

NC Joining Module NCFT

Type 2157A...

for Joining Operation with Single-Channel Control Systems

The NC joining module NCFT Type 2157A... with integrated piezoelectric force sensor for two predefined measuring ranges of 0,25 ... 1 kN is excellent for use in assembly and joining processes monitored by force displacement.

- Force feedback control
- Integrated Piezo charge amplifier
- High measuring accuracy in two ranges
- High velocity
- Practical repeatability <0,005 mm
- Active compensation of process compression for exact positioning
- High overload capacity up to 15x
- No external PC with special software required
- Absolute encoder, eliminates reference point determination
- Low maintenance

Description

The NC joining modules NCFT Type 2157A... consist of a robust housing with an integral piezoelectric tension/compression force sensor. An absolute encoder for precise positioning is integrated in the drive motor. The compressive or tension forces affecting the sensor create a proportional electrical charge in the piezoelectric measuring element, which is converted into an analog voltage signal by the integrated charge amplifier.

The drive motor is an electrically commutated AC servo motor which is controlled by a servo controller. This servo controller provides constant speed independent of load.

Standard functions like block pressing, position pressing and force feedback controlled pressing as well as intermediate positioning are supported.

The NC joining module NCFT can be operated with the IndraDrive servo controller in combination with the DMF-P A300 NCF Type 4734A..., DMF-P A310 Universal Type 4740A... or with the NC Compact Type 2159A. Monitoring of the work area of the screw drive is assumed the electronics in the servo controller.

The functional principle of the individual systems is described on the following pages. A field bus slave interface is used to connect the system to the system control, the Ethernet connection, including output of QA data.



Application

NC joining module NCFT Type 2157A... is excellent for applications in assembly and joining tasks in automated production plants and manual-work places. The compact dimensions, slim design and low joining forces are best suited for precision mechanical fabrication as for example in watch, clock and small-power motor industry.

Vertical and horizontal installation is possible and is performed by wall or flange assembly. Process tooling may be installed on the ram (Fig. 1).

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Technical Data

Dimensions	mm	Fig. 1
Assembly options		wall or flange assembly
Weight	kg	5,8
Max. tool weight*	kg	5
Direction of measurement		tension/ compression
Measuring range	kN	0,25
	kN	0,5
	kN	1
Length of stroke	mm	100
Tool holder	mm	Fig. 1
Holding brake	V/A	24/0,4
Max. movement speed	mm/s	300
Displacement sensor system		absolute encoder
Resolution	µm	0,5
Force sensor		piezoelectric
Temperature range	°C	10 ... 40
Protection class		IP54
Linearity in all ranges	%FSO	≤1
Service life of spindle (acc. to defined drive profile)	cycles	approx. 10 million

Short stroke	mm	≤60
Central lubrication connection (exterior)		standard-lubricating nipple

Servo Controller	Bosch-Rexroth Type IndraDrive	
Standard Interface**		Profibus
Power connection	VDC/W	24 (19,2 ... 28,8) /24
Power connection	V	400 (400 ... 500) ±10 %
	Hz	50/60 ±2 %
	phase	3

Evaluation Unit	Type 4734A... or Type 4740A...	
Standard Interface		Profibus
Power supply	VDC	24 ±10 %

Evaluation Unit		
NC Compact Firmware		Type 2159A
Operating Panel		Type 2158A

* Possible radial forces must be considered independent of the mounting.

** Dependent of system

Dimensions

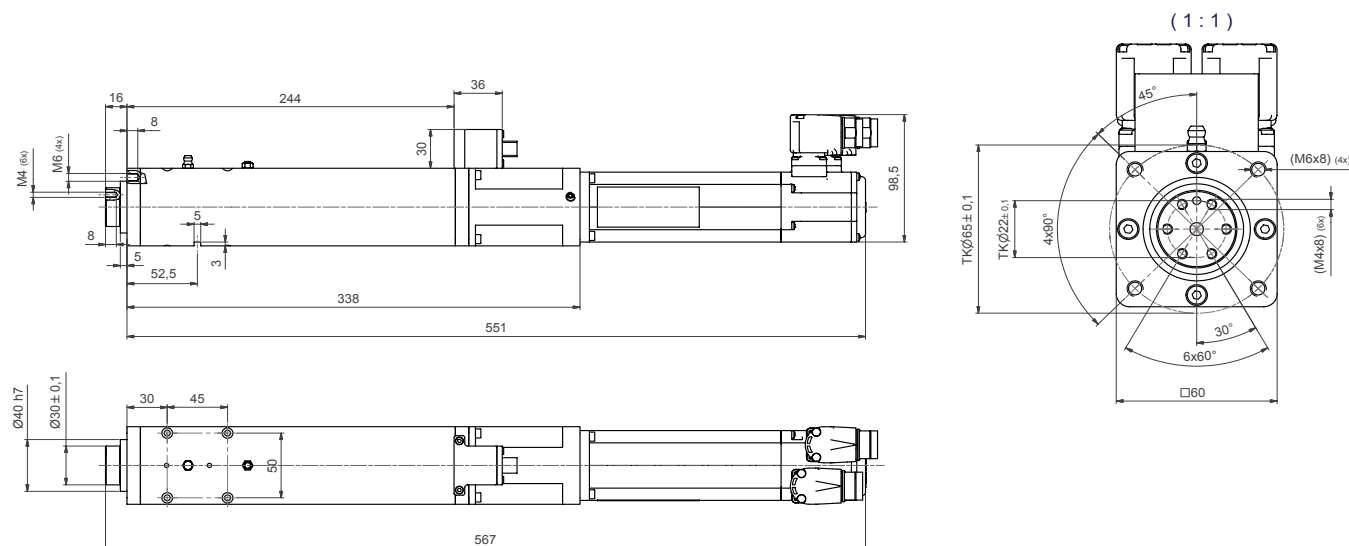


Fig. 1: Dimensions NC joining module NCFT Type 2157A... for measuring range of 0,25, 0,5 and 1 kN

Assembly may require an external guidance for the roller screw. Radial forces such as tool weight must be considered.

Functional Principle with DMF-P A300 NCF Type 4734A...

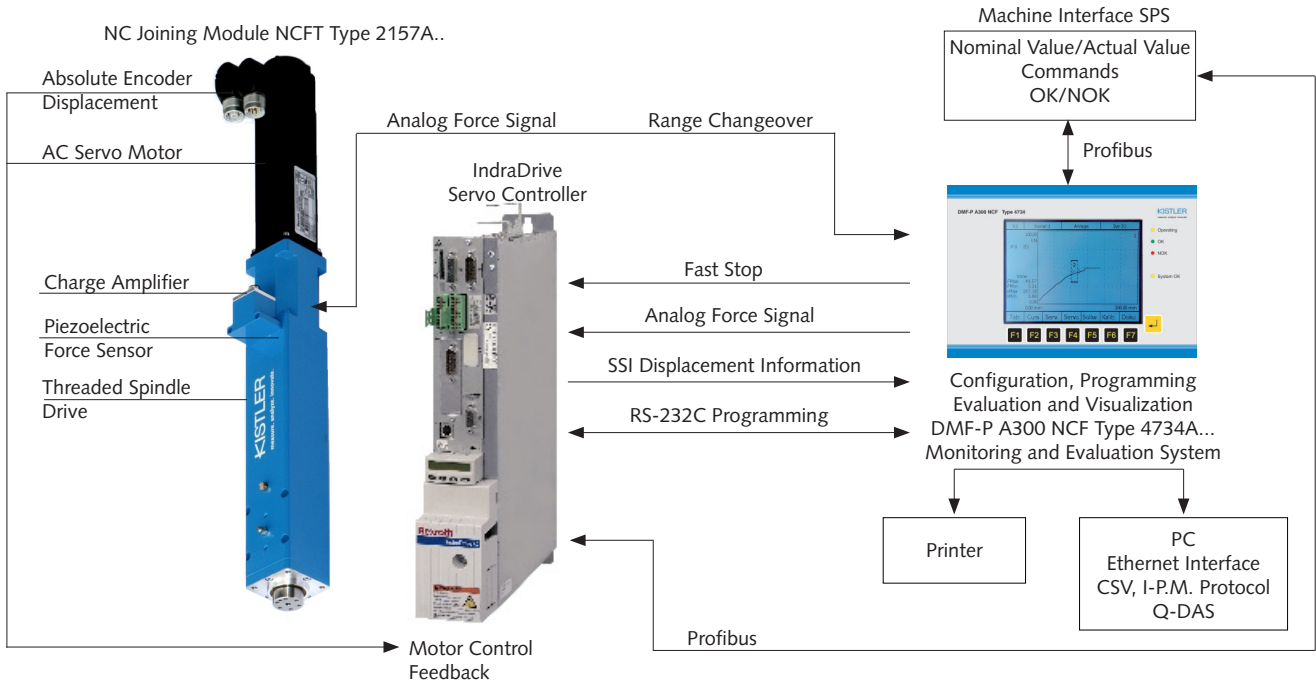


Fig. 2 Functional principal of NC joining system with NC joining module NCFT Type 2157A... and DMF-P A300 NCF Type 4734A...

Included Accessories

- None

Optional Accessories

- Servo controller for Type 2157A... with integrated safety option IndraDrive 12 A PB S2 MPH07
- Evaluation unit DMF-P A300 NCF
- Wall housing evaluation unit
- Desktop housing evaluation unit
- Panel housing evaluation unit

Type/Art. No.

- KSM035366
- 4734A...
- 4734AWDY2X4...
- 4734ATDY2X4...
- 4734AEDY2X4...

Cable

- NCFT motor cable, length 5 m RKL4302 KSM315330-5
- NCFT MSK Feedback cable, length 5 m RKG4200 KSM303500-5
- NCF cable SSI displacement IndraDrive, length 5 m KSM301750-5
- Data cable IndraDrive, length 5 m KSM301640-5
- NCF cable force transmitter, length 5 m KSM313720-5
- NCF cable analog force signal, length 5 m KSM301760-5
- NCF cable XTE, YTE IndraDrive, length 5 m KSM314030-5

Other length on request.

Typ/Art. Nr.

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Functional Principle with DMF-P A310 Universal Type 4740A...

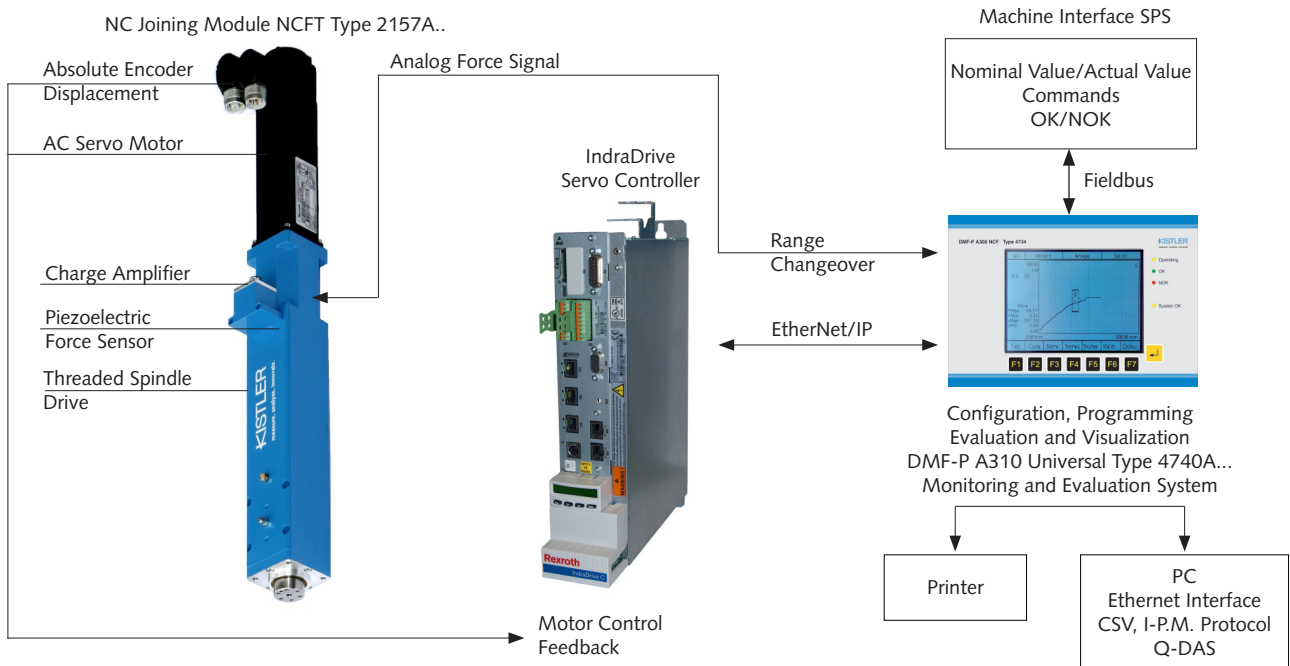


Fig. 3: Functional principle of NC joining system with NC joining module NCFT Type 2157A... and DMF-P A310 Universal Type 4740A...

Included Accessories

- None

Optional Accessories

- | | |
|-----------------------------------------------------------|----------------------------|
| • Servo controller IndraDrive 12 A EI S2 MPC07, NCFT 1 kN | Type/Art. No.
KSM036432 |
| • Evaluation unit DMF-P A310 Universal | 4740A... |
| • Wall housing evaluation unit | 4740AWY2... |
| • Desktop housing evaluation unit | 4740ATY2... |
| • Panel housing evaluation unit | 4740AEY2... |

Cable

- | | |
|-----------------------------------------------|------------------------------|
| • NCFT motor cable, length 5 m RKL4302 | Type/Art. No.
KSM315330-5 |
| • NCFT MSK Feedback cable, length 5 m RKG4200 | KSM303500-5 |
| • NCF cable force transmitter, length 5 m | KSM313720-5 |
| • Network cable A310 EtherNet/IP, length 5 m | KSM036457-5 |
| • Network cable A310 EtherNet/IP, length 10 m | KSM036458-10 |
| • Network cable A310 EtherNet/IP, length 20 m | KSM036459-20 |
| • Network cable A310 EtherNet/IP, length 30 m | KSM036460-30 |

Other length on request.

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Functional Principle with NC Compact

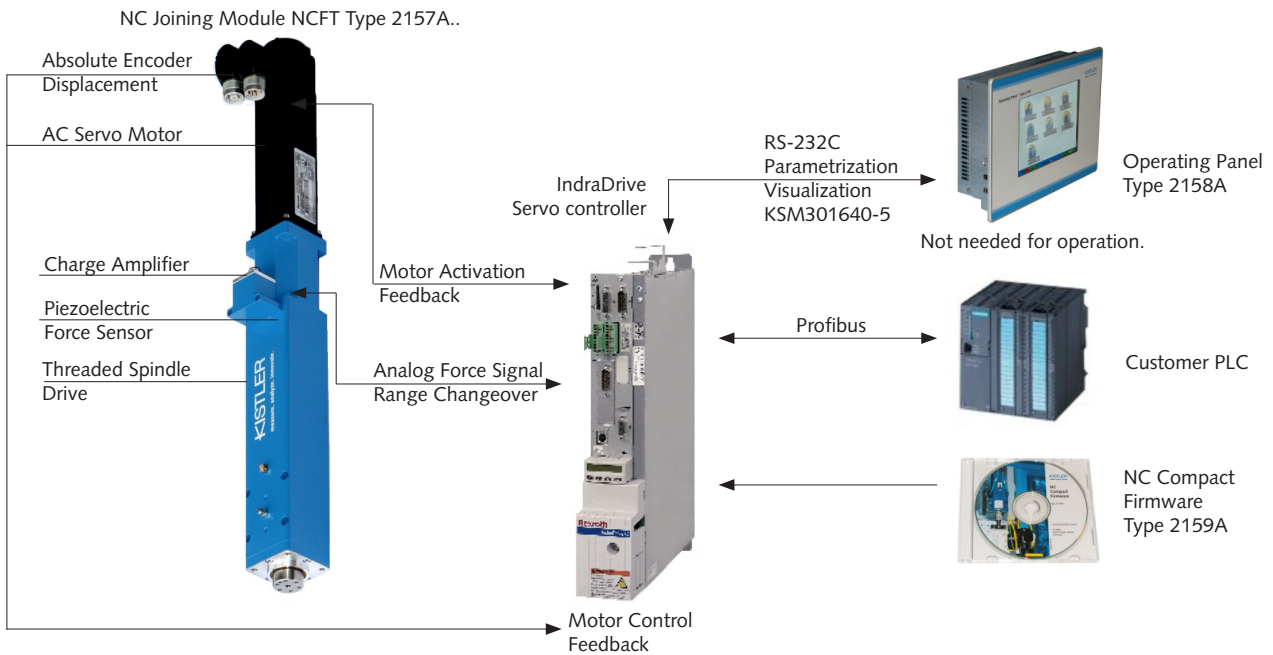


Fig. 4: Functional principle of NC joining system with NC joining module NCFT Type 2157A... and NC Compact Type 2158A and Type 2159A

Included Accessories

- None

Optional Accessories

- | | |
|--------------------------------------------------------------------------------------------------|----------------------------|
| • Servo controller for Type 2157A... with integrated safety option
IndraDrive 12A PB S2 MPH07 | Type/Art. No.
KSM035366 |
| • NC Compact Firmware | 2159A |
| • NC Compact Operating Panel | 2158A |

Cable

- | | |
|--------------------------------------------------------|------------------------------|
| • NCFT motor cable, length 5 m RKL4302 | Type/Art. No.
KSM315330-5 |
| • NCFT MSK Feedback cable, length 5 m RKG4200 | KSM303500-5 |
| • Data cable IndraDrive, length 5 m | KSM301640-5 |
| • NCF cable force transmitter, length 5 m (NC Compact) | KSM313710-5 |

Other length on request.

Note:
Other Fieldbus Interfaces e.g. EtherNet/IP, Profinet, etc. on request.

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Application Example



Fig. 5: Application example for the watch-and-clock industry

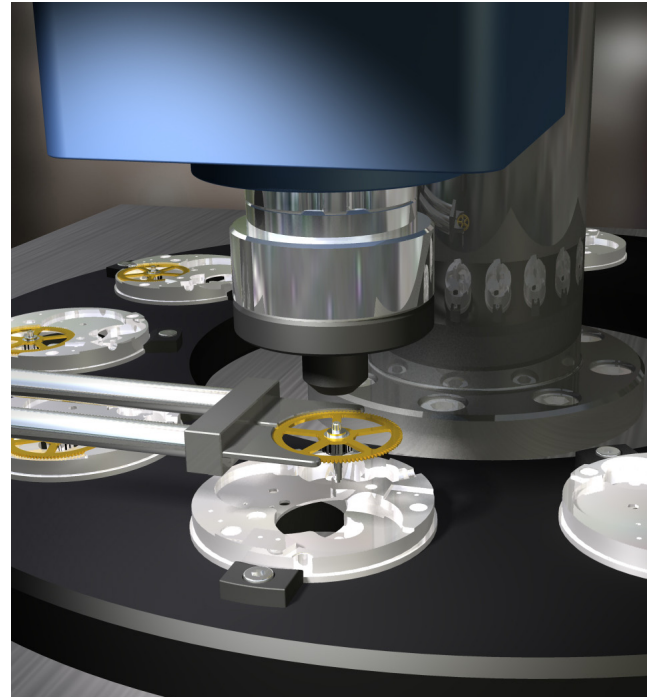


Fig. 6: Detail view

Ordering Key

Type 2157A

Meas. range 1	Meas. range 2	
0,5 kN	0,25 kN	1
1 kN	0,25 kN	2
1 kN	0,5 kN	3



Ordering example

Type 2157A2

NC joining module NCFT **Type 2157A...**, measuring range 1: **1 kN**, measuring range 2: **0,25 kN**, choice: **2**

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