Advanced Computer Controlled Nutrunner

Servo Nutrunners Multi-type / Single-type

AFC-1500 SERIES
CHALLENGING THE FUTURE FOR FASTENING

THE SMALLEST AND LIGHTEST IN THE INDUSTRY
HIGH PERFORMANCE, FULLY DIGITAL NUT RUNNERS

AFC-1500 SERIES
Cost • Flexibility Performance

Space Saving
The most advanced digital technology is used for the controller, and it was possible to succeed dramatically in reducing the number of parts. The Units have been made more compact along with the Control Panel which is also much more simple resulting in the overall possibility to reduce cost. In the wide range of requirements for fastening, we would like to promise our great solution by simple software selection, and easy selectable module on common hardware platform.

Wiring Saving
Adapted global network system will reduce the number of wiring and build an advanced system. We have prepared a flexible control module for these needs. (Devise NET, Inter BUS, Profi BUS, CC link and others.)

Visual Performance

User Friendly Operation
In order to adapt the new FA field, we have prepared a flexible Man-Machine-Interface. With regards to setting up the system, in a wide range information such as fastening parameters, fastening result, analyzing data and maintenance data can be operated easily by using Windows base software. Using an on-demand help function, the operator can be assisted. A PC or other display unit can be used depending on the needs. A stationary or portable selection can also be made.

Quality Performance

Total In-House Manufacturing
We are challenging to develop a complete manufacturing process include torque transducer which is the most sophisticated part of fastening system. We are offering a quality trace certificate for assure fastening quality.

The system has a TOOL ID (ID information include Torque calibration, Product type, etc.) which also recognizes error settings through a FP function maximizing the total protection of the system. The fastening system is guaranteed for quality and durability based on ISO5393. Also a skilled service group perform preventive maintenance, modification, repairs, and after service.
FEATURES FOR THE AFC-1500 SERIES

**HARDWARE FUNCTION**

- Control Interface:
  - Discreet I/O, other types of Networks.
- Communication Interface:
  - RS232C(COM1) Printer, PLC Data Output
  - RS232C(COM2) Bar Code, ID System Input
  - RS232C(COM3) General Display (Touch screen adapted)
- Spindle Control Communication:
  - RS485 High speed exclusive communication 1CH
  - User Console 1CH
- Signal for External Monitor:
  - Torque, Angle pulse, Current
- TOOL ID Function:
  - Equipped in Pre-amp

**MULTI-UNIT**

A maximum of 31 spindles, high speed multi-spindle controls can be used. A small, light body with several sequence functions provide a flexible communication function. A wide range of input voltage (AC100-220V or equivalent) and it is also environment friendly providing a low consumption electricity (15W) level.

**AXIS UNIT**

We are introducing a fully integration of servo and fastening control with the latest RISC-CPU technology. Fitted with an intelligent ID system on the Pre-amp of the Tool, this contributes to the high quality of fastening. Also considering the commonality of the unit for reduction of spare parts contributing.

**NUT RUNNER TOOL**

The reliable PM servo motor has been equipped for nut runner system, also composed of a gear-torque transducer which is certified at A class under ISO5393. (Durability test performed over 1 million continuous cycles.) High level quality guaranteed by Tool ID system.

A multi-system using a minimum amount of parts.

**SETTING FUNCTION (by using user console)**

- Free Format Data Out Function
  - Output data selection and free format function will meet customers needs.
  - Various layouts for output signals to a PLC, layouts for Quality+Maintenance information, etc. (Depending on the purpose a variety of combinations can be realized.)
- Graphical Setting Parameter Function
  - Graphical presetting features are provided for simple and easy presetting.
  - Setting through actual fastening image.
- Fastening sequences can be prepared simply for exclusive demands.

**FASTENING FUNCTION**

- Fastening Method:
  - Torque control, Angle control, Current control (CW/CCW)
  - Function of torque recovery (Solution to torque reduction)
- Monitoring:
  - Torque, Angle, Torque rate, Time, Current
- Fastening Sequence:
  - 16 types, For each; max. 100 steps
- Fastening Parameter:
  - 16 groups
- Fastening Range:
  - 1Nm – 4000Nm
- Maximum Spindle Connections:
  - 31 spindles

**PROTECTION FUNCTION**

- Torque transducer self-diagnoses
- Off-set torque checking
- Diagnoses of different types of Tool / Amp (Tool ID system)
- Equipped with Servo and motor protection function.
  - (Over current, Over load, Abnormal voltage, Temperature abnormal, etc.)

**System Structure**

- **MULTI DATA DISPLAY PANEL** (DISPLAY RS422)
- **PRINTER** (DATA-OUT1 RS232C)
- **SEQUENCER PLC**

**Environment**

- A Compact and lightweight system. A system structure using a minimum amount of parts.
- Usage of minimum energy

**Cost**

- A simple composition of hardware by simply building up
- All-In-One unit

**Reliability**

- Protection Function
- Tool ID System
- Transducer with Pre-amp
- Resolver Motor

- **BAR CODE READER /ID SYSTEM**
- **DIO D-NEt P-BUS CC-LINK**

**System Structure**

Control Interface:
- Discreet I/O, other types of Networks.

Communication Interface:
- RS232C(COM1) Printer, PLC Data Output
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Spindle Control Communication:
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Signal for External Monitor:
- Torque, Angle pulse, Current

TOOL ID Function:
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Fastening sequences can be prepared simply for exclusive demands.

**Multi System**

- MULTI UNIT
  - A maximum of 31 spindles, high speed multi-spindle controls can be used. A small, light body with several sequence functions provide a flexible communication function. A wide range of input voltage (AC100-220V or equivalent) and it is also environment friendly providing a low consumption electricity (15W) level.

  The communication function is the next generation of FA needs and a variety of controls and information networks such as Device-Net, Inter Bus, Profy-bus , AB Company Bus-system, CC-link and others can be used by changing a limited amount of modules.

  In addition, we recommend wire savings as well.

- AXIS UNIT
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  Also considering the commonality of the unit for reduction of spare parts contributing.

- NUT RUNNER TOOL
  - The reliable PM servo motor has been equipped for nut runner system, also composed of a gear-torque transducer which is certified at A class under ISO5393. (Durability test performed over 1 million continuous cycles.) High level quality guaranteed by Tool ID system.

  Resolver used for angle monitoring, which does not use IC or electronic elements, is durable against vibration and dust/mist type of harsh environments allowing a wide range of usage.

  Motor and resolver cable integrated into one compact design which reduce the number of homerun cable.
The Single type is composed of 3 items, axis unit, tool and homerule cable. Economical control system which offers many of the features as the multi system. Suited for 1 spindle (or few spindles), and conveniently used for robotics application. A multi-spindle application can also be used by synchronized feature. Parameter data can be entered by using the display panel mounted on front panels. User console software is available.

Function Chart
1. Parameter Setting
2. Sequence Setting
3. Fastening Torque Curves
4. I/O Free Format Setting
5. Statistical Calculations
6. Data Save / Data Read / Printing
7. Tool Information
8. Others

Can be operated on DOS-V PC (WIN 95, 98, NT, ME, XP etc)
TOOL•UNIT SPECIFICATIONS

 COLUMN TYPE

 Used for an automatic assembly line.
 We design and manufacturing different types of systems
 under customer's specifications.
 The handy type is also available.

 AUTOMATIC FEED TYPE

 (PARTS FEEDER)

 The combination of a nut runner and an automatic bolt feeding system
 allows a complete automatic system
 for fastening.
 Various bolts and nuts can be automatically fed through the system.

 STRAIGHT TYPE

<table>
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<tr>
<th>Model</th>
<th>Max. Torque (Nm)</th>
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<th>Weight (kg)</th>
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 HIGH SPEED TYPE (Straight / Offset)

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APPLICATIONS

Motor cable direct type

Detailed drawings are available on DXF file.
**OFFSET TYPE**

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<td>NFT-401RM1-O</td>
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**SPINDLE ADAPTER**

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**LARGE TYPE**

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**UNIT**

<table>
<thead>
<tr>
<th>Model</th>
<th>Width (mm)</th>
<th>Height (mm)</th>
<th>Depth (mm)</th>
<th>Weight (kg)</th>
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</table>

**SMOOTH ARM TYPE**

The balancing cylinder is used for the smooth arm structure for reducing the operator load. The system offer the same performance as the single type nut runner include fastening accuracy. The FP function also comes as standard.

**ROBOT TYPE**

The emphasis of this system is to be able to use the flexible fastening. Bolts or nuts can be fed by automatically. Can be mounted on multi articulated arm robot.
This catalog was made of environment-preservation-oriented materials; printed on recycle papers with less-polluting soy ink.