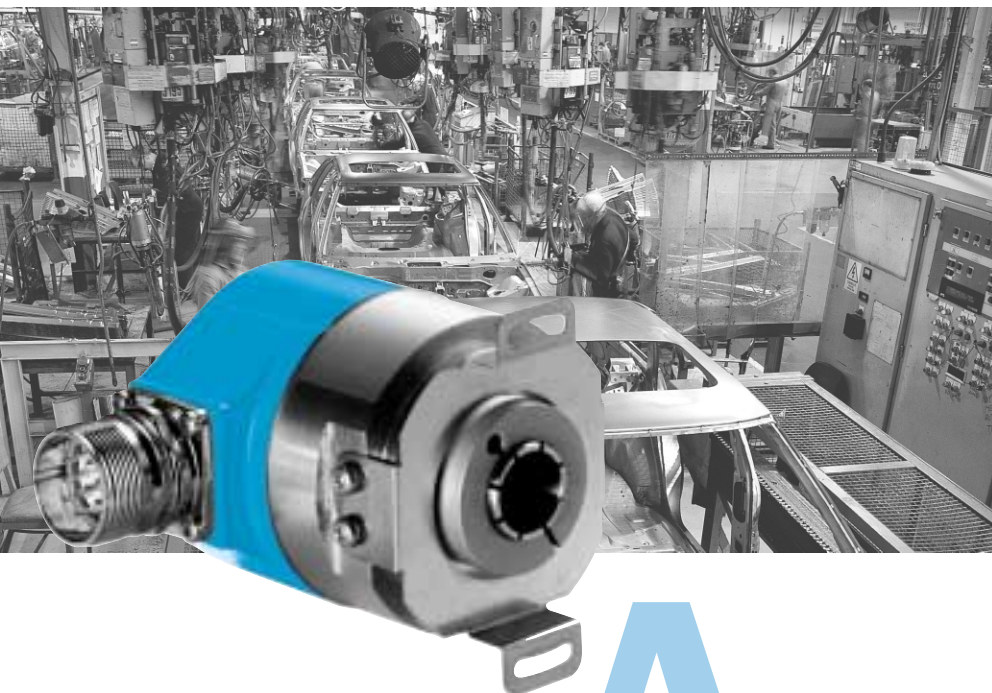


ATM 60/ATM 90: Multiturn Absolute Encoders extremely robust and exceptionally reliable.



With SSI- or RS 422 configuration interface, Profibus, CANopen or DeviceNet field bus technology, all current interfaces suitable for the high requirements in automation technology are also available.

Thanks to this wide variety of products, there are numerous possible uses, for example in:

- machine tools
- textile machines
- woodworking machines
- packaging machines
- wind turbines



A All multiturn designs are implemented using mechanical gearboxes. These supply the revolution information very reliably and free from interference.

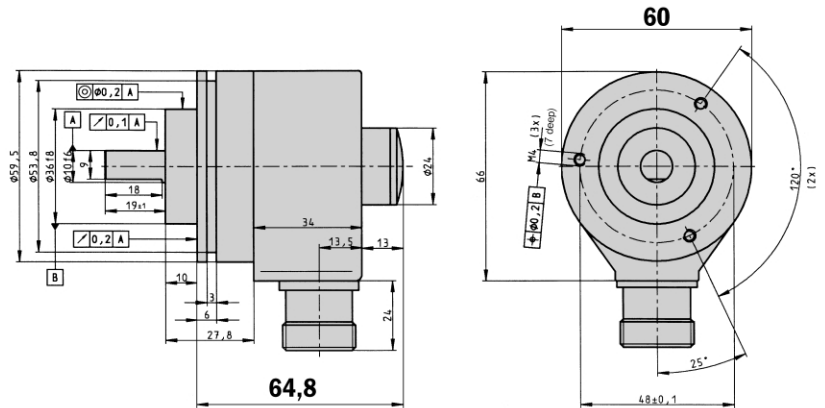
Whether with face mount flange, servo flange, blind or through hollow shaft with connector or cable outlet, the absolute multiturn encoders from SICK-STEGMANN will meet virtually any application profile.

 **Resolution up to 26 Bit**

Absolute Encoder Multiturn

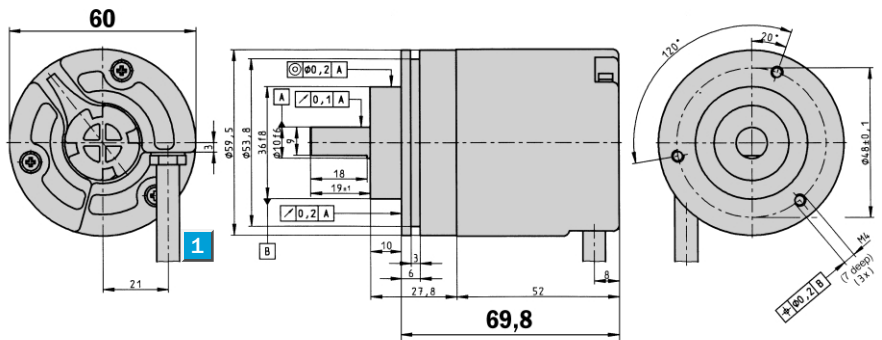
- Extremely robust
- SSI and RS 422 configuration interface
- Electronically adjustable, resolution adjustable
- Highly shock- and vibration-proof
- High degree of protection IP 67

Dimensional drawing face mount flange, connector radial



General tolerances according DIN ISO 2768-mk

Dimensional drawing face mount flange, cable radial

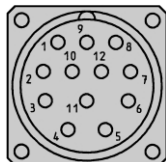


1 = bending radius min. 40 mm

General tolerances according DIN ISO 2768-mk

PIN and wire allocation

PIN	Signal	Wire colours (cable outlet)	Explanation
1	GND	blue	earth connection
2	Data +	white	signal line
3	Clock +	yellow	signal line
4	R x D +	grey	RS 422 programming line
5	R x D -	green	RS 422 programming line
6	T x D +	pink	RS 422 programming line
7	T x D -	black	RS 422 programming line
8	Us	red	supply voltage
9	SET	orange	electronical adjustment
10	Data -	brown	signal line
11	Clock -	lilac	signal line
12	CW/CCW	orange / black	counting sequence when turning
	Sreen		housing potential



View of the connector M 23 fitted to the encoder body

Accessories

Connection systems
Mounting systems
Programming Tool
Adaptor modules

CE

Technical data		ATM 60 SSI									
		Flange type									
		face m.									
Solid shaft	10 mm										
Mass ¹⁾	approx. 0.5 kg										
Moment of inertia of the rotor	35 gcm ²										
Programmable code type	gray / binary										
Programmable code direction	CW / CCW										
Measuring step	0.043°										
Max. number of steps per revolution	8192										
Max. number of revolutions	8192										
Error limits	± 0.25°										
Repeatability	0.1°										
Operating speed	6000 min ⁻¹										
Position forming time	0.15 ms										
Max. angular acceleration	5 x 10 ⁵ rad/s ²										
Operating torque											
with shaft seal	1.8 Ncm										
without shaft seal ²⁾	0.3 Ncm										
Start up torque											
with shaft seal	2.5 Ncm										
without shaft seal ²⁾	0,5 Ncm										
Max. shaft loading											
Radial	300 N										
Axial	50 N										
Bearing lifetime	3.6 x 10 ⁹ revolutions										
Working temperature range	- 20° ... + 85° C										
Storage temperature range	- 40° ... + 100° C										
Permissible relative humidity	98 %										
EMC ³⁾											
Resistance											
to shocks ⁴⁾	100 / 6 g/ms										
to vibration ⁵⁾	20 / 10 ... 2000 g/Hz										
Protection class acc. IEC 60529											
with shaft seal	IP 67										
without shaft seal	IP 43 ⁶⁾										
without shaft seal	IP 65 ⁷⁾										
Operating voltage range (Us)	10 ... 32 V										
Recommended supply voltage	0.8 W										
Initialisation time ⁸⁾	1050 ms										
Signals ⁹⁾											
Interface signals											
Clock +, Clock -, Data +, Data - ¹⁰⁾	SSI max. clock frequency 1 MHz i.e. min. duration of low level (clock +): 500 ns										
T x D +, T x D -, R x D +, R x D -	RS 422										
SET (electronic adjustment)	H - active (L ≙ 0 - 4.7 V; H ≙ 10 - Us V)										
CW/CCW (steps sequence in direction of rotation)	L - active (L ≙ 0 - 1.5 V; H ≙ 2.0 - Us V)										

¹⁾ for an encoder with connector outlet

²⁾ If the shaft seal has been removed by the customer

³⁾ according DIN EN 61000-6-4 and DIN EN 61000-6-1

⁴⁾ according DIN IEC 68 part 2-27

⁵⁾ according DIN IEC 68 part 2-6

⁶⁾ on encoder flange not sealed

⁷⁾ on encoder flange sealed

⁸⁾ from the moment the supply voltage is applied, this is the time which elapses before the data word can be correctly read in.

⁹⁾ carried by 12-way connector, potential-free with respect to housing, or 12-core cable

¹⁰⁾ For higher clock frequencies, choose synchronous SSI

Order information

ATM 60 face mount flange solid shaft; Us 10...32 V; SSI

1 Configuration ex-works: 4096 steps x 4096 revolutions, Gray-Code, Set = 0

Type	Part no.	Explanation
ATM60-A4A12X12	1 030 001	Connector M23, 12-pin
ATM60-A4K12X12	1 030 002	Cable 1.5 m
ATM60-A4L12X12	1 030 003	Cable 3 m
ATM60-A4M12X12	1 030 004	Cable 5 m

1 Other configurations on request

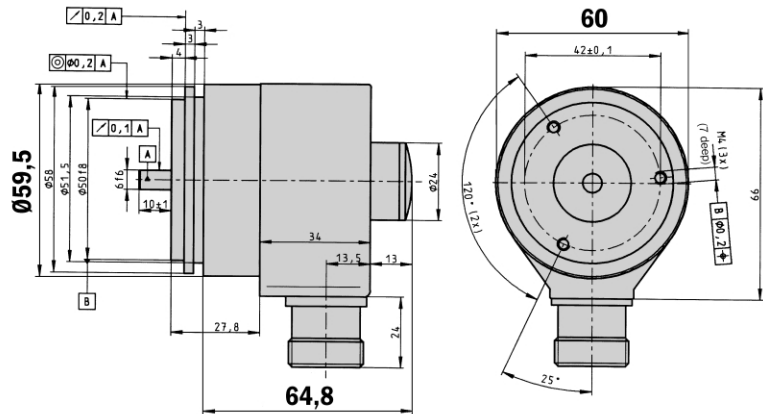


**Resolution
up to 26 Bit**

Absolute Encoder Multiturn

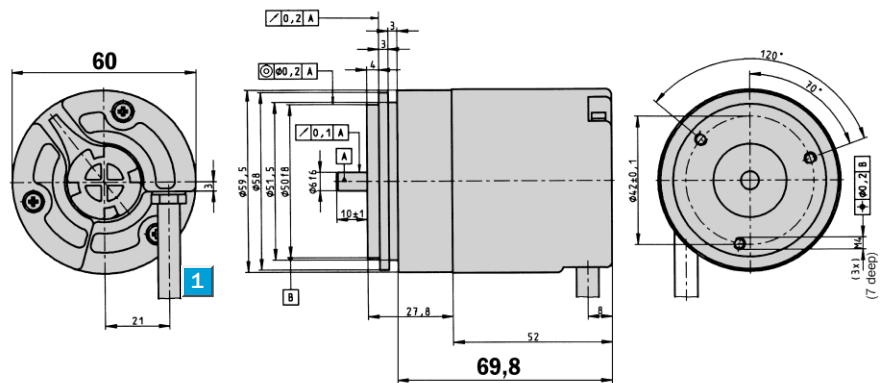
- Extremely robust
- SSI and RS 422 configuration interface
- Electronically adjustable, resolution adjustable
- Highly shock- and vibration-proof
- High degree of protection IP 67

Dimensional drawing servo flange, connector radial



General tolerances according DIN ISO 2768-mk

Dimensional drawing servo flange, cable radial

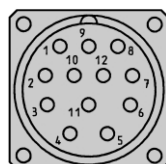


1 = bending radius min. 40 mm

General tolerances according DIN ISO 2768-mk

PIN and wire allocation

PIN	Signal	Wire colours (cable outlet)	Explanation
1	GND	blue	earth connection
2	Data +	white	signal line
3	Clock +	yellow	signal line
4	R x D +	grey	RS 422 programming line
5	R x D -	green	RS 422 programming line
6	T x D +	pink	RS 422 programming line
7	T x D -	black	RS 422 programming line
8	Us	red	supply voltage
9	SET	orange	electronical adjustable
10	Data -	brown	signal line
11	Clock -	lilac	signal line
12	CW/CCW	orange / black	counting sequence when turning
	Sreen		housing potential



View of the connector M 23 fitted to the encoder body

Accessories

- Connection systems
- Mounting systems
- Programming Tool
- Adaptor modules



Technical data		ATM 60 SSI									
		Flange type									
		servo									
Solid shaft	6 mm										
Mass ¹⁾	approx. 0.5 kg										
Moment of inertia of the rotor	35 gcm ²										
Programmable code type	gray / binary										
Programmable code direction	CW / CCW										
Measuring step	0.043°										
Max. number of steps per revolution	8192										
Max. number of revolutions	8192										
Error limits	± 0.25°										
Repeatability	0.1°										
Operating speed	6000 min ⁻¹										
Position forming time	0.15 ms										
Max. angular acceleration	5 x 10 ⁵ rad/s ²										
Operating torque											
with shaft seal	1.8 Ncm										
without shaft seal ²⁾	0.3 Ncm										
Start up torque											
with shaft seal	2.5 Ncm										
without shaft seal ²⁾	0.5 Ncm										
Max. shaft loading											
Radial	300 N										
Axial	50 N										
Bearing lifetime	3.6 x 10 ⁹ revolutions										
Working temperature range	- 20° ... + 85° C										
Storage temperature range	- 40° ... + 100° C										
Permissible relative humidity	98 %										
EMC ³⁾											
Resistance											
to shocks ⁴⁾	100 / 6 g/ms										
to vibration ⁵⁾	20 / 10 ... 2000 g/Hz										
Protection class acc. IEC 60529											
with shaft seal	IP 67										
without shaft seal	IP 43 ⁶⁾										
without shaft seal	IP 65 ⁷⁾										
Operating voltage range (Us)	10 ... 32 V										
Recommended supply voltage	0.8 W										
Initialisation time ⁸⁾	1050 ms										
Signals ⁹⁾											
Interface signals											
Clock +, Clock -, Data +, Data - ¹⁰⁾	SSI max. clock frequency 1 MHz i.e. min. duration of low level (clock +): 500 ns										
T x D +, T x D -, R x D +, R x D -	RS 422										
SET (electronic adjustment)	H - active (L ≙ 0 - 4.7 V; H ≙ 10 - Us V)										
CW/CCW (steps sequence in direction of rotation)	L - active (L ≙ 0 - 1.5 V; H ≙ 2.0 - Us V)										

¹⁾ for an encoder with connector outlet

²⁾ If the shaft seal has been removed by the customer

³⁾ according DIN EN 61000-6-4 and DIN EN 61000-6-1

⁴⁾ according DIN IEC 68 part 2-27

⁵⁾ according DIN IEC 68 part 2-6

⁶⁾ on encoder flange not sealed

⁷⁾ on encoder flange sealed

⁸⁾ from the moment the supply voltage is applied, this is the time which elapses before the data word can be correctly read in.

⁹⁾ carried by 12-way connector, potential-free with respect to housing, or 12-core cable

¹⁰⁾ For higher clock frequencies, choose synchronous SSI

Order information

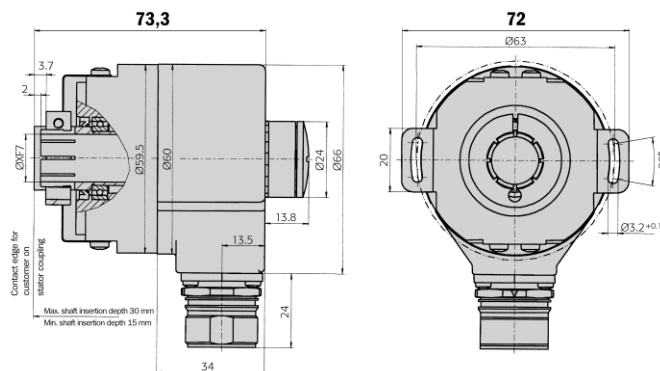
ATM 60 servo flange solid shaft; Us 10...32 V; SSI

1 Configuration ex-works: 4096 steps x 4096 revolutions, Gray-Code, Set = 0

Type	Part no.	Explanation
ATM60-A1A12X12	1 030 005	Connector M23, 12-pin
ATM60-A1K12X12	1 030 006	Cable 1.5 m
ATM60-A1L12X12	1 030 007	Cable 3 m
ATM60-A1M12X12	1 030 008	Cable 5 m

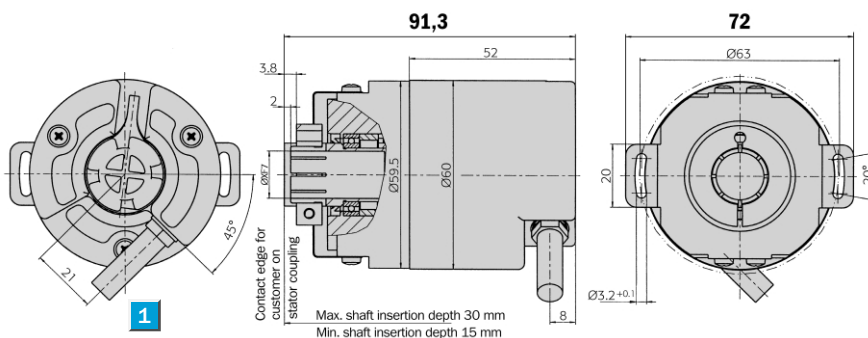
1 Other configurations on request

- ### Dimensional drawing blind hollow shaft, connector radial



General tolerances according DIN ISO 2768-mk

Dimensional drawing blind hollow shaft, cable radial

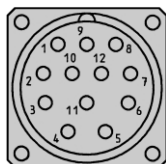


1 = bending radius min. 40 mm

General tolerances according DIN ISO 2768-mk

PIN and wire allocation

PIN	Signal	Wire colours (cable outlet)	Explanation
1	GND	blue	earth connection
2	Data +	white	signal line
3	Clock +	yellow	signal line
4	R x D +	grey	RS 422 programming line
5	R x D –	green	RS 422 programming line
6	T x D +	pink	RS 422 programming line
7	T x D –	black	RS 422 programming line
8	Us	red	supply voltage
9	SET	orange	electronical adjustment
10	Data –	brown	signal line
11	Clock –	lilac	signal line
12	CW/CCW	orange / black	counting sequence when turning
	Sreen		housing potential



View of the connector M 23 fitted to the encoder body



Accessories

Connection systems
Collets
Programming Tool
Adaptor modules

Technical data		ATM 60 SSI									
		Flange type									
		blind									
1 Hollow shaft diameter	6, 8, 10, 12, 15 mm 1/4", 3/8", 1/2"										
Mass ⁴⁾	approx. 0.4 kg										
Moment of inertia of the rotor	55 gcm ²										
Programmable code type	gray / binary										
Programmable code direction	CW / CCW										
Measuring step	0.043°										
Max. number of steps per revolution	8192										
Max. number of revolutions	8192										
Error limits	± 0.25°										
Repeatability	0.1°										
Operating speed	3000 min ⁻¹										
Position forming time	0.15 ms										
Max. angular acceleration	5 x 10 ⁵ rad/s ²										
Operating torque	0.8 Ncm ²⁾										
Start up torque	1.2 Ncm ²⁾										
Permissible shaft movement of the drive element											
Radial static / dynamic	± 0.3 / ± 0.1 mm										
Axial static / dynamic	± 0.5 / ± 0.2 mm										
Bearing lifetime	3.6 x 10 ⁹ revolutions										
Working temperature range	- 20° ... + 85° C										
Storage temperature range	- 40° ... + 100° C										
Permissible relative humidity	98 %										
EMC ³⁾											
Resistance											
to shocks ⁴⁾	100 / 6 g/ms										
to vibration ⁵⁾	20 / 10 ... 2000 g/Hz										
Protection class acc. IEC 60529	IP 67 ²⁾										
without shaft seal	IP 43 ⁶⁾										
Operating voltage range (Us)	10 ... 32 V										
Recommended supply voltage	0.8 W										
Initialisation time ⁷⁾	1050 ms										
Signals ⁸⁾											
Interface signals											
Clock +, Clock -, Data +, Data - ⁹⁾	SSI max. clock frequency 1 MHz i.e. min. duration of low level (clock +): 500 ns										
T x D +, T x D -, R x D +, R x D -	RS 422										
SET (electronic adjustment)	H - active (L ≙ 0 - 4.7 V; H ≙ 10 - Us V)										
CW/CCW ¹⁰⁾	L - active (L ≙ 0 - 1.5 V; H ≙ 2.0 - Us V)										

¹⁾ for an encoder with connector outlet

²⁾ with shaft seal

³⁾ according to DIN EN 61000-6-4 and DIN EN 61000-6-1

⁴⁾ according to DIN IEC 68 part 2-27

⁵⁾ according to DIN IEC 68 part 2-6

⁶⁾ on encoder flange not sealed

⁷⁾ from the moment the supply voltage is applied, this is the time which elapses before the data word can be correctly read in.

⁸⁾ carried by 12-way connector, potential-free with respect to housing, or 12-core cable

⁹⁾ For higher clock frequencies, choose synchronous SSI

¹⁰⁾ step sequence in direction of rotation

Order information

ATM 60 blind hollow shaft; Us 10...32 V; SSI

2 Configuration ex-works: 4096 steps x 4096 revolutions, Gray-Code, Set = 0

Type	Part no.	Explanation
ATM60-AAA12X12	1 030 009	Connector M23, 12-pin
ATM60-AAK12X12	1 030 010	Cable 1.5 m
ATM60-AAL12X12	1 030 011	Cable 3 m
ATM60-AAM12X12	1 030 012	Cable 5 m

2 Other configurations on request

1 Attention: Please order the collet with required diameter separately

Type	Part no.	Shaft diameter
SPZ-006-AD-A	2 029 174	6 mm
SPZ-1E4-AD-A	2 029 175	1/4"
SPZ-008-AD-A	2 029 176	8 mm
SPZ-3E8-AD-A	2 029 177	3/8"
SPZ-010-AD-A	2 029 178	10 mm
SPZ-012-AD-A	2 029 179	12 mm
SPZ-1E2-AD-A	2 029 180	1/2"

For 15 mm shaft diameter, collet is not needed



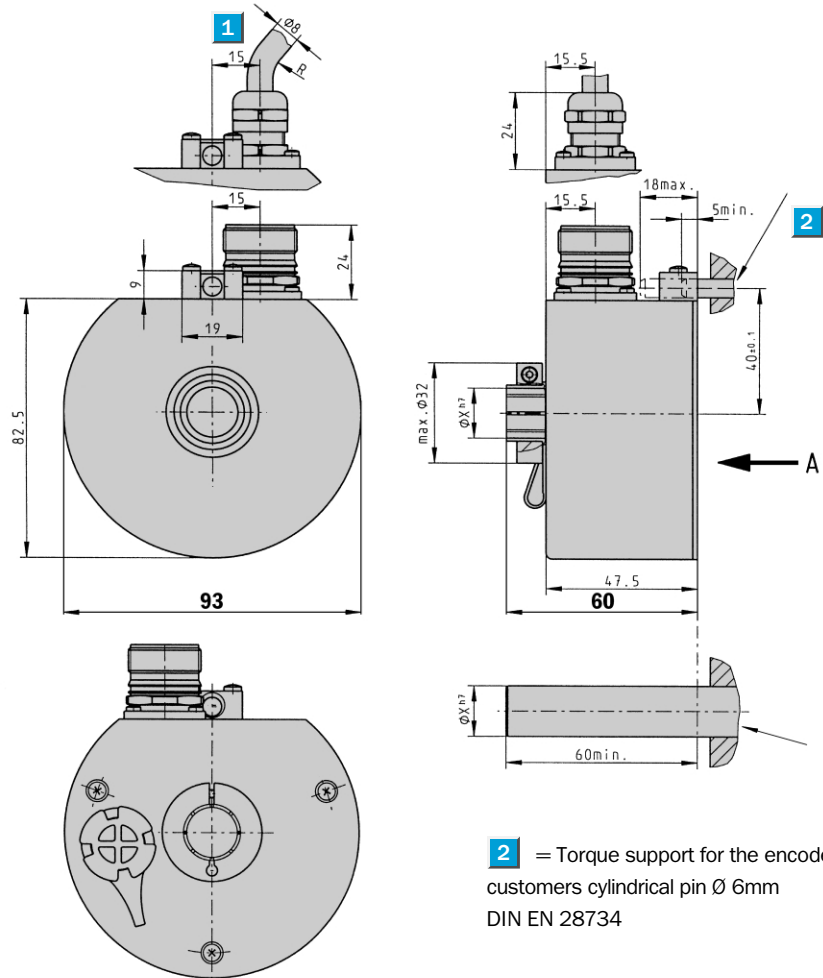
**Resolution
up to 26 Bit**

Absolute Encoder Multiturn

- Extremely robust
- SSI and RS 422 configuration interface
- Electronically adjustable, resolution adjustable
- Highly shock- and vibration-proof
- High degree of protection IP 65



Dimensional drawing through hollow shaft; connector radial, cable radial



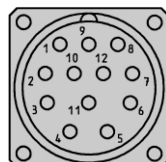
2 = Torque support for the encoder via customers cylindrical pin $\varnothing$ 6mm
DIN EN 28734

1 = bending radius min. 40 mm

General tolerances according DIN ISO 2768-mk

PIN and wire allocation

PIN	Signal	Wire colours (cable outlet)	Explanation
1	GND	blue	earth connection
2	Data +	white	signal line
3	Clock +	yellow	signal line
4	R x D +	grey	RS 422 programming line
5	R x D -	green	RS 422 programming line
6	T x D +	pink	RS 422 programming line
7	T x D -	black	RS 422 programming line
8	Us	red	supply voltage
9	SET	orange	electronical adjustment
10	Data -	brown	signal line
11	Clock -	lilac	signal line
12	CW/CCW	orange / black	counting sequence when turning
	Screen		housing potential



View of the connector M 23 fitted to the encoder body

Accessories

Connection systems
Programming Tool
Adaptor modules



Technical data		ATM 90 SSI									
		Flange type									
		through									
Hollow shaft diameter	12, 16 mm 1/2"										
Mass ¹⁾	approx. 0.8 kg										
Moment of inertia of the rotor	152.77 gcm ²										
Programmable code type	gray / binary										
Programmable code direction	CW / CCW										
Measuring step	0.043°										
Max. number of steps per revolution	8192										
Max. number of revolutions	8192										
Error limits	± 0.25°										
Repeatability	0.1°										
Operating speed	2000 min ⁻¹										
Position forming time	0.15 ms										
Max. angular acceleration	5 x 10 ⁵ rad/s ²										
Operating torque	0.4 Ncm										
Start up torque	0.5 Ncm										
Bearing lifetime	3.6 x 10 ⁹ revolutions										
Working temperature range	- 20° ... + 70° C										
Storage temperature range	- 40° ... + 100° C										
Permissible relative humidity	98 %										
EMC ²⁾											
Resistance											
to shocks ³⁾	100 / 6 g/ms										
to vibration ⁴⁾	20 / 10 ... 2000 g/Hz										
Protection class acc. IEC 60529											
with shaft seal	IP 65										
Operating voltage range (Us)	10 ... 32 V										
Recommended supply voltage	0.8 W										
Initialisation time ⁵⁾	1050 ms										
Signals ⁶⁾											
Interface signals											
Clock +, Clock -, Data +, Data - ⁷⁾	SSI max. clock frequency 1 MHz i.e. min. duration of low level (clock +): 500 ns										
T x D +, T x D -, R x D +, R x D -	RS 422										
SET (electronic adjustment)	H - active (L ≙ 0 - 4.7 V; H ≙ 10 - Us V)										
CW/CCW ⁸⁾	L - active (L ≙ 0 - 0.9 V; H ≙ 1.9 - Us V)										

¹⁾ for an encoder with connector outlet

²⁾ according to DIN EN 61000-6-4 and DIN EN 61000-6-1

³⁾ according to DIN IEC 68 part 2-27

⁴⁾ according to DIN IEC 68 part 2-6

⁵⁾ from the moment the supply voltage is applied, this is the time which elapses before the data word can be correctly read in

⁶⁾ carried by 12-way connector, potential-free with respect to housing, or 12-core cable

⁷⁾ For higher clock frequencies, choose synchronous SSI

⁸⁾ step sequence in direction of rotation

Order information

ATM 90 through hollow shaft; Us 10...32 V; SSI

1 Configuration ex-works: 4096 steps x 4096 revolutions, Gray-Code, Set = 0

Type	Part no.	Explanation
ATM90-ATA12X12	1 030 030	Ø12 mm, connector M23, 12-pin
ATM90-ATK12X12	1 030 031	Ø12 mm, cable 1.5 m
ATM90-ATL12X12	1 030 032	Ø12 mm, cable 3 m
ATM90-ATM12X12	1 030 033	Ø12 mm, cable 5 m
ATM90-AUA12X12	1 030 034	Ø1/2", connector M23, 12-pin
ATM90-AUK12X12	1 030 035	Ø1/2", cable 1.5 m
ATM90-AUL12X12	1 030 036	Ø1/2", cable 3 m
ATM90-AUM12X12	1 030 037	Ø1/2", cable 5 m
ATM90-AXA12X12	1 030 038	Ø16 mm, connector M23, 12-pin
ATM90-AXK12X12	1 030 039	Ø16 mm, cable 1.5 m
ATM90-AXL12X12	1 030 040	Ø16 mm, cable 3 m
ATM90-AXM12X12	1 030 041	Ø16 mm, cable 5 m

1 Other configurations on request



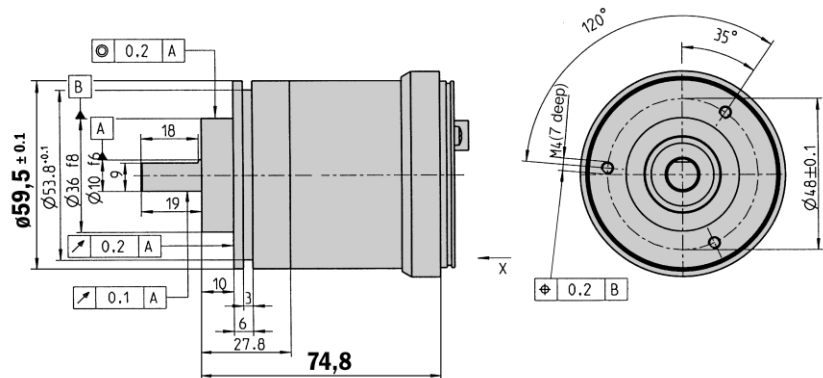
**Resolution
up to 26 Bit**

Absolute Encoder Multiturn

- Extremely robust
- RS 485 bus coupling to Profibus DP Specification
- Electronically adjustable, configuration adjustable
- Highly shock- and vibration-proof
- High degree of protection IP 67

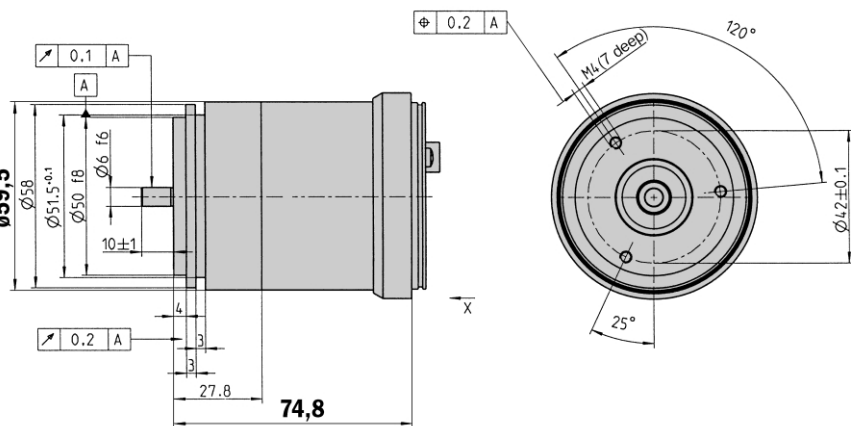


Dimensional drawing face mount flange



General tolerances according DIN ISO 2768-mk

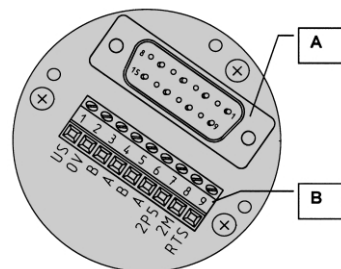
Dimensional drawing servo flange



General tolerances according DIN ISO 2768-mk

1 PIN- and wire allocation for Profibus adaptor

Terminal strip	Signal	Explanation
1	Us (24 V)	supply voltage 10 ... 32 V
2	0 V (GND)	Ground (0 V)
3	B	Profibus DP B line (out)
4	A	Profibus DP A line (out)
5	B	Profibus DP B line (in)
6	A	Profibus DP A line (in)
7	2P5 ¹⁾	+ 5 V (DC isolated)
8	2M ¹⁾	0 V (DC isolated)
9	RTS ²⁾	Request To Send



¹⁾ Use for external bus termination or to supply the transmitter/ receiver of an optical transmission link.

²⁾ Signal is optional, used to detect the direction of an optical connection.

1 Encoders with a Profibus adaptor have a terminal strip for connecting the bus and supply lines. In order to connect the lines, the Profibus adaptor is unscrewed from the complete device. The figure shows the pin allocation within the bus connection

Accessories

Bus Adaptor

Mounting systems



Technical data		ATM 60 Profibus		Flange type							
				face m.	servo						
Solid shaft	10 mm										
	6 mm										
Mass	approx. 0.59 kg										
Moment of inertia of the rotor	35 gcm ²										
Measuring step	0.043°										
Max. number of steps per revolution	8192										
Max. number of revolutions	8192										
Error limits	± 0.25°										
Repeatability	0.1°										
Operating speed	6000 min ⁻¹										
Position forming time	0.15 ms										
Max. angular acceleration	5 x 10 ⁵ rad/s ²										
Operating torque											
with shaft seal	1.8 Ncm										
without shaft seal ¹⁾	0.3 Ncm										
Start up torque											
with shaft seal	2.5 Ncm										
without shaft seal ²⁾	0.5 Ncm										
Max. shaft loading											
Radial	300 N										
Axial	50 N										
Bearing lifetime	3.6 x 10 ⁹ revolutions										
Working temperature range	- 20° ... + 85° C										
Storage temperature range	- 40° ... + 125° C										
Permissible relative humidity	98 %										
EMC ²⁾											
Resistance											
to shocks ³⁾	100 / 6 g/ms										
to vibration ⁴⁾	20 / 10 ... 2000 g/Hz										
Protection class acc. IEC 60529											
with shaft seal	IP 67										
without shaft seal	IP 43 ⁵⁾										
without shaft seal	IP 66 ⁶⁾										
Operating voltage range (Us)	10 ... 32 V										
Recommended supply voltage	2.0 W										
Initialisation time ⁷⁾	1250 ms										
Bus Interface Profibus DP											
Electrical interface ⁸⁾	RS 485										
Protocol	Profile for Encoders (07 _{hex}) – Class 2										
Address setting (node number)	0 ... 127 (DIP-switches or protocol)										
Data transmission rate (Baudrate)	9.6 kBaud – 12 MBaud ⁹⁾										
Electronic adjustment (Number SET)	via PRESET push button or protocol										
Status information	Operation (LED green),										
	bus activity (LED red)										
Bus termination	via DIP-switches ¹⁰⁾										
Electrical connection	Bus adaptor with screw fixing (x3)										

¹⁾ If the shaft seal has been removed by the customer

²⁾ according DIN EN 61000-6-4 and DIN EN 61000-6-1

³⁾ according DIN IEC 68 part 2-27

⁴⁾ according DIN IEC 68 part 2-6

⁵⁾ on encoder flange not sealed

⁶⁾ on encoder flange sealed

⁷⁾ from the moment the supply voltage is applied, this is the time which elapses before the data word can be correctly read in.

⁸⁾ to EN 50 170-2 (DIN 19245 part 1-3) DC isolated via opto-couplers

⁹⁾ automatic detection

¹⁰⁾ should only be connected in the final device

Order information

ATM 60 Profibus face mount flange and servo flange solid shaft; Us 10...32 V

Type	Part no.	Explanation
ATM60-P4H13X13	1 030 013	face mount fl., solid shaft Ø 10 mm
ATM60-P1H13X13	1 030 014	servo flange, solid shaft Ø 6 mm

Attention: Please order the Profibus adaptor separately. (see page 14)

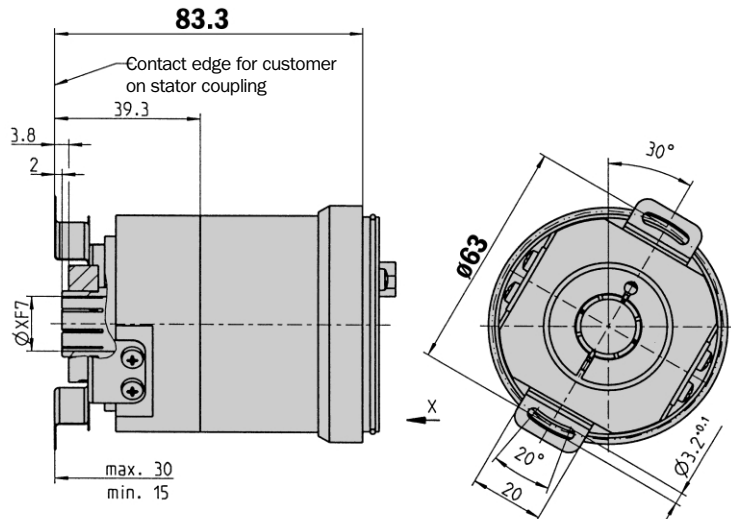


**Resolution
up to 26 Bit**

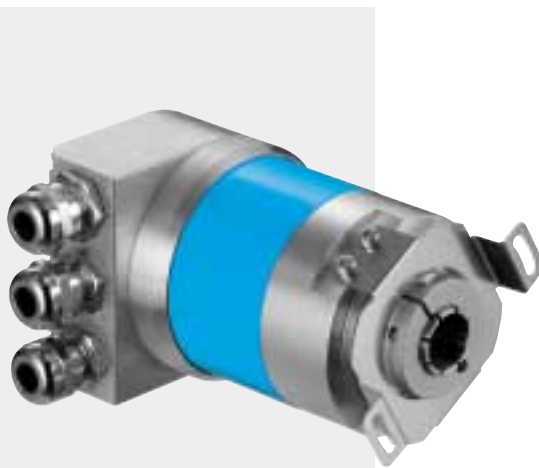
Absolute Encoder Multiturn

- Extremely robust
- RS 485 bus coupling to Profibus DP Specification
- Electronically adjustable, resolution adjustable
- Highly shock- and vibration-proof
- High degree of protection IP 67

Dimensional drawing blind hollow shaft

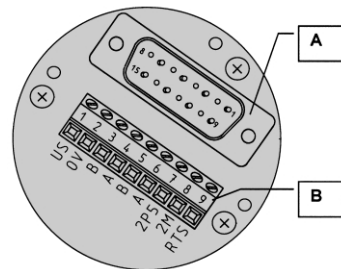


General tolerances according DIN ISO 2768-mk



1 PIN- and wire allocation for Profibus adaptor

Terminal strip	Signal	Explanation
1	Us (24 V)	supply voltage 10 ... 32 V
2	0V (GND)	Ground (0 V)
3	B	Profibus DP B line (out)
4	A	Profibus DP A line (out)
5	B	Profibus DP B line (in)
6	A	Profibus DP A line (in)
7	2P5 ¹⁾	+ 5V (DC isolated)
8	2M ¹⁾	0V (DC isolated)
9	RTS ²⁾	Request To Send



A Internal plug connection to the encoder

B External connection to the bus

¹⁾ Use for external bus termination or to supply the transmitter/ receiver of an optical transmission link.

²⁾ Signal is optional, used to detect the direction of an optical connection.

1 Encoders with a Profibus adaptor have a terminal strip for connecting the bus and supply lines. In order to connect the lines, the Profibus adaptor is unscrewed from the complete device. The figure shows the pin allocation within the bus connection.



Accessories

Bus Adaptor

Collets

Technical data		ATM 60 Profibus									
		Flange type									
		blind									
1 Hollow shaft diameter	6, 8, 10, 12, 15 mm 1/4", 3/8", 1/2"										
Mass	approx. 0.59 kg										
Moment of inertia of the rotor	55 gcm ²										
Measuring step	0.043°										
Max. number of steps per revolution	8192										
Max. number of revolutions	8192										
Error limits	± 0,25°										
Repeatability	0.1°										
Operating speed	3000 min ⁻¹										
Position forming time	0.25 ms										
Max. angular acceleration	5 x 10 ⁵ rad/s ²										
Operating torque	0.8 Ncm ¹⁾										
Start up torque	1.2 Ncm ¹⁾										
Permissible shaft movement of the drive element											
Radial static / dynamic	± 0.3 / ± 0.1 mm										
Axial static / dynamic	± 0.5 / ± 0.2 mm										
Bearing lifetime	3.6 x 10 ⁹ revolutions										
Working temperature range	- 20° ... + 85° C										
Storage temperature range	- 40° ... + 100° C										
Permissible relative humidity	98 %										
EMC ²⁾											
Resistance											
to shocks ³⁾	100 / 6 g/ms										
to vibration ⁴⁾	20 / 10 ... 2000 g/Hz										
Protection class acc. IEC 60529	IP 67 ¹⁾										
without shaft seal	IP 43 ⁵⁾										
Operating voltage range (Us)	10 ... 32 V										
Recommended supply voltage	2.0 W										
Initialisation time ⁶⁾	1250 ms										
Bus Interface Profibus DP											
Electrical Interface ⁷⁾	RS 485										
Protocol	Profile for Encoders (07 _{hex}) – Class 2										
Address setting (node number)	0 ... 127 (DIP-switches or protocol)										
Data transmission rate (baud rate)	9.6 kBaud – 12 MBaud ⁸⁾										
Electronic adjustment (number SET)	via PRESET push button or protocol										
Status information	Operation (green LED), bus activity (red LED)										
Bus termination	via DIP-switches ⁹⁾										
Electrical connection	Bus connector with screw fixing (x3)										

¹⁾ with shaft seal

²⁾ according to DIN EN 61000-6-4 and DIN EN 61000-6-1

³⁾ according to DIN IEC 68 part 2-27

⁴⁾ according to DIN IEC 68 part 2-6

⁵⁾ on encoder flange not sealed

⁶⁾ from the moment the supply voltage is applied, this is the time which elapses before the data word can be correctly read in.

⁷⁾ acc. to EN 50 170-2 (DIN 19245 part 1-3) DC isolated via opto-couplers

⁸⁾ automatic detection

⁹⁾ should only be connected in the final device

Order information

ATM 60 Profibus blind hollow shaft; Us 10...32 V

Type	Part no.	Explanation
ATM60-PAH13X13	1 030 015	Blind hollow shaft

Attention: Please order the Profibus adaptor separately. (see page 14)

1 Attention: Please order the collet with required diameter separately.

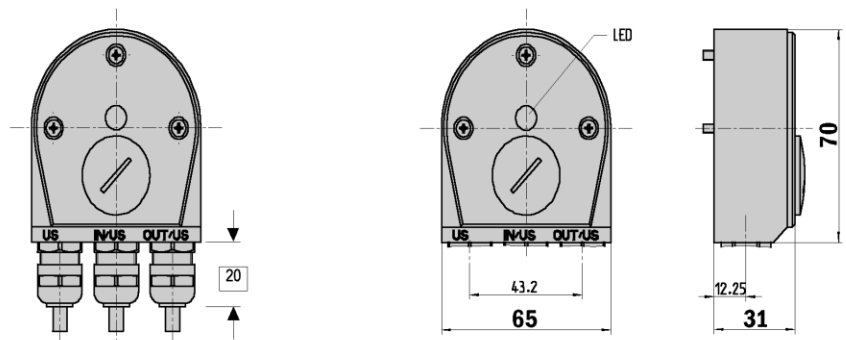
Type	Part no.	Shaft diameter
SPZ-006-AD-A	2 029 174	6 mm
SPZ-1E4-AD-A	2 029 175	1/4"
SPZ-008-AD-A	2 029 176	8 mm
SPZ-3E8-AD-A	2 029 177	3/8"
SPZ-010-AD-A	2 029 178	10 mm
SPZ-012-AD-A	2 029 179	12 mm
SPZ-1E2-AD-A	2 029 180	1/2"

For 15 mm shaft diameter, collet is not needed.



- Extremely robust
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- Highly shock- and vibration-proof
- High degree of protection IP 67

Dimensional drawing Profibus link adaptor KA3

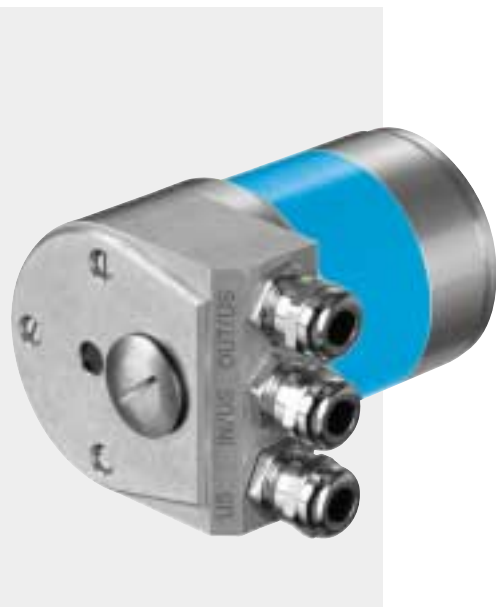


General tolerances according DIN ISO 2768-mk

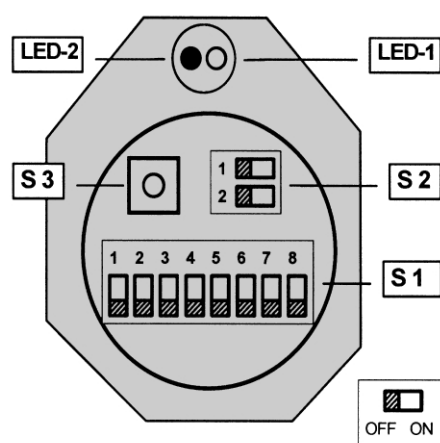
Order information

ATM 60 Profibus adaptor

Type	Part no.	Explanation
AD-ATM60-KA3PR	2 029 225	Profibus adaptor KA3, 3 x PG



Switch settings



Switch settings

Access to the switches is gained by opening the removable screw cap (PG) on the rear of the bus adaptor. Use of the following elements.

S 1 (1-7)	Address setting (0 ... 127)
S 1 (8-8)	Counting direction (CW / CCW)
S 2	Bus termination
S 3	Preset push button (Number SET)

Status information via LEDs

LED-1	Operating voltage (green)
LED-2	Bus activity (red)

Implementation

DP Functionalities

in accordance with the Profibus DP basic functions.

DP services

- Data interchange (Write_Read_Data)
- Address allocation (Set_Slave_Address)
- Control commands (Global_Control)
- Read the inputs (Read_Inputs)
- Read the outputs (Read_Outputs)
- Read diagnostic data (Slave_Diagnosis)
- Send configuration data (Set_Param)
- Check configuration data (Chk_Config)

Communication

- Cyclic master-slave data traffic.

Protective mechanisms

- Data transfer with HD = 4.
- Time monitoring of the data traffic.

Configuration

Settings in accordance with Encoder Profile

- Counting direction (CW, CCW)
- Class-2 functionality (ON, OFF)
- Scaling function (ON, OFF)
- Steps per turn (1...8192)
- Total resolution (GA) -- 1...67.108.864 steps, with $GA = 2^n \times SpU$. -- ($n=0...13$)
- "Activation of SSA - service" ²⁾
- Selection of the station address ²⁾

Configuration

Setting the formats (IN / OUT) for the cyclic data interchange via configuration byte (K-1).

2 words IN / OUT data (I-1 / O-1) ¹⁾

4 words IN / OUT data (I-1, I-2, I-3 / O-1) ²⁾

Data interchange: - Input Data (IN)

- I-1 Position value ¹⁾ 4 bytes
- I-2 Speed (rev/min) ²⁾ 2 bytes
- I-3 Time stamp ²⁾ 2 bytes

Data interchange: - Output data (OUT)

O-1 PRESET - Value ¹⁾ 4 bytes

Diagnostic information

- Station-related diagnosis (63 bytes in acc. with Encoder Profile Class-2)

Setting: - PRESET value

The PRESET-function is used for set into operation and to allocate a specific position value to the current physical angular position.

The following settings are possible:

- by hardware (PRESET-push-button: S3)
- by software: -- (see Output data).

Setting: - Counting direction

- by hardware via DIP switch S1-(8)
- by software via Telegram

Counting direction increasing:

Rotation of the shaft in the clockwise direction (CW) as viewed on the shaft.

Setting: - Station address

- by hardware via DIP switch S1.
- by software via Telegram

The setting by software is carried out only if the "SSA - service" has been previously activated.

Setting: - Bus termination

The 2-way DIP switch (S2) permits an internal bus termination to be switched in and out (ON / OFF).

If the bus is terminated externally, switch S2 must be in the OFF position.

Device-specific file (GS.)

For the purpose of automatic set into operation of the encoder, use is made of the GSD file.

All the characteristic features of the device are defined in it.

STEG 5952.GSD German
STEG 5952.GSE English
STEG 5952.GSF French

¹⁾ as per Encoder Profile

²⁾ manufacturer specific function

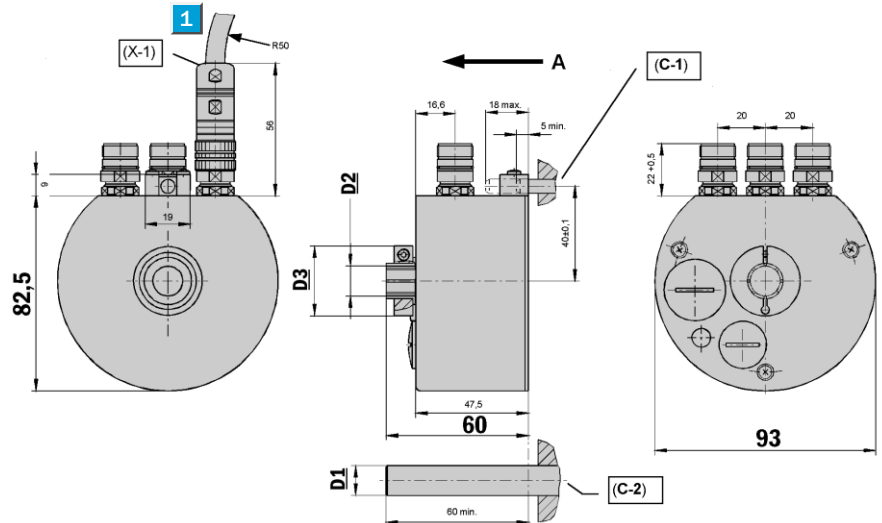


**Resolution
up to 26 Bit**

Absolute Encoder Multiturn

- Extremely robust
- RS 485 bus coupling to Profibus DP Specification
- Electronically adjustable, resolution adjustable
- Highly shock- and vibration-proof
- High degree of protection IP 65

Dimensional drawing through hollow shaft connector radial



1 = bending radius min. 40 mm

General tolerances according DIN ISO 2768-mk

Through hollow shaft	D1	D2	D3
12 mm	12.0 _{h7}	12.0 ^{F7}	29.5
1/2"	12.7 _{h7}	12.7 ^{F7}	29.5
16 mm	16.0 _{h7}	16.0 ^{F7}	32.0

C - 1	Torque support via cylindrical pin (customer) Ø 6 _{m6} to DIN EN ISO 8734
C - 2	Drive shaft (customer)
X - 1	7-pin plug connector MINITEC, (3x)
A	Direction of view on encoder (used to define the direction of rotation)

PIN and wire allocation Profibus DP (In/Out)

PIN	Signal	Explanation
1	RTS	Request To Send ²⁾
2	A	Profibus DP A line
3	N.C.	not connected
4	B	Profibus DP B line
5	2M	0 V (potential free) ¹⁾
6	2P5	+ 5 V (potential free) ¹⁾
7	N.C.	not connected



¹⁾ Use for external bus termination or to supply the transmitter/receiver of an optical fibre transmission link.

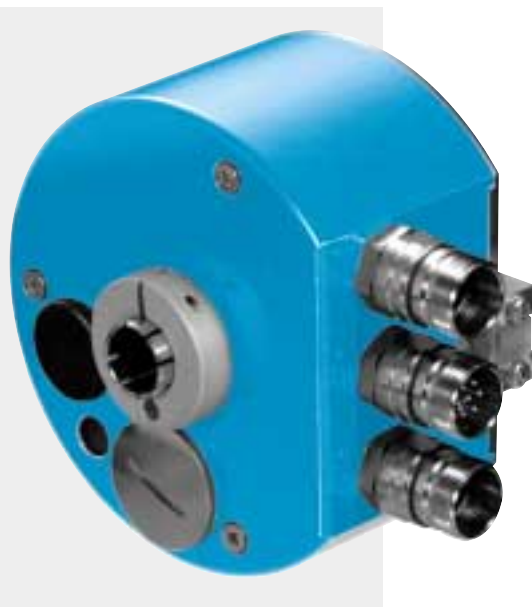
²⁾ Signal is optional, is used to detect the direction of an optical fibre connection.

PIN and wire allocation Us

PIN	Signal	Explanation
1	Us (24 V)	supply voltage
2	N.C.	Not Connected
3	GND (0 V)	0 V (Gnd)
4	N.C.	Not Connected
5	RTS	Request To Send ²⁾
6	N.C.	Not Connected
7	N.C.	Not Connected



²⁾ Signal is optional, is used to detect the direction of an optical fibre connection.



Accessories

Connection systems

Technical data		ATM 90 Profibus connector radial									
		Flange type									
		through									
Hollow shaft diameter	12, 16 mm, 1/2"										
Mass	approx. 0.6 kg										
Moment of inertia of the rotor	153 gcm ²										
Measuring step	0.043°										
Max. number of steps per revolution	8192										
Max. number of revolutions	8192										
Error limits	± 0.25°										
Repeatability	0.1°										
Operating speed	3000 min ⁻¹										
Position forming time	0.25 ms										
Max. angular acceleration	0.6 x 10 ⁵ rad/s ²										
Operating torque	0.4 Ncm										
Start up torque	0.5 Ncm										
Bearing lifetime	3.6 x 10 ⁹ revolutions										
Working temperature range	- 20° ... + 70° C										
Storage temperature range	- 40° ... + 100° C										
Permissible relative humidity	98 %										
EMC ¹⁾											
Resistance											
to shocks ²⁾	100 / 6 g/ms										
to vibration ³⁾	20 / 10 ... 2000 g/Hz										
Protection class acc. IEC 60529											
with shaft seal	IP 65										
Operating voltage range (Us)	10 ... 32 V										
Recommended supply voltage	2.0 W										
Initialisation time ⁴⁾	1250 ms										
Bus Interface Profibus DP											
Electrical Interface ⁵⁾	RS 485										
Protocol	Profile for Encoders (07 _{hex}) – Class 2										
Address setting (node number)	0 ... 127 (DIP-switches or protocol)										
Data transmission rate (baud rate)	9.6 kBaud – 12 MBaud										
	automatic detection										
Electronic adjustment (number SET)	via PRESET push button or protocol										
Status information	Operation (green LED), bus activity (red LED)										
Bus termination ⁶⁾	via DIP-switches										
Electrical connection	M14 plug connector (7 pin)										

¹⁾ according to DIN EN 61000-6-4 and DIN EN 61000-6-1

²⁾ according to DIN IEC 68 part 2-27

³⁾ according to DIN IEC 68 part 2-6

⁴⁾ from the moment the supply voltage is applied, this is the time which elapses before the data word can be correctly read in.

⁵⁾ acc. to EN 50 170-2 (DIN 19245 part 1-3) DC isolated via opto-couplers

⁶⁾ should only be connected in the final device

Order information		
ATM 90 Profibus through hollow shaft; connector radial; Us 10...32 V		
Type	Part no.	Explanation
ATM90-PTF13X13	1 030 042	through hollow Ø 12 mm, 3 x M14, 8192 x 8192
ATM90-PUF13X13	1 030 043	through hollow Ø 1/2", 3 x M14, 8192 x 8192
ATM90-PXF13X13	1 030 044	through hollow Ø 16 mm, 3 x M14, 8192 x 8192
ATM90-PTF13X11	1 032 654	through hollow Ø 12 mm, 3 x M14, 8192 x 2048
ATM90-PUF13X11	1 032 655	through hollow Ø 1/2", 3 x M14, 8192 x 2048
ATM90-PXF13X11	1 032 656	through hollow Ø 16 mm, 3 x M14, 8192 x 2048
ATM90-PTF12X12	1 032 660	through hollow Ø 12 mm, 3 x M14, 4096 x 4096
ATM90-PUF12X12	1 032 661	through hollow Ø 1/2", 3 x M14, 4096 x 4096
ATM90-PXF12X12	1 032 662	through hollow Ø 16 mm, 3 x M14, 4096 x 4096
ATM90-PTF11X13	1 032 896	through hollow Ø 12 mm, 3 x M14, 2048 x 8192
ATM90-PUF11X13	1 032 897	through hollow Ø 1/2", 3 x M14, 2048 x 8192
ATM90-PXF11X13	1 032 898	through hollow Ø 16 mm, 3 x M14, 2048 x 8192

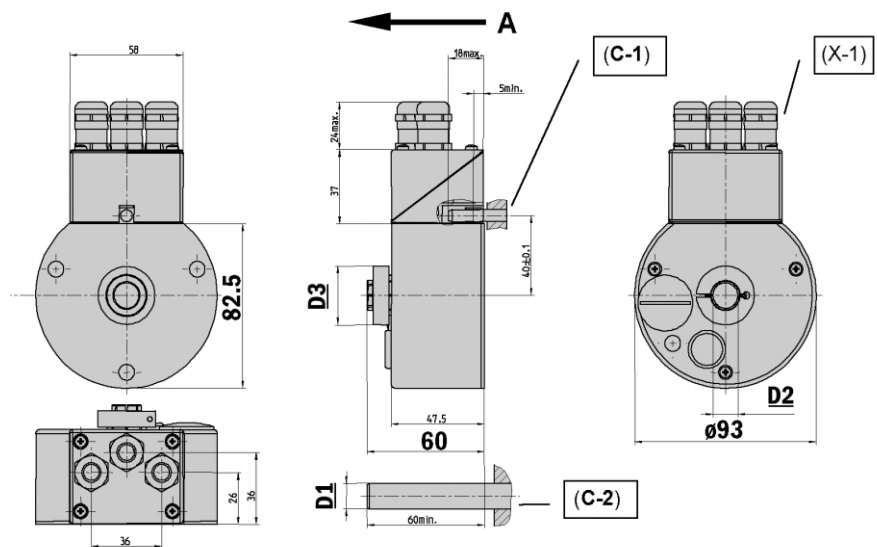


**Resolution
up to 26 Bit**

Absolute Encoder Multiturn

- Extremely robust
- RS 485 bus coupling to Profibus DP Specification
- Electronically adjustable, resolution adjustable
- Highly shock- and vibration-proof
- High degree of protection IP 65

Dimensional drawing through hollow shaft cable radial



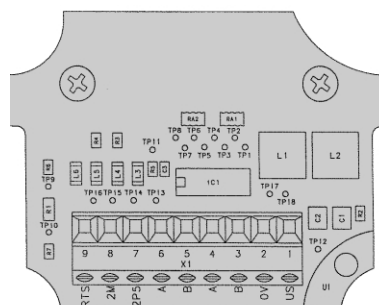
General tolerances according DIN ISO 2768-mk

Through hollow shaft	D1	D2	D3
12 mm	12.0 _{h7}	12.0 ^{F7}	29.5
1/2"	12.7 _{h7}	12.7 ^{F7}	29.5
16 mm	16.0 _{h7}	16.0 ^{F7}	32.0

C - 1	Torque support via cylindrical pin (customer) Ø 6 _{m6} to DIN EN ISO 8734
C - 2	Drive shaft (customer)
X - 1	3x screw fixings for cable connection, metric M16 x 1.5, 17
A	Direction of view on encoder (used to define the direction of rotation)

PIN- and wire allocation for Profibus adaptor

PIN	Signal	Explanation
1	Us (24 V)	supply voltage
2	GND (0 V)	0 V (Gnd)
3	B	Profibus DP B line (out)
4	A	Profibus DP A line (out)
5	A	Profibus DP B line (in)
6	B	Profibus DP A line (in)
7	2P5	+ 5 V (potential free) ¹⁾
8	2M	0 V (potential free) ¹⁾
9	RTS	Request To Send ²⁾



¹⁾ Use for external bus termination or to supply the transmitter/ receiver of an optical transmission link.

²⁾ Signal is optional, used to detect the direction of an optical connection.

Technical data		ATM 90 Profibus with bus adaptor									
		Flange type									
		through									
Hollow shaft diameter	12, 16 mm, 1/2"										
Mass	approx. 0.8 kg										
Moment of inertia of the rotor	153 gcm ²										
Measuring step	0.043°										
Max. number of steps per revolution	8192										
Max. number of revolutions	8192										
Error limits	± 0.25°										
Repeatability	0.1°										
Operating speed	3000 min ⁻¹										
Position forming time	0.25 ms										
Max. angular acceleration	0.6 x 10 ⁵ rad/s ²										
Operating torque	0.4 Ncm										
Start up torque	0.5 Ncm										
Bearing lifetime	3.6 x 10 ⁹ revolutions										
Working temperature range	- 20° ... + 80° C										
Storage temperature range	- 40° ... + 125° C										
Permissible relative humidity	98 %										
EMC ¹⁾											
Resistance											
to shocks ²⁾	100 / 6 g/ms										
to vibration ³⁾	20 / 10 ... 2000 g/Hz										
Protection class acc. IEC 60529											
with shaft seal	IP 65										
Operating voltage range (Us)	10 ... 32 V										
Recommended supply voltage	2.0 W										
Initialisation time ⁴⁾	1250 ms										
Bus Interface Profibus DP											
Electrical Interface ⁵⁾	RS 485										
Protocol	Profile for Encoders (07 _{hex}) – Class 2										
Address setting (node number)	0 ... 127 (DIP-switches or protocol)										
Data transmission rate (baud rate)	9.6 kBaud – 12 MBaud										
	automatic detection										
Electronic adjustment (number SET)	via PRESET push button or protocol										
Status information	Operation (green LED), bus activity (red LED)										
Bus termination ⁶⁾	via DIP-switches										
Electrical connection	screw fixing for cable (3x)										

¹⁾ according to DIN EN 61000-6-4 and DIN EN 61000-6-1

²⁾ according to DIN IEC 68 part 2-27

³⁾ according to DIN IEC 68 part 2-6

⁴⁾ from the moment the supply voltage is applied, this is the time which elapses before the data word can be correctly read in.

⁵⁾ acc. to EN 50 170-2 (DIN 19245 part 1-3) DC isolated via opto-couplers

⁶⁾ should only be connected in the final device

Order information		
ATM 90 Profibus through hollow shaft; cable radial; Us 10...32 V		
Type	Part no.	Explanation
ATM90-PTG13X13	1 030 045	through hollow Ø 12 mm, 3 x PG, 8192 x 8192
ATM90-PUG13X13	1 030 046	through hollow Ø 1/2", 3 x PG, 8192 x 8192
ATM90-PXG13X13	1 030 047	through hollow Ø 16 mm, 3 x PG, 8192 x 8192
ATM90-PTG13X11	1 032 657	through hollow Ø 12 mm, 3 x PG, 8192 x 2048
ATM90-PUG13X11	1 032 658	through hollow Ø 1/2", 3 x PG, 8192 x 2048
ATM90-PXG13X11	1 032 659	through hollow Ø 16 mm, 3 x PG, 8192 x 2048
ATM90-PTG12X12	1 032 663	through hollow Ø 12 mm, 3 x PG, 4096 x 4096
ATM90-PUG12X12	1 032 664	through hollow Ø 1/2", 3 x PG, 4096 x 4096
ATM90-PXG12X12	1 032 665	through hollow Ø 16 mm, 3 x PG, 4096 x 4096
ATM90-PTG11x13	1 032 899	through hollow Ø 12 mm, 3 x PG, 2048 x 8192
ATM90-PUG11x13	1 032 900	through hollow Ø 1/2", 3 x PG, 2048 x 8192
ATM90-PXG11x13	1 032 901	through hollow Ø 16 mm, 3 x PG, 2048 x 8192
Attention: Bus adaptor included		

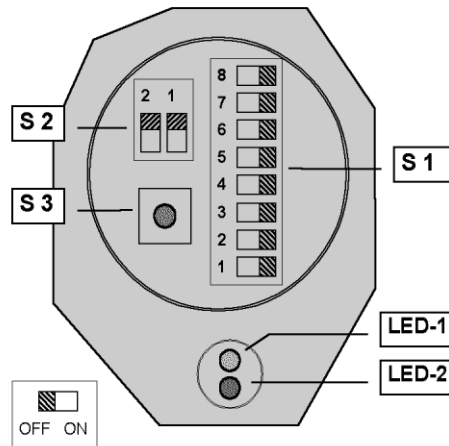


**Resolution
up to 26 Bit**

Absolute Encoder Multiturn

- Extremely robust
- RS 485 bus coupling to Profibus DP Specification
- Electronically adjustable, resolution adjustable
- Highly shock- and vibration-proof
- High degree of protection IP 65

Switch settings



Switch settings

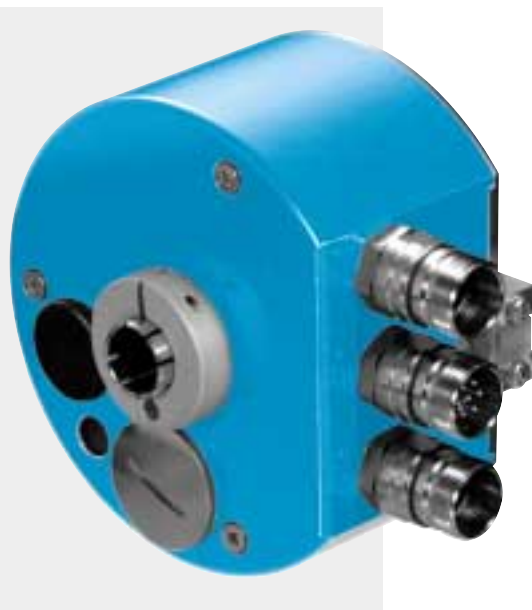
Access to the DIP switches used for configuring the encoder can be gained by removing the screw on the back of the encoder.

- | | |
|-----------|---------------------------------|
| S 1 (1-7) | Address setting (0 ... 127) |
| S 1 (8-8) | Counting direction (CW / CCW) |
| S 2 | Bus termination |
| S 3 | Preset push button (Number SET) |

In the version with a cable connection, the switches S1 and S2 are located inside the bus adaptor.

Status information via LEDs

- | | |
|-------|---------------------------|
| LED-1 | Operating voltage (green) |
| LED-2 | Bus activity (red) |



Accessories

Connection systems