PHOTOELECTRIC ROTARY ENCODER

AK19

AK19 is a singleturn absolute optical encoder that is engineered for high-precision applications in tight spaces, delivering resolution up to 20 bits. Designed with flexibility in mind, it is available in both solid shaft and blind hollow shaft configurations to suit a wide range of installation needs.This encoder features an 8-conductor ribbon cable option, ensuring efficient connectivity while maintaining a compact footprint. For applications in extreme conditions, an upgraded version with an extended temperature range is also available, providing reliable performance in demanding environments.

- Miniature size (∅ 19 mm)
- Various diameter options for solid and blind hollow shafts
- Several flexible couplings with different mounting options
- Special encoder design for extended temperature ranges (-40°C + 85°C)
- Ribbon cable output

SYSTEM SPECIFICATIONS

Measuring type	Absolute singleturn
Measuring technology	Optical reflective
Measuring standard	Glass disc with absolute and incremental tracks
System accuracy	± 75 arc.sec
Resolution (positions per turn)[1)]	up to 20 bits (1 048 576 positions)

AK19S

D, mm	Ø 2 mm h6	Ø 3 mm h6	Ø 4 mm h6

For other diameter options, please contact the manufacturer.

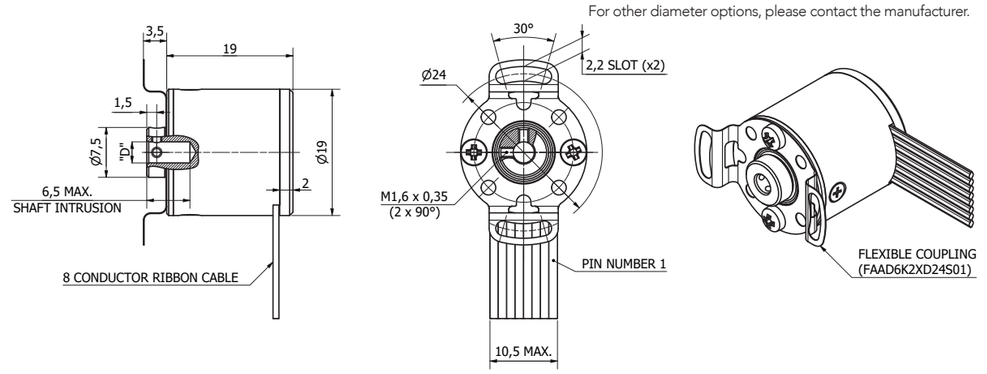
AK19_A00

AK19H

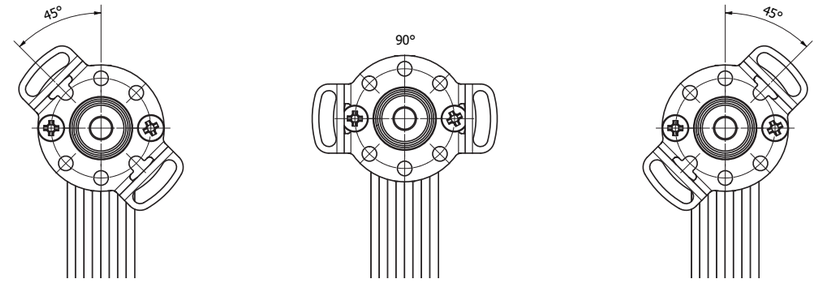
FLEXIBLE COUPLING VERSION 1

D, mm	Ø 2 mm H7	Ø 3 mm H7	Ø 4 mm H6

For other diameter options, please contact the manufacturer.



FLEXIBLE COUPLING MOUNTING OPTIONS

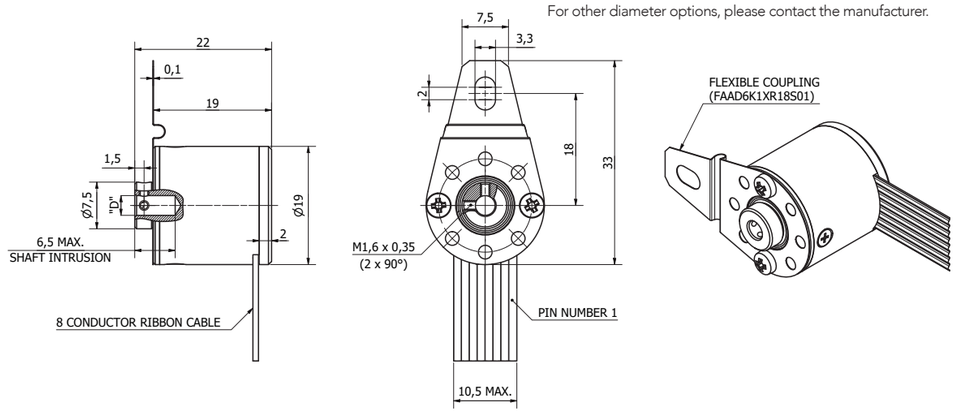


AK19H

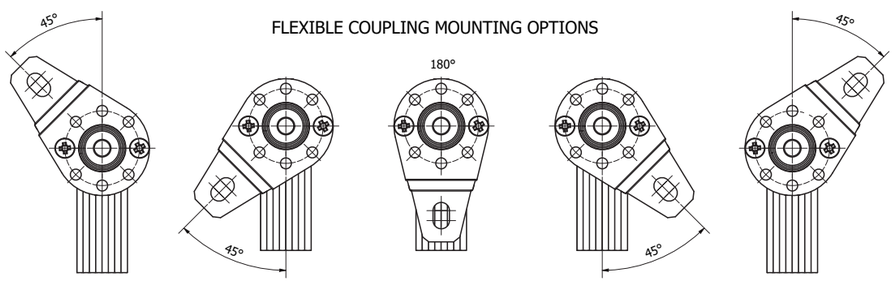
FLEXIBLE COUPLING VERSION 2

D, mm	Ø 2 mm H7	Ø 3 mm H7	Ø 4 mm H6

For other diameter options, please contact the manufacturer.



FLEXIBLE COUPLING MOUNTING OPTIONS



ELECTRICAL DATA

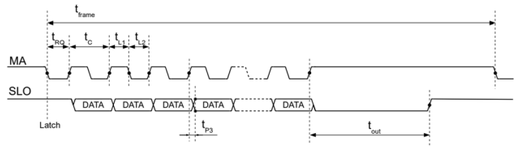
Electrical Interface[1)]	SSI	BISS-C
Output code	Binary / Gray	Binary
Supply voltage	+ 5V ± 5%	
Current consumption (without load)	Max 120 mA	

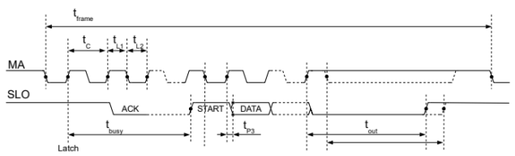
1) Select when ordering.

ABSOLUTE DIGITAL INTERFACE

DESCRIPTION	DATA
$T_{timeout}$	typical 20 µs
Clock frequency	0.5 - 10 MHz

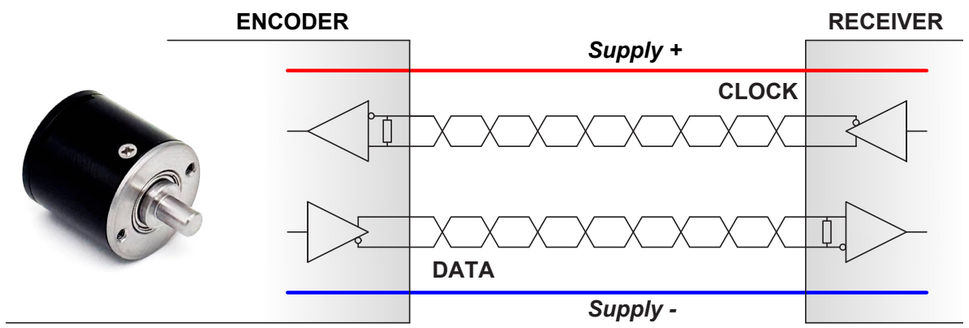
DESCRIPTION	DATA
$T_{timeout}$	0.075 us - 24 us
Clock frequency	62.4 kHz - 20 MHz





SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
SSI Protocol					
t_{frame}	Permissible Frame Repetition		(*)	indefinite	
t_C	Permissible Clock Period		100		ns
t_{L1}	Clock Signal hi Level Duration		25	t_{out}	ns
t_{L2}	Clock Signal lo Level Duration		25	t_{out}	ns
t_{RQ}	REQ Signal lo Level Duration		50		ns
t_{P3}	Propagation Delay: SLO stable after MA lo → hi	CL = 20 pF, rise to 70% VDDIO or fall to 30% VDDIO		60	ns
BISS C Protocol					
t_{frame}	Permissible Frame Repetition		(*)	indefinite	
t_C	Permissible Clock Period		50		ns
t_{L1}	Clock Signal hi Level Duration		20	t_{out}	ns
t_{L2}	Clock Signal lo Level Duration		20	t_{out}	ns
t_{busy}	Processing Time with Start Bit Delay			$5t_C$	
t_{P3}	Propagation Delay: SLO stable after MA lo → hi	CL = 20 pF, rise to 70% VDDIO or fall to 30% VDDIO		60	ns
t_{S1}	Setup Time: SLI stable after MA hi → lo		5		ns
t_{H1}	Hold Time: SLI stable after MA hi → lo		10		ns

ENCODER ELECTRICAL CONNECTION



MECHANICAL DATA

Maximum shaft speed	10 000 RPM
Moment of inertia	< 0.4 gcm²
Starting torque	5 x 10^{-4} Nm
Shaft load: - axial - radial	 3 N 3 N
Vibrations (55 Hz to 2000 Hz)	≤ 100 m/s²
Shock (6 ms)	≤ 300 m/s²
Operating temperature: - standard - extended	 0°C - 70°C -40°C - 85°C
Storage temperature	-40°C - 105°C
Ingress Protection (EN 60529)	IP50
Mass (without cable): - standard - for extended temperature option with stainless steel	 < 15 g < 25 g

ACCESSORIES

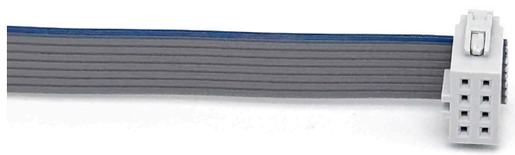
FLEXIBLE COUPLINGS	FAAD6K2XD24S01 flexible coupling version 1	FAAD6K1XR18S01 flexible coupling version 2

FAAD6K2XD24S01 FLEXIBLE COUPLING VERSION 1

FAAD6K1XR18S01 FLEXIBLE COUPLING VERSION 2

CONNECTORS FOR CABLE	71600-108LF 8-pins connector

71600-108LF 8-PINS CONNECTOR



SPECIAL CAPABILITIES

We offer exceptional flexibility in our design and manufacturing processes, allowing us to create tailor-made encoders to meet specific customer needs. We can also modify our standard encoders to accommodate different shaft diameters or designs, special wiring configurations, different mechanical interfaces, etc. Additionally, we can incorporate other custom features, such as specialized connectors, couplings, and various accessories, to ensure seamless integration into your application. Furthermore, we can adapt the design and conduct testing for various environmental conditions, including higher ingress protection levels, extended temperature ranges, and resistance to intensive mechanical vibrations or shock.

ORDER FORM

AK19X1 - **X2** - **X3** - **X4** - **X5** - **X6** - **X7** - **X8/X9**

Type (X1):	Output signals interface (X2):	Singleturn bit number (X3):	Output code (X4):	Operating temperature (X5):	Shaft diameter (X6):	Cable length (X7):	Connector or flange Socket type (X8):	Flexible coupling (X9):
S - solid shaft **H** - blind hollow shaft	**S** - SSI **B** - BiSS-C	**B1** - 1 bit **B9** - 9 bits ... **B20** - 20 bits	**B** - Binary **G** - Gray* *only for SSI output signal.	**N** - 0°C - 70°C (standard) **T** - -40°C - 85°C (extended)	**02M** - ∅ 2 mm **03M** - ∅ 3 mm **04M** - ∅ 4 mm	**RC005** - 500 mm **RC01** - 1 000 mm **RC02** - 2 000 mm	**W** - without connector **B71** - 8-pins connector 71600-108LF	**W** - without coupling **1** - flexible coupling version 1* **2** - flexible coupling version 2* *only for blind hollow shaft encoder type.

ORDER EXAMPLES: 1) AK19S-S-B20-B-N-02M-RC02-W-W
2) AK19H-B-B20-G-T-04M-RC01-B71-1