



Motor feedback systems rotary incremental with
commutation
CFS50

CFS50-AFV12X08



Model Name > CFS50-AFV12X08
Part No. > 1059775

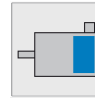


Illustration may differ

At a glance

- Output driver for incremental and commutation signals as per EIA 422
- Resolution of up to 65,536 lines per revolution
- Commutation signals up to 32 pole pairs
- Temperature range from -20 °C to +115 °C
- Various mechanical interfaces

Your benefits

- High level of flexibility due to mechanics already proven in other motor feedback systems
- High level of compatibility thanks to standard interface
- Time-saving due to electrical zero adjustment

Performance

Number of lines per revolution:	4,096 ¹⁾
Measuring step:	90 ° /number of lines
Commutation signals:	8 pole pairs
Reference signal, number:	1
Reference signal, position:	90 ° electronically, gated with A and B
Operating speed:	6,000 /min

¹⁾ Number of lines from 1 ... 1.000 and > 4.096 ... 65.536 on request

Mechanical data

Shaft version:	Tapered shaft
Flange type/stator coupling:	Spring mounting plate
Dimensions:	See dimensional drawing
Mass:	0.1 kg
Moment of inertia of the rotor:	10 gcm ²
Maximum operating speed:	12,000 /min
Maximum angular acceleration:	200,000 rad/s ²
Operating torque:	0.2 Ncm
Start up torque:	0.4 Ncm
Permissible shaft movement, radial, static:	± 0.5 mm
Permissible shaft movement, radial, dynamic:	± 0.1 mm
Permissible shaft movement, axial, static:	± 0.75 mm
Permissible shaft movement, axial, dynamic:	± 0.2 mm
Life of ball bearings:	3.6 x 10 ⁹ revolutions

Connection type:	Stranded cable, 15-pin, radial
Angular motion perpendicular to the rotational axis, static:	± 0.005 mm/mm
Angular motion perpendicular to the rotational axis, dynamic:	± 0.002 mm/mm

Electrical data

Electrical interface:	TTL/RS422
Operating voltage range/supply Voltage:	4.5 V DC ... 5.5 V DC
Maximum output frequency:	820 kHz
Operating power consumption (no load):	60 mA ¹⁾

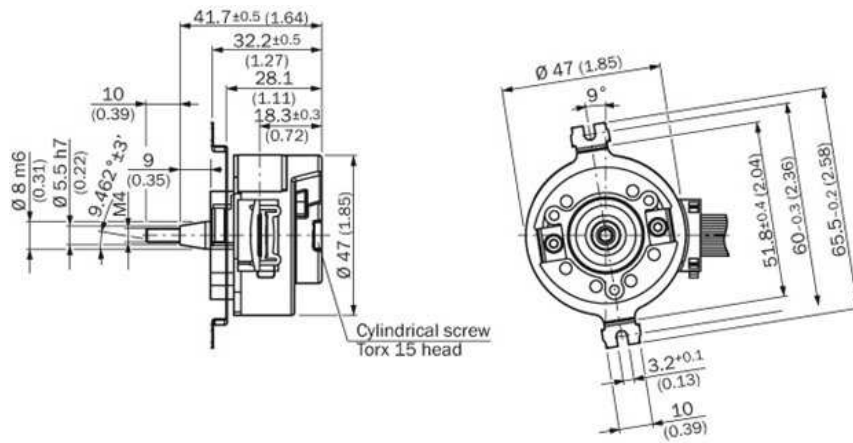
¹⁾ Without load

Ambient data

Working temperature range:	-20 °C ... 115 °C
Storage temperature range:	-40 °C ... 125 °C, without package
Relative humidity/Condensation:	90 %, Condensation not permitted
Resistance to shocks:	100 g/10 ms/according to EN 60068-2-27
Resistance to vibration:	20 g/10 Hz/2,000 Hz/according to EN 60068-2-6
EMC:	(according to EN 61000-6-2 and EN 61000-6-3) ¹⁾
Enclosure rating:	IP 40 (according to IEC 60529)

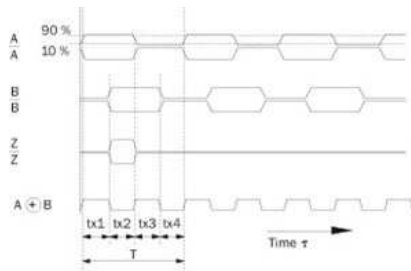
¹⁾ The EMC according to the standards quoted is achieved when the motor feedback system is mounted in an electrically conductive housing, which is connected to the central earthing point of the motor controller via a cable screen. This is also where the GND (0 V) connection of the power supply voltage is linked to earth. Users must perform their own tests when other screen designs are used.

Dimensional drawing



All dimensions in mm (inch)

Incremental track



At constant rotational speed with regard to the input shaft and rotation in clockwise direction.

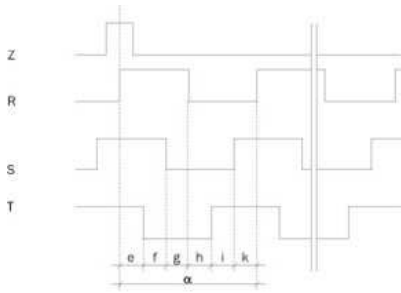
By connecting the two signals A and B, an output signal arises whose period durations tx1 ... tx4 have varying lengths.

The differences are determined:

- by the pulse/pause ratio tolerance of the individual channels
- by the tolerance in the 90° phase shift between A and B
- by the frequency

The times tx1 ... tx4 ideally have to amount to $1/4$ of the particular period duration T. The typical output frequency of the encoder is defined so that the max. time tx is smaller than $1.5 \times T/4$.

Pulse time diagram



Polpairs	Number of poles	e, f, g, h, i, k	α
2	4	30°	180°
3	6	20°	120°
4	8	15°	90°
6	12	10°	60°
8	16	7.5°	45°

The angle information is related to a mechanical shaft rotation. Flank precision of the signals R, S, T $\pm 1^\circ$.

Wire allocation

PIN	Color	Signal
1	Blue	Ground connection (GND)
2	Red	Supply voltage 5 V $\pm 10\%$ (U_{cc})
3	Yellow	Reference signal inverted (\bar{Z})
4	Purple	Reference signal (Z)
5	Brown	Increment signal inverted (\bar{A})
6	White	Increment signal (A)
7	Black	Increment signal inverted (\bar{B})
8	Pink	Increment signal (B)
9	White/Red	Commutation signal inverted (\bar{T})
10	White/Gray	Commutation signal (T)
11	White/Blue	Commutation signal inverted (\bar{S})
12	White/Yellow	Commutation signal (S)
13	White/Pink	Commutation signal inverted (\bar{R})
14	White/Green	Commutation signal (R)
15	Gray	Electronic setting of the commutation signals (SET0)

Australia

Phone +61 3 9457 0600
1800 33 48 02 – tollfree
E-Mail sales@sick.com.au

Belgium/Luxembourg

Phone +32 (0)2 466 55 66
E-Mail info@sick.be

Brasil

Phone +55 11 3215-4900
E-Mail marketing@sick.com.br

Canada

Phone +1 905 771 14 44
E-Mail information@sick.com

Česká republika

Phone +420 2 57 91 18 50
E-Mail sick@sick.cz

China

Phone +86 4000 121 000
E-Mail info.china@sick.net.cn
Phone +852-2153 6300
E-Mail ghk@sick.com.hk

Danmark

Phone +45 45 82 64 00
E-Mail sick@sick.dk

Deutschland

Phone +49 211 5301-301
E-Mail info@sick.de

España

Phone +34 93 480 31 00
E-Mail info@sick.es

France

Phone +33 1 64 62 35 00
E-Mail info@sick.fr

Great Britain

Phone +44 (0)1727 831121
E-Mail info@sick.co.uk

India

Phone +91-22-4033 8333
E-Mail info@sick-india.com

Israel

Phone +972-4-6881000
E-Mail info@sick-sensors.com

Italia

Phone +39 02 27 43 41
E-Mail info@sick.it

Japan

Phone +81 (0)3 5309 2112
E-Mail support@sick.jp

Magyarország

Phone +36 1 371 2680
E-Mail office@sick.hu

Nederland

Phone +31 (0)30 229 25 44
E-Mail info@sick.nl

Norge

Phone +47 67 81 50 00
E-Mail sick@sick.no

Österreich

Phone +43 (0)22 36 62 28 8-0
E-Mail office@sick.at

Polska

Phone +48 22 837 40 50
E-Mail info@sick.pl

România

Phone +40 356 171 120
E-Mail office@sick.ro

Russia

Phone +7-495-775-05-30
E-Mail info@sick.ru

Schweiz

Phone +41 41 619 29 39
E-Mail contact@sick.ch

Singapore

Phone +65 6744 3732
E-Mail sales.gsg@sick.com

Slovenija

Phone +386 (0)1-47 69 990
E-Mail office@sick.si

South Africa

Phone +27 11 472 3733
E-Mail info@sickautomation.co.za

South Korea

Phone +82 2 786 6321/4
E-Mail info@sickkorea.net

Suomi

Phone +358-9-25 15 800
E-Mail sick@sick.fi

Sverige

Phone +46 10 110 10 00
E-Mail info@sick.se

Taiwan

Phone +886 2 2375-6288
E-Mail sales@sick.com.tw

Türkiye

Phone +90 (216) 528 50 00
E-Mail info@sick.com.tr

United Arab Emirates

Phone +971 (0) 4 88 65 878
E-Mail info@sick.ae

USA/México

Phone +1(952) 941-6780
1 (800) 325-7425 – tollfree
E-Mail info@sickusa.com

More representatives and agencies
at www.sick.com