

NC Joining Module NCFT

for Joining Operation with Low Forces

Type 2157B...

The NC joining module NCFT Type 2157B... with integrated piezoelectric force sensor for two predefined measuring ranges of 0,05 ... 1,5 kN is excellent for use in assembly and joining processes monitored by force displacement.

- High-precision force measurement via telemetry
- Certified for class 8 clean room use (7 possible)
- Extremely wide measuring range of 0,05 ... 1,5 kN
- High velocity for very short cycle times
- Practical repeatability <0,002 mm
- High overload capacity of sensor

Description

The NC joining modules NCFT Type 2157B... 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 an integrated charge amplifier. The force sensor is installed directly in the tool connector for maximum precision of the force measurement. Signals are transmitted by telemetry. This means that no additional connection cables are required.

The motor of the NC joining module is an electronically commutated AC servo type controlled by a servo electronics to ensure constant rotational and therefore translational speed. 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 spindle is assumed by the electronics in the servo controller.

A field bus slave interface is used to connect the system to the system controller and the Ethernet connection, including output of QA data.

The functional principle of the individual systems is described on the following pages.



Application

NC joining module NCFT Type 2157B... is excellent for applications in assembly and joining tasks in automated production plants and manual workstations. Certification of clean room capability makes the NC joining module ideal for production and product testing in medical technology. Another area of application is fine mechanical manufacturing, such as the clock making or small motor industries.

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

Page 1/6

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Tel. +41 52 224 11 11, Fax +41 52 224 14 14, info@kistler.com, www.kistler.com
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Technische Daten

Dimensions	mm	Fig. 1
Assembly options		wall assembly
Weight	kg	5,8
Max. tool weight*	kg	5
Direction of measurement		tens./compress.
Measuring range	kN	0,05
	kN	0,1
	kN	0,25
	kN	0,5
	kN	1,0
	kN	1,5
Length of stroke	mm	100
Tool holder	mm	Fig. 1, detail A
Holding brake	V/A	24/0,4
Max. movement speed	mm/s	400
Displacement sensor system		absolute encoder
Resolution	µm	0,2
Practical repeatability	mm	<0,002
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	>10 Mio.
Short stroke	mm	≤60
Central lubrication connection (internal)		standard-lubrication 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

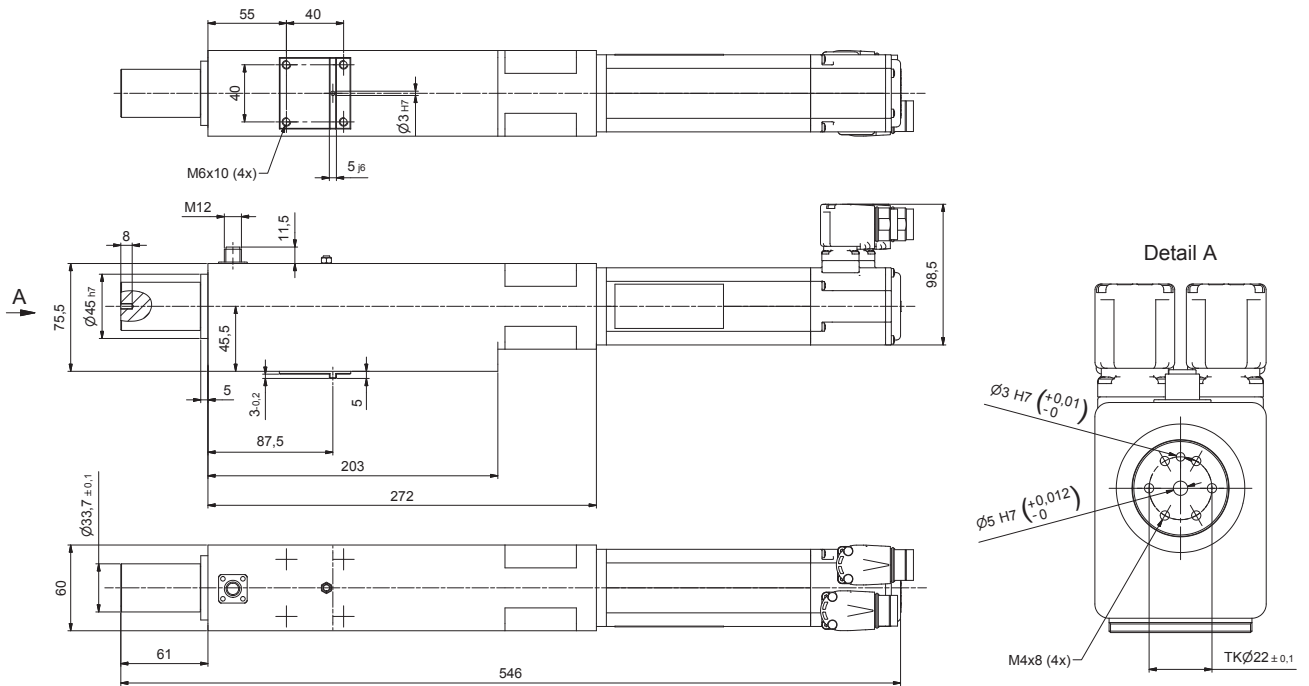
Evaluation Unit	Type 4734A... or Type 4740A...	
Standard Interface		Profibus
Power supply	VDC	24 ±10 %

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



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Fig. 1: Dimensions NC joining module NCFT Type 2157B... for measuring range of 0,05 ... 1,5 kN

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

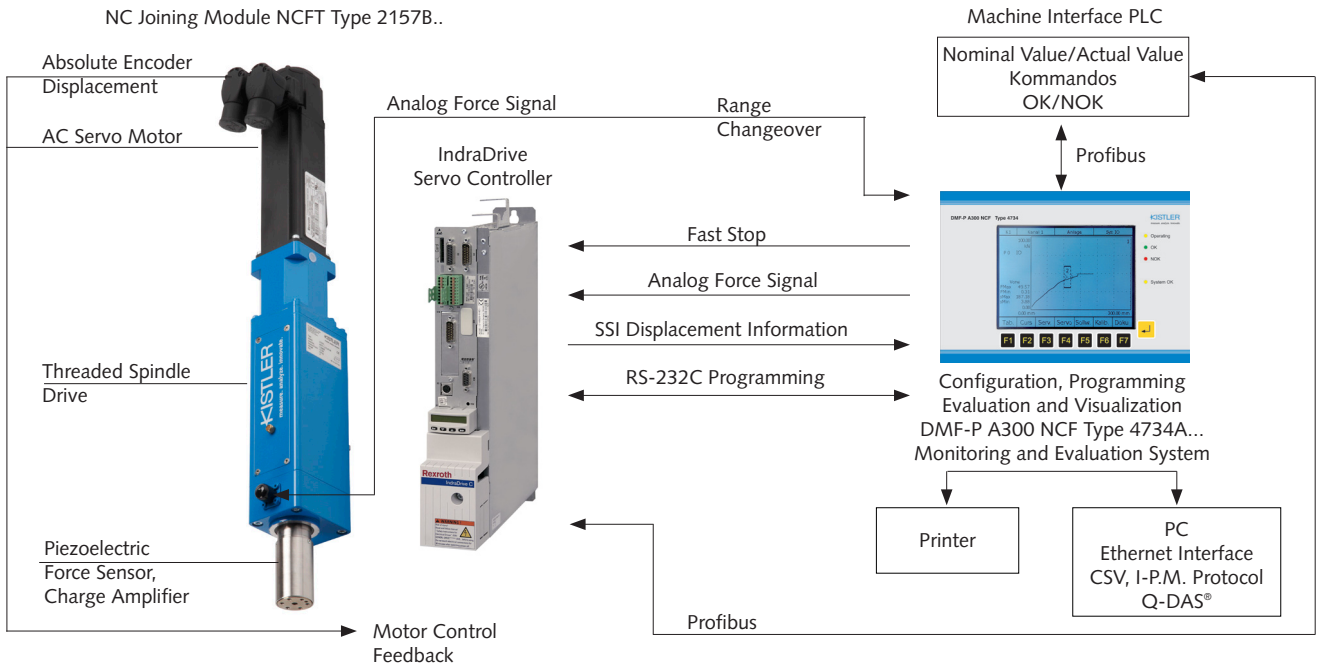


Fig. 2 Functional principal of NC joining system with NC joining module NCFT Type 2157B... and DMF-P A300 NCF Type 4734A...

Included Accessories

- None

Optional Accessories

- Servo controller for Type 2157B... 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
- NCFT Type 2157B... connection cable, length 5 m KSM381230-5
- NCF cable analog force signal, length 5 m KSM301760-5
- NCF cable XTE, YTE IndraDrive, length 5 m KSM314030-5

Other length on request.

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

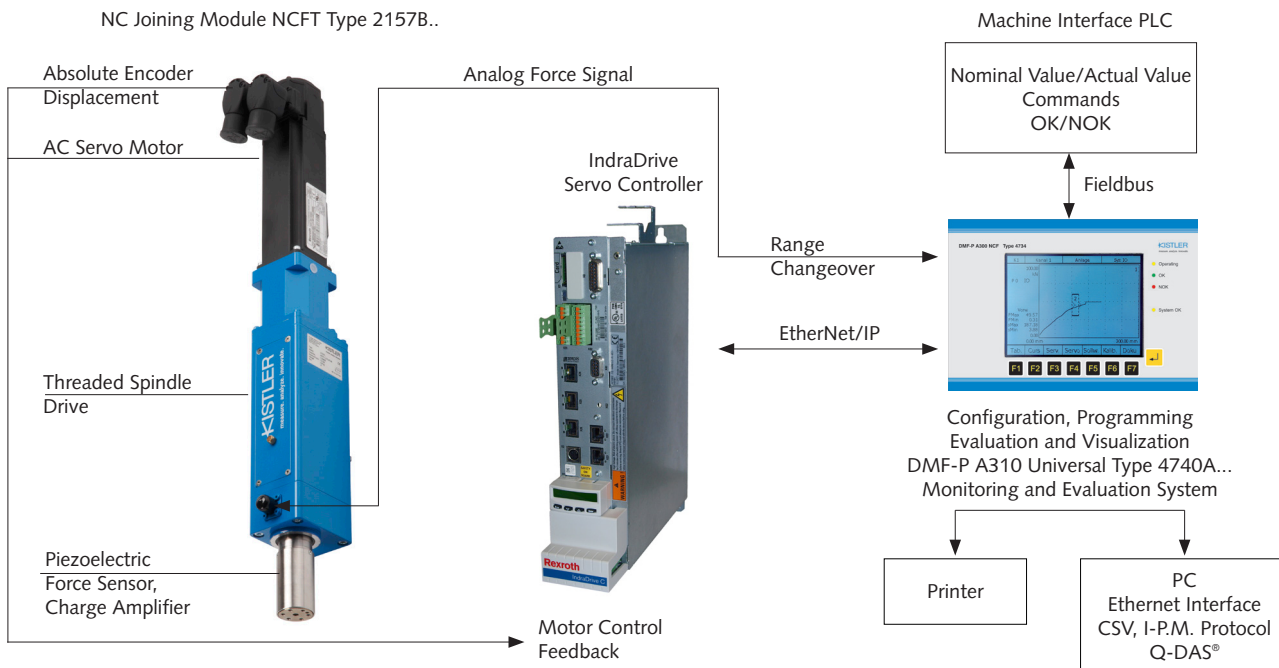


Fig. 3: Functional principle of NC joining system with NC joining module NCFT Type 2157B... and DMF-P A310 Universal Type 4740A...

Included Accessories

- None

Optional Accessories

- | | |
|---|----------------------------|
| • Servo controller for Type 2157B... with integrated safety option
IndraDrive 12 A EI S2 MPC07 | 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 |
| • NCFT Type 2157B... connection cable, length 5 m | KSM381230-5 |
| • 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

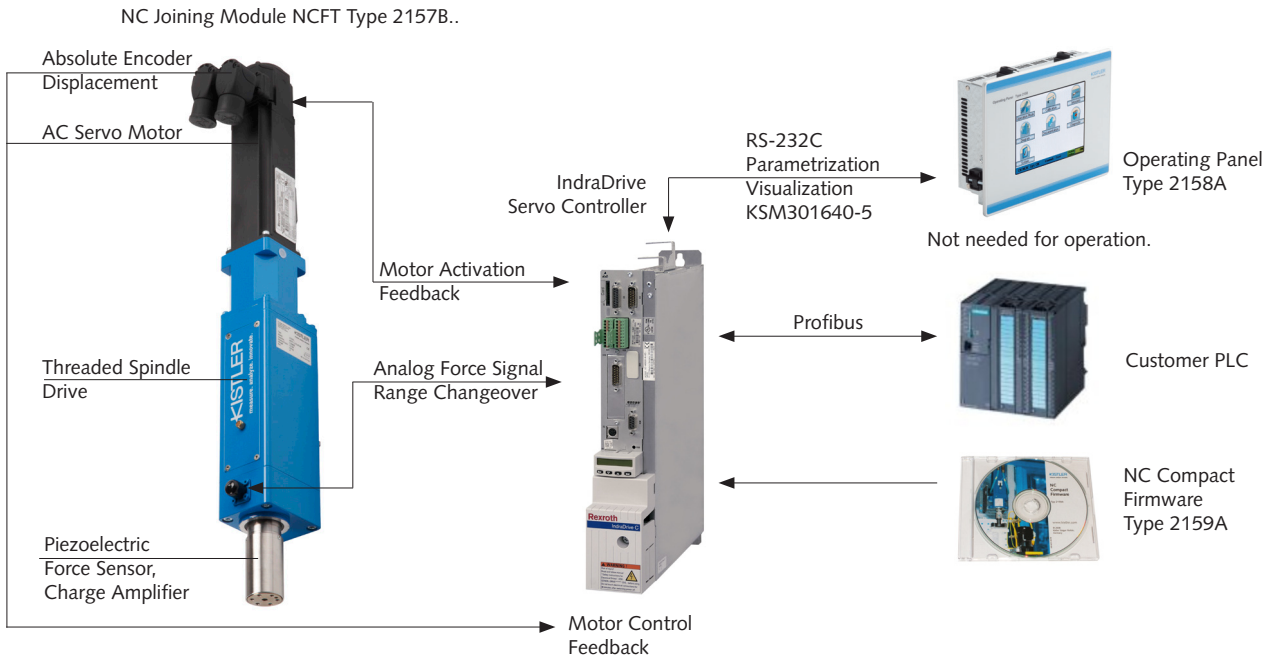


Fig. 4: Functional principle of NC joining system with NC joining module NCFT Type 2157B... and NC Compact Type 2158A and Type 2159A

Included Accessories

- None

Optional Accessories

- | | |
|--|----------------------------|
| • Servo controller for Type 2157B... 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 |
| • NCFT Type 2157B... connection cable NC Compact, length 5 m | KSM381230-5 |

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

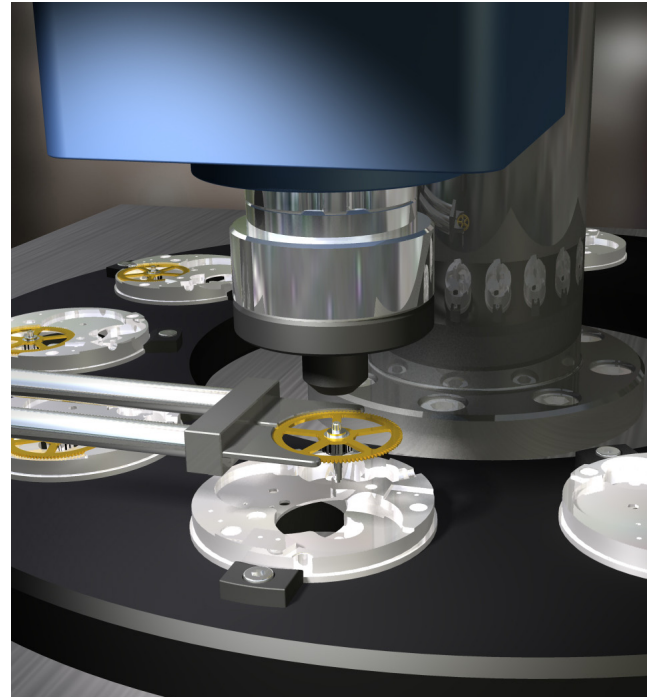


Fig. 6: Detail view watch-and-clock industry

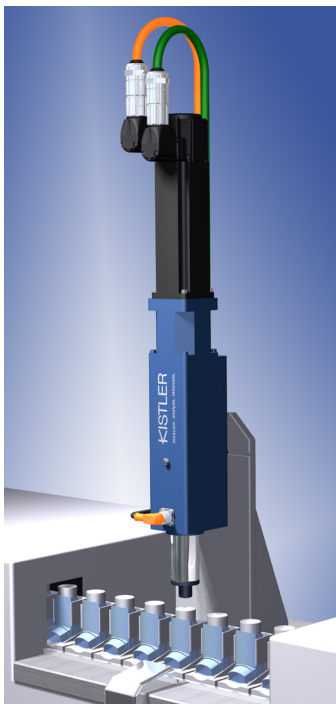


Fig. 7: Testing an inhaler

Ordering Key

Type 2157B

Meas. range 1 [kN]	Meas. range 2 [kN]	
0,25	0,05	1
0,25	0,10	2
0,50	0,10	3
0,50	0,25	4
1	0,25	5
1	0,50	6
1,50	0,10	7
1,50	0,50	8

Ordering Example

Type 2157B5

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

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