BROETJE AUTOMATION

FRAC

FRAME CLIP ASSEMBLY CELL

- Flexible Robotic Assembly System
- Highest levels of automation even with narrow and complex contours
- Field proven technology: >30 systems on the market worldwide

COMPOSED TO COMPETE

FRAC - TECHNICAL INFORMATION

Area of Application

The Frame Clip Assembly Cell (FRAC) is a highly flexible and versatile system for automated drilling and fastening of different aircraft components and substructures (e.g. frame, clips, brackets) with most challenging requirements. Broetje-Automation provides a series of different end-effectors that are tailored to different conditions and requirements to enable highest throughput rates and maximum workpiece flexibility.

FRAC systems are capable to be mounted on stationary or mobile robots as well as other positioning systems. They often combine several different end-effectors (e.g. drill-only end-effectors with automatic tool change combined with drilling- and riveting multifunctional end-effectors). The systems therefore reach highest automation levels of more than 90% for all kinds of aircraft types.

Technical Data

Riveter

Drill speed: 0 - 6.000 rpm	Drill spindle feed: up to 98"/min / 2.500 mm/min
Countersink repeatability: ± 0.002"/ ± 0.05 mm	Material: Al/Ti / optional Composite
Fastener diameter: 0,09" - 0,31" / 2.5 mm - 7.93 mm	Cycle Time: up to 7 rivets/min
Clamping force: 22 - 270 lbs / 10 - 120 daN	Upset force: up to 10,116 lbs / 4,500 daN

Positioner

Positioning accuracy linear axis: ± 0.008" / ± 0.2 mm	Positioning repeatability linear axis: ± 0.004" / ± 0.1 mm
Work travel: X-axis: 670 inch / 17,000 mm (not limited)	Robotic axis: A1-axis: ± 150 deg. A2-axis: +17.5 / -130 deg. A3-axis: +145 / -110 deg. A4-axis: ±175 deg. A5-axis: ±118 deg. A6-axis: ±190 deg.

Special Features

- Fully automated process including machine positioning / referencing, workpiece clamping / unclamping, drilling / countersinking, fastener selection and sealant application
- Automatic Fastener feed and insert with all electric fastening system (AEFS)
- 8/16 slot fastener rack for various fastener sizes & types extendable with additional racks
- Integrated industrial robot with 840D controls
- Multiple end-effectors for highest automation levels incl. automatic coupling system and automatic tool change
- High speed / precise drill spindle
- No limitation in workpiece length
- Easy expandable for future application because of large work envelope
- Broetje-Automation SCALE sensoric system for in-process quality check (e.g. countersink, workpiece compensation etc.)
- BA SOUL Offline Programming System
- Virtual twin machine and workpiece simulation

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