identify actions to reduce risk, RPN # below 90 indicates reduced risk. Note: reference FMEA in procedure
5. Review for 10CFR21 added to procedure and flow chart. Post entire part 21 document.

Internal Audit Report NQA-1-2008/2009a  
Q-n°: 1/2018

| Funzione | Nome                | Telefono/Fax   |
|----------|---------------------|----------------|
| auditor  | Mauro Molinari      | +39 34399178/1 |
| ing      | Pierpaolo Brulatti  |                |
| ing      | Daniilo Romano      |                |
| urance   | Federico Pellegrini |                |

|                        | Risultato<br>Result | Piano<br>d'azione<br>Action Plan |
|------------------------|---------------------|----------------------------------|
| ANCE PROGRAM           | UNSAT               | YES                              |
| ROL                    | UNSAT               | YES                              |
| OCUMENT CONTROL        | UNSAT               | YES                              |
| ROCEDURES AND DRAWINGS | UNSAT               | YES                              |
| TROL                   | UNSAT               | YES                              |
| CHASSED ITEMS AND      | UNSAT               | YES                              |
| ND CONTROL OF ITEMS    | SAT                 | NO                               |
| IAL PROCESSES          | SAT                 | YES                              |
|                        | SAT                 | NO                               |
|                        | SAT                 | NO                               |
| URING & TEST EQUIPMENT | UNSAT               | YES                              |
| E AND SHIPPING         | UNSAT               | YES                              |
| ND OPERATING STATUS    | UNSAT               | YES                              |
| NFORMING ITEMS         | SAT                 | NO                               |
|                        | UNSAT               | YES                              |
| RECORDS                | UNSAT               | YES                              |
|                        | SAT                 | NO                               |
|                        | UNSAT               | YES                              |
|                        | SAT                 | YES                              |

18/04/2018  
Data : 10-13/7/2018  
Date 2/10/2018

Approvato (Neissuna ulteriore azione necessaria)  
Date con commenti (vedi Action List allegata)  
Action List allegata

The audit findings are outlined in the Action Plan  
The audit findings dated 02/10/2018, the closure of all finding have been evaluated satisfactory  
The audit findings dated 02/10/2018, the closure of all finding have been evaluated satisfactory

Audited Area Manager  
Lead Auditor

Page 1 of 16  
MOD.000700-2



# Glenair Zone 1 NG Quick-Disconnect Connector Applications

- Valve controls/monitoring
- Control rod drive mechanisms
- Rod position indicators
- Pressure transmitters
- Solenoids
- Hydrogen detectors
- Fuel handing equipment
- Radiation tolerant cameras
- Limit switches
- Radiation detectors
- In-core detectors
- Data acquisition equipment
- Post accident monitoring systems
- Process control monitoring

# Key Performance Attributes of Signature Glenair SuperNG Quick-Disconnect Connectors

## Optimized for Containment Area (Class 1E) applications

- Radiation resistance
- High-temperature tolerance
- Sealed, high-pressure tolerance
- Fluid / chemical resistance
- Corrosion resistance



# Key Performance Attributes of Signature Glenair SuperNG Quick-Disconnect Connectors, continued

## Optimized for Containment Area (Class 1E) applications

- Machined stainless steel shells
- Three polarization keys and keyways
- Stainless steel backshells suitable for band termination and backpotting
- NPT threaded plugs and receptacles
- Radiation-hardened inserts, gaskets, seals, O-rings
- Standard signal, power or thermocouple contacts

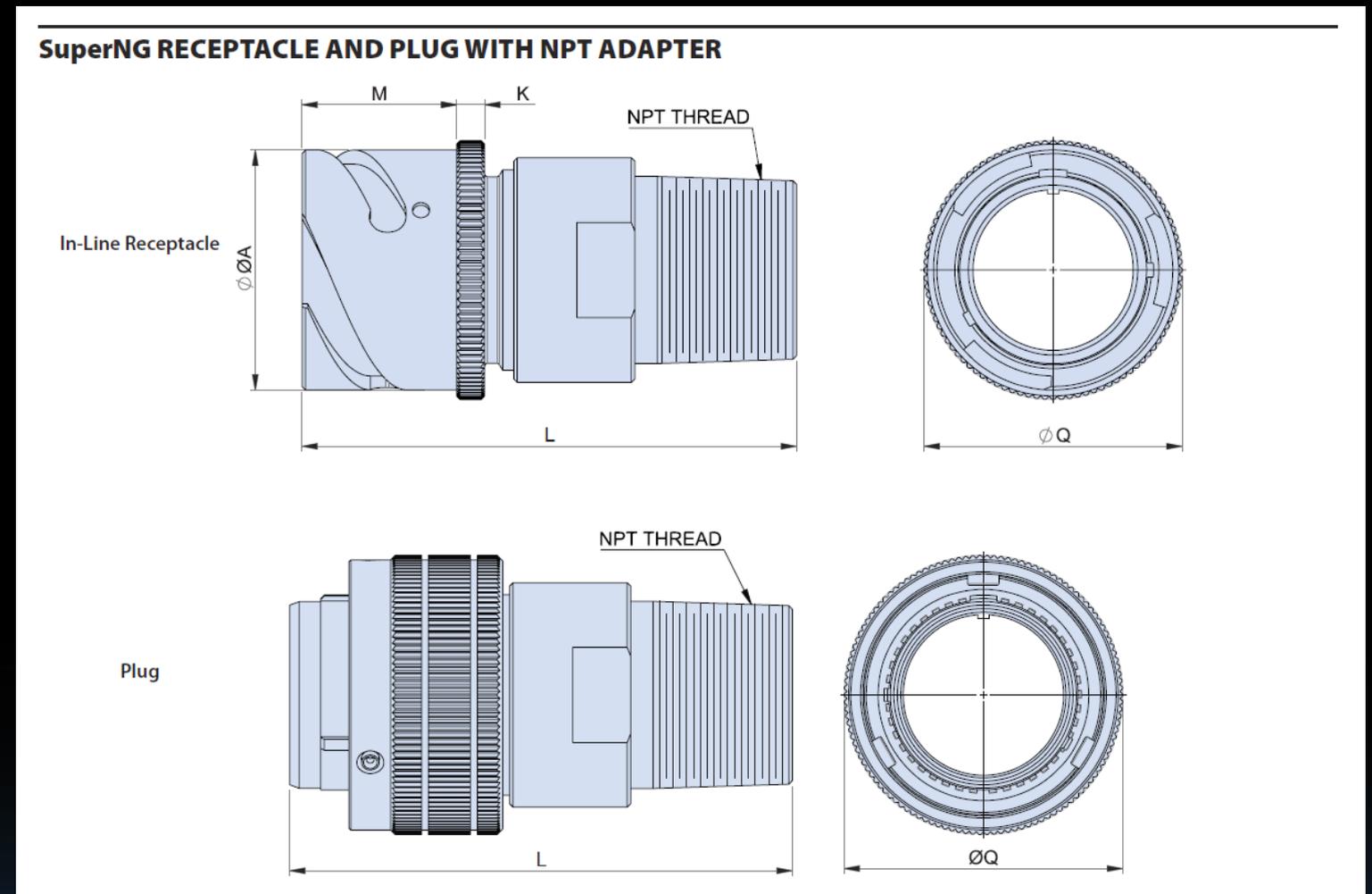
# NGi



# Available SuperNG Connector Configurations

Plugs, mounted and in-line receptacles with a broad range of rear-end thread adapters and backshell accessories

- NPT adapter
- Environmental cable clamp
- Shield termination backshell
- Environmental backshell
- Environmental cable gland backshell



# Mighty Mouse NG

**Ultra high-density, small form-factor nuclear-grade quick-disconnect optimized for Containment Area (Class 1E) applications**

- Radiation, temperature, fluid, and corrosion resistant
- 3500 psi pressure rated
- Ultraminiature #23 signal contacts
- Size #20, #20HD, #16, #12, #8 signal, power, fiber optic and shielded contacts
- Discrete connectors and turnkey cable assemblies

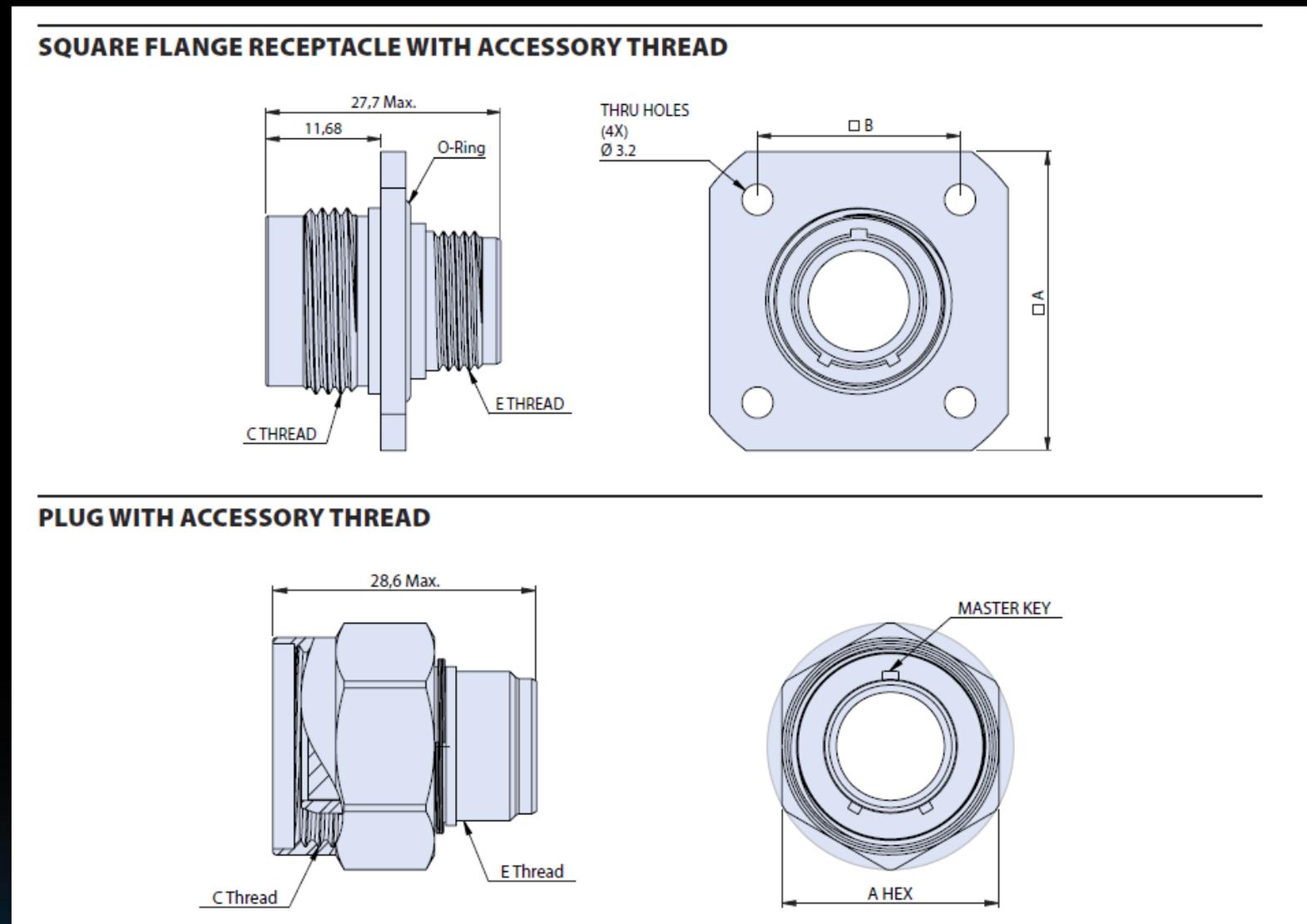


**NG**

# Available Mighty Mouse NG Connector Configurations

## Two standard accessory-threaded connector configurations

- Square flange receptacle
- Cable plug
- Environmental EMI/RFI shield termination and shrink boot adapter
- Available factory-terminated cable assemblies



# Series ITS-NG Reverse-Bayonet

**Quick disconnect / locking nuclear-grade connector series with a broad range of 5015 contact arrangements, intermateable with industry-standard connectors**

- Radiation, temperature, fluid, and corrosion resistant
- Fast connect / disconnect reverse-bayonet coupling
- High corrosion-resistant stainless steel shells and bodies
- Chemical and moisture-resistant inserts and O-rings
- Performance tested for advanced temperature, radiation, and seismic stress factors
- Ideally suited for power generation monitoring, valve control devices, sensors, and other electronic equipment in Class 1E harsh nuclear / safety-related applications
- Consult product guide for connector configurations and available backshell accessories



**NGi**

# Series IPT SE-NG

Quick-disconnect bayonet-lock NG connector with a broad range of MIL-DTL-26482 contact inserts, intermateable with industry-standard connectors

- Radiation, temperature, fluid, and corrosion resistant
- High-performance crimp contact version with integral contact retention clips
- High corrosion-resistant stainless steel shells and bodies
- Two contact sizes: #20 and #16
- 21 signal contact insert arrangements, 3 to 61 contacts
- Rear-insertion / front release snap-in contacts
- Environmentally sealed system
- Audible and visual coupling indicators
- Keyed polarization



**NGi**

# Other Harsh-Environment Interconnect Technologies Suitable for the Nuclear Power Industry and Available from Glenair

- Conduit, polymer-core and metal-core
- Turnkey factory cable assemblies
- Turboflex ultra-flexible power cable
- Hermetically-sealed bulkhead connector feed-thrus
- Rugged high-speed contacts and connectors for 10GbE applications
- Fiber optic connectors and cable assemblies
- Ruggedized high-temperature optoelectronics (photonics)
- Environmental shrink boots



# Nuclear-Grade-Connectors

For more information, see our NG Connector landing page

# NG

[www.glenair.com/nuclear-grade-connectors-and-accessories/](http://www.glenair.com/nuclear-grade-connectors-and-accessories/)



The widest range of  
mission-critical interconnect  
technologies in the world

# NCi



## Nuclear-Grade Connector Series

Class 1E • 10CFR50 Appendix B