



www.fenac.com.tr

- ENCODERS
- SENSORS
- MOTORFEEDBACK

Welcome to the world of quality encoders



The company Fenac was founded in 2002 with 20 years industry and production experience in the industrial automation market. Fenac Engineering defined and positioned itself as a global producer of motion control and feedback devices. For that purpose company enlarge the product range day by day according to customer and market requirements.

Fenac's initial aim is to produce high quality, leading-edge and competitive motion control products for different tasks and applications like all kind of industrial machines, iron-steel motors, different model and type elevator motors, machine tools, weigh scales, conveyors, printing machines, drives, textile machines, production lines, injection - moulding machines, test machines, elevators/lifts, door and gates.

As a result of aiming high quality motion control products, Fenac has the following products in the product range;

- Optical Incremental Encoders
- Optical Absolute Encoders
- Magnetic Incremental Encoders
- Magnetic Absolute Encoders
- Draw Wire Units - Wire Actuated Encoders
- Magnetic Linear Encoders
- Encoder With Analog Outputs
- Heavy Duty Encoders
- Linear Solutions
- Rotary Potentiometers
- Textile Solutions



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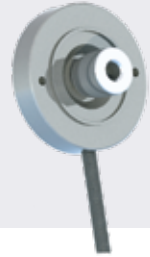
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- BISS
- PARALLEL
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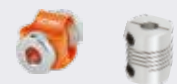
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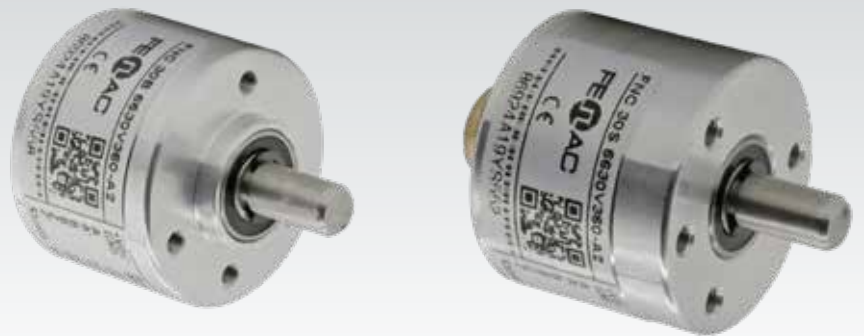
Paper and Pulp Industry



Wind Turbine Applications

Incremental encoders

- **Robust**
- **Reliable**



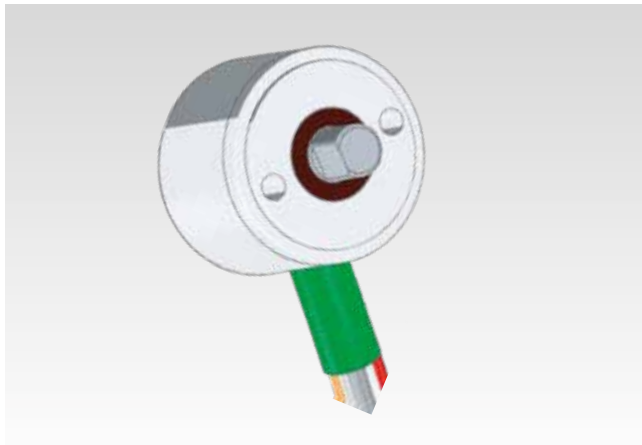
Incremental encoders

Resolution 1...1024 pulses



6

FNC 16S Series, 16 mm Housing, Micro Encoders



Features

- Industry 16 mm special size, servo flange
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 1024 PPR max.
- <300 kHz frequency

PPR Options :

1 to 1024 All PPR, 2048, 4096

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤30 mA (24 VDC)
Resolution (steps/turn)	1...1024
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø16 mm
Shaft loading	≤20 N axial ≤30 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.01 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft Diameter:	up to 4 mm
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	130 g

Accessories

Connectors and cables

CRM1204 M12 4 poles female connector or see page 206

Mounting coupling

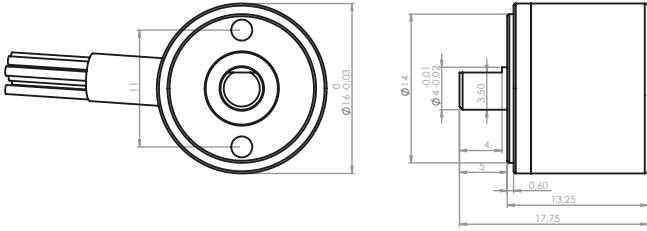
SK240606 plastic or see page 204

Mounting accessories

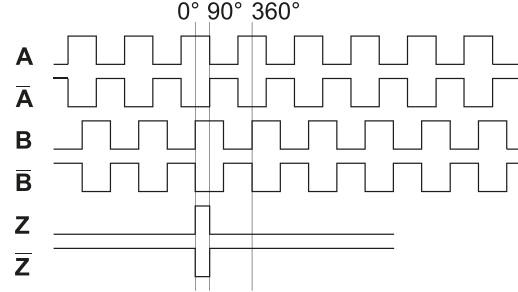
YY RST Spring or see page 202-203

FNC 16S Series, 16 mm Housing, Micro Encoders

Mechanical Dimensions



Pulse Diagram



Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.

For further information please see page 206

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 16 S M 4 6 30V 1024 - R2

Housing:
16 : 16mm

Flange Type:
S : Clamping Flange

O : Optical
M : Magnetic

Shaft diameter : up to 4 mm

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:

Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)

Connector:

R1204 R1212
R1205 R1607
R1208 R1614

PPR Options :

1 to 24 - 64 - 128 - 256- 512 - 1024 ppr

Supply Voltage and output circuit :

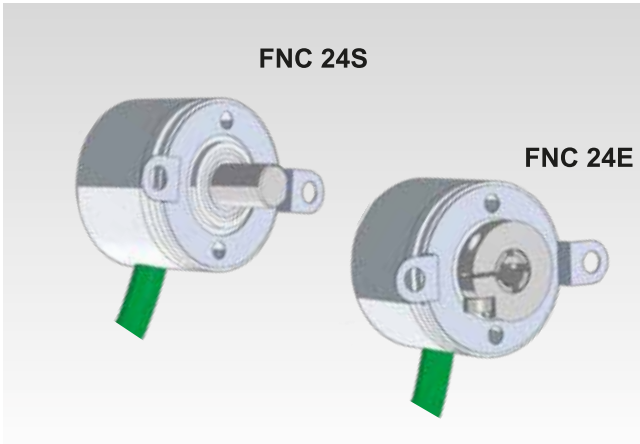
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1...4096 pulses



FNC 24S / 24E Series, 24 mm Housing, Micro Encoders



Features

- Industry 24 mm special size, servo flange and clamp flange
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 4096 PPR max.
- <300 kHz frequency

PPR Options :

1 to 1024 All PPR- 2048 - 4096

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤30 mA (24 VDC)
Resolution (steps/turn)	1...4096
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø24 mm
Shaft loading	≤20 N axial ≤30 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.01 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft Diameter:	24E shaft up to 5 mm 24S shaft up to 6 mm
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	130 g

Accessories

Connectors and cables

CRM1204 M12 4 poles female connector or see page 206

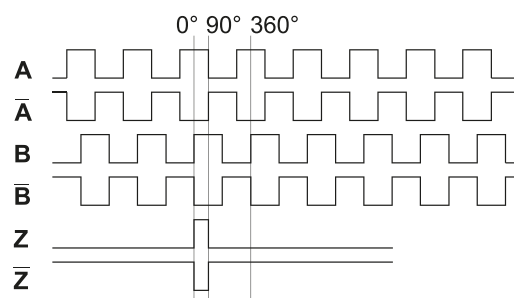
Mounting coupling

SK240606 plastic or see page 204

Mounting accessories

YY RST Spring or see page 202-203

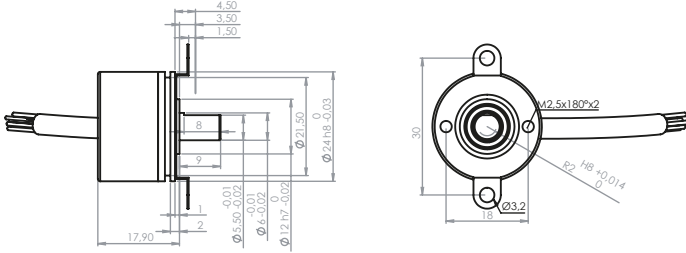
Pulse Diagram



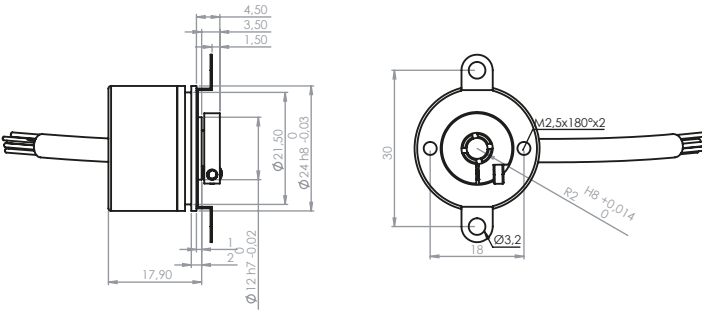
FNC 24S / 24E Series, 24 mm Housing, Micro Encoders

Mechanical Dimensions

FNC 24S



FNC 24E



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.

For further information please see page 206

Encoder Part Number

FNC 24 S M 6 6 30V 1024 - R2

Housing:
24 : 24mm

Flange Type:
S : Clamping Flange
E : End shaft

O : Optical
M : Magnetic

Shaft diameter :
24E shaft up to 5 mm
24S shaft up to 6 mm

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:

Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)

Connector:

R1204 R1212
R1205 R1607
R1208 R1614

PPR Options :

1 to 256 - 512 - 1024 - 2048 - 4096 ppr

Supply Voltage and output circuit :

5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1...2500 pulses



FNC 30S Servo Flange / 30B Clamping Flange Series

10



Features

- Industry 30 mm special size, servo flange and clamp flange
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 2500 PPR max.
- <300 kHz frequency

PPR Options :

1 to 1024 all PPR, - 360 - 500 - 512 - 720 - 1000 - 1024
1250 - 1440 - 2000 - 2048 - 2500

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤30 mA (24 VDC)
Resolution (steps/turn)	1...2500
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø30 mm
Shaft loading	≤20 N axial ≤30 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.01 Nm (IP 67)
Materials	Housing: stainless steel Flange: stainless steel Shaft : stainless steel
Shaft Diameter:	4, 6, 8 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	130 g

Accessories

Connectors and cables

CRM1204 M12 4 poles female connector or see page 206

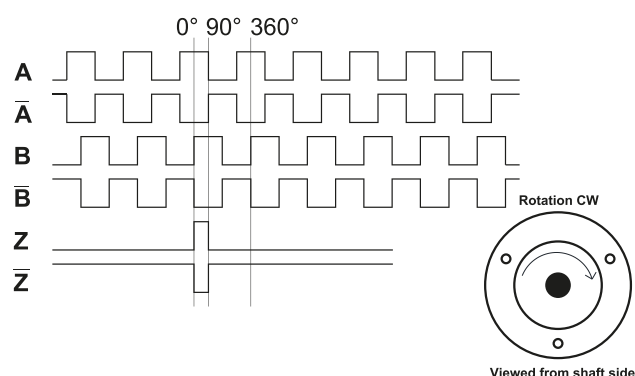
Mounting coupling

SK240606 plastic or see page 204

Mounting accessories

YY RST Spring or see page 202-203

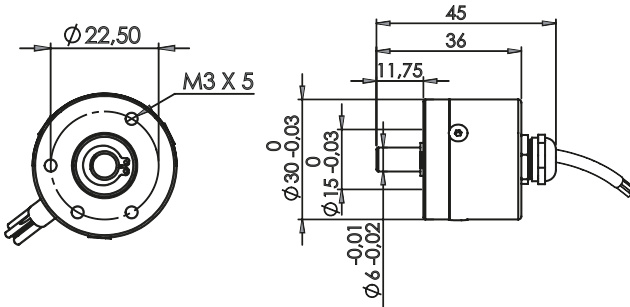
Pulse Diagram



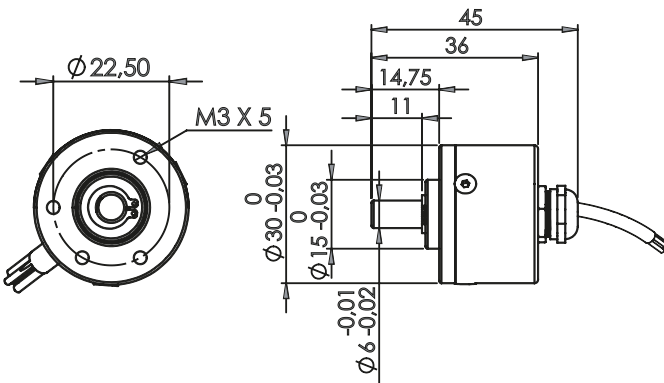
FNC 30S Servo Flange / 30B Clamping Flange Series

Mechanical Dimensions

30S



30B



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.

For further information please see page 206

Encoder Part Number

FNC 30 S 6 6 30V 1000 - R2

Housing:
30 : 30mm

Flange Type:
S : Servo flange B : Clamping flange

Shaft diameter : 4, 6, 8
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:
Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)
Connector:
A1204 A1607
A1205 A1614

PPR Options :
1 to- 1024 all PPR, - 360 - 500 - 512 - 720 - 1000 - 1024 - 1440 - 2000 - 2048 - 2500

Supply Voltage and output circuit :
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1...4096 pulses



FNC 40B & 40V Series

12



Features

- Industry 40 mm size, 20mm diameter clamping flange
- Universal 40 mm encoders
- Robust Mechanical and Electrical Construction
- Protection up to IP67
- Up to 4096 PPR max.
- <300 kHz frequency

PPR Options :

1 to 1024 ALL PPR - 2048 - 4096

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1 to 1024 - 2048 - 4096
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø40 mm
Shaft loading	≤60 N axial ≤80 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.020 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	4, 5, 6, 8 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	80 g

Accessories

Connectors and cables

CRM1204 M12 4 poles female connector or see page 206

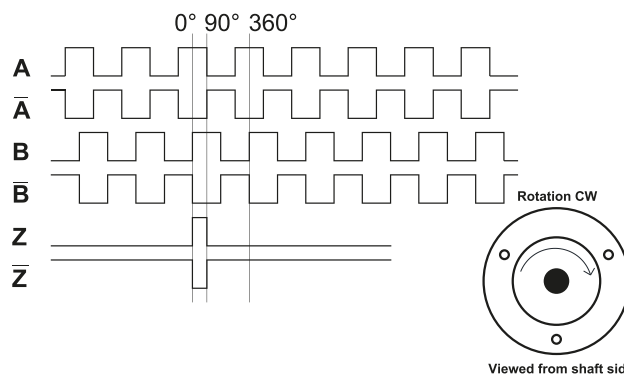
Mounting coupling

SK240606 plastic or see page 204

Mounting accessories

YY RST Spring or see page 202-203

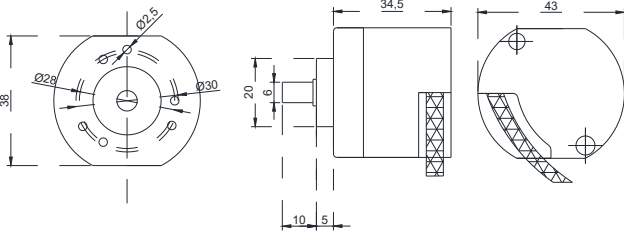
Pulse Diagram



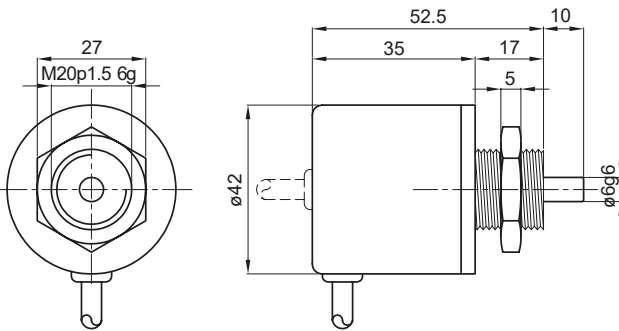
FNC 40B & 40V Series

Mechanical Dimensions

40B



40V



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.

For further information please see page 206

Encoder Part Number

FNC **40** **B** **6** **6** **30V** **1024** **-** **R2**

Housing:
40 : 40mm

Flange Type:
B : Clamping flange

Shaft diameter : 4, 5, 6, 8
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:

Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)

Connector:

R1204 R1212
R1205 R1607
R1208 R1614

PPR Options :

1 to 1024 - 2048 - 4096

Supply Voltage and output circuit :

5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1...65.536 pulses



FNC 50B Series

14



Features

- Industry 50 mm Standard Size, Clamping Flange
- Robust Mechanical and Electrical Construction
- Protection up to IP67
- Up to 65.536 PPR max.
- <300 kHz frequency
- Optical and magnetic sensing

PPR Options :

1 to 1024 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 5000 - 8192 - 10.000, up to 65.536 available

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...65.536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø50 mm
Shaft loading	≤60 N axial ≤80 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	150 g

Accessories

Connectors and cables

CRM1208 M12 8 poles female connector or see page 206

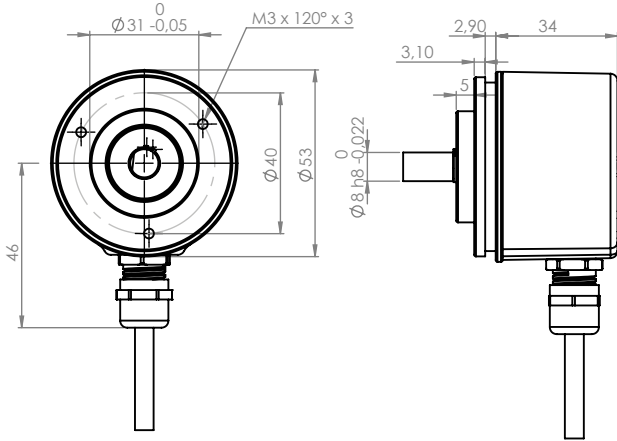
Mounting coupling

MK250808 plastic or see page 204

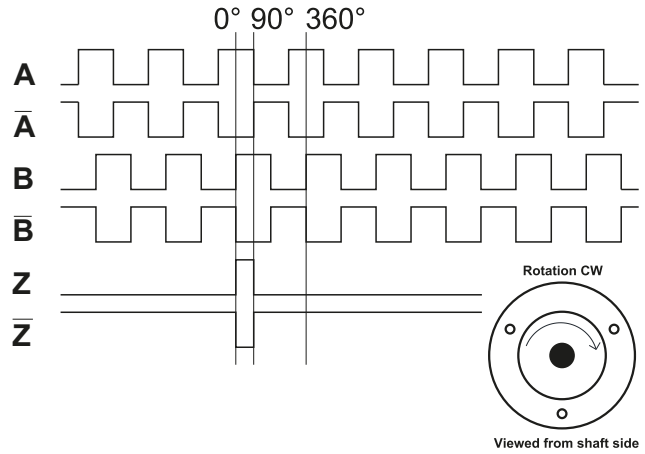
Mounting accessories

SF50 B square flange or see page 202-203

Mechanical Dimensions



Pulse Diagram



Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.
CRM2312R	2-12	10-11	5	6	8	1	3	4	o.r.
CRM2312L	2-12	10-11	5	6	8	1	3	4	o.r.

For further information please see page 206

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 50 B 10 6 30V 1024 - R2

Housing:
50 : 50mm

Flange Type:
S : Servo flange
B : Clamping flange

Shaft diameter : 4, 6, 8, 10
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:

Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)

Connector:

R1204 R1607
R1205 R1614
R1208 R2312R
RM212 R2312L

PPR Options :

1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 -
512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 2000 -
2048 - 2500 - 3000 - 3600 - 4000 - 5000 - 8192 - 10.000 - 65.536

Supply Voltage and output circuit :

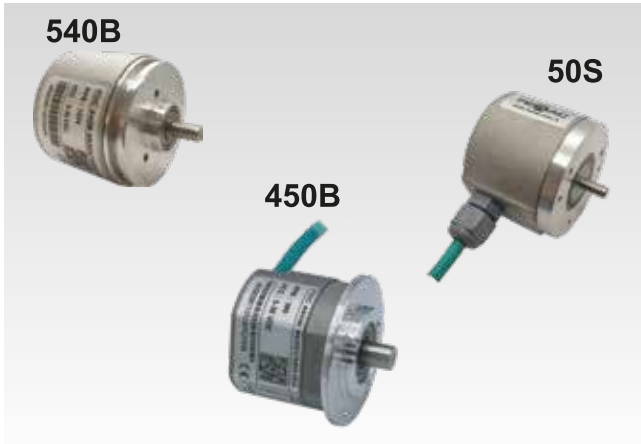
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1...65.536 pulses

FNC 540B Series

16



Features

- Industry 50 mm size, 22mm diameter clamping flange
- Compatible with universal 40 mm encoders
- Robust Mechanical and Electrical Construction
- Protection up to IP67
- Up to 65.536 PPR max.
- <300 kHz frequency

PPR Options :

1 to 1024 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 5000 - 65.536

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...65.536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø50 mm
Shaft loading	≤60 N axial ≤80 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	200 g

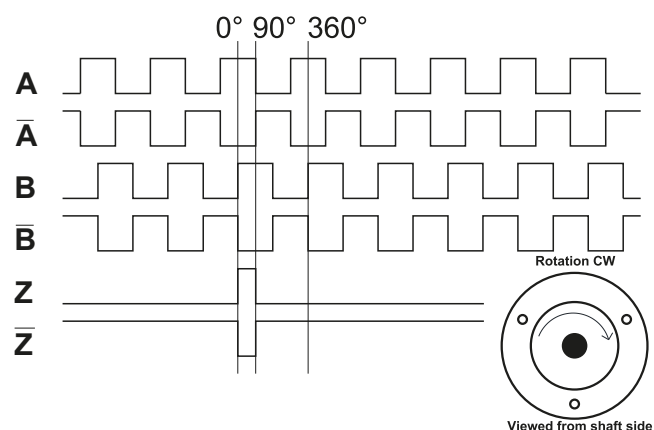
Accessories

Connectors and cables
CRM1204 M12 4 poles female connector or see page 206

Mounting coupling
SK240606 plastic or see page 204

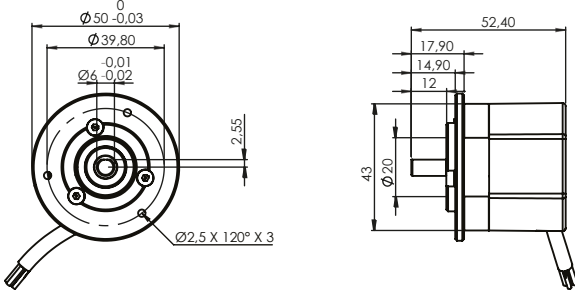
Mounting accessories
YY RST Spring or see page 202-203

Pulse Diagram

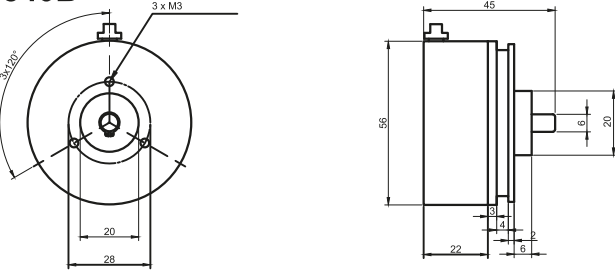


Mechanical Dimensions

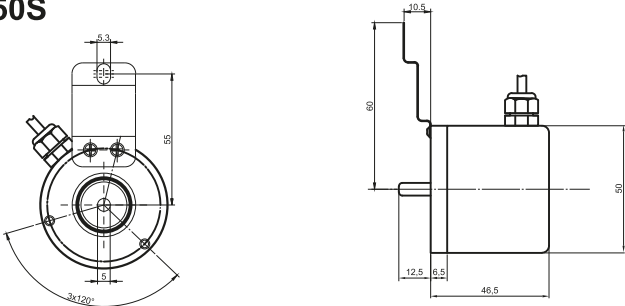
450B



540B



50S



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.
CRM2312R	2-12	10-11	5	6	8	1	3	4	o.r.
CRM2312L	2-12	10-11	5	6	8	1	3	4	o.r.

For further information please see page 206

Encoder Part Number

FNC 540 B 6 6 30V 1024 - R2

Housing:
 50 : 50mm
 450 : 40mm housing, 20mm clamp
 540 : 50mm housing, 2mm clamp

Flange Type:
 S : Servo flange
 B : Clamping flange

Shaft diameter : 4, 6, 8, 10
 Other dimensions on request

Output Channels
 1 : A
 2 : AB
 3 : ABZ
 4 : AB+A' B'
 6 : ABZ+A' B' Z'

Electrical Connections:
Cable
 R2 : radial 2m, shield not connected (standart)
 A2 : axial 2m, shield not connected (standart)

Connector:
 R1204 R1607
 R1205 R1614
 R1208 R2312R
 R1212 R2312L

PPR Options :
 1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 -
 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 2000 -
 2048 - 2500 - 3000 - 3600 - 4000 - 5000

Supply Voltage and output circuit :
 5V : 5V in / out
 245V : 5-30V in 5V out
 30V : 5-30V in / out

Incremental encoders

Resolution 1...65.536 pulses



FNC 58S Series

18



Features

- Industry 58 mm standart size, servo flange
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 65.536 PPR max.
- <300 kHz frequency
- Optical and magnetic sensing

PPR Options :

1 to 65.536 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 - 6000 - 8192 - 10000 - 12500 - 16384 - 20000 - 25000

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...25.000
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤80 N axial ≤100 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	4, 6, 8, 10 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	200 g

Accessories

Connectors and cables

CRM2312R M23 12 poles female connector or see page 206

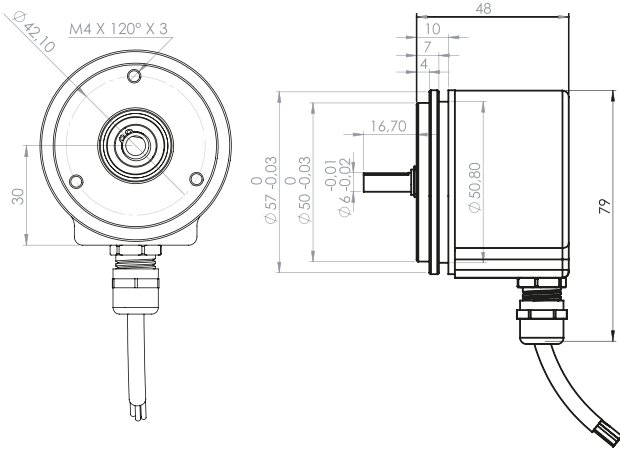
Mounting coupling

PF260808 plastic or see page 204

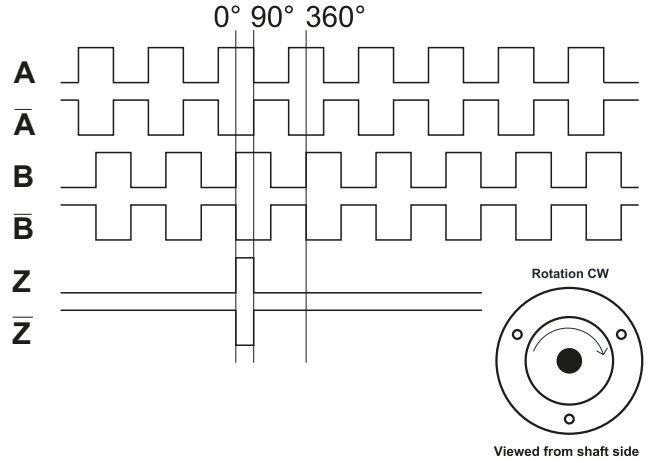
Mounting accessories

YY ASTK spring or see page 202-203

Mechanical Dimensions



Pulse Diagram



Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.
CRM2312R	2-12	10-11	5	6	8	1	3	4	o.r.
CRM2312L	2-12	10-11	5	6	8	1	3	4	o.r.

For further information please see page 206

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC **58** **S** **8** **6** **30V** **1024** **-** **R2**

Housing:
58 : 58mm

Flange Type:
S : Servo flange
B : Clamping flange

Shaft diameter : 4, 6, 8, 10
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:

Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)

Connector:

R1204	R1607
R1205	R1614
R1208	R2312R
R1212	R2312L

PPR Options :

1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 - 6000 - 8192 - 10000 - 12500 - 16384 - 20000 - 25000

Supply Voltage and output circuit :

5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Two Independent / Redundant Outputs



Resolution 1...25.000 pulses

FNC 58S Double Out Series

Two Independent Output Options



Features

- Industry 58 mm standard size, servo flange
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 25.000 PPR max.
- <300 kHz frequency
- Redundant Independent Outputs

PPR Options :

1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 - 6000 - 8192 - 10000 - 12500 - 16384 - 20000 - 25000

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1... up to 65536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤80 N axial ≤100 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	4, 6, 8, 10 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	200 g

Accessories

Connectors and cables

CRM2312R M23 12 poles female connector or see page 206

Mounting coupling

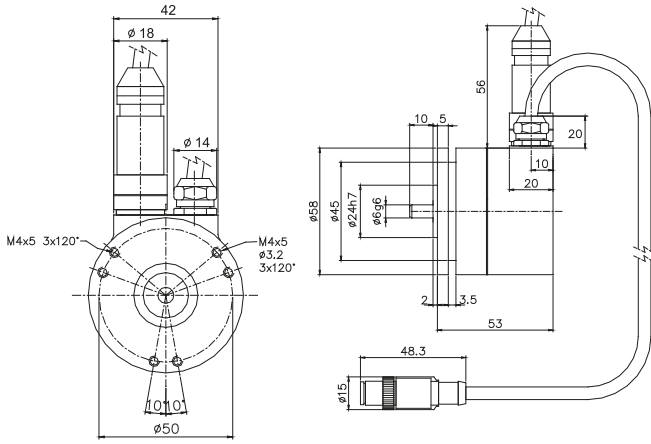
PF260808 plastic or see page 204

Mounting accessories

YY ASTK spring or see page 202-203

FNC 58S Double Out Series

Mechanical Dimensions

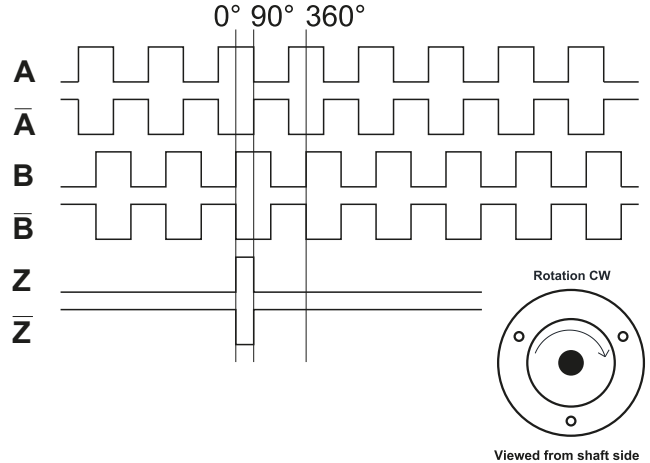


Connector Wiring

MM1205	
	PIN
+V	2
0V	1
A	3
B	4
0	5
Gnd	Chassi

FM1204	
	PIN
0V	1
-A	4
0V	3
-B	2

Pulse Diagram

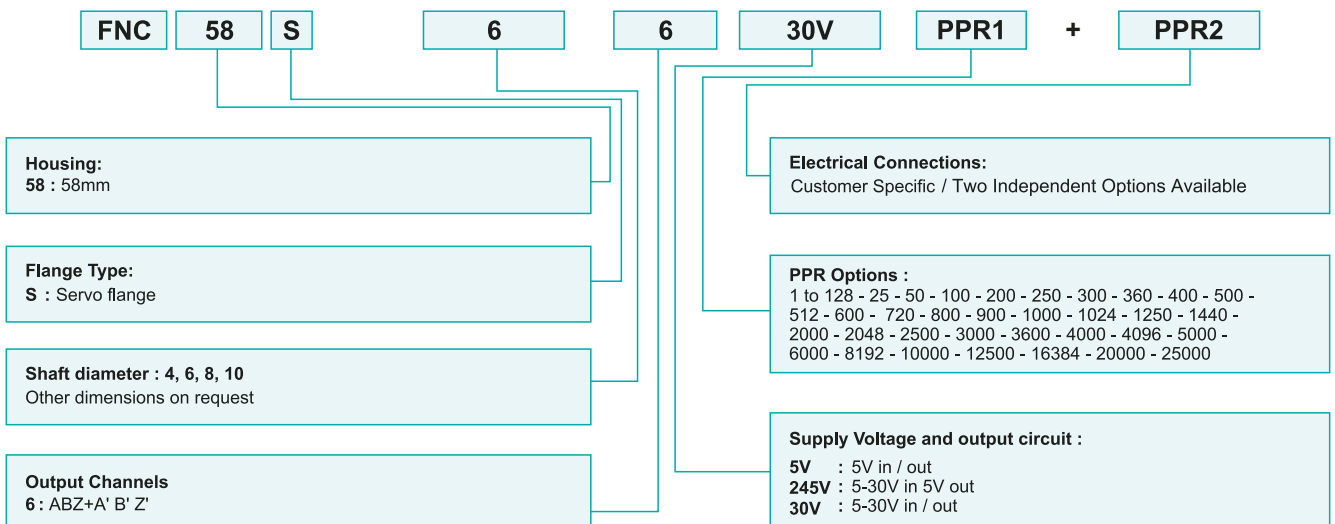


Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

For further information please see page 206

Encoder Part Number



Incremental encoders

Resolution 1...65.536 pulses



FNC 58SC Series

22



Features

- Industry 58 mm standard size, clamping flange
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 25.000 PPR max.
- <300 kHz frequency

PPR Options :

1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 - 6000 - 8192 - 10000 - 12500 - 16384 - 20000 - 25000

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...25.000 up to 65536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤120 N axial ≤160 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	250 g

Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.
CRM2312R	2-12	10-11	5	6	8	1	3	4	o.r.
CRM2312L	2-12	10-11	5	6	8	1	3	4	o.r.

Accessories

Connectors and cables

See page 206

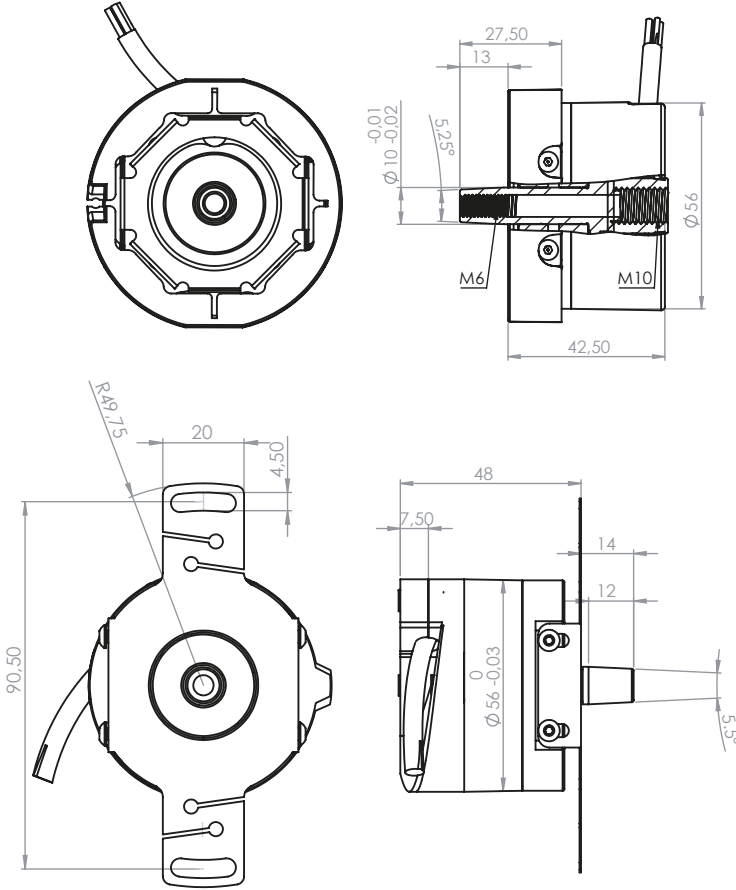
Mounting coupling

See page 204

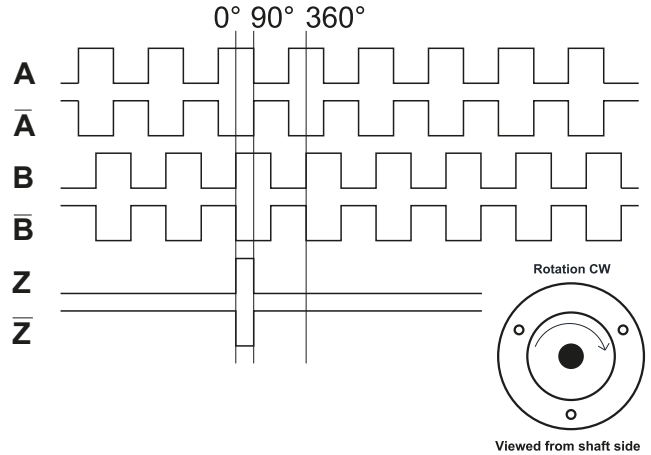
Mounting accessories

See page 202-203

Mechanical Dimensions



Pulse Diagram



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 58 SC 10 6 30V 1024 - R2

Housing:
58 : 58mm

Flange Type:
SC : 58 mm with conic shaft

Shaft diameter : 6, 8, 10, 12
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:

Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)
K12 : 12 pin socket connection

Connector:

R1204 R1607
R1205 R1614
R1208 R2312R
R1212 R2312L

PPR Options :

1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 -
512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 -
2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 -
6000 - 8192 - 10000 - 12500 - 16384 - 20000 - 25000

Supply Voltage and output circuit :

5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1...65.536 pulses



FNC 58B / 58D Series

24



Features

- Industry 58 mm standart size, clamping flange
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 65.536 PPR max.
- <300 kHz frequency

PPR Options :

1 to 65.536 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 - 6000 - 8192 - 10000 - 12500 - 16384 - 20000 - 25000

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...25.000 up to 65536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤120 N axial ≤160 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	4, 6, 8, 10, 12, 14, 15 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	250 g

Accessories

Connectors and cables

CRM2312 M23 12 poles female connector or see page 206

Mounting coupling

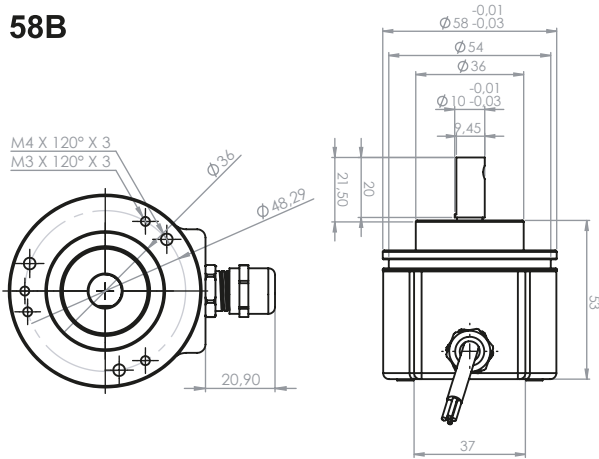
PF481010 plastic or see page 204

Mounting accessories

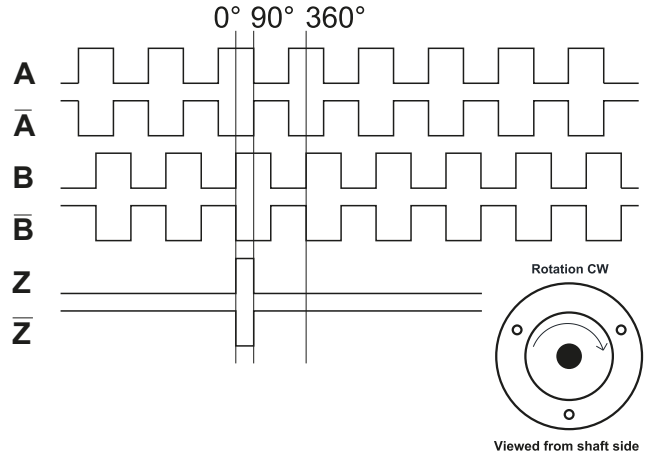
SF58B square flange spring or see page 202-203

Mechanical Dimensions

58B



Pulse Diagram



Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.
CRM2312R	2-12	10-11	5	6	8	1	3	4	o.r.
CRM2312L	2-12	10-11	5	6	8	1	3	4	o.r.

For further information please see page 206

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 58 B 8 6 30V 1024 - R2

Housing:
58 : 58mm

Flange Type:
B : Clamp Diameter 36 mm
D : Clamp Diameter 32 mm

Shaft diameter : 4, 6, 8, 10, 12, 14, 15
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:
Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)

Connector:
R1204 R1607
R1205 R1614
R1208 R2312R
R1212 R2312L

PPR Options :
1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 -
512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 -
2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 -
6000 - 8192 - 10000 - 12500 - 16384 - 20000 - 25000 - 65.536

Supply Voltage and output circuit :
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

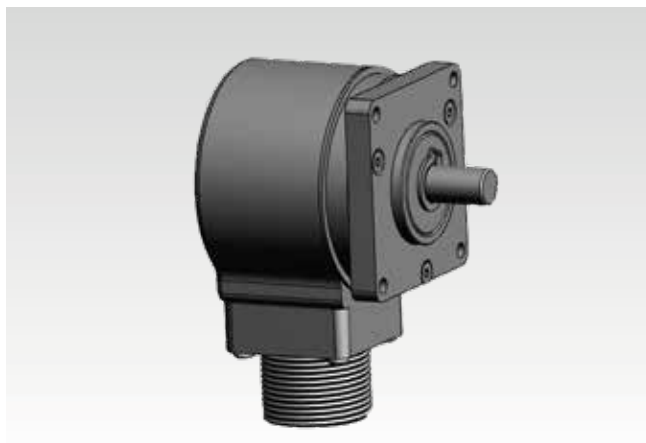
Incremental encoders

Resolution 1...65.536 pulses



FNC 52D Series

26



Features

- Industry 52 mm special size, square flange
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 5.000 PPR max.
- <300 kHz frequency

PPR Options

1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000

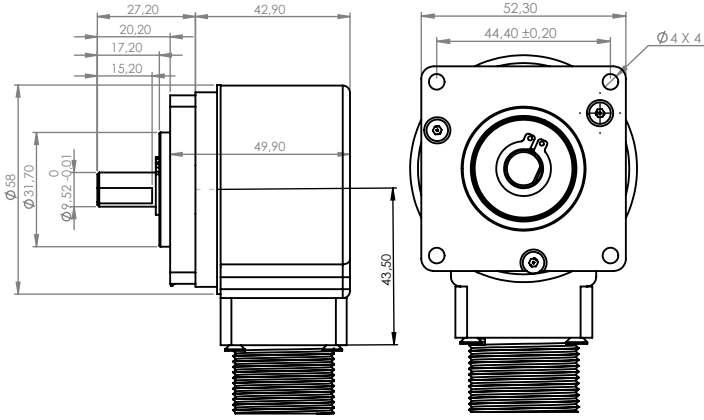
Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...5.000 up to 65536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted Interference	DIN EN 61000-6-4
Approval	CE

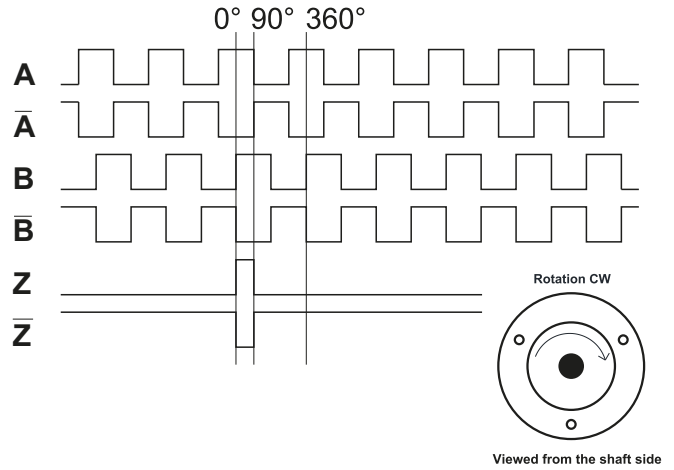
Technical data - mechanical design

Dimensions (flange)	ø52 mm
Shaft loading	≤120 N axial ≤160 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	4, 6, 8, 10, 12, 14, 15 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	200 g

Mechanical Dimensions



Pulse Diagram



Connector Wiring

Please consult factory

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 52 D 10 6 30V 1024 - R2

<p>Housing: 52 : 52mm</p>	<p>Electrical Connections:</p> <p>Cable R2 : radial 2m, shield not connected (standart) A2 : axial 2m, shield not connected (standart)</p> <p>Connector:</p> <table border="0"> <tr> <td>R1204</td> <td>R1607</td> <td>R2810</td> </tr> <tr> <td>R1205</td> <td>R1614</td> <td></td> </tr> <tr> <td>R1208</td> <td>R2312R</td> <td></td> </tr> <tr> <td>R1212</td> <td>R2312L</td> <td></td> </tr> </table>	R1204	R1607	R2810	R1205	R1614		R1208	R2312R		R1212	R2312L	
R1204		R1607	R2810										
R1205		R1614											
R1208		R2312R											
R1212	R2312L												
<p>Flange Type: D : Square flange, 32mm clamp</p>													
<p>Shaft diameter : 4, 6, 8, 10, 12, 14, 15 Other dimensions on request</p>													
<p>Output Channels</p> <p>1 : A 2 : AB 3 : ABZ 4 : AB+A' B' 6 : ABZ+A' B' Z'</p>	<p>PPR Options :</p> <p>1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000</p>												
	<p>Supply Voltage and output circuit</p> <p>5V : 5V in / out 245V : 5-30V in 5V out 30V : 5-30V in / out</p>												

Incremental encoders

Resolution 1...65.536 pulses



FNC 63K - 63D Series, Square Flange

28



Features

- Industry 63 mm special size, square flange
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 65.536 PPR max.
- <300 kHz frequency

PPR Options :

1 to 65.536- 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500
512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 2000 -
2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	up to 65536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø63 mm
Shaft loading	≤120 N axial ≤160 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12, 14 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	200 g

Accessories

Connectors and cables

CRM1208 M12 8 poles female connector or see page 206

Mounting coupling

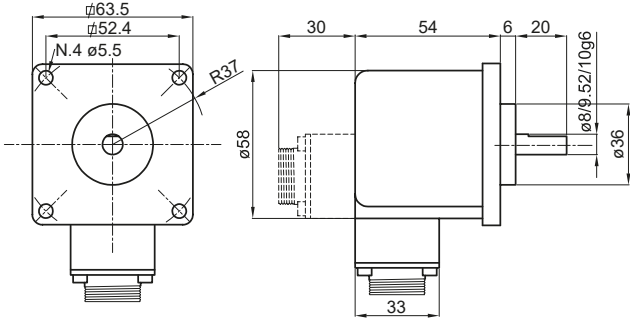
MK301010 metal or see page 204

Mounting accessories

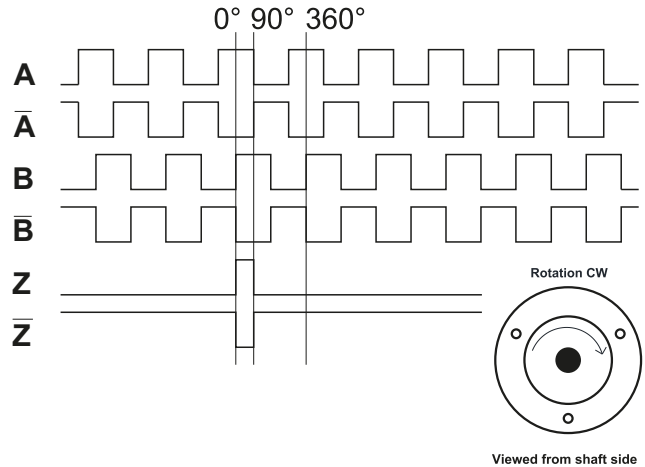
See page 202-203

FNC 63K - 63D Series, Square Flange

Mechanical Dimensions



Pulse Diagram



Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.
CRM2312R	2-12	10-11	5	6	8	1	3	4	o.r.
CRM2312L	2-12	10-11	5	6	8	1	3	4	o.r.

For further information please see page 206

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 63 K 10 6 30V 1024 - R2

Housing:
63 : 63mm

Flange Type:
K : Square flange, 36mm clamp
D : Square flange, 32mm clamp

Shaft diameter : 10, 12, 14
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:
Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)

Connector:
R1204 R1607
R1205 R1614
R1208 R2312R
R1212 R2312L

PPR Options :
1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 - 65536

Supply Voltage and output circuit :
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1...65.536 pulses

FNC 64S & 80S Series



Features

- Industry 64 mm special size, servo flange
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 5.000 PPR max.
- <300 kHz frequency

PPR Options :

1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...5.000 up to 65536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø64 mm
Shaft loading	≤120 N axial ≤160 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	200 g

Accessories

Connectors and cables

CRM1208 M12 8 poles female connector or see page 206

Mounting coupling

SK240808 plastic or see page 204

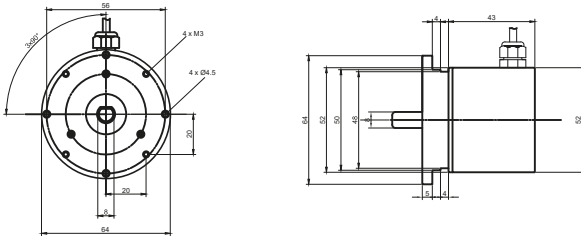
Mounting accessories

See page 202-203

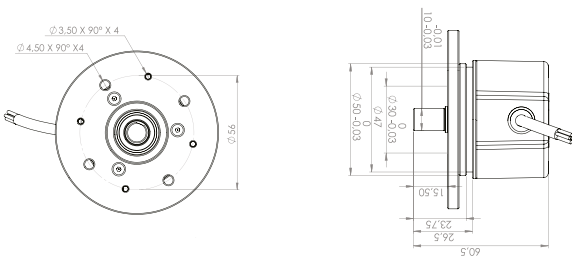
FNC 64S & 80S Series

Mechanical Dimensions

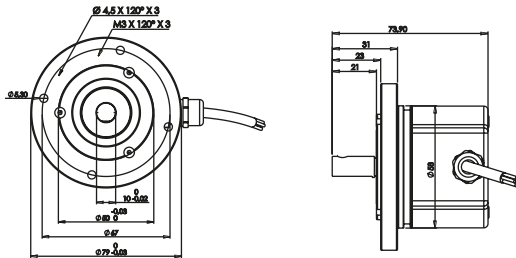
64S



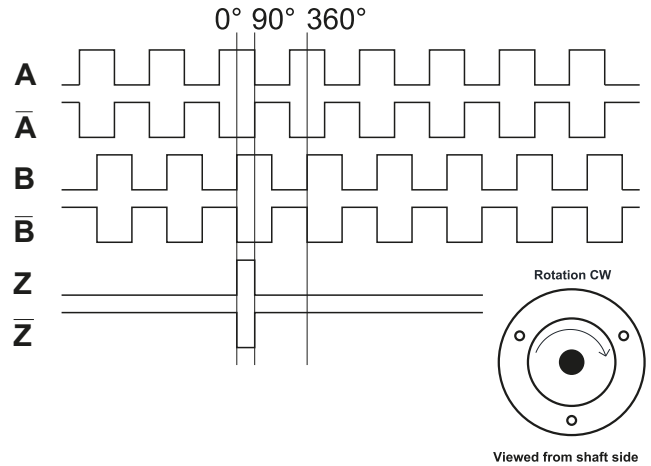
80S



80B



Pulse Diagram



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 64 S 10 6 30V 1024 - R2

Housing:
64 : 64mm
80 : 80mm

Flange Type:
S : Servo flange
B : Clamping flange

Shaft diameter : 4, 6, 8, 10, 12
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:

Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)

Connector:
R1204 R1607
R1205 R1614
R1208 R2312R
R1212 R2312L

PPR Options :
1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 -
512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 2000 -
2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000

Supply Voltage and output circuit :
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1...65.536 pulses

FNC 68K ALM Series



Features

- Industry 68 mm special size, square flange
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 5.000 PPR max.
- <300 kHz frequency

PPR Options :

1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...5.000 up to 65536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø68 mm
Shaft loading	≤120 N axial ≤160 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	4, 6, 8, 10, 12, 14, 15 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	200 g

Accessories

Connectors and cables

See page 206

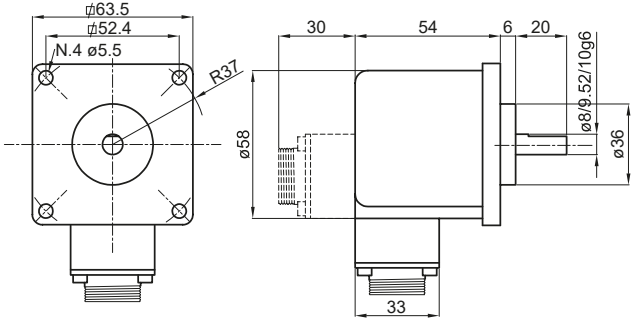
Mounting coupling

See page 204

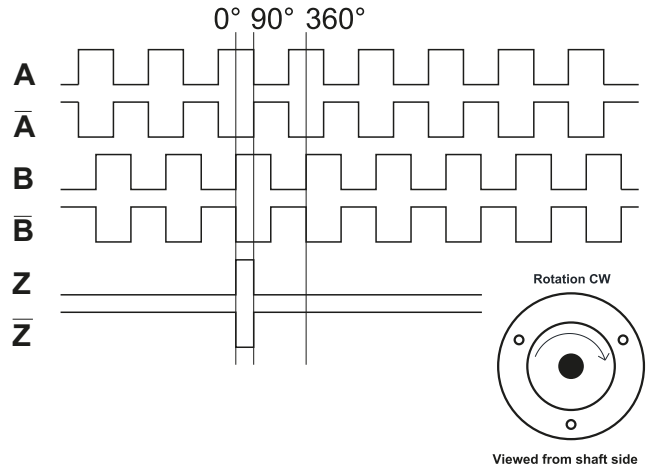
Mounting accessories

See page 202-203

Mechanical Dimensions



Pulse Diagram



Connector Wiring

Please consult factory

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 68 K 10 6 30V 1024 - R2

Housing:
63 : 68mm

Flange Type:
K : Square flange, 36mm clamp
D : Square flange, 32mm clamp

Shaft diameter : 4, 6, 8, 10, 12, 14, 15
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:
Cable
 R2 : radial 2m, shield not connected (standart)
 A2 : axial 2m, shield not connected (standart)

Connector:
 R1204 R1607
 R1205 R1614
 R1208 R2312R
 R1212 R2312L

PPR Options :
 1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 -
 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 2000 -
 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000

Supply Voltage and output circuit :
 5V : 5V in / out
 245V : 5-30V in 5V out
 30V : 5-30V in / out

Incremental encoders

Resolution 1...65.536 pulses



FNC 115S Series, tacho flange

34



Features

- Digital Tachogenerator with robust tacho flange
- Industry 115 mm standart size
- High noise immunity against frequency inverters
- Protection up to IP67
- Up to 65.536 PPR max.
- <300 kHz frequency

PPR Options :

1 to 65.536 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500
512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 2000 -
2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...up to 65536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø115 mm
Shaft loading	≤120 N axial ≤160 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	500 g

Accessories

Connectors and cables

CRM1208 M12 8 poles female connector or see page 206

Mounting coupling

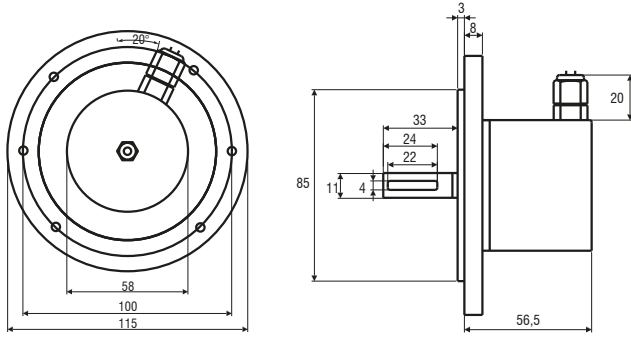
MK301111 plastic or see page 204

Mounting accessories

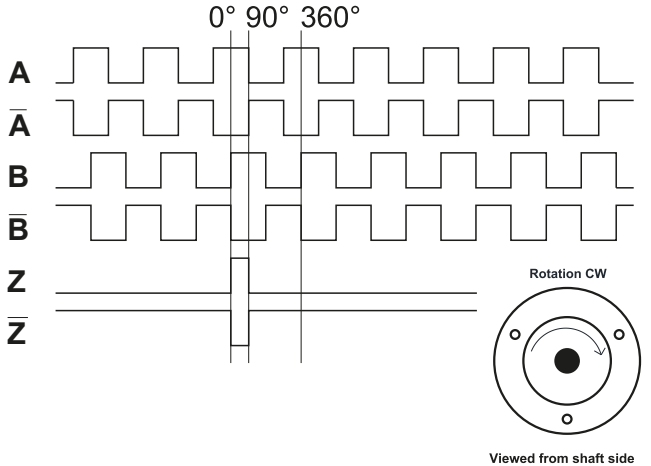
YY RST Spring or see page 202-203

FNC 115S Series, tacho flange

Mechanical Dimensions



Pulse Diagram



Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.
CRM2312R	2-12	10-11	5	6	8	1	3	4	o.r.
CRM2312L	2-12	10-11	5	6	8	1	3	4	o.r.

For further information please see page 206

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 115 S 11 6 30V 1024 - R2

Housing:
115 : 115mm

Flange Type:
S : Servo (Tacho) flange

Shaft diameter : 10,11
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:
Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)

Connector:
R1204 R1607
R1205 RM1614
R1208 RM2312R
R1212 RM2312L

PPR Options :
1 to 65.536 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000

Supply Voltage and output circuit :
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1...2500 pulses



FNC 30E Series

36



Features

- Industry 30 mm special size, servo flange
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 2500 PPR max.
- <300 kHz frequency

PPR Options :

1 to- 1024 all PPR, - 360 - 500 - 512 - 720 - 1000 - 1024
1440 - 2000 - 2048 -2500

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤30 mA (24 VDC)
Resolution (steps/turn)	1...2500
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø30 mm
Shaft loading	≤20 N axial ≤30 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.01 Nm (IP 67)
Materials	Housing: stainless steel Flange: stainless steel Shaft : stainless steel
Shaft Diameter:	4, 6, 8 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	80 g

Accessories

Connectors and cables

See page 206

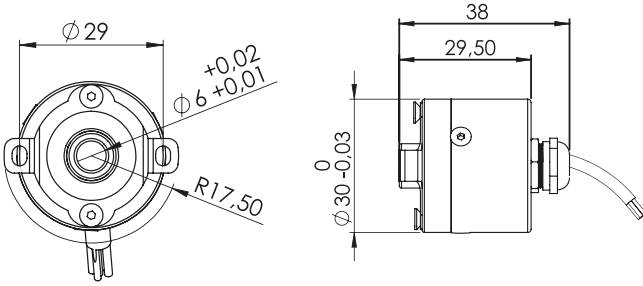
Mounting coupling

See page 204

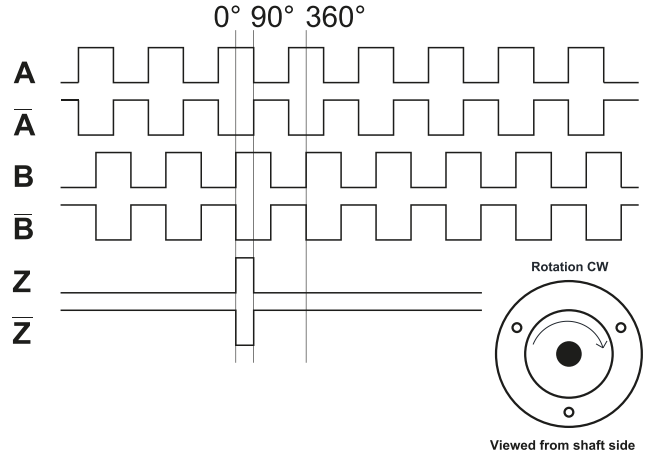
Mounting accessories

See page 202-203

Mechanical Dimensions



Pulse Diagram



Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.

For further information please see page 206

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 30 E 6 6 30V 1000 - R2

Housing:

30 : 30mm

Flange Type:

E : End hollow shaft

Shaft diameter : 4, 6, 8

Other dimensions on request

Output Channels

- 1 : A
- 2 : AB
- 3 : ABZ
- 4 : AB+A' B'
- 6 : ABZ+A' B' Z'

Electrical Connections:

Cable
A2 : axial 2m, Total length 25 mm
R2 : radial Total length 35 mm

Connector:

R1204 R1212
R1205 R1607
R1208 R1614

PPR Options :

1 to- 1024 all PPR, - 360 - 500 - 512 - 720 - 1000 - 1024 - 1440 - 2000 - 2048 - 2500

Supply Voltage and output circuit :

5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1...4096 pulses

FNC 40E Series

38



Features

- Industry 40 mm size, 20mm diameter clamping flange
- Universal 40 mm encoders
- Robust Mechanical and Electrical Construction
- Protection to IP65
- Up to 4096 PPR max.
- <300 kHz frequency

PPR Options :

1 to 1024 ALL PPR - 2048 - 4096

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC HTL 4.75VDC to 5.5VDC TTL
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...4096
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø40 mm
Shaft loading	≤60 N axial ≤80 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.020 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	4, 5, 6, 8 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	150 g

Accessories

Connectors and cables

CRM1204 M12 4 poles female connector or see page 206

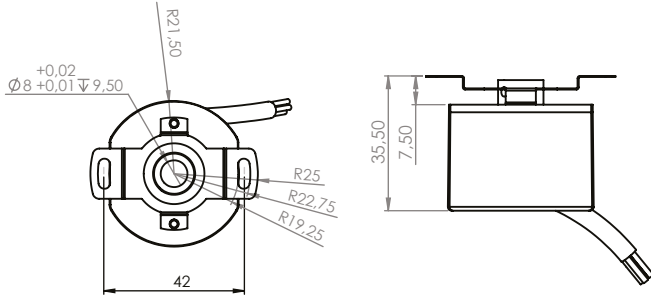
Mounting coupling

See page 204

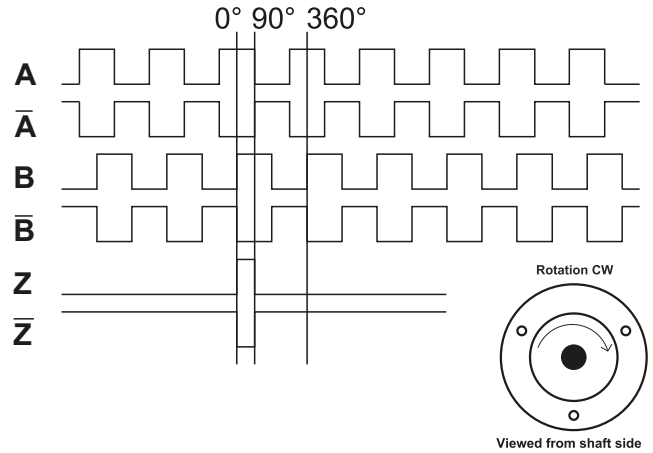
Mounting accessories

YY RST Spring or see page 202-203

Mechanical Dimensions



Pulse Diagram



Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

For further information please see page 206

Encoder Part Number

FNC 40 E 6 6 30V 1024 - R2

Housing:
40 : 40mm

Flange Type:
E : End shaft

Shaft diameter : 4, 5, 6, 8 mm
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:
Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)

Connector:
R1204 R1212
R1205 R1607
R1208 R1614

PPR Options :
1 to 1024 - 2048 - 4096

Supply Voltage and output circuit :
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1...4096 pulses

FNC 40H Series



Features

- Industry 40 mm size
- Universal 40 mm encoders
- Robust Mechanical and Electrical Construction
- Protection to IP65
- Up to 4096 PPR max.
- <300 kHz frequency

PPR Options :

600-1200-2400-625-1250-2500
750-1500-3000-900-1800-3600-
1024-2048-4096

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	up to 4096 ppr
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø40 mm
Shaft loading	≤60 N axial ≤80 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.020 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	4,6,8, 10 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	100 g

Accessories

Connectors and cables

CRM1204 M12 4 poles female connector or see page 206

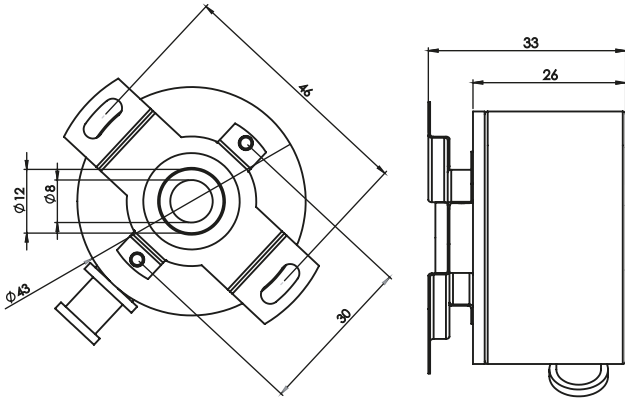
Mounting coupling

SK240606 plastic or see page 204

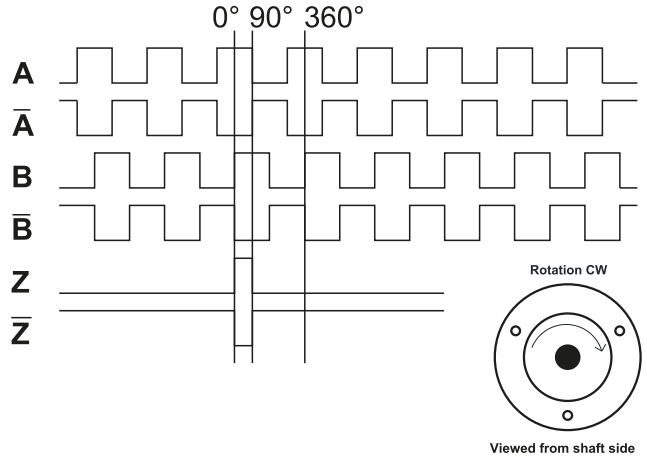
Mounting accessories

YY RST Spring or see page 202-203

Mechanical Dimensions



Pulse Diagram



Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

For further information please see page 206

Encoder Part Number

FNC 40 H 6 6 30V 1024 - R2

Housing:
40 : 40mm

Flange Type:
H: Hollow shaft

Shaft diameter: 4,6,8,10 mm
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:
Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)

Connector:
R1204 R1212
R1205 R1607
R1208 R1614

PPR Options :
600-1200-2400-625-1250-2500
750-1500-3000-900-1800-3600-
1024-2048-4096

Supply Voltage and output circuit :
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1...65.536 pulses

FNC 50E Series

42



Features

- Industry 50 mm standart size, semi hollow shaft
- Robust Mechanical and Electrical Construction
- Protection to IP65
- Up to 5000 PPR max.
- <300 kHz frequency

PPR Options :

1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 5000

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...5000 up to 65536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø50 mm
Shaft loading	≤80 N axial ≤100 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	150 g

Accessories

Connectors and cables

See page 206

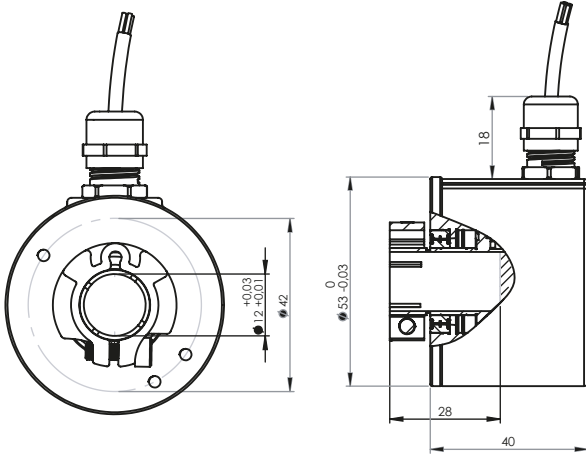
Mounting coupling

See page 204

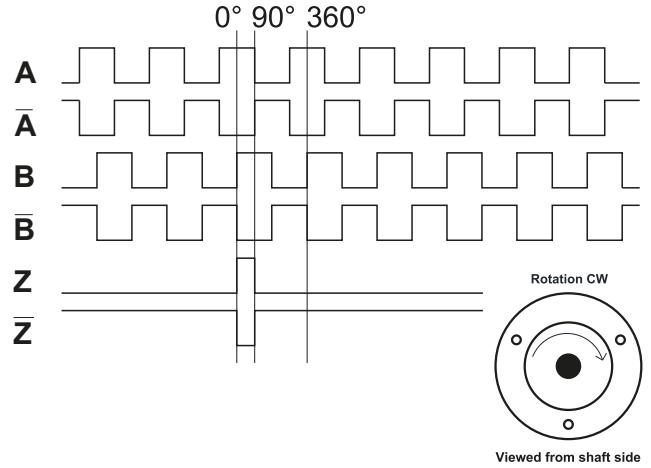
Mounting accessories

YY AKR Spring or see page 202-203

Mechanical Dimensions



Pulse Diagram



Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

For further information please see page 206

Encoder Part Number

FNC **50** **E** **10** **6** **30V** **1024** - **R2**

Housing:
50 : 50mm

Flange Type:
E : End hollow shaft

Shaft diameter : 4, 6, 8, 10, 12, 14
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:

Cable
R2 : radial 2m, shield not connected (standart)

Connector:

R1204 R1212
R1205 R1607
R1208 R1614

PPR Options :

1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 -
512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 2000 -
2048 - 2500 - 3000 - 3600 - 4000 - 5000

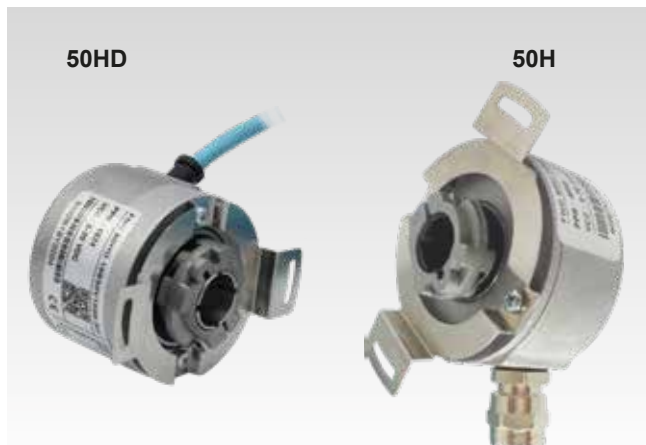
Supply Voltage and output circuit :

5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1...65.536 pulses

FNC 50H Series



Features

- Industry 50 mm standart size, through hollow shaft
- Robust Mechanical and Electrical Construction
- Protection to IP65
- Up to 5000 PPR max.
- <300 kHz frequency

PPR Options :

750 - 900 - 1000 - 1024 - 1250 - 1500 - 1800 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...5000 up to 65536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	<300 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Accessories

Connectors and cables

See page 206

Mounting coupling

See page 204

Mounting accessories

YY AKR Spring or see pag 202-203

Technical data - mechanical design

Dimensions (flange)	ø50 mm
Shaft loading	≤80 N axial ≤100 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12, 14, 15 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	150 g

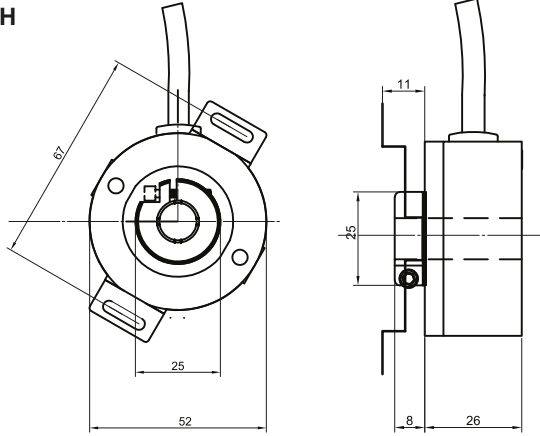
Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.

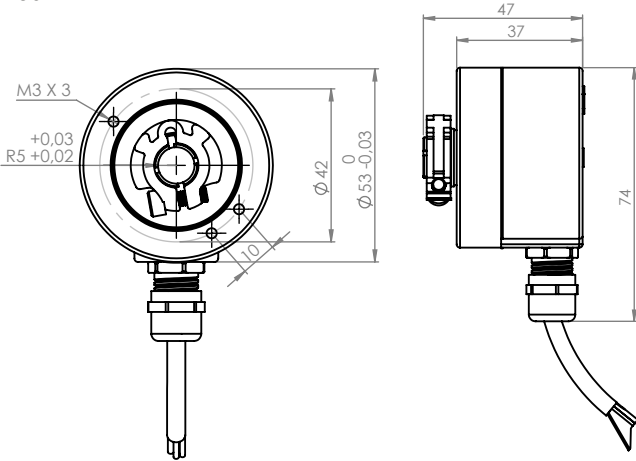
For further information please see page 206

Mechanical Dimensions

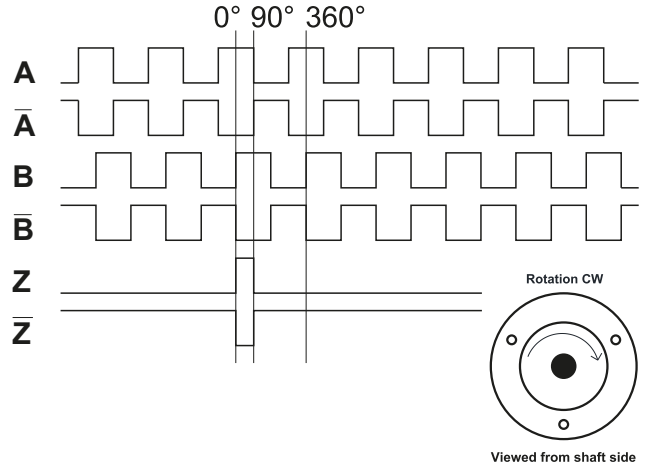
50H



50HD



Pulse Diagram



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 50 H 10 6 30V 1024 - R2

Housing:
50 : 50mm

Flange Type:
E : End hollow
H : Through hollow shaft
HD : Thicker version of 50H

Shaft diameter : 6, 8, 10, 12, 14, 15 mm
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:
Cable
R2 : radial 2m, shield not connected (standart)

Connector:
R1204 R1212
R1205 R1607
R1208 R1614

PPR Options :
750 - 900 - 1000 - 1024 - 1250 - 1500 - 1800 - 2000 - 2048 -
2500 - 3000 - 3600 - 4000 - 4096 - 5000

Supply Voltage and output circuit :
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1...65.536 pulses



FNC 50HB & 50HT Series

46



Features

- Industry 50 mm standard size, tapered shaft
- Robust Mechanical and Electrical Construction
- Protection up to IP67
- Up to 65.536 PPR max.
- <300 kHz frequency

PPR Options :

1024 - 2048 - 4096 - 5000 - 8192 - 10.000 standard PPRs
1 to 65.536 optional

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...65536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	<300 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø50 mm
Shaft loading	≤80 N axial ≤100 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	1/10 conic shaft
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	150 g

Accessories

Connectors and cables

See page 206

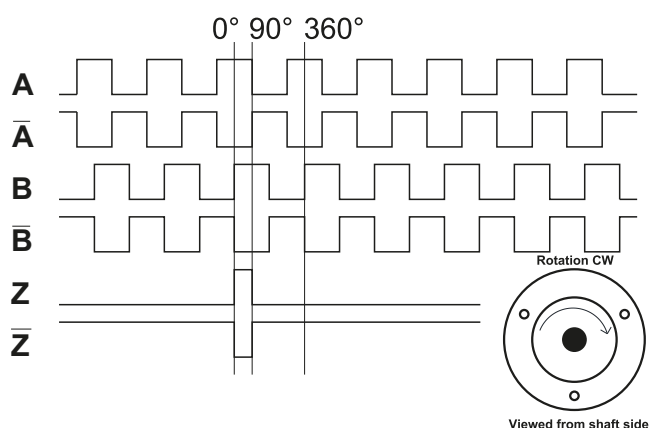
Mounting coupling

See page 204

Mounting accessories

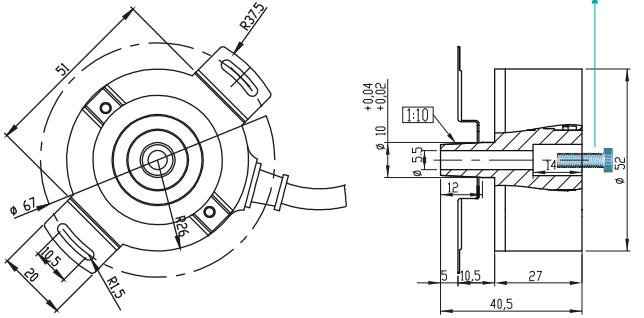
YY AKR Spring or see page 202-203

Pulse Diagram

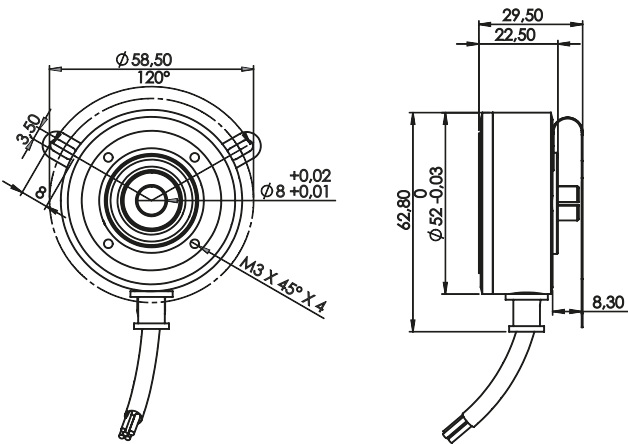


Mechanical Dimensions

50HB



50HT



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.
CRM2312R	2-12	10-11	5	6	8	1	3	4	o.r.
CRM2312L	2-12	10-11	5	6	8	1	3	4	o.r.

For further information please see page 206

Encoder Part Number

FNC **50** **HB** **C** **6** **30V** **8192** - **R2**

Housing:
50 : 50mm

Flange Type:
HB : Conic shaft back screw mounting
HT : Thin version of 50H

Shaft diameter : 1/10 conic shaft
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:
Cable
R2 : radial 2m, shield not connected (standart)

Connector:
R1204 R1212
R1205 R1607
R1208 R1614

PPR Options :
1024 - 2048 - 4096 - 5000 - 8192 - 10.000 standard PPRs
1 to 65.536 optional

Supply Voltage and output circuit :
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1...65.536 pulses



FNC 58E & 58H Series

48



Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	up to 65536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Accessories

Connectors and cables

CRM1607 M16 7 poles female connector or see page 206

Mounting coupling

See page 204

Mounting accessories

YY NGL spring or see page 202-203

Features

- Industry 58 mm standard size, end hollow shaft
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 65.536 PPR max.
- <300 kHz frequency

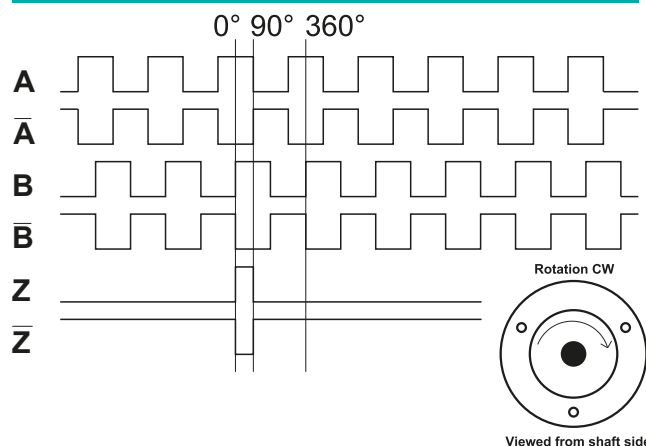
PPR Options :

1 to 65.536 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500
512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 -
2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 -
6000 - 8192 - 10000 - 12500 - 20000 - 25000

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤120 N axial ≤160 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12, 14, 15, 16 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	250 g

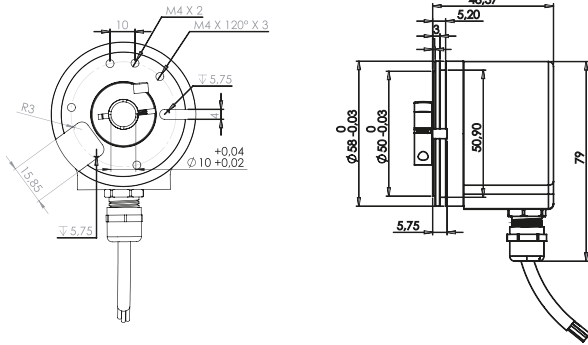
Pulse Diagram



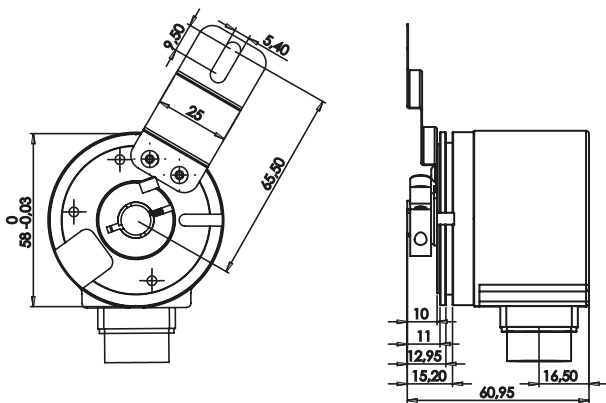
FNC 58E & 58H Series

Mechanical Dimensions

58E



58H



Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.
CRM2312R	2-12	10-11	5	6	8	1	3	4	o.r.
CRM2312L	2-12	10-11	5	6	8	1	3	4	o.r.

For further information please see page 206

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 58 E 8 6 30V 1024 - R2

Housing:
58 : 58mm

Flange Type:
E : End hollow
H : Through hollow shaft

Shaft diameter : 4, 6, 8, 10, 12, 14, 15, 16
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:

Cable
R2 : radial 2m, shield not connected (standart)

Connector:

R1204	R1607
R1205	R1614
R1208	R2312R
R1212	R2312L

PPR Options :
1 to 65.536 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 - 6000 - 8192 - 10000 - 12500 - 20000 - 25000 - 65.536

Supply Voltage and output circuit :

5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 10.000 pulses



FNC 80H Series

50



Features

- Industry 80 mm standard size, through hollow shaft
- Robust Mechanical and Electrical Construction
- Protection up to IP67
- Up to 10.000 PPR max.
- <300 kHz frequency

PPR Options :

500 - 512 - 625 - 1000 - 1024 - 1200 - 1250 - 2000 - 2048 - 2500 - 4096 - 5000 - 8192 - 10.000

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...25.000
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø80 mm
Shaft loading	≤120 N axial ≤160 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	10, 12, 14, 15, 16, 17, 18, 19, 20, 22, 24, 25 mm
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	250 g

Accessories

Connectors and cables

CRM2312R M23 12 poles female connector or see page 206

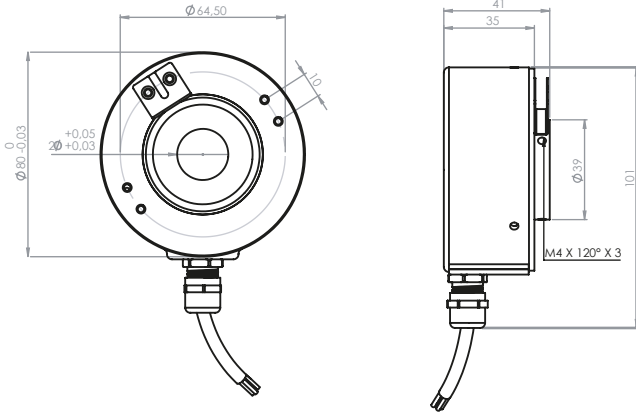
Mounting coupling

See page 204

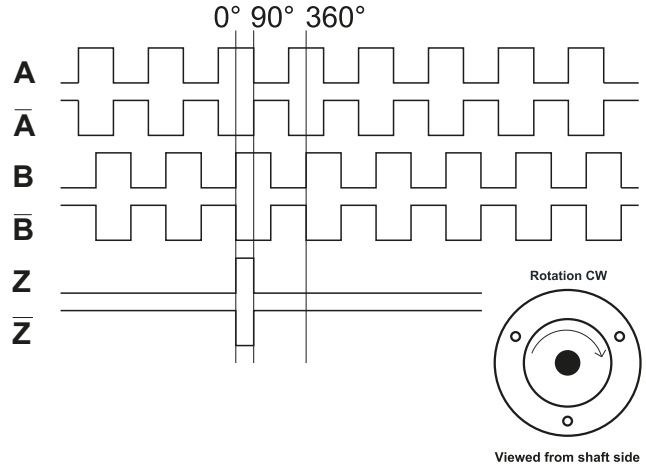
Mounting accessories

YY ASTK spring or see page 202-203

Mechanical Dimensions



Pulse Diagram



Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.
CRM2312R	2-12	10-11	5	6	8	1	3	4	o.r.
CRM2312L	2-12	10-11	5	6	8	1	3	4	o.r.

For further information please see page 206

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 80 H 25 6 30V 1024 - R2

Housing:
80 : 80mm

Flange Type:
E : End hollow
H : Through hollow shaft

Shaft diameter : 10, 12, 14, 15, 16, 17, 18, 19, 20, 22, 24, 25
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:
Cable
R2 : radial 2m, shield not connected (standart)

Connector:
RM1204 R1607
R1205 R1614
R1208 R2312R
R1212 R2312L

PPR Options :
500 - 512 - 625 - 1000 - 1024 - 1200 - 1250 - 2000 - 2048 - 2500 - 4096 - 5000 - 8192 - 10000

Supply Voltage and output circuit :
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1024...8192 pulses



FNC F82 Series

52



Features

- Special 80 mm design, through hollow shaft
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 8192 PPR max.
- <300 kHz frequency

PPR Options :

1024 - 2000 - 2048 - 4000 - 4096 - 8000 - 8192

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1024...8192
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	<300 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø80 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Stainless steel Flange: Stainless steel Shaft : Stainless steel
Shaft diameter:	38, 40, 42, 44 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	300 g

Accessories

Connectors and cables

CRM1208 M12 8 poles female connector or see page 206

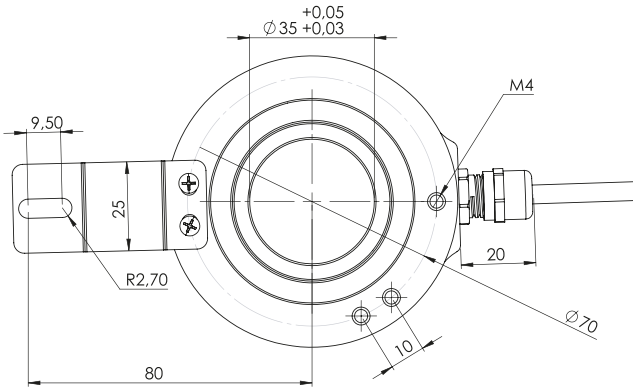
Mounting coupling

See page 204

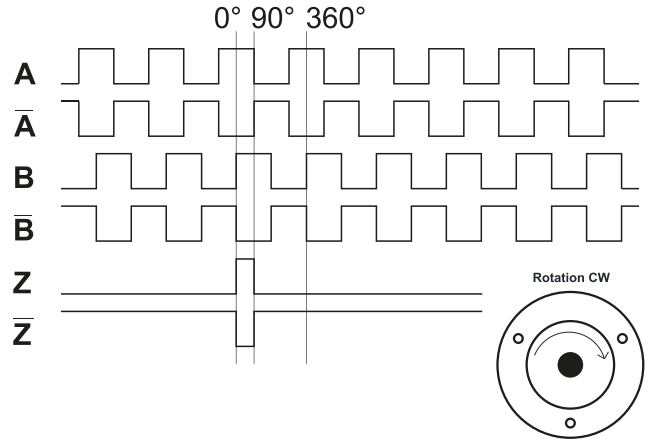
Mounting accessories

KLM spring or see page 202-203

Mechanical Dimensions



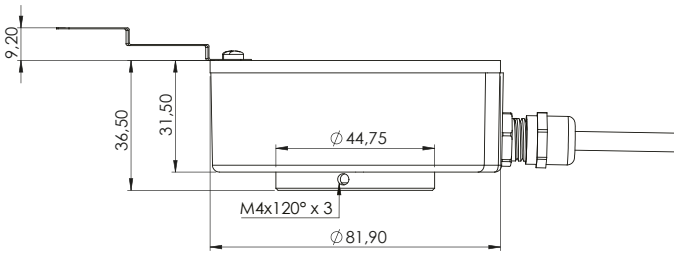
Pulse Diagram



Viewed from shaft side

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield



Encoder Part Number

FNC F82 44 6 30V 1024 - R7

F82 Series

Shaft diameter : 38, 40, 42, 44
Other dimensions on request

Output Channels

- 1 : A
- 2 : AB
- 3 : ABZ
- 4 : AB+A' B'
- 6 : ABZ+A' B' Z'

Electrical Connections:

Cable
R7 : radial 7m, shield not connected (standart)

Connector:

R1204 R1607
R1205 R1614
R1208 R2312R
R1212 R2312L

PPR Options :

1024 - 2000 - 2048 - 4000 - 4096 - 8000 - 8192

Supply Voltage and output circuit :

5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Resolution 1024...10.000 pulses



FNC 100H Series

54



Features

- Industry 100 mm design, through hollow shaft
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 10.000 PPR max.
- <300 kHz frequency

PPR Options :

1024 - 2000 - 2048 - 2500 - 4000 - 4096 - 5000
- 8000 - 8192 - 10000

Technical data - mechanical design

Dimensions (flange)	ø100 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10.000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: aluminium Flange: aluminium Shaft : stainless steel
Shaft diameter:	26, 28, 30, 32, 38 ,40 ,42 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	700 g

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1024...10.000
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	<300 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Accessories

Connectors and cables

CRM1208 M12 8 poles female connector or see page 206

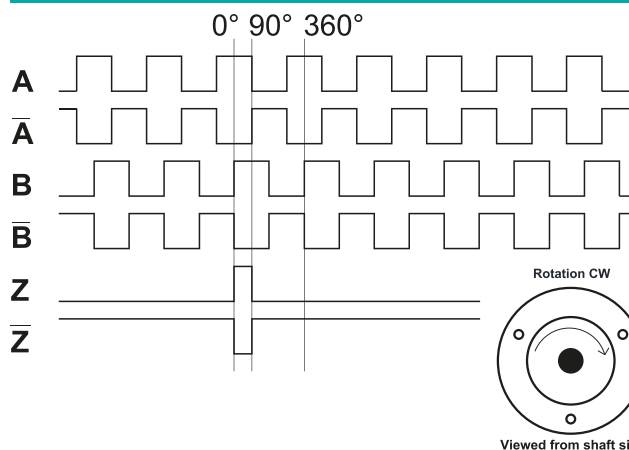
Mounting coupling

See page 204

Mounting accessories

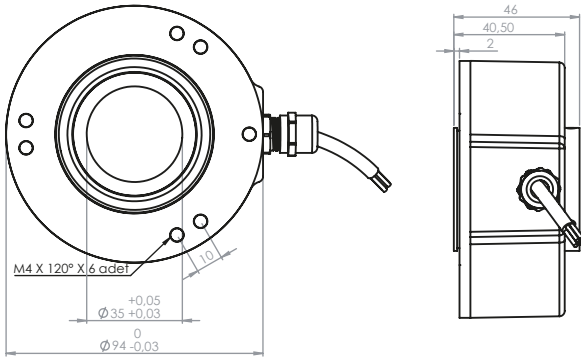
YY ASTK spring or see page 202-203

Pulse Diagram

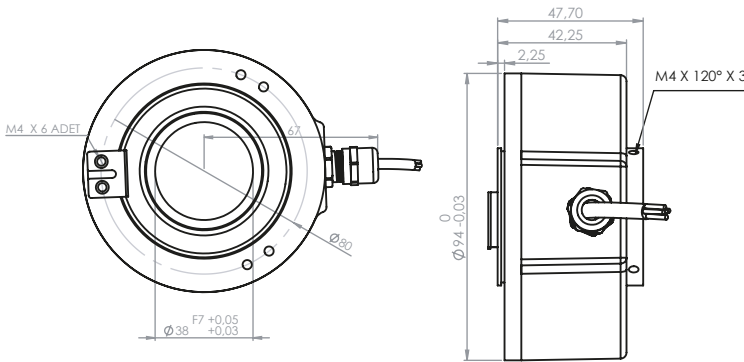


Mechanical Dimensions

100H



100HD



Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.
CRM2312R	2-12	10-11	5	6	8	1	3	4	o.r.
CRM2312L	2-12	10-11	5	6	8	1	3	4	o.r.

For further information please see page 206

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 100 H 38 6 30V 1024 - R2

Housing:
100 : 100mm

Flange Type:
H : Through hollow shaft
HD : Through hollow shaft - thick version

Shaft diameter : 26, 28, 30, 32, 38, 40, 42, 44, 45
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:
Cable
R2 : radial 2m, shield not connected (standart)

Connector:
R1204 R1607
R1205 R1614
R1208 R2312R
R1212 R2312L

PPR Options :
1024 - 2000 - 2048 - 2500 - 4000 - 4096 - 5000
- 8000 - 8192 - 10000

Supply Voltage and output circuit :
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out



MADE IN

1.5" N.C.
1.5" N.C.
1.5" N.C.
1.5" N.C.

FENAC

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www.fenac.com.tr

Programmable encoders

- **Flexible**
- **Compact**



Incremental encoders

Optical and Magnetic Programming Options

Programmable Resolution 1...65.536 pulses

FNC 50 Series Programmable



Features

- Industry 50 mm standart size,
- Clamping- servo- end hollow shaft flange versions
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 65.536 PPR max.
- ≤2 MHz frequency
- Programming via FNC PT - PC Programming tool
- FNC PT - PS easy programming software

PPR Options :

1 to 65.536 programmable PPR

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection	Output short circuit protection. Reverse polarity protection Over voltage protection (except 5V version)
Consumption w/o load	≤60 mA (5 VDC) ≤35 mA (12 VDC) ≤26 mA (24 VDC) ≤27 mA (30 VDC)
Resolution (steps/turn)	1...65.536
Reference signal	Programmable length, 90° 180°, 270°, 360°
Output frequency	≤2 MHz
Output signals	90° shifted A and B, Z + all channels can be set indepently inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø50 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤12000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx	250 g

Accessories

Connectors and cables

CRM2312 M23 12 poles female connector or see page 206

Mounting coupling

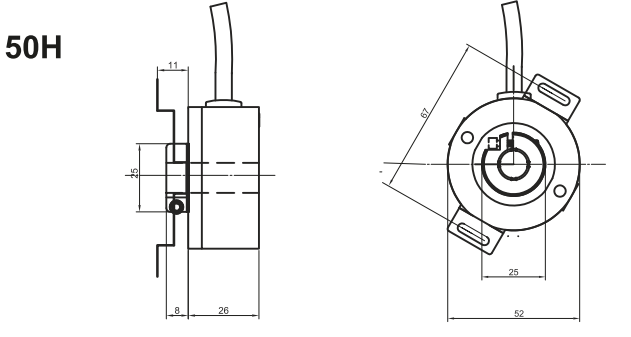
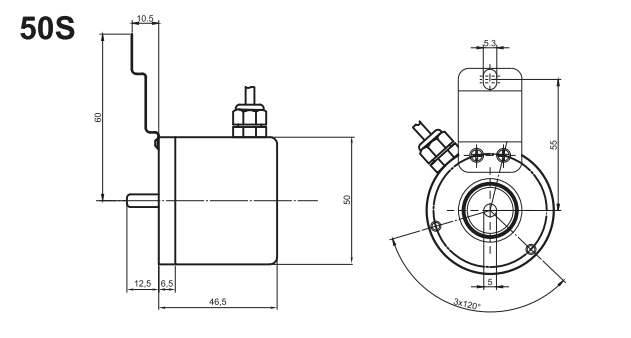
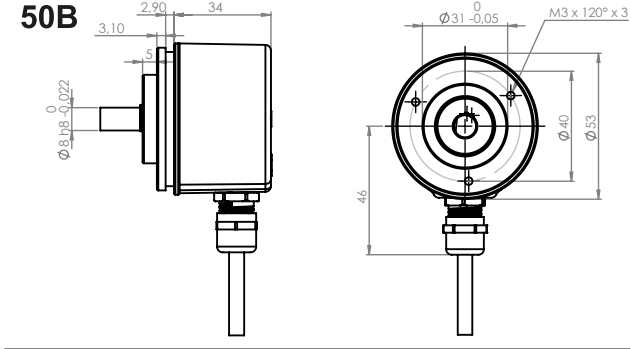
PF481010 plastic or see page 204

Mounting accessories

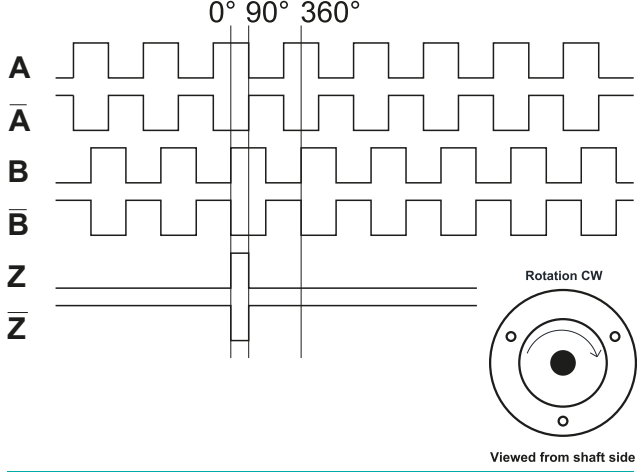
SF50B square flange or see page 202-203

FNC 50 Series Programmable

Mechanical Dimensions



Pulse Diagram



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown-Green	Kahve-Yeşil	Vcc
GND	White-Green	Beyaz-Yeşil	GND
A	Green	Yeşil	A
A'	Green-Black	Yeşil-Siyah	A Inverse
B	Yellow	Sarı	B
B'	Yellow-Black	Sarı- Siyah	B Inverse
Z	Gray	Gri	Z
Z'	Gray-Black	Gri-Siyah	Z Inverse
C	Blue	Mavi	Clock
D	Orange	Turuncu	Data
Shield	Black	Siyah	Shield

Encoder Part Number

FNCP 50 B O 10 6 30V X - R2

Housing:
50 : 50mm

Flange Type:
S : Servo flange
B : Clamping flange
H : Through hollow shaft

O : Optical programmable **M :** Magnetic programmable

Shaft diameter : 4, 6, 8, 10, 12, 14
Other dimensions on request

Output Channels
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:
Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)

Connector:
R1204 R1607 R1208 R2312R
R1205 R1614 R1212 R2312L

PPR Options :
1 to 65.536 Programmable

Supply Voltage and output circuit :
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Incremental encoders

Optical and Magnetic Programming Options

Programmable Resolution 1...65.536 pulses

FNC 58 Series Programmable



Features

- Industry 58 mm standart size,
- Clamping- servo- end hollow shaft flange versions
- Robust mechanical and electrical construction
- Protection up to IP67
- Up to 65.536 PPR max.
- ≤2 MHz frequency
- Programming via FNC PT - PC Programming tool
- FNC PT - PS easy programming software

PPR Options :

1 to 65.536 programmable PPR

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection	Output short circuit protection. Reverse polarity protection Over voltage protection (except 5V version)
Consumption w/o load	≤60 mA (5 VDC) ≤35 mA (12 VDC) ≤26 mA (24 VDC) ≤27 mA (30 VDC)
Resolution (steps/turn)	1...65.536
Reference signal	Programmable length, 90° 180°, 270°, 360°
Output frequency	≤2 MHz
Output signals	90° shifted A and B, Z + all channels can be set indepently inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤12000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx	250 g

Accessories

Connectors and cables

CRM2312 M23 12 poles female connector or see page 206

Mounting coupling

PF481010 plastic or see page 204

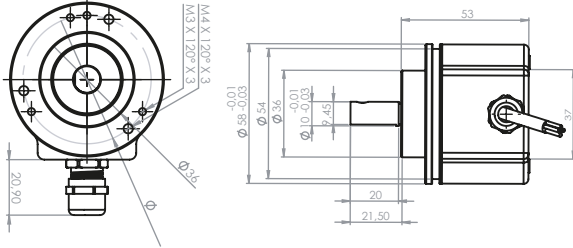
Mounting accessories

SF58B square flange or see page 202-203

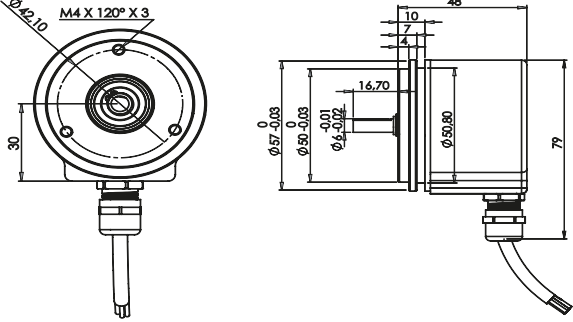
FNC 58 Series Programmable

Mechanical Dimensions

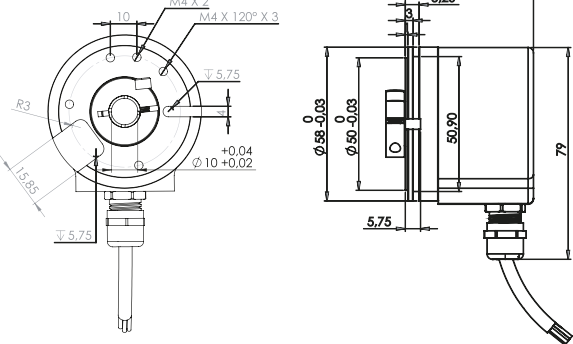
58B



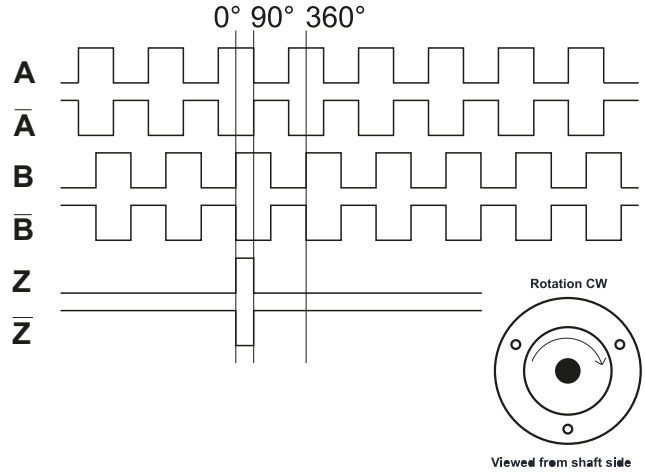
58S



58E



Pulse Diagram



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown-Green	Kahve-Yeşil	Vcc
GND	White-Green	Beyaz-Yeşil	GND
A	Green	Yeşil	A
A'	Green-Black	Yeşil-Siyah	A Inverse
B	Yellow	Sarı	B
B'	Yellow-Black	Sarı- Siyah	B Inverse
Z	Gray	Gri	Z
Z'	Gray-Black	Gri-Siyah	Z Inverse
C	Blue	Mavi	Clock
D	Orange	Turuncu	Data
Shield	Black	Siyah	Shield

Encoder Part Number

FNCP 58 B O 10 6 30V X - R2

Housing:
58 : 58mm

Flange Type:
S : Servo flange
B : Clamping flange
E : End hollow shaft
H : Hollow shaft

O : Optical programmable M : Magnetic programmable

Shaft diameter : 4, 6, 8, 10, 12, 14
Other dimensions on request

Output Channels
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:

Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)

Connector:

R1204 R1607 R1208 R2312R
R1205 R1614 R1212 R2312L

PPR Options :

1 to 65.536 Programmable

Supply Voltage and output circuit :

5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

FNCP 58 Series Programmable Encoders

Advantages of AnyPulse® FNCP 58 Series Programmable encoders

- Free programming of PPR up to 65.536
- 5-30VDC voltage range TTL / HTL together
- Reference pulse setting
- Z Index pulse length 90, 180, 270, 360
- CW or CCW free direction selection
- Programming via user friendly FNC-PT software

Further Flexibilities

- Less product models, Less inventory cost
- Shorter downtime
- Fast and easy replacement and retrofit
- Easy order processing
- Immediate delivery
- Cost efficiency for even high PPR

Order Part Numbers

- 1) Part Number;
FNCP 58B 10630VX-R2
- 2) Part Number;
FNC PD-PC Programming Device



FNCP 58B



FNCP 58S



FNCP 58E

Programming Software



AnyPulse FNCP 58 series Compact, Easy, Flexible

- Magnetic sensing technology (optic optional)
- High protection up to ip67
- Speed up to 12000 rpm
- -40 °C to +100 °C temperature range
- Robust mechanics with DoubleLock system
- Best price-performance



ShaftLock



High Speed



Temperature



High IP



Shock / Vibration resistant



Magnetic field proof

Heavy duty encoders

- **Heavy**
- **Reliable**
- **Robust**



Incremental encoders up to IP69K

Resolution 1...65.536 pulses

FNC 58BSS Stainless Steel

Stainless Steel

64



Features

- Industry 58 mm standard size, clamping flange
- Stainless Steel
- Robust mechanical and electrical construction
- Protection up to IP69K
- Up to 65.536 PPR max.
- <300 kHz frequency
- Optical or magnetic system

PPR Options :

1 to 65.536 PPR Any PPR option

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...65.536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Stainless steel Flange: Stainless steel Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	500 g

Accessories

Connectors and cables

CRM2312 M23 12 poles female connector or see page 206

Mounting coupling

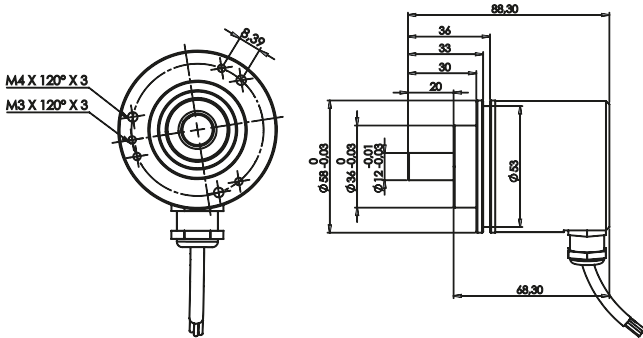
PF481010 plastic or see page 204

Mounting accessories

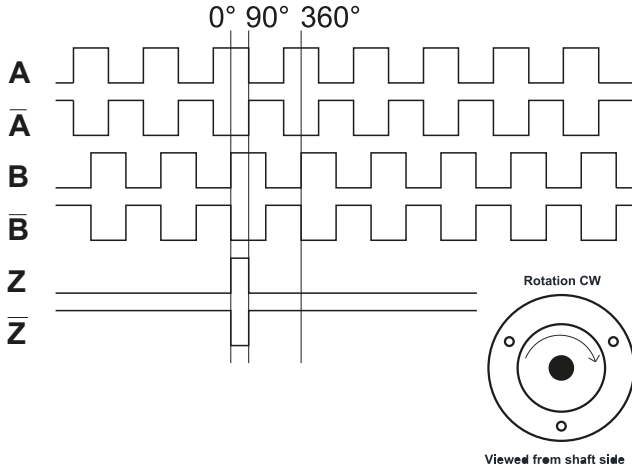
SF58B square flange or see page 202-203

FNC 58BSS Stainless Steel

Mechanical Dimensions



Pulse Diagram



Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.
CRM2312R	2-12	10-11	5	6	8	1	3	4	o.r.
CRM2312L	2-12	10-11	5	6	8	1	3	4	o.r.

For further information please see page 206

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 58 B SS 8 6 30V 1024 - R2

Housing:
58 : 58mm

Flange Type:
B : Clamping flange H : Through hollow shaft
S : Servo flange E : End hollow shaft

SS : Stainless Steel

Shaft diameter : 8, 10, 12, 14
Other dimensions on request

Output Channels
1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:
Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)

Connector:
R1204 R1607
R1205 R1614
R1208 R2312R
R1212 R2312L

PPR Options :
1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 -
512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 -
2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 -
6000 - 8192 - 10000 - 12500 - 16384 - 20000 - 25000

Supply Voltage and output circuit :
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Heavy Duty Series

End hollow shaft $\varnothing 12...16$ mm, cone shaft $\varnothing 17$ mm

1000...10000 pulses per revolution



FHD H100

with redundant option

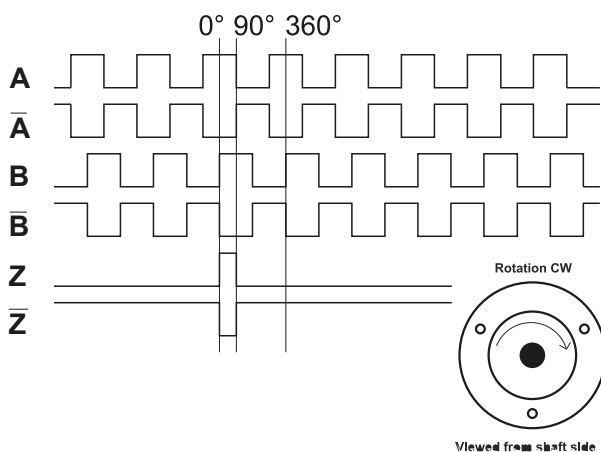
66



Technical data - electrical ratings

Voltage supply	9...30 VDC 5 VDC ± 5 %
Consumption w/o load	≤ 100 mA
Pulses per revolution	1000...10000
Phase shift	$90^\circ \pm 15^\circ$
Scan ratio	45...55 %
Reference signal	Zero pulse, width 90°
Sensing method	Optical
Output frequency	≤ 200 kHz
Output signals	A, B, Z + inverted
Output stages	push-pull TTL/RS422
Shaft insulation	2.8 kV
Transmission length	≤ 400 m at 100kHz
Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3
Approvals	CE

Output signals



Features

- Robust, compact housing
- Two bearings with large distance
- High shaft load up to 400 N
- Highest operating speed 10000 rpm
- Terminal box, M23 connector, Cable options

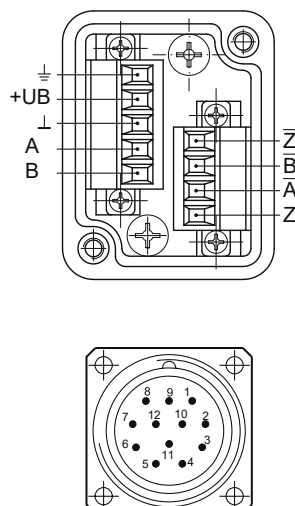
Technical data - mechanical design

Size (flange)	$\varnothing 100$ mm
Shaft type	$\varnothing 12...16$ mm (blind hollow shaft) $\varnothing 17$ mm (cone shaft 1:10)
Shaft loading	≤ 300 N axial ≤ 400 N radial
Motor shaft tolerance	0.2 mm radial
Protection DIN EN 60529	IP 66
Operating speed	≤ 10000 rpm (mechanical)
Operating torque	≤ 6 Ncm
Rotor moment of inertia	160 gcm ²
Materials	Housing: coated aluminium Shaft: stainless steel
Operating temperature	$-40...+100$ °C $-40...+90$ °C
Connection	Terminal box Flange connector M23, 12-pin Cable 1 m
Weight approx.	1.1 kg

Terminal assignment

FHD H100

Connecting terminal terminal box



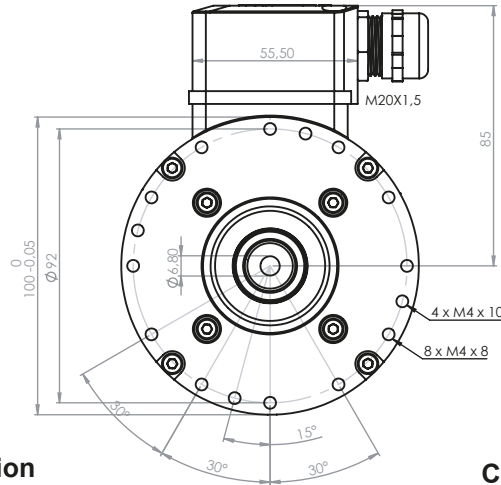
FHD H100

Flange connector

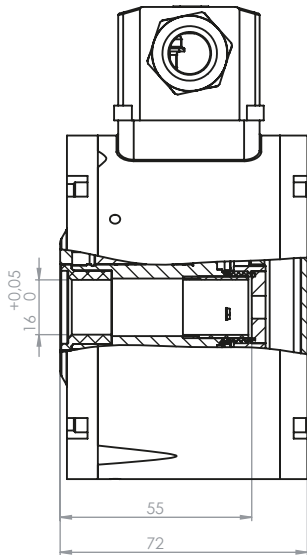
M23, 12-pin, male CW

Pin	Assignment
1	\bar{B}
2	nc
3	Z
4	\bar{Z}
5	A
6	\bar{A}
7	nc
8	B
9, 10	nc
11	GND
12	+UB

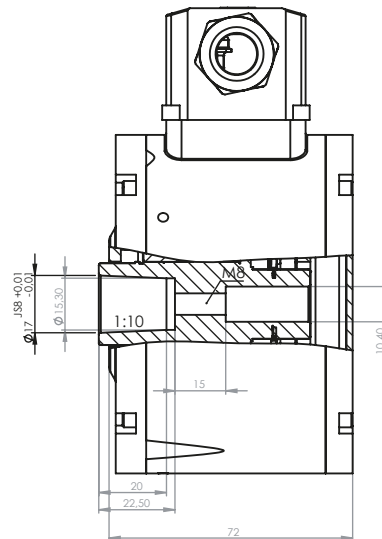
Mechanical Dimensions



End Hollow Shaft Version



Conic Shaft Version



Encoder Part Number

FHD **H** **100** **16** **6** **30V** **1024** **-** **T**

H : Hollow shaft
RH : Hollow shaft redundant

Flange : 100mm

Shaft Diameter

10 : Blind hollow shaft $\varnothing 10$ mm
12 : Blind hollow shaft $\varnothing 12$ mm
16 : Blind hollow shaft $\varnothing 16$ mm
17 : C17 conic shaft $\varnothing 17$ mm

Output Channels

1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:

T : Terminal box
M : M23 12L pin connector
TC : Terminal box with cable
R : Redundant Dsub Connection

PPR Options :

1000 - 1024 - 2000 - 2048 - 2500 - 4096 - 5000 - 8092 - 10000

Supply Voltage and output circuit :

5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Heavy Duty Series

Solid shaft with EURO flange B10
1000...10000 pulses per revolution



FHD S115

with redundant option

68



Features

- Robust, compact housing
- Two bearings with large distance
- High shaft load up to 300 N
- Highest operating speed 10000 rpm
- Terminal box, M23 connector, Cable options

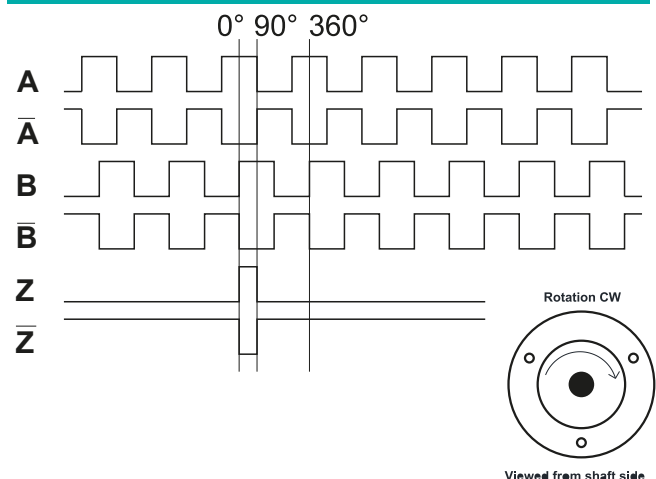
Technical data - electrical ratings

Voltage supply	9...30 VDC 5 VDC $\pm 5\%$
Consumption w/o load	≤ 100 mA
Pulses per revolution	1000...10000
Phase shift	$90^\circ \pm 15^\circ$
Scan ratio	45...55 %
Reference signal	Zero pulse, width 90°
Sensing method	Optical
Output frequency	≤ 200 kHz
Output signals	A, B, Z + inverted
Output stages	push-pull TTL/RS422
Shaft insulation	By plastic coupling
Transmission length	≤ 400 m at 100kHz
Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3
Approvals	CE

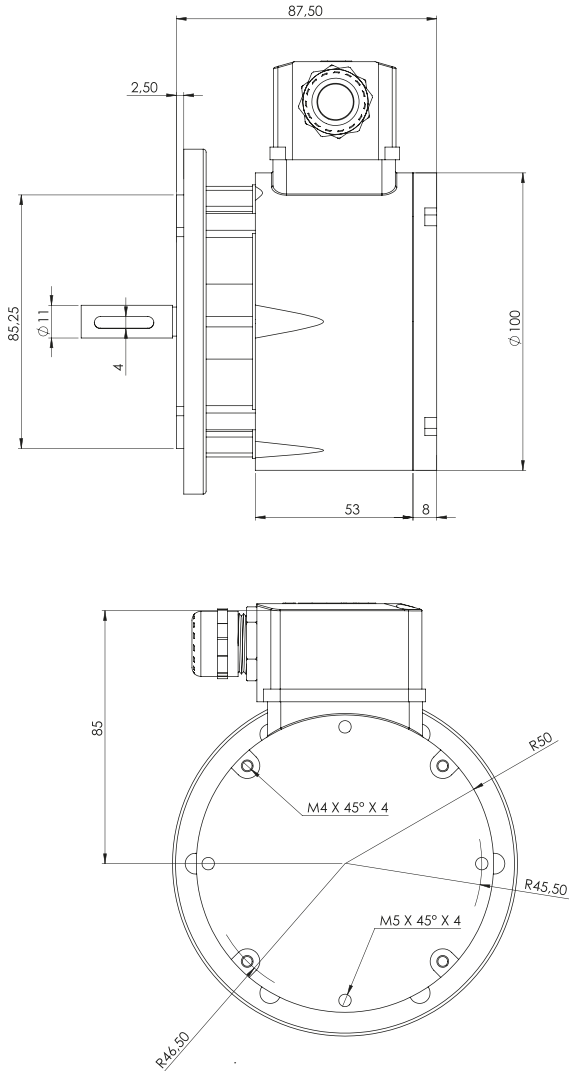
Technical data - mechanical design

Size (flange)	B10 flange//115 mm
Shaft type	$\varnothing 11$ mm solid shaft
Shaft loading	≤ 240 N axial ≤ 300 N radial
Protection DIN EN 60529	IP 66
Operating speed	≤ 10000 rpm (mechanical)
Operating torque	≤ 4 Ncm
Rotor moment of inertia	160 gcm ²
Materials	Housing: die-cast aluminium Shaft: stainless steel
Operating temperature	-40...+100 °C -40...+90 °C
Connection	Terminal box Flange connector M23, 12-pin Cable 1 m
Weight approx.	1.2 kg

Output signals



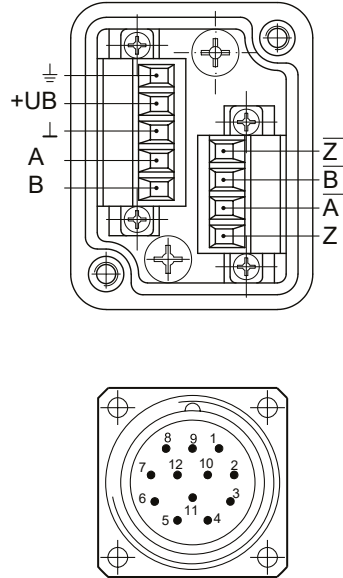
Mechanical Dimensions



Terminal assignment

FHD S115

Connecting terminal terminal box



FHD S115

Flange connector
M23, 12-pin

Pin	Assignment
1	\overline{B}
2	nc
3	Z
4	\overline{Z}
5	A
6	\overline{A}
7	nc
8	B
9, 10	nc
11	GND
12	+UB

Encoder Part Number



S : Shaft
RS : Shaft redundant

Flange : 115mm

Shaft Diameter
11 : 11mm shaft with keyway

Output Channels

- 1 : A
- 2 : AB
- 3 : ABZ
- 4 : AB+A' B'
- 6 : ABZ+A' B' Z'

Electrical Connections:

- T** : Terminal box
- M** : M23 12L pin connector
- TC** : Terminal box with cable
- R** : Redundant Dsub Connection

PPR Options :

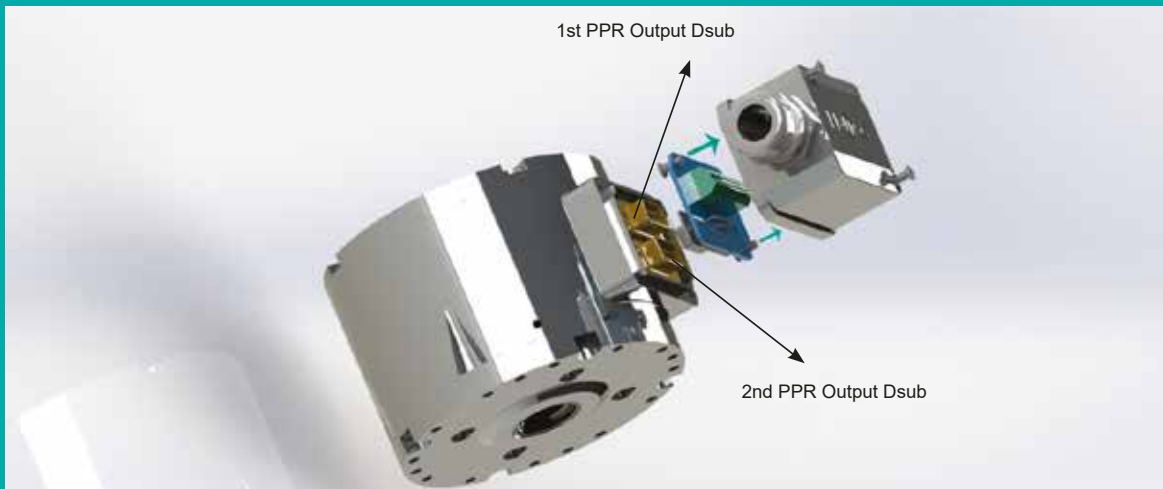
1000 - 1024 - 2000 - 2048 - 2500 - 4096 - 5000 - 8092 - 10000

Supply Voltage and output circuit :

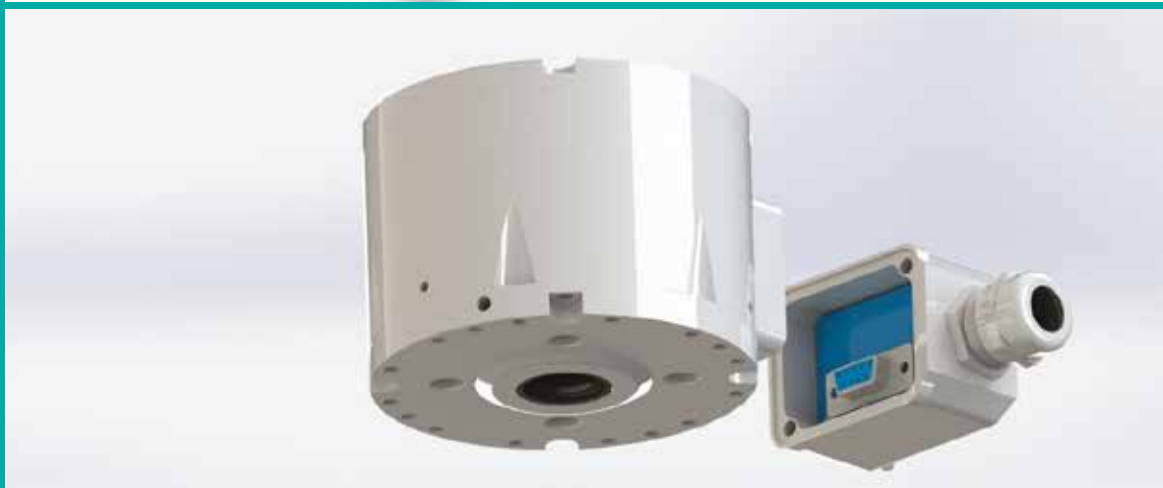
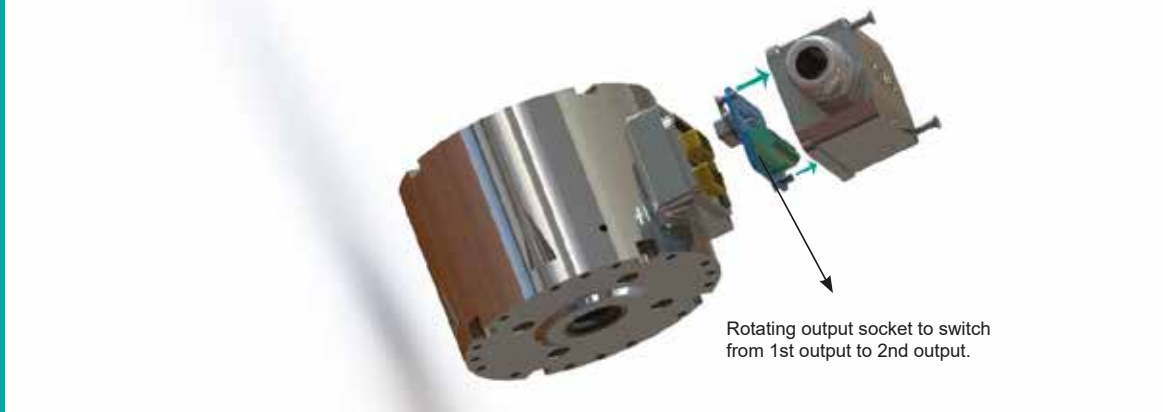
- 5V** : 5V in / out
- 245V** : 5-30V in 5V out
- 30V** : 5-30V in / out

Redundant Connections

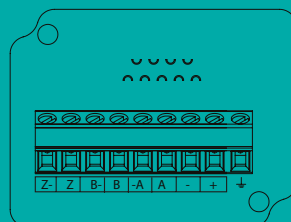
70



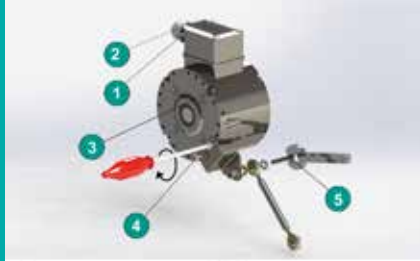
1st PPR output and 2nd PPR output are totally redundant. Optical and electronic side are independent.



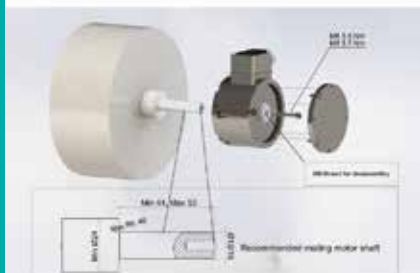
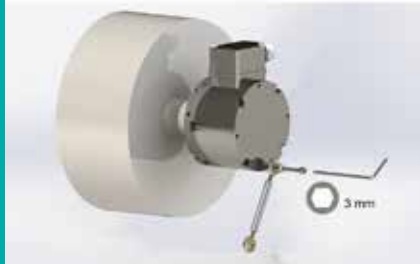
Redundant Output Connector



FHD H100 Mounting



1	M20x1.5 Nipel (Kablo Çıkışı)	1	M20x1.5 Nippin (Cable Out)
2	M20x1.5 Nipel Somunu	2	M20x1.5 Nippin Loof
3	Topraklama M3 Bolt	3	Earthing M3 Bolt
4	Tork Kolu Aksesuar Olarak Mercurul	4	Torque Arm Available As Accessory
5	Genişlik 10 mm	5	Width 10 mm



FHD S115 Mounting



1	Dövde	1	Housing
2	Flang	2	Flange
3	Montaj Kancası	3	Solid shaft with key
4	Kablo Terminal Kapağı	4	Terminal box cover
5	Nipel (Rakor)	5	Screw with lock and slotted drive
6	Bağlama Klemensu	6	Connecting terminal



Features:

- Robust, kompakt housing
- Two bearings with large distance
- High shaft load up to 400 N
- Highest operating speed 10000 rpm
- Terminal box, M23 connector, cable options



Absolute encoders

- **Flexibility**
- **Variety**



Absolute encoders - SSI / BiSS

Shaft with clamping or synchro flange
Single turn 9...19 bit,



FNC AS 27 Series

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Features

- Encoder single - or multturn /SSI - BiSS
- Magnetic or optical sensing
- Single turn resolution up to 21 bit
- Synchro flange
- System monitoring with error/warning messaging
- Optional Prereset and direction input
- Small form factor with sense position data

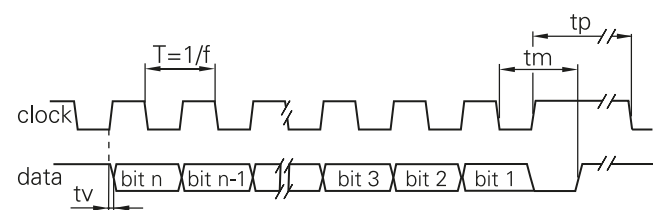
Technical data - electrical ratings

Voltage supply	8VDC to 30VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤80 mA (24 VDC)
Interface	SSI or BiSS
Resolution (steps/turn)	Magnetic: 14 bit Optic: 21 bit
Absolute accuracy	Magnetic: ±0,1° Optic: ±0,01°
Optoelectronic life time	100.000 (min)
Code	Gray or binary
Inputs	SSI differential clock Direction Electronic zero setting
Output frequency	up to 2MHz (SSI) up to 10MHz (BiSS)
Output circuit	SSI data linedriver RS485
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	Ø 27 mm
Shaft loading	≤20 N axial ≤40 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.001 Nm (IP 67)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-40...+90°C -40 °F ... +180 °F
Weight approx.	250 g

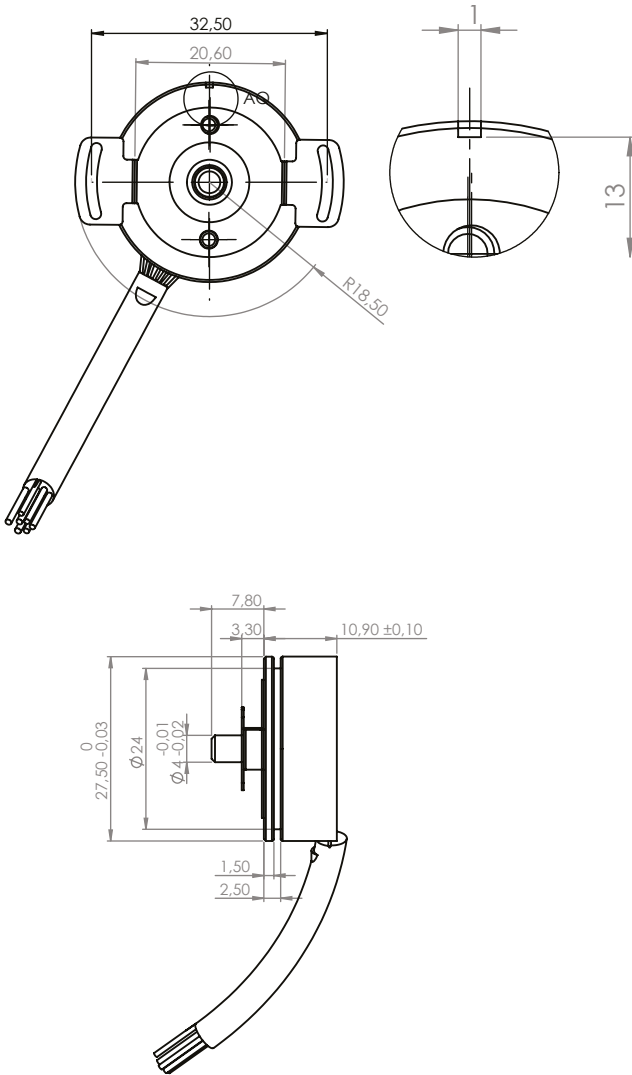
Pulse Diagram



Clock frequency, f	100... 4000 kHz for SSI up to 10MHz for BiSS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	> 5µs

FNC AS 27 Series

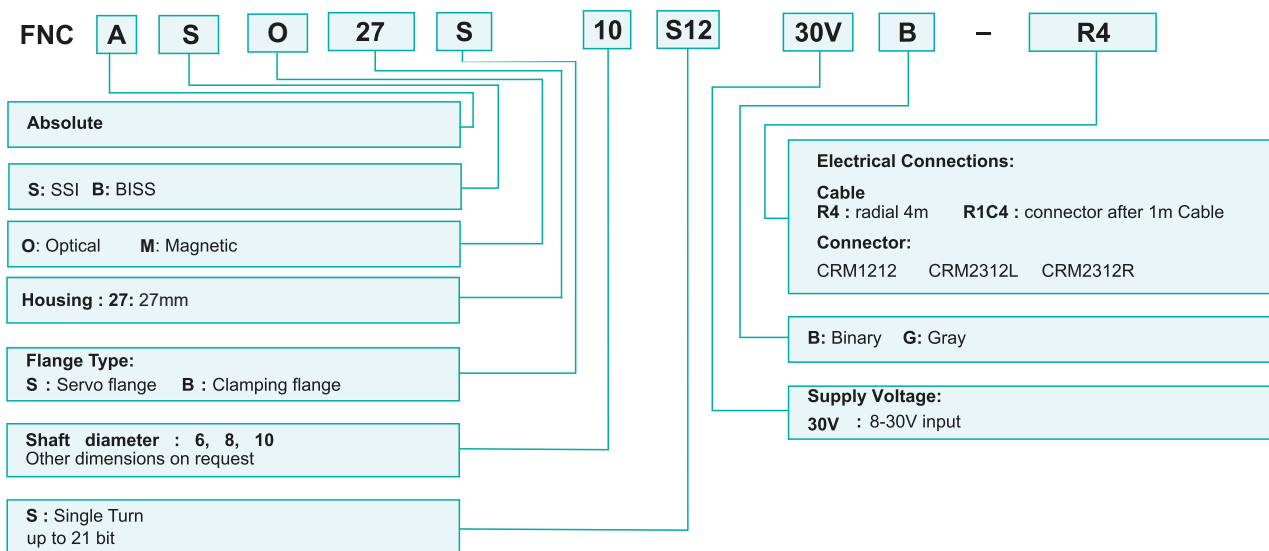
Mechanical Dimensions



Terminal significance

+Vs	Encoder supply voltage.
0 V	Encoder ground connection relating to +Vs
Data+	Positive data output.
Data-	Negative data output.
Clock+	Positive SSI clock input.
Clock-	Negative SSI clock input.
Direction	UP/DOWN counting direction input. This input is standart on High. UP/DOWN means ascending output data with clock-wise shaft rotation when looking at flange.
Preset	Parameter for setting the encoder to a requested position value assigned to a defined shaft position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder.
Note	If needed, Include termination resistor R=120 Ohm between Data+ and Data- on control side.

Encoder Part Number



Absolute encoders - SSI / BiSS

Shaft with clamping or synchro flange
Single turn 9...21 bit,
Multi turn 0...32 bit

FNC AS 36B & 36S Series



Features

- Encoder single - or multiturn /SSI - BiSS
- Magnetic or optical sensing
- Single turn resolution up to 21 bit
- Multi turn 0 ...32 bit
- Clamping flange or synchro flange
- Permanent check of code continuity
- Extreme resistance to shock and vibration
- Encoder with electronic reset

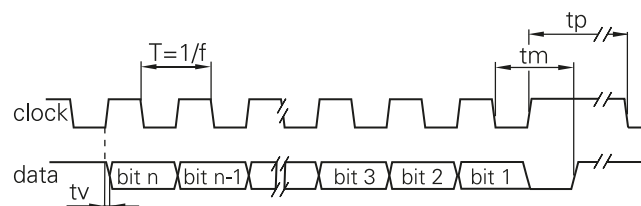
Technical data - electrical ratings

Voltage supply	8VDC to 30VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤80 mA (24 VDC)
Interface	SSI or BiSS
Resolution (steps/turn)	Magnetic: 14 bit Optic: 21 bit
Absolute accuracy	Magnetic: ±0,1° Optic: ±0,01°
Optoelectronic life time	100.000 (min)
Code	Gray or binary
Inputs	SSI differential clock Direction Electronic zero setting
Output frequency	up to 2MHz (SSI) up to 10MHz (BiSS)
Output circuit	SSI data linedriver RS485
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø40 mm
Shaft loading	≤20 N axial ≤40 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.001 Nm (IP 67)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-40...+90°C -40 °F ... +180 °F
Weight approx.	250 g

Pulse Diagram

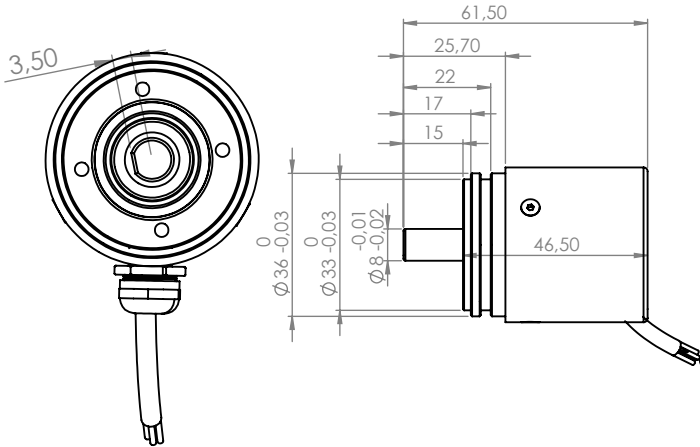


Clock frequency, f	50...2000 kHz for SSI up to 10MHz for BiSS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	>15µs
Clock time out	Programmable at factory

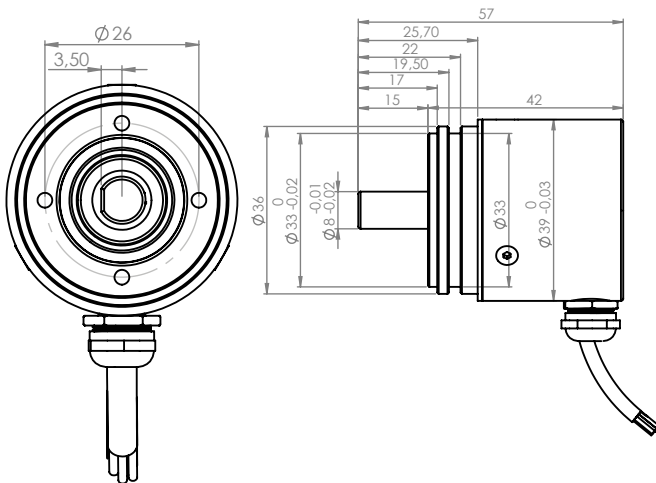
FNC AS 36B & 36S Series

Mechanical Dimensions

36B



36S



Terminal significance

+Vs	Encoder supply voltage.
0 V	Encoder ground connection relating to +Vs.
Data+	Positive data output.
Data-	Negative data output.
Clock+	Positive SSI clock input.
Clock-	Negative SSI clock input.
Direction	UP/DOWN counting direction input. This input is standart on High. UP/DOWN means ascending output data with clock-wise shaft rotation when looking at flange.
Preset	Parameter for setting the encoder to a requested position value assigned to a defined shaft position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder.
Note	If needed, Include termination resistor R=120 Ohm between Data+ and Data- on control side.

Connector	Core colour	Signals	Description
Pin 1	blue	Clock+	Clock signal
Pin 2	blue-black	Clock-	Clock signal
Pin 3	orange	Data+	Data signal
Pin 4	orange-black	Data-	Data signal
Pin 5	gray	Zero	Zero setting input
Pin 6,7,8,9	-	n.c.	-
Pin 10	gray-black	up/down	direction input
Pin 11	white	0 V	GND
Pin 12	brown	+Vs	Supply voltage

Screen: not connected to housing

Cable data: 4 x 2 x 0.14 mm²

Encoder Part Number

FNC **A** **S** **O** **36** **S** **10** **S12** **M12** **30V** **B** - **R4**

Absolute	
S : SSI B : BiSS	
O : Optical M : Magnetic	
Housing : 36 : 36mm	
Flange Type: S : Servo flange B : Clamping flange	
Shaft diameter : 6, 8, 10 Other dimensions on request	
S : Single Turn up to 21 bit	Electrical Connections: Cable R4 : radial 4m R1C4 : connector after 1m Cable Connector: R1214 R2312L R2312R B : Binary G : Gray Supply Voltage: 30V : 8-30V input Multi turn options : 0, 4, 8, 12, 16, 18, 24, 32

Absolute encoders - SSI / BiSS

Shaft with clamping or synchro flange
Single turn 9... 21 bit,
Multi turn 0...32 bit

FNC AS 50B Series

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Features

- Encoder single - or multiturn /SSI - BiSS
- Magnetic or optical sensing
- Single turn resolution up to 21 bit
- Multi turn 0...16 bit
- Clamping flange or synchro flange
- Permanent check of code continuity
- Extreme resistance to shock and vibration
- Encoder with electronic reset

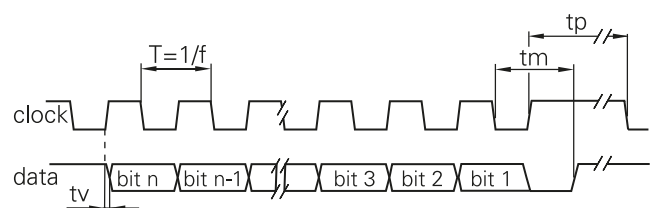
Technical data - electrical ratings

Voltage supply	8VDC to 30VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤80 mA (24 VDC)
Interface	SSI or BiSS
Resolution (steps/turn)	Magnetic: 14 bit Optic: 21 bit
Absolute accuracy	Magnetic: ±0,1° Optic: ±0,01°
Optoelectronic life time	100.000 (min)
Code	Gray or binary
Inputs	SSI differential clock Direction Electronic zero setting
Output frequency	up to 2MHz (SSI) up to 10MHz (BiSS)
Output circuit	SSI data linedriver RS485
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	50 mm
Shaft loading	≤20 N axial ≤40 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.001 Nm (IP 67)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-40...+90°C -40 °F ... +180 °F
Weight approx.	350 g

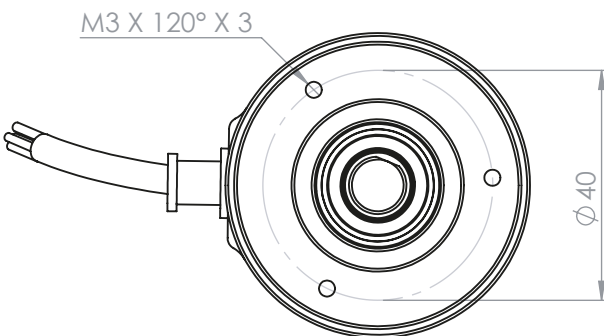
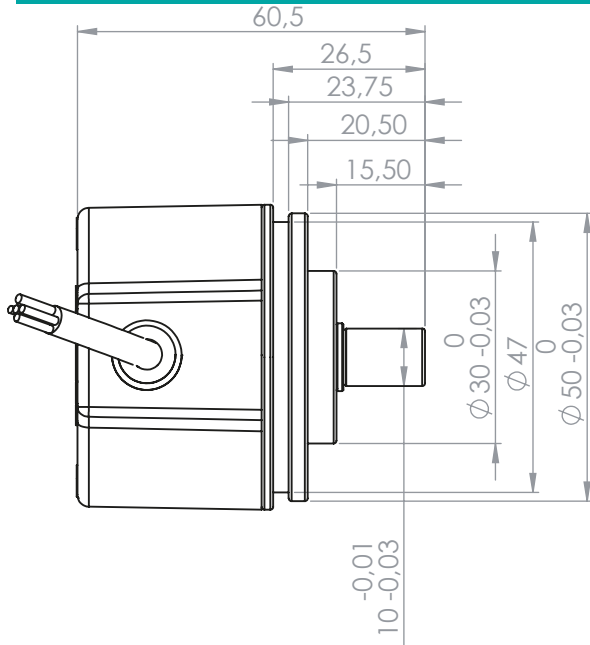
Pulse Diagram



Clock frequency, f	50...2000 kHz for SSI up to 10MHz for BiSS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	>15µs
Clock time out	Programmable at factory

FNC AS 50B Series

Mechanical Dimensions



Terminal significance

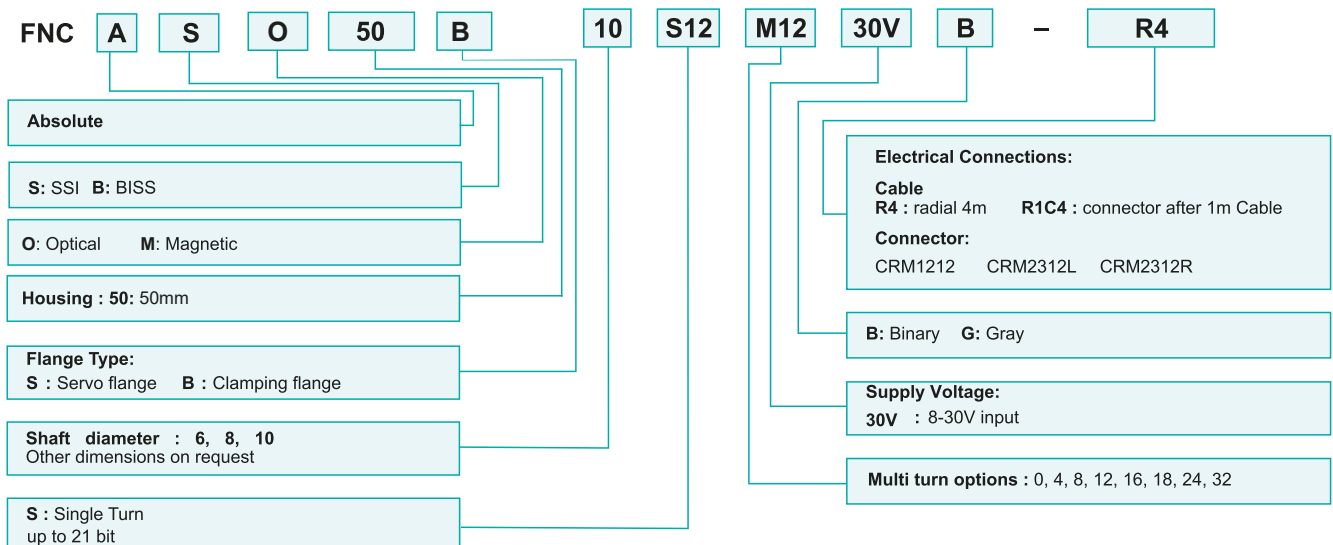
+Vs	Encoder supply voltage.
0 V	Encoder ground connection relating to +Vs.
Data+	Positive data output.
Data-	Negative data output.
Clock+	Positive SSI clock input.
Clock-	Negative SSI clock input.
Direction	UP/DOWN counting direction input. This input is standart on High. UP/DOWN means ascending output data with clock-wise shaft rotation when looking at flange.
Preset	Parameter for setting the encoder to a requested position value assigned to a defined shaft position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder.
Note	If needed, Include termination resistor R=120 Ohm between Data+ and Data- on control side.

Connector	Core colour	Signals	Description
Pin 1	blue	Clock+	Clock signal
Pin 2	blue-black	Clock-	Clock signal
Pin 3	orange	Data+	Data signal
Pin 4	orange-black	Data-	Data signal
Pin 5	gray	Zero	Zero setting input
Pin 6,7,8,9	-	n.c.	-
Pin 10	gray-black	up/down	direction input
Pin 11	white	0 V	GND
Pin 12	brown	+Vs	Supply voltage

Screen: not connected to housing

Cable data: 4 x 2 x 0.14 mm²

Encoder Part Number



Absolute encoders - SSI / BiSS

Shaft with clamping or synchro flange
Single turn 9...21 bit,
Multi turn 0...32 bit

FNC AS 458B Series



Features

- Encoder single - or multiturn /SSI - BiSS
- Magnetic or optical sensing
- Single turn resolution up to 21 bit
- Multi turn 0 ...32 bit
- Clamping flange or synchro flange
- Permanent check of code continuity
- Extreme resistance to shock and vibration
- Encoder with electronic reset

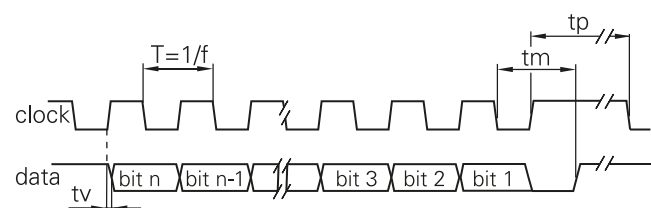
Technical data - electrical ratings

Voltage supply	8VDC to 30VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤80 mA (24 VDC)
Interface	SSI or BiSS
Resolution (steps/turn)	Magnetic: 14 bit Optic: 21 bit
Absolute accuracy	Magnetic: ±0,1° Optic: ±0,01°
Optoelectronic life time	100.000 (min)
Code	Gray or binary
Inputs	SSI differential clock Direction Electronic zero setting
Output frequency	up to 2MHz (SSI) up to 10MHz (BiSS)
Output circuit	SSI data linedriver RS485
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤20 N axial ≤40 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.001 Nm (IP 67)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-40...+90°C -40 °F ... +180 °F
Weight approx.	350 g

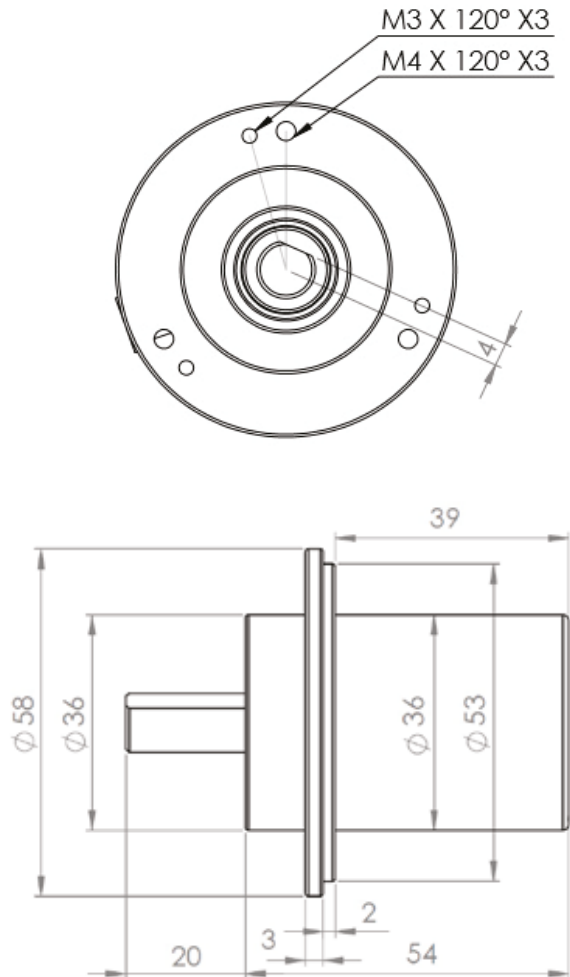
Pulse Diagram



Clock frequency, f	50...2000 kHz for SSI up to 10MHz for BiSS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	>15µs
Clock time out	Programmable at factory

FNC AS 458B Series

Mechanical Dimensions



Terminal significance

+Vs	Encoder supply voltage.
0 V	Encoder ground connection relating to +Vs.
Data+	Positive data output.
Data-	Negative data output.
Clock+	Positive SSI clock input.
Clock-	Negative SSI clock input.
Direction	UP/DOWN counting direction input. This input is standart on High. UP/DOWN means ascending output data with clock-wise shaft rotation when looking at flange.
Preset	Parameter for setting the encoder to a requested position value assigned to a defined shaft position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder.
Note	If needed, Include termination resistor R=120 Ohm between Data+ and Data- on control side.

Connector	Core colour	Signals	Description
Pin 1	blue	Clock+	Clock signal
Pin 2	blue-black	Clock-	Clock signal
Pin 3	orange	Data+	Data signal
Pin 4	orange-black	Data-	Data signal
Pin 5	gray	Zero	Zero setting input
Pin 6,7,8,9	-	n.c.	-
Pin 10	gray-black	up/down	direction input
Pin 11	white	0 V	GND
Pin 12	brown	+Vs	Supply voltage

Screen: not connected to housing
Cable data: 4 x 2 x 0.14 mm²

Encoder Part Number

FNC A S O 458 B 10 S12 M12 30V B - R4

- Absolute**
- S**: SSI **B**: BiSS
- O**: Optical **M**: Magnetic
- Housing** : 58: 58mm
- Flange Type**:
S : Servo flange **B** : Clamping flange
- Shaft diameter** : 6, 8, 10
Other dimensions on request
- S** : Single Turn
up to 21 bit

Electrical Connections:
Cable
R4 : radial 4m **R1C4** : connector after 1m Cable
Connector:
R1212 R2312L R2312R

B: Binary **G**: Gray

Supply Voltage:
30V : 8-30V input

Multi turn options : 0, 4, 8, 12, 16, 18, 24, 32

Absolute encoders - SSI / BiSS

Shaft with clamping or synchro flange
Single turn 12...19 bit,
Multi turn 4...32bit

FNC AS 58B & 58S Series



Features

- Encoder single - or multiturn / SSI - BiSS
- Magnetic Sensing (Optional optical sensing)
- Optical Single turn Resolution: 12...19 bit
- Magnetic Single turn Resolution: 9...13bit
- Multi turn 4...32bit
- Clamping flange or synchro flange
- Permanent check of code continuity
- Extreme resistance to shock and vibration
- Encoder with electronic reset

Technical data - electrical ratings

Voltage supply	5.5VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤50 mA (24 VDC)
Interface	SSI or BiSS
Resolution (steps/turn)	Magnetic: 14 bit Optic: 21 bit
Absolute accuracy	Magnetic: ±0,1° Optic: ±0,01°
Optoelectronic life time	100.000 (min)
Code	Gray or binary
Inputs	SSI differential clock Direction Electronic zero setting Chip select (Optional)
Output frequency	up to 2MHz (SSI) up to 10MHz (BiSS)
Output circuit	SSI data linedriver RS485
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Accessories

Connectors and cables

CRM2312R M23 12 poles female connector or see page 206

Mounting coupling

PF481010 metal coupling or see page 204

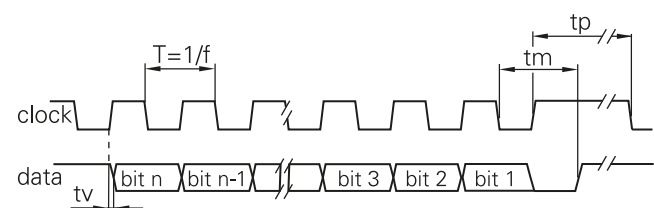
Mounting accessories

YY TEO spring or see page 202-203

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-40...+110 °C -40 °C up to +120 °C (Storage)
Weight approx.	250 g

Pulse Diagram

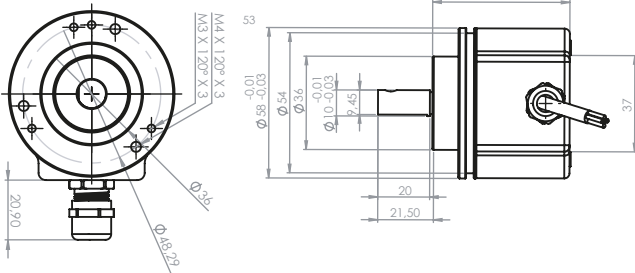


Clock frequency, f	50...2000 kHz for SSI up to 10MHz for BiSS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	>15µs
Clock time out	Programmable at factory

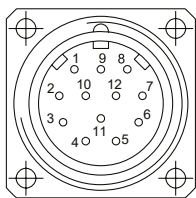
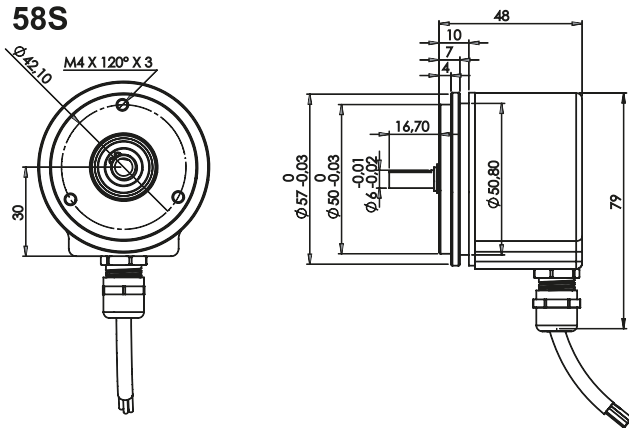
FNC AS 58B & 58S Series

Mechanical Dimensions

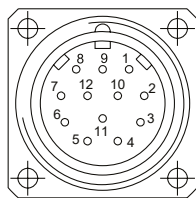
58B



58S



M2312R



M2312L

Cable / Connector M23 male

Connector	Core colour	Signals	Description
Pin 1	blue	Clock+	Clock signal
Pin 2	blue-black	Clock-	Clock signal
Pin 3	orange	Data+	Data signal
Pin 4	orange-black	Data-	Data signal
Pin 5	gray	Zero	Zero setting input
Pin 6,7,8,9	-	n.c.	-
Pin 10	gray-black	up/down	direction input
Pin 11	white	0 V	GND
Pin 12	brown	+Vs	Supply voltage

Screen: not connected to housing

Cable data: 4 x 2 x 0.14 mm²

Terminal significance

+Vs	Encoder supply voltage.
0 V	Encoder ground connection relating to +Vs.
Data+	Positive data output.
Data-	Negative data output.
Clock+	Positive SSI clock input.
Clock-	Negative SSI clock input.
Zero	Input for setting a zero point anywhere within the encoder resolution. The zero setting operation is triggered by a Low impulse. Connect to +Vs after setting operation for maximum interference immunity. Impulse duration >2 ms.
Note	Include termination resistor R=120 Ohm between Data+ and Data- on control side.
Direction	UP/DOWN counting direction input. This input is standart on High. UP/DOWN means ascending output data with clock-wise shaft rotation when looking at flange.

Encoder Part Number

FNC **A** **S** **58** **B** **10** **S12** **M12** **30V** **B** - **R2**

- Absolute**
- S**: SSI **B**: BiSS
- Housing: 58** : 58mm
- Flange Type:**
S : Servo flange **B** : Clamping flange
- Shaft diameter : 6, 8, 10, 12**
Other dimensions on request
- S** : Single Turn
up to 21 bit

- Electrical Connections:**
- Cable**
R2 : radial 2m **A2** : axial 2m
- Connector:**
R1212 R2312L R2312R
- B**: Binary **G**: Gray
- Supply Voltage:**
5V : 5V in / out **30V** : 5-30V in / out
- Multi turn options** : 4, 8, 12, 16, 20, 24, 32

Absolute encoders - SSI / BiSS

Shaft with clamping or synchro flange
 Single turn 9...19 bit,
 Multi turn 0...32 bit

FNC AS 36E Series



Features

- Encoder single - or multiturn /SSI - BiSS
- Magnetic or optical sensing
- Single turn resolution up to 22 bit
- Multi turn 0 ...16 bit
- Optional preset and direction input
- 36 mm diameter body
- 6 mm diameter solid shaft

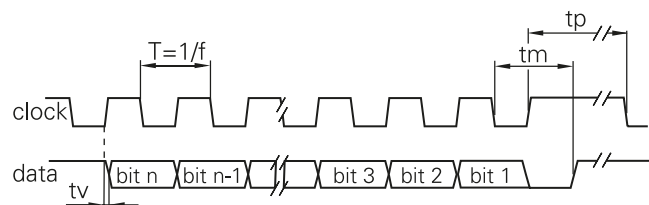
Technical data - electrical ratings

Voltage supply	8VDC to 30VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤80 mA (24 VDC)
Interface	SSI or BiSS
Resolution (steps/turn)	Magnetic: 14 bit Optic: 21 bit
Absolute accuracy	Magnetic: ±0,1° Optic: ±0,01°
Optoelectronic life time	100.000 (min)
Code	Gray or binary
Inputs	SSI differential clock Direction Electronic zero setting
Output frequency	up to 2MHz (SSI) up to 10MHz (BiSS)
Output circuit	SSI data linedriver RS485
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	Ø 36mm
Shaft loading	≤20 N axial ≤40 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.001 Nm (IP 67)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6 (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-40...+90°C -40 °F ... +180 °F
Weight approx.	250 g

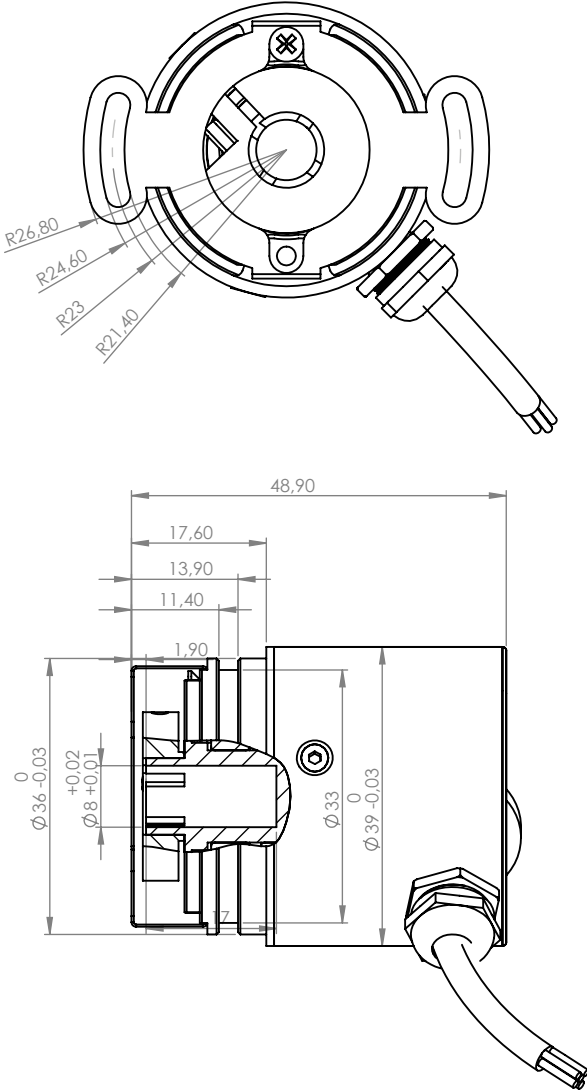
Pulse Diagram



Clock frequency, f	50...2000 kHz for SSI up to 10MHz for BiSS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	>15µs
Clock time out	Programmable at factory

FNC AS 36E Series

Mechanical Dimensions

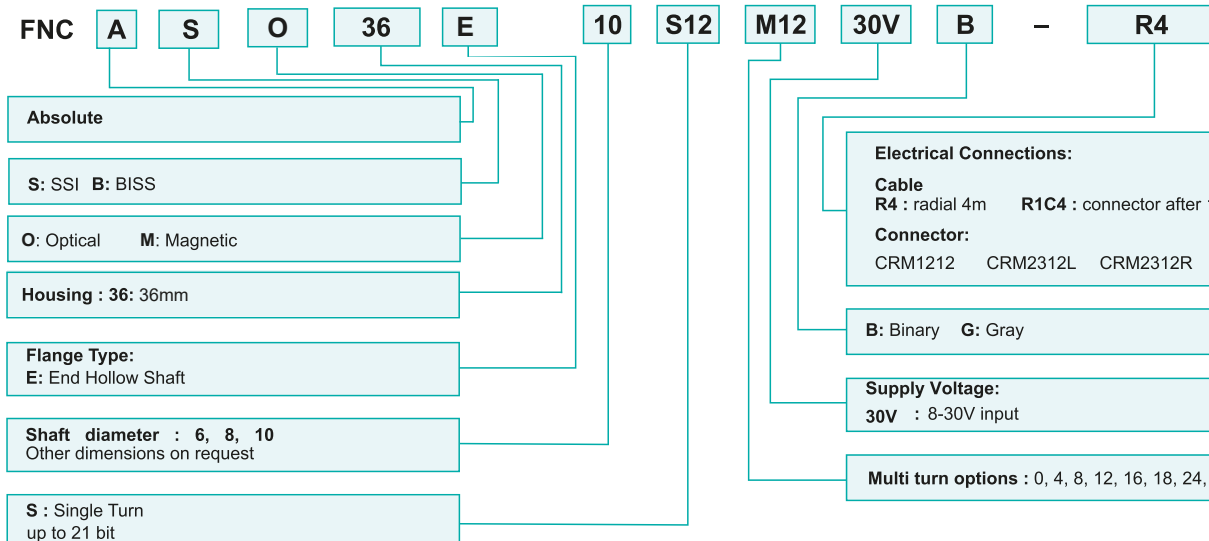


Terminal significance

+Vs	Encoder supply voltage.
0 V	Encoder ground connection relating to +Vs.
Data+	Positive data output.
Data-	Negative data output.
Clock+	Positive SSI clock input.
Clock-	Negative SSI clock input.
Direction	UP/DOWN counting direction input. This input is standart on High. UP/DOWN means ascending output data with clock-wise shaft rotation when looking at flange.
Preset	Parameter for setting the encoder to a requested position value assigned to a defined shaft position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder.
Note	If needed, Include termination resistor R=120 Ohm between Data+ and Data- on control side.

Function	Color	Renk
Vcc.	Brown	Kahverengi
GND	White	Beyaz
Clock+	Blue	Mavi
Clock-	Blue-Black	Mavi-Beyaz
Data+	Orange	Turuncu
Data-	Orange-Black	Turuncu-Siyah

Encoder Part Number



Absolute encoders - SSI / BiSS

Shaft with clamping or synchro flange
Single turn 9... 21 bit,



FNC AS 50H Series

86



Features

- Encoder single turn /SSI - BiSS
- Magnetic or optical sensing
- Single turn resolution up to 21 bit
- Clamping flange or synchro flange
- Permanent check of code continuity
- Extreme resistance to shock and vibration
- Encoder with electronic reset

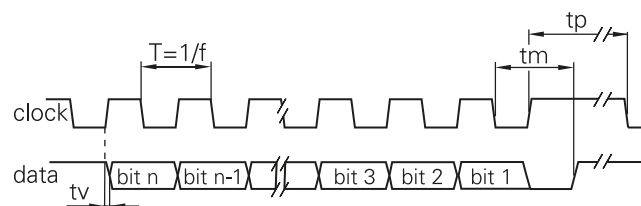
Technical data - electrical ratings

Voltage supply	8VDC to 30VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤80 mA (24 VDC)
Interface	SSI or BiSS
Resolution (steps/turn)	Magnetic: 14 bit Optic: 21 bit
Absolute accuracy	Magnetic: ±0,1° Optic: ±0,01°
Optoelectronic life time	100.000 (min)
Code	Gray or binary
Inputs	SSI differential clock Direction Electronic zero setting
Output frequency	up to 2MHz (SSI) up to 10MHz (BiSS)
Output circuit	SSI data linedriver RS485
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	50 mm
Shaft loading	≤20 N axial ≤40 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.001 Nm (IP 67)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-40...+90°C -40 °F ... +180 °F
Weight approx.	350 g

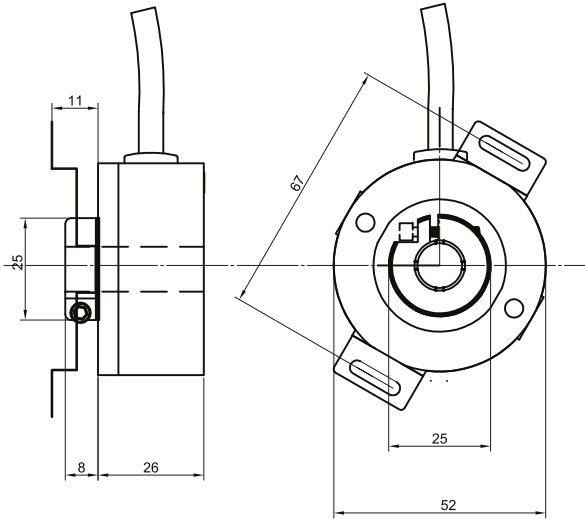
Pulse Diagram



Clock frequency, f	50...2000 kHz for SSI up to 10MHz for BiSS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	>15µs
Clock time out	Programmable at factory

FNC AS 50H Series

Mechanical Dimensions



Terminal significance

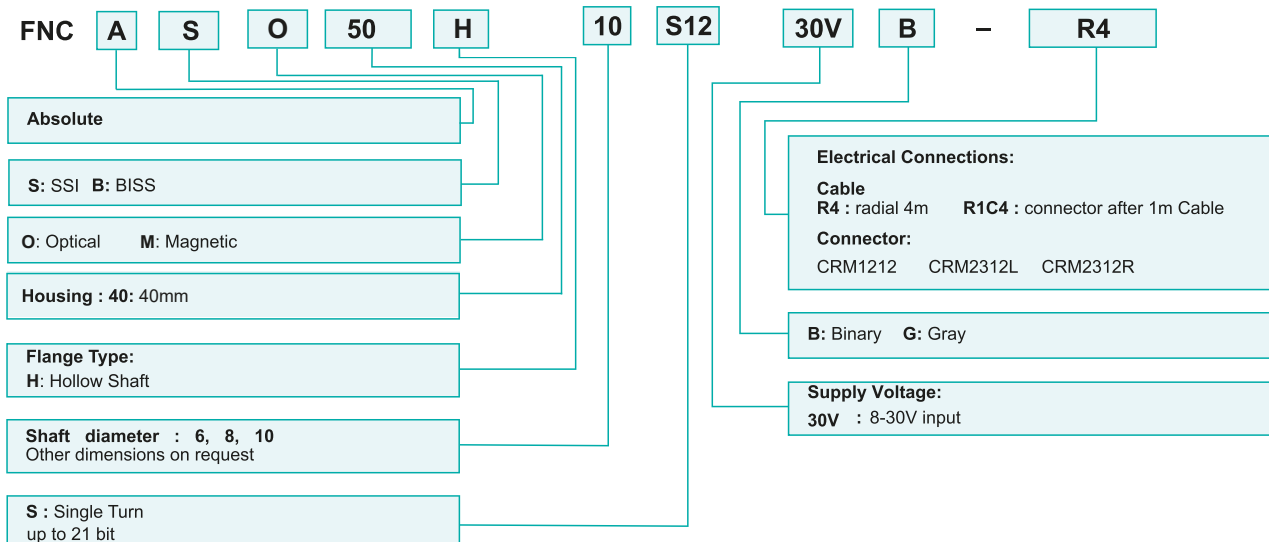
+Vs	Encoder supply voltage.
0 V	Encoder ground connection relating to +Vs.
Data+	Positive data output.
Data-	Negative data output.
Clock+	Positive SSI clock input.
Clock-	Negative SSI clock input.
Direction	UP/DOWN counting direction input. This input is standart on High. UP/DOWN means ascending output data with clockwise shaft rotation when looking at flange.
Preset	Parameter for setting the encoder to a requested position value assigned to a defined shaft position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder.
Note	If needed, Include termination resistor R=120 Ohm between Data+ and Data- on control side.

Connector	Core colour	Signals	Description
Pin 1	blue	Clock+	Clock signal
Pin 2	blue-black	Clock-	Clock signal
Pin 3	orange	Data+	Data signal
Pin 4	orange-black	Data-	Data signal
Pin 5	gray	Zero	Zero setting input
Pin 6,7,8,9	–	n.c.	–
Pin 10	gray-black	up/down	direction input
Pin 11	white	0 V	GND
Pin 12	brown	+Vs	Supply voltage

Screen: not connected to housing

Cable data: 4 x 2 x 0.14 mm²

Encoder Part Number



Absolute encoders - SSI / BiSS



End Hollow Shaft - Through Hollow Shaft
Single turn 12...19 bit,
Multi turn 4...32bit

FNC AS 58E & 58H Series

88



Features

- Encoder single - or multiturn / SSI - BiSS
- Magnetic Sensing (Optional optical sensing)
- Optical Single turn Resolution: 12...19 bit
- Magnetic Single turn Resolution: 9...13bit
- Multi turn 4...32bit
- Clamping flange or synchro flange
- Permanent check of code continuity
- Extreme resistance to shock and vibration
- Encoder with electronic reset

Technical data - electrical ratings

Voltage supply	5.5VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤50 mA (24 VDC)
Interface	SSI or BiSS
Resolution (steps/turn)	Magnetic: 14 bit Optic: 21 bit
Absolute accuracy	Magnetic: ±0,1° Optic: ±0,01°
Optoelectronic life time	100.000 (min)
Code	Gray or binary
Inputs	SSI differential clock Direction Electronic zero setting Chip select (Optional)
Output frequency	up to 2MHz (SSI) up to 10MHz (BiSS)
Output circuit	SSI data linedriver RS485
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Accessories

Connectors and cables

CRM2312R M23 12 poles female connector or see page 206

Mounting coupling

See page 204

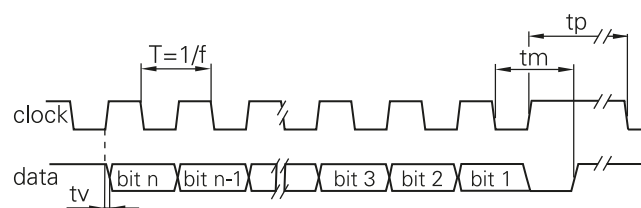
Mounting accessories

YY TEO spring or see page 202-203

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12, 14 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-40...+110 °C -40 °C up to +120 °C (Storage)
Weight approx.	250 g

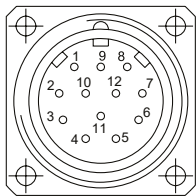
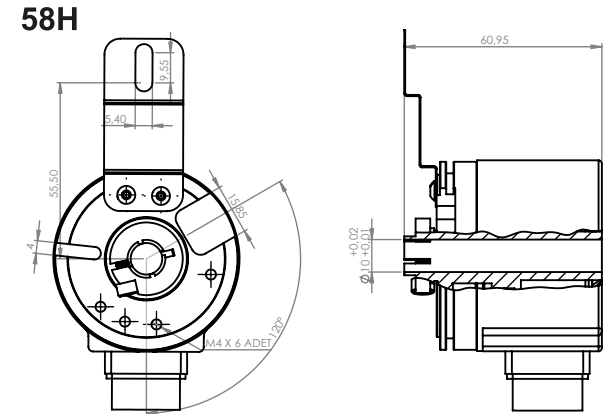
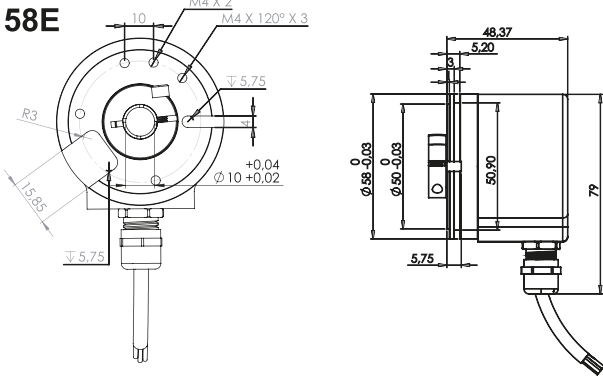
Pulse Diagram



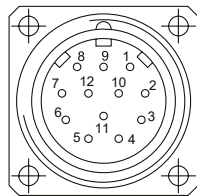
Clock frequency, f	50...2000 kHz for SSI up to 10MHz for BiSS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	>15µs
Clock time out	Programmable at factory

FNC AS 58E & 58H Series

Mechanical Dimensions



M2312R



M2312L

Cable / Connector M23 male

Connector	Core colour	Signals	Description
Pin 1	blue	Clock+	Clock signal
Pin 2	blue-black	Clock-	Clock signal
Pin 3	orange	Data+	Data signal
Pin 4	orange-black	Data-	Data signal
Pin 5	gray	Zero	Zero setting input
Pin 6,7,8,9	-	n.c.	-
Pin 10	gray-black	up/down	direction input
Pin 11	white	0 V	GND
Pin 12	brown	+Vs	Supply voltage

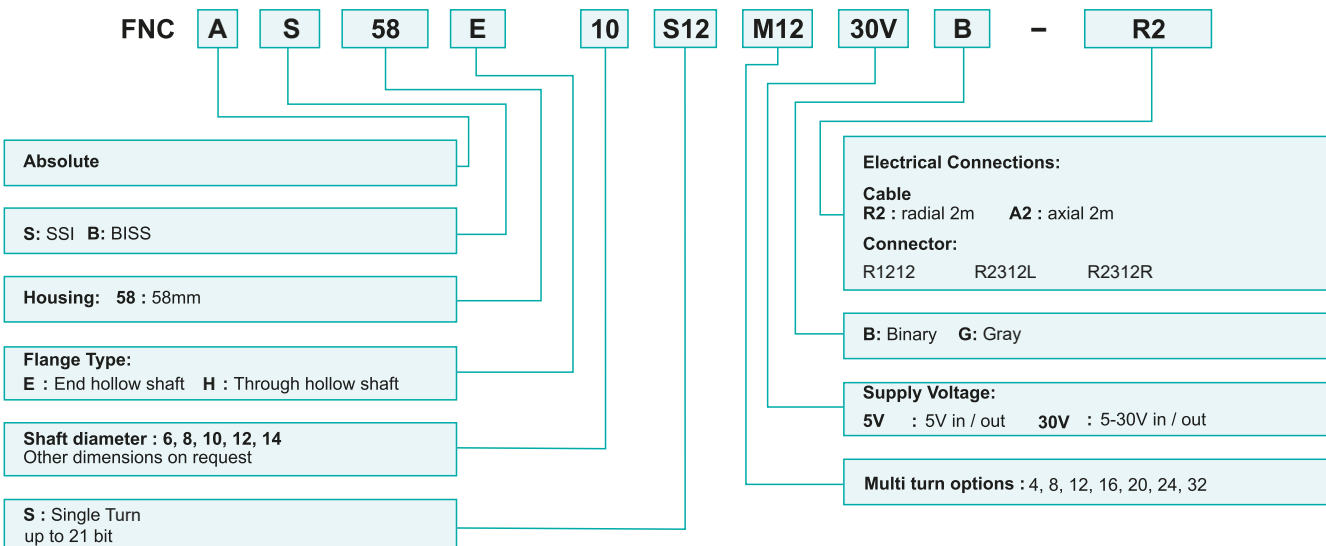
Screen: not connected to housing

Cable data: 4 x 2 x 0.14 mm²

Terminal significance

+Vs	Encoder supply voltage.
0 V	Encoder ground connection relating to +Vs.
Data+	Positive data output.
Data-	Negative data output.
Clock+	Positive SSI clock input.
Clock-	Negative SSI clock input.
Zero	Input for setting a zero point anywhere within the encoder resolution. The zero setting operation is triggered by a Low impulse. Connect to +Vs after setting operation for maximum interference immunity. Impulse duration >2 ms.
Note	Include termination resistor R=120 Ohm between Data+ and Data- on control side.
Direction	UP/DOWN counting direction input. This input is standart on High. UP/DOWN means ascending output data with clockwise shaft rotation when looking at flange.

Encoder Part Number



Absolute encoders - SSI / BiSS



Through Hollow Shaft
Single turn up to 18 bit
Multi turn up to 24 bit

FNC ASM 80H Series

90



Features

- Encoder single - or multiturn / SSI - BiSS
- Magnetic Sensing
- Magnetic Single turn Resolution up to 18 bit
- Multi turn 0...24 bit
- Through Hollow Shaft
- Permanent check of code continuity
- Extreme resistance to shock and vibration
- Encoder with electronic reset

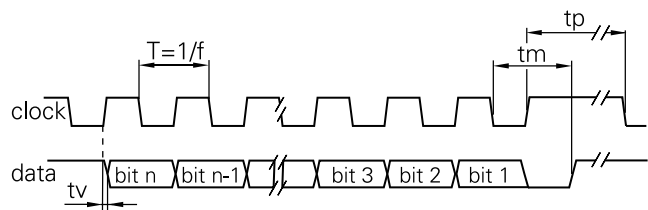
Technical data - electrical ratings

Voltage supply	8VDC to 30VDC 5 VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤ 100 mA (24VDC)
Consumption w/o load	≤ 100 mA (5VDC)
Interface	SSI or BiSS
Resolution (steps/turn)	up to 18 bit
Absolute accuracy	0,1°
Optoelectronic life time	100.000 (min)
Code	Gray or binary
Inputs	SSI differential clock Direction Electronic zero setting
Output frequency	up to 2MHz (SSI) up to 10MHz (BiSS)
Output circuit	SSI data linedriver RS485
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	Ø80 mm
Shaft loading	≤20 N axial ≤40 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.001 Nm (IP 67)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	25 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-40...+90°C -40 °F ... +180 °F
Weight approx.	250 g

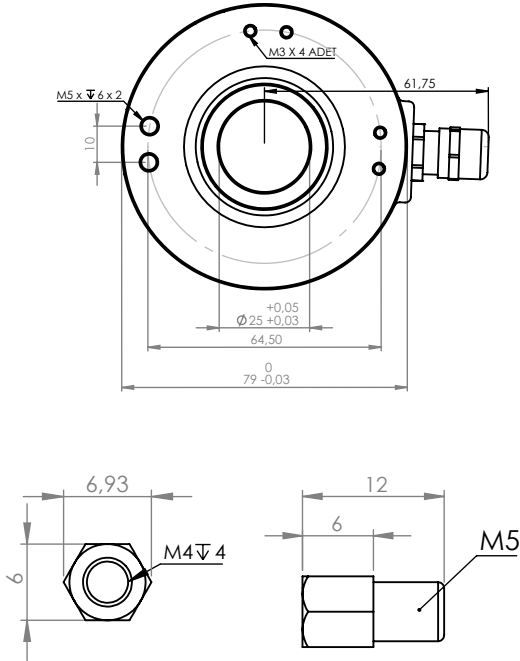
Pulse Diagram



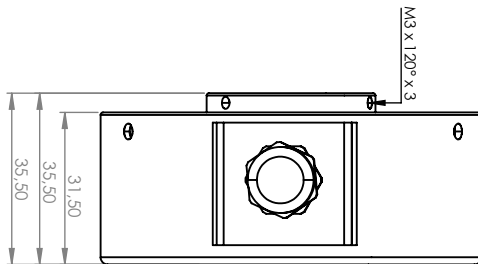
Clock frequency, f	50...2000 kHz for SSI up to 10MHz for BiSS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	>15µs
Clock time out	Programmable at factory

FNC ASM 80H Series

Mechanical Dimensions



(Material : Brass)



Terminal significance

+Vs	Encoder supply voltage.
0 V	Encoder ground connection relating to +Vs.
Data+	Positive data output.
Data-	Negative data output.
Clock+	Positive SSI clock input.
Clock-	Negative SSI clock input.
Note	If needed, Include termination resistor R=120 Ohm between Data+ and Data- on control side.

Core colour	Signals	Description
blue	Clock+	Clock signal
blue-black	Clock-	Clock signal
orange	Data+	Data signal
orange-black	Data-	Data signal
white	0 V	GND
brown	+Vs	Supply voltage
black	Shield	connected to housing

Cable data: 4 x 2 x 0.14 mm² Cable length : 2m

Encoder Part Number

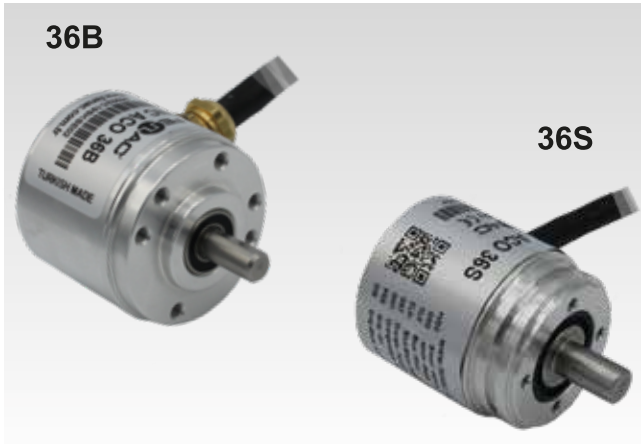
FNC **A** **S** **M** **80** **H** **10** **S12** **M12** **30V** **B** - **R4**

Absolute	<p>Electrical Connections: Cable R4 : radial 4m R1C4 : connector after 1m cable Connector: R1212 R2312L R2312R</p> <p>B: Binary</p> <p>Supply Voltage: 5V : 5V in / out 30V : 5-30V in / out</p> <p>M: Multi turn up to 24 bit</p>
S: SSI B: BISS	
M: Magnetic	
Housing : 80: 80mm	
Flange Type: H: Hollow Shaft	
Shaft diameter : 6, 8, 10 Other dimensions on request	
S : Single Turn up to 18 bit	

Absolute encoders - CANopen

Shaft with clamping or synchro flange
Single turn 9...16 bit,
Multi turn 0...16 bit

FNC AC 36B & 36S Series



Features

- Encoder single - or multiturn /CANopen
- Magnetic or optical sensing
- Single turn resolution up to 21 bit
- Multi turn 0 ...32 bit
- Clamping flange or synchro flange
- Permanent check of code continuity
- Extreme resistance to shock and vibration
- Encoder with electronic reset

Technical data - electrical ratings

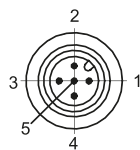
Voltage supply	8VDC to 30VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤80 mA (24 VDC)
Interface	CANopen CiA DSP 301 V4.01, DSP 305 V1.0, DSP 406 V3.1
Resolution (steps/turn)	Magnetic: 14 bit Optic: 21 bit
Absolute accuracy	Magnetic: ±0,1° Optic: ±0,01°
Sensing method	Magnetic
Code	Binary
Code sequence	CW default, programmable
Programmable parameters	Operating modes Total resolution Scaling Rotation speed monitoring Node ID Baud Rate
Note:	All parameters change via microchip interface
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø40 mm
Shaft loading	≤40 N axial ≤80 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.001Nm (IP 65)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-40...+90 °C -40 °F ...+180 °F
Weight approx.	350 g

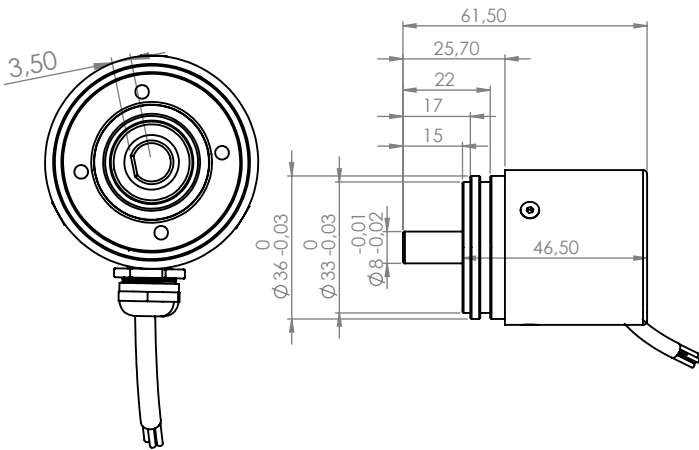
Terminal assignment

Connector M12			
Conn.	Signals	Description	
Pin 1	n.c.	-	
Pin 2	+Vs	Supply voltage	
Pin 3	CAN_GND	CAN Ground	
Pin 4	CAN_H	Bus (dominant High)	
Pin 5	CAN_L	Bus (dominant Low)	

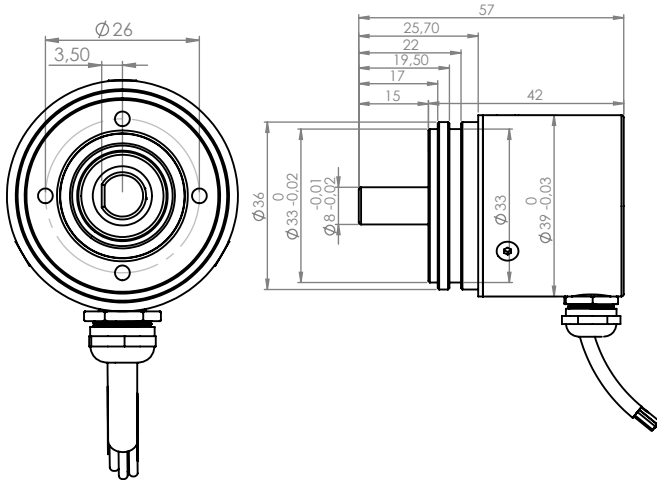


Mechanical Dimensions

36B



36S



CANopen® features

Bus protocol	CANopen
Device profile	CANopen - CiA DS 406
Preset	Parameter for setting the encoder to a requested position value assigned to a defined shaft position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder.
Rotating direction	The rotating direction in which there have to be ascending or descending position values can be defined. Default setting: Ascending position values when looking at the flange and rotating the shaft clockwise.
Scaling	Parameter defining the steps per turn as well as the total resolution.
Diagnosis	The encoder supports the following error warnings: - Position error - Lithium battery voltage (multiturn)
Default	125 kbit/s, Node ID 1

Cable

Core colour	Signals	Description
white	0 V	Supply voltage
brown	+Vs	Supply voltage
green	CAN_H	Bus (dominant High)
yellow	CAN_L	Bus (dominant Low)

Encoder Part Number

FNC **A** **C** **O** **36** **S** **10** **S12** **M12** **30V** - **R4**

- Absolute**
- C:** CANopen
- O:** Optical **M:** Magnetic
- Housing:** 40: 40 mm
- Flange Type:**
S: Servo flange **B:** Clamping flange
- Shaft diameter:** 6, 8, 10
Other dimensions on request
- S:** Single Turn
up to 21 bit

Electrical Connections:
Cable
R4 : radial 4m R1C4 : connector after 1m Cable
Connector:
R1212 R2312L R2312R

Supply Voltage:
30V : 8-30V input

Multi turn options : 0, 8, 12, 16

Absolute encoders - CANopen

Shaft with clamping or synchro flange
Single turn 9...16 bit,
Multi turn 0...16 bit

FNC AC 458B Series



Features

- Encoder single - or multiturn /CANopen
- Magnetic or optical sensing
- Single turn resolution up to 21 bit
- Multi turn 0 ...32 bit
- Clamping flange or synchro flange
- Permanent check of code continuity
- Extreme resistance to shock and vibration
- Encoder with electronic reset

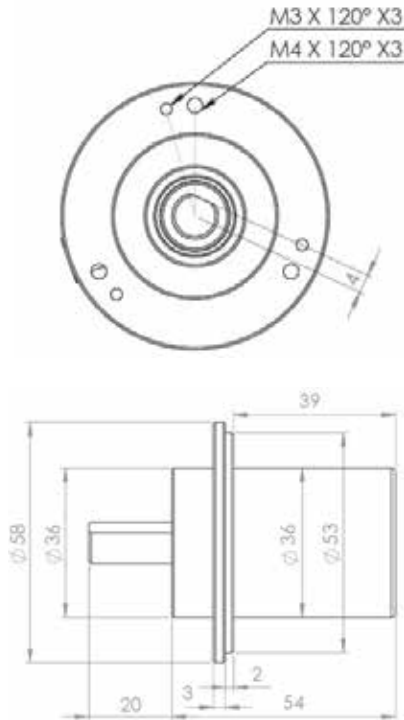
Technical data - electrical ratings

Voltage supply	8VDC to 30VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤80 mA (24 VDC)
Interface	CANopen CiA DSP 301 V4.01, DSP 305 V1.0, DSP 406 V3.1
Resolution (steps/turn)	Magnetic: 14 bit Optic: 21 bit
Absolute accuracy	Magnetic: ±0,1° Optic: ±0,01°
Sensing method	Magnetic, Optic
Code	Binary
Code sequence	CW default, programmable
Programmable parameters	Operating modes Total resolution Scaling Rotation speed monitoring Node ID Baud Rate
Note:	All parameters change via microchip interface
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤40 N axial ≤80 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.001Nm (IP 65)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-40...+90 °C -40 °F ...+180 °F
Weight approx.	350 g

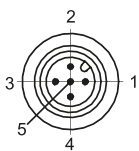
Mechanical Dimensions



CANopen® features

Bus protocol	CANopen
Device profile	CANopen - CiA DS 406
Preset	Parameter for setting the encoder to a requested position value assigned to a defined shaft position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder.
Rotating direction	The rotating direction in which there have to be ascending or descending position values can be defined. Default setting: Ascending position values when looking at the flange and rotating the shaft clockwise.
Scaling	Parameter defining the steps per turn as well as the total resolution.
Diagnosis	The encoder supports the following error warnings: - Position error - Lithium battery voltage (multiturn)
Default	125 kbit/s, Node ID 1

Terminal assignment



Connector M12		
Conn.	Signals	Description
Pin 1	n.c.	–
Pin 2	+Vs	Supply voltage
Pin 3	CAN_GND	CAN Ground
Pin 4	CAN_H	Bus (dominant High)
Pin 5	CAN_L	Bus (dominant Low)

Cable

Core colour	Signals	Description
white	0 V	Supply voltage
brown	+Vs	Supply voltage
green	CAN_H	Bus (dominant High)
yellow	CAN_L	Bus (dominant Low)

Encoder Part Number

FNC A C O 458 BZ 10 S12 M12 30V B - R4

Absolute

C: CANopen

O: Optical **M:** Magnetic

Housing: 58: 58mm

Flange Type:
S: Servo flange **B:** Clamping flange

Shaft diameter : 6, 8, 10
Other dimensions on request

S: Single Turn
up to 21 bit

Electrical Connections:

Cable
R4 : radial 4m R1C4 : connector after 1m cable

Connector:
R1212 R2312L R2312R

B: Binary

Supply Voltage:
5V : 5V in / out **30V :** 5-30V in / out

Multi turn options : 0, 4, 8, 12, 16

Absolute encoders - Parallel

Shaft with synchro and clamping flange
Magnetic single turn 12 bit encoder

FNC APA 50B Series



Features

- Absolute encoder with parallel interface
- Magnetic sensing
- Resolution: up to 12 bit
- Synchro or clamping flange
- Optional Preset input
- Optional Direction input

Technical data - electrical ratings

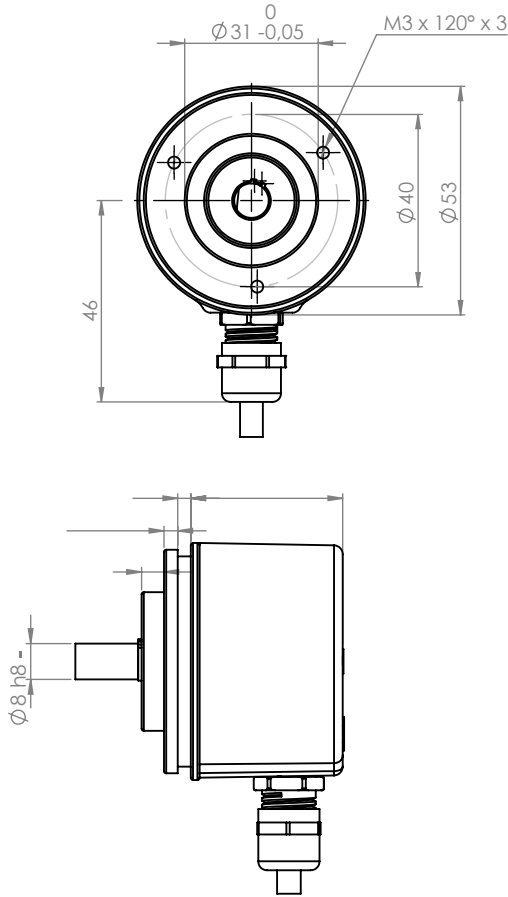
Voltage supply	5V to 30V DC
Protection:	Reverse & over voltage Output short circuit
Consumption w/o load	≤60 mA (outputs unloaded)
Interface	Parallel
Resolution (steps/turn)	up to 14 bit
Absolute accuracy	≤ ±0.35°
Sensing methode	Magnetic
Code	Gray or binary
Inputs	Direction (CW / CCW) Preset (Zero setting)
Direction of rotation	Output is incremented by CW (as viewed from the shaft side)
Initializing time	Typ. 60ms after power on
Max. response freq.	10 kHz
Output capacity	16mA (sink/source)
Output circuit	Push-Pull (opt. Open-Collector)
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø50 mm
Shaft loading	≤ 20 N axial ≤ 30 N radial
Protection DIN EN 60529	IP 54 (optional IP65)
Operating speed	≤ 3000 rpm
Starting torque	≤ 0.001 Nm
Materials	Housing, Flange : Aluminium Shaft :Stainless steel
Shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20 to +85 °C
Weight approx.	180 g

Note: Custom (non-binary) resolutions can be implemented on request. eg. 360 or 1000.

Mechanical Dimensions

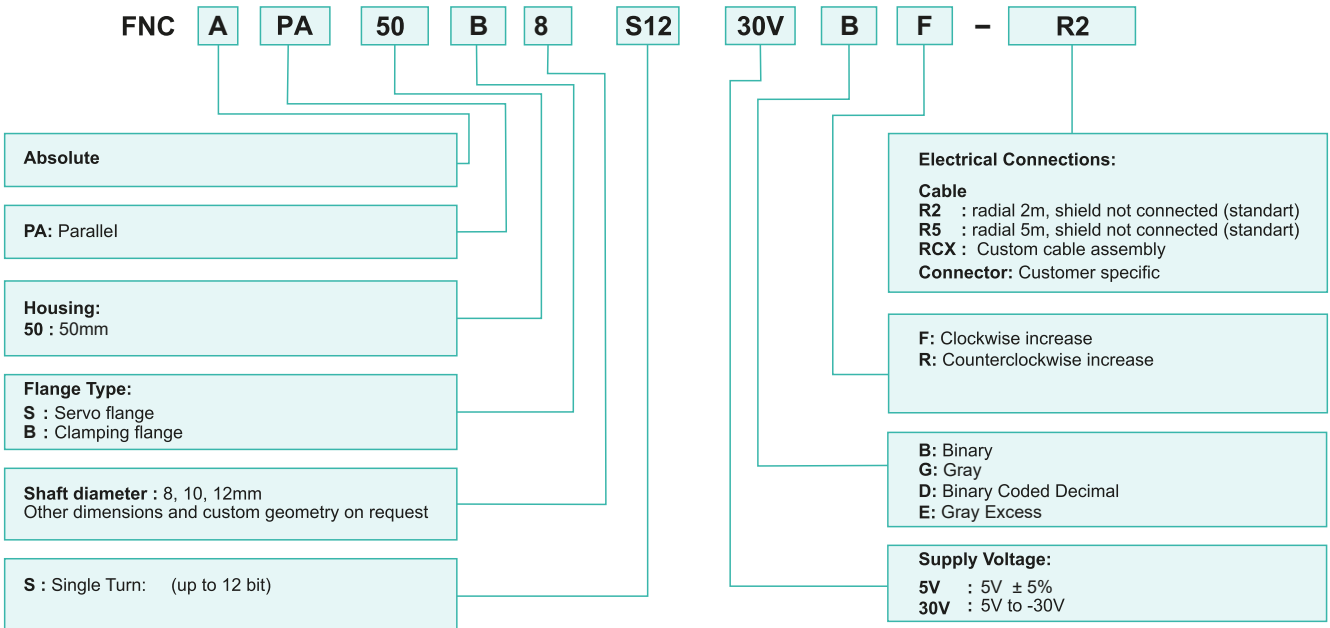


Cable Wiring / Connector

Function	Connector	Color	Renk
+VB	pin 1	Brown	Kahve
GND	pin 2	White	Beyaz
Bit 0	pin 3	Green	Yeşil
Bit 1	pin 4	Green-Black	Yeşil-Siyah
Bit 2	pin 5	Yellow	Sarı
Bit 3	pin 6	Yellow-Black	Sarı-siyah
Bit 4	pin 7	Blue	Mavi
Bit 5	pin 8	Blue-Black	Mavi-Siyah
Bit 6	pin 9	Orange	Turuncu
Bit 7	pin 10	Orange-Black	Turuncu-Siyah
Bit 8	pin 11	Red	Kırmızı
Bit 9	pin 12	Red-Black	Kırmızı-Siyah
Bit 10	pin 13	Pink	Pembe
Bit 11	pin 14	Pink-Black	Pembe-Siyah
PRESET	pin 15	Gray	Gri
DIRECTION	pin 16	Gray-Black	Gri-Siyah

NOTE : Preset and Direction inputs are optional
Connector is free hanging, inline type

Encoder Part Number



Absolute encoders - SSI / BiSS + SinCos

Integral bearing for integration in motors



FNC ASS 58 Series

98



Technical data - electrical ratings	
Voltage supply	5.5VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤50 mA (24 VDC)
Interface	SSI or BiSS
Resolution (steps/turn)	up to 19 bit
Absolute accuracy	±0.025°
Optoelectronic life time	100.000 (min)
Code	Gray or binary
Inputs	SSI differential clock Direction Electronic zero setting Chip select (Optional)
Output frequency	up to 2MHz (SSI) up to 10MHz (BiSS)
Output circuit	SSI data linedriver RS485 2048 Sin/Cos signals
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Accessories

Connectors and cables
CRM2312R M23 12 poles female connector or see page 206

Mounting coupling
PF481010 metal coupling or see page 204

Mounting accessories
YY TEO spring or see page 202-203

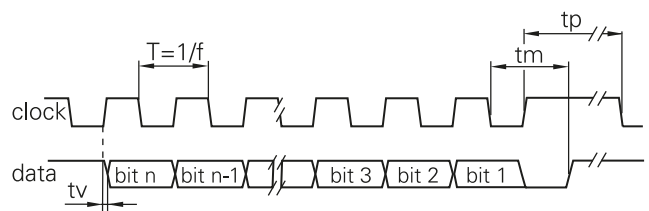
Features

- Encoder singleturn, SSI / BiSS + SinCos
- Optical sensing
- Resolution: 13 bit standard, programmable
- 2048 SinCos signal
- Clamping flange or synchro flange
- Permanent check of code continuity
- Extreme resistance to shock and vibration
- Encoder with electronic reset

Technical data - mechanical design

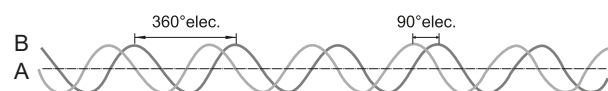
Dimensions (flange)	ø58 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12 mm, standart 1:10 taper shaft, optional
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-40...+110 °C -40 °C up to +120 °C (Storage)
Weight approx.	250 g

SSI Pulse Diagram



Clock frequency, f	50...2000 kHz for SSI up to 10MHz for BiSS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	>15µs
Clock time out	Programmable at factory

2048 SinCos pulse diagram



Signals shown at CW rotation with view on shaft's end

Absolute encoders - SSI / BiSS + SinCos



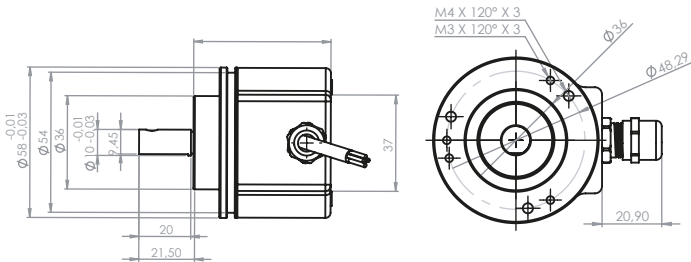
Mechanical Dimensions

Cable/Connector Wiring, Part Number

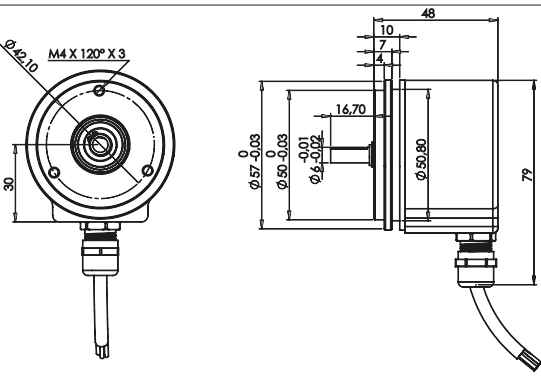
FNC ASS 58 Series

Mechanical Dimensions

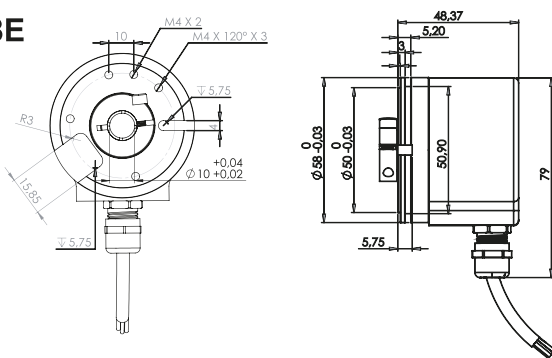
58B



58S



58E



Cable / Connector M23 male

Connector	Core colour	Signals	Description
Pin 1	blue	Clock+	Clock signal
Pin 2	blue-black	Clock-	Clock signal
Pin 3	orange	Data+	Data signal
Pin 4	orange-black	Data-	Data signal
Pin 5	gray	Zero	Zero setting input
Pin 6,7,8,9	see connection blow		
Pin 10	gray-black	up/down	direction input
Pin 11	white	0 V	GND
Pin 12	brown	+Vs	Supply voltage

Screen: not connected to housing

Cable data: 4 x 2 x 0.14 mm²

Terminal significance

+Vs	Encoder supply voltage.
0 V	Encoder ground connection relating to +Vs.
Data+	Positive data output.
Data-	Negative data output.
Clock+	Positive SSI clock input.
Clock-	Negative SSI clock input.
Zero	Input for setting a zero point anywhere within the encoder resolution. The zero setting operation is triggered by a Low impulse. Connect to +Vs after setting operation for maximum interference immunity. Impulse duration >2 ms.
Note	Include termination resistor R=120 Ohm between Data+ and Data- on control side.
Direction	UP/DOWN counting direction input. This input is standart on High. UP/DOWN means ascending output data with clock-wise shaft rotation when looking at flange.

Encoder Part Number

FNC A S S 58 S 10 S12 SC2 30V B - R4

Absolute	
S: SSI B: BiSS	
S: 2048 1, Vpp	
Housing 58: 58mm	
Flange Type: S : Servo flange B : Clamping flange	
Shaft diameter : 6, 8, 10, 12 Other dimensions on request	
S : Single Turn 12...19 bit options	
Electrical Connections: Cable R4 : radial 4m R1C4 : connector after 1m Cable Connector: R1212 R2312L R2312R	
B: Binary G: Gray	
Supply Voltage: 5V : 5V in / out 30V : 5-30V in / out	
SC1: 1024 SinCos SC2: 2048 SinCos SC4: 4096 SinCos	

Absolute encoders - CANopen

Shaft with clamping or synchro flange
 Single turn 12...19 bit,
 Multi turn 4...32bit

FNC AC 58B & 58S & 58E & 58H Series



Features

- Encoder single - or multiturn / CANopen
- Magnetic Sensing
- Optical Single turn Resolution: 12...19 bit (optional)
- Magnetic Single turn Resolution: 9...13bit
- Multi turn 4...32bit
- Clamping flange or synchro flange
- Extreme resistance to shock and vibration
- Permanent check of code continuity
- Resolution end zero point programmable

Technical data - electrical ratings

Voltage supply	
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤100 mA (24 VDC)
Resolution (steps/turn)	CANopen CiA DSP 301 V4.01, DSP 305 V1.0, DSP 406 V3.1 Magnetic: 14 bit Optic: 21 bit
Absolute accuracy	Magnetic: ±0,1° Optic: ±0,01°
Sensing method	Magnetic
	Binary
	CW default, programmable
Programmable	Operating modes Total resolution Scaling Rotation speed monitoring
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	

Accessories

Connectors and cables

CRM2312R M23 12 poles female connector or see page 206

Mounting coupling

PF481010 metal coupling or see page 204

Mounting accessories

YY TEO spring or see page 202-203

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤40 N axial ≤60 N radial
Protection	DIN EN 60529
Operating speed	≤
Starting torque	≤0.025 Nm (IP 65)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime:	⁹ . at 100% of full rated shaft load (minimum)
Operating temperature	-40...+110 °C -40 °C up to +120 °C (Storage)
	eight approx.

Terminal assignment

Connector M12

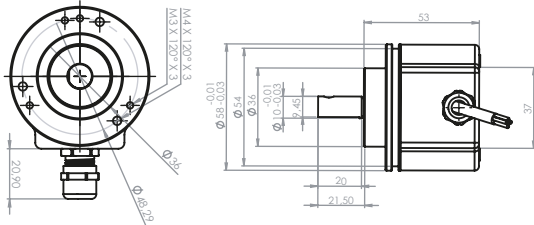


Pin	Signals	Description
Pin 1		
Pin 2		Supply voltage
Pin 3		
Pin 4		Bus (dominant High)
Pin 5		Bus (dominant Low)

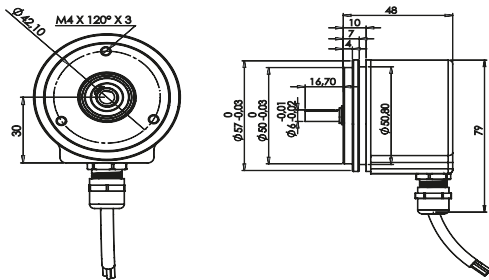
FNC AC 58B & 58S & 58E & 58H Series

Mechanical Dimensions

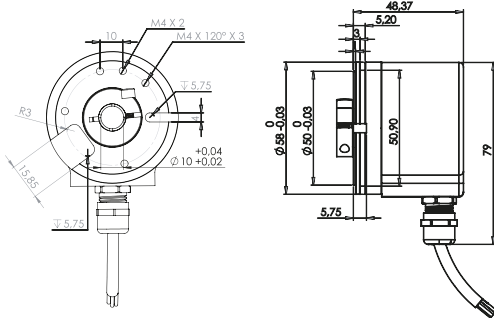
58B



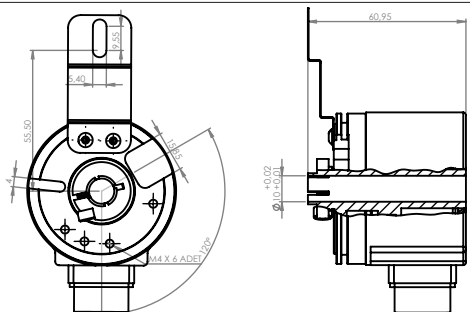
58S



58E



58H



CANopen® features

Bus protocol	CANopen
Device profile	CANopen - CiA DS 406
Operating modes	- Event-triggered / Time-triggered - Sync (cyclic)
Preset	Parameter for setting the encoder to a requested position value assigned to a defined shaft position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder.
Rotating direction	The rotating direction in which there have to be ascending or descending position values can be defined. Default setting: Ascending position values when looking at the flange and rotating the shaft clockwise.
Scaling	Parameter defining the steps per turn as well as the total resolution.
Diagnosis	The encoder supports the following error warnings: - Position error - Lithium battery voltage (multiturn)
Node Monitoring	Heartbeat
Default	125 kbit/s, Node ID 1

Cable

Core colour	Signals	Description
white	0 V	Supply voltage
brown	+Vs	Supply voltage
green	CAN_H	Bus (dominant High)
yellow	CAN_L	Bus (dominant Low)

Encoder Part Number

FNC **A** **C** **O** **58** **B** **10** **S12** **M12** **30V** **B** - **R2**

Absolute	<p>Electrical Connections:</p> <p>Cable R2 : radial 2m A2 : axial 2m</p> <p>Connector: R1212 R2312L R2312R</p> <p>B: Binary</p> <p>Supply Voltage: 5V : 5V in / out 30V : 5-30V in / out</p> <p>Multi turn options : 4, 8, 12, 16, 20, 24, 32</p>
C: CANopen	
O: Optic M: Magnetic	
Housing 58 : 58 mm	
Flange Type: S : Servo flange B : Clamping flange E : End hollow shaft H : Through hollow shaft	
Shaft diameter : 6, 8, 10, 12 Other dimensions on request	
S : Single Turn up to 21 bit	

Absolute encoders - CANopen

End Hollow Shaft - Through Hollow Shaft
Single turn 12...19 bit,
Multi turn 4...32bit

FNC AC 58B & 58S & 58E Series



Features

- Encoder single - or multiturn / CANopen
- Magnetic Sensing (Optional optical sensing)
- Optical Single turn Resolution: 12...19 bit (optional)
- Magnetic Single turn Resolution: 9...13bit
- Multi turn 4...32bit
- Clamping flange or synchro flange
- Extreme resistance to shock and vibration
- Permanent check of code continuity
- Resolution end zero point programmable

Technical data - electrical ratings

Voltage supply	5.5VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤100 mA (24 VDC)
Interface	CANopen CiA DSP 301 V4.01, DSP 305 V1.0, DSP 406 V3.1
Resolution (steps/turn)	Magnetic: 14 bit Optic: 21 bit
Absolute accuracy	Magnetic: ±0,1° Optic: ±0,01°
Sensing method	Magnetic
Code	Binary
Code sequence	CW default, programmable
Programmable parameters	Operating modes Total resolution Scaling Rotation speed monitoring
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤40 N axial ≤60 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 65)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12, 14 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-40...+110 °C -40 °C up to +120 °C (Storage)
Weight approx.	250 g

Accessories

Connectors and cables

CRM2312R M23 12 poles female connector or see page 206

Mounting coupling

See page 204

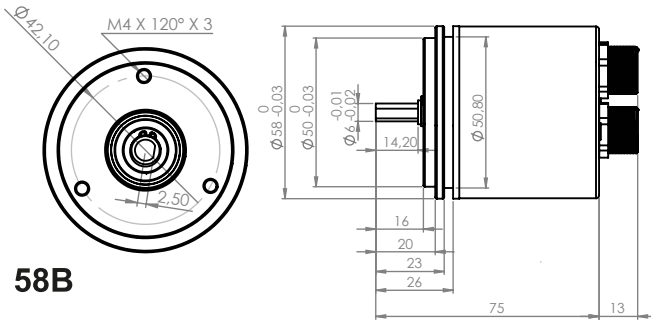
Mounting accessories

YY TEO spring or see page 202-203

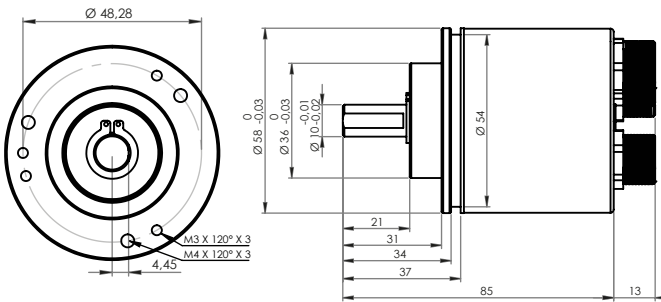
FNC AC 58B & 58S & 58E Series

Mechanical Dimensions

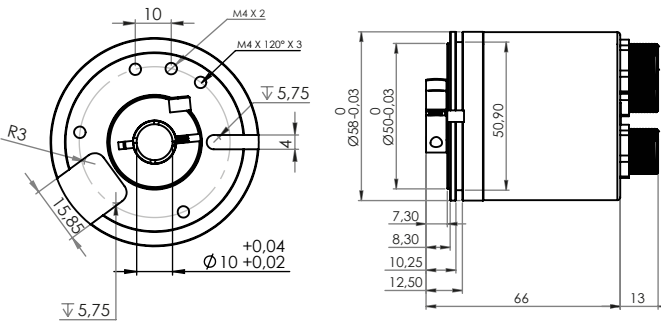
58S



58B



58E



CANopen® features

Bus protocol	CANopen
Device profile	CANopen - CiA DS 406
Operating modes	- Event-triggered / Time-triggered - Sync (cyclic)
Preset	Parameter for setting the encoder to a requested position value assigned to a defined shaft position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder.
Rotating direction	The rotating direction in which there have to be ascending or descending position values can be defined. Default setting: Ascending position values when looking at the flange and rotating the shaft clockwise.
Scaling	Parameter defining the steps per turn as well as the total resolution.
Diagnosis	The encoder supports the following error warnings: - Position error - Lithium battery voltage (multiturn)
Node Monitoring	Heartbeat
Default	125 kbit/s, Node ID 1

Cable

Core colour	Signals	Description
white	0 V	Supply voltage
brown	+Vs	Supply voltage
green	CAN_H	Bus (dominant High)
yellow	CAN_L	Bus (dominant Low)

Encoder Part Number

FNC **A** **C** **O** **58** **E** **10** **S12** **M12** **30V** **B** - **3M12**

Absolute	Electrical Connections: Cable R2 : radial 2m A2 : axial 2m Connector: R1212 R2312L R2312R B: Binary Supply Voltage: 5V : 5V in / out 30V : 5-30V in / out Multi turn options : 4, 8, 12, 16, 20, 24, 32
C: CANopen	
O: Optic M: Magnetic	
Housing 58 : 58 mm	
Flange Type: E : End hollow shaft H : Through hollow shaft	
Shaft diameter : 6, 8, 10, 12 Other dimensions on request	
S : Single Turn up to 21 bit	

Absolute encoders - CANopen

Shaft with clamping or synchro flange
Single turn 9...14 bit,
Multi turn 0...32 bit

FNC AC 36E Series



Features

- Encoder single - or multiturn /CANopen
- Magnetic or optical sensing
- Single turn resolution up to 22 bit
- Multi turn 0 ...16 bit
- Optional preset and direction input
- 36 mm diameter body
- 6 mm diameter solid shaft

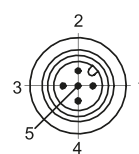
Technical data - electrical ratings

Voltage supply	5.5VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤100 mA (24 VDC)
Interface	CANopen CiA DSP 301 V4.01, DSP 305 V1.0, DSP 406 V3.1
Resolution (steps/turn)	Magnetic: 14 bit Optic: 21 bit
Absolute accuracy	Magnetic: ±0,1° Optic: ±0,01°
Sensing method	Magnetic
Code	Binary
Code sequence	CW default, programmable
Programmable paramaters	Operating modes Total resolution Scaling Rotation speed monitoring
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø36 mm
Shaft loading	≤40 N axial ≤60 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 65)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-40...+110 °C -40 °C up to +120 °C (Storage)
Weight approx.	250 g

Terminal assignment

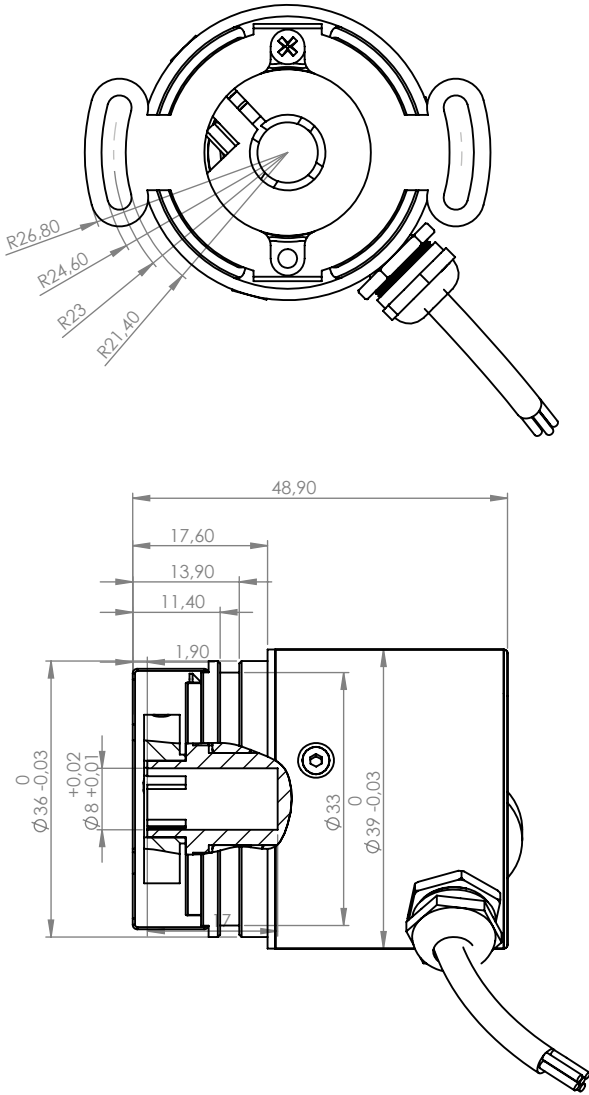


Connector M12

Conn.	Signals	Description
Pin 1	n.c.	–
Pin 2	+Vs	Supply voltage
Pin 3	CAN_GND	CAN Ground
Pin 4	CAN_H	Bus (dominant High)
Pin 5	CAN_L	Bus (dominant Low)

FNC AC 36E Series

Mechanical Dimensions



Terminal significance

Bus protocol	CANopen
Device profile	CANopen - CiA DS 406
Preset	Parameter for setting the encoder to a requested position value assigned to a defined shaft position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder.
Rotating direction	The rotating direction in which there have to be ascending or descending position values can be defined. Default setting: Ascending position values when looking at the flange and rotating the shaft clockwise.
Scaling	Parameter defining the steps per turn as well as the total resolution.
Diagnosis	The encoder supports the following error warnings: - Position error - Lithium battery voltage (multiturn)
Default	125 kbit/s, Node ID 1

Cable

Core colour	Signals	Description
white	0 V	Supply voltage
brown	+Vs	Supply voltage
green	CAN_H	Bus (dominant High)
yellow	CAN_L	Bus (dominant Low)

Encoder Part Number

FNC **A** **C** **O** **36** **E** **10** **S12** **M12** **30V** **B** - **R4**

Absolute	<p>Electrical Connections: Cable R4 : radial 4m R1C4 : connector after 1m Cable Connector: CRM1212 CRM2312L CRM2312R</p> <p>B: Binary G: Gray</p> <p>Supply Voltage: 30V : 8-30V input</p> <p>Multi turn options : 0, 4, 8, 12, 16, 18, 24, 32</p>
S: SSI B: BISS	
O: Optical M: Magnetic	
Housing : 36: 36mm	
Flange Type: E: End Hollow Shaft	
Shaft diameter : 6, 8, 10 Other dimensions on request	
S : Single Turn up to 21 bit	

Absolute encoders bus cover

- **Modular**
- **Flexibilitiy**



Absolute encoders - Modular bus covers

Solid shaft with clamping or synchro flange
Magnetic single- or multiturn encoders



FNC AC 58B Bus Cover Series

Canopen & Profibus

108



Features

- Encoder single- or multiturn / bus cover
- Magnetic sensing
- Single turn Resolution: 12...19 bit
- Multi turn 4...32bit
- Clamping flange or synchro flange
- Permanent check of code continuity
- Extreme resistance to shock and vibration
- Modular fieldbus interfaces
- Profibus / CANopen®

Technical data - electrical ratings

Voltage supply	5.5VDC to 30VDC 4.75VDC to 5.5VDC 8VDC to 30VDC
Protection:	Output short circuit protection. Reverse polarity protection
Consumption w/o load	≤50 mA (24 VDC)
Initializing time typ.	170 ms after power on
Interface	Profibus / CANopen® /
Resolution (steps/turn)	9 to 16 bit
Number of revolution	4, 8, 12, 16, 24, 32,
Code	Binary
Code sequence	CW default, programmable
Absolute accuracy	±0,35°
Device adress	Rotary switch in bus cover
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE
Programmable parameters	Steps per revolution Number of revolutions Preset Scaling Rotating direction
Diagnostic functions	Position or parameter error Multiturn sensing
Status indicator	RED&GREEN-LED integrated in bus cover

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	10 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-25...+90 °C
Weight approx.	300 g
Connection	Bus cover
Relative humidity	95 %
Resistance	DIN EN 60068-2-6 Vibration 30 g, 10-2000 Hz DIN EN 60068-2-27 Shock 200 g, 6 ms

Accessories

Connectors and cables

CRM2312R M23 12 poles female connector or see page 206

Mounting coupling

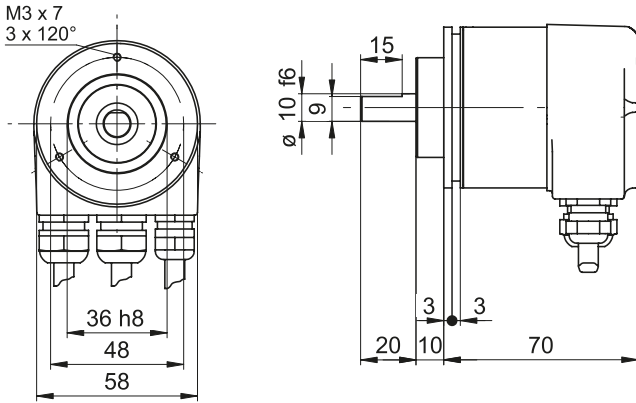
PF481010 metal coupling or see page 204

Mounting accessories

SF58B spring or see page 202-203

FNC AC 58B Bus Cover Series

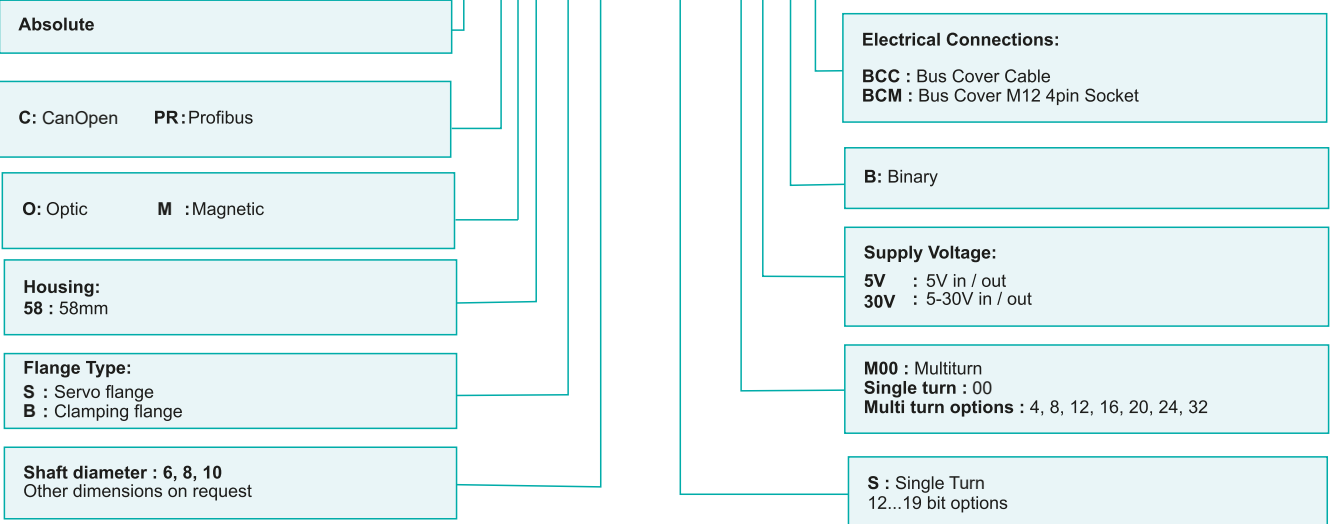
Mechanical Dimensions



for details see page 114 - 115

Encoder Part Number

FNC **A** **C** **O** **58** **B** **10** **S12** **M00** **30V** **B** - **BCC**



Absolute encoders - Modular bus covers

Solid shaft with synchro flange
Magnetic single or multiturn encoders



FNC AC 58S Bus Cover Series

Canopen & Profibus

110



Features

- Encoder single- or multiturn / bus cover
- Magnetic sensing
- Single turn Resolution: 12...19 bit
- Multi turn 4...32bit
- Clamping flange or synchro flange
- Permanent check of code continuity
- Extreme resistance to shock and vibration
- Modular fieldbus interfaces
- Profibus / CANopen® /

Technical data - electrical ratings

Voltage supply	5.5VDC to 30VDC 4.75VDC to 5.5VDC 8VDC to 30VDC
Protection:	Output short circuit protection. Reverse polarity protection
Consumption w/o load	≤50 mA (24 VDC)
Initializing time typ.	170 ms after power on
Interface	Profibus / CANopen® /
Resolution (steps/turn)	9 to 16 bit
Number of revolution	4, 8, 12, 16, 24, 32,
Code	Binary
Code sequence	CW default, programmable
Absolute accuracy	±0,35°
Device adress	Rotary switch in bus cover
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE
Programmable parameters	Steps per revolution Number of revolutions Preset Scaling Rotating direction
Diagnostic functions	Position or parameter error Multiturn sensing
Status indicator	RED&GREEN-LED integrated in bus cover

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-25...+90 °C
Weight approx.	400 g
Connection	Bus cover
Relative humidity	95 %
Resistance	DIN EN 60068-2-6 Vibration 30 g, 10-2000 Hz DIN EN 60068-2-27 Shock 200 g, 6 ms

Accessories

Connectors and cables

CRM2312R M23 12 poles female connector or see page 206

Mounting coupling

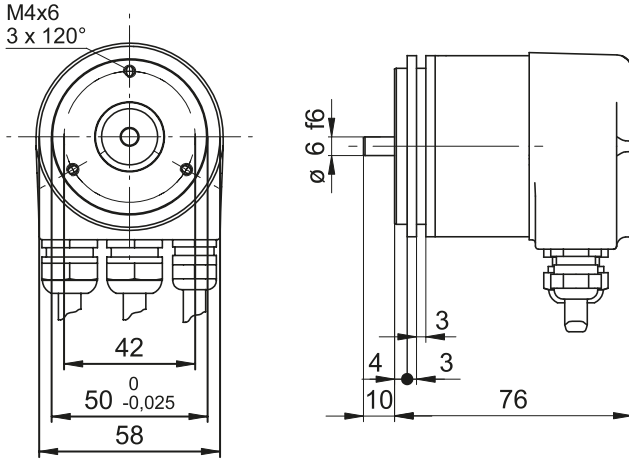
PF260606 metal coupling or see page 204

Mounting accessories

YY ASTK spring or see page 202-203

FNC AC 58S Bus Cover Series

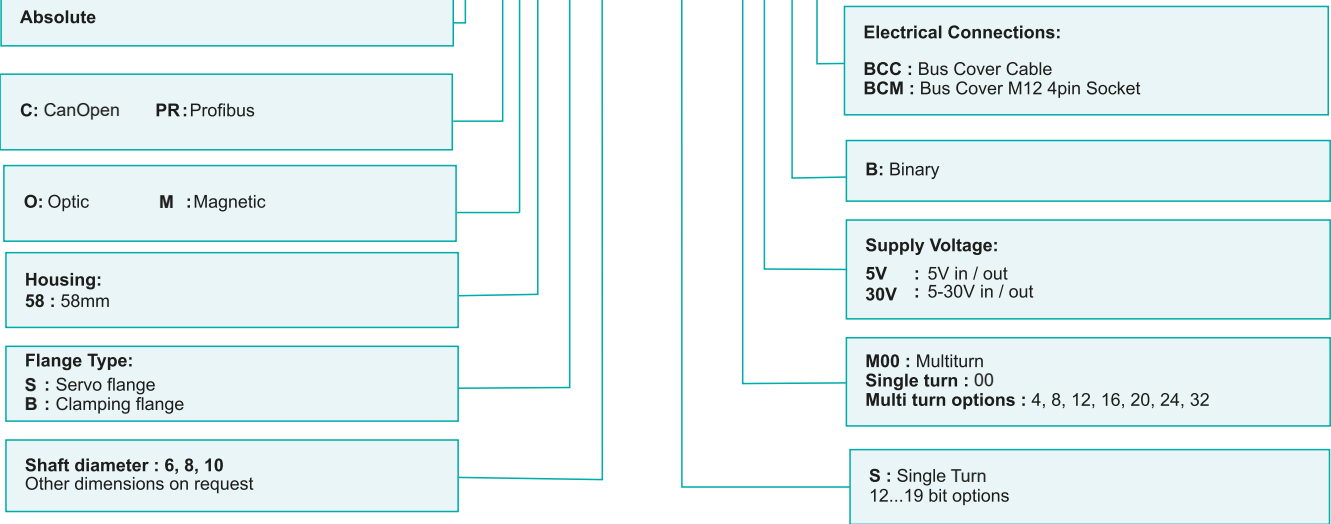
Mechanical Dimensions



for details see page 114 - 115

Encoder Part Number

FNC **A** **PR** **O** **58** **S** **10** **S12** **M00** **30V** **B** - **BCC**



Absolute encoders - Modular bus covers

End Hollow Shaft
Magnetic single or multiturn encoders

FNC AC 58E Bus Cover Series

Canopen & Profibus

112



Features

- Encoder single- or multiturn / bus cover
- Magnetic sensing
- Single turn Resolution: 12...19 bit
- Multi turn 4...32bit
- End Hollow Shaft
- Permanent check of code continuity
- Extreme resistance to shock and vibration
- Modular fieldbus interfaces
- Profibus / CANopen®

Technical data - electrical ratings

Voltage supply	5.5VDC to 30VDC 4.75VDC to 5.5VDC 8VDC to 30VDC
Protection:	Output short circuit protection. Reverse polarity protection
Consumption w/o load	≤50 mA (24 VDC)
Initializing time typ.	170 ms after power on
Interface	Profibus / CANopen® /
Resolution (steps/turn)	9 to 16 bit
Number of revolution	4, 8, 12, 16, 24, 32,
Code	Binary
Code sequence	CW default, programmable
Absolute accuracy	±0,35°
Device adress	Rotary switch in bus cover
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE
Programmable parameters	Steps per revolution Number of revolutions Preset Scaling Rotating direction
Diagnostic functions	Position or parameter error Multiturn sensing
Status indicator	RED&GREEN-LED integrated in bus cover

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing, Flange : Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-25...+90 °C
Weight approx.	300 g
Connection	Bus cover
Relative humidity	95 %
Resistance	DIN EN 60068-2-6 Vibration 30 g, 10-2000 Hz DIN EN 60068-2-27 Shock 200 g, 6 ms

Accessories

Connectors and cables

CRM2312R M23 12 poles female connector or see page 206

Mounting coupling

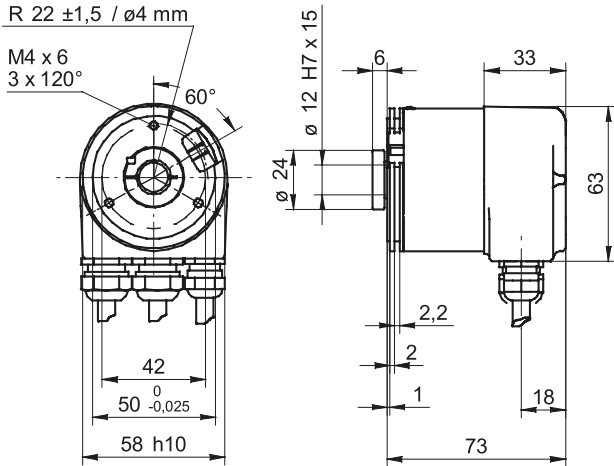
See page 204

Mounting accessories

YY TEO spring or see page 202-203

FNC AC 58E Bus Cover Series

Mechanical Dimensions



for details see page 114 - 115

Encoder Part Number

FNC **A** **C** **O** **58** **E** **10** **S12** **M00** **30V** **B** - **BCC**

Absolute

C: CanOpen **PR:** Profibus

O: Optic **M:** Magnetic

Housing:
58: 58mm

Flange Type:
E: End Hollow Shaft

Shaft diameter: 6, 8, 10
Other dimensions on request

Electrical Connections:
BCC: Bus Cover Cable
BCM: Bus Cover M12 4pin Socket

B: Binary

Supply Voltage:
5V: 5V in / out
30V: 5-30V in / out

M00: Multiturn
Single turn: 00
Multi turn options: 4, 8, 12, 16, 20, 24, 32

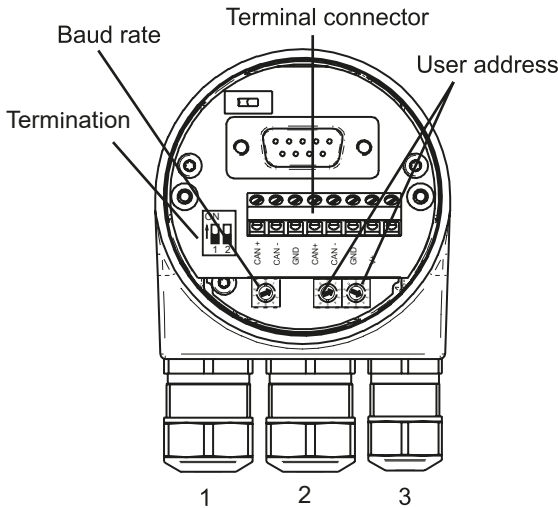
S: Single Turn
12...19 bit options

Shaft / end shaft encoders

CANopen

114

Accessories

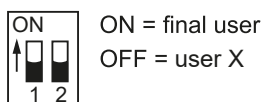


Cable: 1, 2 = \varnothing 8-10 mm (-40-85 °C) / \varnothing 5-9 mm (-25-85 °C)
 Cable: 3 = \varnothing 4.5-6 mm (-40-85 °C) / \varnothing 3-6 mm (-25-85 °C)

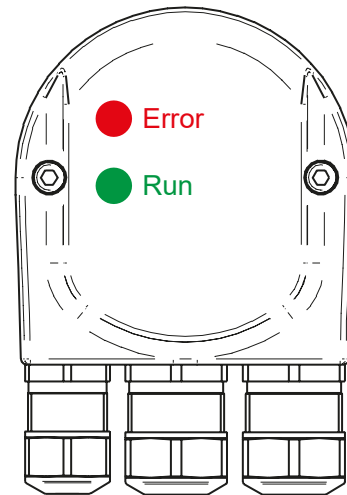
Features - CANopen®

Bus protocol	CANopen®
Device profile	CANopen® - CiA DSP 406, V 3.1 (Device Class 2, CAN 2.0A)
Operating mode	Event-triggered Time-triggered Remotely-requested Sync (cyclic) Sync (acyclic)
Preset	Parameter for setting the encoder to a requested position value assigned to a defined shaft position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder.
Rotating direction	Parameter for defining the rotating direction in which there have to be ascending or descending position values.
Scaling	Parameter defining the steps per turn as well as the total resolution.
Diagnosis	The encoder supports the following error warnings: - Position and parameter error - Lithium battery voltage control (Multiturn)
Node ID monitoring	Heartbeat or Nodeguarding
Default	125 kbit/s, Node ID 1

Termination

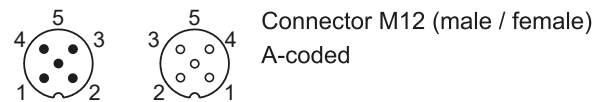


Bus cover

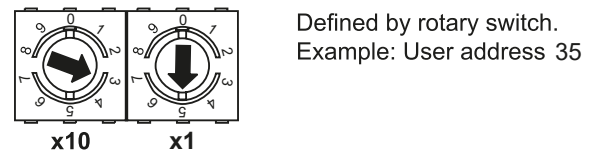


Terminal assignment

Pin 1	GND	Ground connection relating to UB
Pin 2	UB	Voltage supply 10...30 VDC
Pin 3	GND	Ground connection relating to UB
Pin 4	CAN_H	CAN bus signal (dominant High)
Pin 5	CAN_L	CAN bus signal (dominant Low)



User address (identifier)

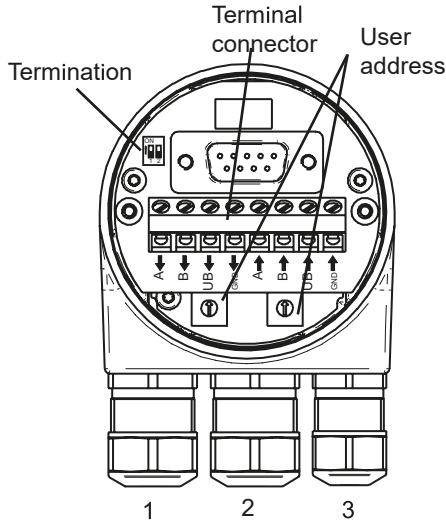


Baud rate

Switch	Baud rate
0	EEPROM Value
1	10 kbps
2	20 kbps
3	50 kbps
4	100 kbps
5	125 kbps
6	250 kbps
7	500 kbps
8	800 kbps
9	1000 kbps

Shaft / end shaft encoders

View inside bus cover

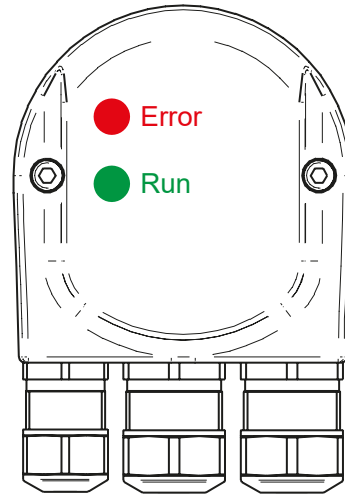


Cable: 1, 2 = \varnothing 8-10 mm (-40-85 °C) / \varnothing 5-9 mm (-25-85 °C)
Cable: 3 = \varnothing 4.5-6 mm (-40-85 °C) / \varnothing 3-6 mm (-25-85 °C)

Features - Profibus-DPV0

Bus protocol	Profibus-DPV0
Device profile	Device Class 1 and 2
Cyclic data exchange	Communication in line with DPV0
Input data	Position value. In addition optionally speed signal parametering (output of current rotation speed).
Output data	Preset
Preset	Parameter for setting the encoder to a requested position value assigned to a defined shaft position of the system. Storage non-volatile.
Rotating direction	Parameter for defining the rotating direction in which there have to be ascending or descending position values.
Scaling	Parameter defining the steps per turn as well as the total resolution.
Diagnosis	The encoder supports the following error warnings: - Position and parameter error - Lithium battery voltage control (Multiturn)
Default	User address 00 Termination OFF

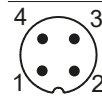
Bus cover



Terminal assignment

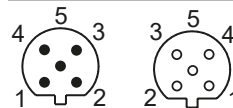
Connector M12 (male), A-coded

Pin 1	UB	Voltage supply 10...30 VDC
Pin 3	GND	Ground connection relating to UB



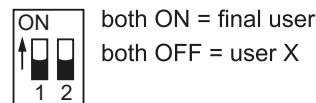
Connector M12 (male / female), B-coded

Pin 2	A	Negative data line
Pin 4	B	Positive data line

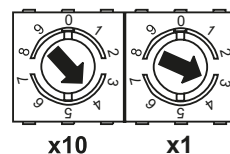


Terminals of the same significance are internally connected and identical in their functions. Max. load on the internal terminal connections UB-UB and GND-GND is 1 A each.

Termination



User address (identifier)



Defined by rotary switch.
Example: User address 43



FNCC 40E 865P

PPR : 2500

VCC : 5VDC

PP : 5P

86923F155G01

Motor feedback encoders

- Quick
- Smooth



F08IM Series Encoder

118



Features

- Compact miniature design
- A, B, Z incremental signal output
- Differential RS 422 incremental output signals
- Super small non-contact magnetic technology
- 8 mm diameter body

Technical data - electrical ratings

Voltage supply	5VDC \pm %5
Interface	ABZ; Line Driver RS422
Resolution (steps/turn)	up to 4096 CPR

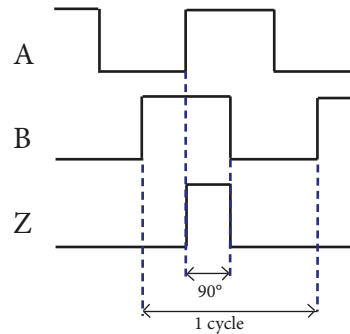
Technical data - mechanical design

Dimensions	8 mm
Materials	Housing : Aluminium
Magnet	4x4 mm NdFeB
Wire thickness	AWG28

Connections

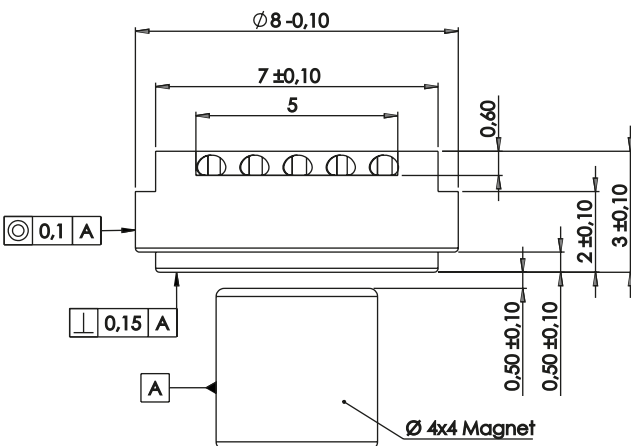
Function	Color	Renk	Explanation
+5V	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
B	Yellow	Sarı	B Channel
Z	Gray	Gri	Z Channel
Shield	Black	Siyah	Shield

Pulse Diagram

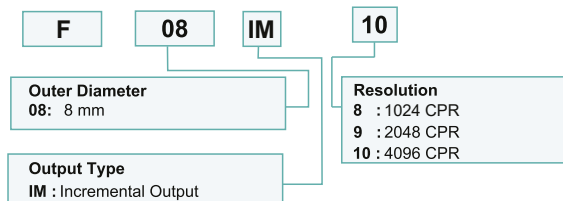


B leads A for CW rotation of magnet

Mechanical Dimensions



Encoder Part Number



F08AS Series Encoder



Features

- Compact miniature design
- BISS interface with error/warning and CRC bits
- Differential absolute output signals
- Super small non-contact magnetic technology
- 8 mm diameter body

Technical data - electrical ratings

Voltage supply	5VDC \pm %5
Interface	SSI or BISS
Resolution (steps/turn)	up to 14 bit

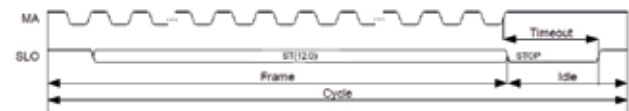
Technical data - mechanical design

Dimensions	8 mm
Materials	Housing : Aluminium
Magnet	4x4 mm NdFeB
Wire thickness	AWG28

Connections

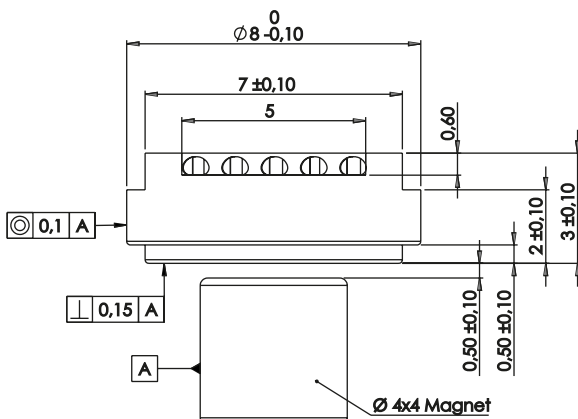
Function	Color	Renk	Explanation
+5V	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
D+	Orange	Turuncu	Data+
D-	Pink	Pembe	Data-
C+	Blue	Mavi	Clock+
C-	Gray	Gri	Clock-

Timing Diagram

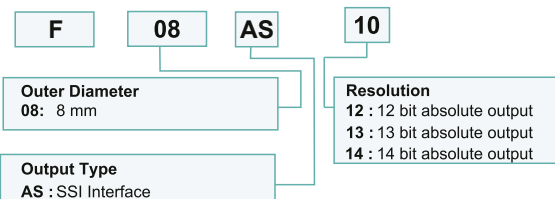


Clock frequency, f	50...2000 kHz for SSI up to 10MHz for BISS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	>15 μ s
Clock time out	Programmable at factory

Mechanical Dimensions



Encoder Part Number



F10 Series Encoder

120



Features

- Compact miniature design
- A, B, Z incremental signal output
- Differential RS 422 incremental output signals
- Super small non-contact magnetic technology
- 16 mm diameter body

Technical data - electrical ratings

Voltage supply	5VDC \pm %5
Interface	ABZ; Line Driver RS422
Resolution (steps/turn)	up to 4096 CPR

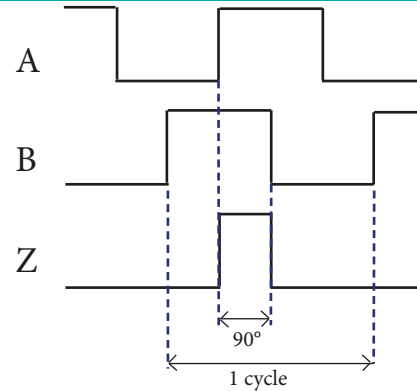
Technical data - mechanical design

Dimensions	16 mm
Materials	Housing : Aluminium
Magnet	4x4 mm NdFeB
Wire thickness	AWG28

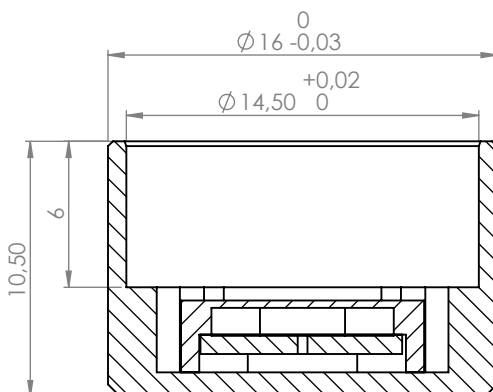
Connections

Function	Color	Renk	Explanation
+5V	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
B	Red	Sarı	B Channel
Z	Yellow	Gri	Z Channel
Shield	Pink	Siyah	Shield

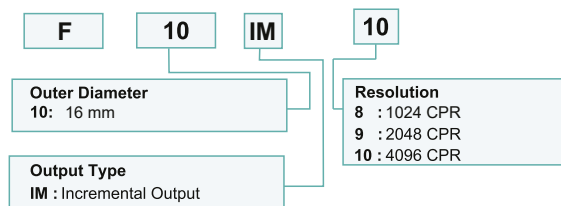
Pulse Diagram



Mechanical Dimensions



Encoder Part Number



FNC 35i Series



Features

- Semi hollow shaft, hollow shaft options
- Robust mechanical and electrical construction
- Differential RS 422 output signals
- Shaft can mount from front or back side with setscrew
- Thin design

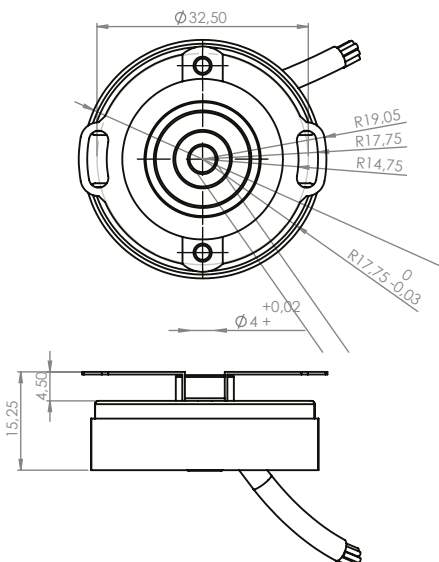
Technical data - Mechanical Ratings

Dimensions:	35 mm
Shaft Diameter:	4, 6 mm
Materials:	Housing: Aluminium Cover : ABS

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

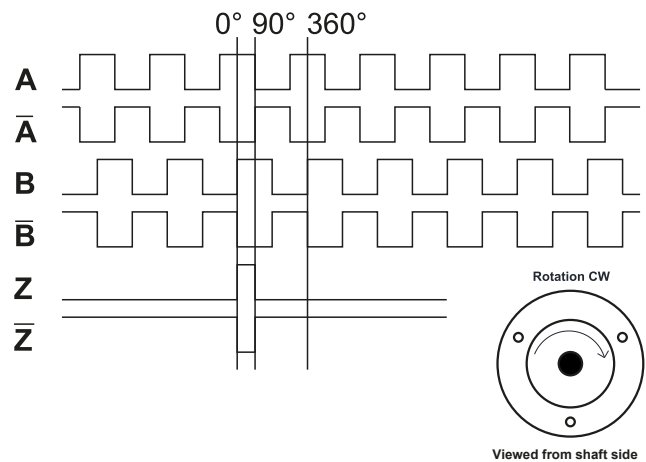
Mechanical Dimensions



Technical data - Electrical Ratings

Supply Voltage:	5V DC \pm 5%
Interface:	Line Driver RS422
Protection:	Overvoltage protection Short-circuit protection
Resolution (steps/turn):	500-512-1000-2000-2048
Output frequency:	up to 200 kHz
Output Signals:	90° shifted A and B, and inverted A and B

Pulse Diagram



Encoder Part Number

FNC **35** **i** - **FL**

Mount Options

FL : Shaft setscrew from front side, long spring

FNC F16 Series

122



Features

- Designed for motor feedback applications
- Both A, B, Z incremental and U, V, W commutation signals
- Differential RS 422 incremental output signals.
- Non-contact magnetic technology
- 16 mm diameter body

Technical data - electrical ratings

Voltage supply	5VDC \pm %5
Interface	ABZ ; Line Driver RS422 UVW ; (\pm 24 mA output drive)
Resolution (steps/turn) :	up to 4096 CPR
Commutation Signals :	up to 16 pole

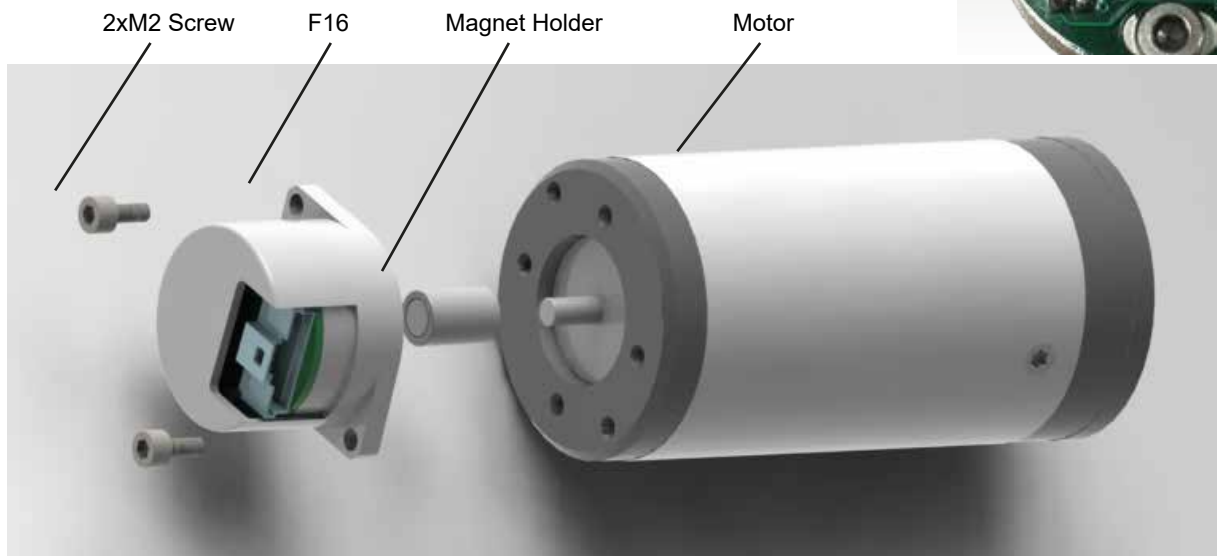
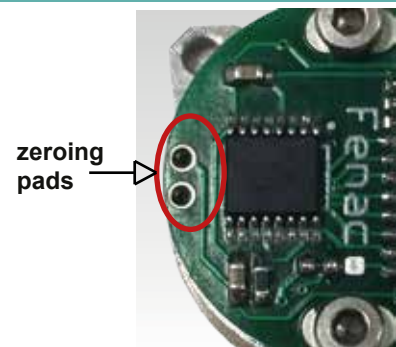
Technical data - mechanical design

Dimensions	\varnothing 16 mm
Mount Diameter	21 mm
Materials	Housing: Aluminium Cover: Aluminium
Magnet actuator	for integration into 3 mm shaft

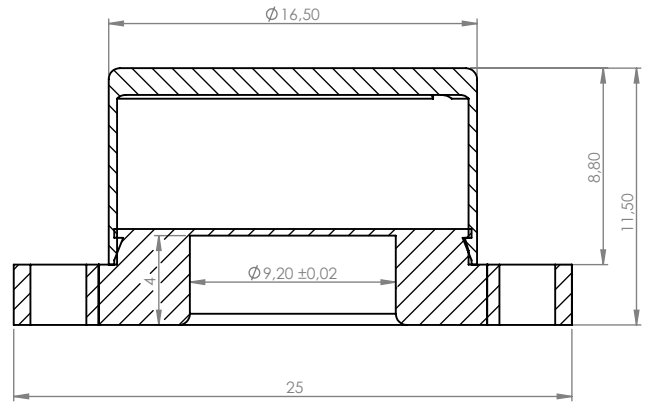
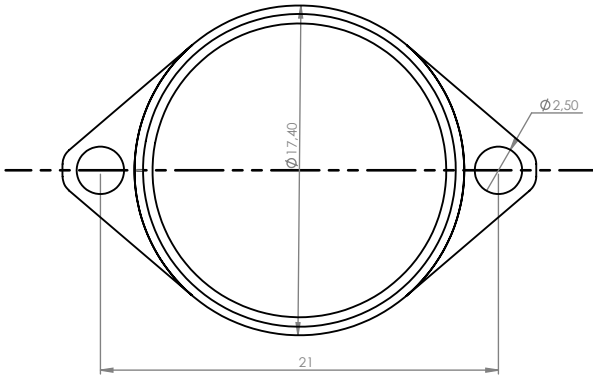
Installation Guide

Zero the UVW signals

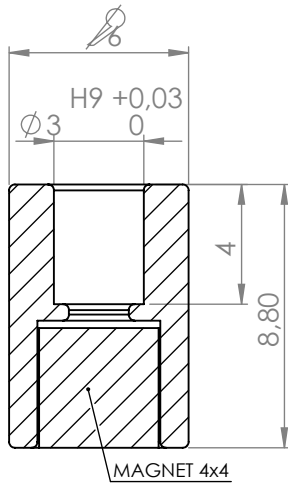
First move the motor to the required zero UVW position. Short together the two zeroing pads.



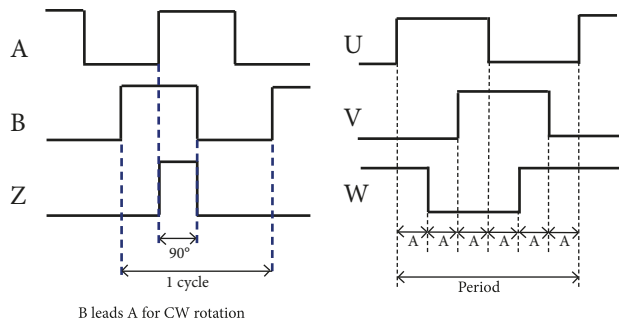
Mechanical Dimensions



F22M4403 / F22M4404



Pulse Diagram



Encoder Part Number

Commutation Version with Preset

F	16	K	A	7	C
Outer Diameter 16 : 16 mm					
Mounting Type K : Ear Flange					
Commutation Signals A : 2 pole B : 4 pole C : 6 pole D : 8 pole E : 10 pole F : 12 pole G : 14 pole H : 16 pole					
			Connection Options C : Cable M* : Molex 501568-1107 Connector * (mating with Molex 501330 -1100)		
			Resolution 7 : 128 ppr / 512 cpr 8 : 256 ppr / 1024 cpr 9 : 512 ppr / 2048 cpr 10 : 1024 ppr / 4096 cpr		

Commutation Version without Preset

F	16	K	A	4096	C
Outer Diameter 16 : 16 mm					
Mounting Type K : Ear Flange					
Commutation Signals X : without commutation signal A : 2 pole B : 4 pole C : 6 pole D : 8 pole E : 10 pole F : 12 pole G : 14 pole H : 16 pole					
				Connection Options C : Cable M* : Molex 501568-1107 Connector * (mating with Molex 501330 -1100)	
				Resolution 4096 : up to 4096 ppr	

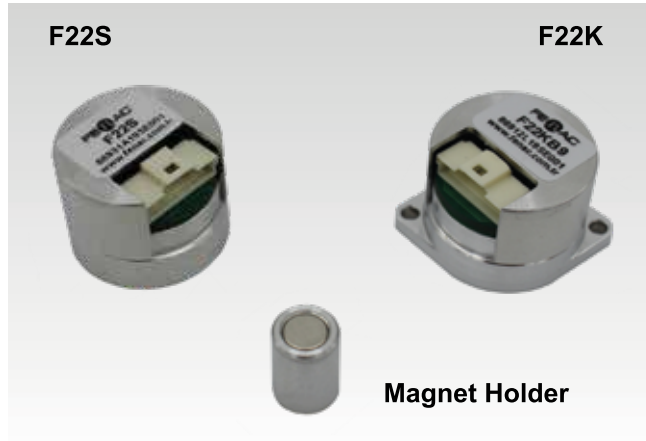
Magnet Holder

F 22 M 44 03

03 : 3 mm
04 : 4 mm

FNC F22 Series

124



Features

- Designed for motor feedback applications
- Both A, B, Z incremental and U, V, W commutation signals
- Differential RS 422 incremental output signals.
- Non-contact magnetic technology
- 22 mm diameter body

Technical data - electrical ratings

Voltage supply	5VDC \pm %5
Interface	ABZ ; Line Driver RS422 UVW ; (\pm 24 mA output drive)
Resolution (steps/turn) :	up to 4096 CPR
Commutatiton Signals :	up to 16 pole

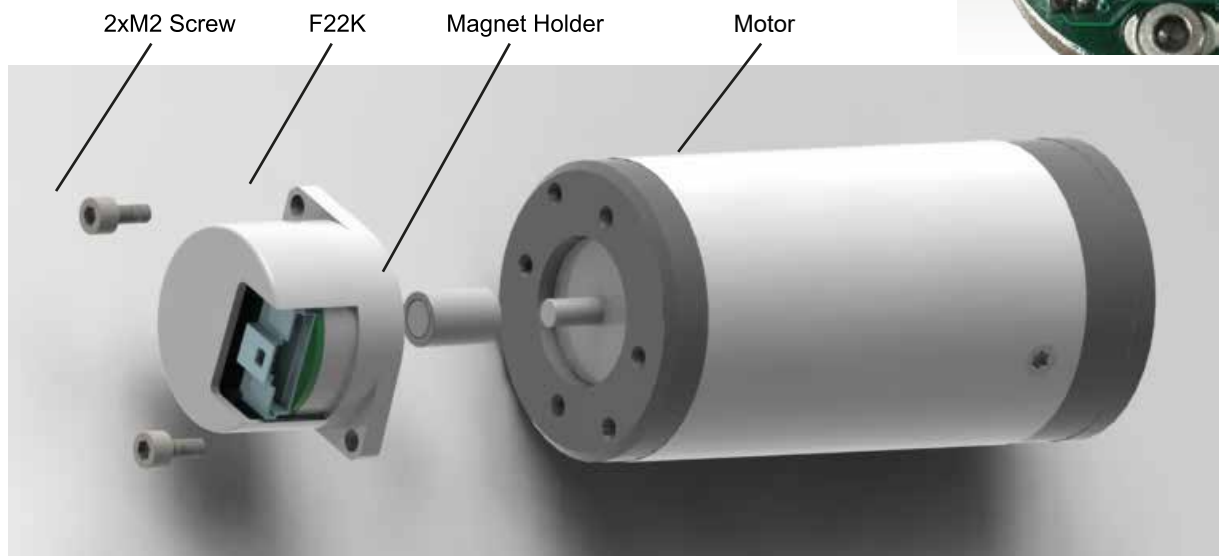
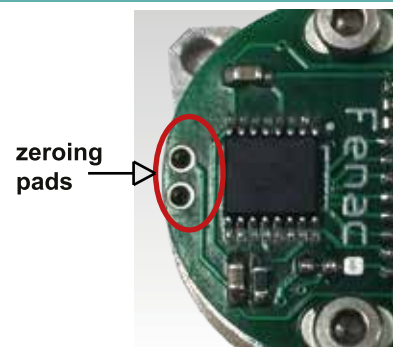
Technical data - mechanical design

Dimensions	\varnothing 22 mm
Mount Diameter	26 mm
Materials	Housing: Aluminium Cover: Aluminium
Magnet actuator	for integration into 3 mm shaft

Installation Guide

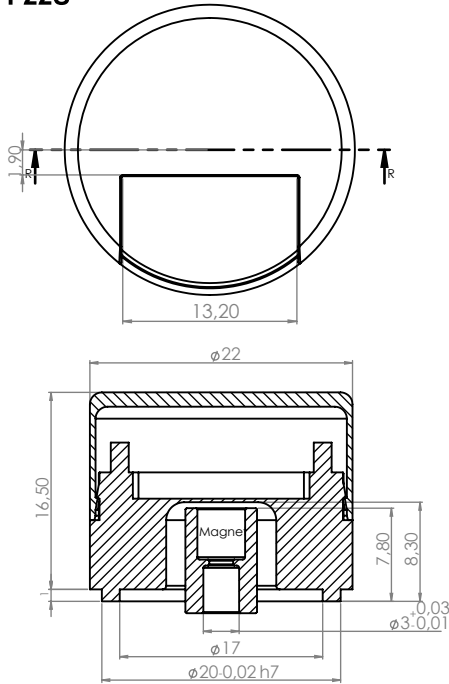
Zero the UVW signals

First move the motor to the required zero UVW position. Short together the two zeroing pads.

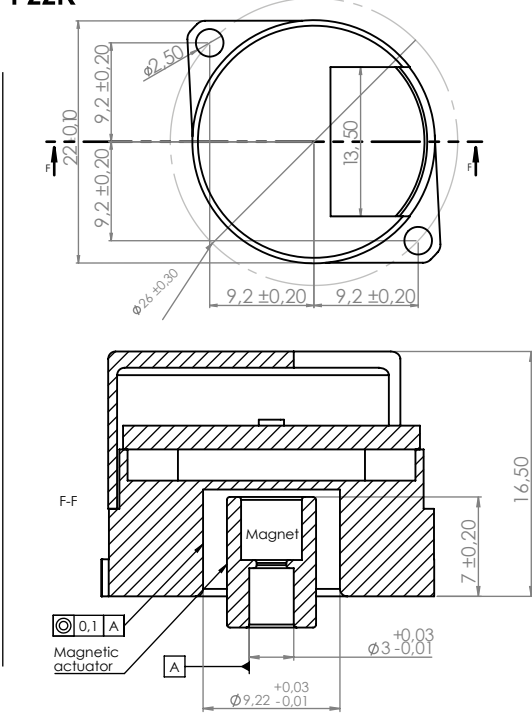


Mechanical Dimensions

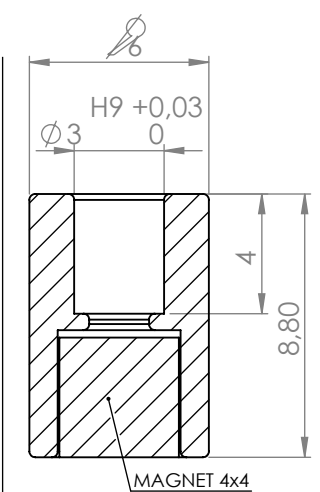
F22S



F22K



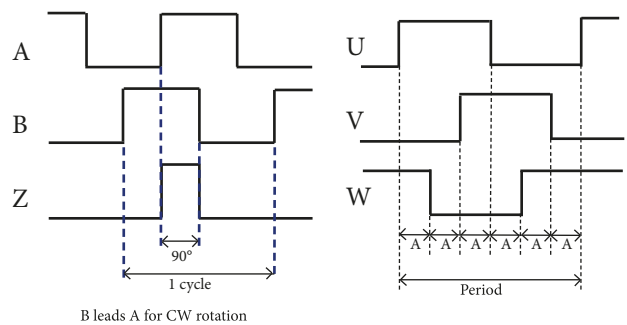
F22M4403 / F22M4404



Connection

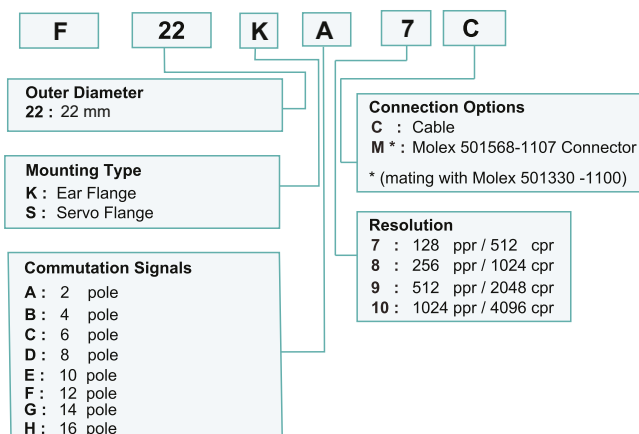
Please consult the factory.

Pulse Diagram

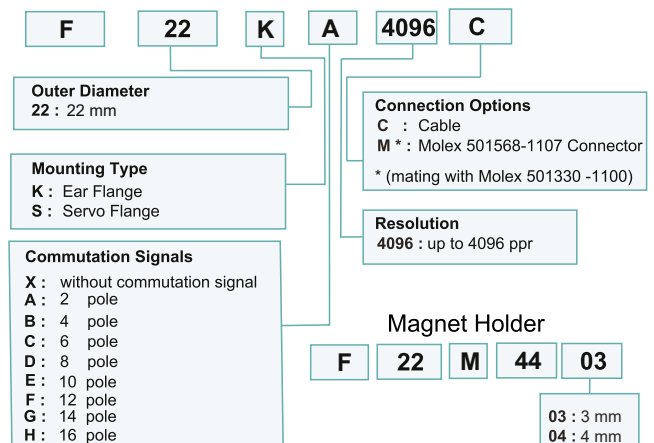


Encoder Part Number

Commutation Version



Incremental Version



Absolute commutation encoders

Resolution 1...5000 pulses

FNCC 40EF Series

126



without cover



with cover

Features

- Industry 40 mm, end or through hollow shaft
- Robust Mechanical and Electrical Construction
- Protection up to IP67
- Up to 5000 PPR max.
- 2P, 3P, 4P, 5P Pole pairs options

PPR Options :

1000 - 1024 - 1250 - 2000 - 2048 - 2500 - 5000

Technical data - mechanical design

Dimensions (flange)	ø40 mm
Shaft loading	≤80 N axial ≤100 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	4, 5, 6, 7, 8 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	250 g

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...5000
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Accessories

Connectors and cables

See page 206

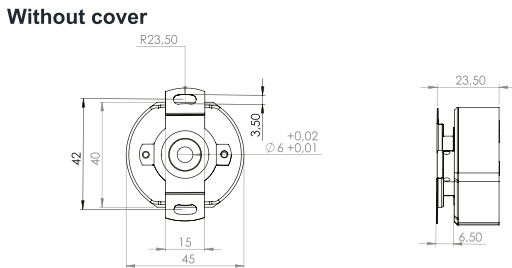
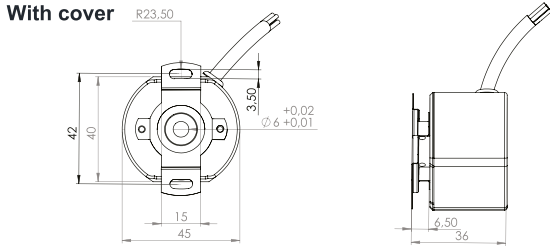
Mounting coupling

See page 204

Mounting accessories

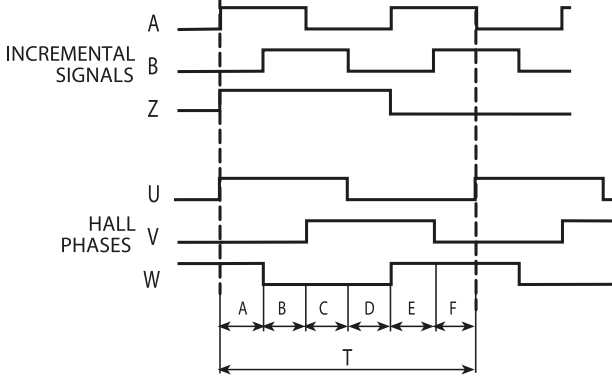
See page 202-203

Mechanical Dimensions



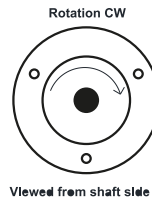
Pulse Diagram

Clockwise rotating direction when looking at flange.



Cable / Connector Wiring

Function	Connector	Color	Renk
+VB	pin 1	Brown	Kahve
GND	pin 2	White	Beyaz
A	pin 3	Green	Yeşil
A'	pin 4	Green-Black	Yeşil-Siyah
B	pin 5	Yellow	Sarı
B'	pin 6	Yellow-Black	Sarı-Siyah
Z	pin 7	Gray	Gri
Z'	pin 8	Gray-Black	Gri-Siyah
U	pin 9	Blue	Mavi
U'	pin 10	Blue-Black	Mavi-Siyah
V	pin 11	Orange	Turuncu
V'	pin 12	Orange-Black	Turuncu-Siyah
W	pin 13	Red	Kırmızı
W'	pin 14	Red-Black	Kırmızı-Siyah
shield	pin 15		



POLES	A / B / C / D / E / F	T
4	30° ±1,5°	180°
6	20° ±1,5°	120°
8	15° ±1,5°	90°
10	12° ±1,5°	72°

Encoder Part Number

FNCC 40 EF 8 6 8P 2500 30V - R2

Housing:
40 : 40mm

Flange Type:
EF : End hollow shaft optic
EFM : End hollow shaft magnetic

Shaft diameter : 4, 5, 6, 7, 8 mm
Other dimensions on request

Output Channels
3 : ABZ
6 : ABZ+A' B' Z'

Cable
R2 : Radial 2 mm, Standard ,without cover
R2C : Radial 2m, With cover

Supply Voltage and output circuit :
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

PPR Options :
1000 - 1024 - 1250 - 2000 - 2048 - 2500 - 4096 - 5000

Pole pairs
4P : 4 poles, 2 pole pair 2P : 2 poles, 1 pole pair
6P : 6 poles, 3 pole pair 10P : 10 poles, 5 pole pair
8P : 8 poles, 4 pole pair 12P : 12 poles, 6 pole pair

Absolute commutation encoders

Resolution 1...65536 pulses



FNCC 40HF Series

128



Features

- Industry 40 mm, end or through hollow shaft
- Robust Mechanical and Electrical Construction
- Protection up to IP67
- Up to 65536 PPR max.
- 2P, 3P, 4P, 5P Pole pairs options

PPR Options :

1000 - 1024 - 1250 - 2000 - 2048 - 2500 - 5000

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...65536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø40 mm
Shaft loading	≤80 N axial ≤100 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	4, 5, 6, 7, 8 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	250 g

Accessories

Connectors and cables

See page 206

Mounting coupling

See page 204

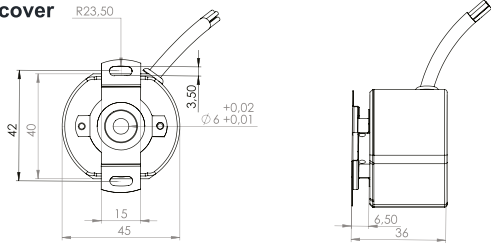
Mounting accessories

See page 202-203

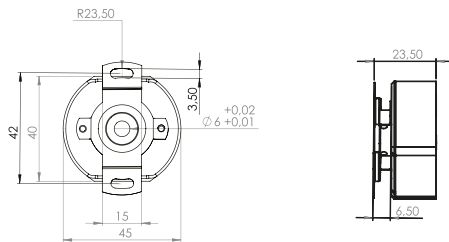
FNCC 40HF Series

Mechanical Dimensions

With cover

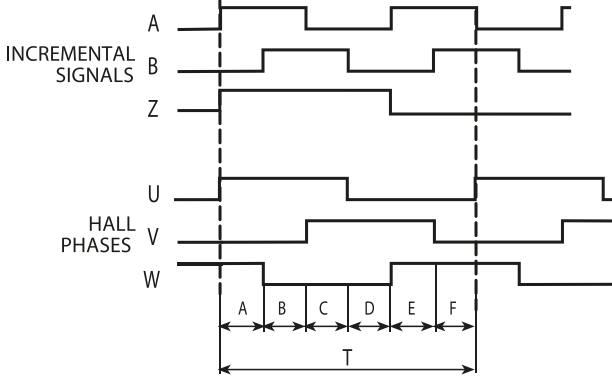


Without cover



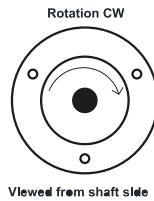
Pulse Diagram

Clockwise rotating direction when looking at flange.



Cable / Connector Wiring

Function	Connector	Color	Renk
+VB	pin 1	Brown	Kahve
GND	pin 2	White	Beyaz
A	pin 3	Green	Yeşil
A'	pin 4	Green-Black	Yeşil-Siyah
B	pin 5	Yellow	Sarı
B'	pin 6	Yellow-Black	Sarı-Siyah
Z	pin 7	Gray	Gri
Z'	pin 8	Gray-Black	Gri-Siyah
U	pin 9	Blue	Mavi
U'	pin 10	Blue-Black	Mavi-Siyah
V	pin 11	Orange	Turuncu
V'	pin 12	Orange-Black	Turuncu-Siyah
W	pin 13	Red	Kırmızı
W'	pin 14	Red-Black	Kırmızı-Siyah
shield	pin 15		



POLES	A / B / C / D / E / F	T
4	30° ±1,5°	180°
6	20° ±1,5°	120°
8	15° ±1,5°	90°

Encoder Part Number

FNCC 40 HF 8 6 8P 2500 30V - R2

Housing:
40 : 40mm

Flange Type:
HF: Through hollow shaft optic

Shaft diameter : 4, 5, 6, 7, 8 mm
Other dimensions on request

Output Channels

3 : ABZ
6 : ABZ + A' B' Z'
: ABZ + UVW
12 : ABZ + A'B'Z' + UVW + U' V' W'

Cable
R2 : radial 2m, shield not connected (standart)

Supply Voltage and output circuit :

5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

PPR Options :

1000 - 1024 - 1250 - 2000 - 2048 - 2500 - 4096 - 5000 - 65536

Pole pairs

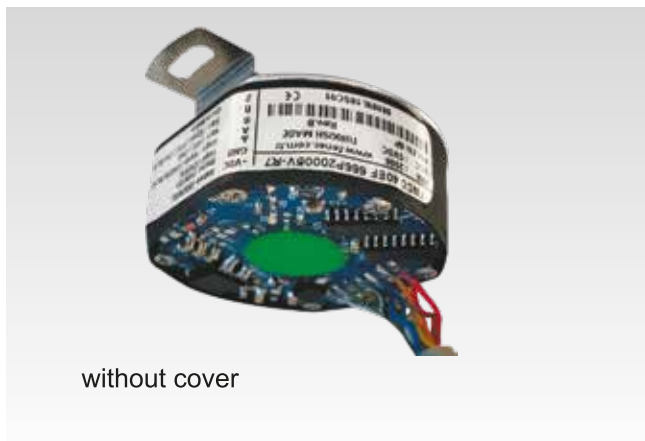
0P : No poles, 0 pole pair
4P : 4 poles, 2 pole pair
8P : 8 poles, 4 pole pair
12P : 12 poles, 6 pole pair
16P : 16 poles, 8 pole pair
2P : 2 poles, 1 pole pair
6P : 6 poles, 3 pole pair
10P : 10 poles, 5 pole pair
14P : 14 poles, 7 pole pair
32P : 32 poles, 16 pole pair

Absolute commutation encoders

Resolution 1...5000 pulses

FNCC 40HFS Serial Motor Feedback Encoder

130



Features

- Industry 40 mm, end or through hollow shaft
- Robust Mechanical and Electrical Construction
- Protection up to IP67

Technical data - mechanical design

Dimensions (flange)	ø40 mm
Shaft loading	≤80 N axial ≤100 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	4, 5, 6, 7, 8 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	250 g

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...5000
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Accessories

Connectors and cables

See page 206

Mounting coupling

See page 204

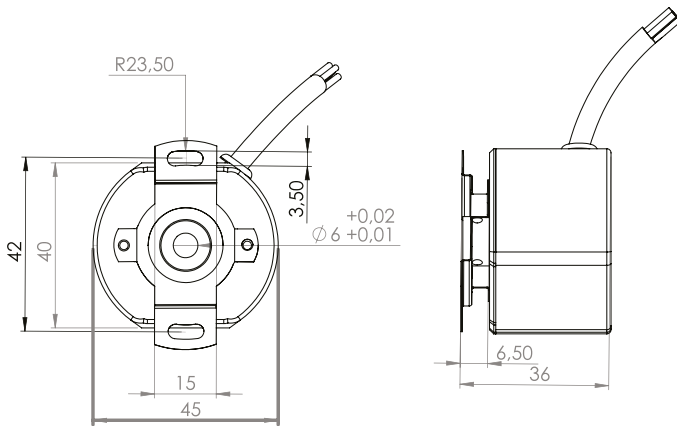
Mounting accessories

See page 202-203

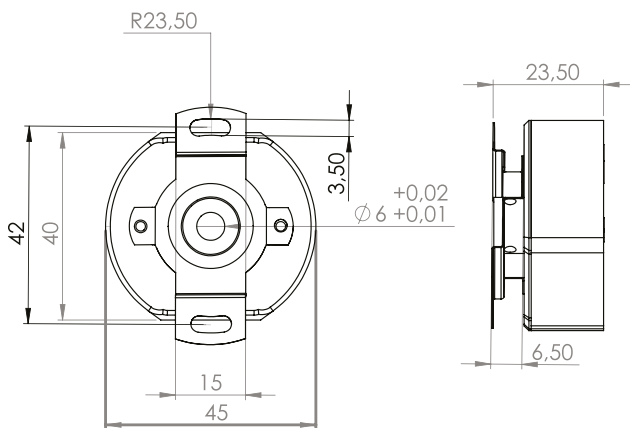
FNCC 40HFS Serial Motor Feedback Encoder

Mechanical Dimensions

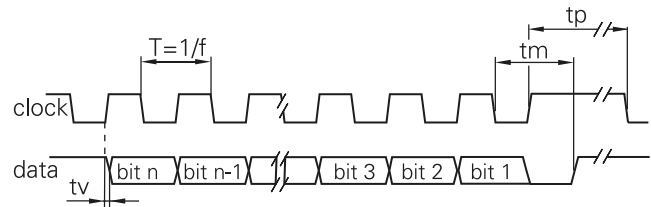
With cover



Without cover



Pulse Diagram



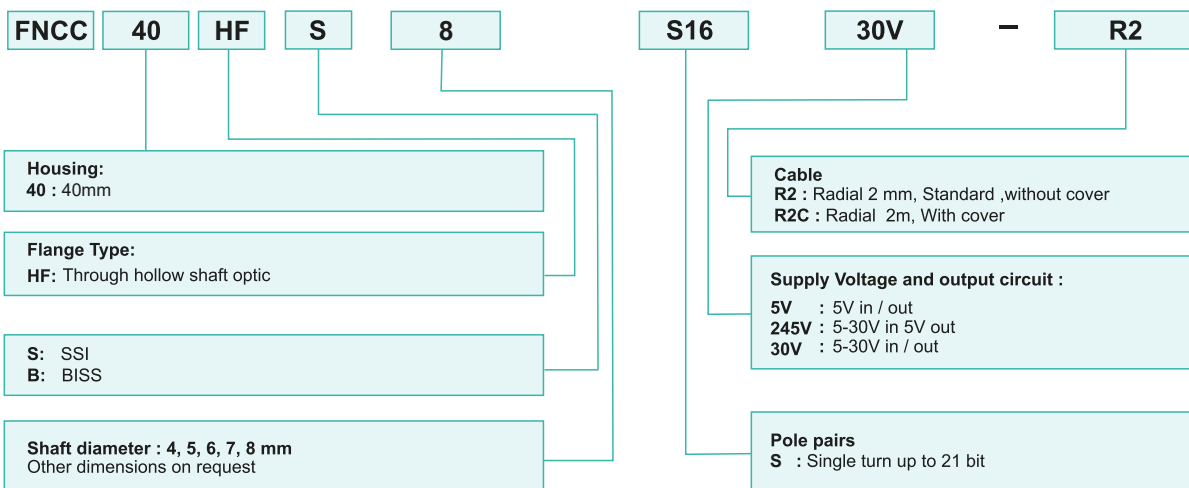
Clock frequency, f	50...2000 kHz for SSI up to 10MHz for BISS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	>15µs
Clock time out	Programmable at factory

Cable / Connector Wiring

Connector	Core colour	Signals	Description
Pin 1	blue	Clock+	Clock signal
Pin 2	blue-black	Clock-	Clock signal
Pin 3	orange	Data+	Data signal
Pin 4	orange-black	Data-	Data signal
Pin 5	gray	Zero	Zero setting input
Pin 6,7,8,9	-	n.c.	-
Pin 10	gray-black	up/down	direction input
Pin 11	white	0 V	GND
Pin 12	brown	+Vs	Supply voltage

Screen: not connected to housing
Cable data: 4 x 2 x 0.14 mm²

Encoder Part Number



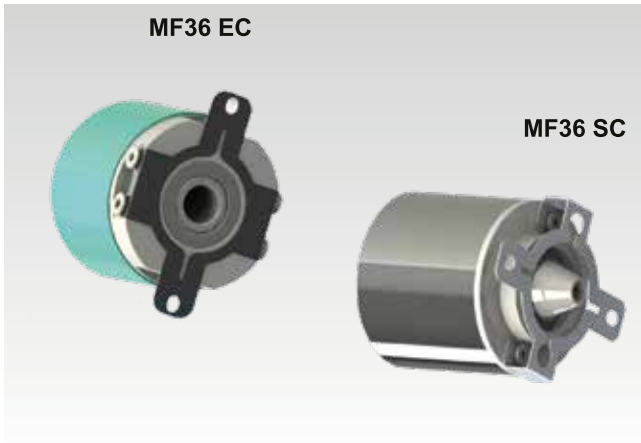
Absolute encoders - SSI/BISS+SinCos

Integral bearing for integration in motors



FNC MF36 Series

132



Features

- Compact robust motor integration design
- 12...bit SSI/BISS accurate position information
- 2048 PPR sin cosine accurate speed information
- Through hollow shaft 8 mm
- Interfaces : SSI- - BISS
- IP65 protection class

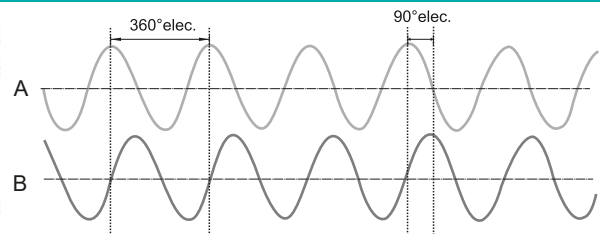
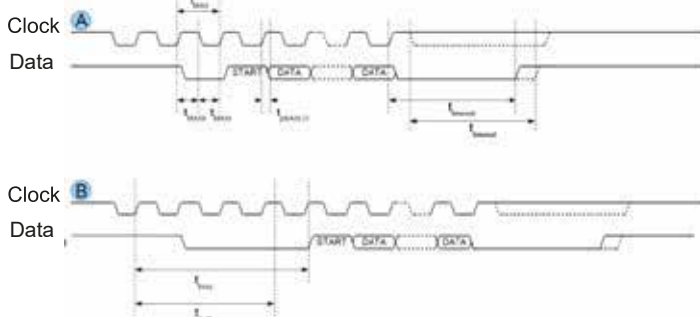
Technical data - electrical ratings

Voltage supply	4.75VDC to 5.5VDC or 7 - 30V
Protection:	Output short circuit protection. Reverse polarity protection
Consumption w/o load	≤120 mA (5 VDC)
Interface, Output	Sine cosine / 1 Vpp
Resolution (steps/turn)	up to 21 bit
Absolute accuracy	±0.01°
Absolute angle error	0.02T°
Output frequency	500 kHz (max.)
Output circuit	1 Vpp incremental Sin/Cos differential driver

Technical data - mechanical design

Dimensions (flange)	ø36 mm
Protection DIN EN 60529	IP 65
Operating speed	≤10000 rpm
Starting torque	≤0.03 Nm (IP 67)
Materials	Housing : Aluminium Flange : Aluminium Shaft : Stainless steel
Shaft specs	8 mm
Operating temperature	-40...+110 °C
Storage temperature	-40 °C up to +120 °C
Weight approx.	250 g
Approval	CE

Pulse diagram



Signals shown at CW rotation with view on shaft's end

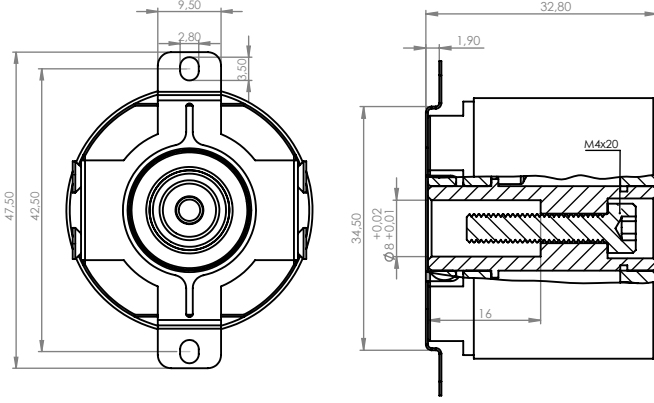
Symbol	Parameter	Conditions	Min	Max	Unit
tMAS	Permissible Clock Period	TIMO in accordance	100	2 x ttimeout	ns
tMASH	Permissible Signal Hi Level Duration		50	ttimeout	ns
tMASL	Permissible Signal Lo Level Duration		50		ns
treq	REQ Lo Level Duration		50	ttimeout	ns

Absolute encoders - SSI/BISS+SinCos

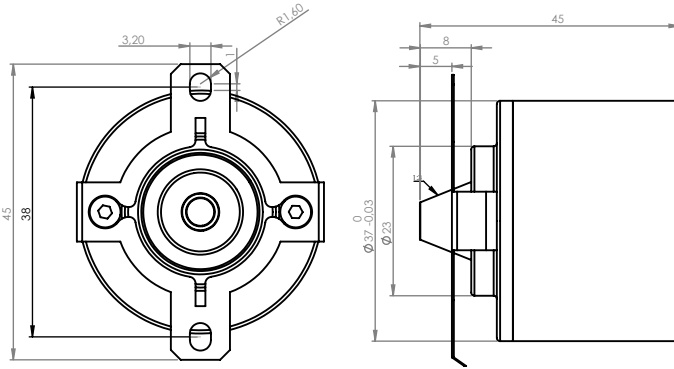
FNC MF36 Series

Mechanical Dimensions

MF36 EC



MF36 SC



Cable / Connector Wiring

Function	Connector	Color	Renk
+VB	pin 1	Brown	Kahve
GND	pin 2	White	Beyaz
A	pin 3	Green	Yeşil
A'	pin 4	Green-Black	Yeşil-Siyah
B	pin 5	Yellow	Sarı
B'	pin 6	Yellow-Black	Sarı-Siyah
Clock	pin 7	Blue	Mavi
Clock-	pin 8	Blue-Black	Mavi-Siyah
Data	pin 9	Orange	Turuncu
Data-	pin 10	Orange-Black	Turuncu-Siyah
Preset	pin 11	Gray	Gri
Direction	pin 12	Gray-Black	Gri-Siyah
Shield	Connected to housing		

Encoder Part Number

FNC MF 36 SC 6 S12 M12

MF: Motor Feedback

Housing 36: 36mm

Flange Type:

SC: Shaft conic

EC: End shaft conic

Shaft diameter : 6, 8

Other dimensions on request

S : Single Turn

12...19 bit options

M: Multi Turn

12, 14, 16 bit options

SC2 30V B - R4

Electrical Connections:

Cable

R4 : radial 4m R1C4 : connector after 1m Cable

Connector:

R2312L R2312R

B: Binary G: Gray

Supply Voltage:

5V : 5V in / out 30V : 5-30V in / out

SC1: 1024 SinCos

SC2: 2048 SinCos

FNC SC2048 Series, SinCos motorfeedback

134



FNC SC2048-R8S8



FNC SC2048-R8S34



FNC SC2048-R8S38

Features

- Compact robust motor integration design
- 1Vpp / 1PPR accurate position information
- 2048 PPR sin cosine accurate speed information
- Installation diameter 65mm
- 1:10 taper shaft
- IP67 protection class

Technical data - mechanical design

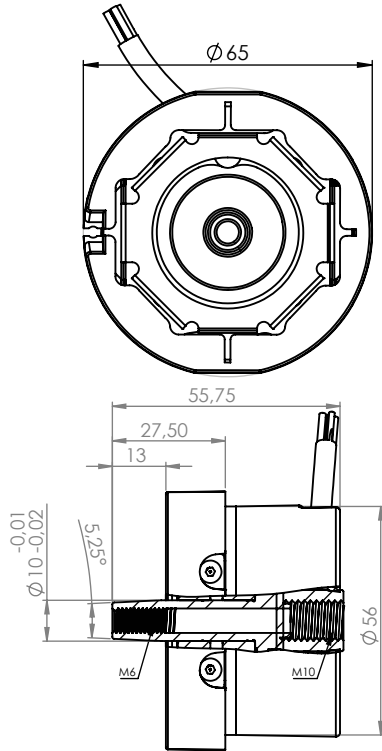
Dimensions (flange)	ø56 mm
Clamp mounting diameter	65 mm
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.03 Nm (IP 67)
Materials	Housing : Aluminium Flange : Aluminium Shaft : Stainless steel
Shaft specs	Taper shaft Ø 9.25 Taper 1:10
Operating temperature	-40...+110 °C
Storage temperature	-40 °C up to +120 °C
Weight approx.	250 g
Approval	CE

Technical data - electrical ratings

Voltage supply	4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection
Consumption w/o load	≤120 mA (5 VDC)
Interface, Output	Sine cosine / 1 Vpp
Resolution (steps/turn)	2048
Absolute accuracy	±0.17°
Absolute angle error	0.087°
Output frequency	500 kHz (max.)
Output circuit	1 Vpp incremental Sin/Cos differential driver

FNC SC2048 Series, SinCos motorfeedback

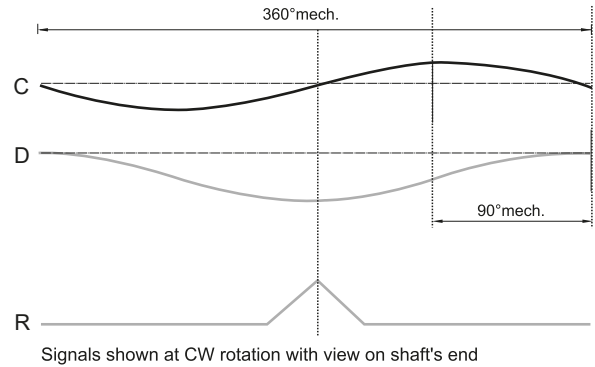
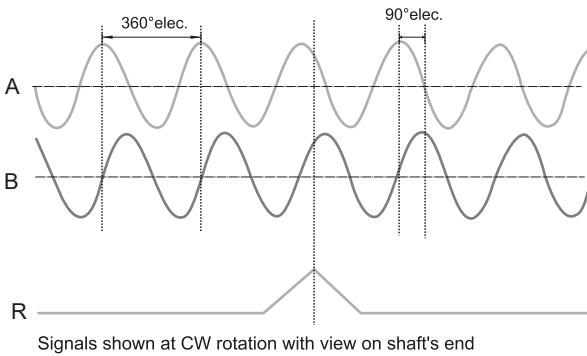
Mechanical Dimensions



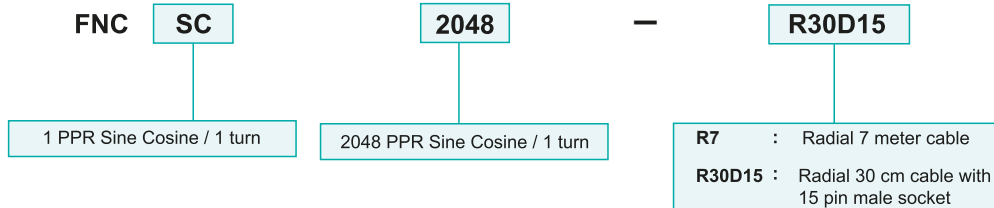
Cable / Connector Wiring

Function	Connector	Color	Renk
+VB	pin 1	Brown	Kahve
GND	pin 2	White	Beyaz
A	pin 3	Green	Yeşil
A'	pin 4	Green-Black	Yeşil-Siyah
B	pin 5	Yellow	Sarı
B'	pin 6	Yellow-Black	Sarı-Siyah
C	pin 7	Blue	Mavi
C'	pin 8	Blue-Black	Mavi-Siyah
D	pin 9	Orange	Turuncu
D'	pin 10	Orange-Black	Turuncu-Siyah
Z	pin 11	Gray	Gri
Z'	pin 12	Gray-Black	Gri-Siyah
Shield	Connected to housing		

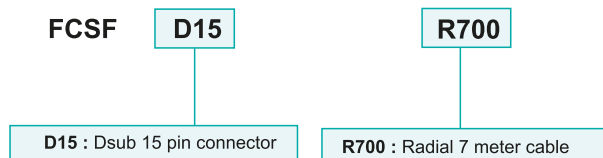
Pulse Diagram



Encoder Part Number



Female Cable Connector



Absolute encoders - SSI/BISS+SinCos

Integral bearing for integration in motors



FNC BISS2048 Series, SSI/BISS+SinCos motorfeedback

136



FNC BISS2048-R8CS



FNC BISS2048-R8S8



FNC BISS2048-R8S34



FNC BISS2048-R8S38



FNC BISS2048-R8S42

Features

- Compact robust motor integration design
- 12...19bit SSI/BISS accurate position information
- 2048 PPR sin cosine accurate speed information
- Installation diameter 65mm
- 1:10 taper shaft
- IP67 protection class

Technical data - mechanical design

Dimensions (flange)	ø56 mm
Clamp mounting diameter	65 mm
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.03 Nm (IP 67)
Materials	Housing : Aluminium Flange : Aluminium Shaft : Stainless steel
Shaft specs	Taper shaft Ø 9.25 Taper 1:10
Operating temperature	-40...+110 °C
Storage temperature	-40 °C up to +120 °C
Weight approx.	250 g
Approval	CE

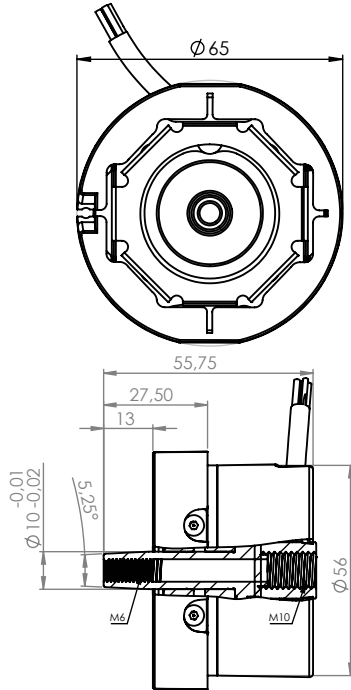
Technical data - electrical ratings

Voltage supply	4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection
Consumption w/o load	≤120 mA (5 VDC)
Interface, Output	Sine cosine / 1 Vpp
Resolution (steps/turn)	up to 19 bit
Absolute accuracy	±0.17°
Absolute angle error	0.087°
Output frequency	500 kHz (max.)
Output circuit	1 Vpp incremental Sin/Cos differential driver

Absolute encoders - SSI/BISS+SinCos

FNC BISS2048 Series, SSI/BISS+SinCos motorfeedback

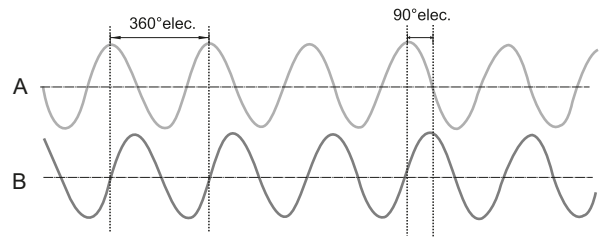
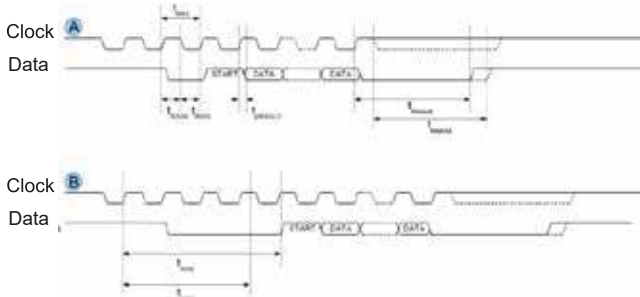
Mechanical Dimensions



Cable / Connector Wiring

Function	Connector	Color	Renk
+VB	pin 1	Brown	Kahve
GND	pin 2	White	Beyaz
A	pin 3	Green	Yeşil
A'	pin 4	Green-Black	Yeşil-Siyah
B	pin 5	Yellow	Sarı
B'	pin 6	Yellow-Black	Sarı-Siyah
Clock	pin 7	Blue	Mavi
Clock-	pin 8	Blue-Black	Mavi-Siyah
Data	pin 9	Orange	Turuncu
Data-	pin 10	Orange-Black	Turuncu-Siyah
Preset	pin 11	Gray	Gri
Direction	pin 12	Gray-Black	Gri-Siyah
Shield	Connected to housing		

Pulse Diagram



Signals shown at CW rotation with view on shaft's end

Symbol	Parameter	Conditions	Min	Max	Unit
tMAS	Permissible Clock Period	TIMO in accordance	100	2 x ttimeout	ns
tMASH	Permissible Signal Hi Level Duration		50	ttimeout	ns
tMASI	Permissible Signal Lo Level Duration		50		ns
treq	REQ Lo Level Duration		50	ttimeout	ns

Encoder Part Number

FNC

BISS

2048

-

R30D15

SSI : SSI Interface
BISS : BISS Interface

2048 PPR Sine Cosine / 1 turn

R7 : Radial 7 meter cable
R30D15 : Radial 30 cm cable with 15 pin male socket

Female Cable Connector

FCSF

D15

R700

D15 : Dsub 15 pin connector

R700 : Radial 7 meter cable

40mA



86928H15SE002

CE

HEQAC



1



2



Programmable Multiturn
Analog Encoder

Absolute analog encoders

- **Smart**
- **Easy**



FNC Programmable MT Analog Output

Current / voltage output



FNC MT Programmable Analog Output

Ø50 Flange

140



Features

- Programmable measuring range
- Industry 50 mm end hollow shaft version
- Robust mechanical and electrical construction
- Protection up to IP67
- 0-10V voltage / 4-20mA current output

Output Options :

- Programmable;**
- 0-10VDC Voltage
 - 0-5VDC Voltage
 - 4-20mA current

Technical data - electrical ratings

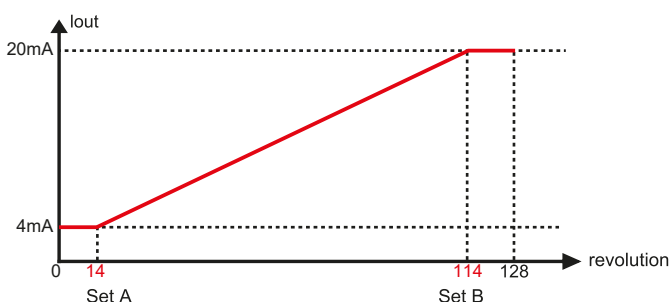
Voltage supply	10-30VDC
Protection:	Output short circuit protection. Reverse polarity protection
Consumption w/o load	≤60 mA (24 VDC)
Output signals	0-10VDC Voltage output 0-5VDC Voltage output 4-20mA current output
Measuring range	up to 65536 revolution
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	Ø50 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 65)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft/Hollow shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	250 g

Pulse Diagram

Example: 128 revolution current output.



Accessories

Connectors and cables

CRM1205 M12 4 poles female connector or see page 206

Mounting coupling

PF481010 plastic or see page 204

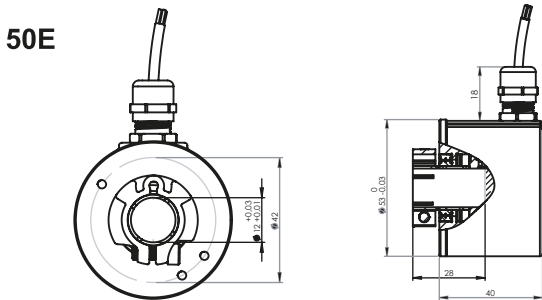
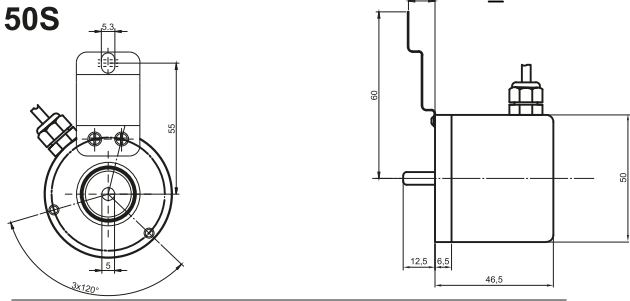
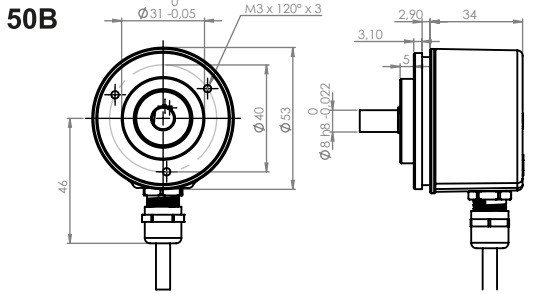
Mounting accessories

SF58B square flange or see page 202-203

Ø50 Flange

FNC MT Programmable Analog Output

Mechanical Dimensions



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply voltage
GND	White	Beyaz	Ground
V	Green	Yeşil	Voltage output
A	Red	Kırmızı	Current output

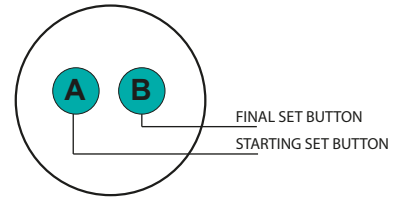
Connector Wiring

Connector Type	Analog Output	+VDC	GND	SET1	SET2
CRM1205	1	2	3	4	5

Teach Procedure

Teach Procedure 1:
Press A and B button for 10 sec.
Leds will flash.
At start point press A button

Teach Procedure 2:
Turn shaft CW to final point.
Press B button at final point.
Teach procedure is done.



For fabrication settings press A and B button for 30 sec.

Encoder Part Number

FNC P A A 50 B 10 M8 C1 30V - CRM1205

- Programmable
- Absolute
- Analog
- Housing : 50mm
- Flange Type:
E : End hollow shaft
B : Shaft clamping flange
S : Servo flange
- Shaft diameter : 4, 6, 8, 10, 12, 14
Other dimensions on request

- Electrical Connections:
Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)
CRM1205 : M12 5pin connector
- Supply Voltage:
5 : 5V in/out 30 : 5 - 30V in/out
- Output type :
C1 : 4-20mA
V1 : 0-10V
V2 : 1-5V
- Multiturn
4, 8, 12, 16, 20, 24, 32 bit

FNC Programmable MT Analog Output

Current / voltage output



FNC MT Programmable Analog Output

Ø58 Flange

142



Features

- Programmable measuring range
- Industry 58 mm end hollow shaft version
- Robust mechanical and electrical construction
- Protection up to IP67
- 0-10V voltage / 4-20mA current output

Output Options :

- Programmable;**
- 0-10VDC Voltage
 - 0-5VDC Voltage
 - 4-20mA current

Technical data - electrical ratings

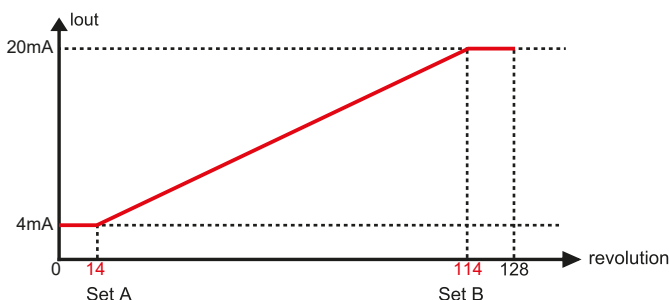
Voltage supply	10-30VDC
Protection:	Output short circuit protection. Reverse polarity protection
Consumption w/o load	≤60 mA (24 VDC)
Output signals	0-10VDC Voltage output 0-5VDC Voltage output 4-20mA current output
Measuring range	up to 65536 revolution
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	Ø58 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 65)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft/Hollow shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	250 g

Pulse Diagram

Example: 128 revolution current output.



Accessories

Connectors and cables

CRM1205 M12 4 poles female connector or see page 206

Mounting coupling

PF481010 plastic or see page 204

Mounting accessories

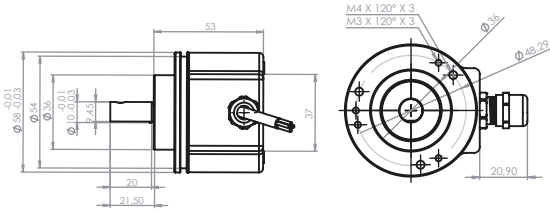
SF58B square flange or see page 202-203

Ø58 Flange

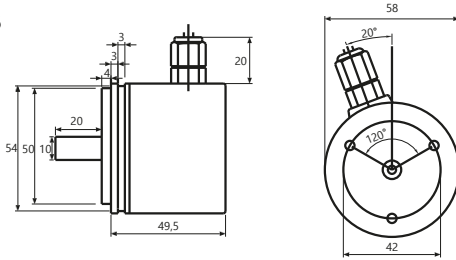
FNC MT Programmable Analog Output

Mechanical Dimensions

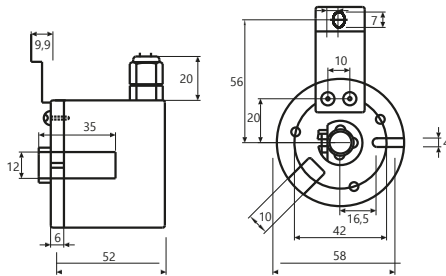
58B



58S



58E



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply voltage
GND	White	Beyaz	Ground
V	Green	Yeşil	Voltage output
A	Red	Kırmızı	Current output

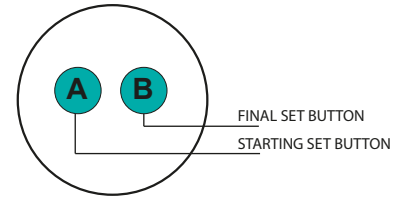
Connector Wiring

Connector Type	Analog Output	+VDC	GND	SET1	SET2
CRM1205	1	2	3	4	5

Teach Procedure

Teach Procedure 1:
Press A and B button for 10 sec.
Leds will flash.
At start point press A button

Teach Procedure 2:
Turn shaft CW to final point.
Press B button at final point.
Teach procedure is done.



For fabrication settings press A and B button for 30 sec.

Encoder Part Number

FNC P A A 58 B 10 M8 C1 30V - CRM1205

Programmable	Electrical Connections:
Absolute	Cable
Analog	R2 : radial 2m, shield not connected (standart)
Housing : 58mm	A2 : axial 2m, shield not connected (standart)
Flange Type:	CRM1205 : M12 5pin connector
E : End hollow shaft	Supply Voltage:
B : Shaft clamping flange	5 : 5V in/out 30 : 5 - 30V in/out
S : Servo flange	Output type :
Shaft diameter : 4, 6, 8, 10, 12, 14	C1 : 4-20mA
Other dimensions on request	V1 : 0-10V
	V2 : 1-5V
	Multiturn
	4, 8, 12, 16, 20, 24, 32 bit

FNC ST Analog Output

Current / voltage output

FNC ST Analog Output

50 mm & 58 mm Housing

144



Features

- Industry 58 mm shaft version
- Industry 58 mm end hollow shaft version
- Robust mechanical and electrical construction
- Protection up to IP67
- 0-10V voltage / 4-20mA current output versus position

Output Options :

- 0-10VDC Voltage
- 0-5VDC Voltage
- 4-20mA current

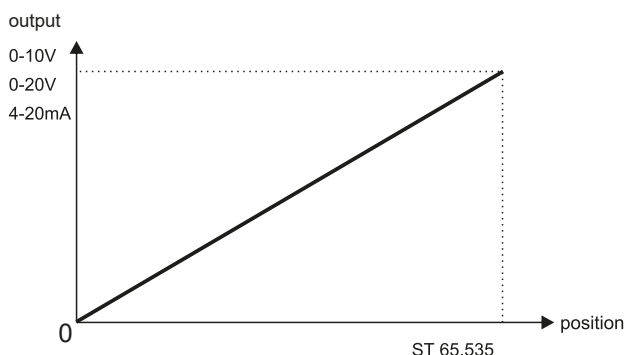
Technical data - electrical ratings

Voltage supply	10-30VDC
Protection:	Output short circuit protection. Reverse polarity protection
Consumption w/o load	≤60 mA (24 VDC)
Output signals	0-10VDC Voltage output 1-5VDC Voltage output 4-20mA current output
Resolution	up to 16 bit
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft/Hollow shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	250 g

Pulse Diagram



Accessories

Connectors and cables

CRM1205 M12 4 poles female connector or see page 206

Mounting coupling

PF481010 plastic or see page 204

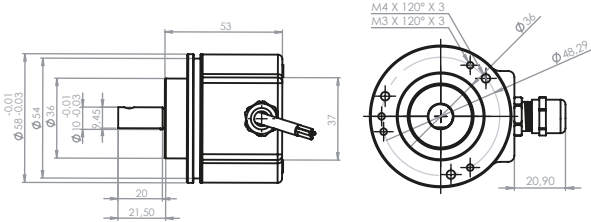
Mounting accessories

SF58B square flange or see page 202-203

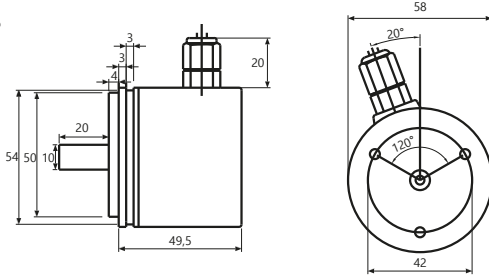
FNC ST Analog Output

Mechanical Dimensions

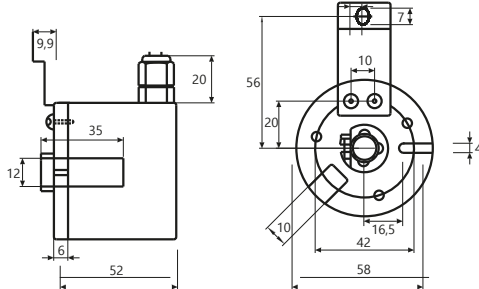
58B



58S



58E



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply voltage
GND	White	Beyaz	Ground
V	Green	Yeşil	Voltage output
A	Red	Kırmızı	Current output

Connector Wiring

Connector Type	+Vcc	GND	V	A	NC
CRM1204	1	2	3	4	
CRM1205	1	2	3	4	5

Encoder Part Number

FNC AA 58 B 10

AA : Absolute Analog

Housing:
50 : 50mm
58 : 58mm

Flange Type:
E : End hollow shaft
B : Shaft clamping flange
S : Servo flange

Shaft diameter : 4, 6, 8, 10, 12, 14
Other dimensions on request

C1 P00 30V - R2

Electrical Connections:
Cable
R2 : radial 2m, shield not connected (standart)
A2 : axial 2m, shield not connected (standart)
R1205 : M12 5pin connector

Supply Voltage:
5V : 5V in/out 30V : 5-30V in/out

Output position
P00 : 360° position angle
P180 : 180° position angle
P90 : 90° position angle

Output type
C1 : 4-20mA current
C2 : 0-20 mA current
V1 : 0-10V voltage
V2 : 0-5V voltage

FNC Tacho Analog Output Versus Speed

Current / voltage output

FNC Tacho Analog Output Versus Speed 50 mm & 58 mm Housing

146



Features

- Industry 58 mm shaft version
- Industry 58 mm end hollow shaft version
- Robust mechanical and electrical construction
- Protection up to IP67
- 0-10V voltage / 4-20mA current output versus speed

Output Options :

- 0-10VDC Voltage
- 0-5VDC Voltage
- 4-20mA current

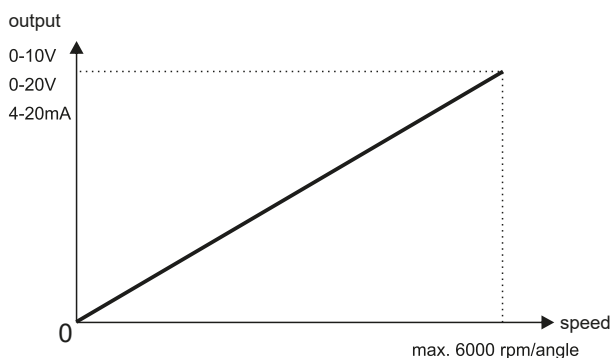
Technical data - electrical ratings

Voltage supply	10-30VDC
Protection:	Output short circuit protection. Reverse polarity protection
Consumption w/o load	≤60 mA (24 VDC)
Output signals	0-10VDC Voltage output 0-5VDC Voltage output 4-20mA current output
Measuring range	up to 6000 rpm
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft/Hollow shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	250 g

Pulse Diagram



Accessories

Connectors and cables

CRM1205 M12 4 poles female connector or see page 206

Mounting coupling

PF481010 plastic or see page 204

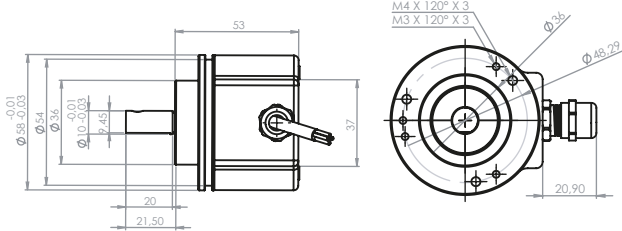
Mounting accessories

SF58B square flange or see page 202-203

FNC Tacho Analog Output Versus Speed

Mechanical Dimensions

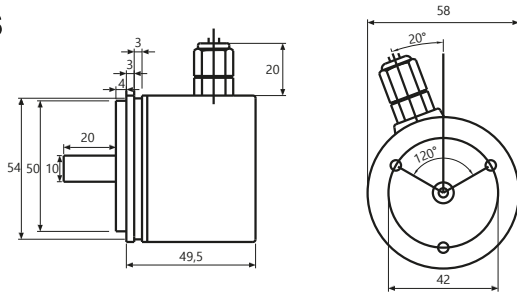
58B



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply voltage
GND	White	Beyaz	Ground
V	Green	Yeşil	Voltage output
A	Red	Kırmızı	Current output

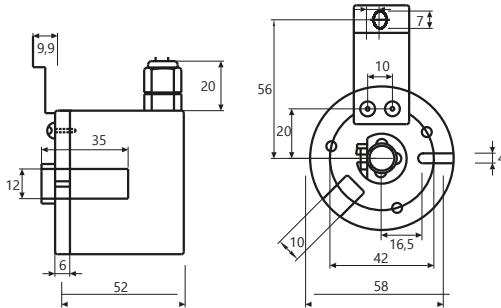
58S



Connector Wiring

Connector Type	+Vcc	GND	V	A	NC
CRM1204	1	2	3	4	
CRM1205	1	2	3	4	5

58E



Encoder Part Number

FNC **T** **58** **B** **8** **C1** **T15** **30V** - **R2**

<p>T : Tacho Analog Output</p> <p>Housing: 50 : 50mm 58 : 58mm</p> <p>Flange Type: E : End hollow shaft B : Shaft clamping flange S : Servo flange</p> <p>Shaft diameter : 4, 6, 8, 10, 12, 14 Other dimensions on request</p> <p>Output type : C1 : 4-20mA V1 : 0-10V V2 : 0-5V</p>	<p>Electrical Connections: Cable R2 : radial 2m, shield not connected (standart) A2 : axial 2m, shield not connected (standart) RZ1205 : M12 5pin connector</p> <p>Supply Voltage: 5: 5V in/out 30: 5-30V in/out</p> <p>Output speed T60 : Tacho max 6000 rpm T30 : Tacho max 3000 rpm T15 : Tacho max 1500 rpm T960 : Tacho max 0-10V/ 960 rpm T03 : Tacho max 300 rpm</p>
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Linear Solutions

- Lineertiy
- Output Variety
- Compact Size



FNC TPD Wheel Series

150



Features

- Suitable for measuring the length and speed of the moving target by selecting wheel type
- Distance measurement output wavelength and it conforms to the international measurement
- Different wheel diameters and surface options depending on the application
- Protection up to IP65 or IP54
- Easy Mounting
- <300 kHz frequency

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Reference signal	Zero pulse, width 90° 180°, 360° optional
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Accessories

Connectors and cables

M12 4 poles, M15 8 poles and for other connector options see page 202

Technical data - mechanical design

Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.020 Nm (IP 67)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	650 g

Resolution

Resolution:

For 250 mm Circumference Wheels

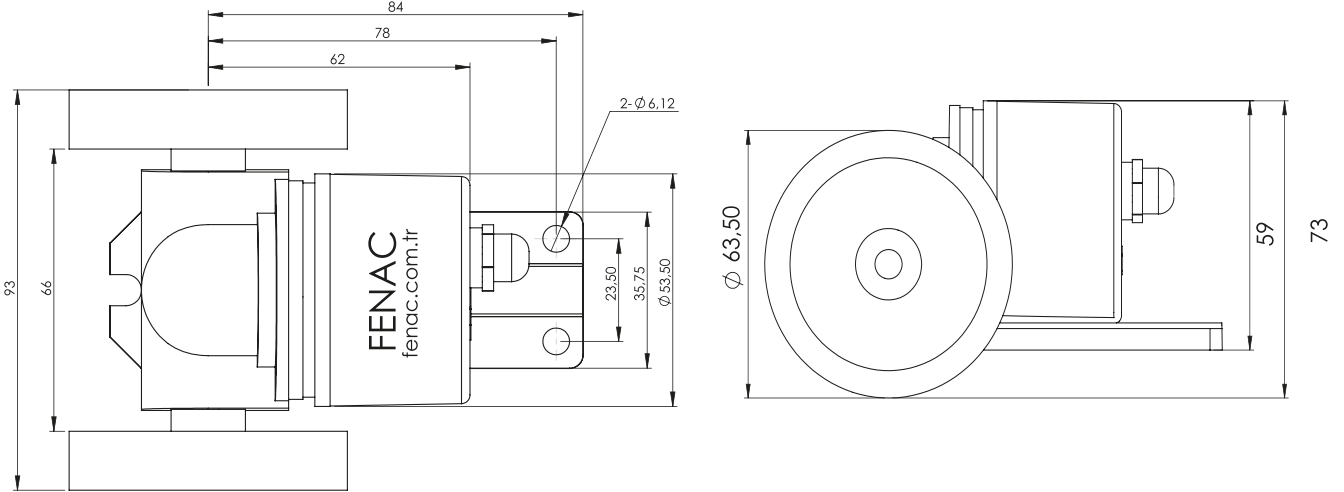
0,1 = 1PPR = 0,1 mm	= 2500 PPR Encoder
1 = 1PPR = 1 mm	= 250 PPR Encoder
2 = 1PPR = 2 mm	= 125 PPR Encoder
5 = 1PPR = 5 mm	= 50 PPR Encoder
10 = 1PPR = 10 mm (1 cm)	= 25 PPR Encoder

For 200 mm Circumference Wheels

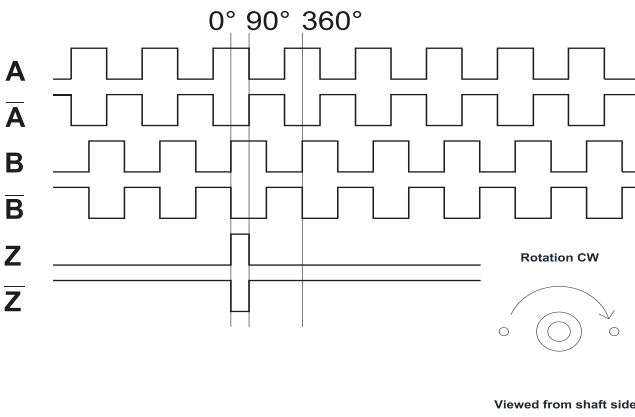
2 = 1PPR = 2 mm	= 100 PPR Encoder
100 = 1PPR = 100 mm (10 cm)	= 2 PPR Encoder

Mechanical Dimensions Cable/Connector Wiring, Part Number FNC TPD Wheel Series

Mechanical Dimensions



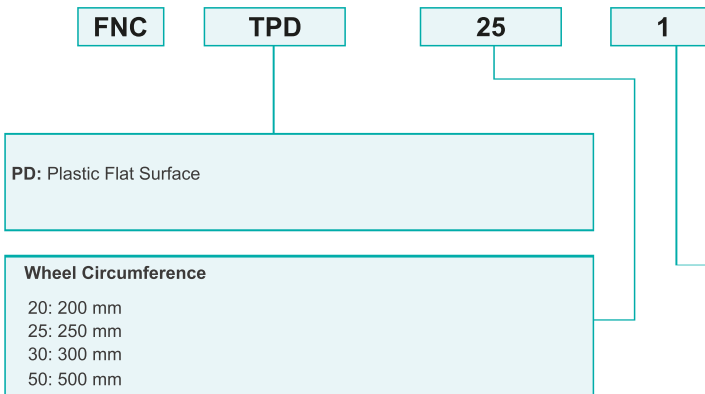
Pulse Diagram



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

System Part Number



Resolution:

Resolution	Encoder Type
0,1 = 1PPR = 0,1 mm	= 2500 PPR Encoder
1 = 1PPR = 1 mm	= 250 PPR Encoder
2 = 1PPR = 2 mm	= 125 PPR Encoder
5 = 1PPR = 5 mm	= 50 PPR Encoder
10 = 1PPR = 10 mm (1 cm)	= 25 PPR Encoder

Resolution	Encoder Type
2 = 1PPR = 2 mm	= 100 PPR Encoder
100 = 1PPR = 100 mm (10 cm)	= 2 PPR Encoder

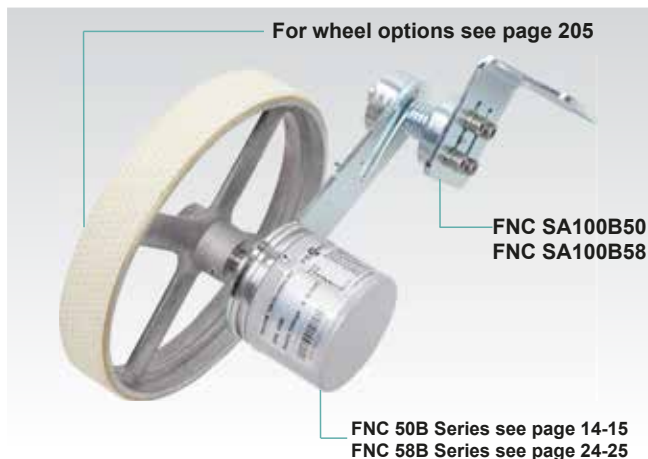
**For All TPD Models;
5-30VDC, Push Pull Out, A-B Channel**

Wheel Measuring System

Textile, steel etc...length measurement

FNC WMS Measuring System

152



Features

- Wheel + spring arm + encoder linear measurement system
- Robust mechanical and electrical construction
- Protection up to IP67

PPR Options :

1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 - 6000 - 8192 - 10000 - 12500 - 16384 - 20000 - 25000

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Resolution (steps/turn)	1...25.000
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z +

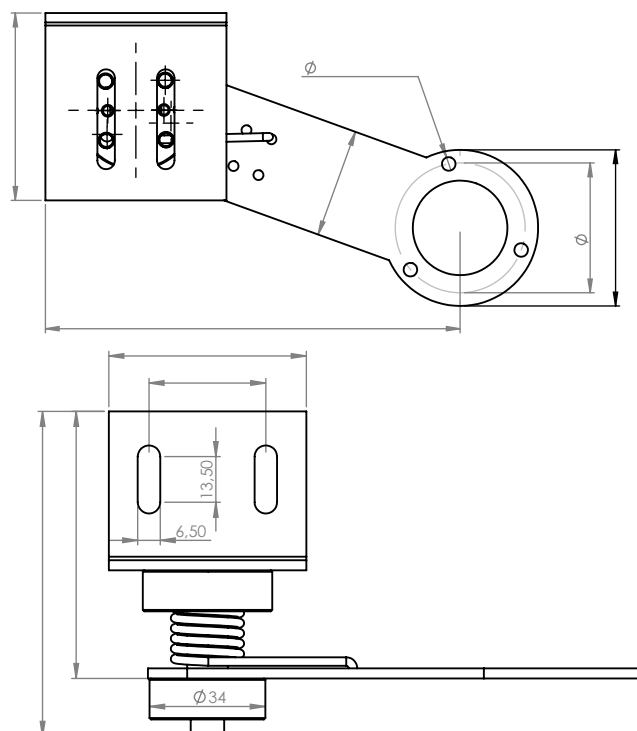
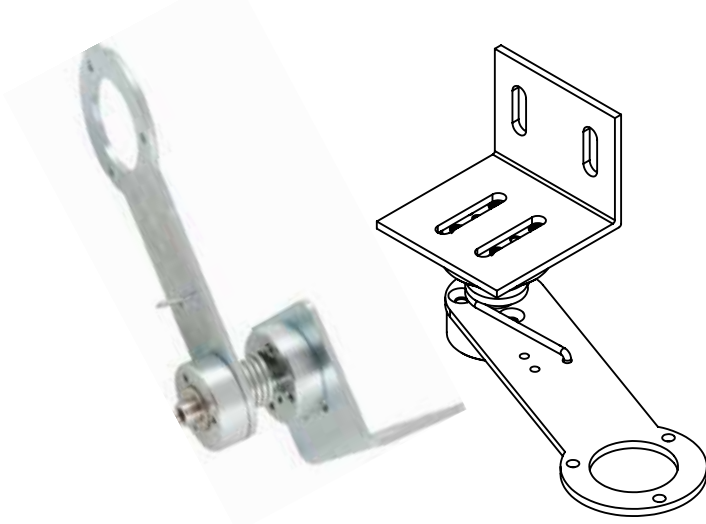
Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Operating / Storage temperature	-20...+85 °C -30 °C up to +90 °C
Weight approx.	250 g

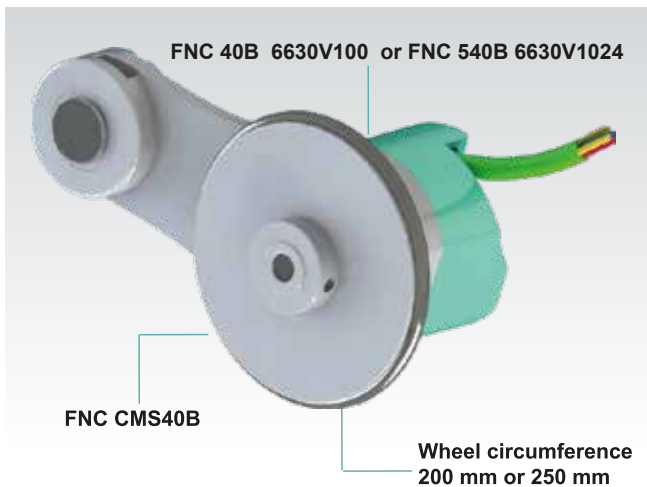
FNC SA100

Spring lever for length determination

- For encoder FNC 40B, FNC 50B
FNC 58B
- Variable installation from below, from above, horizontal, vertical



FNC CMS Measuring System



Features

- Compact - small size wheel + spring arm + encoder linear measurement system
- Robust mechanical and electrical construction
- Protection up to IP67

PPR Options :

1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 - 6000 - 8192 - 10000 - 12500 - 16384 - 20000 - 25000

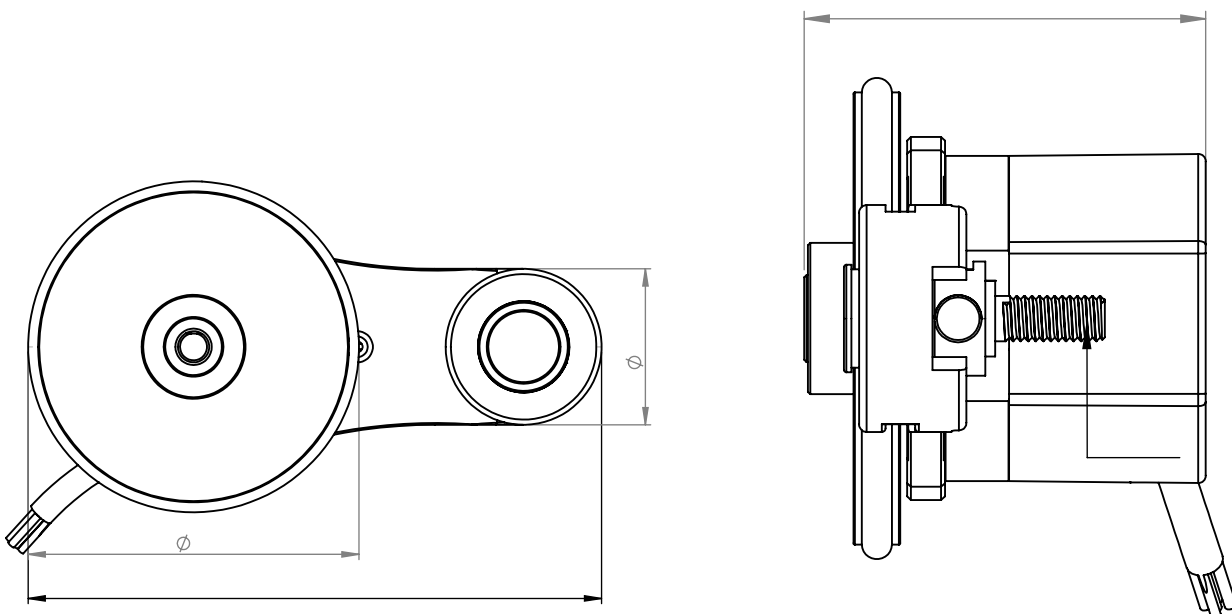
Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Resolution (steps/turn)	1...25.000
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z +

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Operating / Storage temperature	-20...+85 °C -30 °C up to +90 °C
Weight approx.	250 g

Mechanical Dimensions



FLM Linear Magnetic Sensors

Resolution up to 0,001mm



FLM Linear Magnetic Sensors

154



Features

- Resolution up to 0,001 mm
- Robust mechanical and electrical construction
- Protection to IP67
- Periodic reference signal.

Resolution Options :

2.5, 5, 10, 12.5, 20, 25, 40, 50, 80, 100, 200um for 5 mm tape
0.5, 1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80um for 2 mm tape

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution	See part number selection
Reference signal	Zero pulse, width 90° 180°, 360° optional
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

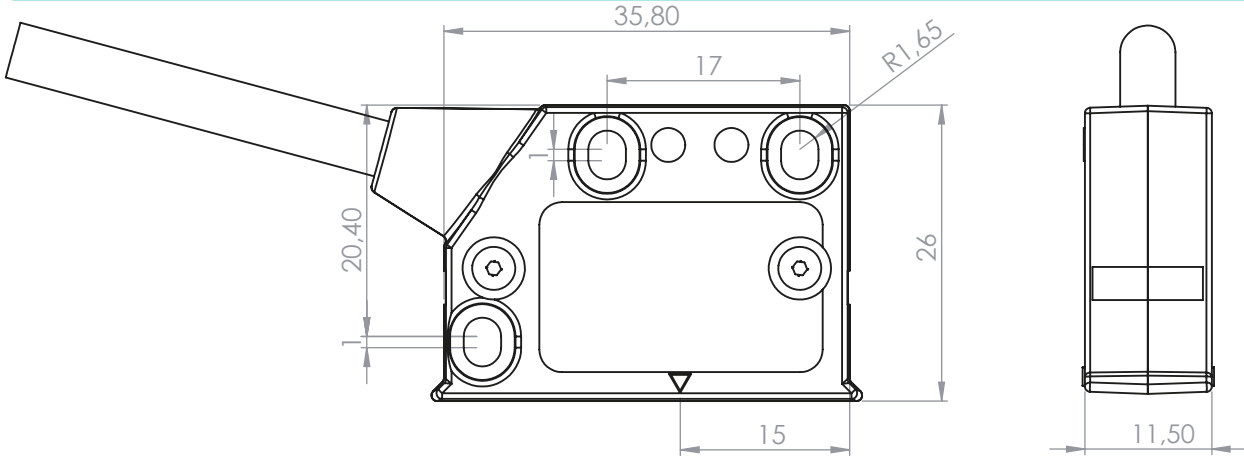
Sensor/tape reading distance	0.1...2mm
Pole Length	5mm for FMTL500 tape 2mm for FMTL200 tape
Protection DIN EN 60529	IP 67
Travel speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Zinc die cast
System accuracy	±0.025mm for linear ±1°
Repeat	±10um
Operating temperature	-10...+70 °C
Storage temperature	-30 °C up to +70 °C
Weight approx.	250 g

** 5 mm pole pitch magnetic band : **MB05**

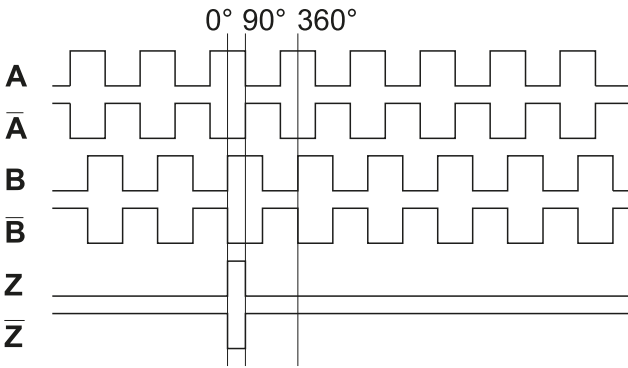
** 2 mm pole pitch magnetic band : **MB02**

FLM Linear Magnetic Sensors

Mechanical Dimensions



Pulse Diagram



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FLM 5 005 2 30V - R2

Tape Type:

5 : 5mm width tape
2 : 5mm width tape

Resolution : 0.005mm / 5um

Options :
2,5, 5, 10, 12,5, 20, 25, 40, 50, 80, 100, 200um for 5 mm tape
0,5, 1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80um for 2 mm tape

Output Channels

1 : A
2 : AB
3 : ABZ
4 : AB+A' B'
6 : ABZ+A' B' Z'

Electrical Connections:

Cable
R2 : radial 2m, shield not connected (standart)

Supply Voltage and output circuit :

5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out



Bearingless Encoders

- **Micro**
- **Smooth**
- **Flexible**

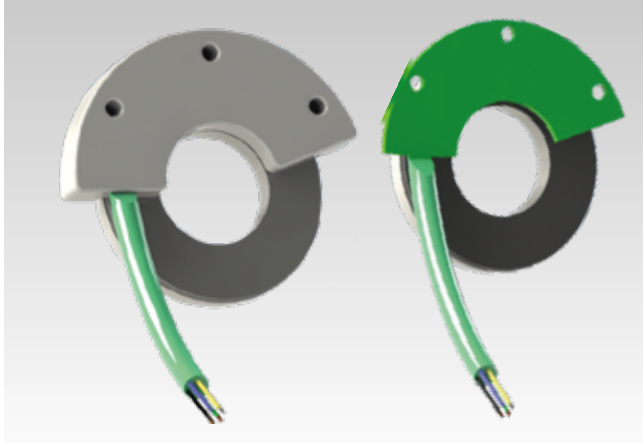


Linear & Bearingless encoders

Resolution 1 ...65536 for Incremental Version
 Resolution 8 to 18 bit for Absolute Version
 SSI / BISS Interface



FNCA MAR3015 Series, Incremental & Absolute Axial



Features

- Off - Axis Incremental & Commutation rotary encoder
- Robust mechanical and electrical construction
- Corrosion resistant magnetic ring
- Outer diameter 30 mm
- Inner diameter 15mm
- Up to 65.536 PPR max. for incremental rotary encoder
- Up to 18 bit for absolute rotary encoder
- Up to 16 pole pairs
- <300 kHz frequency
- Magnetic system

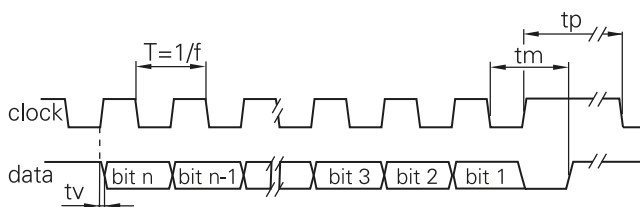
Technical data

Voltage supply	4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection
Consumption w/o load	≤60 mA
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
EMC Standars	EN 61000-6-2 / EN 61000-6-4
Approval	CE
Dimensions (ring)	ø30 mm
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Materials	Ring: Aluminium
Operating / Storage temperature	-20...+85 °C / -30°C ...+90°C
Weight approx.	200 g

Cable Wiring

Incremental Version		Absolute Version	
Function	Color	Function	Color
+VB	Brown	+VB	Brown
GND	White	GND	White
A	Green	Clock+	Blue
A'	Red	Clock-	Blue-black
B	Yellow	Data+	Orange
B'	Pink	Data-	Orange-black
Z	Gray	Preset	Gray
Z'	Blue	shield	
U	Transparent		
V	Orange		
W	Black		
shield			

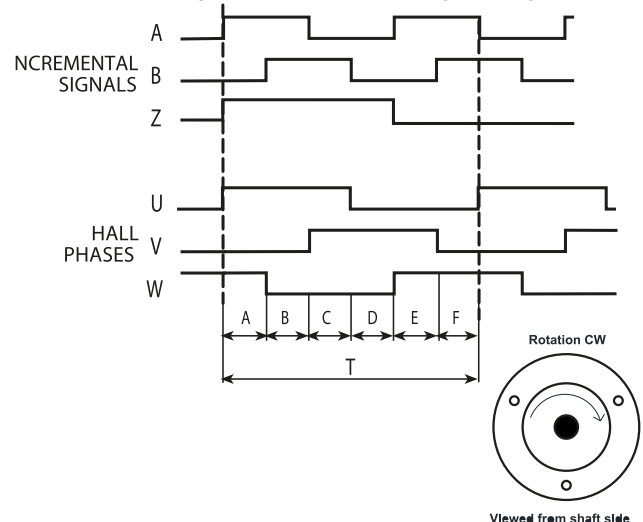
Pulse Diagram for Absolute Version



Clock frequency, f	50...2000 kHz for SSI up to 10MHz for BISS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	>15µs
Clock time out	Programmable at factory

Pulse Diagram for Incremental Version

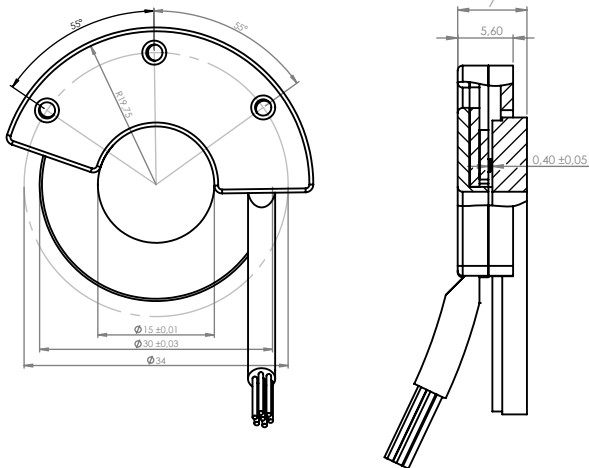
Clockwise rotating direction when looking at flange.



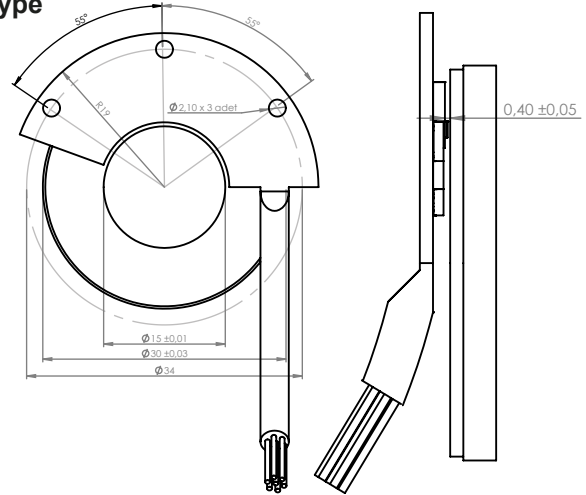
FNCA MAR3015 Series, Incremental & Absolute Axial

Mechanical Dimensions

Cover Type



PCB Type



Encoder Part Number for Absolute Version

FNCA P 30 15 S12 30V B - R2

- P** : PCB
C : Cover
- Housing:**
30 : 15mm
- Shaft Diameter :** 10, 15, 20, 30, 35 mm
others on request
- S** : single turn
8 ... 18 bit

- Electrical Connections:**
Cable
R2 : radial 2m, shield not connected (standart)
- B** : Binary
- Supply Voltage and output circuit :**
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Encoder Part Number for Incremental & Commutation Version

FNCI P 30 15 6 6P 30V 1024 - R2

- P** : PCB
C : Cover
- Housing:**
30 : 30 mm
- Shaft Diameter :** 10, 15, 20, 30, 35 mm
others on request
- Output Channels**
1 : A 4 : AB+A' B'
2 : AB 6 : ABZ+A' B' Z'
3 : ABZ
- Pole Pairs**
2P : 2 poles 10P : 10 poles
4P : 4 poles 12P : 12 poles
6P : 6 poles 16P : 16 poles
8P : 8 poles
Empty : without commutation, direct incremental

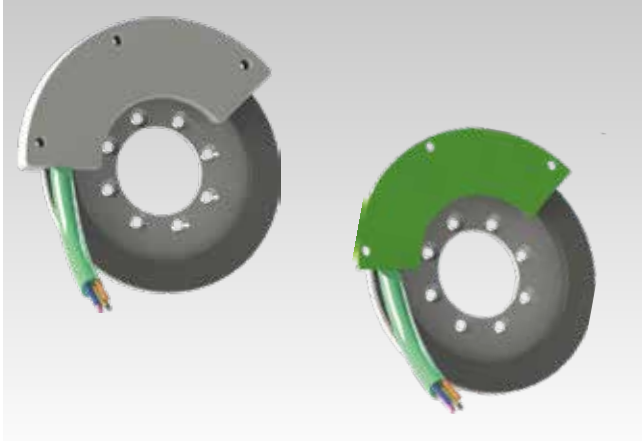
- Electrical Connections:**
Cable
R2 : radial 2m, shield not connected (standart)
- PPR Options :**
1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 - 6000 - 8192 - 10000 - 12500 - 20000 - 25000 ... 65536
- Supply Voltage and output circuit :**
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Linear & Bearingless encoders

Resolution 1...65536 pulses for Incremental Version
 Resolution 8 to 18 bit for Absolute Version
 SSI / BISS Interface



FNC MAR55 Series, Incremental & Absolute Axial



Features

- Off - Axis Incremental & Absolute rotary encoder
- Robust mechanical and electrical construction
- Corrosion resistant magnetic ring
- Outer diameter 55 mm
- Inner diameter 35 mm
- Up to 65.536 PPR max. for incremental rotary encoder
- Up to 18 bit for absolute rotary encoder
- <300 kHz frequency
- Magnetic system

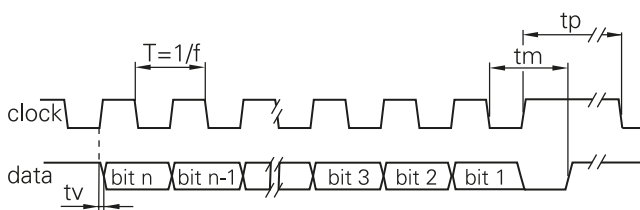
Technical data

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Output circuit	Linedriver/RS422 Push-pull short-circuit proof
Dimensions (ring)	ø55 mm
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Materials	Ring: Aluminium
Operating / Storage temperature	-20...+85 °C / -30 °C ... +90 °C
Weight approx.	350 g
EMC Standards	EN 61000-6-2 /EN 6100-6-4
Approval	CE

Cable Wiring

Incremental Version		Absolute Version	
Function	Color	Function	Color
+VB	Brown	+VB	Brown
GND	White	GND	White
A	Green	Clock+	Blue
A'	Red	Clock-	Blue-black
B	Yellow	Data+	Orange
B'	Pink	Data-	Orange-black
Z	Gray	Preset	Gray
Z'	Blue	shield	
U	Transparent		
V	Orange		
W	Black		
shield			

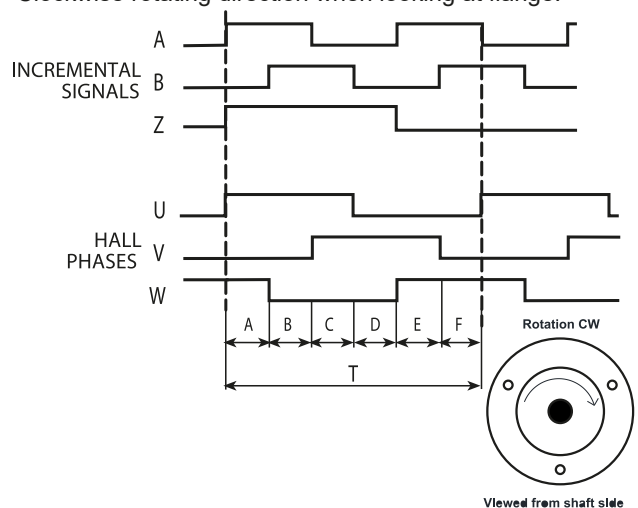
Pulse Diagram for Absolute Version



Clock frequency, f	50...2000 kHz for SSI up to 10MHz for BISS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	>15µs
Clock time out	Programmable at factory

Pulse Diagram for Incremental Version

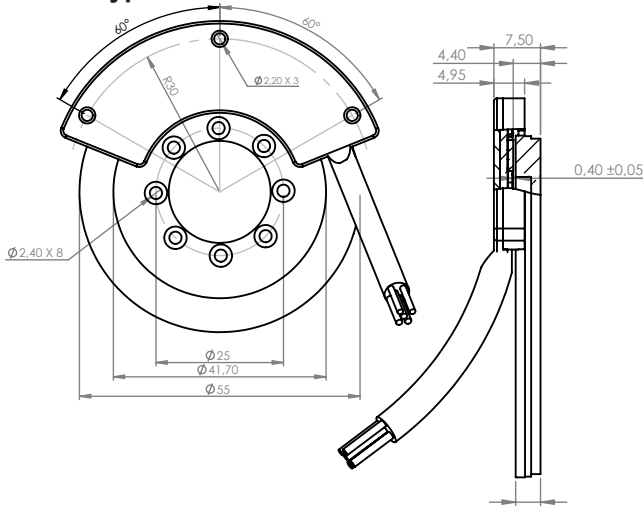
Clockwise rotating direction when looking at flange.



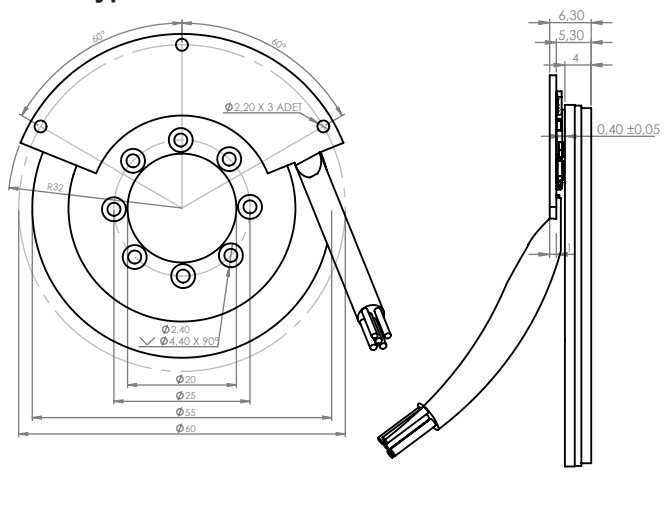
FNC MAR55 Series, Incremental & Absolute Axial

Mechanical Dimensions

Cover Type



PCB Type



Encoder Part Number for Absolute Version

FNCA P 55 35 S12 30V B - R2

P : PCB C : Cover	Electrical Connections: Cable R2 : radial 2m, shield not connected (standart)
Housing: 55 : 55mm	B : Binary
Shaft Diameter : 10, 15, 20, 30, 35 mm others on request	Supply Voltage and output circuit : 5V : 5V in / out 245V : 5-30V in 5V out 30V : 5-30V in / out
S : single turn 8 ...18 bit	

Encoder Part Number for Incremental & Commutiton Version

FNCI P 55 35 6 8P 30V 1024 - R2

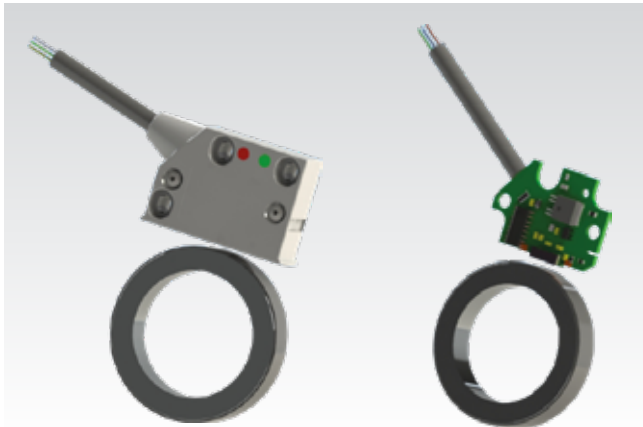
P : PCB C : Cover	Electrical Connections: Cable R2 : radial 2m, shield not connected (standart)
Housing: 55 : 55mm	PPR Options : 1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 - 6000 - 8192 - 10000 - 12500 - 20000 - 25000 ... 65536
Shaft Diameter : 10, 15, 20, 30, 35 mm others on request	Supply Voltage and output circuit : 5V : 5V in / out 245V : 5-30V in 5V out 30V : 5-30V in / out
Output Channels 1 : A 2 : AB 3 : ABZ 4 : AB+A' B' 6 : ABZ+A' B' Z'	Pole Pairs 2P : 2 poles 10P : 10 poles 4P : 4 poles 12P : 12 poles 6P : 6 poles 16P : 16 poles Empty : without commutation, direct incremental

Linear & Bearingless encoders

Resolution 1...524.288 pulses

FNC MRR Series, Incremental Radial

162



Features

- Resolution up to 0,001 mm
- Robust mechanical and electrical construction
- Protection to IP67
- Periodic reference signal
- MRR200 (Rotary)

Resolution Options :

512, 1024, 1600, 2048, 3200, 4096, 524.288

Technical data - electrical ratings

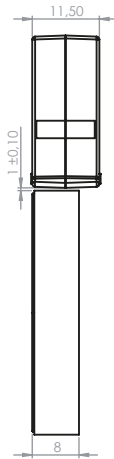
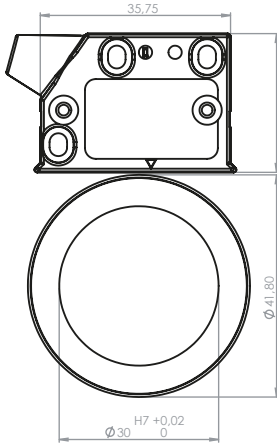
Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution	See part number selection
Reference signal	Zero pulse, width 90° 180°, 360° optional
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

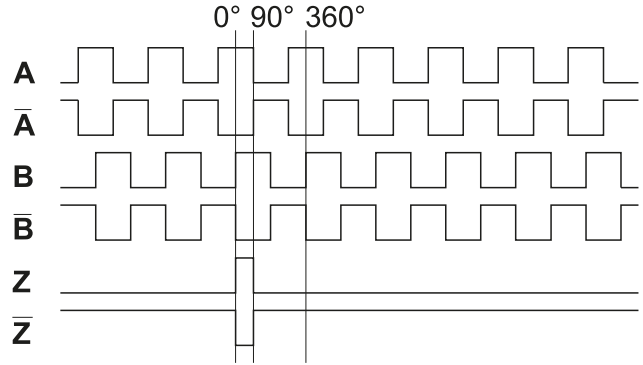
Pole Length	2mm for MRR200 tape
Protection DIN EN 60529	IP 67
Travel speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Ring : Stainless Steel
System accuracy	±0.025mm for rotary ±1°
Repeat	±10um
Operating temperature	-10...+70 °C
Storage temperature	-30 °C up to +70 °C
Weight approx.	250 g

FNC MRR Series, Incremental Radial

Mechanical Dimensions



Pulse Diagram



Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC MRR S

1024

30V

N

-

R2

Flange Type:
S : Sensor Led

PPR Options :
512 - 1024 - 1600 - 2048 - 3200 - 4096 - ... 524288

Supply Voltage and output circuit :
5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

Electrical Connections:
Cable
R2 : radial 2m, shield not connected (standart)

Connector:
R1204

N : without reference magnet
Z : with reference magnet

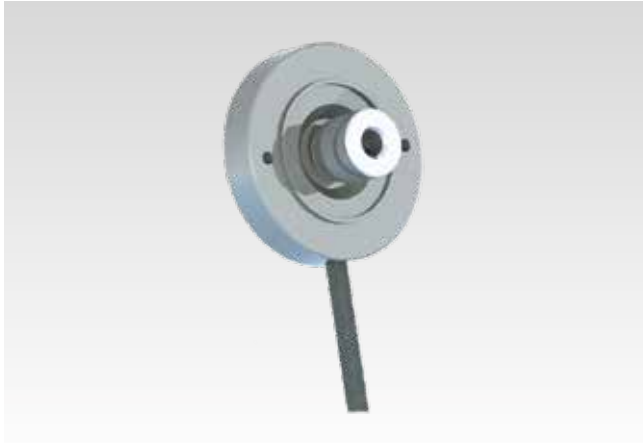
Linear & Bearingless encoders

Resolution 8 to 16 bit
SSI / BISS Interface



FNC MBI50 Incremental & MBA50 Absolute Series

164



Features

- Off - Axis Absolute rotary encoder
- Robust mechanical and electrical construction
- Corrosion resistant magnetic ring
- Outer diameter 55 mm
- Inner diameter 35 mm
- Up to 16 bit
- <300 kHz frequency
- Magnetic system

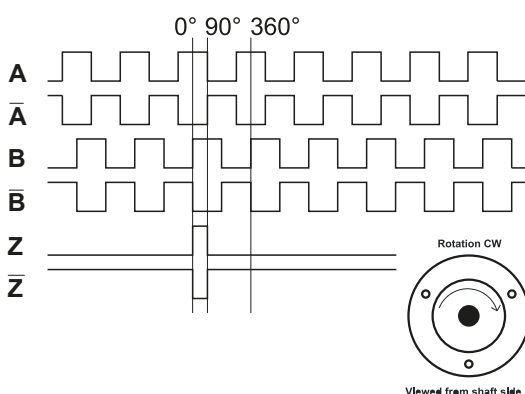
Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	up to 16 bit
Reference signal	Zero pulse, width 90° 180°, 360° optional
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Interference	SSI or BISS
Output circuit	Linedriver/RS422 SSI Linedriver/RS485 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4

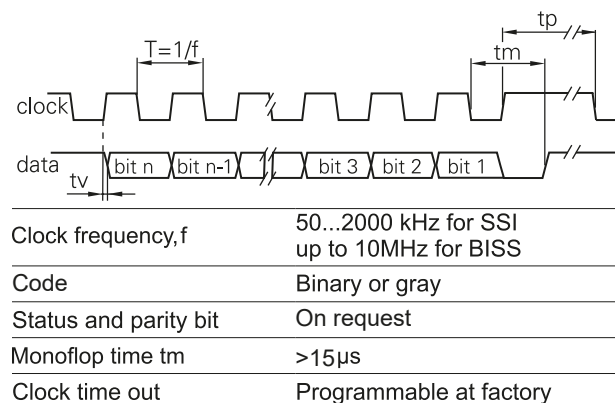
Technical data - mechanical design

Dimensions (ring)	ø50 mm
Protection DIN EN 60529	IP54, IP65
Operating speed	≤120 rpm
Materials	Ring: Aluminium
Shaft diameter:	6, 8, 10, M6, M7 mm (other diameters on request)
Operating temperature	-40...+85 °C
Storage temperature	-30 °C up to +90 °C
Service life	No limitation
Weight approx.	53 g

Pulse Diagram - Incremental

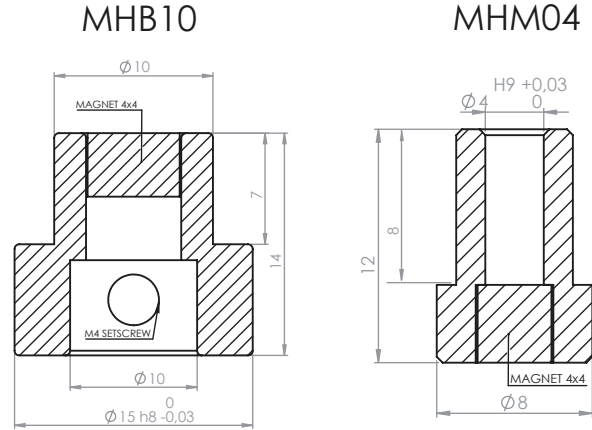
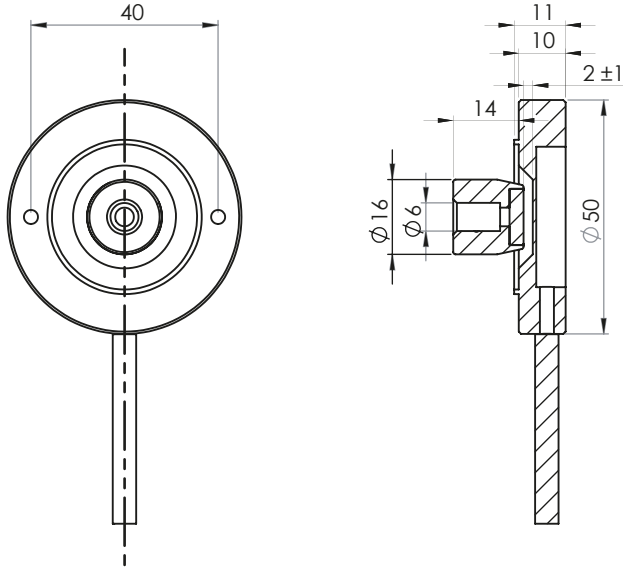


Pulse Diagram - Absolute



FNC MBI50 Incremental & MBA50 Absolute Series

Mechanical Dimensions



MHB10 : Magnet Holder Big Version

MHM04 : Magnet Holder Medium Version

Cable / Connector Wiring - Absolute

Connector	Core colour	Signals	Description
Pin 1	blue	Clock+	Clock signal
Pin 2	blue-black	Clock-	Clock signal
Pin 3	orange	Data+	Data signal
Pin 4	orange-black	Data-	Data signal
Pin 5	gray	Zero	Zero setting input
Pin 6,7,8,9	–	n.c.	–
Pin 10	gray-black	up/down	direction input
Pin 11	white	0 V	GND
Pin 12	brown	+Vs	Supply voltage

Screen: not connected to housing
Cable data: 4 x 2 x 0.14 mm²

Cable Wiring - Incremental

Function	Color	Renk	Explanation
+VB	Red	Kırmızı	Supply Voltage
GND	Black	Siyah	Ground
A	Yellow	Sarı	A Channel
A'	Yellow-White	Sarı-Beyaz	A Inverted Channel
B	Blue	Mavi	B Channel
B'	Blue-White	Mavi-Beyaz	B Inverted Channel
Z	Orange	Turuncu	Z Channel
Z'	Orange-White	Turuncu-Beyaz	Z Inverted Channel
Shield			Shield

Encoder Part Number

FNC **MBA** **50** **6** **S12** **30V** **B** - **R2**

MBA : Absolute
MBI : Incremental

Housing:
50 : 50mm

Magnet Rotor: 6, 8, 10 mm
Screw : M6, M7

S : single turn *
8 ... 16 bit
2048 : 2048 ppr Sine Cosine / 1 Turn **

Electrical Connections:

Cable
R2 : radial 2m, shield not connected (standart)

B : Binary *

Supply Voltage and output circuit :

5V : 5V in / out
245V : 5-30V in 5V out
30V : 5-30V in / out

* : FNC MBA 50 Series

** : FNC MBI 50 Series

Linear & Bearingless encoders

Resolution 1...4096 pulses



FNC MBI44 & MBI 58 Series

166



Features

- Off - Axis Incremental rotary encoder
- Robust mechanical and electrical construction
- Corrosion resistant magnetic ring
- Outer diameter 50 mm
- Inner diameter 35 mm
- Up to 4096 PPR max.
- <300 kHz frequency
- Magnetic system

PPR Options :

64 - 128 - 256 - 512 - 1024 - 2048 - 4096

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1... up to 4096
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof NPN Open Collector
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

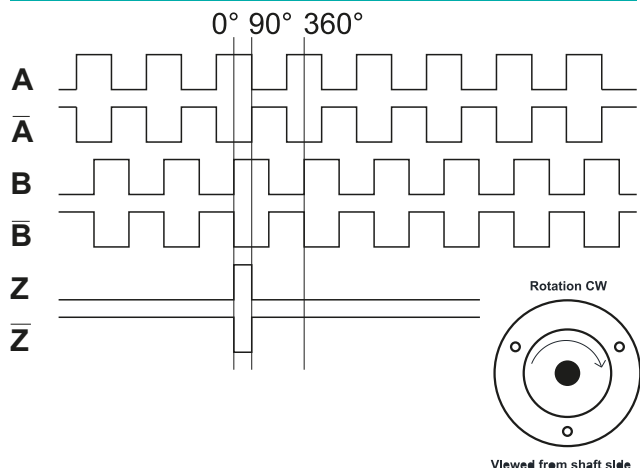
Technical data - mechanical design

Dimensions (ring)	ø44-58 mm
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Aluminium
Shaft diameter:	6, 8, 10, M6, M7 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	350 g

Cable Wiring

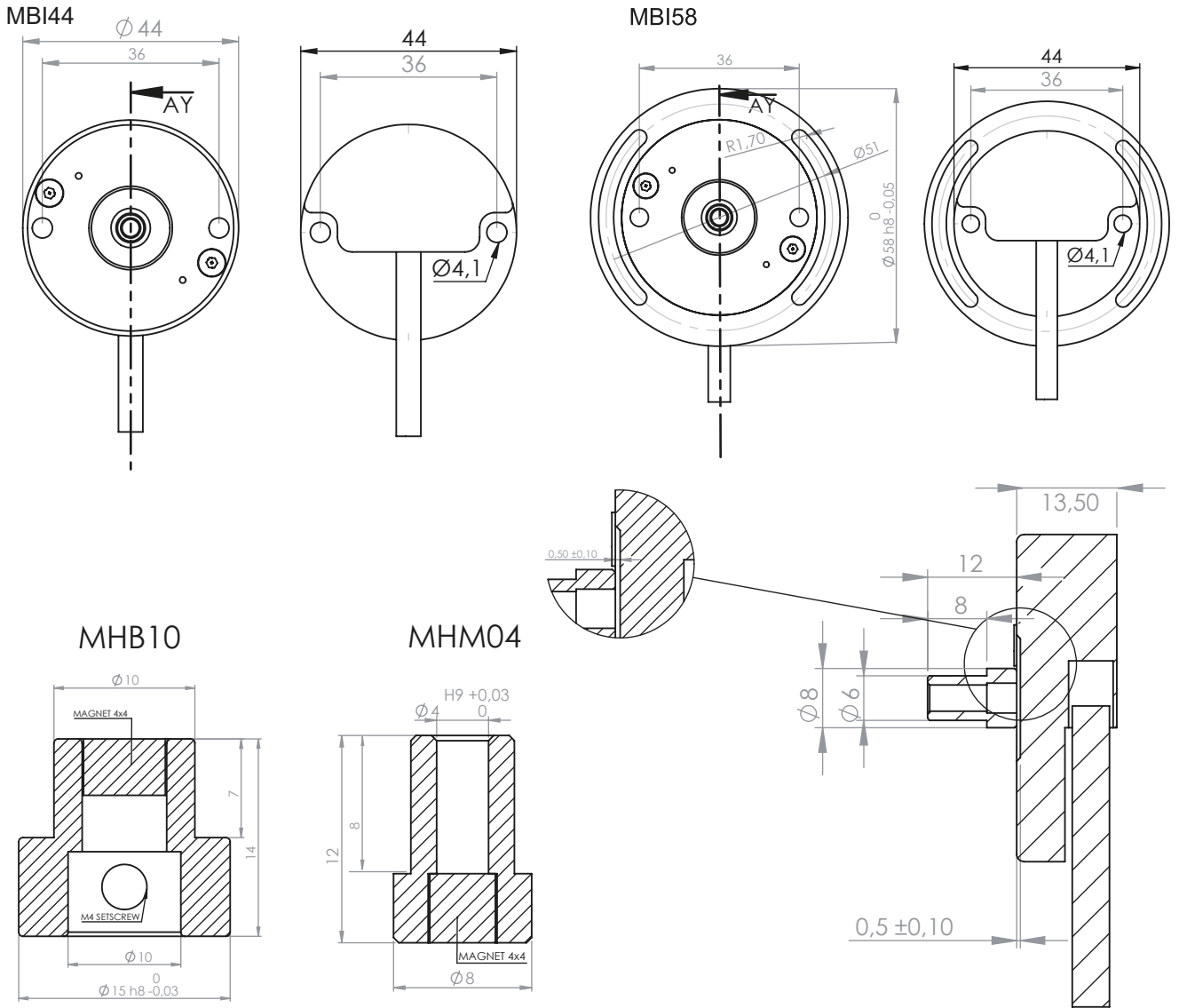
Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Pulse Diagram

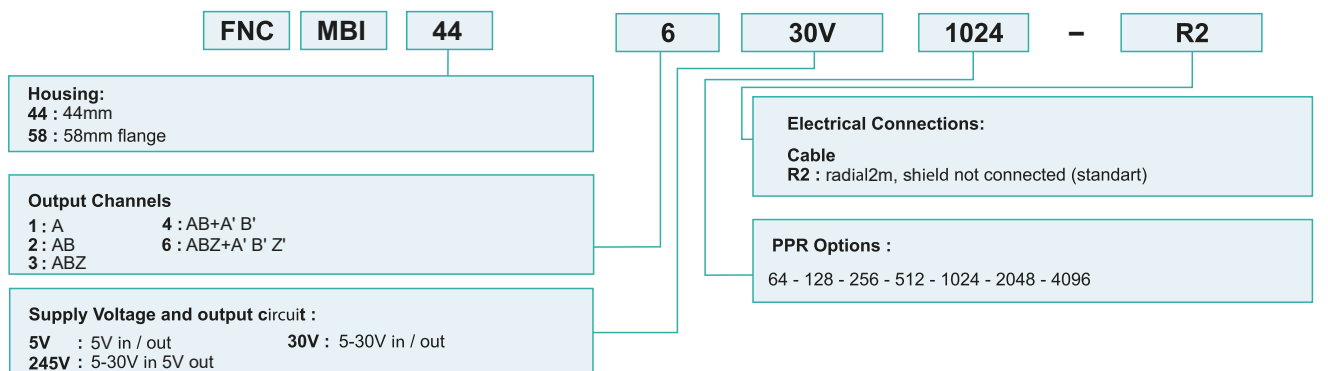


FNC MBI44 & MBI58 Series

Mechanical Dimensions



Encoder Part Number



Magnet Holder Part Number

MHB10 : Magnet Holder Big Version

MHM04 : Magnet Holder Medium Version

Linear & Bearingless encoders

Resolution 1...65536 pulses for Incremental Version
 Resolution 8 to 18 bit for Absolute Version
 SSI / BISS Interface



FNC MAR135 Series, Incremental & Absolute Axial



Features

- Off - Axis Incremental & Absolute rotary encoder
- Robust mechanical and electrical construction
- Corrosion resistant magnetic ring
- Outer diameter 135 mm
- Inner diameter 90 mm
- Up to 65.536 PPR max. for incremental rotary encoder
- Up to 18 bit for absolute rotary encoder
- <300 kHz frequency
- Magnetic system

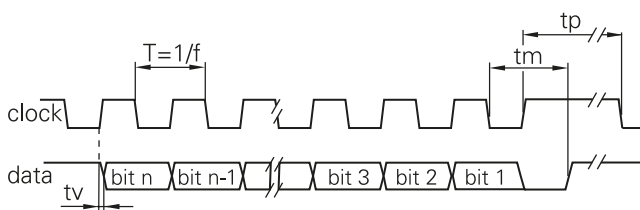
Technical data

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Output circuit	Linedriver/RS422 Push-pull short-circuit proof
Dimensions (ring)	ø135 mm
Protection DIN EN 60529	IP54, IP65
Operating speed	≤10000 rpm
Materials	Ring: Stainless Steel
Operating / Storage temperature	-20...+85 °C / -30 °C ... +90 °C
Weight approx.	350 g
EMC Standards	EN 61000-6-2 /EN 6100-6-4
Approval	CE

Cable Wiring

Incremental Version		Absolute Version	
Function	Color	Function	Color
+VB	Brown	+VB	Brown
GND	White	GND	White
A	Green	Clock+	Blue
A'	Red	Clock-	Blue-black
B	Yellow	Data+	Orange
B'	Pink	Data-	Orange-black
Z	Gray	Preset	Gray
Z'	Blue	shield	
U	Transparent		
V	Orange		
W	Black		
shield			

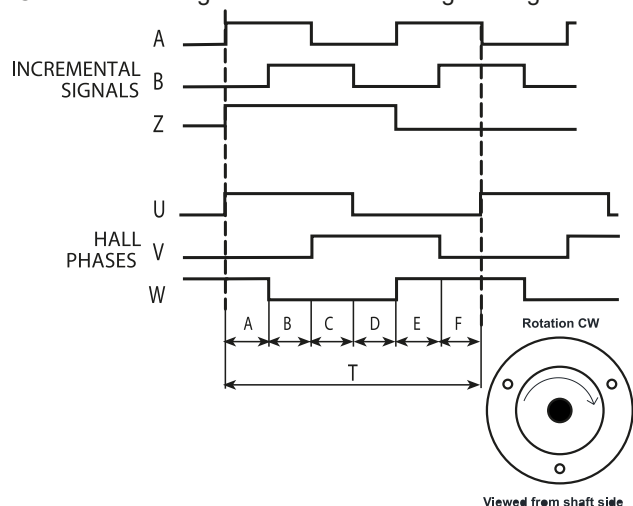
Pulse Diagram for Absolute Version



Clock frequency, f	50...2000 kHz for SSI up to 10MHz for BISS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	>15µs
Clock time out	Programmable at factory

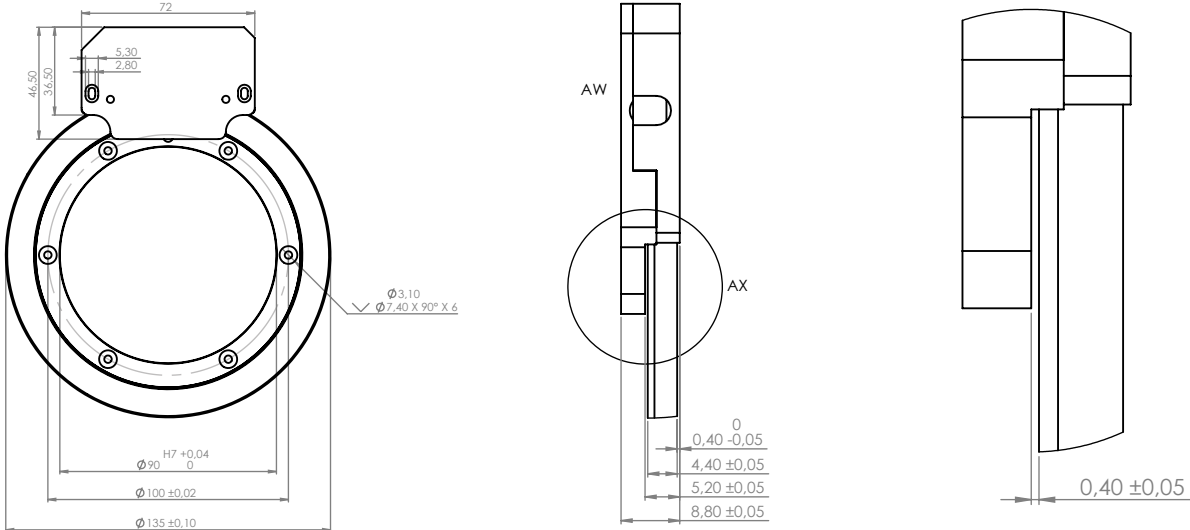
Pulse Diagram for Incremental Version

Clockwise rotating direction when looking at flange.



FNC MAR135 Series, Incremental & Absolute Axial

Mechanical Dimensions



Encoder Part Number for Absolute Version

FNCA P 135 90 S12 30V B - R2

P : PCB C : Cover	Electrical Connections: Cable R2 : radial 2m, shield not connected (standart)
Housing: 135 : 135 mm	B : Binary
Shaft Diameter : 90 mm others on request	Supply Voltage and output circuit : 5V : 5V in / out 245V : 5-30V in 5V out 30V : 5-30V in / out
S : single turn 8 ...18 bit	

Encoder Part Number for Incremental & Commutation Version

FNCI P 135 90 6 8P 30V 1024 - R2

P : PCB C : Cover	Electrical Connections: Cable R2 : radial 2m, shield not connected (standart)
Housing: 135 : 135 mm	PPR Options : 1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 - 6000 - 8192 - 10000 - 12500 - 20000 - 25000 ... 65536
Shaft Diameter : 90 mm others on request	Supply Voltage and output circuit : 5V : 5V in / out 245V : 5-30V in 5V out 30V : 5-30V in / out
Output Channels 1 : A 2 : AB 3 : ABZ 4 : AB+A' B' 6 : ABZ+A' B' Z'	Pole Pairs 2P : 2 poles 10P : 10 poles 4P : 4 poles 12P : 12 poles 6P : 6 poles 16P : 16 poles 8P : 8 poles Empty : without commutation, direct incremental

Draw Wire Sensors

- **Robustness**
- **Ergonomic Design**



Fenac Draw-Wire Sensor

Length up to 1000 mm



FNC W55 Series

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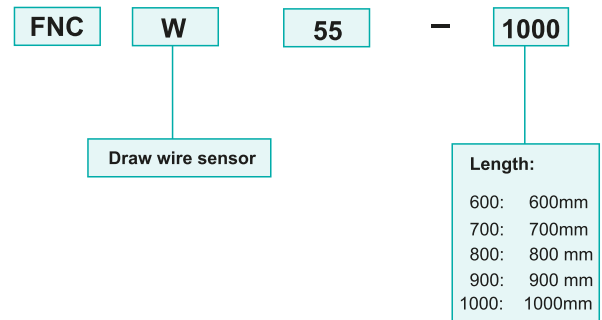
Features

- Measurement length up to 1000 mm
- Robust aluminium housing
- Very compact design
- Protection to IP54
- Wire-actuated ancoder for all rotary encoders with 58mm servo flange and different signal outputs
- Stainless steel wire
- Drum circumference is 125 mm
- Linearity is $\pm 0,35\%$

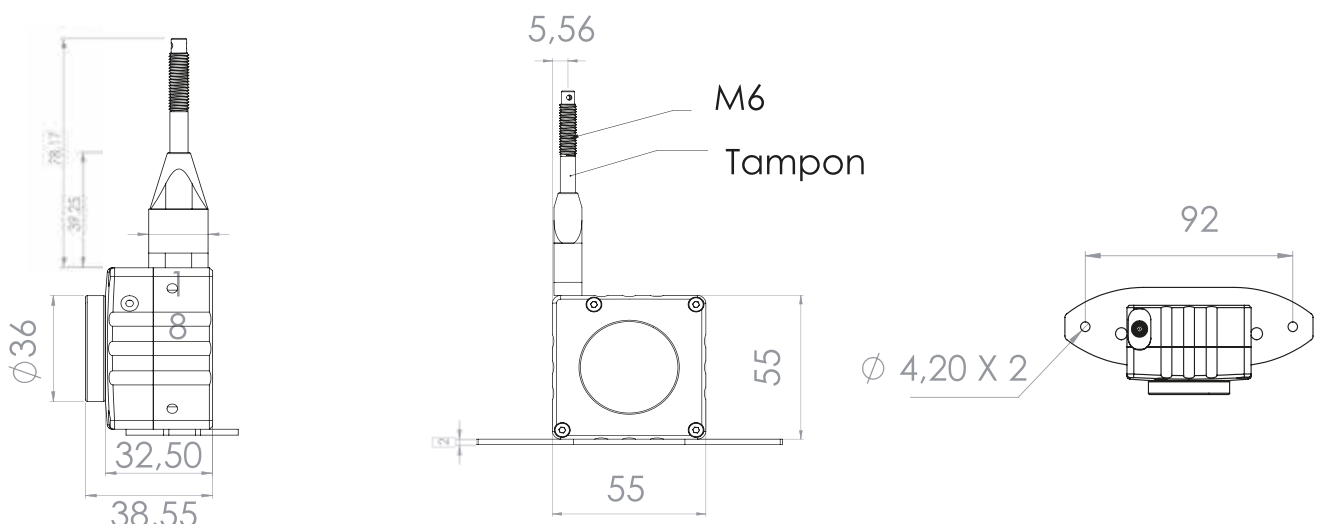
Technical data

Measuring range	0 - 1000mm
Resolution	customer specific
Sensor element	Incremental, analog, absolute, CANopen etc.
Temperature range	20 °C +80 °C
Material:	housing: aluminium
	draw-wire: 7x7 pvc coated 304 stainless steel (\varnothing 0.8mm)
Wire acceleration	approx. 5g
Wire retraction	approx. 1N
Wire extension	1,5N
Protection class	IP54
Max speed	2m/s

Part number



Mechanical dimensions



FNC W80 Series



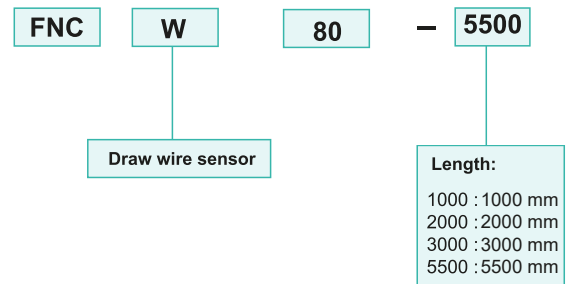
Features

- Measurement length up to 5500mm
- Robust aluminium housing
- Very compact design
- Protection to IP54
- Wire-actuated ancoder for all rotary encoders with 58mm servo flange and different signal outputs
- Stainless steel wire
- Drum circumference is 200 mm
- Linearity is $\sim \pm 0,35 \%$

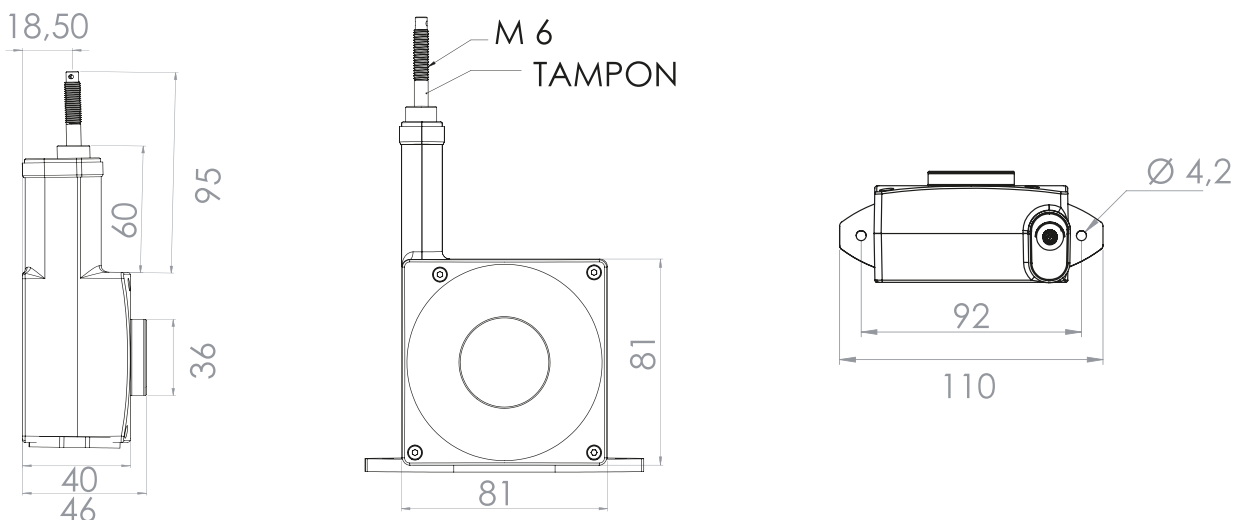
Technical data

Measuring range	0 - 5500mm
Resolution	customer specific
Sensor element	Incremental, analog, absolute, CANopen etc.
Temperature range	20 °C +80 °C
Material: housing:	aluminium
draw-wire:	7x7 pvc coated 304 stainless steel (Ø 0.8mm - 1 mm)
Wire acceleration	approx. 5g
Wire retraction	approx. 1N
Wire extension	1,5N
Protection class	IP54
Max speed	2m/s

Part number



Mechanical dimensions



Fenac Draw-Wire Sensor

Length up to 10000 mm



FNC W100 Series

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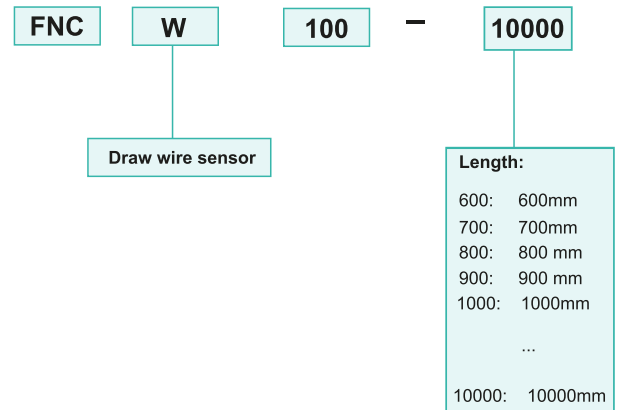
Features

- Measurement length up to 10000 mm
- Robust aluminium housing
- Very compact design
- Protection to IP54
- Wire-actuated ancoder for all rotary encoders with 58mm servo flange and different signal outputs
- Stainless steel wire
- Drum circumference is 250 mm
- Linearity is $\sim \pm 0,35\%$

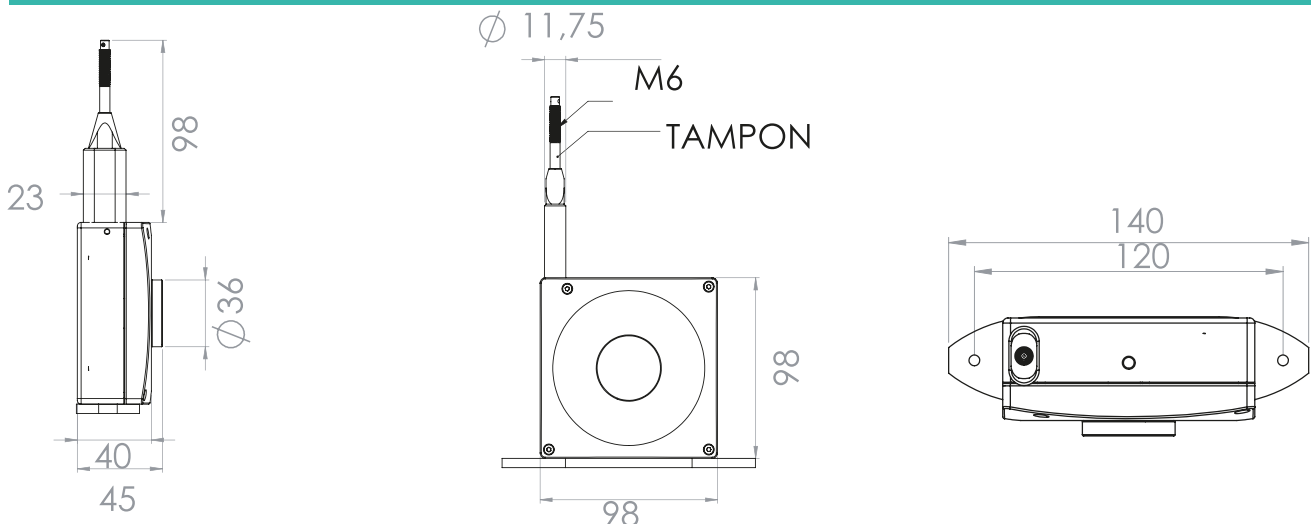
Technical data

Measuring range	0 - 10000mm
Resolution	customer specific
Sensor element	Incremental, analog, absolute, CANopen etc.
Temperature range	20 °C +80 °C
Material: housing:	aluminium
draw-wire:	7x7 pvc coated 304 stainless steel (\varnothing 1 mm)
Wire acceleration	approx. 5g
Wire retraction	approx. 1N
Wire extension	1,5N
Protection class	IP54
Max speed	2m/s

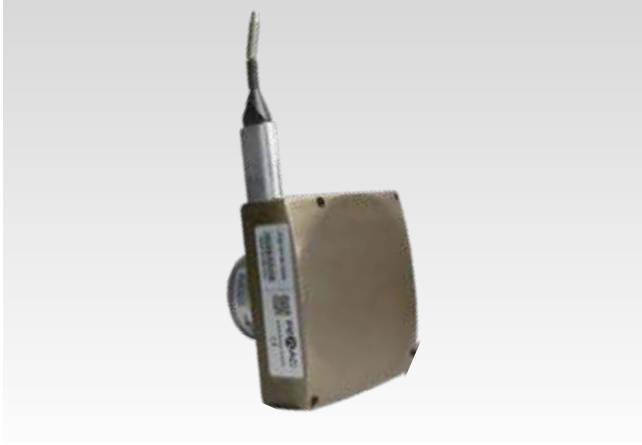
Part number



Mechanical dimensions



FNC W115 Series



Features

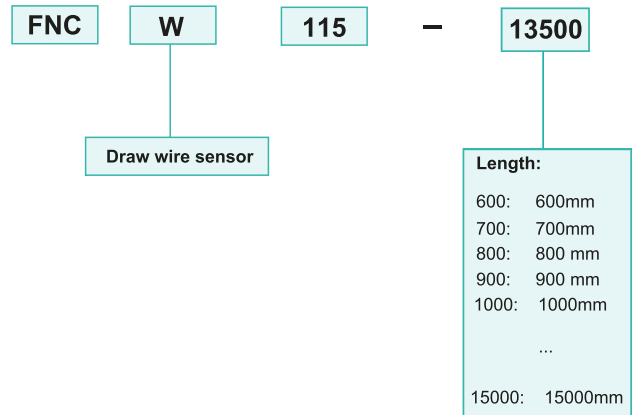
- Measurement length up to 15000 mm
- Robust aluminium housing
- Very compact design
- Protection to IP54
- Wire-actuated ancoder for all rotary encoders with 58mm servo flange and different signal outputs
- Stainless steel wire
- Drum circumference is 300 mm
- Linearity is $\sim \pm 0,35 \%$

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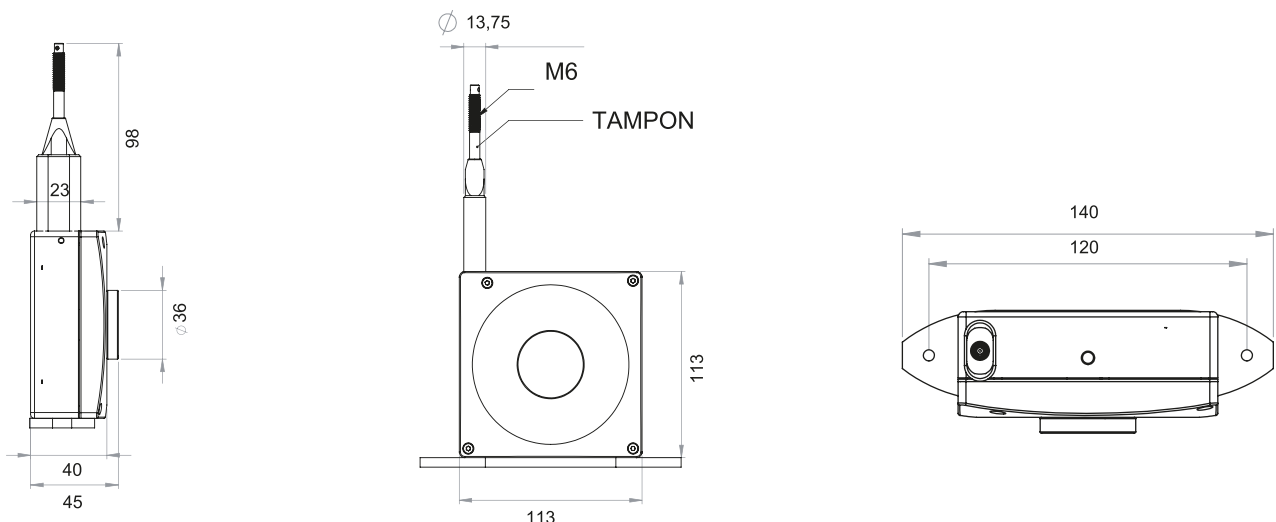
Technical data

Measuring range	0 - 15000mm
Resolution	customer specific
Sensor element	Incremental, analog, absolute, CANopen etc.
Temperature range	20 °C +80 °C
Material: housing:	aluminium
draw-wire:	7x7 pvc coated 304 stainless steel (Ø 1 mm)
Wire acceleration	approx. 5g
Wire retraction	approx. 1N
Wire extension	1,5N
Protection class	IP54
Max speed	2m/s

Part number



Mechanical dimensions



Fenac Draw-Wire Sensors

Length up to 20000 mm



FNC W120 Series

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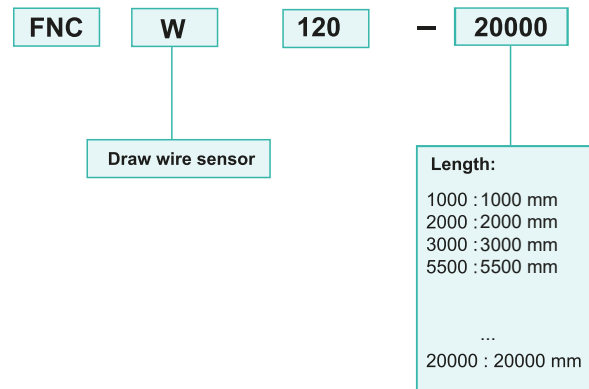
Features

- Measurement length up to 20000mm
- Robust aluminium housing
- Very compact design
- Protection to IP54
- Wire-actuated ancoder for all rotary encoders with 58mm servo flange and different signal outputs
- Stainless steel wire
- Drum circumference is 350 mm
- Linearity is $\sim \pm 0,35\%$

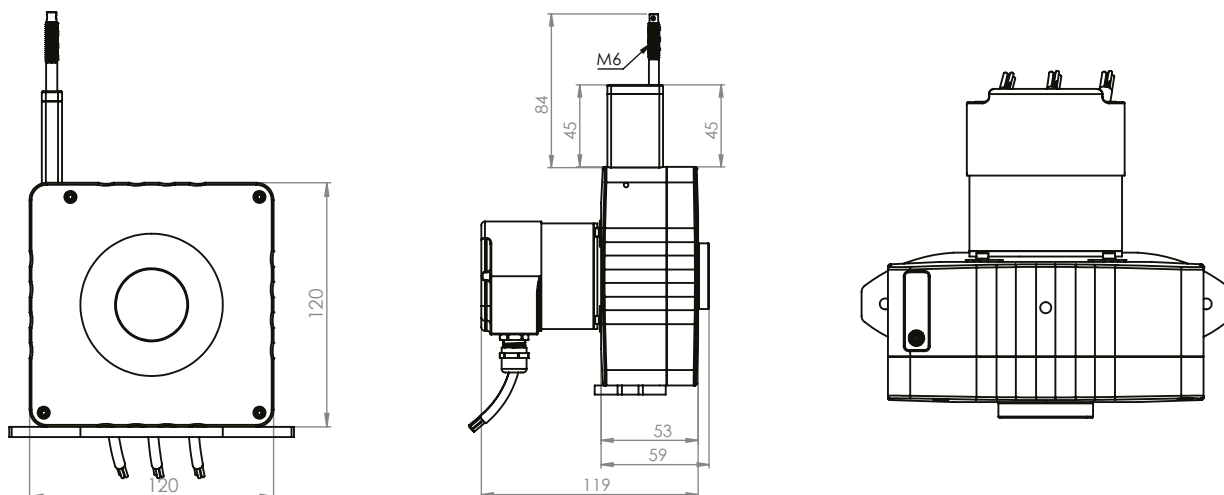
Technical data

Measuring range	0 - 20000
Resolution	customer specific
Sensor element	Incremental, analog, absolute, CANopen etc.
Temperature range	20 °C +80 °C
Material: housing:	aluminium
draw-wire:	7x7 pvc coated 304 stainless steel (\varnothing 0.8mm - 1 mm)
Wire acceleration	approx. 5g
Wire retraction	approx. 1N
Wire extension	1,5N
Protection class	IP54
Max speed	2m/s

Part number



Mechanical dimensions



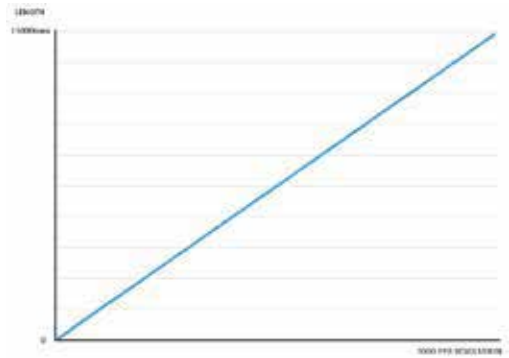
Wire Encoders Output Options

Mounting options

W110 + FNC 58S 6630V 1250 - R2



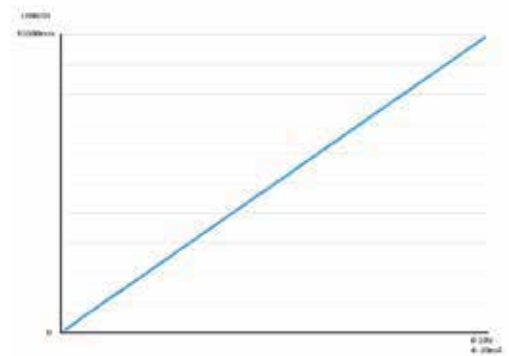
Wire length versus PPR



W115 + FNC PAA5 58S 6 M4 V1 30V - R2



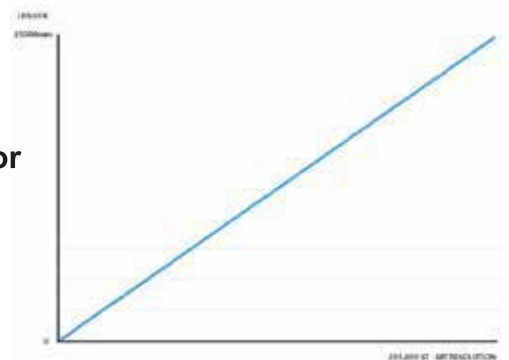
Wire length versus voltage or current



W115 + FNC AP 58S 6 S12M12 30V B BCC



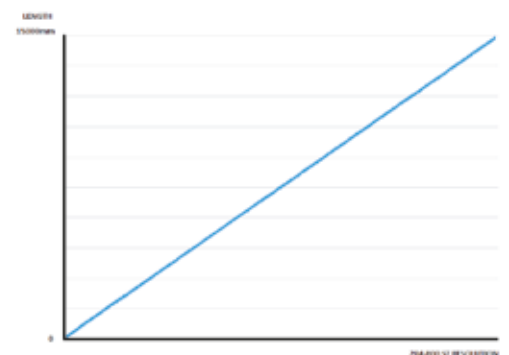
Wire length versus can or profibus position data



W115 + FNC AS 58S 6 S12 30V B -R2

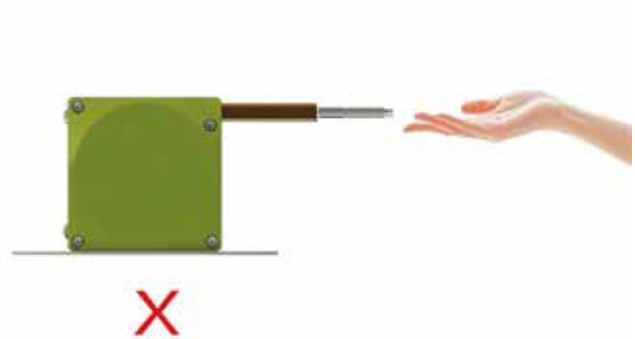
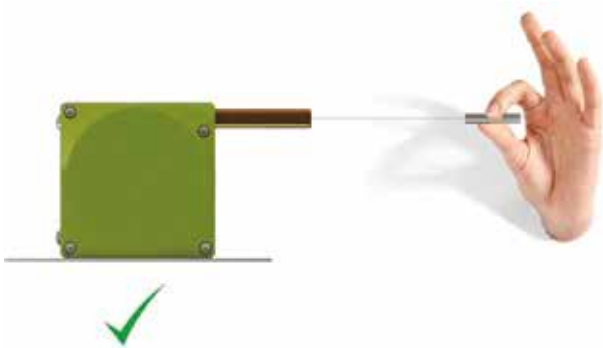


Wire length versus SSI position data

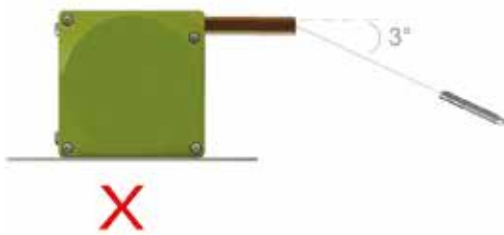


Wire Units User Manual

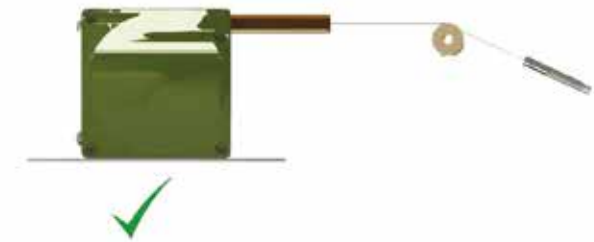
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Never allow the measurement cable to retract in an uncontrolled manner. Releasing a tensioned cable will break the device. Risk of injury!



An extension angle of up to 3° is possible but not recommended. The service life may be reduced.



Extending the cable in a straight line is ideal. This can be achieved with a guide pulley if necessary.



If there is no risk of ice forming on the measurement cable, then the cable outlet can be positioned horizontally. However, the cable outlet should be mounted at the bottom.

If there is a risk of ice forming on the measurement cable, a guide pulley must be used in order to break up the ice. The cable outlet must always face downward. This arrangement is always preferable wherever moisture or dust may accumulate on the measurement cable.



Textile Solutions

- **Fast Solution**
- **Fast Replacement**
- **Easy Maintenance**

Incremental encoders

Resolution 1...65.536 pulses



FNC 58S 81 Series

Direct replacement to
1XP8001-1 and 1XP8001-2

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Features

- Industry 58 mm standard size, servo flange
- Robust mechanical and electrical construction
- Protection to IP67
- Up to 65.536 PPR max.
- <300 kHz frequency
- Special shaft design

PPR Options :

1 to 128 - 25 - 50 - 100 - 200 - 250 - 300 - 360 - 400 - 500 - 512 - 600 - 720 - 800 - 900 - 1000 - 1024 - 1250 - 1440 - 2000 - 2048 - 2500 - 3000 - 3600 - 4000 - 4096 - 5000 - 6000 - 8192 - 10000 - 12500 - 16384 - 20000 - 25000

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...25.000
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤120 N axial ≤200 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	200 g

Accessories

Connectors and cables

CRM2312R M23 12 poles female connector or see page 206

Mounting coupling

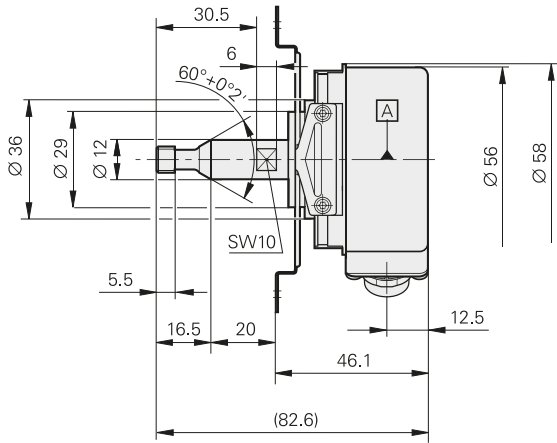
PF260808 plastic or see page 204

Mounting accessories

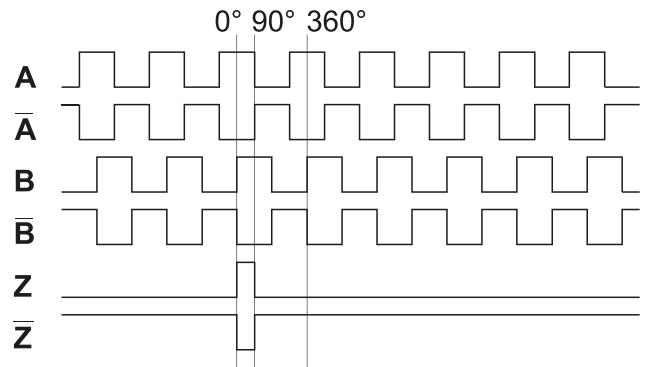
ASTK spring or see page 202-203

FNC 58S 81 Series

Mechanical Dimensions



Pulse Diagram



Encoder Part Number

FNC 58S81-1 / Up = 10 ... 30V

FNC 58S81-2 / Up = 5V ± 10%

Absolute encoders

Absolute Parallel + Incremental



Special Design for textile industry
Special design for Smit Sulzer machines

FNC 58B PAR

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Features

- Industry 58 mm standard size, clamping flange
- Robust mechanical and electrical construction
- Protection to IP67
- <1 MHz frequency
- Up to 10 bit parallel output
- Up to 65.536 PPR incremental output
- Optional strobe output for parallel output
- Optional direction change input

PPR Options :

1 to 65.536

Technical data - electrical ratings

Voltage supply	5VDC to 30VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤150 mA (24 VDC)
Resolution (steps/turn)	1...65.536
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	<1 MHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	Customer specific design
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	350 g

Accessories

Connectors and cables

CRM2312 M23 12 poles female connector or see page 206

Mounting coupling

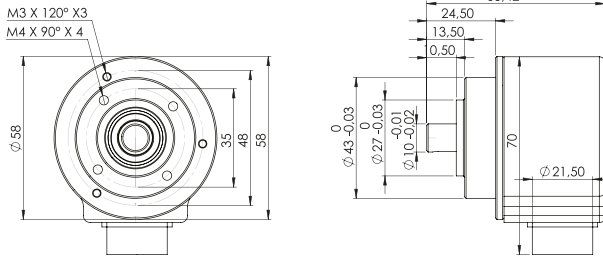
PF481010 plastic or see page 204

Mounting accessories

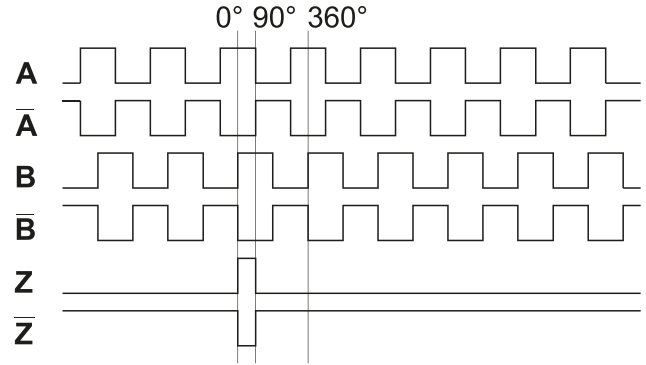
SF58B square flange or see page 202-203

FNC 58B PAR

Mechanical Dimensions



Pulse Diagram



Connector Wiring

Connector Type	+Vcc	GND	A	A'	B	B'	Z	Z'	Shield
CRM1204	1	2	3		4				o.r.
CRM1205	1	2	3		4		5		o.r.
CRM1208	1	2	3	6	4	7	5	8	o.r.
CRM1212	1	2	3	6	4	7	5	8	o.r.
CRM1607	1	2	3		4		5		o.r.
CRM1614	Customer Specific								o.r.
CRM2312R	2-12	10-11	5	6	8	1	3	4	o.r.
CRM2312L	2-12	10-11	5	6	8	1	3	4	o.r.

For further information please see page 206

Cable Wiring

Function	Color	Renk	Explanation
+VB	Brown	Kahve	Supply Voltage
GND	White	Beyaz	Ground
A	Green	Yeşil	A Channel
A'	Red	Kırmızı	A Inverted Channel
B	Yellow	Sarı	B Channel
B'	Pink	Pembe	B Inverted Channel
Z	Gray	Gri	Z Channel
Z'	Blue	Mavi	Z Inverted Channel
Shield	Black	Siyah	Shield

Encoder Part Number

FNC 58B - PAR

Incremental encoders

Special design encoders



FNC 58E 100 BHF Series

Special Design for textile industry Special Design for Reiter machines

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Features

- Industry 58 mm standard size, end hollow shaft
- Robust mechanical and electrical construction
- Protection to IP67
- 100 or 200 PPR options
- <300 kHz frequency

PPR Options :

100 PPR
200 PPR

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...25.000
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12, 14, 15, 16 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	250 g

Accessories

Connectors and cables

CRM1607 M16 7 poles female connector or see page 206

Mounting coupling

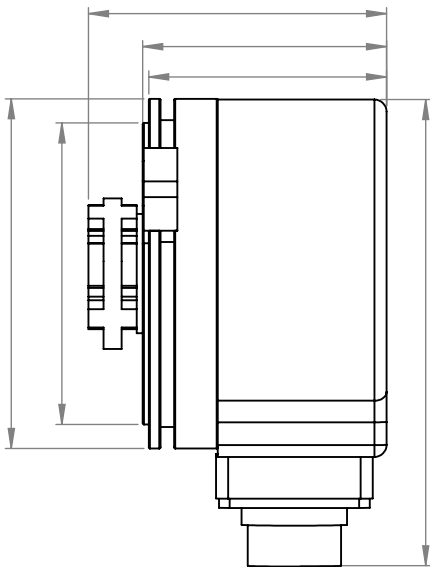
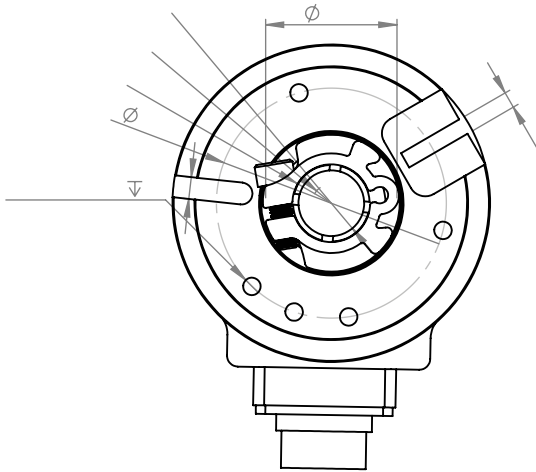
See page 204

Mounting accessories

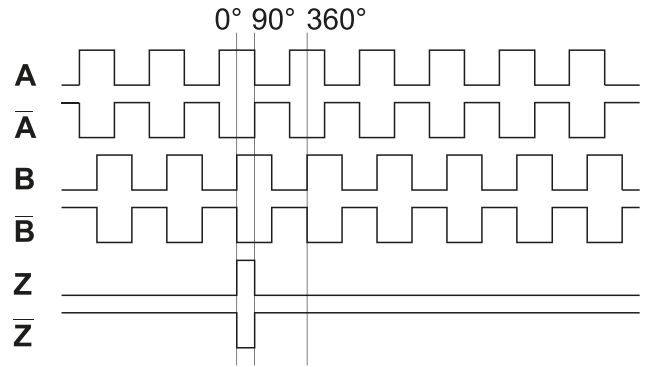
NGL spring or see page 202-203

FNC 58E 100 BHF Series

Mechanical Dimensions



Pulse Diagram



Encoder Part Number

Option 1

FNC 58 E 100 BHF

Option 2

FNC 58 E 200 BHF

Incremental encoders

Special design encoders



FNC TR Series

Special Design for textile industry Special Design for Reiter machines

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Features

- Industry 58 mm standard size, end hollow shaft
- Robust mechanical and electrical construction
- Protection to IP67
- 100 or 200 PPR options
- <300 kHz frequency

PPR Options :

1024 PPR, 2048 PPR, 4096 PPR

Technical data - electrical ratings

Voltage supply	4.75VDC to 30VDC 4.75VDC to 5.5VDC
Protection:	Output short circuit protection. Reverse polarity protection (except 5V version)
Consumption w/o load	≤60 mA (24 VDC)
Resolution (steps/turn)	1...25.000
Reference signal	Zero pulse, width 90° 180°, 360° optional
Optoelectronic life time	100.000 (min)
Output frequency	>200 kHz
Output signals	90° shifted A and B, Z + inverted
Output circuit	Linedriver/RS422 Push-pull short-circuit proof
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	CE

Technical data - mechanical design

Dimensions (flange)	ø58 mm
Shaft loading	≤140 N axial ≤240 N radial
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm
Starting torque	≤0.025 Nm (IP 67)
Materials	Housing: Aluminium Flange: Aluminium Shaft : Stainless steel
Shaft diameter:	6, 8, 10, 12, 14, 15, 16 mm (other diameters on request)
Bearings lifetime:	2x10 ⁹ rev. at 100% of full rated shaft load (minimum)
Operating temperature	-20...+85 °C
Storage temperature	-30 °C up to +90 °C
Weight approx.	370 g

Accessories

Connectors and cables

CRM1607 M16 7 poles female connector or see page 206

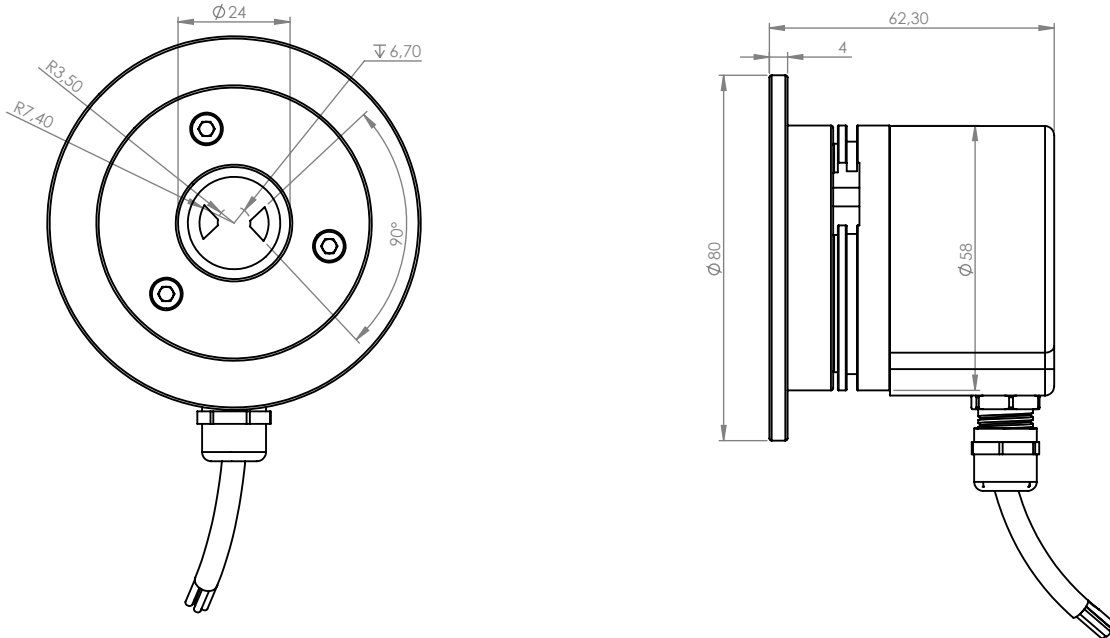
Mounting coupling

See page 204

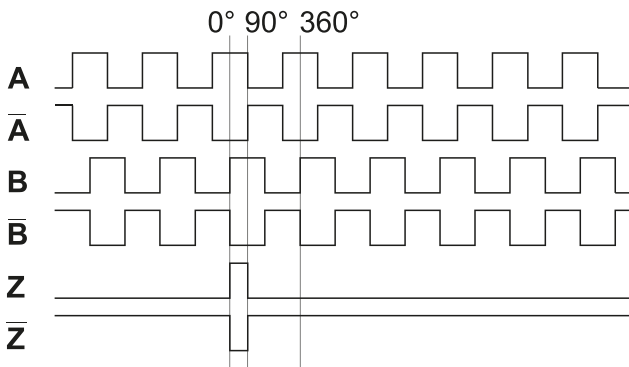
Mounting accessories

See page 202-203

Mechanical Dimensions



Pulse Diagram



Encoder Part Number

Option 1

FNC

TR245V

1024

Option 2

FNC

TR245V

2048

Option 3

FNC

TR245V

4096

Rotary Potentiometers

- **Simple**
- **Accurate**
- **Trusty**



FNC FRPS 30 Series

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Features

- Hollow shaft
- Better than 0.1° resolution
- Linearity up to $\pm 0.25\%$
- Long lifetime
- Robust

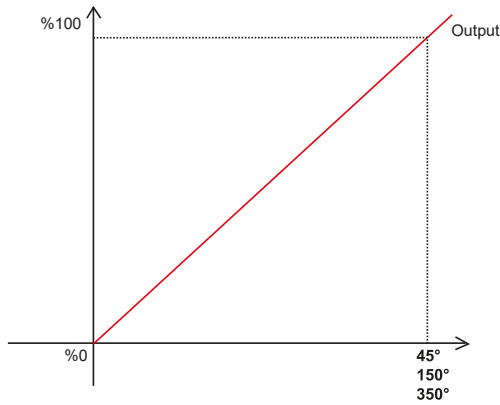
Technical data - electrical ratings

Total Resistance	5 or 10 k Ω
Interface	Analog output
Resistance tolerance	$\pm 20\%$
Linearity	up to $\pm 0.25\%$
Electrical travel range	45, 150, 350

Technical data - mechanical design

Dimensions	$\varnothing 31\text{mm}$ Thickness: 18 mm
Materials	Housing : Aluminium Shaft :Aluminium
Shaft diameter:	6 mm

Output Functions



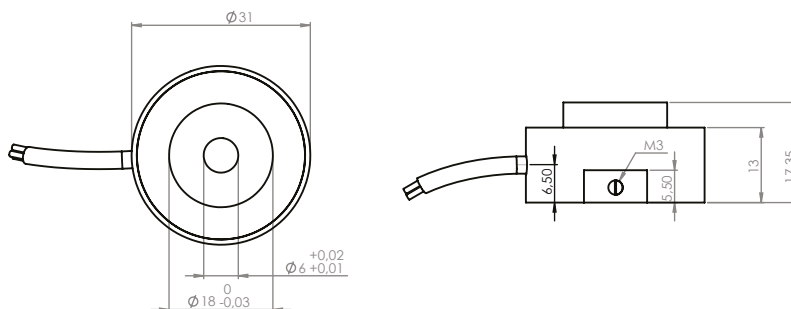
Cable Wiring / Connector

Function	Color	Renk
+VB	Red	Kırmızı
GND	Black	Siyah
Out	Yellow	Sarı

Part Number

FRPS	30	05	K5	M	150
Outer Diameter					Electrical Angle 45: 45° 150: 150° 350: 350°
Inner Diameter : 4, 5, 6, 8					
Resistance K1: 1 k Ω K5: 5 k Ω K10: 10 k Ω					M: Metal Housing P: Plastic Housing

Mechanical Dimensions



FNC FRPK Series



Features

- Hollow shaft
- Better than 0.1° resolution
- Linearity up to $\pm 0.25\%$
- Long lifetime
- Robust
- With 2 mounting holes ar diameter D: 38 mm

191

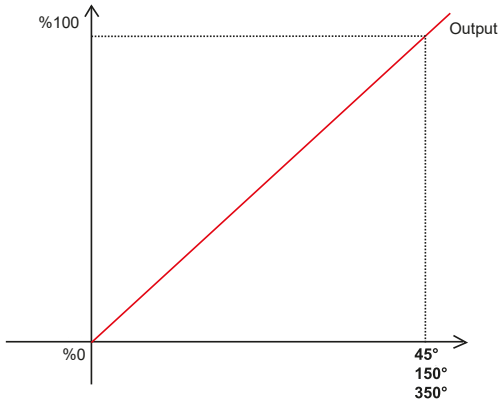
Technical data - electrical ratings

Total Resistance	5 or 10 k Ω
Interface	Analog output
Resistance tolerance	$\pm 20\%$
Linearity	up to $\pm 0.25\%$
Electrical travel range	45, 150, 350

Technical data - mechanical design

Dimensions	$\varnothing 31\text{mm}$ Thickness: 18 mm
Materials	Housing : Aluminium Shaft :Aluminium
Shaft diameter:	6 mm

Output Functions



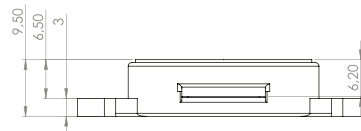
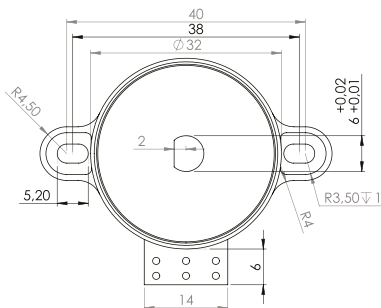
Cable Wiring / Connector

Function	Color	Renk
+VB	Red	Kırmızı
GND	Black	Siyah
Out	Yellow	Sarı

Part Number

FRPK	30	05	K5	P	150
Outer Diameter		Resistance		Electrical Angle	
Inner Diameter : 4, 5, 6, 8		K1: 1 k Ω K5: 5 k Ω K10: 10 k Ω		45: 45° 150: 150° 350: 350°	
				M: Metal Housing P: Plastic Housing	

Mechanical Dimensions



FNC MTP Series

192



Features

- Non contact magnetic sensing
- Resolution: 12 bit
- Robust redundancy option
- Highly resistance to fluid / dust ingress

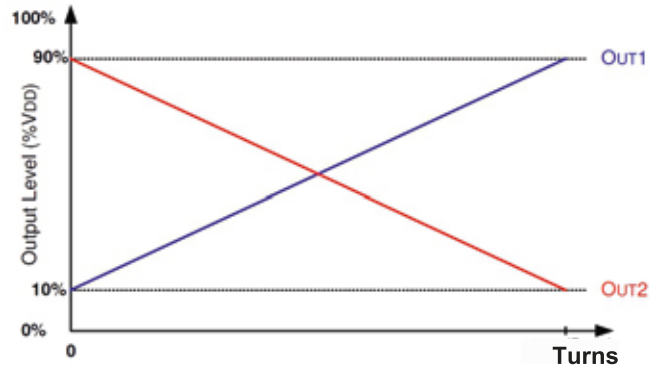
Technical data - mechanical design

Protection	IP 69K
Operating speed	≤180 rpm (Speed can be increase after inital development test)
Materials	Housing : Delrin Shaft :Stainless steel
Shaft diameter:	6 mm
Operating temperature	-40 to +125 °C
Weight approx.	20 g ± %5

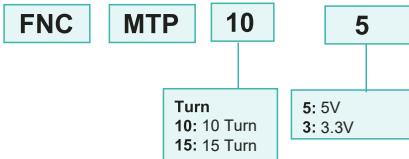
Technical data - electrical ratings

Voltage supply	5V ± %10 DC 3.3V ± % 10 DC
Protection:	Reverse & over voltage Output short circuit
Consumption w/o load	≤15 mA ≤30 mA for redundancy
Interface	Ratiometric analog output
Resolution (steps/turn)	12 bit
Linearity	≤ ±%1
Sensor life time	≥ 50.000.000 cycles
Approval	CE

Output Functions

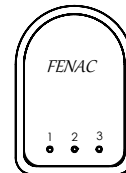


Part Number

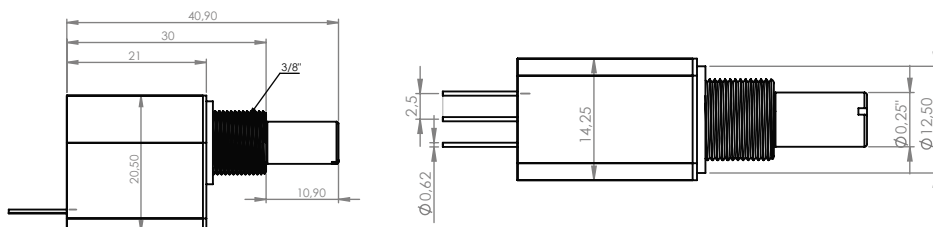


Cable Wiring / Connector

Function	Pin
+VB	3
GND	1
Out	2



Mechanical Dimensions



Door detectors

- Sensitive
- Reliable



FNC DD 36 Series

194



Features

- Extremely dense protective field
- Wide operation range
- Robust and reliable
- Simple Mounting
- Virtually no alignment necessary
- Wide power supply range

Technical data - Door Detector

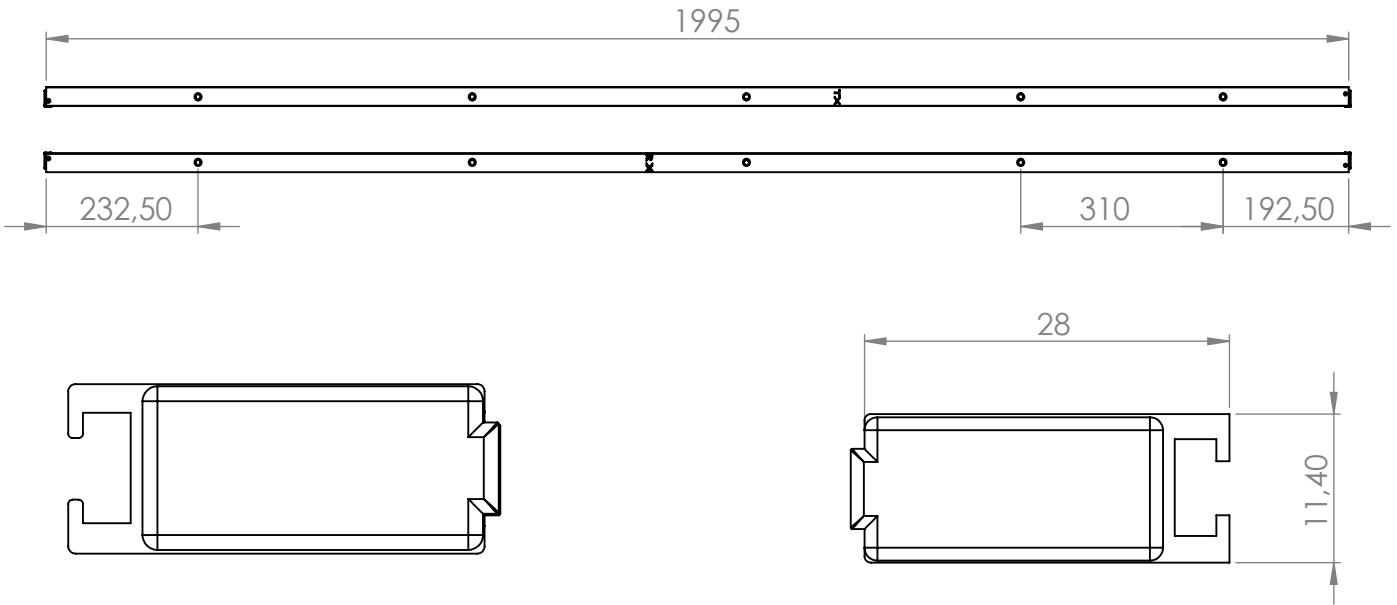
Dimensions	12 x 30 x 2000 mm
Detection range	0 – 4000 mm
Number of beams	172 Non-Parallel
Number of diodes	36
Detection height	1600 mm
Response time	300 ms
Power consumption	< 4W
Output	Relay, 1NO - 1NC
Power supply	220 VAC
Operating temperature	-20...+65° C
Storage temperature	-20...+85° C
Power indicator	Red LED
Status indicator	LED in receiver Green on : working normal Red on : Fault
Light immunity	<100.000 Lux
Tolerance	Vertical : ± 15 mm (7°) Horizontal : ± 3 mm (5°)
Cables length (TX&RX)	4200 mm
Protection degree	IP54

Technical data - Power Unit

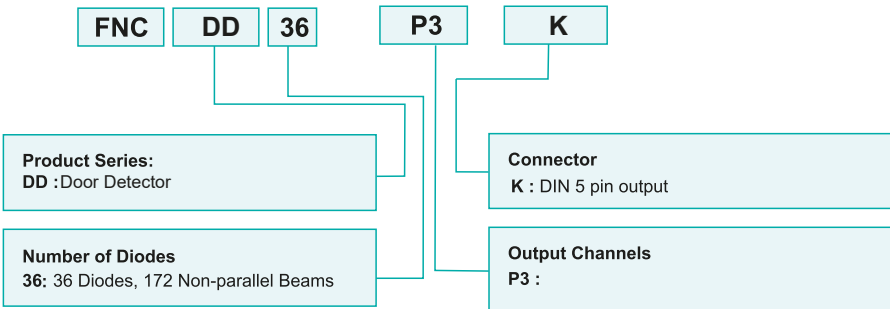
Dimensions	30 x 57 x 133 mm
Operating voltage	85–230 VAC ±% 15 60 Hz 24 VDC ± %15
Housing material	IP54, IP65
Contact ratings	3A - 120 VAC 1A - 250 VAC 24 VDC
Switching current	max. 5A
Operating temperature	-20...+65° C
Storage temperature	-20...+85° C
Protection level	IP31
Isolation	> 2000V
Relay life expectancy	operation 100.000

FNC DD 36 Series

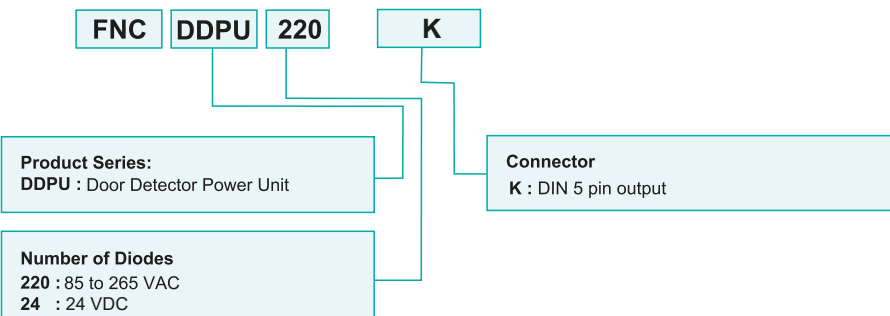
Mechanical Dimensions



Door Detector Part Number



Power Unit Part Number

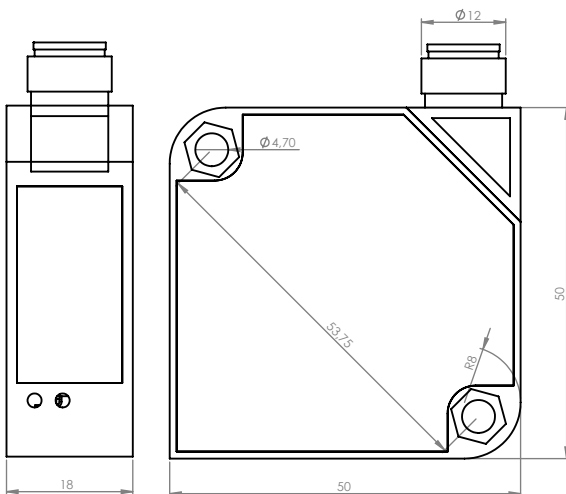


FNC Diffuse Sensor

196



Mechanical Dimensions



Part Number

FNC DS 20 D 200 R 1

- Housing:**
20 : 20mm
- Sensor Type:**
D Dif
R Reflective Sensor
T
- Sensing Distance :** 80, 100, 200, 500 cm
Other dimensions on request
- Output Types :**
R : Relay
N : NPN output
P : output
- Electrical Connections:**
Cable
1 : PVC 5 x 0.25 Cable
Connector:
2 : M12 5 pin male connector

Features

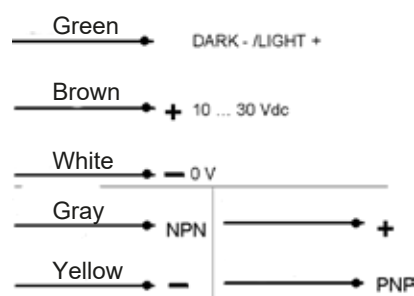
- The operating distance can be set to the optimal value
- Configurable dark or light mode
- PNP/NPN open collector or relay output
- Compact design

Technical data - mechanical design

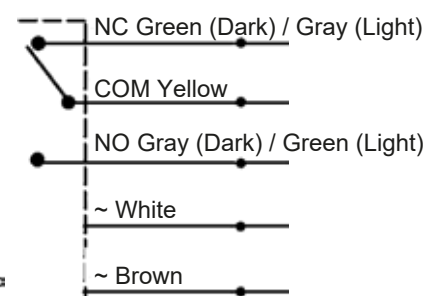
Voltage Supply	10VDC to 30VDC (dc vers.) 30VAC to 260VAC (ac vers.)
Consumption w/o load	≤30 mA VDC (dc vers.) ≤40 mA VAC (ac vers.)
Light emission	infrared LED 940 nm
Diffuse proximity operating distance	5 - 200 cm
Settings	Red LED (output LED)
Output type	relay 250V / 3A (ac vers.) PNP / NPN open Collector
Response time	30 ms max.
Operating mode	darklight configurable
Connection	Cable length : 2m 5 x 0,22
Dimensions	50 x 50 x 18 mm
Protection DIN EN 60529	IP65
Materials	Housing : ABS Lens : PMMA plastics
Operating temperature	-25...+65 °C
Storage temperature	-25 °C up to +70 °C
Weight approx.	160 g with cable

Cable Wiring

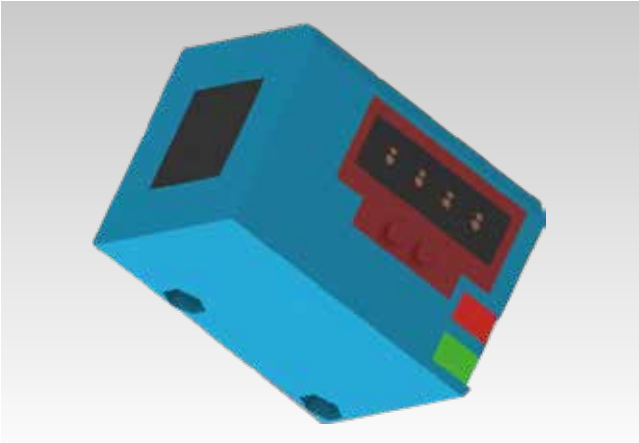
DC Version



AC Version



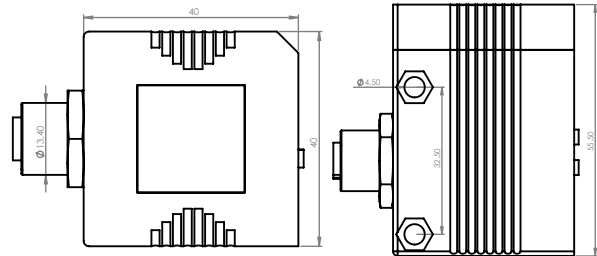
FNC Laser Distance Sensor



Features

- Reliable optical distance measurement with long range up to 10 meters
- Operation up to 200 klux ambient light immunity measurement
- High accuracy (%1)
- Scalable measuring range and window function
- Two switching outputs, one of them is programmable
- Easy integration
- High repeatability

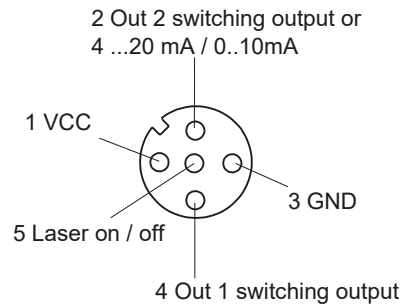
Mechanical Dimensions



Technical data - electrical ratings

Voltage Supply	18VDC to 30VDC
Consumption w/o load	≤200 mA VDC
Light emission	650 nm visible red
Ambient light immunity	200 klux
Measuring range	10 mm - 10 meter
Sample rates	1 ... 50 Hz
Measuring accuracy	%1
Digital output	1 or 2 PNP / NPN / Push pull
Analog current output	4 ... 20 mA
Analog voltage output	0 ... 10V
Display	Switching status : LED Yellow Power : LED Green Distance & prog. : 4-digit
Connector	1xM12

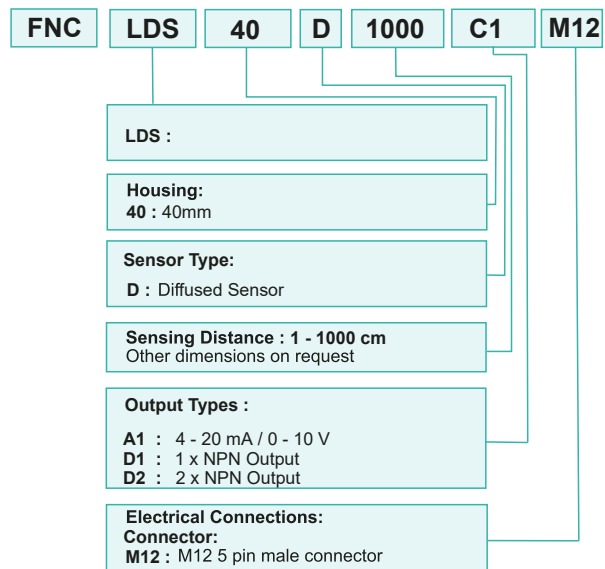
Cable Wiring



Technical data - mechanical design

Dimensions	59 x 42 x 52
Housing	rectangular
Protection DIN EN 60529	IP65
Materials	Housing : aluminium Lens : glass Window : Gorilla glass
Operating temperature	-10...+55 °C
Storage temperature	-25 °C up to +70 °C
Weight approx.	300 g

Part Number





Hand encoders

- **Manuel**
- **Easy**



Hand encoders

Lengths up to 15 meters

200

FNC EL and ELT hand encoders

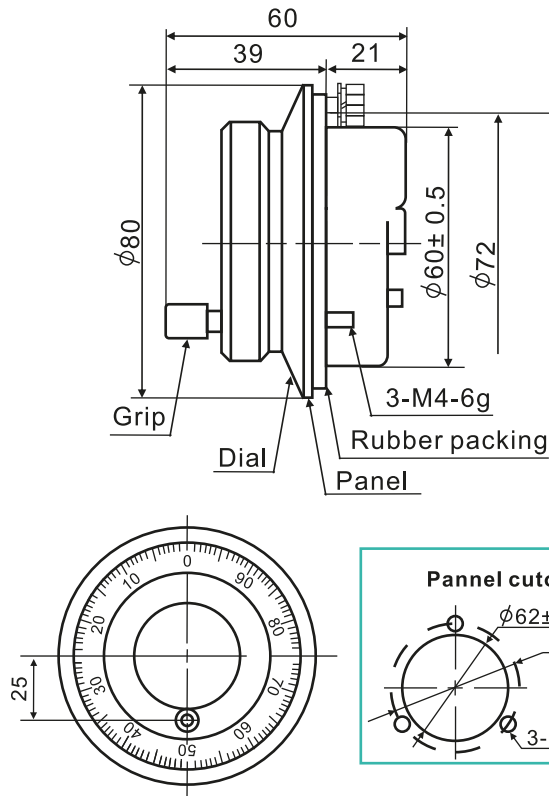


FNC EL 100

Features

- Manuel puls encoder
- 60mm, 80mm diameter housing
- 100PPR option
- Voltage output or LD output
- Operating temperature : -10...+80 °C
- Weight : 250 g
- Normal rotational speed : max 200 r / min
- Current consumption : max 60mA
- Frequency response : 5kHz

Dimensions

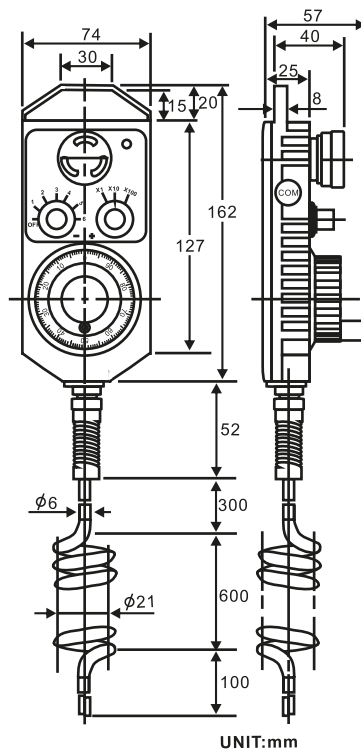


FNC ELT 100

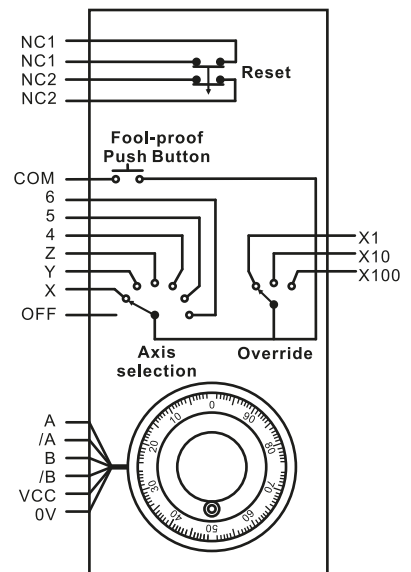
Features

- Hand held manuel puls encoder
- Axis select switch
- Rate override switch
- Reset switch
- 100PPR option
- Voltage output or LD output
- Operating temperature : -10...+80 °C
- Weight : 450 g
- Normal rotational speed : max 200 r / min
- Current consumption : max 60mA
- Frequency response : 5kHz

Dimensions



Connection



Accessories

- **Comfort**
- **Flexibility**



Torque supports

202

Encoder mounting attachments Fixing components for hollow shaft encoders

Order Code : YY UV

Encoder mounting attachments Fixing components for hollow shaft encoders

Order Code : YY ASTK

Order Code : YY AKR3

Order Code : YY SS

Order Code : YY AKS

Order Code : YY KKBL

Order Code : YY RST

Order Code : YY KLM

Order Code : YY SCR

Order Code : YY MNT

Torque supports

Encoder mounting attachments Fixing components for hollow shaft encoders

Order Code : YY NGL20

Encoder mounting attachments Fixing components for hollow shaft encoders

Order Code : YY SC42

Order Code : YY NGL

Order Code : YY SC8

Order Code : YY SCRH

Order Code : YY DB

Order Code : YY SC38

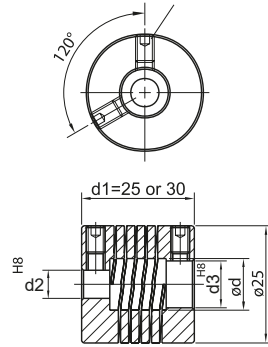
Order Code : YY SCBLZ

Order Code : YY SC34

Order Code : YY TEO

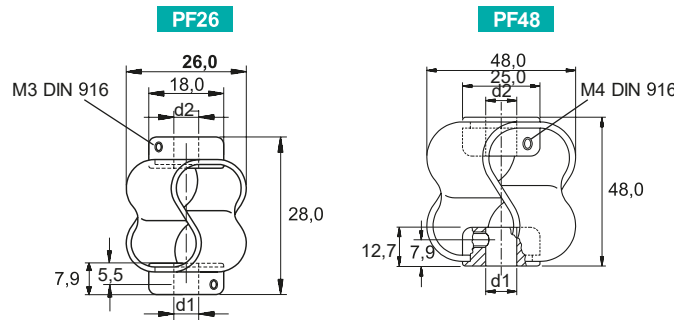
Coupling view **Drawing** **Order Code**

METAL COUPLINGS



d2= 6, d3= 6	MK250606
d2= 6, d3= 8	MK250608
d2= 6, d3=10	MK250610
d2= 8, d3= 8	MK250808
d2=10, d3=10	MK301010
d2=11, d3=11	MK301111
d2=12, d3=12	MK301212
d2=10, d3=12	MK301012

PAGUFLEX COUPLINGS



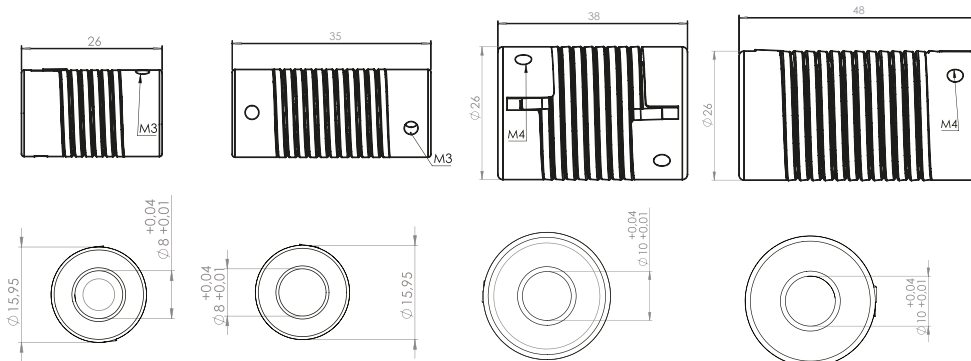
PF26, d1= 6, d2= 6	PF260606
PF26, d1= 8, d2= 8	PF260808
PF48, d1= 10, d2= 10	PF481010
PF48, d1= 10, d2= 12	PF481012

SPRING FLEX COUPLINGS

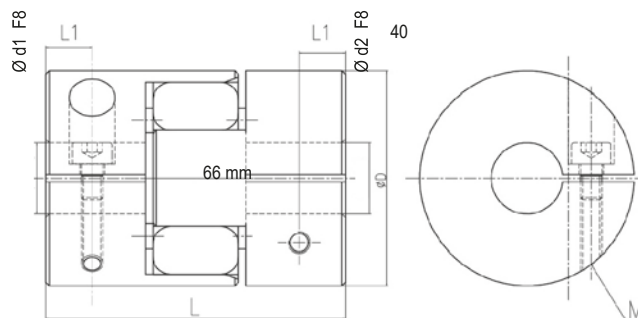
SPF L D d1d2



L=26 D=16 d1= 6, d2=6	SPF26160606
L=26 D=16 d1= 8, d2=8	SPF26160808
L=35 D=16 d1= 6, d2=6	SPF35160606
L=35 D=16 d1= 8, d2=8	SPF35160808
L=38 D=26 d1= 8, d2=8	SPF38260808
L=38 D=26 d1= 10, d2=10	SPF38261010
L=48 D=26 d1= 10, d2=10	SPF48261010



ROTEX COUPLINGS



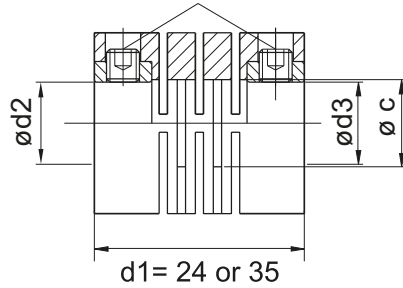
RTX66 d1= 14, d2= 14	RTX661414
RTX66 d1= 16, d2= 16	RTX661616
RTX66 d1= 18, d2= 18	RTX661818

Coupling view **Drawing** **Order Code**

PLASTIC COUPLINGS



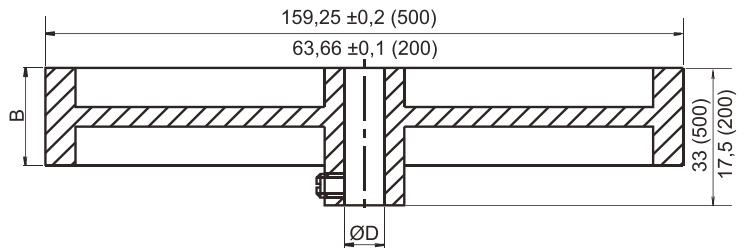
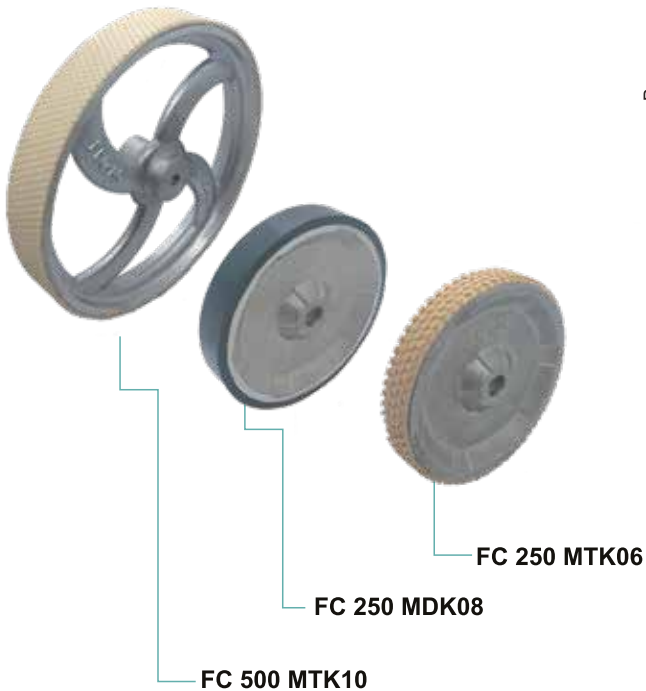
Set-screws M4x4 DIN916



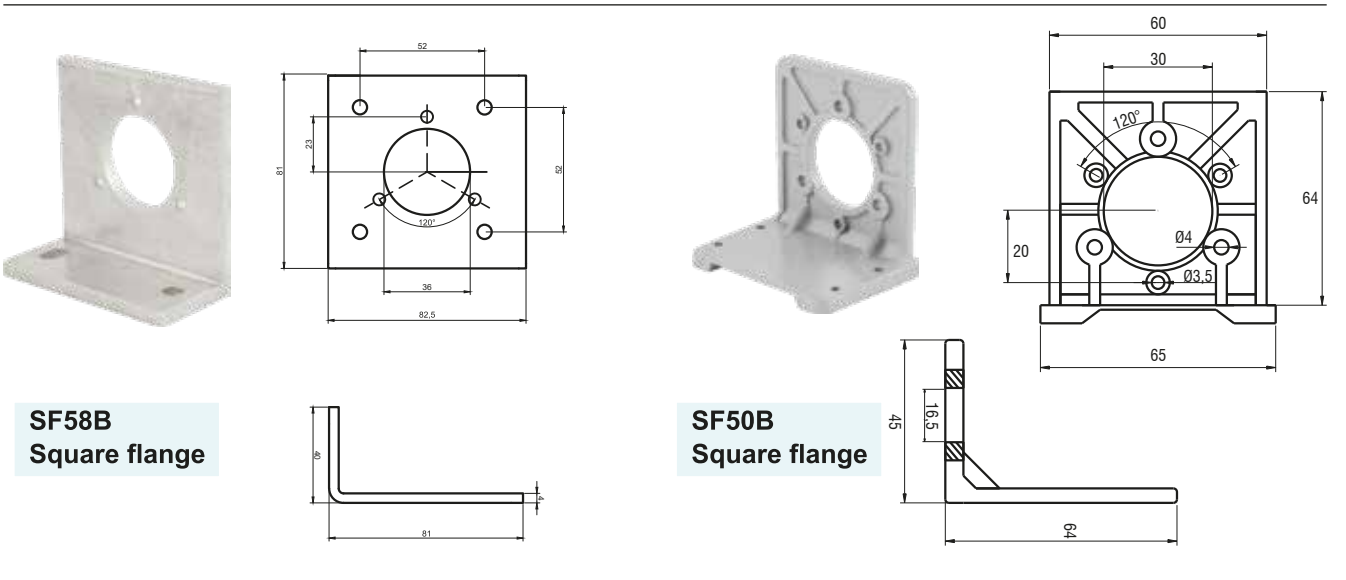
d2= 6, d3= 6	SK240606
d2= 8, d3= 8	SK240808
d2=10, d3=10	SK351010

Wheel view

Drawing



FC	500	M	T	K	08
Wheel Circumference 200: 200 mm 250: 250 mm 300: 300 mm 500: 500 mm			Shaft Diameter 06: 6 mm 08: 8 mm 10: 10 mm		
Body Type M: Metal Body P: Plastic Body			Surface Material K: Rubber Surface M: Metal Surface		
Surface Type D: Flat Surface T: Serrated Surface					



SF58B
Square flange

SF50B
Square flange

Accessories

M12,16, Female Sensor Connectors

Ready-made shielded female cable connector for M12, M16 sensor connectors

Male Code	R 1204 / A 1204	R 1205 / A 1205	R 1208 / A 1208	R 1605 / A 1605
Male Photo				
Pin Connections				
Female Cable Code	FCSF M1204	FCSF M1205	FCSF M1208	FCSF M1605
Cable Female Photo				
Cable Male Code	FCSM M1204	FCSM M1205	FCSM M1208	FCSM M1605
Cable Male Photo				

Male Code	R 1606 / A 1606	R 1607 / A 1607	R 1608 / A 1608	R 1614 / A 1614
Male Photo				
Pin Connections				
Female Cable Code	FCSF M1606	FCSF M1607	FCSF M1608	FCSF M1614
Cable Female Photo				
Cable Male Code	FCSM M1606	FCSM M1607	FCSM M1608	FCSM M1614
Cable Male Photo				

M23, 30 Female Sensor Connectors

Ready-made shielded female cable connector for M23, M30 sensor connectors

Male Code	R 2312R / A 2312R	R 2312L / A 2312L	R 2019 / A 2019	R 2507 / A 2507
Male Photo				
Pin Connections			On Request	O. R.
Female Cable Code	FCSF M2312L	FCSF M2312R	FCSF M2019	FCSF M2507
Cable Female Photo				
Cable Male Code	FCSM M2312L	FCSM M2312R	FCSM M2019	FCSM M2507
Cable Male Photo				

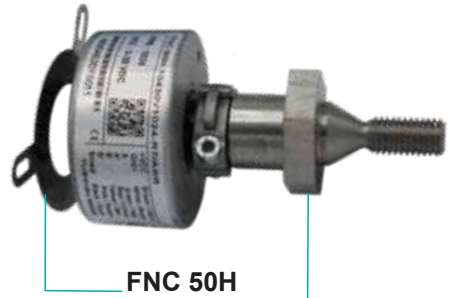
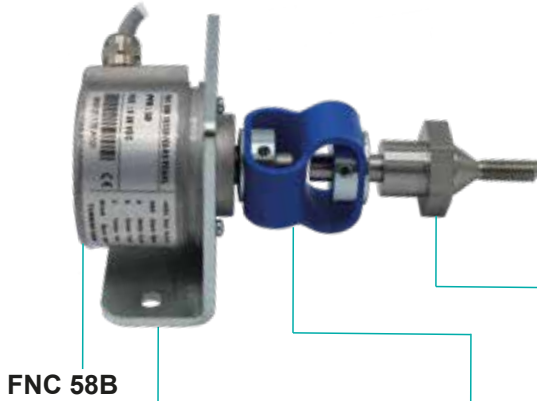
Male Code	R 3007 / A 3007	R 3010 / A 3010	R 3017 / A 3017	MDS9
Male Photo				
Pin Connections	O. R.	O. R.	O. R.	
Female Cable Code	FCSF M3007	FCSF M3010	FCSF M3017	FCSF DS9
Cable Female Photo				
Cable Male Code	FCSM M3007	FCSM M3010	FCSM M3017	
Cable Male Photo				

Installation kit for FNC 50H & FNC 58B Series Encoder

FNC 58B MK10M08

FNC 50H MK10M08

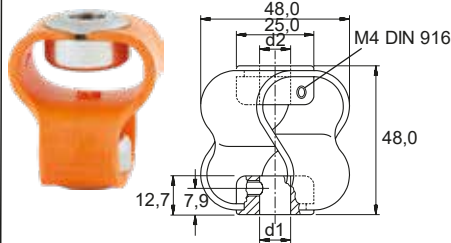
208



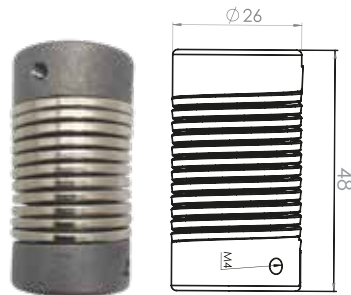
SQUARE FLANGE 58B



PAGUFLEX COUPLINGS



SPRING FLEX COUPLINGS



SA10M08L20



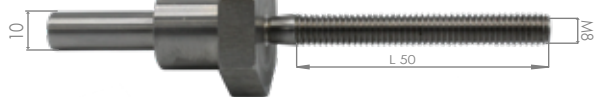
SA10M10L20



SA10M12L20



SA10M08L50



Kit Part Number

FNC

58

B

MK

10

M10



Technical

- **Optics**
- **Electronics**
- **Mechanics**



Optical Principle

FENAC Optical Incremental Encoders are based on non-contact optical scanning. A parallel IR light beam is produced from a collimated light source which is formed by an IR Led and a collimator lens. The light is passing from a mask and a code disc to reach an optical detector. When the disc rotates, optically dark and light regions appear on optical detector's active areas. So rotation is transformed to an electrical information which is based whether light is passing from a code disc or interrupted by a code disc. So two signals that has a 90° phase shift is produced as well as a zero reference signal. Optical detector is a photo-diode array, working differentially to eliminate common mode noise effects. Then highprecision signals are amplified for industrial use. Outputs are either Push-Pull or Line Driver square waves and their inverter signals.

FENAC Incremental Encoders consists of precision optical assembly, robust mechanics and high-performance electronics to achieve low noise precision output signals.

Magnetic Principle

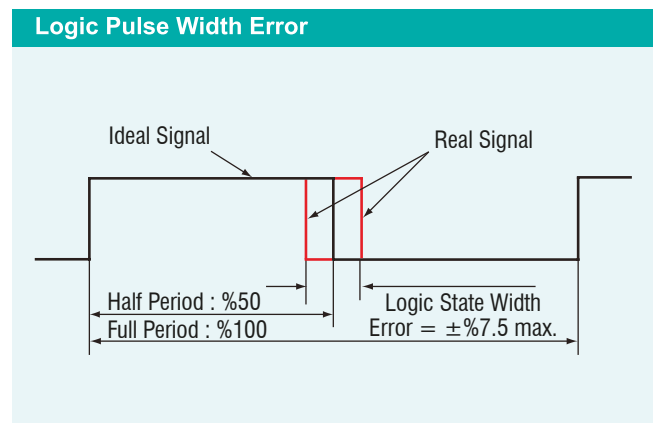
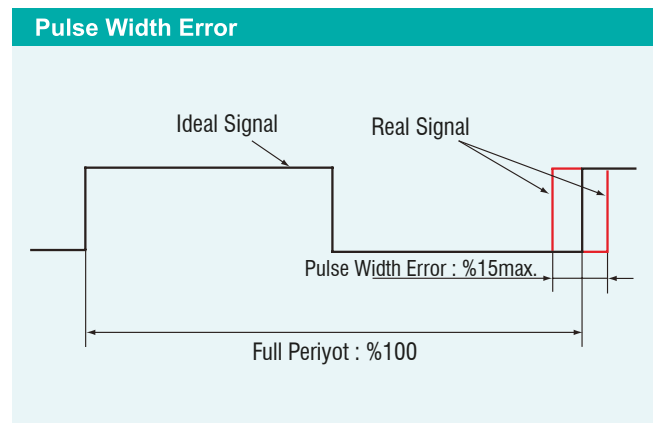
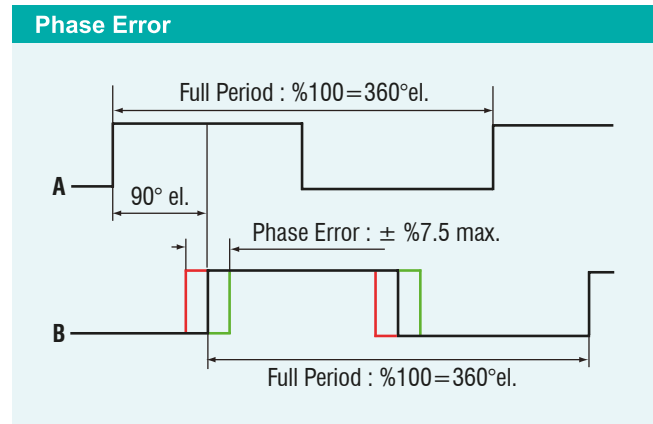
FENAC Magnetic Incremental encoders are based on non-contact magnetic scanning principle. A diametrical magnetised magnet is mounted in stainless steel shaft. As the encoder rotates, changing magnetic field is sensed by an Hall-Effect IC and voltages that are induced by magnetic field are converted to 90° phase shifted square waves. Then high-precision signals are amplified for industrial use. Outputs are either Push-Pull or Line Driver square waves and their inverter signals.

Optics

- Light Source: IR-LED
- Optoelectronics life: 100.000 hours
- Scanning: differential

Error Components

Error components of rotary encoders are described in three sections which are phase error, pulse width error and logic pulse width error. Maximum errors are illustrated as follows.



Mechanical Parts

All FENAC encoders consists of a high precision mechanics including two shaft bearings. Bearings are capable of withstanding high speed and load and featuring long-term load capacity. The lifetime of bearing is 10⁷ revolutions which is a minimum value, actual value may be higher surely. Lifetime in hours can be evaluated by following Formula

$$\text{Lifetime (hours)} = \frac{\text{Number of resolution}}{\text{RPM} * 60}$$

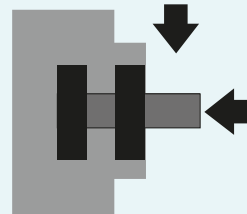
Maximum Operating Speed

The maximum operating speed is limited by number of pulses per revolution, maximum output frequency of electrical circuit and maximum mechanical operating speed. The maximum speed can be expressed as follows.

$$\text{Max. operating speed} = \frac{\text{Max. output frequency of encoder in Hz.} * 60}{\text{PPR of encoder}}$$

Double bearing lock system

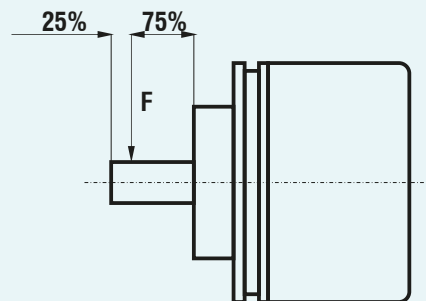
Fenac encoders designed according to double bearing lock system which ensures high radial and axial shaft loadings. Maximum distance and quality bearings increase the strenght of the mechanical parts. In this way encoder becomes more robust against vibration and installation errors.



Protection from Noise Interference

For proper operation to get rid of noise effects, we recommend the following measures.

- It is recommended to wire the shield of encoder cable to earth potential. The entire system must be grounded at one signal location to avoid ground loops.
- The connecting cables should be shielded and should be kept away from power lines and other noise generating equipments.
- Sources of interference such as motors, solenoid valves, frequency converters etc should always have their noise suppressed at
- Encoders should not be powered from the same mains supply as solenoid valves or contactors, as this may cause interference.



Technical definitions

Absolute encoders provide current position for output by digital serial or parallel data interface without need of reference signal. Actual position of encoder is stored by the encoder by the help of gear or battery solution.

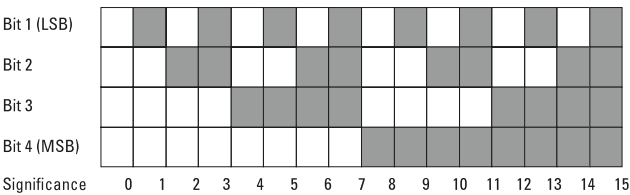
Optical absolute encoders identify a code on a glass disc. High performance Opto ASICs with integrated monitoring and diagnostic verifies every position value in realtime. Adaptation of signals than obtained multi-layer electronics circuits.

Magnetic absolute encoders provide exact position value without need of glass disc and using magnetic ASICs which make them more robust to shock and vibrations.

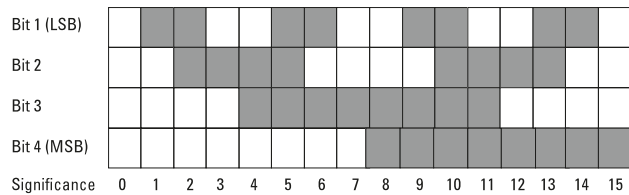
Code types

Absolute position information is sent to receiver electronics by means of binary or gray coded data. The gray code is a single step code which ensures that from one position to next only one bit changes while change from one position to next for binary code result to changes more than one bit. This may cause wrong position information. That is why gray coded position information is more preferable.

Binary code



Gray code

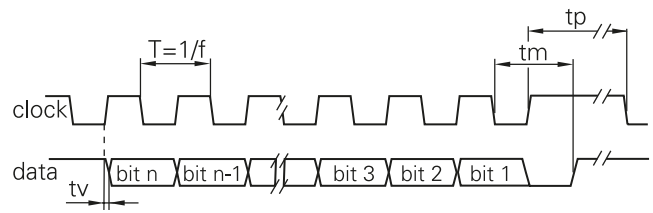


SSI data transmission

Terminal significance

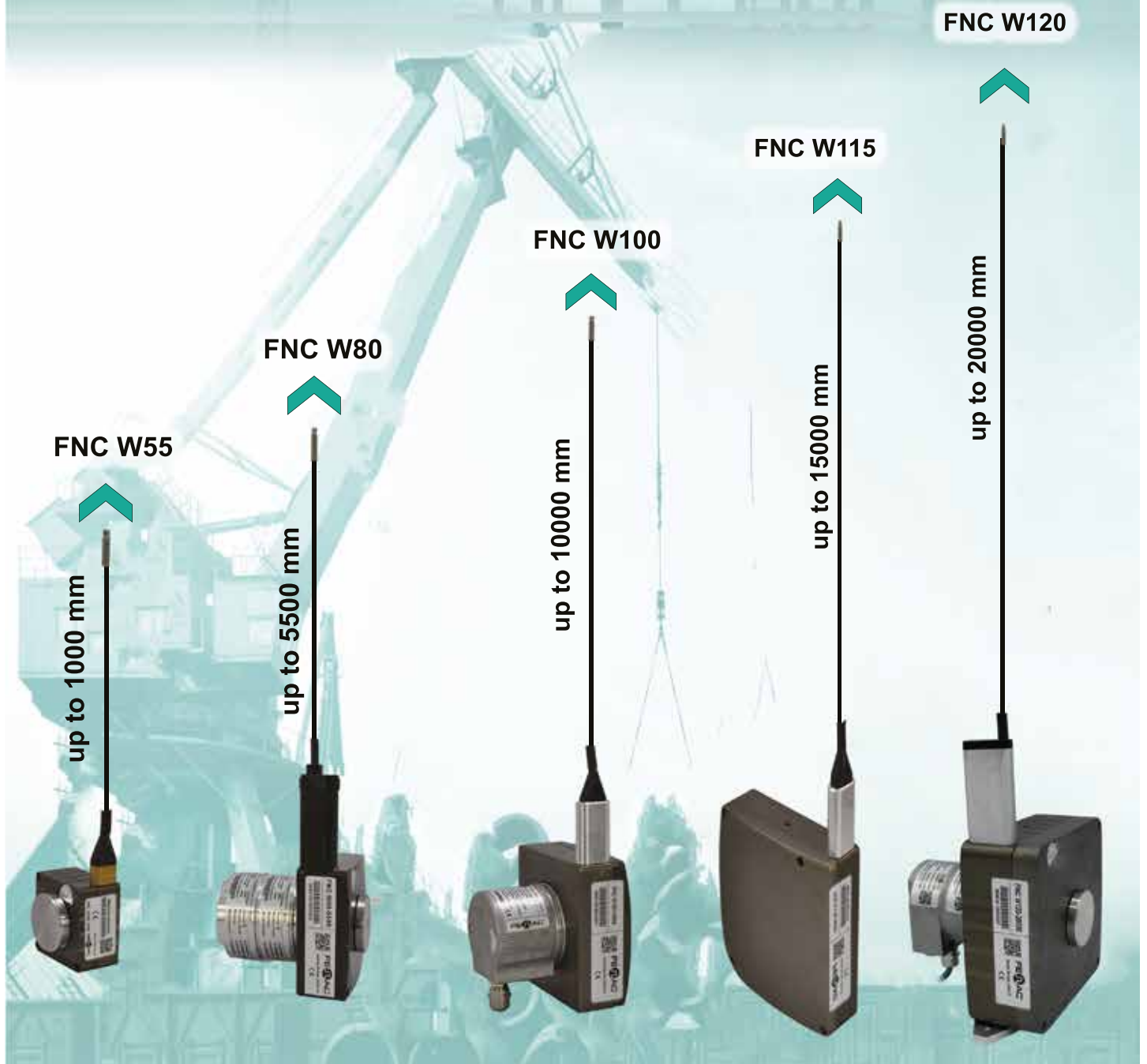
+VB	Encoder voltage supply.
GND	Encoder ground connection relating to UB.
DATA+	Positive, serial data output of differential linedriver.
DATA-	Negative, serial data output of differential linedriver.
CLK+	Positive SSI clock input. Clock + together with clock-forms a current loop.
CLK-	Negative SSI clock input. Clock - together with clock + forms a current loop.
ZERO SET	Input for setting a zero point anywhere within the programmed encoder resolution. The zero setting is standart on Low and triggered by a High impulse over 100 ms duration
DIRECTION	Input for setting counting direction. This input is standart Low and triggered by a High impulse. Direction is counter-clockwise on standart, when high impulse applied it becomes clockwise

Pulse Diagram



Clock frequency, f	50...2000 kHz for SSI up to 10MHz for BISS
Code	Binary or gray
Status and parity bit	On request
Monoflop time tm	>15µs
Clock time out	Programmable at factory

FENAC WIRE UNITS FAMILY



World of quality encoders



Represented by:



FENAC MÜHENDİSLİK SAN. TİC. LTD. ŞTİ.

Ferhatpaşa Mah. 35. Sok. No. 20 Ataşehir 34888 - İstanbul - Turkey
Tel/Phone : +90 216 232 27 00 Faks/Fax : +90 216 661 10 22

www.fenac.com.tr

info@fenac.com.tr



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