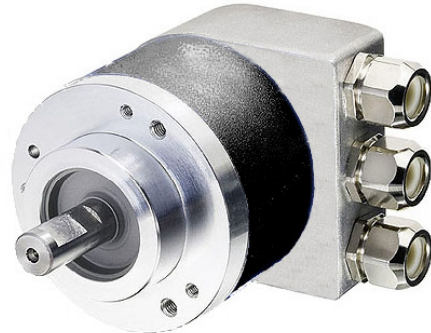


Code ST04	Project E04-A	Release A	TECHNICAL DATASHEET
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ABSOLUTE OPTICAL ENCODER AEN536 (Fieldbus)

GENERAL FEATURES

- Absolute optical encoder (singleturn or multiturn).
- Output protocol: **CANopen, Profibus, DeviceNet.**
- Aluminium flange and housing.
- Radial output with sealed cable exit or connector M12 8 Pin.



MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL <ul style="list-style-type: none"> • Round flange, with centering \varnothing 36 mm. • Aluminium housing. • Stainless steel shaft. • Ball bearings with special high-sealed screens. • High protection even in harsh environmental conditions. ELECTRICAL <ul style="list-style-type: none"> • Diagnostic LED. • Programmable (resolution, offset, preset, direction). • Output data: speed, acceleration. 	Cod. AEN536	
	Resolution	10-16 Bit Singleturn 12 Bit Multiturn
	Max. rotating speed	continuous 10000 rpm momentary 12000 rpm
	Max. shaft load	40 N (axial) - 60 N (radial)
	Shaft diameter (mm)	\varnothing 9.52 – \varnothing 10
	Operating temperature	-40 °C + 85 °C
	Storage temperature	-40 °C + 85 °C
	Vibration resistance (EN 60068-2-6)	100 m/s ² (10 + 500 Hz)
	Shock resistance (EN 60068-2-27)	1000 m/s ² (6 ms)
	Protection class (EN 60529)	IP 64 standard IP 67 optional
	Torque	0.5 Ncm
	Moment of inertia	3.8 x 10 ⁻⁶ kgm ²
	Power supply	10 + 30 V ± 5%
	Current consumption	220 mA (SG), 250 mA (MG)
	Protocol	Profibus, CANopen, DeviceNet
	Output code	Binary
	Electrical connections	see related table
	Weight	350 g (SG), 400 g (MG)

ORDERING CODE

MODEL	TYPE / OUTPUT	RESOL. Bit (MG)	RESOL. Bit (SG)	POWER SUPPLY	\varnothing SHAFT	CABLE / CONNECTOR	SIGNAL	CONNECTION	OPTIONS
AEN536	M R	12	12	1030	D10	M01	CO	C	V2
	S = singleturn M = multiturn R = radial	00 = if SG 12 = 12 Bit	10 = 10 Bit 12 = 12 Bit 13 = 13 Bit 14 = 14 Bit 16 = 16 Bit* *Only CANopen	1030 = 10+30 V	952 = \varnothing 9.52 mm D10 = \varnothing 10 mm	PC = sealed cable only Mnn = cable length in m CT = M12 8 Pin	CO = CANopen PR = Profibus DN = DeviceNet	No cod.= sealed cable only C = cable n = connection number	No cod.= standard V2 = IP 67

Example  **ABSOLUTE OPTICAL ENCODER AEN536 MR 1212 1030 D10 M01 CO C V2**

Code ST04	Project E04-A	Release A	TECHNICAL DATASHEET
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CABLE AND ELECTRICAL CONNECTIONS

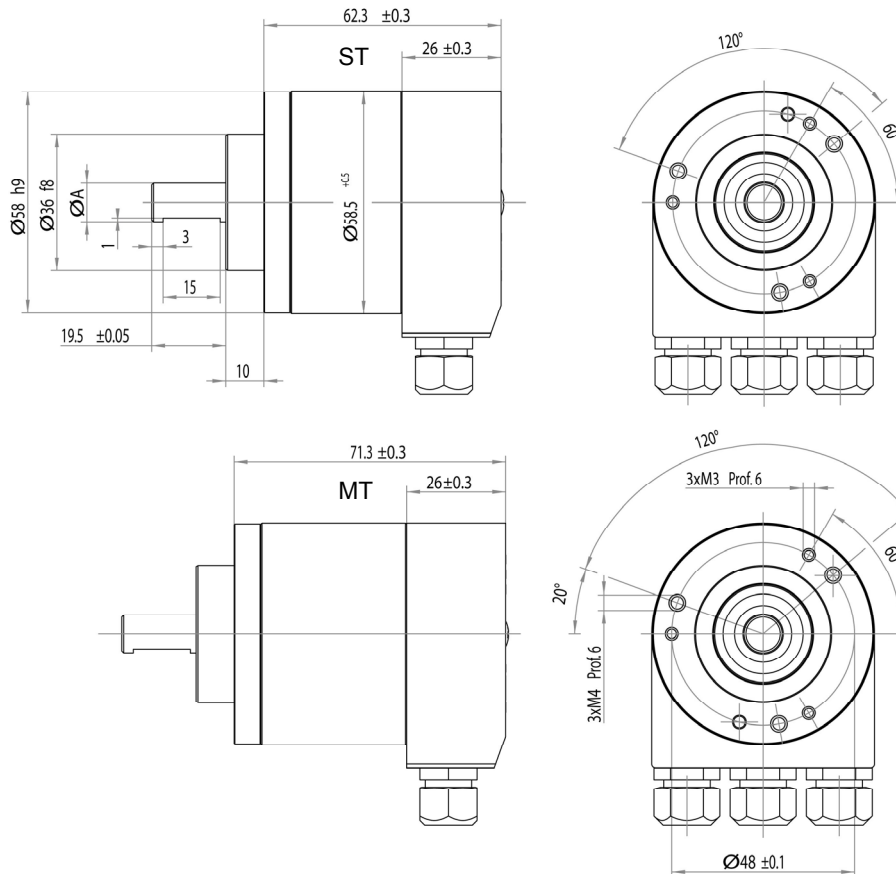
The encoder is supplied with 3 sealed cable exits or, alternatively, with 3 connectors M12 (8 Pin)

CONNECTION (TERMINAL BLOCK) sealed cable output			
N. Pin	CANopen	Profibus	DeviceNet
1	+V in	+V in	+V in
2	0V in	0V in	0V in
3	CAN in -	+V out	CAN-L
4	CAN in +	0V out	CAN-H
5	CAN GND in	B in	DRAIN
6	CAN GND out	A in	DRAIN
7	CAN out +	B out	DRAIN
8	CAN out -	A out	CAN-L
9	0V out		0V out
10	+V out		+V out

CONNECTOR M12 8 PIN (only Profibus)			
N. Pin	Bus In	Power supply	Bus Out
1		+V in	+V out *
2	A in		A out
3		0V in	0V out *
4	B in		B out
5	⊥	⊥	⊥

* The output can be used as power supply for an external bus termination resistor.

DIMENSIONS



ST = Singleturn
MT = Multiturn

WHAT TO AVOID

- Any mechanical working (cutting, drilling, milling, etc.).
- Any modification of the encoder body or shaft.
- Any improper use, not complying with the technical instructions provided by the Manufacturer.
- External shocks or stresses.



Code ST04	Project E06-A	Release A	TECHNICAL DATASHEET
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ABSOLUTE OPTICAL ENCODER AEN500 (Fieldbus)

GENERAL FEATURES

- Absolute optical encoder (singleturn or multiturn).
- Output protocol: **CANopen, Profibus, DeviceNet.**
- Aluminium flange and housing.
- Radial output with sealed cable exit or connector M12 8 Pin.



MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL <ul style="list-style-type: none"> • Round flange, with centering \varnothing 50 mm. • Aluminium housing. • Stainless steel shaft. • Ball bearings with special high-sealed screens. • High protection even in harsh environmental conditions. ELECTRICAL <ul style="list-style-type: none"> • Diagnostic LED. • Programmable (resolution, offset, preset, direction). • Output data: speed, acceleration. 	Cod. AEN500	
	Resolution	10-16 Bit Singleturn 12 Bit Multiturn
	Max. rotating speed	continuous 10000 rpm momentary 12000 rpm
	Max. shaft load	40 N (axial) - 60 N (radial)
	Shaft diameter (mm)	\varnothing 6
	Operating temperature	-40 °C + 85 °C
	Storage temperature	-40 °C + 85 °C
	Vibration resistance (EN 60068-2-6)	100 m/s ² (10 + 500 Hz)
	Shock resistance (EN 60068-2-27)	1000 m/s ² (6 ms)
	Protection class (EN 60529)	IP 64 standard IP 67 optional
	Torque	0.5 Ncm
	Moment of inertia	3.8 x 10 ⁻⁶ kgm ²
	Power supply	10 + 30 V ± 5%
	Current consumption	220 mA (SG), 250 mA (MG)
	Protocol	Profibus, CANopen, DeviceNet
	Output code	Binary
	Electrical connections	see related table
	Weight	350 g (SG), 400 g (MG)

ORDERING CODE

MODEL	TYPE / OUTPUT	RESOL. Bit (MG)	RESOL. Bit (SG)	POWER SUPPLY	\varnothing SHAFT	CABLE / CONNECTOR	SIGNAL	CONNECTION	OPTIONS
AEN500	M R	12	12	1030	D06	M01	CO	C	V2

S = singleturn M = multiturn R = radial	00 = if SG 12 = 12 Bit	10 = 10 Bit 12 = 12 Bit 13 = 13 Bit 14 = 14 Bit 16 = 16 Bit* <small>*Only CANopen</small>	1030 = 10+30 V	D06 = \varnothing 6 mm	PC = sealed cable only Mnn = cable length in m CT = M12 8 Pin	CO = CANopen PR = Profibus DN = DeviceNet	No cod. = sealed cable only C = cable n = connection number	No cod. = standard V2 = IP 67
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Example **ABSOLUTE OPTICAL ENCODER AEN500 MR 1212 1030 D06 M01 CO C V2**

Code ST04	Project E06-A	Release A	TECHNICAL DATASHEET
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CABLE AND ELECTRICAL CONNECTIONS

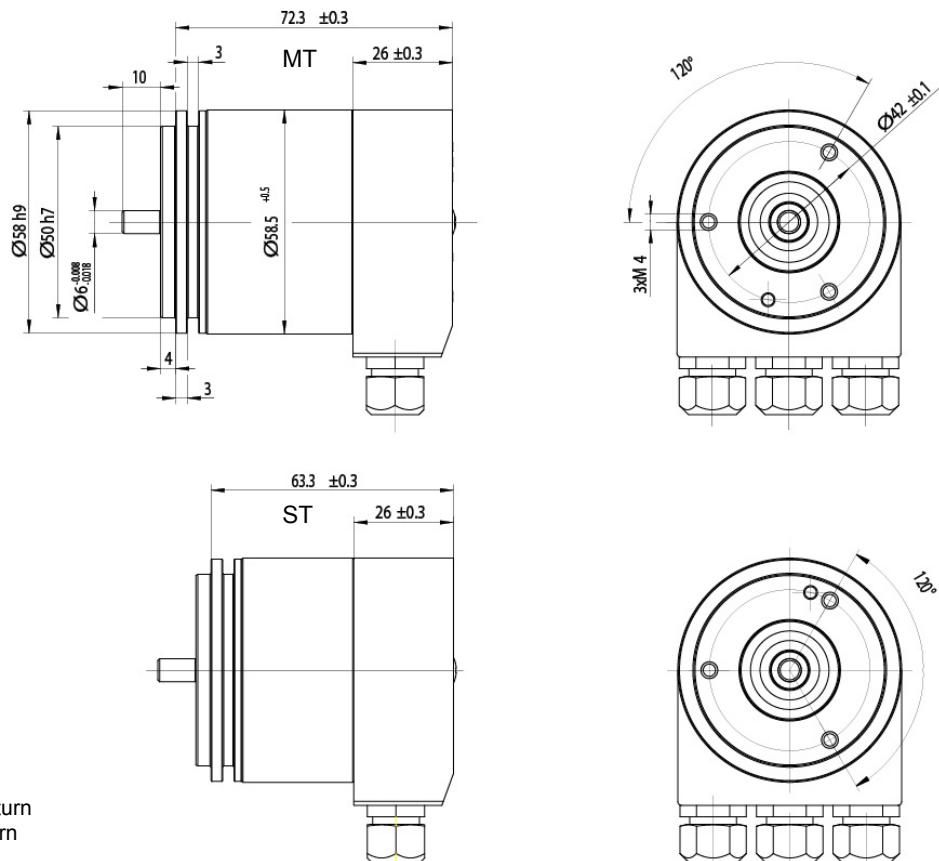
The encoder is supplied with 3 sealed cable exits or, alternatively, with 3 connectors M12 (8 Pin)

CONNECTION (TERMINAL BLOCK) sealed cable output			
N. Pin	CANopen	Profibus	DeviceNet
1	+V in	+V in	+V in
2	0V in	0V in	0V in
3	CAN in -	+V out	CAN-L
4	CAN in +	0V out	CAN-H
5	CAN GND in	B in	DRAIN
6	CAN GND out	A in	DRAIN
7	CAN out +	B out	DRAIN
8	CAN out -	A out	CAN-L
9	0V out		0V out
10	+V out		+V out

CONNECTOR M12 8 PIN (only Profibus)			
N. Pin	Bus In	Power supply	Bus Out
1		+V in	+V out *
2	A in		A out
3		0V in	0V out *
4	B in		B out
5	⊥	⊥	⊥

* The output can be used as power supply for an external bus termination resistor.

DIMENSIONS



WHAT TO AVOID

- Any mechanical working (cutting, drilling, milling, etc.).
- Any modification of the encoder body or shaft.
- Any improper use, not complying with the technical instructions provided by the Manufacturer.
- External shocks or stresses.

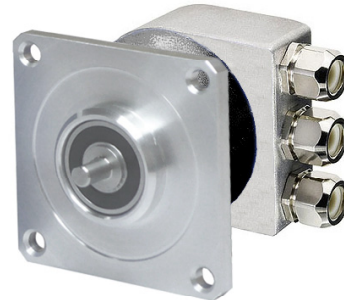


Code ST04	Project E07-A	Release A	TECHNICAL DATASHEET
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ABSOLUTE OPTICAL ENCODER AEN600 (Fieldbus)

GENERAL FEATURES

- Absolute optical encoder (singleturn or multiturn).
- Output protocol: **CANopen, Profibus, DeviceNet.**
- Aluminium flange and housing.
- Radial output with sealed cable exit or connector M12 8 Pin.



MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL <ul style="list-style-type: none"> • Square flange, with centering Ø 31.75 mm. • Aluminium housing. • Stainless steel shaft. • Ball bearings with special high-sealed screens. • High protection even in harsh environmental conditions. ELECTRICAL <ul style="list-style-type: none"> • Diagnostic LED. • Programmable (resolution, offset, preset, direction). • Output data: speed, acceleration. 	Cod. AEN600	
	Resolution	10-16 Bit Singleturn 12 Bit Multiturn
	Max. rotating speed	continuous 10000 rpm momentary 12000 rpm
	Max. shaft load	40 N (axial) - 60 N (radial)
	Shaft diameter (mm)	Ø 9.52 – Ø 10
	Operating temperature	-40 °C + 85 °C
	Storage temperature	-40 °C + 85 °C
	Vibration resistance (EN 60068-2-6)	100 m/s ² (10 ÷ 500 Hz)
	Shock resistance (EN 60068-2-27)	1000 m/s ² (6 ms)
	Protection class (EN 60529)	IP 64 standard IP 67 optional
	Torque	0.5 Ncm
	Moment of inertia	3.8 x 10 ⁻⁶ kgm ²
	Power supply	10 ÷ 30 V ± 5%
	Current consumption	220 mA (SG), 250 mA (MG)
	Protocol	Profibus, CANopen, DeviceNet
	Output code	Binary
	Electrical connections	see related table
	Weight	350 g (SG), 400 g (MG)

ORDERING CODE

MODEL	TYPE / OUTPUT	RESOL. Bit (MG)	RESOL. Bit (SG)	POWER SUPPLY	Ø SHAFT	CABLE / CONNECTOR	SIGNAL	CONNECTION	OPTIONS
AEN600	M R	12	12	1030	D10	M01	CO	C	V2

S = singleturn	00 = if SG	10 = 10 Bit	1030 = 10÷30 V	952 = Ø9.52 mm	PC = sealed cable only	CO = CANopen	No cod. = sealed cable only	No cod. = standard
M = multiturn	12 = 12 Bit	12 = 12 Bit		D10 = Ø10 mm	Mnn = cable length in m	PR = Profibus	cable only	V2 = IP 67
R = radial		13 = 13 Bit			CT = M12 8 Pin	DN = DeviceNet	C = cable	
		14 = 14 Bit					n = connection number	
		16 = 16 Bit*						

*Only CANopen

Example **ABSOLUTE OPTICAL ENCODER AEN600 MR 1212 1030 D10 M01 CO C V2**

Code ST04	Project E07-A	Release A	TECHNICAL DATASHEET
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CABLE AND ELECTRICAL CONNECTIONS

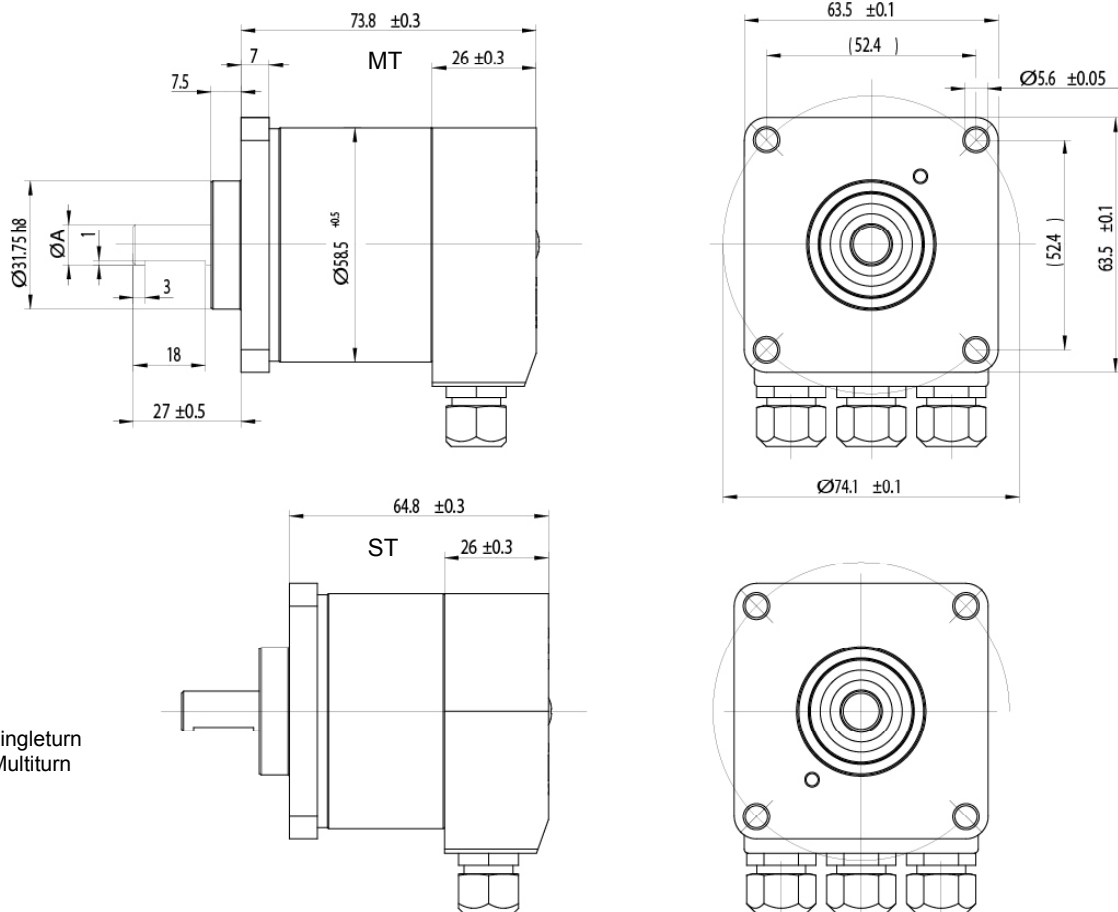
The encoder is supplied with 3 sealed cable exits or, alternatively, with 3 connectors M12 (8 Pin)

CONNECTION (TERMINAL BLOCK) sealed cable output			
N. Pin	CANopen	Profibus	DeviceNet
1	+V in	+V in	+V in
2	0V in	0V in	0V in
3	CAN in -	+V out	CAN-L
4	CAN in +	0V out	CAN-H
5	CAN GND in	B in	DRAIN
6	CAN GND out	A in	DRAIN
7	CAN out +	B out	DRAIN
8	CAN out -	A out	CAN-L
9	0V out		0V out
10	+V out		+V out

CONNECTOR M12 8 PIN (only Profibus)			
N. Pin	Bus In	Power supply	Bus Out
1		+V in	+V out *
2	A in		A out
3		0V in	0V out *
4	B in		B out
5	⊥	⊥	⊥

* The output can be used as power supply for an external bus termination resistor.

DIMENSIONS



WHAT TO AVOID

- Any mechanical working (cutting, drilling, milling, etc.).
- Any modification of the encoder body or shaft.
- Any improper use, not complying with the technical instructions provided by the Manufacturer.
- External shocks or stresses.



Code ST04	Project E12-A	Release A	TECHNICAL DATASHEET
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ABSOLUTE OPTICAL ENCODER AEN58SC (Fieldbus)

GENERAL FEATURES

- Absolute optical encoder (singleturn or multiturn).
- Output protocol: **CANopen, Profibus, DeviceNet.**
- Aluminium flange and housing.
- Radial output with sealed cable exit.



MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL <ul style="list-style-type: none"> • Elastic flange. • Aluminium housing. • Stainless steel shaft. • Ball bearings with special high-sealed screens. • High protection even in harsh environmental conditions. ELECTRICAL <ul style="list-style-type: none"> • Diagnostic LED. • Programmable (resolution, offset, preset, direction). • Output data: speed, acceleration. 	Cod. AEN58SC	
	Resolution	10-16 Bit Singleturn 12 Bit Multiturn
	Max. rotating speed	continuous 10000 rpm momentary 12000 rpm
	Max. shaft load	40 N (axial) - 60 N (radial)
	Shaft diameter (mm)	Ø 9.52 - Ø 10 - Ø 12
	Operating temperature	-40 °C ÷ 85 °C
	Storage temperature	-40 °C ÷ 85 °C
	Vibration resistance (EN 60068-2-6)	100 m/s ² (10 ÷ 500 Hz)
	Shock resistance (EN 60068-2-27)	1000 m/s ² (6 ms)
	Protection class (EN 60529)	IP 64
	Torque	≤ 0.5 Ncm
	Moment of inertia	3.8 x 10 ⁻⁶ kgm ²
	Power supply	10 ÷ 30 V
	Current consumption	220 mA (ST), 250 mA (MT)
	Protocol	Profibus, CANopen, DeviceNet
Output code	Binary	
Electrical connections	see related table	
Weight	350 g (ST), 400 g (MT)	

ORDERING CODE

MODEL	TYPE / OUTPUT	RESOL. Bit (MT)	RESOL. Bit (ST)	POWER SUPPLY	Ø SHAFT	CONNECTOR	SIGNAL	OPTIONS
AEN58SC	M R	12	12	1030	D10	PC	CO	

S = singleturn **00** = if ST **10** = 10 Bit* **1030** = 10-30 V **952** = ø 9.52 mm **PC** = Bus Cover with sealed cable **CO** = CANopen **No cod.** = standard
M = multiturn **12** = 12 Bit **12** = 12 Bit **D10** = ø 10 mm **D10** = ø 10 mm **PR** = Profibus
R = radial **13** = 13 Bit **D12** = ø 12 mm **DN** = DeviceNet
14 = 14 Bit
16 = 16 Bit**

* Only singleturn version
 ** Only singleturn CANopen version

Example  **ABSOLUTE OPTICAL ENCODER AEN58SC MR 1212 1030 D10 PC CO**

Code ST04	Project E12-A	Release A	TECHNICAL DATASHEET
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ELECTRICAL CONNECTIONS

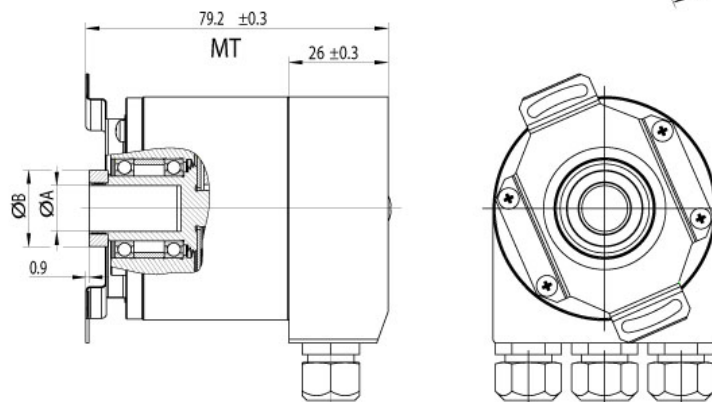
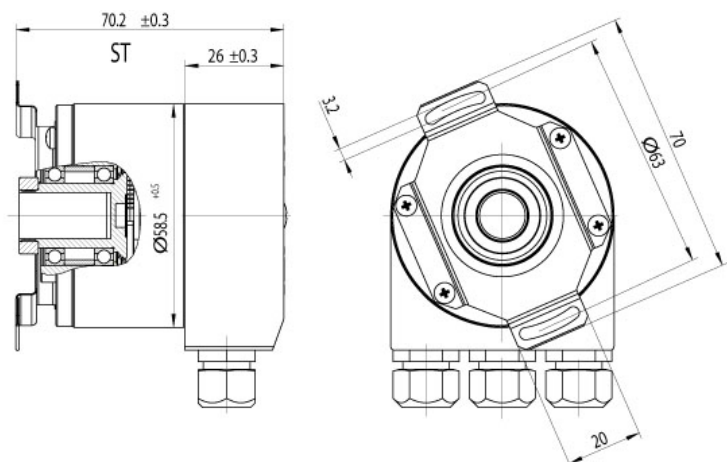
The encoder is supplied with 3 sealed cable exits.

CONNECTION (TERMINAL BLOCK)			
N. Pin	CANopen	Profibus	DeviceNet
1	+V in	+V in	+V in
2	0V in	0V in	0V in
3	CAN in -	+V out	CAN-L
4	CAN in +	0V out	CAN-H
5	CAN GND in	B in	DRAIN
6	CAN GND out	A in	DRAIN
7	CAN out +	B out	DRAIN
8	CAN out -	A out	CAN-L
9	0V out		0V out
10	+V out		+V out

DIMENSIONS

	DIMENSIONS IN mm		
	9.52 ^{+0.012}	10 ^{+0.012}	12 ^{+0.012}
Hollow shaft Ø A	9.52 ^{+0.012}	10 ^{+0.012}	12 ^{+0.012}
Connecting shaft Ø	9.52 _{g7}	10 _{g7}	12 _{g7}
Clamping ring Ø B	18	18	20
L min.	15	15	18
L max.	20	20	20
Shaft code	952	D10	D12

L = inside length of connecting shaft



ST = Singleturn
MT = Multiturn

WHAT TO AVOID

- Any mechanical working (cutting, drilling, milling, etc.).
- Any modification of the encoder body or shaft.
- Any improper use, not complying with the technical instructions provided by the Manufacturer.
- External shocks or stresses.



Code ST05	Project E04-A	Release B	TECHNICAL DATASHEET
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ABSOLUTE OPTICAL ENCODER AEN536 (Serial)

GENERAL FEATURES

- Absolute optical encoder (singleturn or multiturn).
- Output protocol: **SSI, BiSS-C**.
- Aluminium flange and housing.
- Radial or axial output with connector M23 12 Pin or M12 8 Pin.



MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL <ul style="list-style-type: none"> • Round flange, with centering \varnothing 36 mm. • Aluminium housing. • Stainless steel shaft. • Ball bearings with special high-sealed screens. • High protection even in harsh environmental conditions. ELECTRICAL <ul style="list-style-type: none"> • Diagnostic LED. • Input (direction). • Output data: status, preset. 	Cod. AEN536																																		
	<table border="1"> <tr> <td>Resolution</td> <td>10-17 Bit Singleturn 12 Bit Multiturn</td> </tr> <tr> <td>Max. rotating speed</td> <td>continuous 10000 rpm momentary 12000 rpm</td> </tr> <tr> <td>Max. shaft load</td> <td>40 N (axial) - 60 N (radial)</td> </tr> <tr> <td>Shaft diameter (mm)</td> <td>\varnothing 9.52 - \varnothing 10</td> </tr> <tr> <td>Operating temperature</td> <td>-40 °C \pm 100 °C</td> </tr> <tr> <td>Storage temperature</td> <td>-25 °C \pm 85 °C (due to packaging)</td> </tr> <tr> <td>Vibration resistance (EN 60068-2-6)</td> <td>100 m/s² (10 \pm 2000 Hz)</td> </tr> <tr> <td>Shock resistance (EN 60068-2-27)</td> <td>1000 m/s² (6 ms)</td> </tr> <tr> <td>Protection class (EN 60529)</td> <td>IP 64 standard IP 67 optional</td> </tr> <tr> <td>Torque</td> <td>\leq 0.01 Nm</td> </tr> <tr> <td>Moment of inertia</td> <td>3.8×10^{-6} kgm²</td> </tr> <tr> <td>Power supply</td> <td>10 \pm 30 V or 5 V \pm 10%</td> </tr> <tr> <td>Current consumption</td> <td>100 mA (ST), 150 mA (MT), 250 mA (SP)</td> </tr> <tr> <td>Protocol</td> <td>BiSS-C, SSI (with or without SinCos 1 Vpp)</td> </tr> <tr> <td>Output code</td> <td>Binary, Gray</td> </tr> <tr> <td>Electrical connections</td> <td>see related table</td> </tr> <tr> <td>Weight</td> <td>260 g (ST), 310 g (MT)</td> </tr> </table>		Resolution	10-17 Bit Singleturn 12 Bit Multiturn	Max. rotating speed	continuous 10000 rpm momentary 12000 rpm	Max. shaft load	40 N (axial) - 60 N (radial)	Shaft diameter (mm)	\varnothing 9.52 - \varnothing 10	Operating temperature	-40 °C \pm 100 °C	Storage temperature	-25 °C \pm 85 °C (due to packaging)	Vibration resistance (EN 60068-2-6)	100 m/s ² (10 \pm 2000 Hz)	Shock resistance (EN 60068-2-27)	1000 m/s ² (6 ms)	Protection class (EN 60529)	IP 64 standard IP 67 optional	Torque	\leq 0.01 Nm	Moment of inertia	3.8×10^{-6} kgm ²	Power supply	10 \pm 30 V or 5 V \pm 10%	Current consumption	100 mA (ST), 150 mA (MT), 250 mA (SP)	Protocol	BiSS-C, SSI (with or without SinCos 1 Vpp)	Output code	Binary, Gray	Electrical connections	see related table	Weight
Resolution	10-17 Bit Singleturn 12 Bit Multiturn																																		
Max. rotating speed	continuous 10000 rpm momentary 12000 rpm																																		
Max. shaft load	40 N (axial) - 60 N (radial)																																		
Shaft diameter (mm)	\varnothing 9.52 - \varnothing 10																																		
Operating temperature	-40 °C \pm 100 °C																																		
Storage temperature	-25 °C \pm 85 °C (due to packaging)																																		
Vibration resistance (EN 60068-2-6)	100 m/s ² (10 \pm 2000 Hz)																																		
Shock resistance (EN 60068-2-27)	1000 m/s ² (6 ms)																																		
Protection class (EN 60529)	IP 64 standard IP 67 optional																																		
Torque	\leq 0.01 Nm																																		
Moment of inertia	3.8×10^{-6} kgm ²																																		
Power supply	10 \pm 30 V or 5 V \pm 10%																																		
Current consumption	100 mA (ST), 150 mA (MT), 250 mA (SP)																																		
Protocol	BiSS-C, SSI (with or without SinCos 1 Vpp)																																		
Output code	Binary, Gray																																		
Electrical connections	see related table																																		
Weight	260 g (ST), 310 g (MT)																																		

ORDERING CODE

MODEL	TYPE / OUTPUT	RESOL. Bit (MT)	RESOL. Bit (ST)	POWER SUPPLY	\varnothing SHAFT	CONNECTOR	SIGNAL	CONNECTION	OPTIONS
AEN536	M R	12	12	1030	D10	CG	SG	11	V2

S = singleturn M = multiturn R = radial A = axial	00 = if ST 12 = 12 Bit	10 = 10 Bit * 12 = 12 Bit 13 = 13 Bit 14 = 14 Bit 17 = 17 Bit 0360 = 360 increment ST * 0720 = 720 increment ST *	1030 = 10 \pm 30 V 05V = 5 V **	952 = \varnothing 9.52 mm D10 = \varnothing 10 mm	CG = M23 12 Pin CT = M12 8 Pin **	BE = BiSS-C BV = BiSS-C+1Vpp SB = SSI Binary SG = SSI Gray SC = SSI Gray+1Vpp SP = SSI program. SR = SSI Binary+ Preset active high SH = SSI Gray+ Preset active high	n = connection number No cod. = standard V2 = IP 67
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* Only singleturn version
 ** Not available for SP version

Example  **ABSOLUTE OPTICAL ENCODER AEN536 MR 1212 1030 D10 CG SG 11 V2**

Code ST05	Project E04-A	Release B	TECHNICAL DATASHEET
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ELECTRICAL CONNECTIONS

Encoder supplied with M23 (12 Pin) connector

CONNECTION				
N. Pin	Signals (BE, SB, SG)	Signals (SC, BV)	Signals (SP)	Signals (SR, SH)
1	0 V (supply voltage)	0 V (supply voltage)	Clock	0 V (supply voltage)
2	Data	Data	Clock	Data
3	Clock	Clock	Data	Clock
4	n.c.	A	Data	n.c.
5	Direction *	Direction *	RS 232 TxD	Direction **
6	n.c.	B	RS 232 RxD	n.c.
7	n.c.	A	0 V (signal output)	n.c.
8	+ V	+ V	Direction	+ V
9	n.c.	B	Preset 1	n.c.
10	Data	Data	Preset 2	Data
11	Clock	Clock	+ V	Clock
12	0 V (signal output)	Sense	0 V (supply voltage)	Preset **

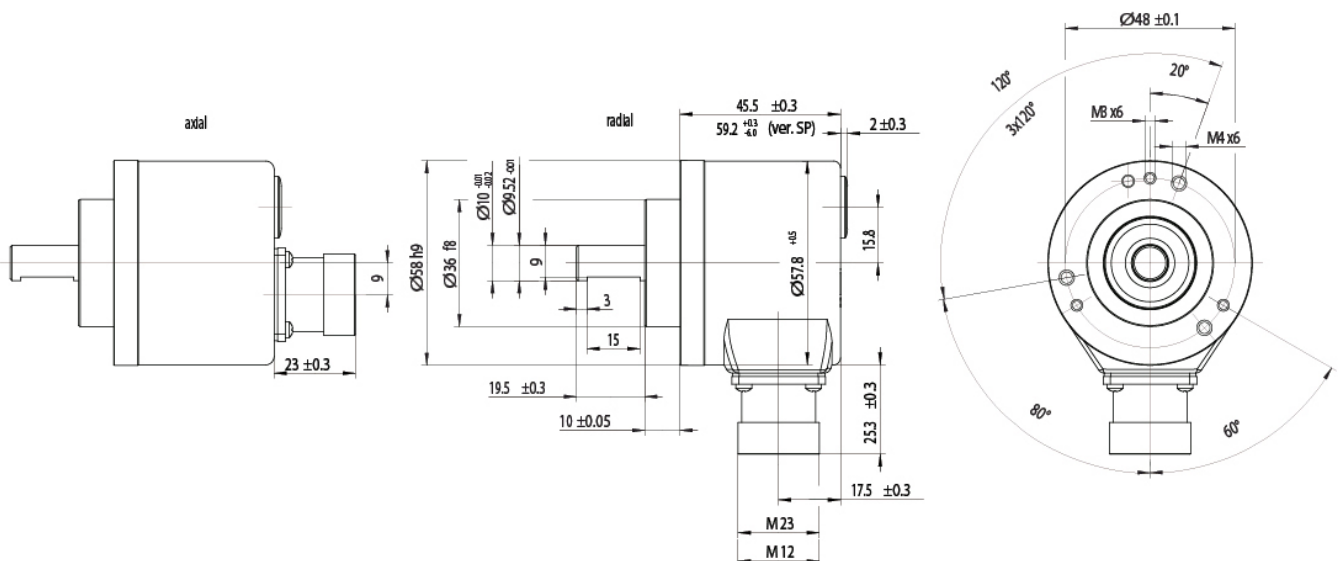
Encoder supplied with M12 (8 Pin) connector

CONNECTION	
N. Pin	Signals (BE, SB, SG)
1	+ V
2	0 V
3	n.c.
4	Clock
5	Data
6	Clock
7	Direction *
8	Data

* Not connected = ascending code values with clockwise rotation
 Connected to 0 V = descending code values with clockwise rotation

** Preset and Direction active with signal high

DIMENSIONS



WHAT TO AVOID

- Any mechanical working (cutting, drilling, milling, etc.).
- Any modification of the encoder body or shaft.
- Any improper use, not complying with the technical instructions provided by the Manufacturer.
- External shocks or stresses.



Code ST05	Project E06-A	Release C	TECHNICAL DATASHEET
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ABSOLUTE OPTICAL ENCODER AEN500 (Serial)

GENERAL FEATURES

- Absolute optical encoder (singleturn or multiturn).
- Output protocol: **SSI-BISS**.
- Aluminium flange and housing.
- Radial or axial output with connector M23 12 Pin or M12 8 Pin.



MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL <ul style="list-style-type: none"> • Round flange, with centering \varnothing 50 mm. • Aluminium housing. • Stainless steel shaft. • Ball bearings with special high-sealed screens. • High protection even in harsh environmental conditions. ELECTRICAL <ul style="list-style-type: none"> • Input (direction). • Option: 1 Vpp analog signal. 	Cod. AEN500		
	Resolution 360 / 720 cpr 10-17 Bit Singleturn 12 Bit Multiturn		
	Max. rotating speed momentary 12000 rpm continuous 10000 rpm		
	Centering (mm) \varnothing 50		
	Max. shaft load 40 N (axial) - 60 N (radial)		
	Shaft diameter (mm) \varnothing 6 others on request		
	Operating temperature $0^{\circ}\text{C} \div 70^{\circ}\text{C}$ others on request		
	Storage temperature $-25^{\circ}\text{C} \div 85^{\circ}\text{C}$		
	Vibration resistance (EN 60068-2-6) $100 \text{ m/s}^2 (10 \div 2000 \text{ Hz})$		
	Shock resistance (EN 60068-2-27) $1000 \text{ m/s}^2 (6 \text{ ms})$		
	Protection class (EN 60529) IP 64 standard IP 67 optional		
	Torque $\leq 0.01 \text{ Nm}$		
	Moment of inertia $3.8 \times 10^{-6} \text{ kgm}^2$		
	Power supply $10 \div 30 \text{ V}$ or $5 \text{ V} \pm 10\%$		
	Current consumption 100 mA (ST), 150 mA (MT), 250 mA (SP)		
	Protocol BiSS, SSI (with or without SinCos 1 Vpp)		
	Output code Binary, Gray		
	Electrical connections see related table		
	Weight 260 g (ST), 310 g (MT)		

ORDERING CODE

MODEL	TYPE / OUTPUT	RESOL. Bit (MT)	RESOL. Bit (ST)	POWER SUPPLY	\varnothing SHAFT	CONNECTOR	SIGNAL	CONNECTION	OPTIONS
AEN500	M R	12	12	1030	D06	CG	SG	11	V2

S = singleturn **00** = if ST **10** = 10 Bit * **1030** = 10÷30 V **D06** = \varnothing 6 mm **CG** = M23 12 Pin **BE** = BiSS **n** = connection number **No cod.** = standard
M = multiturn **12** = 12 Bit **12** = 12 Bit **05V** = 5 V ** **CT** = M12 8 Pin ** **BV** = BiSS+1Vpp **V2** = IP 67
R = radial **13** = 13 Bit **14** = 14 Bit **17** = 17 Bit **SB** = SSI Binary **SG** = SSI Gray **SC** = SSI Gray+1Vpp **SP** = SSI program.
A = axial **0360** = 360 increment ST * **SR** = SSI Binary+ Preset active high
0720 = 720 increment ST * **SH** = SSI Gray+ Preset active high

* Only singleturn version
 ** Not available for SP version

Example  **ABSOLUTE OPTICAL ENCODER AEN500 MR 1212 1030 D06 CG SG 11 V2**

Code ST05	Project E06-A	Release C	TECHNICAL DATASHEET
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ELECTRICAL CONNECTIONS

Encoder supplied with M23 (12 Pin) connector

CONNECTION				
N. Pin	Signals (BE, SB, SG)	Signals (SC, BV)	Signals (SP)	Signals (SR, SH)
1	0 V (supply voltage)	0 V (supply voltage)	Clock	0 V (supply voltage)
2	Data	Data	Clock	Data
3	Clock	Clock	Data	Clock
4	n.c.	A	Data	n.c.
5	Direction *	Direction *	RS 232 TxD	Direction **
6	n.c.	B	RS 232 RxD	n.c.
7	n.c.	A	0 V (signal output)	n.c.
8	+ V	+ V	Direction	+ V
9	n.c.	B	Preset 1	n.c.
10	Data	Data	Preset 2	Data
11	Clock	Clock	+ V	Clock
12	0 V (signal output)	0 V (signal output)	0 V (supply voltage)	Preset **

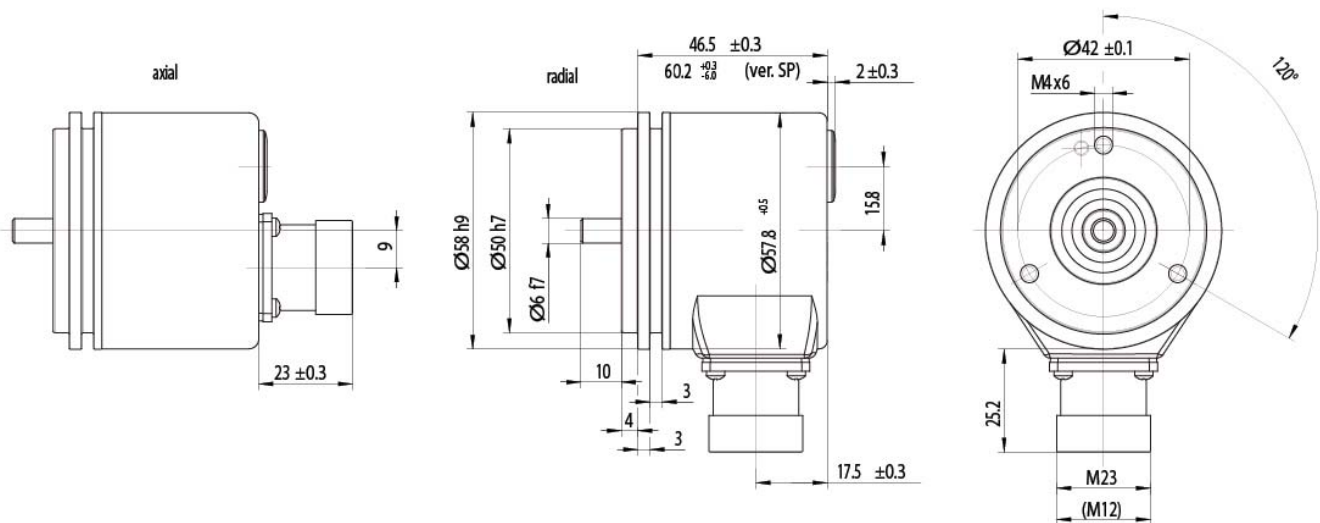
Encoder supplied with M12 (8 Pin) connector

CONNECTION	
N. Pin	Signals (BE, SB, SG)
1	+ V
2	0 V
3	n.c.
4	Clock
5	Data
6	Clock
7	Direction *
8	Data

* Not connected = ascending code values with clockwise rotation
 Connected to 0 V = descending code values with clockwise rotation

** Preset and Direction active with signal high

DIMENSIONS



WHAT TO AVOID

- Any mechanical working (cutting, drilling, milling, etc.).
- Any modification of the encoder body or shaft.
- Any improper use, not complying with the technical instructions provided by the Manufacturer.
- External shocks or stresses.



Code ST05	Project E07-A	Release B	TECHNICAL DATASHEET
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ABSOLUTE OPTICAL ENCODER AEN600 (Serial)

GENERAL FEATURES

- Absolute optical encoder (singleturn or multiturn).
- Output protocol: **SSI, BiSS-C**.
- Aluminium flange and housing.
- Radial or axial output with connector M23 12 Pin or M12 8 Pin.



MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL <ul style="list-style-type: none"> • Round flange, with centering \varnothing 31.75 mm. • Aluminium housing. • Stainless steel shaft. • Ball bearings with special high-sealed screens. • High protection even in harsh environmental conditions. ELECTRICAL <ul style="list-style-type: none"> • Diagnostic LED. • Input (direction). • Output data: status, preset. 	Cod. AEN600	
	Resolution	10-17 Bit Singleturn 12 Bit Multiturn
Max. rotating speed	continuous 10000 rpm momentary 12000 rpm	
Max. shaft load	40 N (axial) - 60 N (radial)	
Shaft diameter (mm)	\varnothing 9.52 - \varnothing 10	
Operating temperature	-40 °C ÷ 100 °C	
Storage temperature	-25 °C ÷ 85 °C (due to packaging)	
Vibration resistance (EN 60068-2-6)	100 m/s ² (10 ÷ 2000 Hz)	
Shock resistance (EN 60068-2-27)	1000 m/s ² (6 ms)	
Protection class (EN 60529)	IP 64 standard IP 67 optional	
Torque	≤ 0.01 Nm	
Moment of inertia	3.8 × 10 ⁻⁶ kgm ²	
Power supply	10 ÷ 30 V or 5 V ± 10%	
Current consumption	100 mA (ST), 150 mA (MT), 250 mA (SP)	
Protocol	BiSS-C, SSI (with or without SinCos 1 Vpp)	
Output code	Binary, Gray	
Electrical connections	see related table	
Weight	260 g (ST), 310 g (MT)	

ORDERING CODE

MODEL	TYPE / OUTPUT	RESOL. Bit (MT)	RESOL. Bit (ST)	POWER SUPPLY	Ø SHAFT	CONNECTOR	SIGNAL	CONNECTION	OPTIONS
AEN600	M R	12	12	1030	D10	CG	SG	11	V2

S = singleturn M = multiturn R = radial A = axial	00 = if ST 12 = 12 Bit	10 = 10 Bit * 12 = 12 Bit 13 = 13 Bit 14 = 14 Bit 17 = 17 Bit 0360 = 360 increment ST * 0720 = 720 increment ST *	1030 = 10-30 V 05V = 5 V **	952 = \varnothing 9.52 mm D10 = \varnothing 10 mm	CG = M23 12 Pin CT = M12 8 Pin **	BE = BiSS-C BV = BiSS-C+1Vpp SB = SSI Binary SG = SSI Gray SC = SSI Gray+1Vpp SP = SSI program. SR = SSI Binary+ Preset active high SH = SSI Gray+ Preset active high	n = connection number No cod. = standard V2 = IP 67
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* Only singleturn version

** Available only for shaft \varnothing 10 mm, IP64, with BE, SB and SG signals

Example  **ABSOLUTE OPTICAL ENCODER AEN600 MR 1212 1030 D10 CG SG 11 V2**

Code ST05	Project E07-A	Release B	TECHNICAL DATASHEET
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ELECTRICAL CONNECTIONS

Encoder supplied with M23 (12 Pin) connector

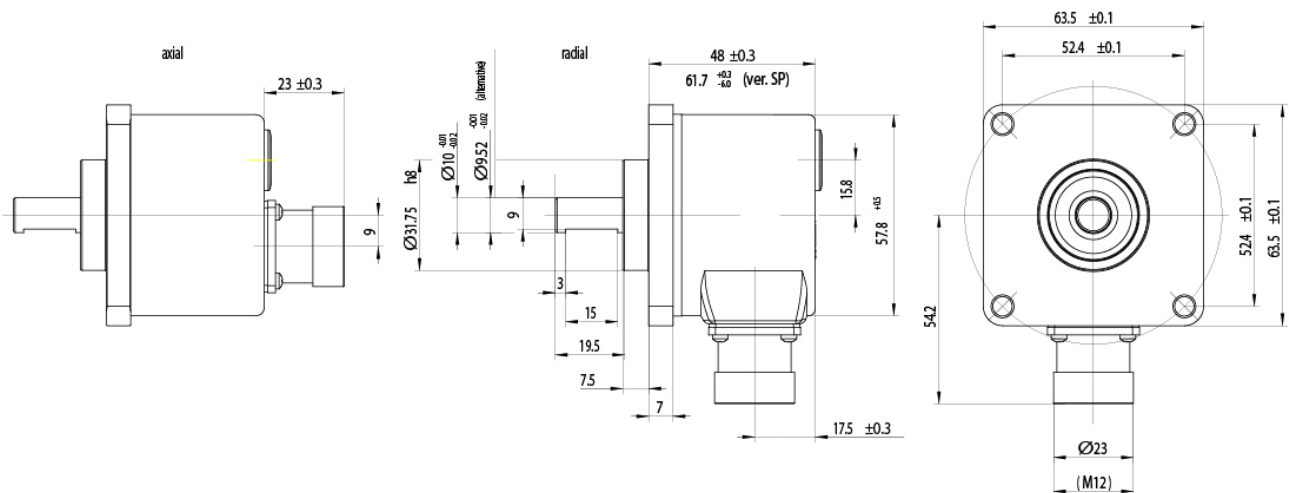
CONNECTION				
N. Pin	Signals (BE, SB, SG)	Signals (SC, BV)	Signals (SP)	Signals (SR, SH)
1	0 V (supply voltage)	0 V (supply voltage)	Clock	0 V (supply voltage)
2	Data	Data	Clock	Data
3	Clock	Clock	Data	Clock
4	n.c.	A	Data	n.c.
5	Direction *	Direction *	RS 232 TxD	Direction **
6	n.c.	B	RS 232 RxD	n.c.
7	n.c.	A	0 V (signal output)	n.c.
8	+ V	+ V	Direction	+ V
9	n.c.	B	Preset 1	n.c.
10	Data	Data	Preset 2	Data
11	Clock	Clock	+ V	Clock
12	0 V (signal output)	Sense	0 V (supply voltage)	Preset **

Encoder supplied with M12 (8 Pin) connector

CONNECTION	
N. Pin	Signals (BE, SB, SG)
1	+ V
2	0 V
3	n.c.
4	Clock
5	Data
6	Clock
7	Direction *
8	Data

* Not connected = ascending code values with clockwise rotation
 Connected to 0 V = descending code values with clockwise rotation
 ** Preset and Direction active with signal high

DIMENSIONS



WHAT TO AVOID

- Any mechanical working (cutting, drilling, milling, etc.).
- Any modification of the encoder body or shaft.
- Any improper use, not complying with the technical instructions provided by the Manufacturer.
- External shocks or stresses.



Code ST05	Project E12-A	Release B	TECHNICAL DATASHEET
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ABSOLUTE OPTICAL ENCODER AEN58SC (Serial)

GENERAL FEATURES

- Absolute optical encoder (singleturn or multiturn).
- Output protocol: **SSI, BiSS-C**.
- Aluminium flange and housing.
- Radial or axial output with connector M23 12 Pin or M12 8 Pin.



MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL	Cod. AEN58SC	
• Elastic flange.	Resolution	10-17 Bit Singleturn 12 Bit Multiturn
• Aluminium housing.	Max. rotating speed	continuous 10000 rpm momentary 12000 rpm
• Stainless steel shaft.	Max. shaft load	40 N (axial) - 60 N (radial)
• Ball bearings with special high-sealed screens.	Shaft diameter (mm)	Ø 9.52 - Ø 10 - Ø 12
• High protection even in harsh environmental conditions.	Operating temperature	-40 °C ÷ 100 °C
	Storage temperature	-25 °C ÷ 85 °C (due to packaging)
	Vibration resistance (EN 60068-2-6)	100 m/s ² (10 ÷ 2000 Hz)
	Shock resistance (EN 60068-2-27)	1000 m/s ² (6 ms)
	Protection class (EN 60529)	IP 64
	Torque	≤ 0.01 Nm
	Moment of inertia	3.8 × 10 ⁻⁶ kgm ²
	Power supply	10 ÷ 30 V or 5 V ± 10%
	Current consumption	100 mA (ST), 150 mA (MT), 250 mA (SP)
	Protocol	BiSS-C, SSI (with or without SinCos 1 Vpp)
	Output code	Binary, Gray
	Electrical connections	see related table
	Weight	260 g (ST), 310 g (MT)
ELECTRICAL		
• Diagnostic LED.		
• Input (direction).		
• Output data: status, preset.		

ORDERING CODE

MODEL	TYPE / OUTPUT	RESOL. Bit (MT)	RESOL. Bit (ST)	POWER SUPPLY	Ø SHAFT	CONNECTOR	SIGNAL	CONNECTION	OPTIONS
AEN58SC	MR	12	12	1030	D10	CG	SG	11	

S = singleturn
M = multiturn
R = radial
A = axial

00 = if ST
12 = 12 Bit
10 = 10 Bit *
12 = 12 Bit
13 = 13 Bit
14 = 14 Bit
17 = 17 Bit
0360 = 360 increment ST *
0720 = 720 increment ST *

1030 = 10÷30 V
05V = 5 V **

952 = ø 9.52 mm
D10 = ø 10 mm
D12 = ø 12 mm

CG = M23 12 Pin
CT = M12 8 Pin **

BE = BiSS-C
BV = BiSS-C+1Vpp
SB = SSI Binary
SG = SSI Gray
SC = SSI Gray+1Vpp
SP = SSI program.
SR = SSI Binary+
Preset active high
SH = SSI Gray+
Preset active high

n = connection number

No cod. = standard

* Only singleturn version

** Not available for SP version

Example  **ABSOLUTE OPTICAL ENCODER AEN58SC MR 1212 1030 D10 CG SG 11**

Code ST05	Project E12-A	Release B	TECHNICAL DATASHEET
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ELECTRICAL CONNECTIONS

Encoder supplied with M23 (12 Pin) connector

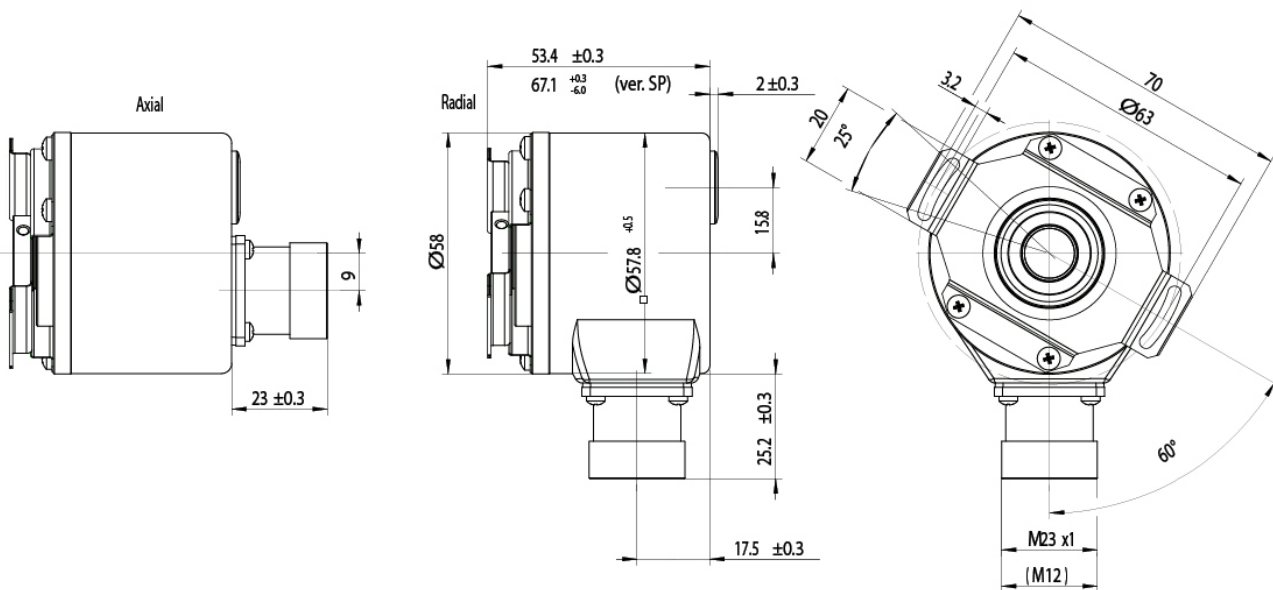
CONNECTION				
N. Pin	Signals (BE, SB, SG)	Signals (SC, BV)	Signals (SP)	Signals (SR, SH)
1	0 V (supply voltage)	0 V (supply voltage)	Clock	0 V (supply voltage)
2	Data	Data	Clock	Data
3	Clock	Clock	Data	Clock
4	n.c.	A	Data	n.c.
5	Direction *	Direction *	RS 232 TxD	Direction **
6	n.c.	B	RS 232 RxD	n.c.
7	n.c.	A	0 V (signal output)	n.c.
8	+ V	+ V	Direction	+ V
9	n.c.	B	Preset 1	n.c.
10	Data	Data	Preset 2	Data
11	Clock	Clock	+ V	Clock
12	0 V (signal output)	Sense	0 V (supply voltage)	Preset **

* Not connected = ascending code values with clockwise rotation
 Connected to 0 V = descending code values with clockwise rotation
 ** Preset and Direction active with signal high

Encoder supplied with M12 (8 Pin) connector

CONNECTION	
N. Pin	Signals (BE, SB, SG)
1	+ V
2	0 V
3	n.c.
4	Clock
5	Data
6	Clock
7	Direction *
8	Data

DIMENSIONS



WHAT TO AVOID

- Any mechanical working (cutting, drilling, milling, etc.).
- Any modification of the encoder body or shaft.
- Any improper use, not complying with the technical instructions provided by the Manufacturer.
- External shocks or stresses.



Code ST06	Project E04-A	Release A	TECHNICAL DATASHEET
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ABSOLUTE OPTICAL ENCODER AEN536 (Parallel)

GENERAL FEATURES

- Absolute optical encoder (singleturn or multiturn).
- Output protocol: **Parallel (Gray or Binary)**.
- Aluminium flange and housing.
- Axial or radial output with connector or sealed cable exit.



MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL <ul style="list-style-type: none"> • Round flange, with centering Ø 36 mm. • Aluminium housing. • Stainless steel shaft. • Ball bearings with special high-sealed screens. • High protection even in harsh environmental conditions. ELECTRICAL <ul style="list-style-type: none"> • Diagnostic LED. • Input (direction). • Output data: status, preset. 	Cod. AEN536	
	Resolution	10-14 Bit Singleturn 4-8-12 Bit Multiturn
	Max. rotating speed	continuous 10000 rpm momentary 12000 rpm
	Max. shaft load	40 N (axial) - 60 N (radial)
	Shaft diameter (mm)	Ø 9.52 – Ø 10
	Operating temperature	-40 °C ÷ 100 °C
	Storage temperature	-40 °C ÷ 85 °C
	Vibration resistance (EN 60068-2-6)	100 m/s ² (10 ÷ 2000 Hz)
	Shock resistance (EN 60068-2-27)	1000 m/s ² (6 ms)
	Protection class (EN 60529)	IP 64 standard IP 67 optional
	Torque	0.01 Ncm
	Moment of inertia	3.8 x 10 ⁻⁶ kgm ²
	Power supply	10 ÷ 30 V ± 10%
	Current consumption	200 mA (SG), 300 mA (MG)
	Protocol	Parallel
Output code	Binary, Gray	
Electrical connections	see related table	
Weight	350 g (SG), 400 g (MG)	

ORDERING CODE

MODEL	TYPE / OUTPUT	RESOL. Bit (MG)	RESOL. Bit (SG)	POWER SUPPLY	Ø SHAFT	CABLE / CONNECTOR	SIGNAL	CONNECTION	OPTIONS
AEN536	M R	08	12 *	1030	D10	M01	PB	C	V2

S = singleturn M = multiturn R = radial A = axial	00 = if SG 04 = 4 Bit 08 = 8 Bit 12 = 12 Bit	10 = 10 Bit 12 = 12 Bit 13 = 13 Bit 14 = 14 Bit 0360 = 360 increment SG 0720 = 720 increment SG	1030 = 10÷30 V	952 = ø9.52 mm D10 = ø10 mm	Mnn = cable length in m CQ = M23 17 Pin	PB = Parallel Binary PG = Parallel Gray	C = cable n = connection number	No cod. = standard V2 = IP 67
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* If the encoder is Multiturn, the possible resolution SG can be only 12 Bit.

Example **ABSOLUTE OPTICAL ENCODER AEN536 MR 0812 1030 D10 M01 PB C V2**

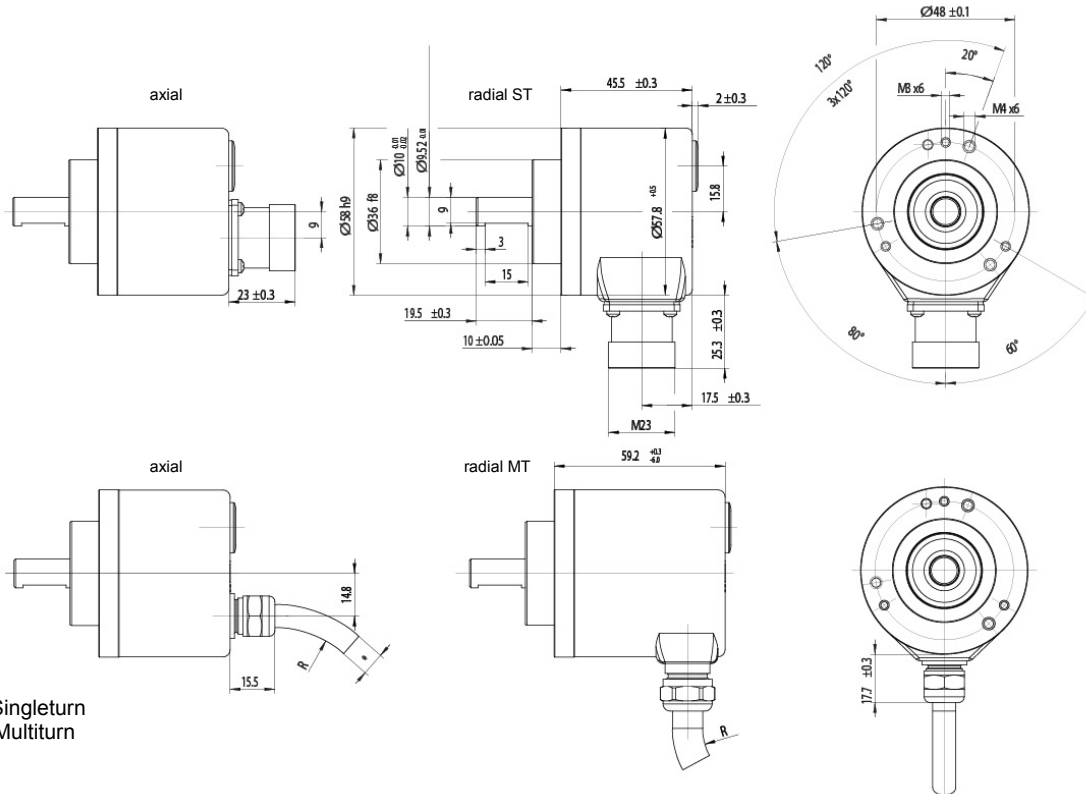
Code ST06	Project E04-A	Release A	TECHNICAL DATASHEET
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CABLE AND ELECTRICAL CONNECTIONS

SINGLETURN, CABLE OUTPUT					
Color	9 Bit / 360 inc.	10 Bit / 720 inc.	12 Bit	13 Bit	14 Bit
Grey/Pink	n.c.	n.c.	n.c.	n.c.	S0 (LSB)
Brown/Yellow	n.c.	n.c.	n.c.	S0 (LSB)	S1
Brown/Grey	n.c.	n.c.	S0 (LSB)	S1	S2
Red/Blue	n.c.	n.c.	S1	S2	S3
Violet	n.c.	S0 (LSB)	S2	S3	S4
White/Brown	S0 (LSB)	S1	S3	S4	S5
White/Green	S1	S2	S4	S5	S6
White/Yellow	S2	S3	S5	S6	S7
White/Grey	S3	S4	S6	S7	S8
White/Pink	S4	S5	S7	S8	S9
White/Blue	S5	S6	S8	S9	S10
White/Red	S6	S7	S9	S10	S11
White/Black	S7	S8	S10	S11	S12
Brown/Green	S8 (MSB)	S9 (MSB)	S11 (MSB)	S12 (MSB)	S13 (MSB)
Yellow	Tristate S0 + S8	Tristate S0 + S9	Tristate S0 + S11	Tristate S0 + S12	Tristate S0 + S13
Pink	Latch	Latch	Latch	Latch	Latch
Green	Direction	Direction	Direction	Direction	Direction
Black	0 V	0 V	0 V	0 V	0 V
Red	+ V	+ V	+ V	+ V	+ V
Brown	Alarm	Alarm	Alarm	Alarm	Alarm

SINGLETURN, CONNECTOR M23 (17 Pin)					
Pin	9 Bit / 360 inc.	10 Bit / 720 inc.	12 Bit	13 Bit	14 Bit
1	S0 (LSB)	S0 (LSB)	S0 (LSB)	S12 (MSB)	S13 (MSB)
2	S1	S1	S1	S11	S12
3	S2	S2	S2	S10	S11
4	S3	S3	S3	S9	S10
5	S4	S4	S4	S8	S9
6	S5	S5	S5	S7	S8
7	S6	S6	S6	S6	S7
8	S7	S7	S7	S5	S6
9	S8 (MSB)	S8	S8	S4	S5
10	n.c.	S9 (MSB)	S9	S3	S4
11	n.c.	n.c.	S10	S2	S3
12	Tristate S0 + S8	Tristate S0 + S9	S11 (MSB)	S1	S2
13	Latch	Latch	Latch	S0 (LSB)	S1
14	Direction	Direction	Direction	Direction	S0 (LSB)
15	0 V	0 V	0 V	0 V	0 V
16	+ V	+ V	+ V	+ V	+ V
17	Alarm	Alarm	Alarm	Alarm / Latch	Alarm / Latch

DIMENSIONS



WHAT TO AVOID <ul style="list-style-type: none"> Any mechanical working (cutting, drilling, milling, etc.). Any modification of the encoder body or shaft. Any improper use, not complying with the technical instructions provided by the Manufacturer. External shocks or stresses. 	
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Code ST06	Project E06-A	Release A	TECHNICAL DATASHEET
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ABSOLUTE OPTICAL ENCODER AEN500 (Parallel)

GENERAL FEATURES

- Absolute optical encoder (singleturn or multiturn).
- Output protocol: **Parallel (Gray or Binary)**.
- Aluminium flange and housing.
- Axial or radial output with connector or sealed cable exit.



MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL <ul style="list-style-type: none"> • Round flange, with centering \varnothing 50 mm. • Aluminium housing. • Stainless steel shaft. • Ball bearings with special high-sealed screens. • High protection even in harsh environmental conditions. ELECTRICAL <ul style="list-style-type: none"> • Diagnostic LED. • Input (direction). • Output data: status, preset. 	Cod. AEN500	
	Resolution	10-14 Bit Singleturn 4-8-12 Bit Multiturn
	Max. rotating speed	continuous 10000 rpm momentary 12000 rpm
	Max. shaft load	40 N (axial) - 60 N (radial)
	Shaft diameter (mm)	\varnothing 6
	Operating temperature	-40 °C + 100 °C
	Storage temperature	-40 °C + 85 °C
	Vibration resistance (EN 60068-2-6)	100 m/s ² (10 + 2000 Hz)
	Shock resistance (EN 60068-2-27)	1000 m/s ² (6 ms)
	Protection class (EN 60529)	IP 64 standard IP 67 optional
	Torque	0.01 Ncm
	Moment of inertia	3.8 x 10 ⁻⁶ kgm ²
	Power supply	10 + 30 V \pm 10%
	Current consumption	200 mA (SG), 300 mA (MG)
	Protocol	Parallel
	Output code	Binary, Gray
	Electrical connections	see related table
	Weight	350 g (SG), 400 g (MG)

ORDERING CODE

MODEL	TYPE / OUTPUT	RESOL. Bit (MG)	RESOL. Bit (SG)	POWER SUPPLY	\varnothing SHAFT	CABLE / CONNECTOR	SIGNAL	CONNECTION	OPTIONS
AEN500	M R	08	12 *	1030	D06	M01	PB	C	V2

S = singleturn	00 = if SG	10 = 10 Bit	1030 = 10+30 V	D06 = \varnothing 6 mm	Mnn = cable length in m	PB = Parallel Binary	C = cable n = connection number	No cod. = standard = IP 67
M = multiturn	04 = 4 Bit	12 = 12 Bit			CQ = M23 17 Pin	PG = Parallel Gray		
R = radial	08 = 8 Bit	13 = 13 Bit						
A = axial	12 = 12 Bit	14 = 14 Bit						
		0360 = 360 incrementi SG						
		0720 = 720 incrementi SG						

* If the encoder is Multiturn, the possible resolution SG can be only 12 Bit.

Example **ABSOLUTE OPTICAL ENCODER AEN500 MR 0812 1030 D06 M01 PB C V2**

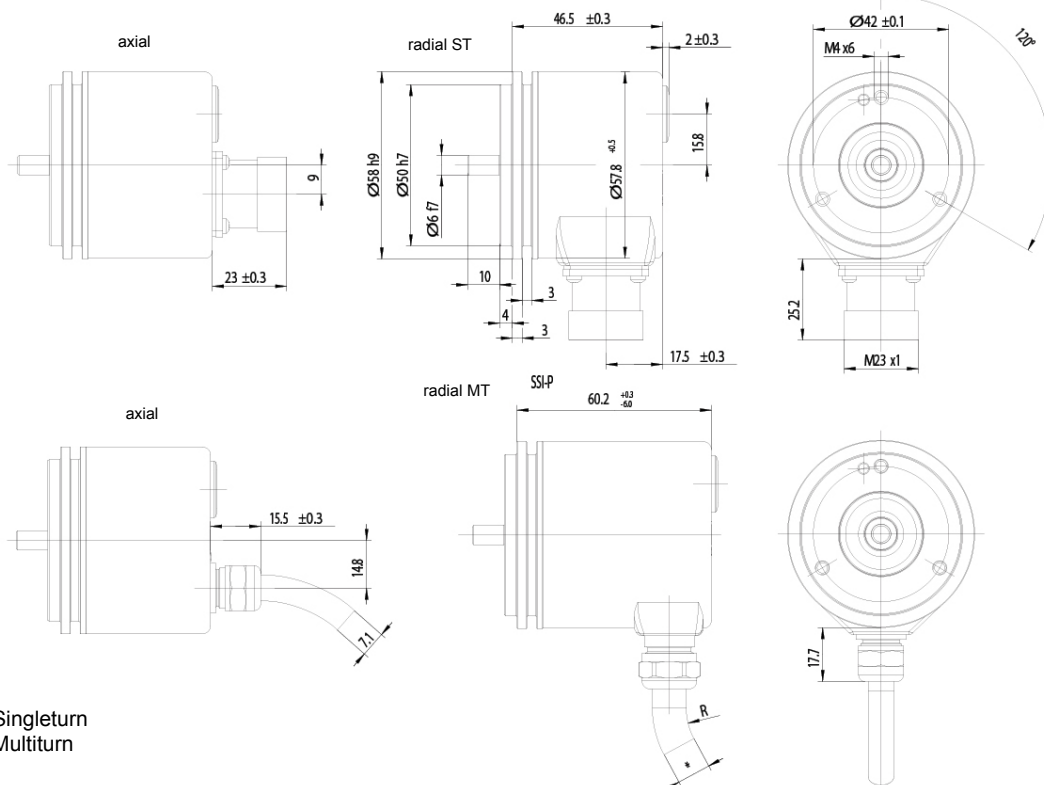
Code ST06	Project E06-A	Release A	TECHNICAL DATASHEET
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CABLE AND ELECTRICAL CONNECTIONS

SINGLETURN, CABLE OUTPUT					
Color	9 Bit / 360 inc.	10 Bit / 720 inc.	12 Bit	13 Bit	14 Bit
Grey/Pink	n.c.	n.c.	n.c.	n.c.	S0 (LSB)
Brown/Yellow	n.c.	n.c.	n.c.	S0 (LSB)	S1
Brown/Grey	n.c.	n.c.	S0 (LSB)	S1	S2
Red/Blue	n.c.	n.c.	S1	S2	S3
Violet	n.c.	S0 (LSB)	S2	S3	S4
White/Brown	S0 (LSB)	S1	S3	S4	S5
White/Green	S1	S2	S4	S5	S6
White/Yellow	S2	S3	S5	S6	S7
White/Grey	S3	S4	S6	S7	S8
White/Pink	S4	S5	S7	S8	S9
White/Blue	S5	S6	S8	S9	S10
White/Red	S6	S7	S9	S10	S11
White/Black	S7	S8	S10	S11	S12
Brown/Green	S8 (MSB)	S9 (MSB)	S11 (MSB)	S12 (MSB)	S13 (MSB)
Yellow	Tristate S0 + S8	Tristate S0 + S9	Tristate S0 + S11	Tristate S0 + S12	Tristate S0 + S13
Pink	Latch	Latch	Latch	Latch	Latch
Green	Direction	Direction	Direction	Direction	Direction
Black	0 V	0 V	0 V	0 V	0 V
Red	+ V	+ V	+ V	+ V	+ V
Brown	Alarm	Alarm	Alarm	Alarm	Alarm

SINGLETURN, CONNECTOR M23 (17 Pin)					
Pin	9 Bit / 360 inc.	10 Bit / 720 inc.	12 Bit	13 Bit	14 Bit
1	S0 (LSB)	S0 (LSB)	S0 (LSB)	S12 (MSB)	S13 (MSB)
2	S1	S1	S1	S11	S12
3	S2	S2	S2	S10	S11
4	S3	S3	S3	S9	S10
5	S4	S4	S4	S8	S9
6	S5	S5	S5	S7	S8
7	S6	S6	S6	S6	S7
8	S7	S7	S7	S5	S6
9	S8 (MSB)	S8	S8	S4	S5
10	n.c.	S9 (MSB)	S9	S3	S4
11	n.c.	n.c.	S10	S2	S3
12	Tristate S0 + S8	Tristate S0 + S9	S11 (MSB)	S1	S2
13	Latch	Latch	Latch	S0 (LSB)	S1
14	Direction	Direction	Direction	Direction	S0 (LSB)
15	0 V	0 V	0 V	0 V	0 V
16	+ V	+ V	+ V	+ V	+ V
17	Alarm	Alarm	Alarm	Alarm / Latch	Alarm / Latch

DIMENSIONS



WHAT TO AVOID

- Any mechanical working (cutting, drilling, milling, etc.).
- Any modification of the encoder body or shaft.
- Any improper use, not complying with the technical instructions provided by the Manufacturer.
- External shocks or stresses.



Code ST06	Project E07-A	Release A	TECHNICAL DATASHEET
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ABSOLUTE OPTICAL ENCODER AEN600 (Parallel)

GENERAL FEATURES

- Absolute optical encoder (singleturn or multiturn).
- Output protocol: **Parallel (Gray or Binary)**.
- Aluminium flange and housing.
- Axial or radial output with connector or sealed cable exit.



MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL <ul style="list-style-type: none"> • Square flange, with centering Ø 31.75 mm. • Aluminium housing. • Stainless steel shaft. • Ball bearings with special high-sealed screens. • High protection even in harsh environmental conditions. ELECTRICAL <ul style="list-style-type: none"> • Diagnostic LED. • Input (direction). • Output data: status, preset. 	Cod. AEN600	
	Resolution	10-14 Bit Singleturn 4-8-12 Bit Multiturn
	Max. rotating speed	continuous 10000 rpm momentary 12000 rpm
	Max. shaft load	40 N (axial) - 60 N (radial)
	Shaft diameter (mm)	Ø 9.52 – Ø 10
	Operating temperature	-40 °C ÷ 100 °C
	Storage temperature	-40 °C ÷ 85 °C
	Vibration resistance (EN 60068-2-6)	100 m/s ² (10 ÷ 2000 Hz)
	Shock resistance (EN 60068-2-27)	1000 m/s ² (6 ms)
	Protection class (EN 60529)	IP 64 standard IP 67 optional
	Torque	0.01 Ncm
	Moment of inertia	3.8 x 10 ⁻⁶ kgm ²
	Power supply	10 ÷ 30 V ± 10%
	Current consumption	200 mA (SG), 300 mA (MG)
	Protocol	Parallel
Output code	Binary, Gray	
Electrical connections	see related table	
Weight	350 g (SG), 400 g (MG)	

ORDERING CODE

MODEL	TYPE / OUTPUT	RESOL. Bit (MG)	RESOL. Bit (SG)	POWER SUPPLY	Ø SHAFT	CABLE / CONNECTOR	SIGNAL	CONNECTION	OPTIONS
AEN600	M R	08	12 *	1030	D10	M01	PB	C	V2

S = singleturn **00** = if SG **10** = 10 Bit **1030** = 10÷30 V **952** = ø9.52 mm **Mnn** = cable length in m **PB** = Parallel Binary **C** = cable **No cod.** = standard
M = multiturn **04** = 4 Bit **12** = 12 Bit **D10** = ø10 mm **CQ** = M23 17 Pin **PG** = Parallel Gray **n** = connection number **V2** = IP 67
R = radial **08** = 8 Bit **13** = 13 Bit
A = axial **12** = 12 Bit **14** = 14 Bit
0360 = 360 increment SG
0720 = 720 increment SG

* If the encoder is Multiturn, the possible resolution SG can be only 12 Bit.

Example  **ABSOLUTE OPTICAL ENCODER AEN600 MR 0812 1030 D10 M01 PB C V2**

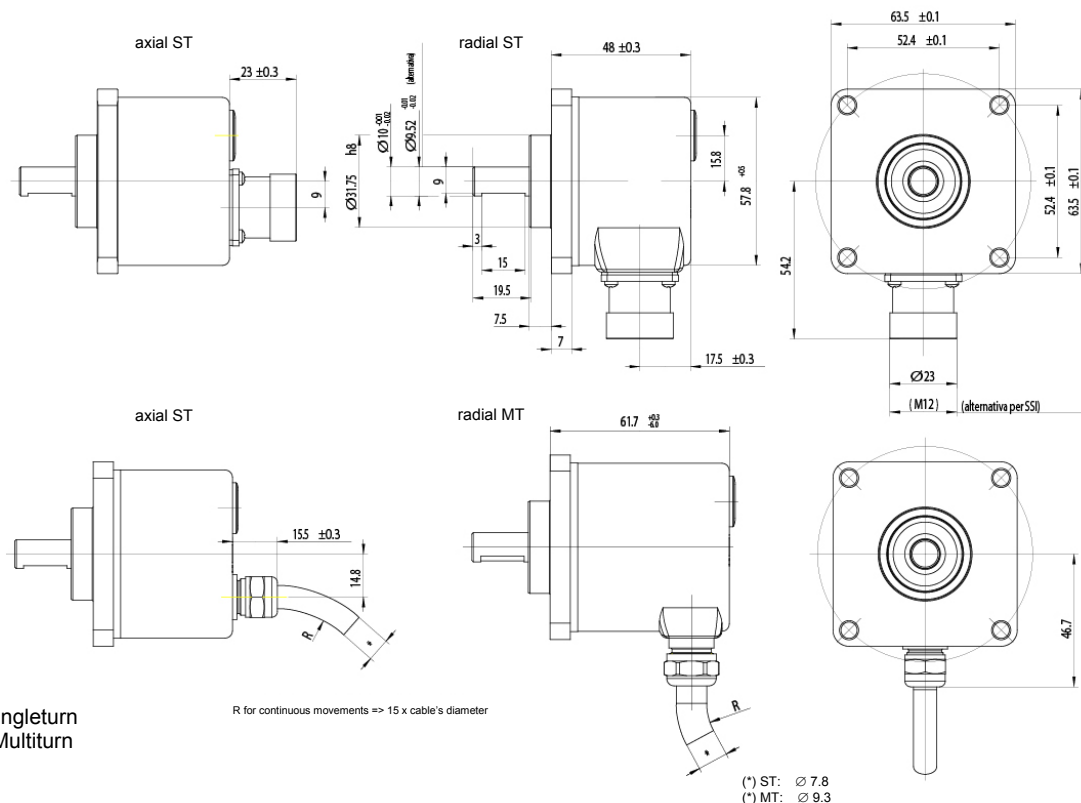
Code ST06	Project E07-A	Release A	TECHNICAL DATASHEET
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CABLE AND ELECTRICAL CONNECTIONS

SINGLETURN, CABLE OUTPUT					
Color	9 Bit / 360 inc.	10 Bit / 720 inc.	12 Bit	13 Bit	14 Bit
Grey/Pink	n.c.	n.c.	n.c.	n.c.	S0 (LSB)
Brown/Yellow	n.c.	n.c.	n.c.	S0 (LSB)	S1
Brown/Grey	n.c.	n.c.	S0 (LSB)	S1	S2
Red/Blue	n.c.	n.c.	S1	S2	S3
Violet	n.c.	S0 (LSB)	S2	S3	S4
White/Brown	S0 (LSB)	S1	S3	S4	S5
White/Green	S1	S2	S4	S5	S6
White/Yellow	S2	S3	S5	S6	S7
White/Grey	S3	S4	S6	S7	S8
White/Pink	S4	S5	S7	S8	S9
White/Blue	S5	S6	S8	S9	S10
White/Red	S6	S7	S9	S10	S11
White/Black	S7	S8	S10	S11	S12
Brown/Green	S8 (MSB)	S9 (MSB)	S11 (MSB)	S12 (MSB)	S13 (MSB)
Yellow	Tristate S0 + S8	Tristate S0 + S9	Tristate S0 + S11	Tristate S0 + S12	Tristate S0 + S13
Pink	Latch	Latch	Latch	Latch	Latch
Green	Direction	Direction	Direction	Direction	Direction
Black	0 V	0 V	0 V	0 V	0 V
Red	+ V	+ V	+ V	+ V	+ V
Brown	Alarm	Alarm	Alarm	Alarm	Alarm

SINGLETURN, CONNECTOR M23 (17 Pin)					
Pin	9 Bit / 360 inc.	10 Bit / 720 inc.	12 Bit	13 Bit	14 Bit
1	S0 (LSB)	S0 (LSB)	S0 (LSB)	S12 (MSB)	S13 (MSB)
2	S1	S1	S1	S11	S12
3	S2	S2	S2	S10	S11
4	S3	S3	S3	S9	S10
5	S4	S4	S4	S8	S9
6	S5	S5	S5	S7	S8
7	S6	S6	S6	S6	S7
8	S7	S7	S7	S5	S6
9	S8 (MSB)	S8	S8	S4	S5
10	n.c.	S9 (MSB)	S9	S3	S4
11	n.c.	n.c.	S10	S2	S3
12	Tristate S0 + S8	Tristate S0 + S9	S11 (MSB)	S1	S2
13	Latch	Latch	Latch	S0 (LSB)	S1
14	Direction	Direction	Direction	Direction	S0 (LSB)
15	0 V	0 V	0 V	0 V	0 V
16	+ V	+ V	+ V	+ V	+ V
17	Alarm	Alarm	Alarm	Alarm / Latch	Alarm / Latch

DIMENSIONS



WHAT TO AVOID

- Any mechanical working (cutting, drilling, milling, etc.).
- Any modification of the encoder body or shaft.
- Any improper use, not complying with the technical instructions provided by the Manufacturer.
- External shocks or stresses.



Code ST06	Project E12-A	Release A	TECHNICAL DATASHEET
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ABSOLUTE OPTICAL ENCODER AEN58SC (Parallel)

GENERAL FEATURES

- Absolute optical encoder (singleturn or multiturn).
- Output protocol: **Parallel (Gray or Binary)**.
- Aluminium flange and housing.
- Axial or radial output with connector or sealed cable exit.



MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL <ul style="list-style-type: none"> • Elastic flange. • Aluminium housing. • Stainless steel shaft. • Ball bearings with special high-sealed screens. • High protection even in harsh environmental conditions. ELECTRICAL <ul style="list-style-type: none"> • Diagnostic LED. • Input (direction). • Output data: status, preset. 	Cod. AEN58SC	
	Resolution	10-14 Bit Singleturn 4-8-12 Bit Multiturn
Max. rotating speed	continuous 10000 rpm momentary 12000 rpm	
Max. shaft load	40 N (axial) - 60 N (radial)	
Shaft diameter (mm)	Ø 9.52 - Ø 10 - Ø 12	
Operating temperature	-40 °C ÷ 100 °C	
Storage temperature	-40 °C ÷ 85 °C	
Vibration resistance (EN 60068-2-6)	100 m/s ² (10 ÷ 2000 Hz)	
Shock resistance (EN 60068-2-27)	1000 m/s ² (6 ms)	
Protection class (EN 60529)	IP 64	
Torque	≤ 0.01 Ncm	
Moment of inertia	3.8 x 10 ⁻⁶ kgm ²	
Power supply	10 ÷ 30 V or 5 V ± 10%	
Current consumption	200 mA (ST), 300 mA (MT)	
Protocol	Parallel	
Output code	Binary, Gray	
Electrical connections	see related table	
Weight	350 g (ST), 400 g (MT)	

ORDERING CODE

MODEL	TYPE / OUTPUT	RESOL. Bit (MT)	RESOL. Bit (ST)	POWER SUPPLY	Ø SHAFT	CABLE / CONNECTOR	SIGNAL	CONNECTION	OPTIONS
AEN58SC	M R	08	12	1030	D10	M01	PB	C	

S = singleturn **00** = if ST **10** = 10 Bit **1030** = 10÷30 V **952** = ø 9.52 mm **Mnn** = cable length in m **PB** = Parallel Binary **C** = cable n = connection number **No cod.** = standard
M = multiturn **04** = 4 Bit **12** = 12 Bit * **05V** = 5 V **D10** = ø 10 mm **CQ** = M23 17 Pin **PG** = Parallel Gray
R = radial **08** = 8 Bit **13** = 13 Bit
A = axial **12** = 12 Bit **14** = 14 Bit
0360 = 360 increment ST
0720 = 720 increment ST

* If the encoder is multiturn, the singleturn resolution can be only 12 Bit.

Example  **ABSOLUTE OPTICAL ENCODER AEN58SC MR 0812 1030 D10 M01 PB C**

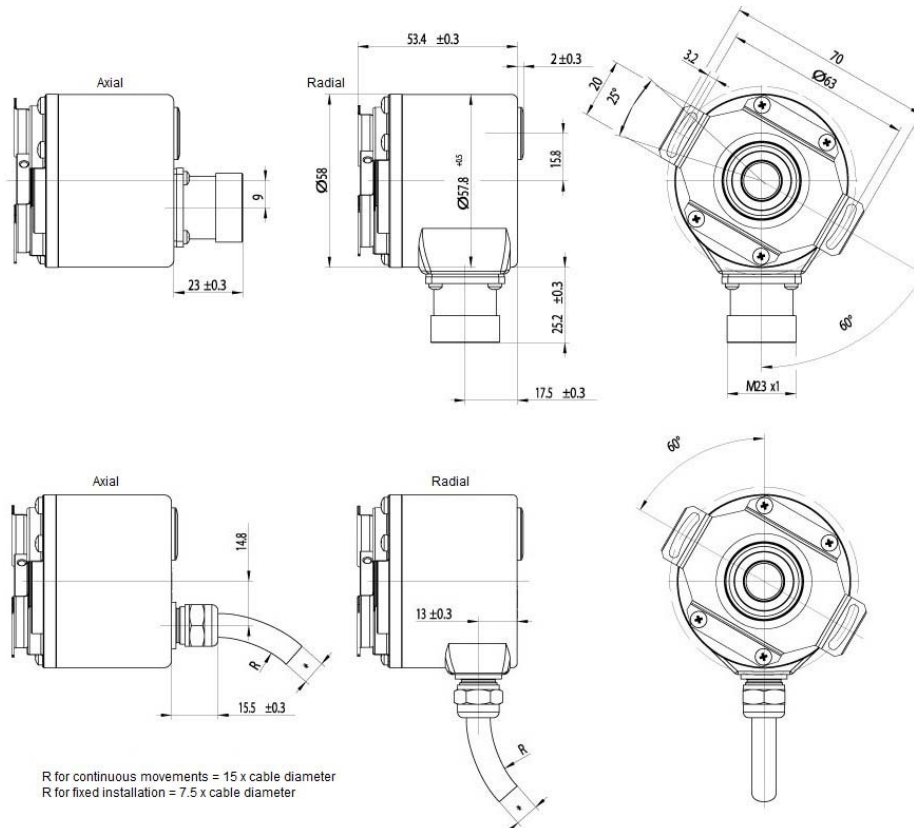
Code ST06	Project E12-A	Release A	TECHNICAL DATASHEET
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CABLE AND ELECTRICAL CONNECTIONS

SINGLETURN, CABLE OUTPUT					
Color	9 Bit / 360 inc.	10 Bit / 720 inc.	12 Bit	13 Bit	14 Bit
Grey/Pink	n.c.	n.c.	n.c.	n.c.	S0 (LSB)
Brown/Yellow	n.c.	n.c.	n.c.	S0 (LSB)	S1
Brown/Grey	n.c.	n.c.	S0 (LSB)	S1	S2
Red/Blue	n.c.	n.c.	S1	S2	S3
Violet	n.c.	S0 (LSB)	S2	S3	S4
White/Brown	S0 (LSB)	S1	S3	S4	S5
White/Green	S1	S2	S4	S5	S6
White/Yellow	S2	S3	S5	S6	S7
White/Grey	S3	S4	S6	S7	S8
White/Pink	S4	S5	S7	S8	S9
White/Blue	S5	S6	S8	S9	S10
White/Red	S6	S7	S9	S10	S11
White/Black	S7	S8	S10	S11	S12
Brown/Green	S8 (MSB)	S9 (MSB)	S11 (MSB)	S12 (MSB)	S13 (MSB)
Yellow	Tristate S0 + S8	Tristate S0 + S9	Tristate S0 + S11	Tristate S0 + S12	Tristate S0 + S13
Pink	Latch	Latch	Latch	Latch	Latch
Green	Direction	Direction	Direction	Direction	Direction
Black	0 V	0 V	0 V	0 V	0 V
Red	+ V	+ V	+ V	+ V	+ V
Brown	Alarm	Alarm	Alarm	Alarm	Alarm

SINGLETURN, CONNECTOR M23 (17 Pin)					
Pin	9 Bit / 360 inc.	10 Bit / 720 inc.	12 Bit	13 Bit	14 Bit
1	S0 (LSB)	S0 (LSB)	S0 (LSB)	S12 (MSB)	S13 (MSB)
2	S1	S1	S1	S11	S12
3	S2	S2	S2	S10	S11
4	S3	S3	S3	S9	S10
5	S4	S4	S4	S8	S9
6	S5	S5	S5	S7	S8
7	S6	S6	S6	S6	S7
8	S7	S7	S7	S5	S6
9	S8 (MSB)	S8	S8	S4	S5
10	n.c.	S9 (MSB)	S9	S3	S4
11	n.c.	n.c.	S10	S2	S3
12	Tristate S0 + S8	Tristate S0 + S9	S11 (MSB)	S1	S2
13	Latch	Latch	Latch	S0 (LSB)	S1
14	Direction	Direction	Direction	Direction	S0 (LSB)
15	0 V	0 V	0 V	0 V	0 V
16	+ V	+ V	+ V	+ V	+ V
17	Alarm	Alarm	Alarm	Alarm / Latch	Alarm / Latch

DIMENSIONS



WHAT TO AVOID <ul style="list-style-type: none"> Any mechanical working (cutting, drilling, milling, etc.). Any modification of the encoder body or shaft. Any improper use, not complying with the technical instructions provided by the Manufacturer. External shocks or stresses. 	
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Code ST02	Project A47-A	Release D	TECHNICAL DATASHEET
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ABSOLUTE MAGNETIC SENSOR AGM

GENERAL FEATURES

- Linear magnetic sensor, with direct reading of the absolute position.
- Resolutions up to 1 μm .
- Measuring length up to 30 000 mm.
- High-speed serial interface.
- Contactless reading.
- Warning indication through LED.
- Extremely easy and fast mounting of the entire measuring system, with wide alignment tolerances.
- Small size, to allow installation in narrow spaces.
- Option: 1 Vpp analog signal.
- Axial or radial cable output.



MECHANICAL AND ELECTRICAL CHARACTERISTICS

MECHANICAL	Cod. AGM	M
<ul style="list-style-type: none"> • Magnetic sensor with die-cast body. • Possibility to fix the magnetic sensor with M4 screws or with through M3 screws. • Wide alignment tolerances. • Robust sealed cable exit. 	Pole pitch	2+2 mm
	Incremental signal	sine wave 1 Vpp (optional)
	Resolution 1 Vpp	up to 1 μm *
	Repeatability	± 1 increment
	Signal period	2 mm
	Serial interface	SSI – BiSS
	Resolution absolute position	500 - 100 - 50 - 10 - 5 - 1 μm
	Accuracy	± 15 μm
	Measuring length ML	up to 30 000 mm
	Max. traversing speed	300 m/min
	Vibration resistance (EN 60068-2-6)	200 m/s ² [55 \div 2 000 Hz]
	Protection class (EN 60529)	IP 67
	Operating temperature	0 °C \div 50° C
	Storage temperature	-20 °C \div 70° C
	Relative humidity	100%
	Power supply	5 \div 28 Vdc
	Current consumption	150 mA _{MAX} (with R = 120 Ω)
	Max. cable length	25 m **
	Electrical connections	see related table
	Electrical protections	inversion of polarity and short circuits
	Weight	80 g

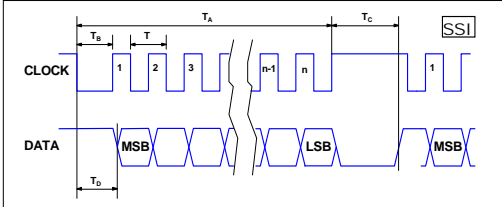
SIGNALS	CONDUCTOR COLOR
V+	Brown
V-	White
CK	Green
$\overline{\text{CK}}$	Yellow
D	Pink
$\overline{\text{D}}$	Grey
SCH	Shield

* Depending on CNC division factor.

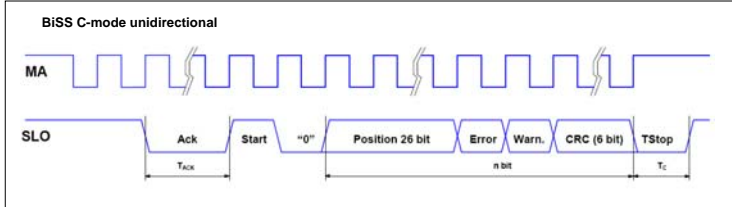
** Ensuring a minimum power supply of 5 V to the sensor, the maximum cable length can be extended to 100 m.

Code ST02	Project A47-A	Release D	TECHNICAL DATASHEET
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OUTPUT SIGNALS

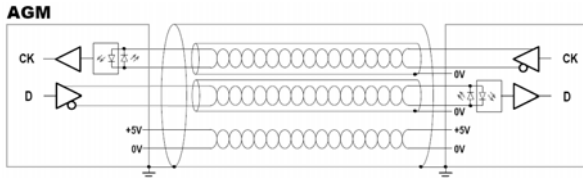
SSI Version


Interface	SSI Binary - Gray
Signals level	EIA RS 485
Clock frequency	0.1 ÷ 1.2 MHz
n	Position bit
Tc	12 ÷ 65 µs

BiSS C (unidirectional) Version


Interface	BiSS C unidirectional
Signals level	EIA RS 485
Clock frequency	0.1 ÷ 4 MHz
n	26 + 2 + 6 bit
Tc	12 ÷ 20 µs

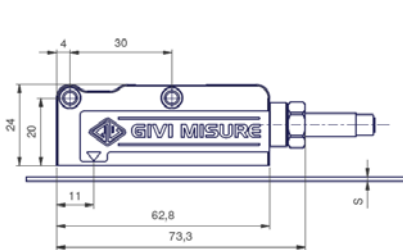
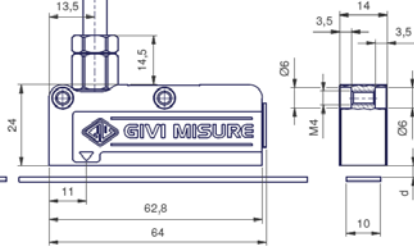
CABLE

Serial output


In case of cable extension, it is necessary to guarantee:

- the electrical connection between the body of the connectors and the cables shield;
- a minimum power supply voltage of 5 V to the sensor.

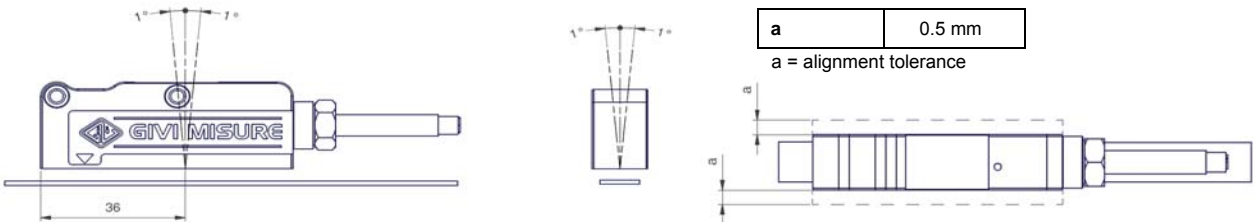
SENSOR DIMENSIONS

AXIAL

RADIAL


values in mm	MP200A	MP200A + CV103	MP200A + SP202
s	1.3	1.6	2.1
d	0.3 ÷ 1	0.7 _{MAX}	0.2 _{MAX}

s = thickness
 d = distance to be maintained between sensor and surface of the magnetic band (or eventual cover/support)

SENSOR ALIGNMENT TOLERANCES



ORDERING CODE

MODEL	POLE PITCH	RESOLUTION	CABLE OUTPUT	POWER SUPPLY	OUTPUT SIGNALS	INCREMENTAL SIGNAL	CABLE LENGTH, CABLE TYPE	CONNECTOR
AGM	M	1	A	528V	S0	V	M03 / S	SC

M = 2+2 mm
500 = 500 µm
100 = 100 µm
50 = 50 µm
10 = 10 µm
5 = 5 µm
1 = 1 µm
A = axial
R = radial
528V = 5 ÷ 28 V
S0 = SSI programmable
S1 = SSI binary
S2 = SSI binary+even parity
S3 = SSI binary+odd parity
S4 = SSI binary+error
S5 = SSI binary+even parity+error
S6 = SSI binary+odd parity+error
S7 = SSI Gray
B1 = BiSS binary
V = +1 Vpp
No cod. = no incremental signal
Mnn = length in m
M02 = 2 m (standard)
100 = 100 m
R = 6 wires (only serial)
S = 10 wires (serial + analog)
SC = without connector
Cnn = progressive

Example **ABSOLUTE MAGNETIC SENSOR AGM M1A 528V S0 V M03/S SC**

AGS

ABSOLUTE OPTICAL SCALE
RIGA OTTICA ASSOLUTA

NEW

The new **ABSOLUTE** scale for high-performance machines.

La nuova riga ASSOLUTA per macchine ad alta prestazione.



ABSOLUTELY ACCURATE

QUALITY AND INNOVATION
SINCE 1979

 **GIVI MISURE**
Measuring and control systems

GIVI MISURE's line of optical linear encoder is now enriched with the new ABSOLUTE scale (AGS), with glass measuring support.

La linea di righe ottiche GIVI MISURE si arricchisce della nuova AGS, riga ottica ASSOLUTA con supporto di misura in vetro.

- Resolutions up to **0.1 μm** / *Risoluzioni fino a 0,1 μm*
- Accuracy grade **$\pm 3 \mu\text{m}$** / *Grado di accuratezza $\pm 3 \mu\text{m}$*
- **Direct reading** of absolute measure / *Lettura diretta della quota assoluta*
- Serial interface (**SSI – BiSS**, with or without 1 Vpp analog)
Interfaccia seriale (SSI – BiSS, con o senza segnale analogico 1 Vpp)
- **High-speed** serial data transfer / *Trasferimento dati seriali ad alta velocità*
- **Adjustable** cable output / *Uscita del cavo di collegamento orientabile*
- Highly protected against dust and liquids (**IP64** protection class*)
Elevata protezione dalla polvere e dai liquidi (Grado di protezione IP64)*
- **Small-sized**, for applications with limited installation space
Dimensioni contenute, per applicazioni con spazio di installazione limitato
- Particularly suitable for applications on **CNC** machines
Particolarmente adatta per applicazioni su macchine a CNC
- **Protected** against polarity inversion and short circuits on output ports
Protetta contro l'inversione di polarità e i cortocircuiti sulle uscite
- High **signal stability** even with high speed, accelerations and vibrations
Notevole stabilità dei segnali, anche in presenza di alte velocità, accelerazioni e vibrazioni
- Measuring length up to **3 240 mm** / *Corsa utile fino a 3 240 mm*
- **Robust** and stable mechanical structure / *Struttura meccanica robusta e stabile*

* with pressurization / *con pressurizzazione*



Technical datasheets available on request / *Schede tecniche disponibili su richiesta*



OPTICAL SCALES
RIGHE OTTICHE



MAGNETIC SYSTEMS
SISTEMI MAGNETICI



ROTARY ENCODERS
ENCODER ROTATIVI



DIGITAL READOUTS
VISUALIZZATORI



POSITION CONTROLLERS
POSIZIONATORI



GIVI MISURE s.r.l. A SOCIO UNICO
Via Assunta, 57 - 20054 Nova Milanese (MB) - Italy
Tel.: +39 0362 366 126 - Fax: +39 0362 366 876
E-mail: info@givimisure.it - www.givimisure.it



GIVI MISURE

Measuring and control systems