

NC Joining System

NC Joining Module NCFN

Type 2153A...

for Joining Operation with Single-Channel Control Systems

The NC joining module NCFN Type 2153A... with integrated strain gage force sensor for nominal forces of 30 ... 300 kN is excellent for use in assembly and joining processes monitored by force displacement.

- Force feedback control
- High velocity
- Practical repeatability <0,01 mm
- High measuring accuracy for all ranges
- Active compensation of process compression for exact positioning
- High overload capacity
- Easy handling

Description

The NC joining modules NCFN Type 2153A... consist of a robust housing with an integral strain gage tension/compression force sensor. An absolute encoder for precise positioning is integrated in the drive motor. The motor is an electrically commutated AC servo motor which is driven 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 NCFN 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 NCFN Type 2153A... is excellent for applications in assembly and joining tasks in automated production plants and manual-work places.

Vertical and horizontal installation is possible and is performed by flange or wall mounting. Tapped holes for tool mounting are located at the tappet of the ball bearing screw (Fig. 1).



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Technical Data

Dimensions	mm	Fig. 1
Assembly		Wall or flange assembly
Weight	kg	refer dimension
Max. tool weight*	kg	refer dimension
Direction of measurement		tension/ compression
Nominal force	kN	30, 60, 100, 200, 300
Stroke length		
only nominal force ≤100 kN	mm	200
nominal force 30 ... 300 kN	mm	400
Anti rotate tool fitting		Fig. 1
Safety device optional	V/A	24/3 to 5 ¹⁾
Holding brake (standard)	V/A	24/0,7 to 1,5 ¹⁾
Max. speed		
NC joining module 300 kN	mm/s	100
NC joining module 200 kN	mm/s	140
NC joining module 100 kN	mm/s	200
NC joining module 30, 60 kN	mm/s	250
Displacement sensor system		absolute encoder
Resolution	mm	0,001
Force sensor		strain gage
Accuracy	%	<0,5
Temperature range	°C	10 ... 40

Protection class		IP54
Life cycle ball screw (per defined drive profile)	cycles	approx. 10 million

Servo Controller	Bosch-Rexroth Type IndraDrive	
Standard Interface**		Profibus
Control voltage	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
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

¹⁾ Dependent size/type

To assure sufficient lubrication in case of strokes which are considerably smaller than the nominal stroke one nominal stroke has to be made at regular intervals.

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Dimensions

Type	A	A**	B	øJ	øK	C2	C3	G1	G2	P	O	R	F1	F2	C1	X	Y	øV
2153A030200	1 042	1 237	528	90	120	50	5	148	150	100	100	M12x24	75	75	215	20	4,5	11
2153A030400	1 242	1 437	728	90	120	50	5	148	150	100	100	M12x24	75	75	215	20	4,5	11
2153A060200	1 150	1 345	544	110	150	50	5	177	180	130	130	M16x32	90	90	215	20	4,5	13,5
2153A060400	1 350	1 545	744	110	150	50	5	177	180	130	130	M16x32	90	90	215	20	4,5	13,5
2153A100200	1 332,5	1 557,5	640	160	195	50	5	227	230	170	170	M20x40	115	115	280	28	6	17,5
2153A100400	1 532,5	1 757,5	840	160	195	50	5	227	230	170	170	M20x40	115	115	280	28	6	17,5
2153A200400	1 732,5	1 957,5	968	160	200	50	5	247	250	190	190	M20x40	115	115	282	36	9	22
2153A300400	1 885,5	2 110,4	1 035	200	240	72	8	297	300	210	210	M24x48	150	150	377	36	9	26

** Dimensions with safety device

Type	øL	H	D	E	Z	M	øT	N	øS	W	U	Q	Weight [kg]	Tool weight [kg]
2153A030200	18	75	150	150	125	65	8x16	68	8x16	112,5 °	8x45 °	M8x16	75	100
2153A030400	18	75	150	150	125	65	8x16	68	8x16	112,5 °	8x45 °	M8x16	95	100
2153A060200	20	90	140	150	150	80	8x16	82	10x10	112,5 °	8x45 °	M10x20	115	100
2153A060400	20	90	140	150	150	80	8x16	82	10x10	112,5 °	8x45 °	M10x20	140	100
2153A100200	26	80	204	180	200	120	10x20	106	12x24	112,5 °	8x45 °	M16x32	225	100
2153A100400	26	80	204	180	200	120	10x20	106	12x24	112,5 °	8x45 °	M16x32	270	100
2153A200400	33	100	200	200	205	120	10x20	115	12x24	112,5 °	8x45 °	M16x32	355	100
2153A300400	40	145	270	250	252	140	12x24	135	12x24	112,5 °	8x45 °	M16x32	794	150

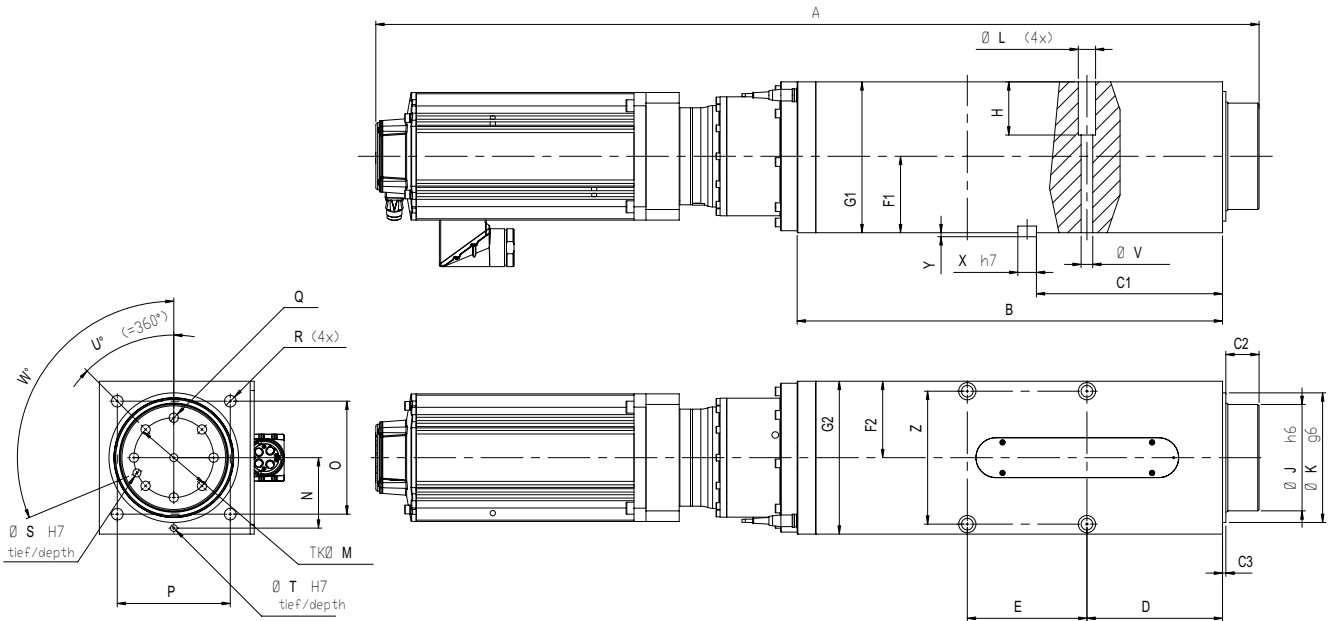


Fig. 1: Dimensions NC joining module NCFN Type 2153A...

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

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

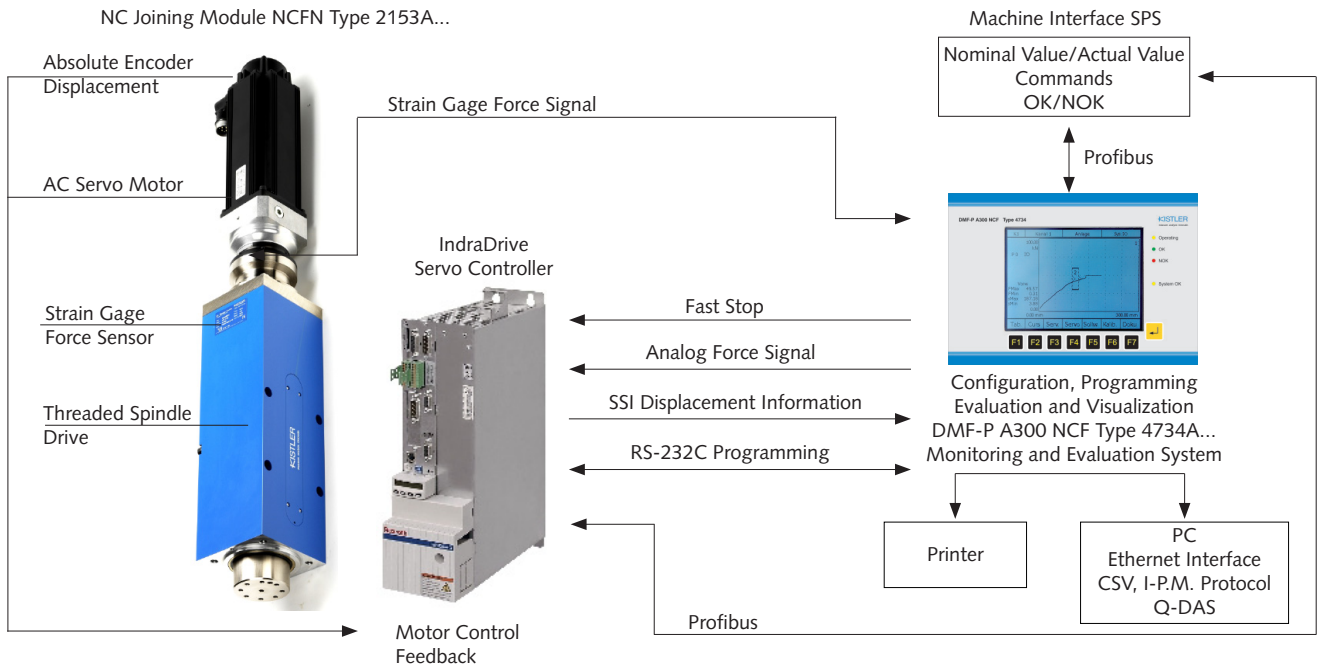


Fig. 2: Functional principle of NC joining system with NC joining module NCFN Type 2153A... and DMF-P A300 NCF Type 4734A...

Included Accessories

- None

Optional Accessories

- | | |
|--|--------------|
| • Servo controller for Type 2153A... with integrated safety option
IndraDrive 54 A PB S2 MPH07 | KSM035374 |
| • Servo controller for Type 2153A... with integrated safety option
IndraDrive 70 A PB S2 MPH07 | KSM035377 |
| • Servo controller for Type 2153A... with integrated safety option
IndraDrive 100 A PB S2 MPH07 | KSM035362 |
| • Evaluation unit DMF-P A300 NCF | 4734A... |
| • Wall housing evaluation unit | 4734AWDY1... |
| • Desktop housing evaluation unit | 4734ATDY1... |
| • Panel housing evaluation unit | 4734AEDY1... |

Cable

- | | |
|---|-------------|
| • NCFN 30 motor cable, length 5 m RKL4309 | KSM303490-5 |
| • NCFN 60 motor cable, length 5 m RKL4314 | KSM305640-5 |
| • NCFN 100 motor cable, length 5 m RKL4323 | KSM307530-5 |
| • NCFN 200/300 motor cable, length 5 m RKL4329 | KSM316330-5 |
| • NCFN 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 |
| • NCFN Strain gage force cable, length 5 m | KSM206000-5 |
| • 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...

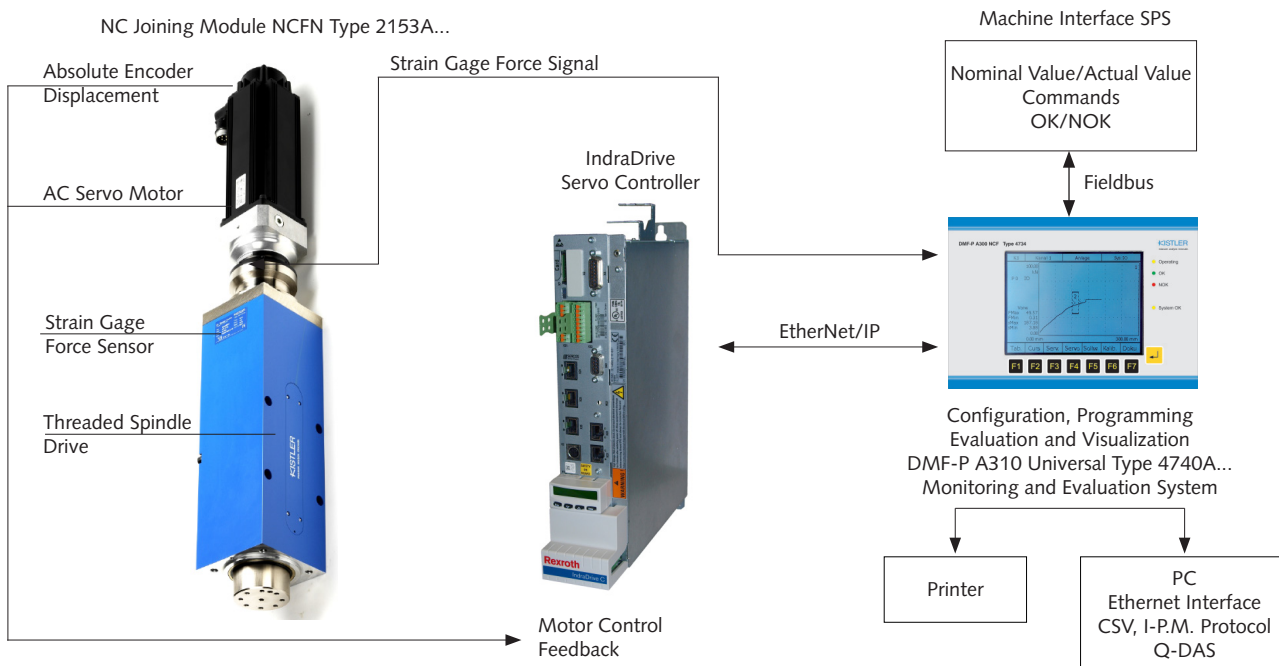


Fig. 3: Functional principle of NC joining system with NC joining module NCFN Type 2153A... and DMF-P A310 Universal Type 4740A...

Included Accessories

- None

Optional Accessories

	Type/Art. No.
• Servo controller IndraDrive 54 A EI S2 MPC07, NCFN 30 kN	KSM036444
• Servo controller IndraDrive 70 A EI S2 MPC07, NCFN 60/100 kN	KSM036448
• Servo controller IndraDrive 100 A EI S2 MPC07, NCFN 200/300 kN	KSM036453
• Evaluation unit DMF-P A310 Universal	4740A...
• Wall housing evaluation unit	4740AWY1...
• Desktop housing evaluation unit	4740ATY1...
• Panel housing evaluation unit	4740AEY1...

Cable

	Type/Art. No.
• NCFN 30 motor cable, length 5 m RKL4309	KSM303490-5
• NCFN 60 motor cable, length 5 m RKL4314	KSM305640-5
• NCFN 100 motor cable, length 5 m RKL4323	KSM307530-5
• NCFN 200/300 motor cable, length 5 m RKL4329	KSM316330-5
• NCFN MSK Feedback cable, length 5 m RKG4200	KSM303500-5
• NCFN Strain gage force cable, length 5 m	KSM206000-5
• 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

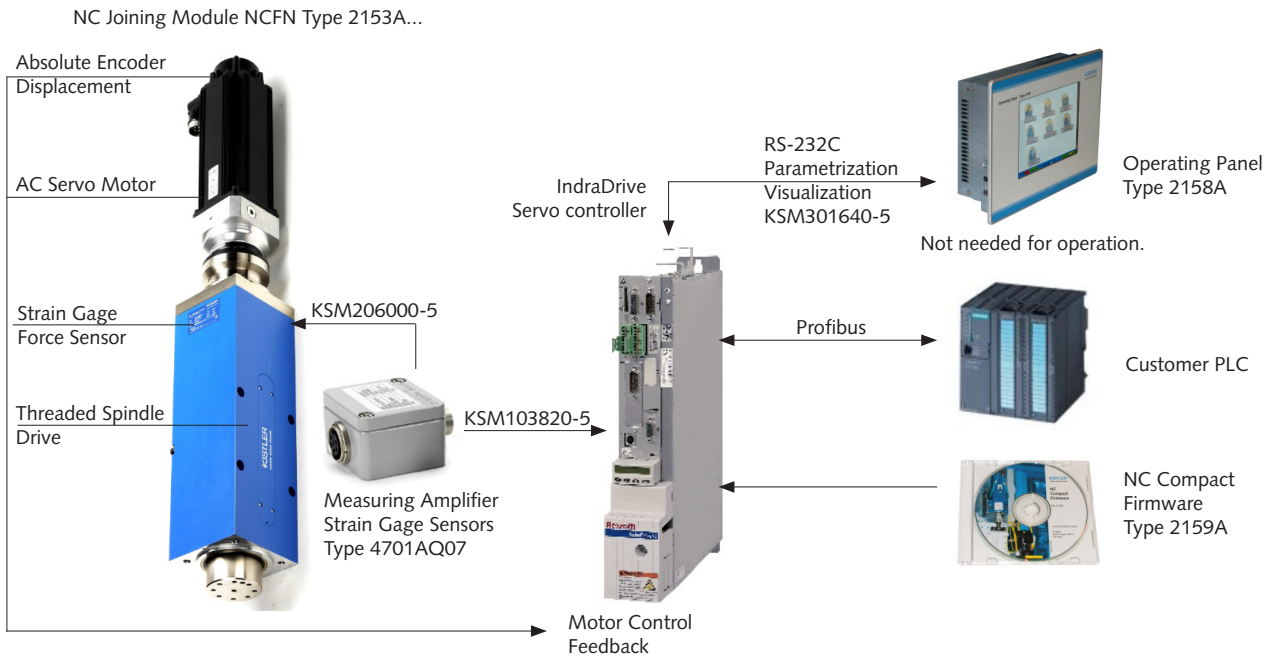


Fig. 4: Functional principle of NC joining system with NC joining module NCFN Type 2153A... and NC Compact Type 2158A and Type 2159A

Included Accessories

- None

Optional Accessories

- | | |
|--|-----------|
| • Servo controller for Type 2153A... with integrated safety option
IndraDrive 54 A PB S2 MPH07 | KSM035374 |
| • Servo controller for Type 2153A... with integrated safety option
IndraDrive 70 A PB S2 MPH07 | KSM035377 |
| • Servo controller for Type 2153A... with integrated safety option
IndraDrive 100 A PB S2 MPH07 | KSM035362 |
| • NC Compact Firmware | 2159A |
| • NC Compact Operating Panel | 2158A |
| • Measuring amplifier for strain gage sensors | 4701AQ07 |

Cable

- | | |
|--|-------------|
| • NCFN 30 motor cable, length 5 m RKL4309 | KSM303490-5 |
| • NCFN 60 motor cable, length 5 m RKL4314 | KSM305640-5 |
| • NCFN 100 motor cable, length 5 m RKL4323 | KSM307530-5 |
| • NCFN 200/300 motor cable, length 5 m RKL4329 | KSM316330-5 |
| • NCFN MSK Feedback cable, length 5 m RKG4200 | KSM303500-5 |
| • NCFN Strain gage force cable, length 5 m | KSM206000-5 |
| • Data cable IndraDrive, length 5 m | KSM301640-5 |
| • Cable DMS free/KD6 Tuchel | KSM103820-5 |
- Other length on request.

Type/Art. No.

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

Ordering Key

Type 2153A

Nominal Force [kN]

30	030
60	060
100	100
200	200
300	300

Stroke Length [mm]

200 only nominal force ≤100 kN	200
400	400

Speed [mm/s]

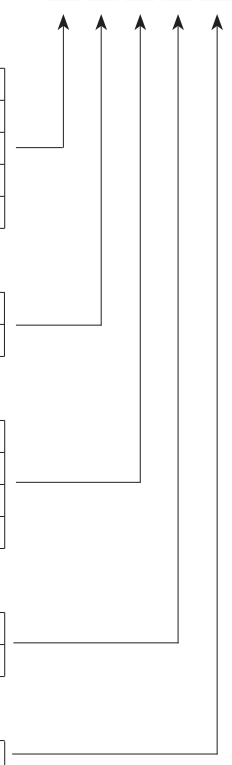
100 mm/s only 300 kN	0
140 mm/s only 200 kN	1
200 mm/s only 100 kN	2
250 mm/s only 30 and 60 kN	3

Brake

holding brake (standard)	H
safety brake ¹⁾	K

Configuration

straight	G
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¹⁾ Safety device is optional

Ordering Example: Type 2153A0602003HG

NC joining module NCFN **Type 2153A...**, nominal force **60 kN**, stroke **200 mm**, speed **250 mm/s**, holding brake **H**, configuration **G**

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