

NC Joining Module NCFB with Cost Optimized Standard Design

Type 2160A...

The joining module Type 2160A... (in two size available) with integral piezoelectric force sensor and measuring ranges of 5 ... 50 kN is for force-displacement assembly and joining processes. This extremely economically priced NC joining module NCFB allows the user to implement standard joining processes cost-effectively using electromechanical joining modules.

- Force feedback control
- Direction of measurement: compression
- Integral charge amplifier
- High measuring accuracy in two ranges
- High rigidity
- High level of sensor overload protection

Description

The NC joining module Type 2160A... consists of a robust case with integral piezoelectric force sensor. Its motor has an absolute encoder for exact positioning. The compression forces acting on the sensor's piezoelectric measuring element generate a proportional electric charge converted by the integral charge amplifier into an analog voltage signal.

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 such as block pressing, position pressing and force feedback controlled pressing as well as intermediate positioning are supported.

The NC joining module NCFB can be operated with the IndraDrive servo amplifier in combination with maXYmos NC type 5847A... The communication between IndraDrive and maXYmos NC takes place in real-time via SERCOS III. Several field bus slave interfaces are available onboard for customer controlling. PROFIBUS, PROFINET, EtherNet/IP or even EtherCAT can be used with the maXYmos NC can be used at the customer's choosing. Quality data can be transmitted via the Ethernet interface through different protocols and a visualization via VNC® or a data backup can be performed.



Application

The NC joining module NCFB Type 2160A... is ideal for use in automated production systems.

Assembly is possible vertically and horizontally. The module can be flanged onto the frame of the production unit. Threaded bores of sufficient strength to hold tools are provided in the ram of the threaded spindle drive (Figure 1 and 2).

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Technical Data

Dimensions	mm	Fig. 1 and 2
Assembly options		flange assembly
Weight		
Type 2160A15...	kg	35
Type 2160A50...	kg	145
Max. tool weight Type 2160A15...		
without holding brake ¹⁾	kg	10
with holding brake ¹⁾	kg	50
Max. tool weight Type 2160A50...		
without holding brake ¹⁾	kg	15
with holding brake ¹⁾	kg	100
Holding brake	V/A	24/0,7
Direction of measurement		compression
Measuring range		
Type 2160A15...	kN	5, 15
Type 2160A50...	kN	25, 50
Length of stroke		
Type 2160A15...	mm	200
Type 2160A50...	mm	400
Practical repeatability	mm	0,01
Tool holder	mm	Fig. 1 and 2
Max. movement speed		
Type 2160A15...	mm/s	250
Type 2160A50...	mm/s	150
Displacement sensor system		absolute encoder
Resolution	mm	0,001
Force sensor		piezoelectric
Temperature range	°C	10 ... 40

¹⁾ Attention has to be paid to possible radial forces independent of the installation position. Permissible tool weight may have to be reduced for manual feed.

A bending of the plunger depending on the tool weight must be considered for a horizontal installation.

Protection class		IP54
Linearity in all ranges	%FSO	≤1
Accuracy class force sensor	%	0,5
Service life of spindle (acc. to defined drive profile)	cycles	approx. 5 million
Short stroke		
Type 2160A15...	mm	≤70
Type 2160A50...	mm	≤120
Lubrication connection (internal)		standard- lubrication nipple

Servo amplifier²⁾ Bosch-Rexroth Type 2180A...
Standard interface SERCOS III (internal bus)

Evaluation unit³⁾ maXYmos NC Type 5847A...
Standard interface PROFIBUS, PROFINET,
EtherNet/IP, EtherCAT

Power supply VDC 24 ±5 %

²⁾ Servo amplifier see accessories data sheet 003-125 Type 2180A...

³⁾ Evaluation unit maXYmos NC Type 5847A... see data sheet 003-126

Dimensions NC Joining Module NCFB Type 2160A...

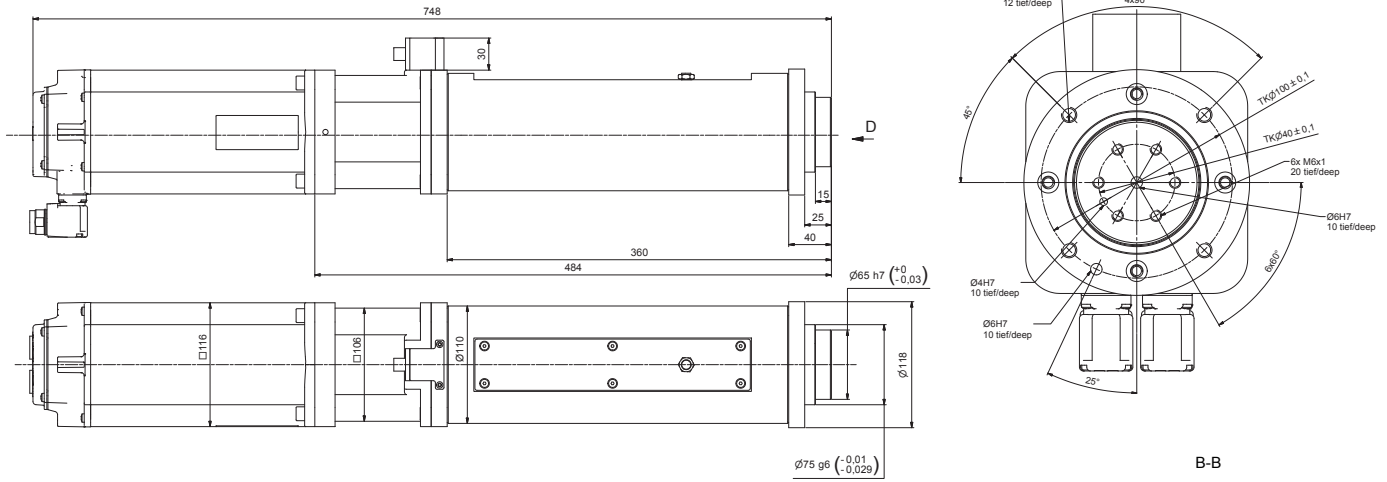


Fig. 1: Dimensions NC joining module NCFB Type 2160A15... measuring range 1: 15 kN and measuring range 2: 5 kN

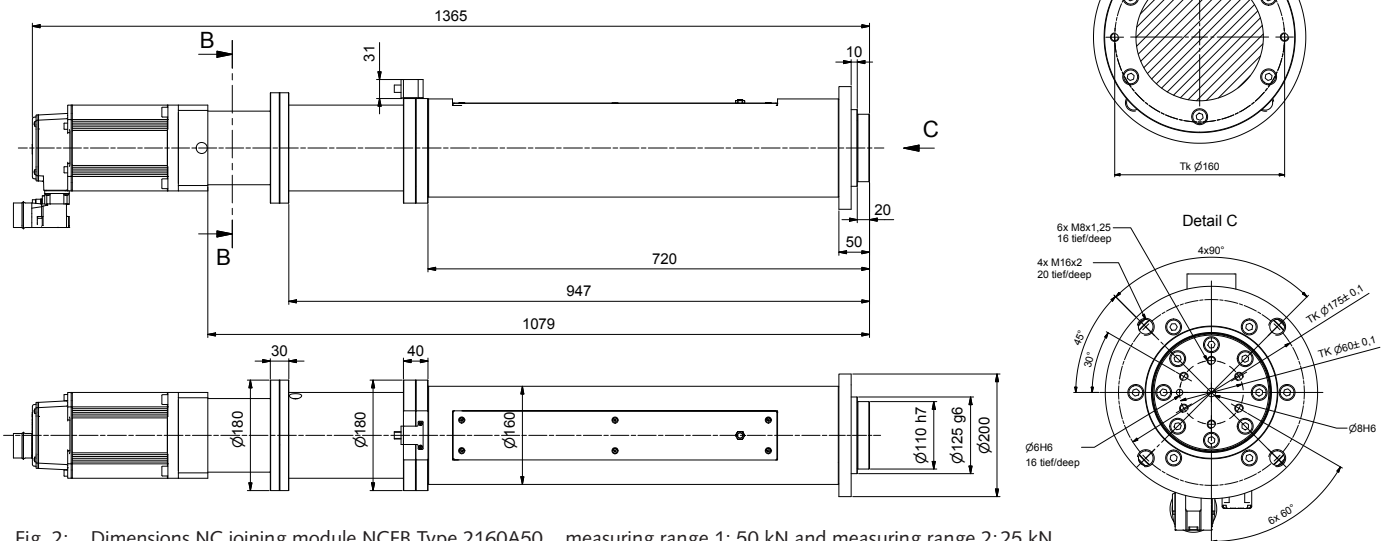


Fig. 2: Dimensions NC joining module NCFB Type 2160A50... measuring range 1: 50 kN and measuring range 2: 25 kN

The radial forces (for example due to the weight of the tool) must be considered for the installation. An external guide may have to be provided for the plunger.

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Functional Principle with maXYmos NC Type 5847A...

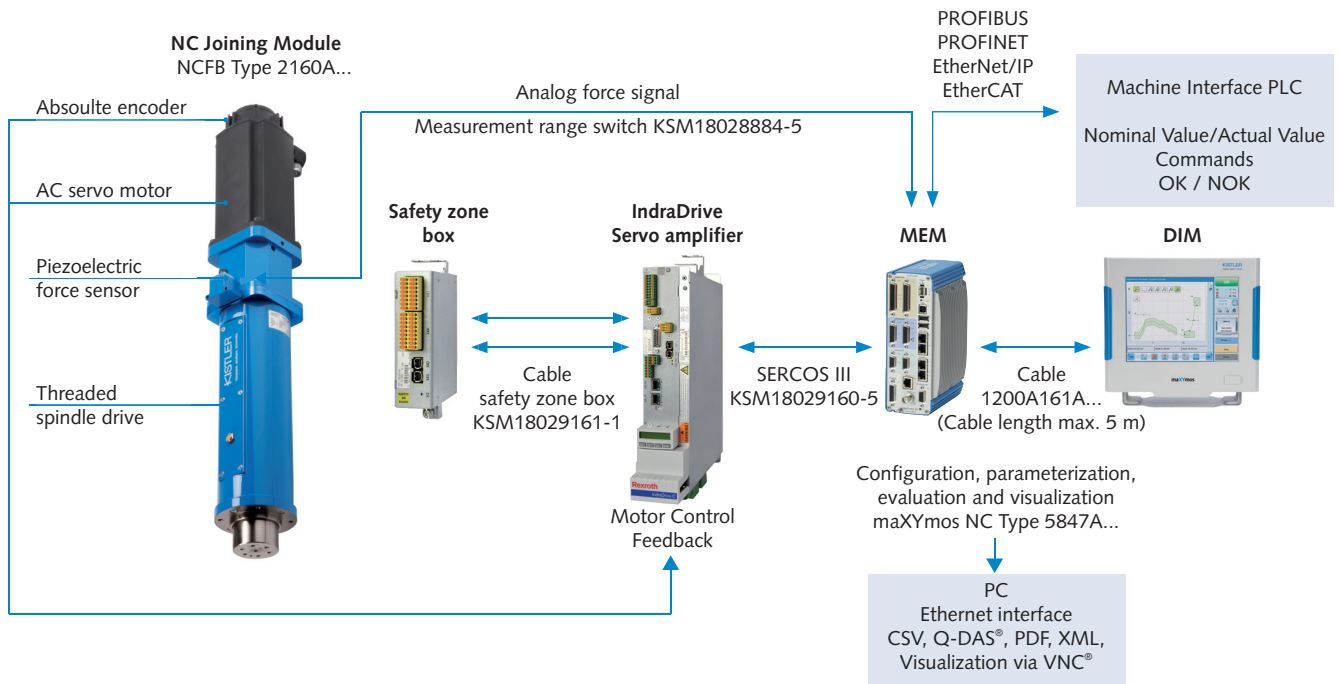


Fig. 3: Functional principle of NC joining system with NC joining module NCFB Type 2160A... and maXYmos NC Type 5847A...

Included Accessories

- None

Optional Accessories

	Type/Art. No.
• Evaluation unit maXYmos NC ⁴⁾ (MEM)	5847A...
• Bearing rail adapter for 35 mm Cap rail including 2 fastening screws M3x10	5700A31
• Display module (DIM) with pedestal	5877AZ000
• Connection cable maXYmos MEM on DIM, length 5 m	1200A161A5
• Servo amplifier ²⁾	2180A...

²⁾ Servo amplifier Type 2180A... see accessory data sheet 003-125

⁴⁾ Evaluation unit maXYmos NC Type 5847A... see data sheet 003-126

Cable

	Type/Art. No.
• NCFB 15 motor cable, length 5 m RKL4302	KSM341600-5
• NCFB 50 motor cable, length 5 m RKL4306	KSM347990-5
• NCFB MSK Feedback cable, length 5 m RKG4200	KSM303500-5
• maXYmos Force transmitter cable, length 5 m	KSM18028884-5
• SERCOS III connection cable, length 5 m	KSM18029160-5
• Safety zone box cable, 2 cables required), length 1 m	KSM18029161-1

Other length on request.

Ordering Key Servo Amplifier for NCFB

Power section for NC joining module		Type 2180A
NCFB 2160A 15...	NCFB0015	□ □
NCFB 2160A 50...	NCFB0050	
Safety technology		
with safety zone box	SB	

2160A_000-764e-06.15

Ordering Key

Type 2160A

Mating Force [kN]			
Measuring range 1	15	15	↑
Measuring range 2	5		
Measuring range 1	50	50	↑
Measuring range 2	25		
Stroke [mm]			
200 (only 15 kN)		200	↑
400 (only 50 kN)		400	
Holding Brake			
Without holding brake ¹⁾		N	↑
With holding brake ²⁾		H	

Note:

¹⁾ Without holding brake 10 kg at 15 kN
15 kg at 50 kN

²⁾ With holding brake 50 kg at 15 kN
100 kg at 50 kN

Ordering Example

Type **2160A50400N**

NC joining module NCFB **Type 2160A...**, measuring range 1: **50 kN**,
stroke: **400** mm, without holding brake: **N**.