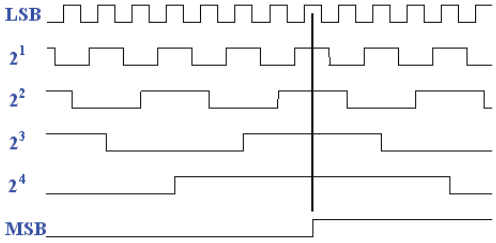
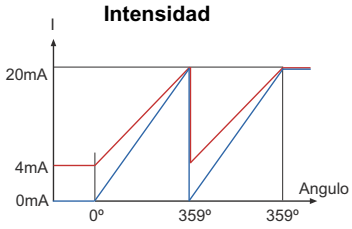
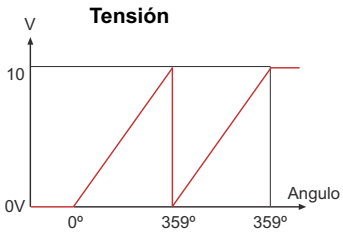
Parallel



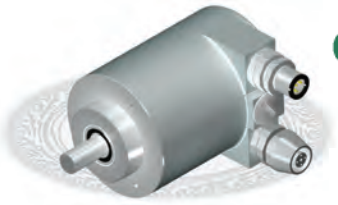
SSI

Analog





Fieldbus



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BiSS INTERFACE

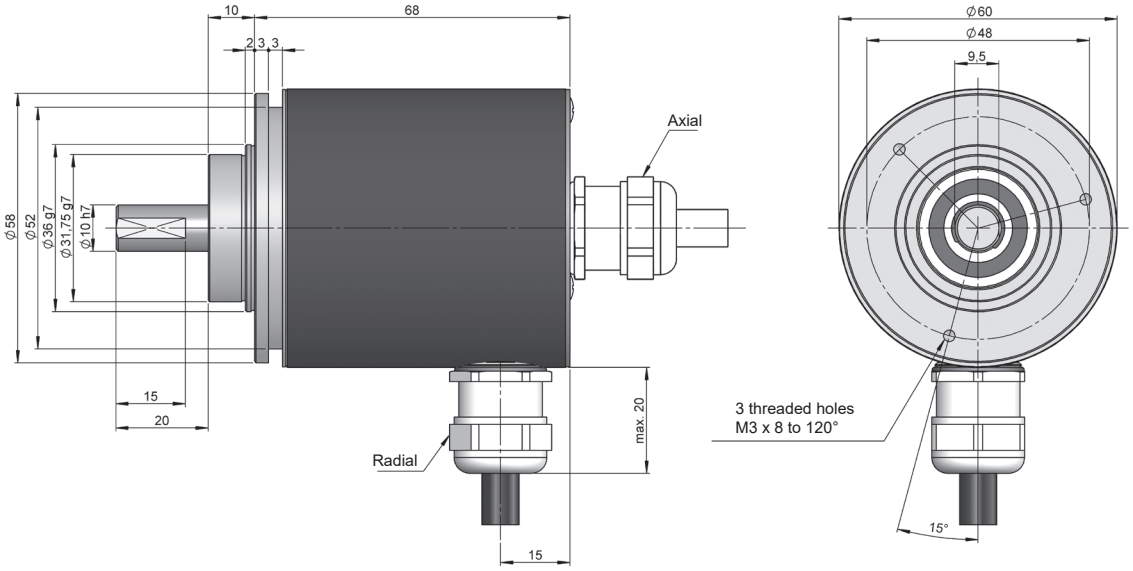
SSI

SERIE CS10

SINGLETURN ABSOLUTE ENCODER PARALLEL

- Parallel
- Singleturn resolution up to 13 bits
- External diameter 58 mm
- Shaft Ø 6 or 10 mm
- Protection class IP65 according to DIN EN 40050
- Connection by cable (other cable length available) or industrial connector

Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP65 | Temperature range | Express Delivery



Drawing shaft type 2, connection type 11/12, without flange

REFERENCE

Reference example: CS10-12110212S-4096

Serie	Solid shaft	Flange	Connection	Interface	Code	IP	Power Supply / Electronic output	Parameters config.	Singleturn resolution	Special customer
CS10 -	☐	☐	☐☐	☐	☐	☐	☐	☐	-☐☐☐☐	.☐☐
	1. Ø 6x10 mm **2.** Ø 10x20 mm	**1.** None **2.** 90.1002 **3.** 90.1003 **4.** 90.1004 **5.** 90.1005 **6.** 90.1006	**11.** Axial cable **12.** Radial cable **31.** Axial M23 12p **32.** Radial M23 12p **41.** Axial M23 16p **42.** Radial M23 16p **51.** Axial M27 21p **52.** Radial M27 21p	**0.** Parallel	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW **5.** Gray excess CW **6.** Gray excess CCW **7.** BCD CW **8.** BCD CCW	**1.** IP65	**2.** 10...30 VDC / NPN **3.** 10...30 VDC / Push-Pull **4.** 10...30 VDC / NPN OC	**Blank.** None **S.** Direction		

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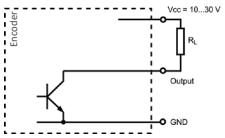
SINGLETURN ABSOLUTE ENCODER

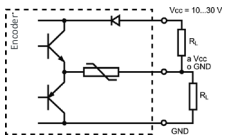
PARALLEL

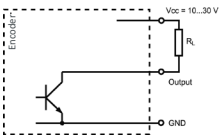
MECHANICAL SPECIFICATIONS

Materials	Housing: Steel Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Shaft diameter	6 or 10 mm
Maximum number of revolutions permitted mechanically	6000 rpm
Protection against dust and splashes according to DIN EN 40050	IP65
Rotor inertia moment	30 gcm^2
Starting torque at 20°C (68°F)	≤ 0,02 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	60 N
Weight aprox.	0,4 Kg
Operating temperature range	-10°C to +70°C
Vibration	100 m/s^2 (10Hz...2000Hz)
Shock	1000 m/s^2 (6ms)
Axial or radial connection	2 meters cable or industrial connector (other cable lengths available on order) **Female connector not included**

OUTPUT SIGNALS







OUTPUT CIRCUIT	**NPN**	**Push-Pull**	**NPN Open Collector**
Reference code	*2*	*3*	*4*
Power supply	10...30 VDC	10...30 VDC	10...30 VDC
Consumption max.	100 mA	100 mA	100 mA
Max. load capability / channel	40 mA	±30 mA	40 mA
“Low” signal level	VOL < 2.5 VDC	VOL < 2.5 VDC	VOL < 2.5 VDC
“High” signal level	VOH > VCC - 3V	VOH > VCC - 3V	VOH > VCC - 3V
Frequency	200 kHz	200 kHz	200 kHz

ELECTRICAL SPECIFICATIONS

Interface	Parallel
Inputs	Opto-coupled
Code	Binary Gray BCD
Singleturn resolution	up to 8192 points per turn (13 bits)
Linearity	±1/2 LSB
Parameters config.	Direction

SERIE CS10

SINGLETURN ABSOLUTE ENCODER

PARALLEL

CONNECTION

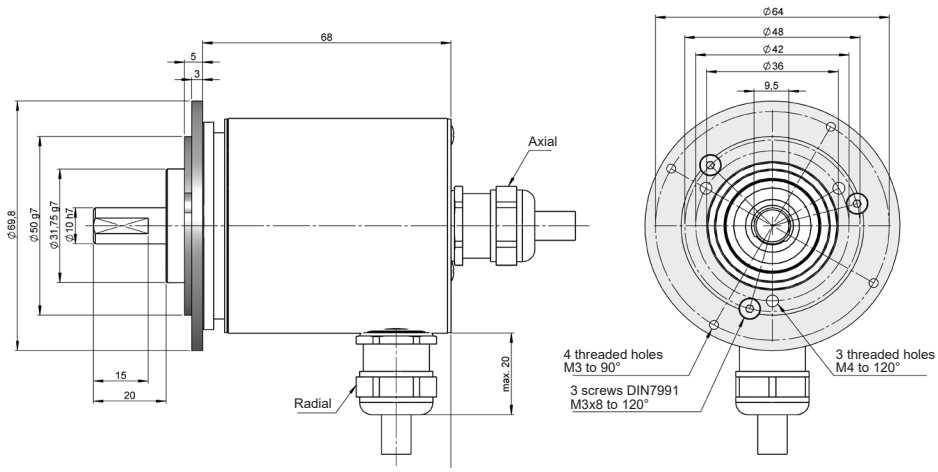




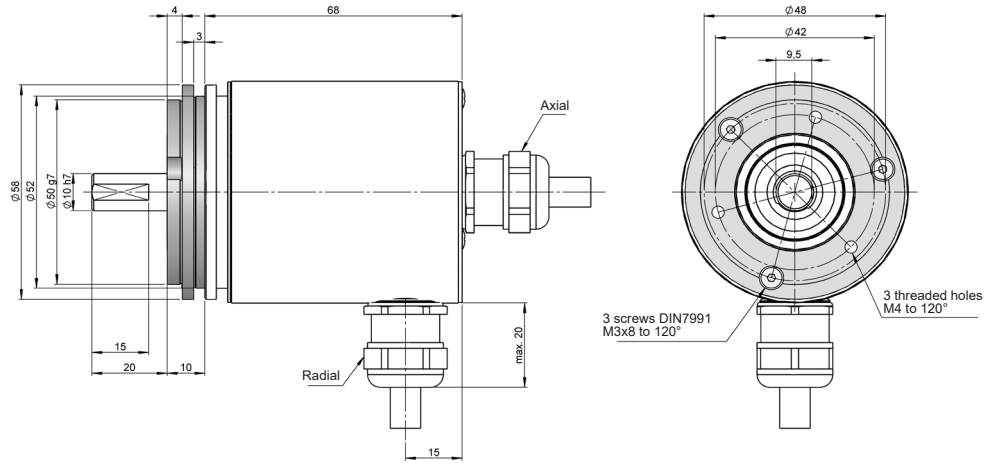
	Cable 15x0,14 mm² 95.0008031	**Cable** 25x0,14 mm² 95.0008030	**Connector** M23 12p CW	**Connector** M23 16p CW	**Connector** M27 21p CW
GND	Black	Black	1	1	1
VCC	Red	Red	2	2	2
Bit 0	Brown	Brown	3	3	3
Bit 1	White	White	4	4	4
Bit 2	Yellow	Yellow	5	5	5
Bit 3	Green	Green	6	6	6
Bit 4	Orange	Pink	7	7	7
Bit 5	Violet	Orange	8	8	8
Bit 6	Grey	Grey	9	9	9
Bit 7	Blue	Blue	10	10	10
Bit 8	White - Black	Yellow - Black	11	11	11
Bit 9	White - Red	Yellow - Red	12	12	12
Bit 10	White - Brown	Yellow - Brown		13	13
Bit 11	White - Yellow	Yellow - Green		14	14
Bit 12	White - Blue	Yellow - Grey		15	15
Bit 13		Yellow - Blue		16	16
Bit 14		White - Black			17
Bit 15		White - Red			18
DIR	White - Yellow	Yellow - Pink	11	15	20
RES	White - Blue	White - Blue	12	16	21

FLANGE DIMENSIONS

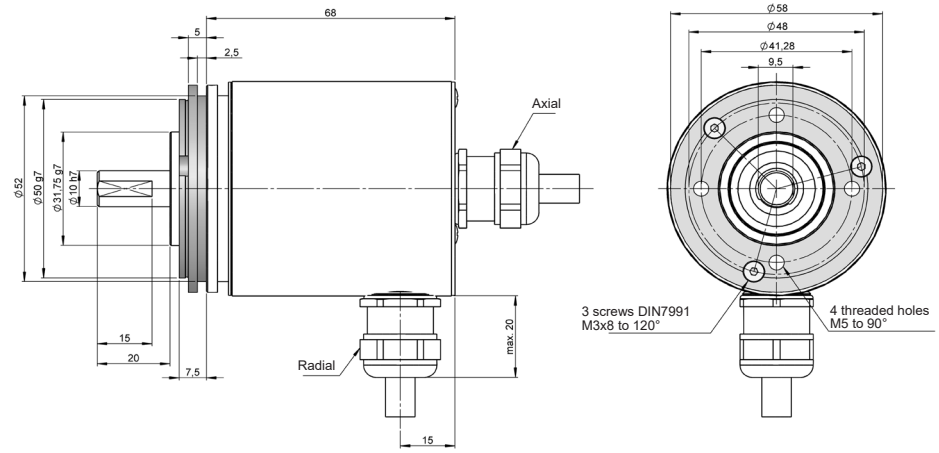
Flange 2
90.1002



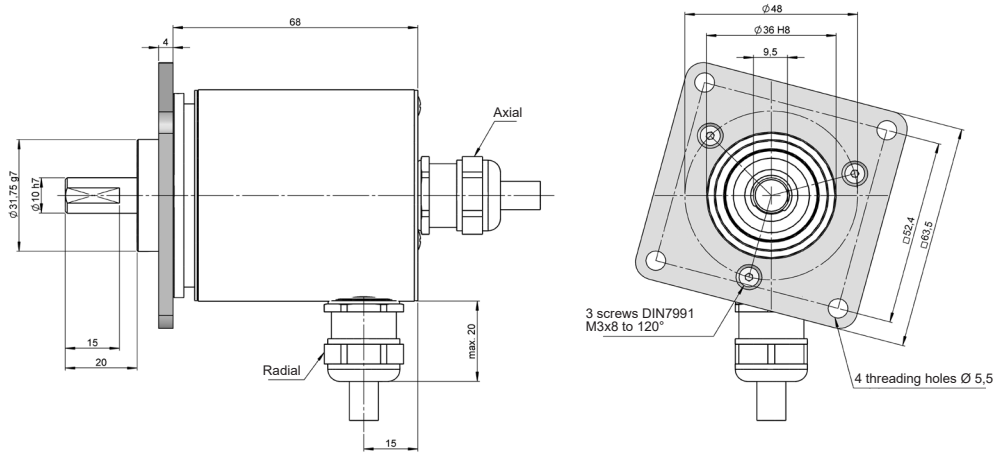
Flange 3
90.1003



Flange 4
90.1004



Flange 5
90.1005

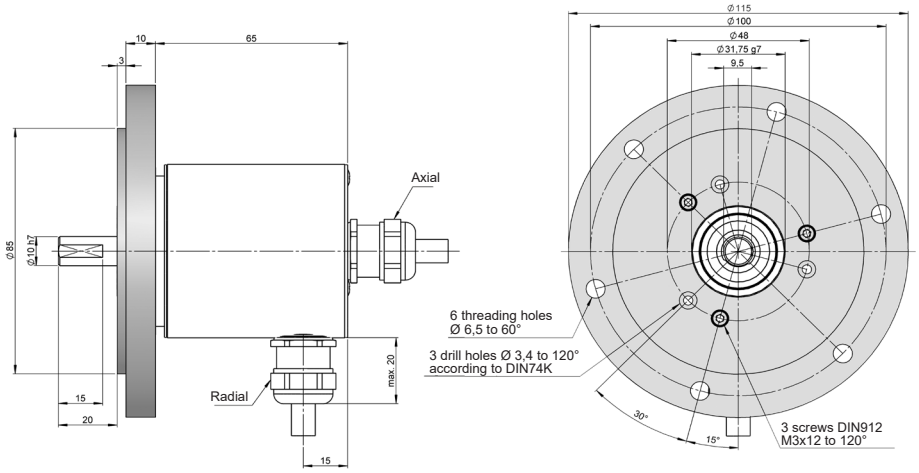


SERIE CS10

SINGLETURN ABSOLUTE ENCODER

PARALLEL

Flange 6
90.1006



CONNECTION DIMENSIONS

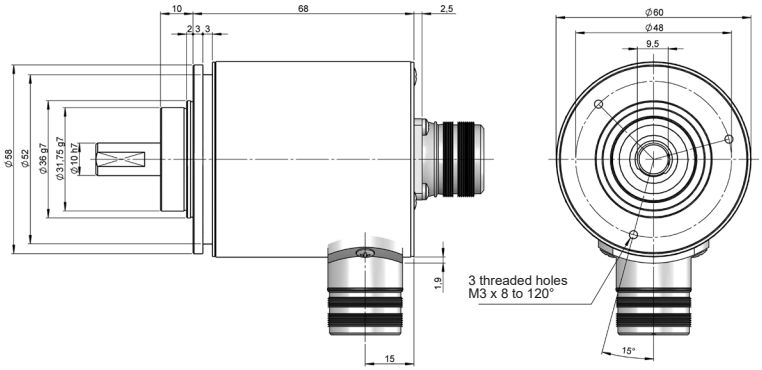
Female connector not included

Connection 31

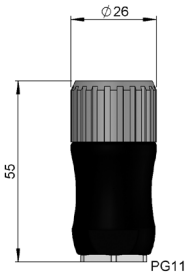
Axial
M23 12p
male panel
clockwise

Connection 32

Radial
M23 12p
male panel
clockwise



Female connector
95.0007131

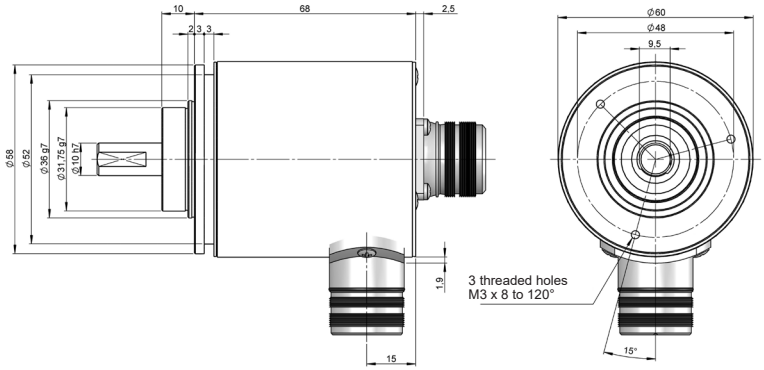


Connection 41

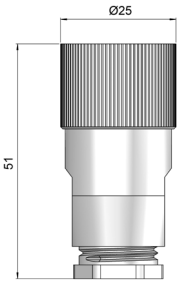
Axial
M23 16p
male panel
clockwise

Connection 42

Radial
M23 16p
male panel
clockwise



Female connector
95.0007006

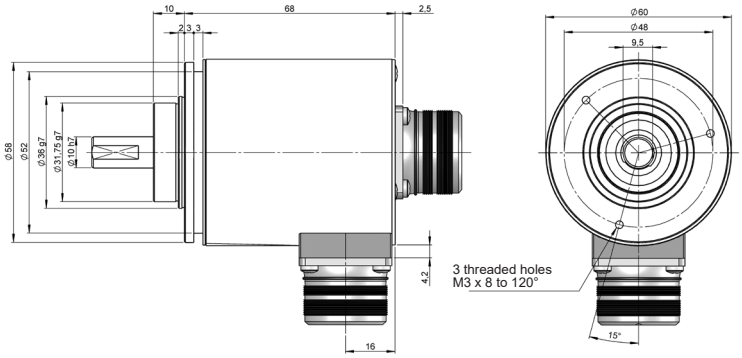


Connection 51

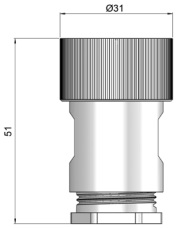
Axial
21p
male panel
clockwise

Connection 52

Radial
21p
male panel
clockwise



Female connector
95.0007062

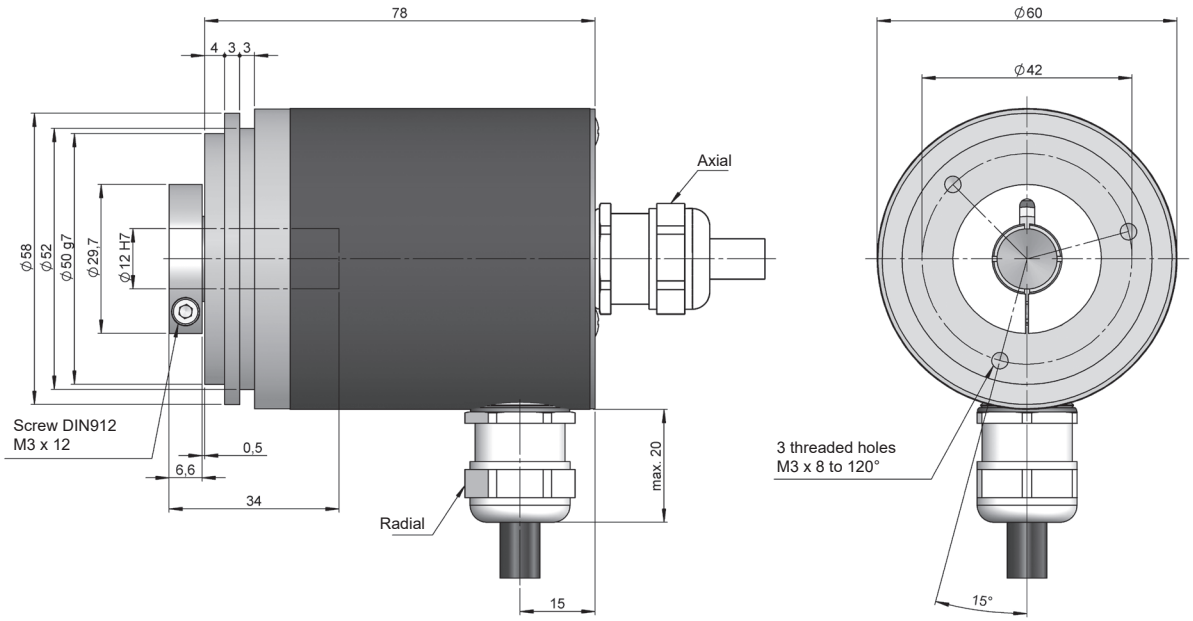


SERIE HS10

SINGLETURN ABSOLUTE ENCODER PARALLEL

- Parallel
- Singleturn resolution up to 13 bits
- External diameter 58 mm
- Shaft Ø 10 or 12 mm
- Protection class IP65 according to DIN EN 40050
- Connection by cable (other cable length available) or industrial connector

Optical Encoder | Absolute Encoder | Vibration and shock resistant | IP65 | Temperature range | Express Delivery



Drawing shaft type 3, connection type 11/12, without flange

REFERENCE

Reference example: HS10-31110212S-1024

Serie	Blind-Hollow shaft	Anti-rotation system	Connection	Interface	Code	IP	Power Supply / Electronic output	Parameters config.	Singleturn resolution	Special customer
HS10 -	☐	☐	☐☐	☐	☐	☐	☐	☐	-☐☐☐☐	.☐☐
	3. Ø 12 mm **4.** Ø 10 mm	**1.** None	**11.** Axial cable **12.** Radial cable **31.** Axial M23 12p **32.** Radial M23 12p **41.** Axial M23 16p **42.** Radial M23 16p **51.** Axial M27 21p **52.** Radial M27 21p	**0.** Parallel	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW **5.** Gray excess CW **6.** Gray excess CCW **7.** BCD CW **8.** BCD CCW	**1.** IP65	**2.** 10...30 VDC / NPN **3.** 10...30 VDC / Push-Pull **4.** 10...30 VDC / NPN OC	**Blank.** None **S.** Direction		

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SERIE HS10

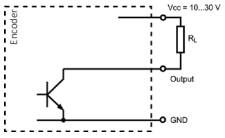
SINGLETURN ABSOLUTE ENCODER

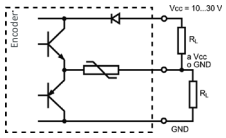
PARALLEL

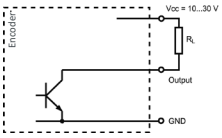
MECHANICAL SPECIFICATIONS

Materials	Housing: Steel Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Housing fixing	Flexible flange
Shaft fixing	Clamp
Permitted misalignment	± 0.5 mm axial, ±0.3 mm radial
Blind hollow shaft diameter	10 or 12 mm
Maximum number of revolutions permitted mechanically	6000 rpm
Protection against dust and splashes according to DIN EN 40050	IP65
Rotor inertia moment	30 gcm²
Starting torque at 20°C (68°F)	≤ 0,02 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	60 N
Weight aprox.	0,4 Kg
Operating temperature range	-10°C to +70°C
Vibration	100 m/s² (10Hz...2000Hz)
Shock	1000 m/s² (6ms)
Axial or radial connection	2 meters cable or industrial connector (other cable lengths available on order) **Female connector not included**

OUTPUT SIGNALS







OUTPUT CIRCUIT	**NPN**	**Push-Pull**	**NPN Open Collector**
Reference code	*2*	*3*	*4*
Power supply	10...30 VDC	10...30 VDC	10...30 VDC
Consumption max.	100 mA	100 mA	100 mA
Max. load capability / channel	40 mA	±30 mA	40 mA
“Low” signal level	VOL < 2.5 VDC	VOL < 2.5 VDC	VOL < 2.5 VDC
“High” signal level	VOH > VCC - 3V	VOH > VCC - 3V	VOH > VCC - 3V
Frequency	200 kHz	200 kHz	200 kHz

SERIE HS10

SINGLETURN ABSOLUTE ENCODER

PARALLEL

ELECTRICAL SPECIFICATIONS

Interface	Parallel
Inputs	Opto-coupled
Code	Binary Gray BCD
Singleturn resolution	up to 8192 points per turn (13 bits)
Linearity	±1/2 LSB
Parameters config.	Direction

CONNECTION





	Cable 15x0,14 mm² 95.0008031	**Cable** 25x0,14 mm² 95.0008030	**Connector** M23 12p CW	**Connector** M23 16p CW	**Connector** M27 21p CW
GND	Black	Black	1	1	1
VCC	Red	Red	2	2	2
Bit 0	Brown	Brown	3	3	3
Bit 1	White	White	4	4	4
Bit 2	Yellow	Yellow	5	5	5
Bit 3	Green	Green	6	6	6
Bit 4	Orange	Pink	7	7	7
Bit 5	Violet	Orange	8	8	8
Bit 6	Grey	Grey	9	9	9
Bit 7	Blue	Blue	10	10	10
Bit 8	White - Black	Yellow - Black	11	11	11
Bit 9	White - Red	Yellow - Red	12	12	12
Bit 10	White - Brown	Yellow - Brown		13	13
Bit 11	White - Yellow	Yellow - Green		14	14
Bit 12	White - Blue	Yellow - Grey		15	15
Bit 13		Yellow - Blue		16	16
Bit 14		White - Black			17
Bit 15		White - Red			18
DIR	White - Yellow	Yellow - Pink	11	15	20
RES	White - Blue	White - Blue	12	16	21

CONNECTION DIMENSIONS

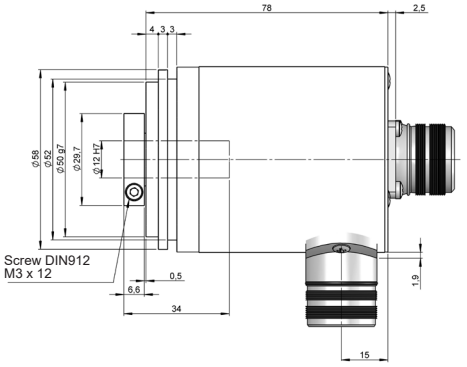
Female connector not included

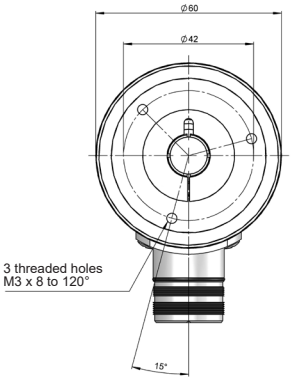
Connection 31

Axial
M23 12p
male panel
clockwise

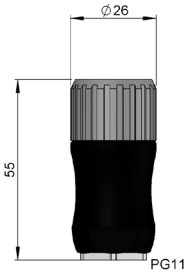
Connection 32

Radial
M23 12p
male panel
clockwise





Female connector
95.0007131

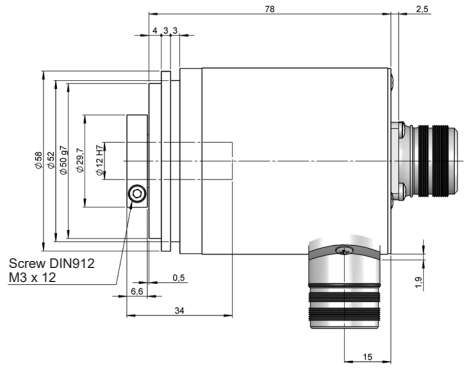


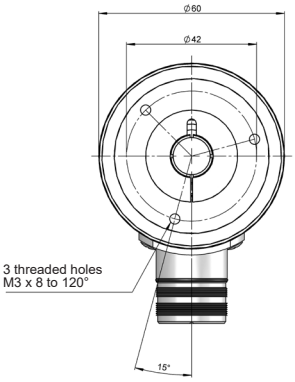
Connection 41

Axial
M23 16p
male panel
clockwise

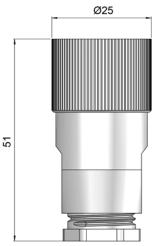
Connection 42

Radial
M23 16p
male panel
clockwise





Female connector
95.0007006

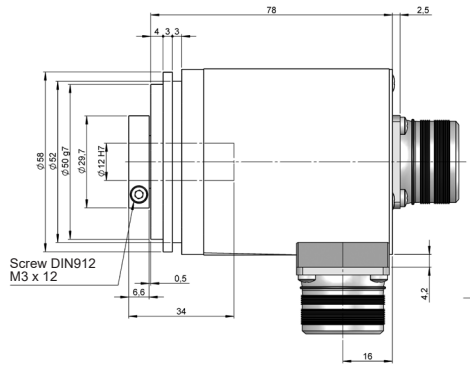


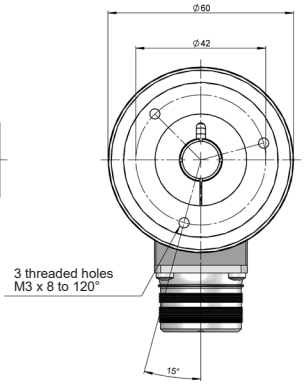
Connection 51

Axial
M27 24p
male panel
clockwise

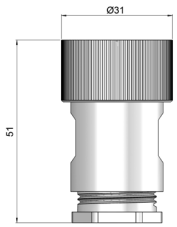
Connection 52

Radial
M27 24p
male panel
clockwise





Female connector
95.0007062

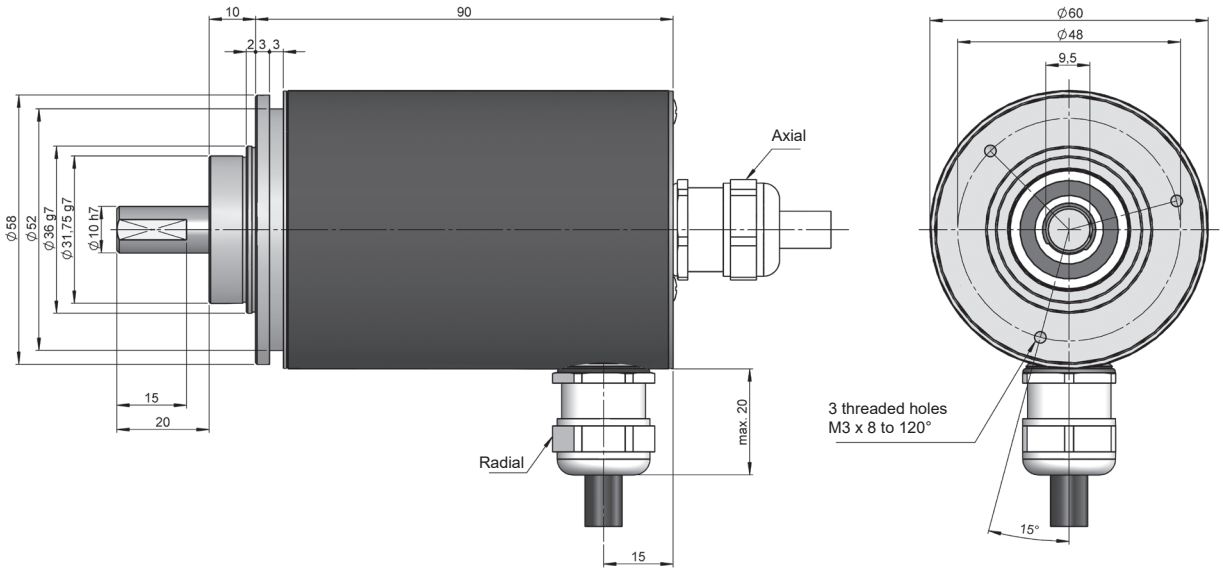


SERIE CM10

MULTITURN ABSOLUTE ENCODER PARALLEL

- Parallel
- Singleturn resolution up to 13 bits
- Multiturn resolution up to 24 bits
- External diameter 58 mm
- Shaft Ø 6 or 10 mm
- Protection class IP65 according to DIN EN 40050
- Connection by cable (other cable length available) or industrial connector

Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP65 | Temperature range | Express Delivery



Drawing shaft type 1, connection type 11/12, without flange

REFERENCE

Reference example: CM10-12110212S-1024/2048

Serie	Solid shaft	Flange	Connection	Interface	Code	IP	Power Supply / Electronic output	Parameters config.	Singleturn resolution	Multiturn resolution	Special customer
CM10 -	☐	☐	☐☐	☐	☐	☐	☐	☐	- ☐☐☐☐	/ ☐☐☐☐	. ☐☐
	1. Ø 10x20 mm **2.** Ø 6x10 mm	**1.** None **2.** 90.1002 **3.** 90.1003 **4.** 90.1004 **5.** 90.1005 **6.** 90.1006	**11.** Axial cable **12.** Radial cable **31.** Axial M23 12p **32.** Radial M23 12p **41.** Axial M23 16p **42.** Radial M23 16p **51.** Axial M27 21p **52.** Radial M27 21p **61.** Axial M27 26p **62.** Radial M27 26p	**0.** Parallel	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW **5.** Gray excess CW **6.** Gray excess CCW	**1.** IP65	**2.** 10...30 VDC / NPN **3.** 10...30 VDC / Push-Pull **4.** 10...30 VDC / NPN OC	**Blank.** None **S.** Direction			

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SERIE CM10

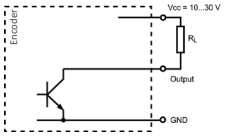
MULTITURN ABSOLUTE ENCODER

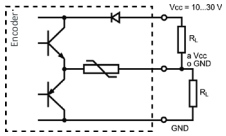
PARALLEL

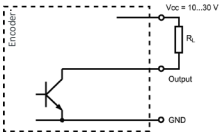
MECHANICAL SPECIFICATIONS

Materials	Housing: Steel Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Shaft diameter	6 or 10 mm
Maximum number of revolutions permitted mechanically	6000 rpm
Protection against dust and splashes according to DIN EN 40050	IP65
Rotor inertia moment	30 gcm²
Starting torque at 20°C (68°F)	≤ 0,02 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	60 N
Weight aprox.	0,5 Kg
Operating temperature range	-10°C to +70°C
Vibration	100 m/s² (10Hz...2000Hz)
Shock	1000 m/s² (6ms)
Axial or radial connection	2 meters cable or industrial connector (other cable lengths available on order) **Female connector not included**

OUTPUT SIGNALS







OUTPUT CIRCUIT	**NPN**	**Push-Pull**	**NPN Open Collector**
Reference code	*2*	*3*	*4*
Power supply	10...30 VDC	10...30 VDC	10...30 VDC
Consumption max.	150 mA	150 mA	150 mA
Max. load capability / channel	40 mA	±30 mA	40 mA
“Low” signal level	VOL < 2.5 VDC	VOL < 2.5 VDC	VOL < 2.5 VDC
“High” signal level	VOH > VCC - 3V	VOH > VCC - 3V	VOH > VCC - 3V
Frequency	200 kHz	200 kHz	200 kHz

ELECTRICAL SPECIFICATIONS

Interface	Parallel
Inputs	Opto-coupled
Code	Binary Gray
Singleturn resolution	up to 8192 points per turn (13 bits) (*)
Multiturn resolution	up to 4096 turns (12 bits)
Linearity	±1/2 LSB
Parameters config.	Direction

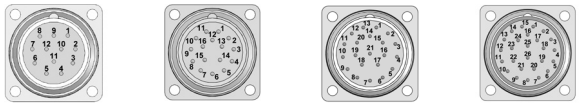
(*) 8192 points per turn (13 bits) only available for multiturn resolution up to 2048 points per turn (11 bits).

SERIE CM10

MULTITURN ABSOLUTE ENCODER

PARALLEL

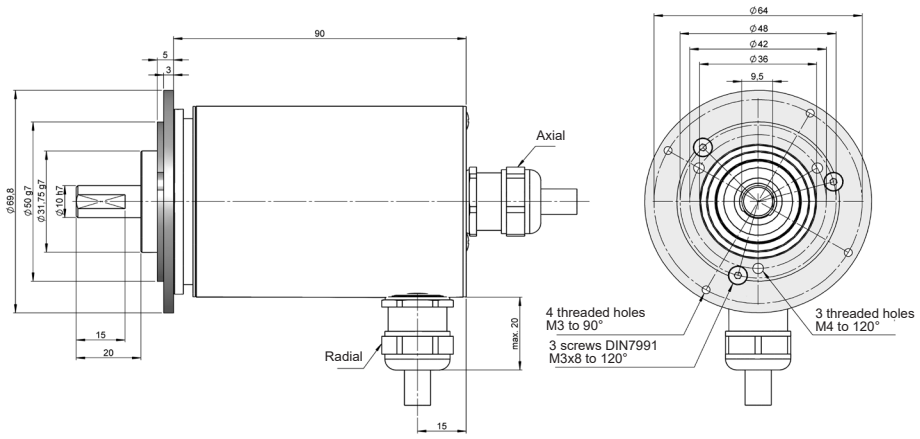
CONNECTION



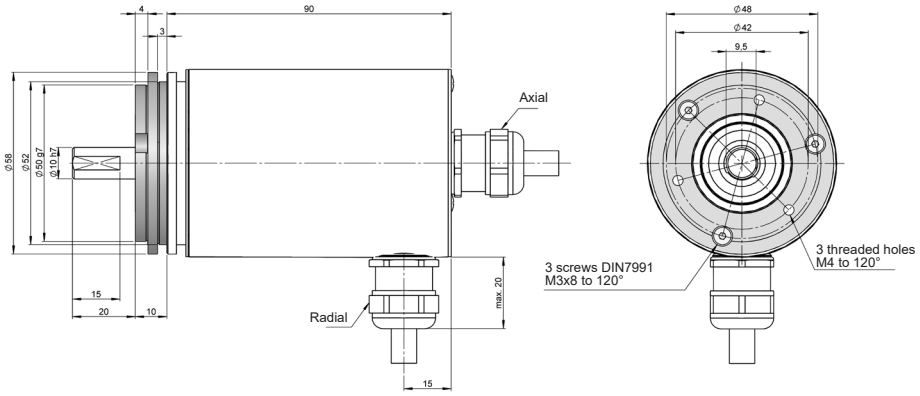
	Cable 15x0,14 mm² 95.0008031	**Cable** 25x0,14 mm² 95.0008030	**Cable** 36x0,14 mm² 95.0008032	**Connector** M23 12p CW	**Connector** M23 16p CW	**Connector** M27 21p CW	**Connector** M27 26p CW
GND	Black	Black	Black	1	1	1	1
VCC	Red	Red	Red	2	2	2	2
Bit 0	Brown	Brown	Brown	3	3	3	3
Bit 1	White	White	White	4	4	4	4
Bit 2	Yellow	Yellow	Yellow	5	5	5	5
Bit 3	Green	Green	Green	6	6	6	6
Bit 4	Orange	Pink	Pink	7	7	7	7
Bit 5	Violet	Orange	Orange	8	8	8	8
Bit 6	Grey	Grey	Grey	9	9	9	9
Bit 7	Blue	Blue	Blue	10	10	10	10
Bit 8	White - Black	Yellow - Black	Yellow - Black	11	11	11	11
Bit 9	White - Red	Yellow - Red	Yellow - Red	12	12	12	12
Bit 10	White - Brown	Yellow - Brown	Yellow - Brown		13	13	13
Bit 11	White - Yellow	Yellow - Green	Yellow - Green		14	14	14
Bit 12	White - Blue	Yellow - Grey	Yellow - Pink		15	15	15
Bit 13		Yellow - Blue	Yellow - Grey		16	16	16
Bit 14		White - Black	Yellow - Blue			17	17
Bit 15		White - Red	White - Black			18	18
Bit 16		White - Brown	White - Red			18	19
Bit 17		White - Green	White - Brown			19	20
Bit 18		White - Pink	White - Green			20	21
Bit 19		White - Orange	White - Pink			21	22
Bit 20		White - Grey	White - Orange				23
Bit 21		White - Blue	White - Grey				24
Bit 22			White - Blue				25
Bit 23			Green - Black				26
DIR	White - Yellow	Yellow - Pink	Grey - Brown	11	15	20	25
RES	White - Blue	White - Blue	Grey - Blue	12	16	21	26

FLANGE DIMENSIONS

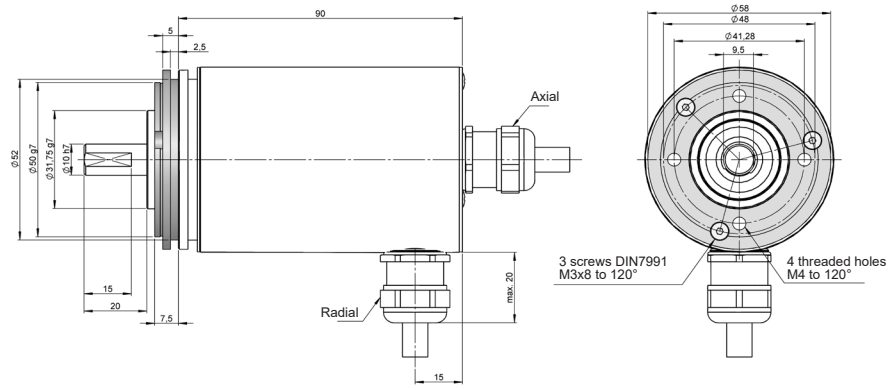
Flange 2
90.1002



Flange 3
90.1003



Flange 4
90.1004

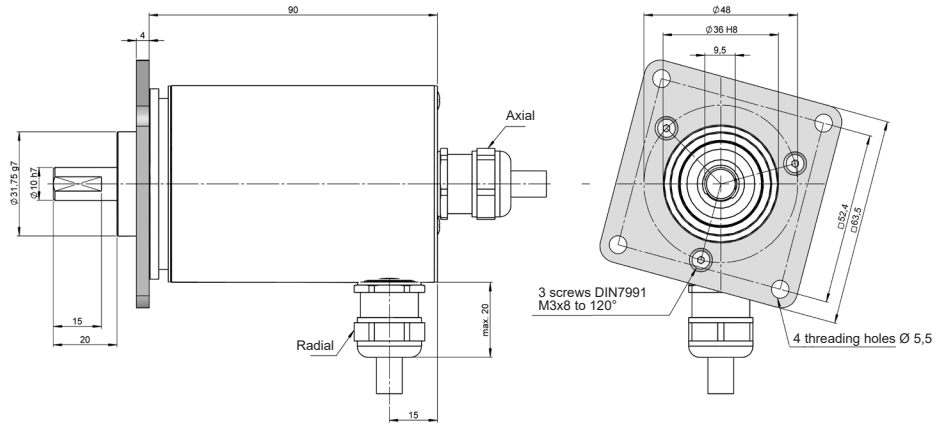


SERIE CM10

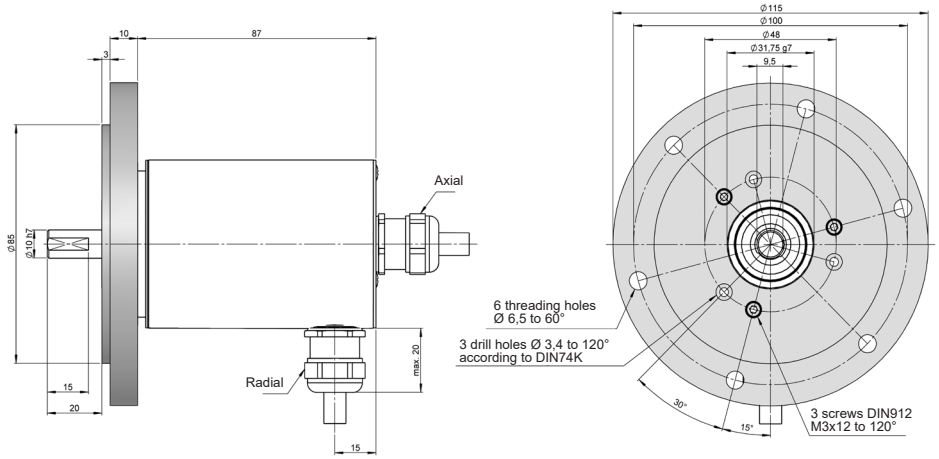
MULTITURN ABSOLUTE ENCODER

PARALLEL

Flange 5
90.1005



Flange 6
90.1006



CONNECTION DIMENSIONS

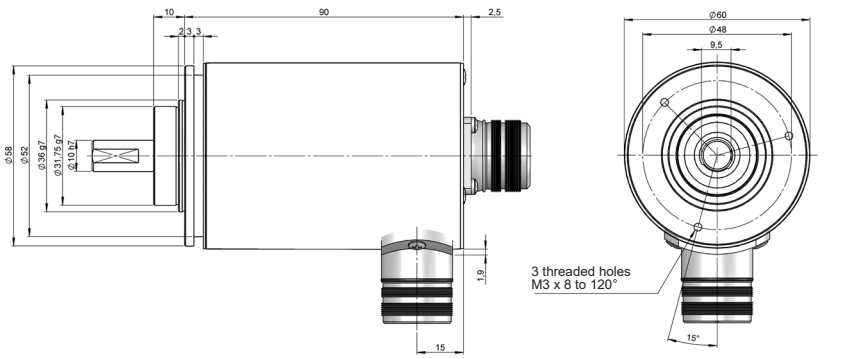
Female connector not included

Connection 31

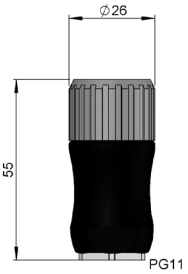
Axial
M23 12p
male panel
clockwise

Connection 32

Radial
M23 12p
male panel
clockwise



Female connector
95.0007131



SERIE CM10

MULTITURN ABSOLUTE ENCODER

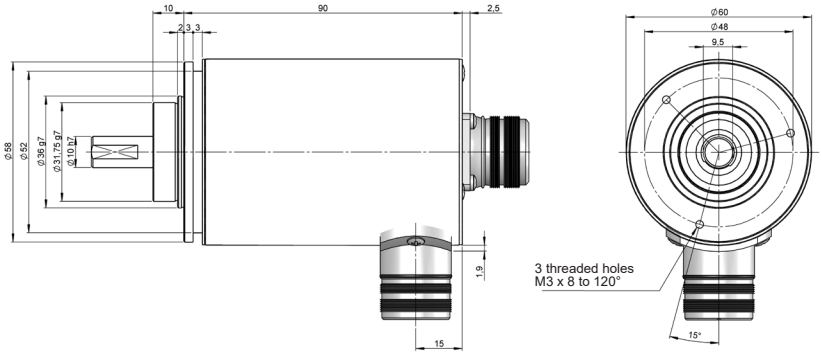
PARALLEL

Connection 41

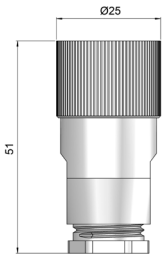
Axial
M23 16p
male panel
clockwise

Connection 42

Radial
M23 16p
male panel
clockwise



Female connector
95.0007006

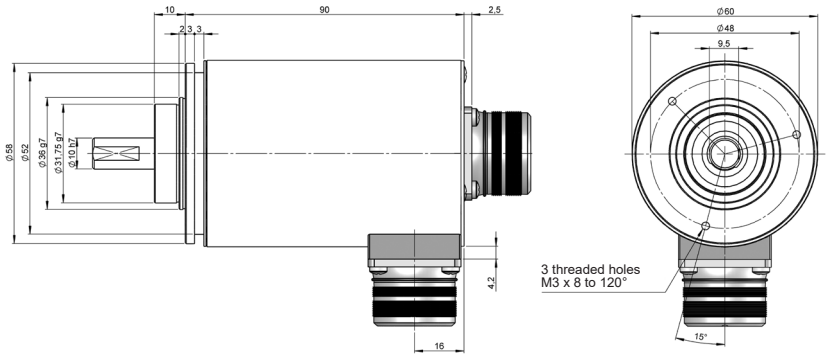


Connection 51

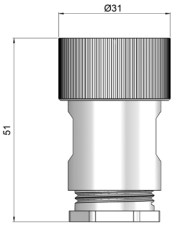
Axial
M27 21p
male panel
clockwise

Connection 52

Radial
M27 21p
male panel
clockwise



Female connector
95.0007062

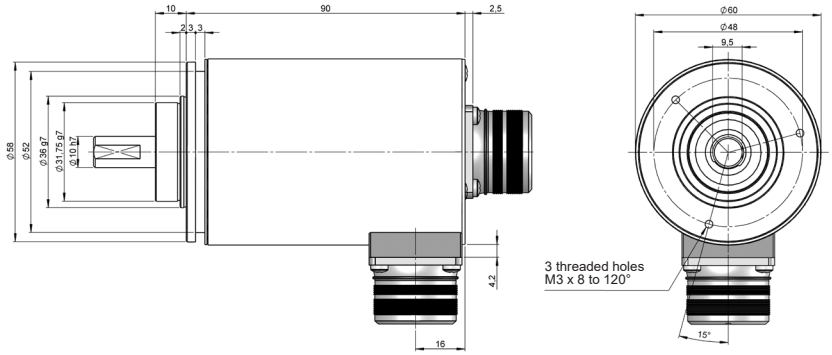


Connection 61

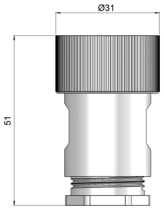
Axial
M27 26p
male panel
clockwise

Connection 62

Radial
M27 26p
male panel
clockwise



Female connector
95.0007063

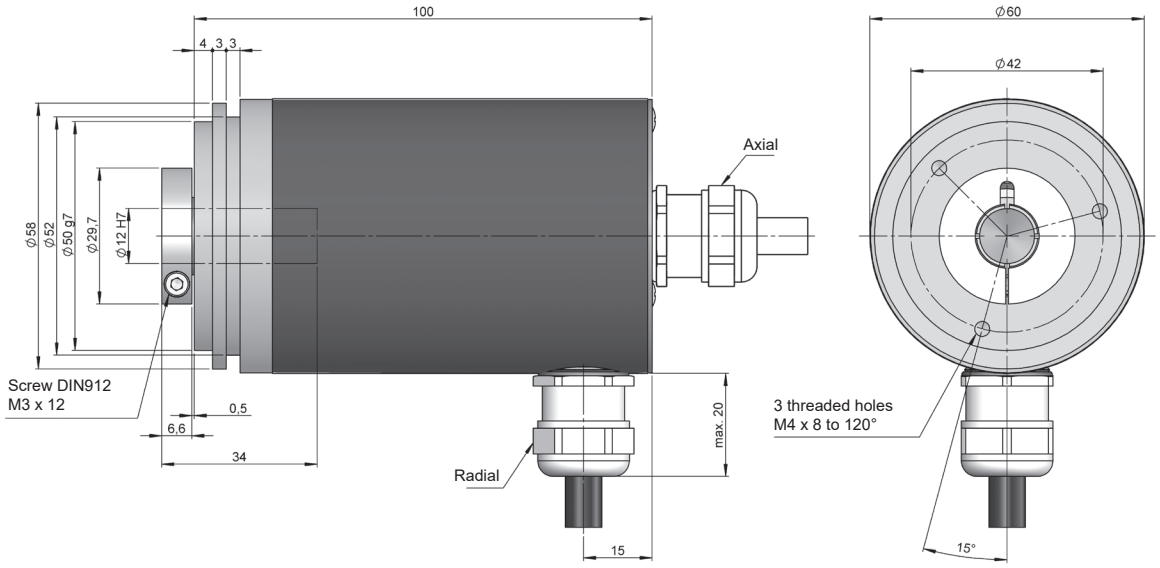


SERIE HM10

MULTITURN ABSOLUTE ENCODER PARALLEL

- Parallel
- Singleturn resolution up to 13 bits
- Multiturn resolution up to 24 bits
- External diameter 58 mm
- Shaft Ø 10 or 12 mm
- Protection class IP65 according to DIN EN 40050
- Connection by cable (other cable length available) or industrial connector

Optical Encoder | Absolute Encoder | Vibration and shock resistant | IP65 | Temperature range | Express Delivery



Drawing shaft type 1, connection type 11/12, without flange

REFERENCE

Reference example: HM10-32110212S-1024/2048

Serie	Blind-Hollow shaft	Anti-rotation system	Connection	Interface	Code	IP	Power Supply / Electronic output	Parameters config.	Singleturn resolution	Multiturn resolution	Special customer
HM10 -	☐	☐	☐☐	☐	☐	☐	☐	☐	-☐☐☐☐	/☐☐☐☐	.☐☐
	3. Ø 12 mm **4.** Ø 10 mm	**1.** None	**11.** Axial cable **12.** Radial cable **31.** Axial M23 12p **32.** Radial M23 12p **41.** Axial M23 16p **42.** Radial M23 16p **51.** Axial M27 21p **52.** Radial M27 21p **61.** Axial M27 26p **62.** Radial M27 26p	**0.** Parallel	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW **5.** Gray excess CW **6.** Gray excess CCW	**1.** IP65	**2.** 10...30 VDC / NPN **3.** 10...30 VDC / Push-Pull **4.** 10...30 VDC / NPN OC	**Blank.** None **S.** Direction			

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SERIE HM10

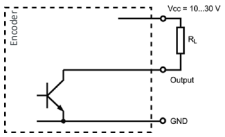
MULTITURN ABSOLUTE ENCODER

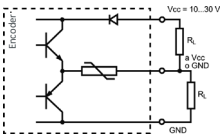
PARALLEL

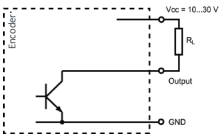
MECHANICAL SPECIFICATIONS

Materials	Housing: Steel Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Housing fixing	Flexible flange
Shaft fixing	Clamp
Permitted misalignment	± 0.5 mm axial, ±0.3 mm radial
Blind hollow shaft diameter	10 or 12 mm
Maximum number of revolutions permitted mechanically	6000 rpm
Protection against dust and splashes according to DIN EN 40050	IP65
Rotor inertia moment	30 gcm²
Starting torque at 20°C (68°F)	≤ 0,02 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	60 N
Weight aprox.	0,5 Kg
Operating temperature range	-10°C to +70°C
Vibration	100 m/s² (10Hz...2000Hz)
Shock	1000 m/s² (6ms)
Axial or radial connection	2 meters cable or industrial connector (other cable lengths available on order) **Female connector not included**

OUTPUT SIGNALS







OUTPUT CIRCUIT	**NPN**	**Push-Pull**	**NPN Open Collector**
Reference code	*2*	*3*	*4*
Power supply	10...30 VDC	10...30 VDC	10...30 VDC
Consumption max.	150 mA	150 mA	150 mA
Max. load capability / channel	40 mA	±30 mA	40 mA
“Low” signal level	VOL < 2.5 VDC	VOL < 2.5 VDC	VOL < 2.5 VDC
“High” signal level	VOH > VCC - 3V	VOH > VCC - 3V	VOH > VCC - 3V
Frequency	200 kHz	200 kHz	200 kHz

SERIE HM10

MULTITURN ABSOLUTE ENCODER

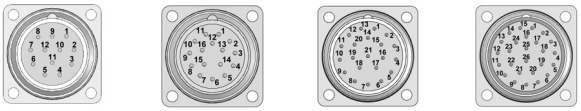
PARALLEL

ELECTRICAL SPECIFICATIONS

Interface	Parallel
Inputs	Opto-coupled
Code	Binary Gray
Singleturn resolution	up to 8192 points per turn (13 bits) (*)
Multiturn resolution	up to 4096 turns (12 bits)
Linearity	±1/2 LSB
Parameters config.	Direction

(*) 8192 points per turn (13 bits) only available for multiturn resolution up to 2048 points per turn (11 bits).

CONNECTION

	Cable 15x0,14 mm² 95.0008031	**Cable** 25x0,14 mm² 95.0008030	**Cable** 36x0,14 mm² 95.0008032	**Connector** M23 12p CW	**Connector** M23 16p CW	**Connector** M27 21p CW	**Connector** M27 26p CW
GND	Black	Black	Black	1	1	1	1
VCC	Red	Red	Red	2	2	2	2
Bit 0	Brown	Brown	Brown	3	3	3	3
Bit 1	White	White	White	4	4	4	4
Bit 2	Yellow	Yellow	Yellow	5	5	5	5
Bit 3	Green	Green	Green	6	6	6	6
Bit 4	Orange	Pink	Pink	7	7	7	7
Bit 5	Violet	Orange	Orange	8	8	8	8
Bit 6	Grey	Grey	Grey	9	9	9	9
Bit 7	Blue	Blue	Blue	10	10	10	10
Bit 8	White - Black	Yellow - Black	Yellow - Black	11	11	11	11
Bit 9	White - Red	Yellow - Red	Yellow - Red	12	12	12	12
Bit 10	White - Brown	Yellow - Brown	Yellow - Brown		13	13	13
Bit 11	White - Yellow	Yellow - Green	Yellow - Green		14	14	14
Bit 12	White - Blue	Yellow - Grey	Yellow - Pink		15	15	15
Bit 13		Yellow - Blue	Yellow - Grey		16	16	16
Bit 14		White - Black	Yellow - Blue			17	17
Bit 15		White - Red	White - Black			18	18
Bit 16		White - Brown	White - Red			18	19
Bit 17		White - Green	White - Brown			19	20
Bit 18		White - Pink	White - Green			20	21
Bit 19		White - Orange	White - Pink			21	22
Bit 20		White - Grey	White - Orange				23
Bit 21		White - Blue	White - Grey				24
Bit 22			White - Blue				25
Bit 23			Green - Black				26
DIR	White - Yellow	Yellow - Pink	Grey - Brown	11	15	20	25
RES	White - Blue	White - Blue	Grey - Blue	12	16	21	26

CONNECTION DIMENSIONS

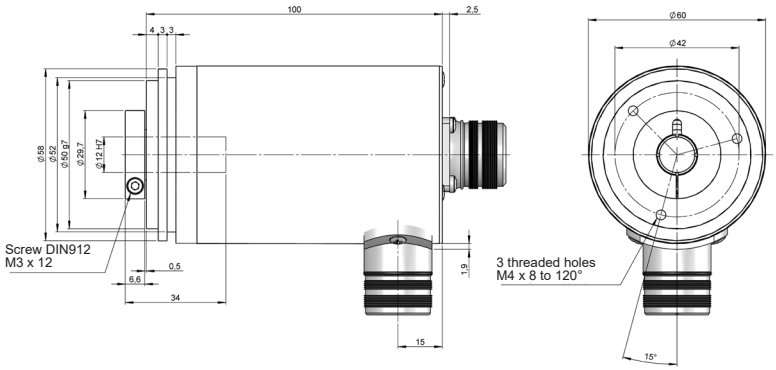
Female connector not included

Connection 31

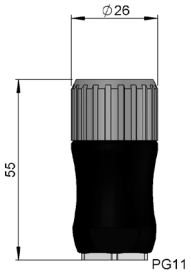
Axial
M23 12p
male panel
clockwise

Connection 32

Radial
M23 12p
male panel
clockwise



Female connector
95.0007131

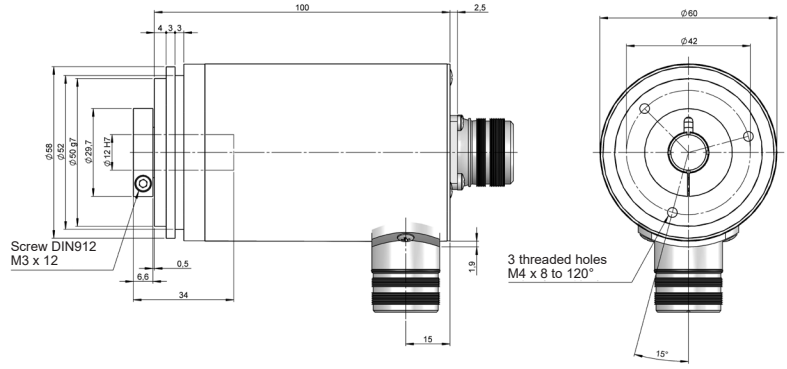


Connection 41

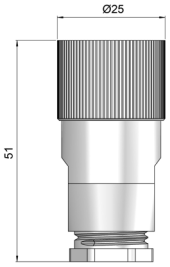
Axial
M23 16p
male panel
clockwise

Connection 42

Radial
M23 16p
male panel
clockwise



Female connector
95.0007006

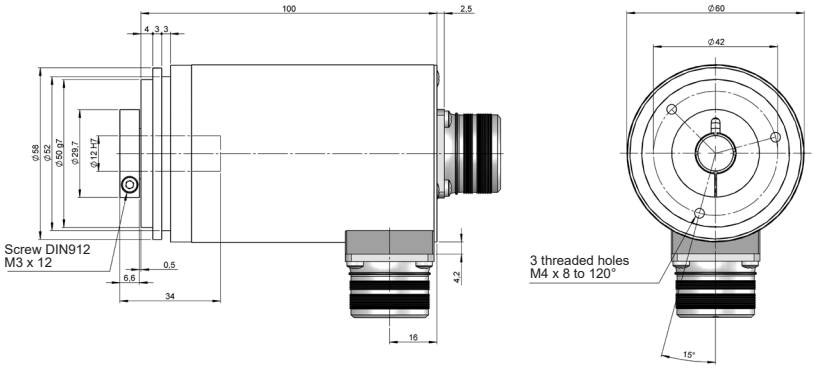


Connection 51

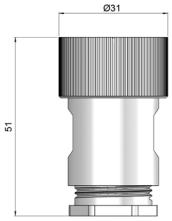
Axial
M27 24p
male panel
clockwise

Connection 52

Radial
M27 24p
male panel
clockwise



Female connector
95.0007062



SERIE HM10

MULTITURN ABSOLUTE ENCODER

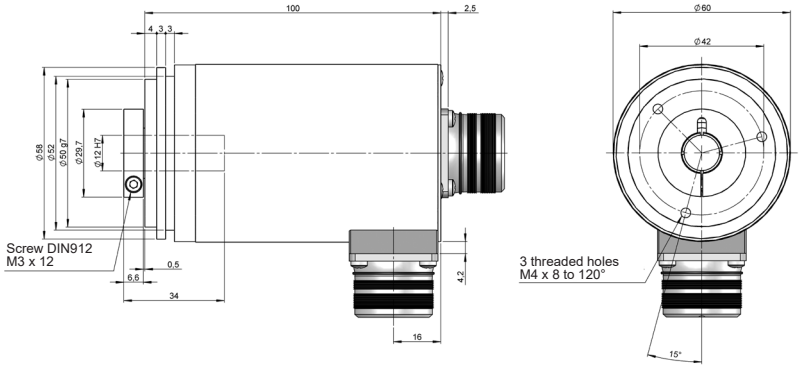
PARALLEL

Connection 61

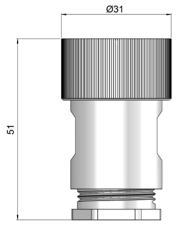
Axial
M27 26p
male panel
clockwise

Connection 62

Radial
M27 26p
male panel
clockwise



Female connector
95.0007063

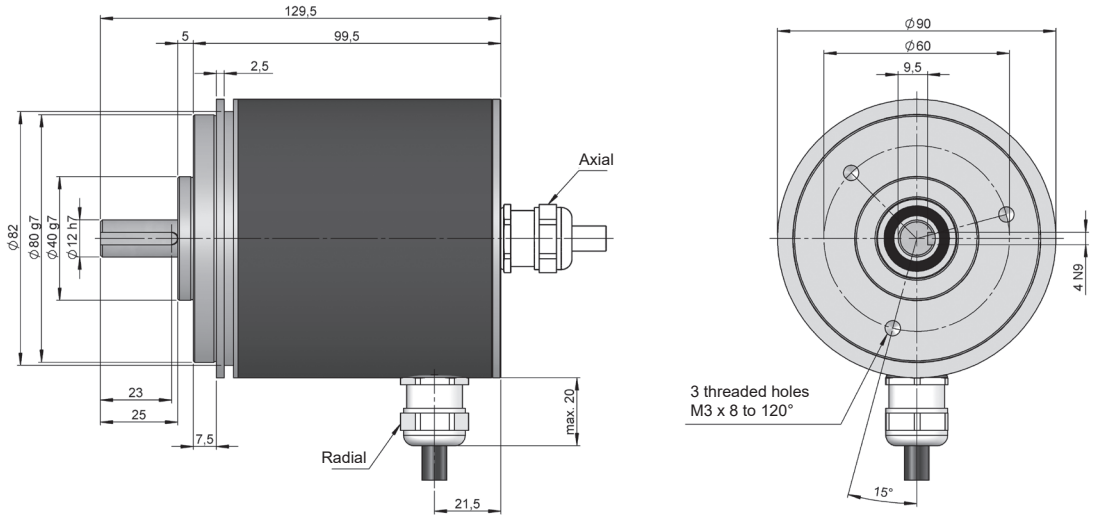


SERIE CS30

ABSOLUTE ENCODER FOR HEAVY DUTY INDUSTRIAL APPLICATIONS PARALLEL

- Parallel
- Singleturn resolution up to 13 bits
- External diameter 90 mm
- Shaft Ø 12 mm
- Protection class IP65 according to DIN EN 40050
- Connection by cable (other cable length available) or industrial connector

Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP65 | Temperature range | Express Delivery



Drawing shaft type 2, connection type 11/12, without flange

REFERENCE

Reference example: CS30-21120212S-1024

Serie	Solid shaft	Flange	Connection	Interface	Code	IP	Power Supply / Electronic output	Parameters config.	Singleturn resolution	Special customer
CS30 -	□	□	□□	□	□	□	□	□	- □□□□	. □□
	2. Ø 12x25 mm	**1.** None **3.** 90.1008	**11.** Axial cable **12.** Radial cable **31.** Axial M23 12p **32.** Radial M23 12p **41.** Axial M23 16p **42.** Radial M23 16p **51.** Axial M27 21p **52.** Radial M27 21p **61.** Axial M27 26p **62.** Radial M27 26p	**0.** Parallel	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW **5.** Gray excess CW **6.** Gray excess CCW **7.** BCD CW **8.** BCD CCW	**1.** IP65	**2.** 10...30 VDC / NPN **3.** 10...30 VDC / Push-Pull **4.** 10...30 VDC / NPN OC	**Blank.** None **S.** Direction		

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SERIE CS30

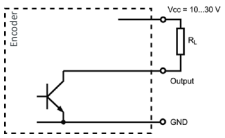
ABSOLUTE ENCODER FOR HEAVY DUTY INDUSTRIAL APPLICATIONS

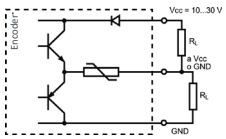
PARALLEL

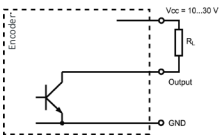
MECHANICAL SPECIFICATIONS

Materials	Housing: Steel Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Shaft diameter	12 mm
Maximum number of revolutions permitted mechanically	6000 rpm
Protection against dust and splashes according to DIN EN 40050	IP65
Rotor inertia moment	270 gcm²
Starting torque at 20°C (68°F)	≤ 0,05 Nm
Maximum load permitted on axial shaft	80 N
Maximum load permitted on radial shaft	100 N
Weight aprox.	1,2 Kg
Operating temperature range	-10°C to +70°C
Vibration	100 m/s² (10Hz...2000Hz)
Shock	1000 m/s² (6ms)
Axial or radial connection	2 meters cable or industrial connector (other cable lengths available on order) **Female connector not included**

OUTPUT SIGNALS







OUTPUT CIRCUIT	**NPN**	**Push-Pull**	**NPN Open Collector**
Reference code	*2*	*3*	*4*
Power supply	10...30 VDC	10...30 VDC	10...30 VDC
Consumption max.	100 mA	100 mA	100 mA
Max. load capability / channel	40 mA	±30 mA	40 mA
“Low” signal level	VOL < 2.5 VDC	VOL < 2.5 VDC	VOL < 2.5 VDC
“High” signal level	VOH > VCC - 3V	VOH > VCC - 3V	VOH > VCC - 3V
Frequency	200 kHz	200 kHz	200 kHz

ELECTRICAL SPECIFICATIONS

Interface	Parallel
Inputs	Opto-coupled
Code	Binary Gray BCD
Singleturn resolution	up to 8192 points per turn (13 bits)
Linearity	±1/2 LSB
Parameters config.	Direction

SERIE CS30

ABSOLUTE ENCODER FOR HEAVY DUTY INDUSTRIAL APPLICATIONS

PARALLEL

CONNECTION

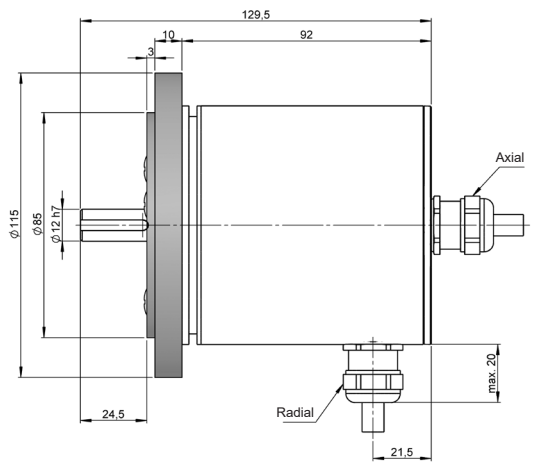


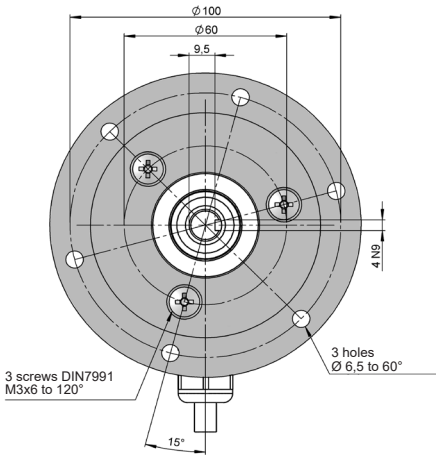



	Cable 15x0,14 mm² 95.0008031	**Cable** 25x0,14 mm² 95.0008030	**Connector** M23 12p CW	**Connector** M23 16p CW	**Connector** M27 21p CW	**Connector** M27 26p CW
GND	Black	Black	1	1	1	1
VCC	Red	Red	2	2	2	2
Bit 0	Brown	Brown	3	3	3	3
Bit 1	White	White	4	4	4	4
Bit 2	Yellow	Yellow	5	5	5	5
Bit 3	Green	Green	6	6	6	6
Bit 4	Orange	Pink	7	7	7	7
Bit 5	Violet	Orange	8	8	8	8
Bit 6	Grey	Grey	9	9	9	9
Bit 7	Blue	Blue	10	10	10	10
Bit 8	White - Black	Yellow - Black	11	11	11	11
Bit 9	White - Red	Yellow - Red	12	12	12	12
Bit 10	White - Brown	Yellow - Brown		13	13	13
Bit 11	White - Yellow	Yellow - Green		14	14	14
Bit 12	White - Blue	Yellow - Grey		15	15	15
Bit 13		Yellow - Blue		16	16	16
Bit 14		White - Black			17	17
Bit 15		White - Red			18	18
DIR	White - Yellow	Yellow - Pink	11	15	20	25
RES	White - Blue	White - Blue	12	16	21	26

FLANGE DIMENSIONS

Flange 3
90.1008





SERIE CS30

ABSOLUTE ENCODER FOR HEAVY DUTY INDUSTRIAL APPLICATIONS

PARALLEL

CONNECTION DIMENSIONS

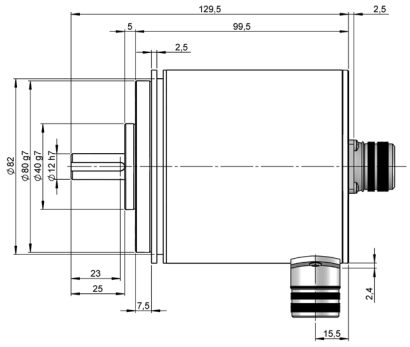
Female connector not included

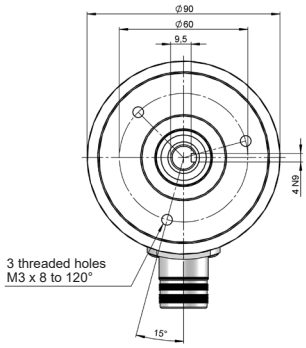
Connection 31

Axial
M23 12p
male panel
clockwise

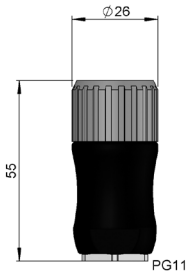
Connection 32

Radial
M23 12p
male panel
clockwise





Female connector
95.0007131

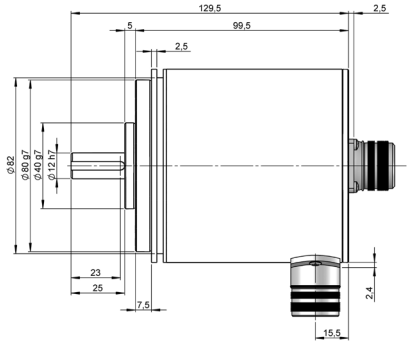


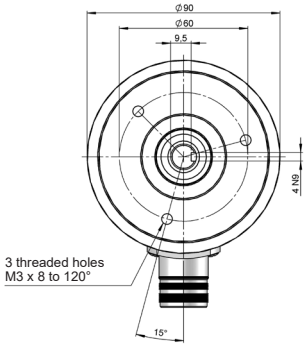
Connection 41

Axial
M23 16p
male panel
clockwise

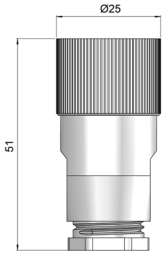
Connection 42

Radial
M23 16p
male panel
clockwise





Female connector
95.0007006

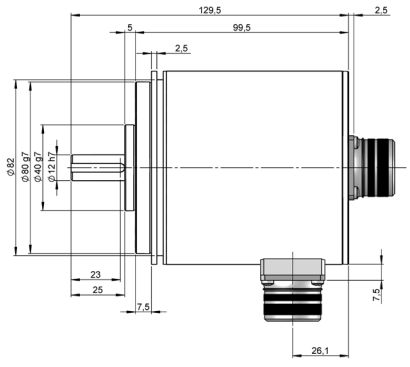


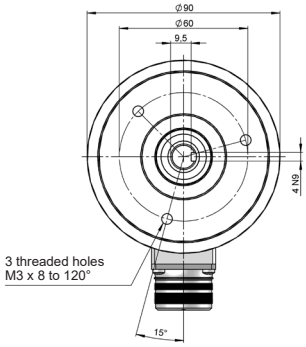
Connection 51

Axial
24p
male panel
clockwise

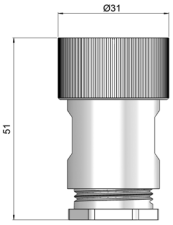
Connection 52

Radial
24p
male panel
clockwise





Female connector
95.0007062



SERIE CS30

ABSOLUTE ENCODER FOR HEAVY DUTY INDUSTRIAL APPLICATIONS

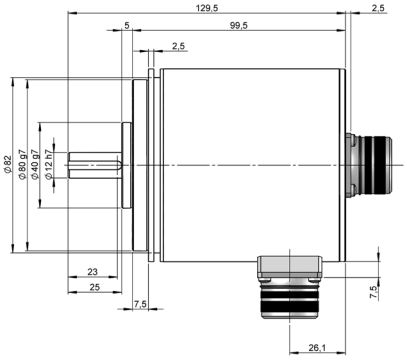
PARALLEL

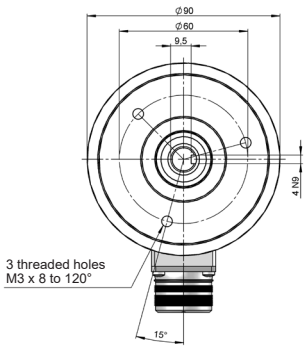
Connection 61

Axial
26p
male panel
clockwise

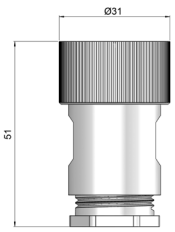
Connection 62

Radial
26p
male panel
clockwise





Female connector
95.0007063

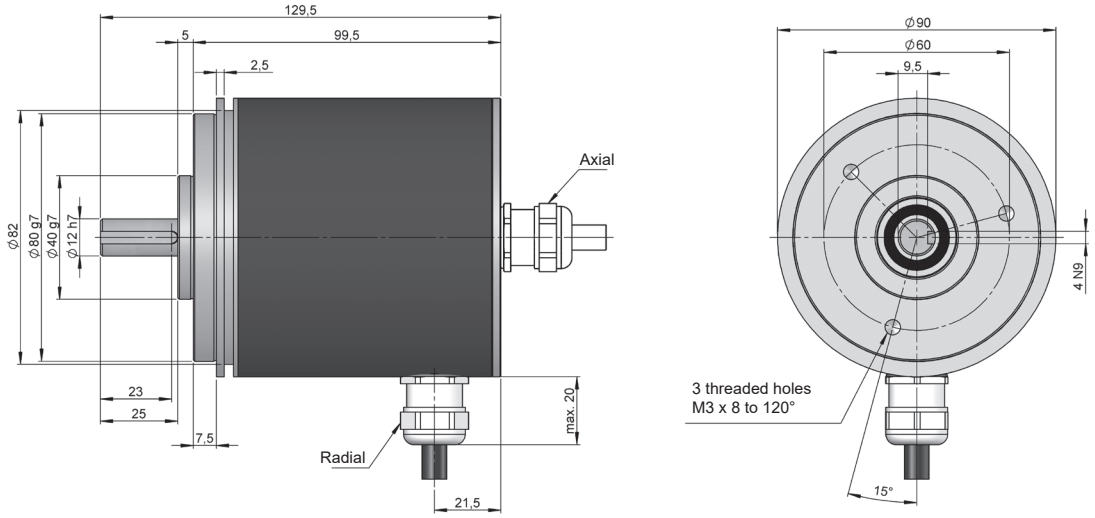


SERIE CM30

ABSOLUTE ENCODER FOR HEAVY DUTY INDUSTRIAL APPLICATIONS PARALLEL

- Parallel
- Singleturn resolution up to 13 bits
- Multiturn resolution up to 24 bits
- External diameter 90 mm
- Shaft Ø 12 mm
- Protection class IP65 according to DIN EN 40050
- Connection by cable (other cable length available) or industrial connector

Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP65 | Temperature range | Express Delivery



Drawing shaft type 2, connection type 11/12, without flange

REFERENCE

Reference example: CM30-21120212S-1024/2048

Serie	Solid shaft	Flange	Connection	Interface	Code	IP	Power Supply / Electronic output	Parameters config.	Singleturn resolution	Multiturn resolution	Special customer
CM30 -	☐	☐	☐☐	☐	☐	☐	☐	☐	-☐☐☐☐	/☐☐☐☐	.☐☐
	2. Ø 12x25 mm	**1.** None **3.** 90.1008	**11.** Axial cable **12.** Radial cable **31.** Axial M23 12p **32.** Radial M23 12p **41.** Axial M23 16p **42.** Radial M23 16p **51.** Axial M27 21p **52.** Radial M27 21p **61.** Axial M27 26p **62.** Radial M27 26p	**0.** Parallel	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW **5.** Gray excess CW **6.** Gray excess CCW	**1.** IP65	**2.** 10...30 VDC / NPN **3.** 10...30 VDC / Push-Pull **4.** 10...30 VDC / NPN OC	**Blank.** None **S.** Direction			

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info@encoderhohner.com
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SERIE CM30

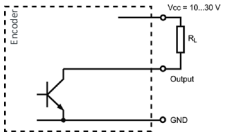
ABSOLUTE ENCODER FOR HEAVY DUTY INDUSTRIAL APPLICATIONS

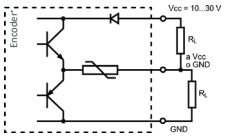
PARALLEL

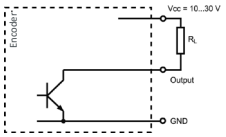
MECHANICAL SPECIFICATIONS

Materials	Housing: Steel Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Shaft diameter	12 mm
Maximum number of revolutions permitted mechanically	6000 rpm
Protection against dust and splashes according to DIN EN 40050	IP65
Rotor inertia moment	270 gcm²
Starting torque at 20°C (68°F)	≤ 0,05 Nm
Maximum load permitted on axial shaft	80 N
Maximum load permitted on radial shaft	100 N
Weight aprox.	1,3 Kg
Operating temperature range	-10°C to +70°C
Vibration	100 m/s² (10Hz...2000Hz)
Shock	1000 m/s² (6ms)
Axial or radial connection	2 meters cable or industrial connector (other cable lengths available on order) **Female connector not included**

OUTPUT SIGNALS







OUTPUT CIRCUIT	**NPN**	**Push-Pull**	**NPN Open Collector**
Reference code	*2*	*3*	*4*
Power supply	10...30 VDC	10...30 VDC	10...30 VDC
Consumption max.	150 mA	150 mA	150 mA
Max. load capability / channel	40 mA	±30 mA	40 mA
“Low” signal level	VOL < 2.5 VDC	VOL < 2.5 VDC	VOL < 2.5 VDC
“High” signal level	VOH > VCC - 3V	VOH > VCC - 3V	VOH > VCC - 3V
Frequency	200 kHz	200 kHz	200 kHz

ELECTRICAL SPECIFICATIONS

Interface	Parallel
Inputs	Opto-coupled
Code	Binary Gray
Singleturn resolution	up to 8192 points per turn (13 bits) (*)
Multiturn resolution	up to 4096 turns (12 bits)
Linearity	±1/2 LSB
Parameters config.	Direction

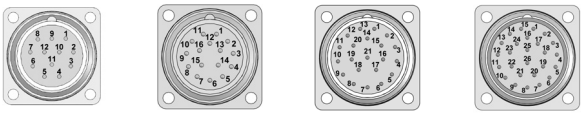
(*) 8192 points per turn (13 bits) only available for multiturn resolution up to 2048 points per turn (11 bits).

SERIE CM30

ABSOLUTE ENCODER FOR HEAVY DUTY INDUSTRIAL APPLICATIONS

PARALLEL

CONNECTION

	Cable 15x0,14 mm² 95.0008031	**Cable** 25x0,14 mm² 95.0008030	**Cable** 36x0,14 mm² 95.0008032	**Connector** M23 12p CW	**Connector** M23 16p CW	**Connector** M27 21p CW	**Connector** M27 26p CW
GND	Black	Black	Black	1	1	1	1
VCC	Red	Red	Red	2	2	2	2
Bit 0	Brown	Brown	Brown	3	3	3	3
Bit 1	White	White	White	4	4	4	4
Bit 2	Yellow	Yellow	Yellow	5	5	5	5
Bit 3	Green	Green	Green	6	6	6	6
Bit 4	Orange	Pink	Pink	7	7	7	7
Bit 5	Violet	Orange	Orange	8	8	8	8
Bit 6	Grey	Grey	Grey	9	9	9	9
Bit 7	Blue	Blue	Blue	10	10	10	10
Bit 8	White - Black	Yellow - Black	Yellow - Black	11	11	11	11
Bit 9	White - Red	Yellow - Red	Yellow - Red	12	12	12	12
Bit 10	White - Brown	Yellow - Brown	Yellow - Brown		13	13	13
Bit 11	White - Yellow	Yellow - Green	Yellow - Green		14	14	14
Bit 12	White - Blue	Yellow - Grey	Yellow - Pink		15	15	15
Bit 13		Yellow - Blue	Yellow - Grey		16	16	16
Bit 14		White - Black	Yellow - Blue			17	17
Bit 15		White - Red	White - Black			18	18
Bit 16		White - Brown	White - Red			18	19
Bit 17		White - Green	White - Brown			19	20
Bit 18		White - Pink	White - Green			20	21
Bit 19		White - Orange	White - Pink			21	22
Bit 20		White - Grey	White - Orange				23
Bit 21		White - Blue	White - Grey				24
Bit 22			White - Blue				25
Bit 23			Green - Black				26
DIR	White - Yellow	Yellow - Pink	Grey - Brown	11	15	20	25
RES	White - Blue	White - Blue	Grey - Blue	12	16	21	26

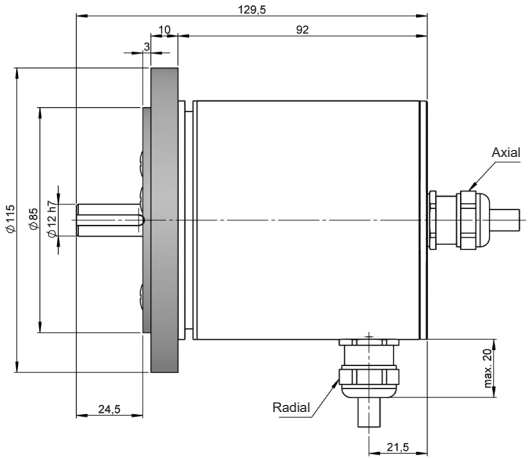
SERIE CM30

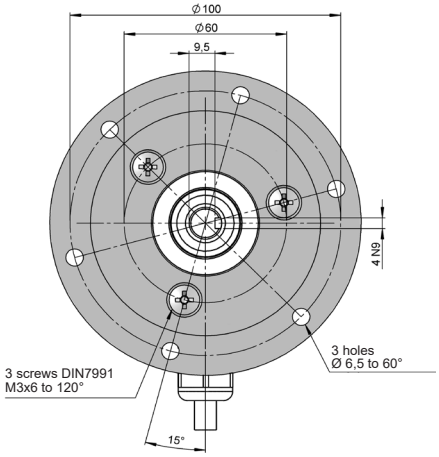
ABSOLUTE ENCODER FOR HEAVY DUTY INDUSTRIAL APPLICATIONS

PARALLEL

FLANGE DIMENSIONS

Flange 3
90.1008





CONNECTION DIMENSIONS

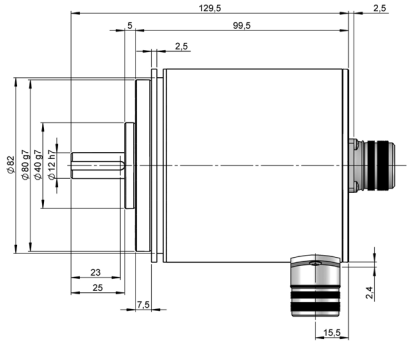
Female connector not included

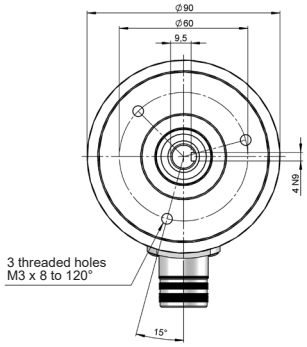
Connection 31

Axial
M23 12p
male panel
clockwise

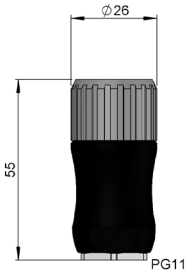
Connection 32

Radial
M23 12p
male panel
clockwise





Female connector
95.0007131

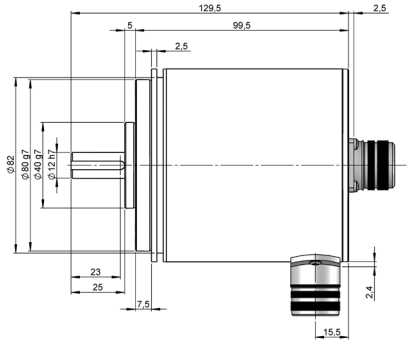


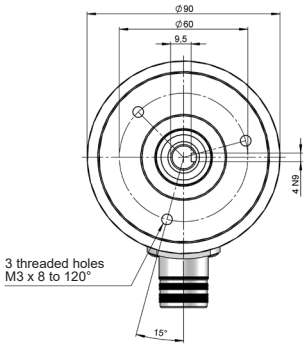
Connection 41

Axial
M23 16p
male panel
clockwise

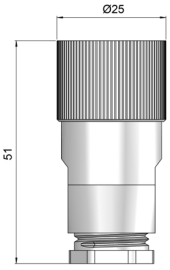
Connection 42

Radial
M23 16p
male panel
clockwise





Female connector
95.0007006



SERIE CM30

ABSOLUTE ENCODER FOR HEAVY DUTY INDUSTRIAL APPLICATIONS

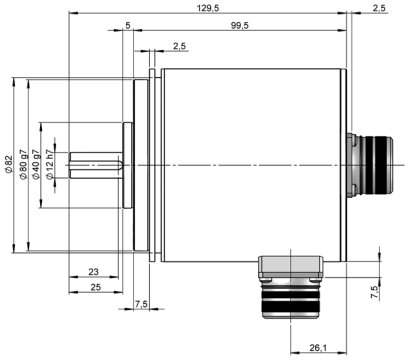
PARALLEL

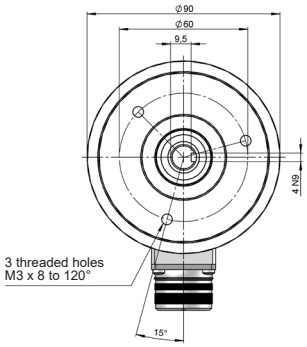
Connection 51

Axial
M27 24p
male panel
clockwise

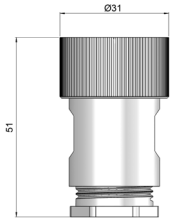
Connection 52

Radial
M27 24p
male panel
clockwise





Female connector
95.0007062

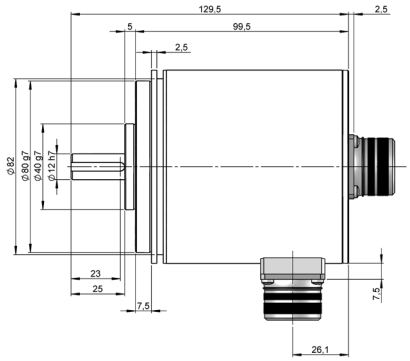


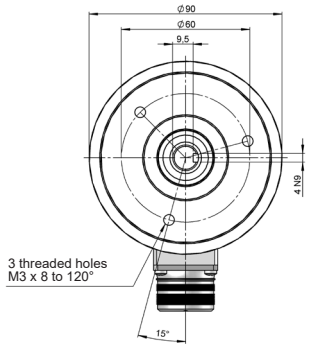
Connection 61

Axial
M27 26p
male panel
clockwise

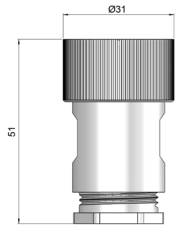
Connection 62

Radial
M27 26p
male panel
clockwise





Female connector
95.0007063

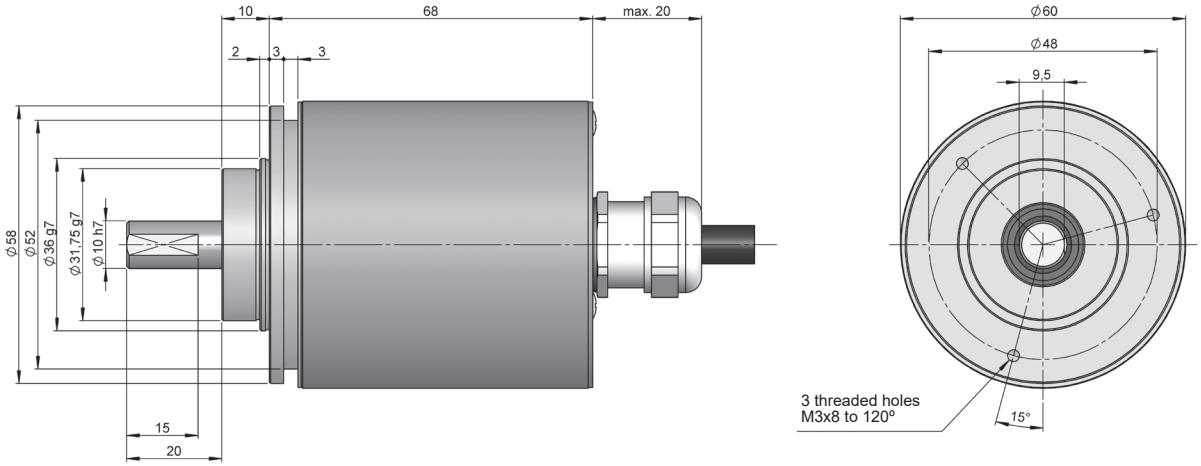


SERIE CS10 IP67

SINGLETURN ABSOLUT ENCODER FOR SEVERE APPLICATIONS PARALLEL

- Parallel
- Singleturn resolution up to 13 bits
- External diameter 58 mm
- Shaft from Ø 6 or 10 mm
- Protection class IP67 according to DIN EN 40050
- Connection by cable (other cable length available)

Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP67 | Temperature range | Express Delivery



Drawing shaft type 1, connection type 11, without flange

REFERENCE

Reference example: CS10-11110124S-1024

Serie	Solid shaft	Flange	Connection	Interface	Code	IP	Power Supply / Electronic output	Parameters config.	Singleturn resolution	Special customer
CS10 -	☐	☐	☐☐	☐	☐	☐	☐	☐	- ☐☐☐☐	.☐☐
	1. Ø 6x10 mm **2.** Ø 10x20 mm	**1.** None **2.** 90.1002 **3.** 90.1003 **4.** 90.1004 **5.** 90.1005 **6.** 90.1006	**11.** Axial cable	**0.** Parallel	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW **5.** Gray excess CW **6.** Gray excess CCW **7.** BDC CW **8.** BDC CCW	**2.** Stainless steel IP67 **3.** IP67	**2.** 10...30 VDC / NPN **3.** 10...30 VDC / Push-Pull **4.** 10...30 VDC / NPN OC	**Blank.** None **S.** Direction		

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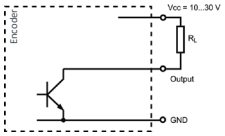
SINGLETURN ABSOLUT ENCODER FOR SEVERE APPLICATIONS

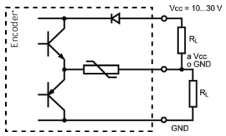
PARALLEL

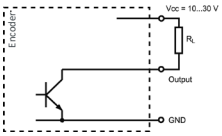
MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium (IP type 3) / Stainless steel (IP type 2) Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Shaft diameter	6 or 10 mm
Maximum number of revolutions permitted mechanically	6000 rpm
Protection according to DIN EN 40050	IP67
Rotor inertia moment	30 gcm²
Starting torque at 20°C (68°F)	≤ 0,02 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	60 N
Weight aprox.	0,4 Kg
Operating temperature range	-10°C to +70°C
Vibration	100 m/s² (10Hz...2000Hz)
Shock	1000 m/s² (6ms)
Axial connection	2 meters cable (other cable lengths available on order)

OUTPUT SIGNALS







OUTPUT CIRCUIT	**NPN**	**Push-Pull**	**NPN Open Collector**
Reference code	*2*	*3*	*4*
Power supply	10...30 VDC	10...30 VDC	10...30 VDC
Consumption max.	100 mA	100 mA	100 mA
Max. load capability / channel	40 mA	±30 mA	40 mA
“Low” signal level	VOL < 2.5 VDC	VOL < 2.5 VDC	VOL < 2.5 VDC
“High” signal level	VOH > VCC - 3V	VOH > VCC - 3V	VOH > VCC - 3V
Frequency	200 kHz	200 kHz	200 kHz

ELECTRICAL SPECIFICATIONS

Interface	Parallel
Inputs	Opto-coupled
Code	Binary Gray BDC
Singleturn resolution	up to 8192 points per turn (13 bits)
Linearity	±1/2 LSB
Parameters config.	Direction

SERIE CS10 IP67

SINGLETURN ABSOLUT ENCODER FOR SEVERE APPLICATIONS

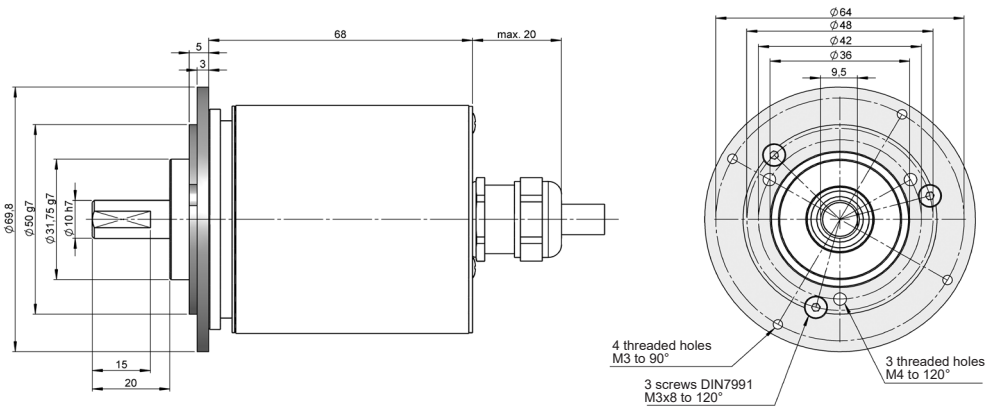
PARALLEL

CONNECTION

	Cable 15 x 0.14 mm² 95.0008031	**Cable** 25 x 0.14 mm² 95.0008030
GND	Black	Black
VCC	Red	Red
Bit 0	Brown	Brown
Bit 1	White	White
Bit 2	Yellow	Yellow
Bit 3	Green	Green
Bit 4	Orange	Pink
Bit 5	Violet	Orange
Bit 6	Grey	Grey
Bit 7	Blue	Blue
Bit 8	White - Black	Yellow - Black
Bit 9	White - Red	Yellow - Red
Bit 10	White - Brown	Yellow - Brown
Bit 11	White - Yellow	Yellow - Green
Bit 12	White - Blue	Yellow - Grey
Bit 13		Yellow - Blue
Bit 14		White - Black
Bit 15		White - Red
DIR	White - Yellow	Yellow - Pink
RES	White - Blue	White - Blue

FLANGE DIMENSIONS

Flange 2
90.1002

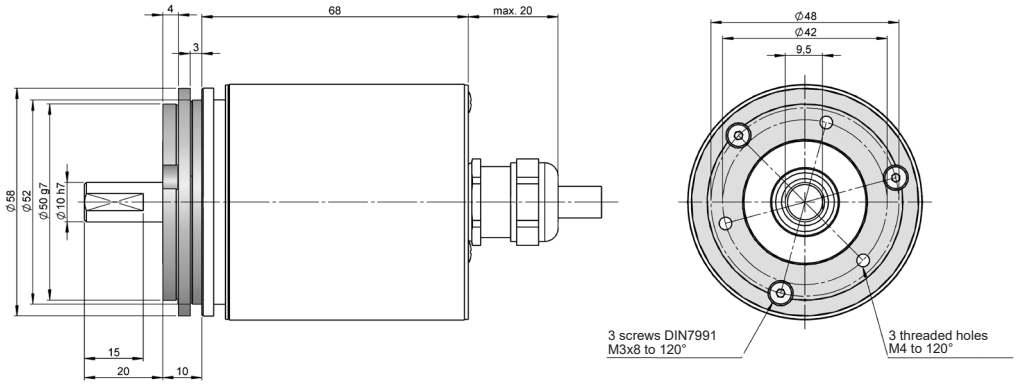


SERIE CS10 IP67

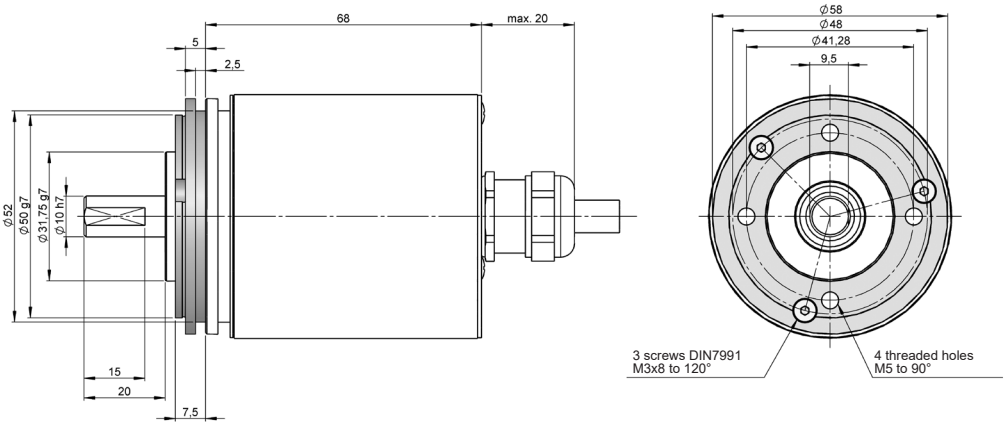
SINGLETURN ABSOLUT ENCODER FOR SEVERE APPLICATIONS

PARALLEL

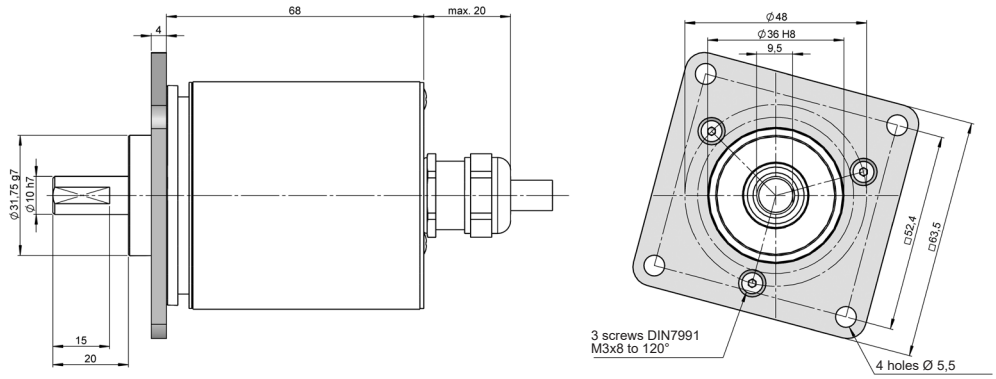
Flange 3
90.1003



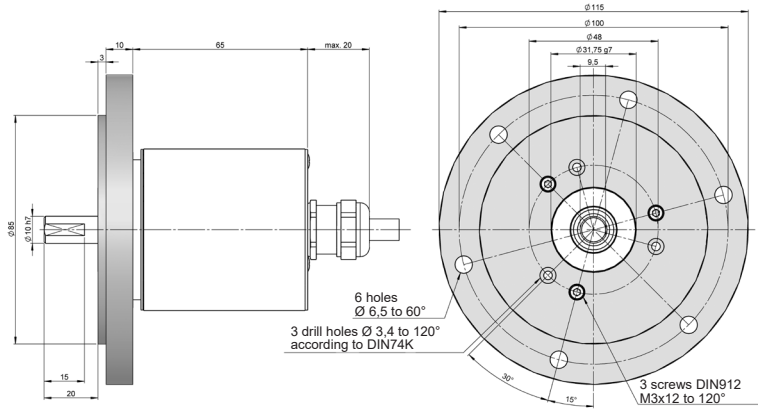
Flange 4
90.1004



Flange 5
90.1005



Flange 6
90.1006



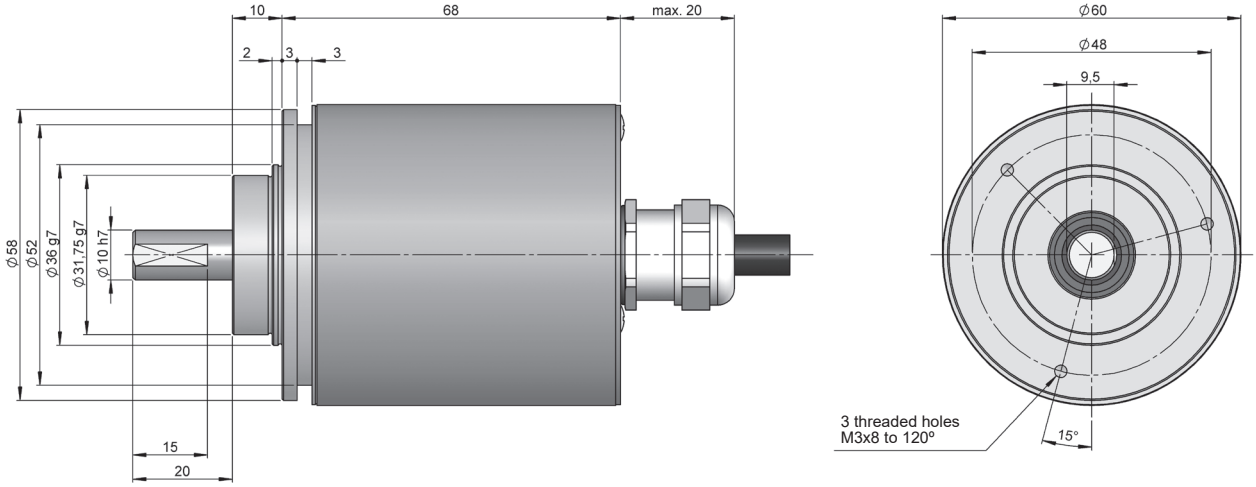
SERIE CM10 IP67

MULTITURN ABSOLUT ENCODER FOR SEVERE APPLICATIONS

PARALLEL

- **Parallel**
- **Singleturn resolution up to 13 bits**
- **Multiturn resolution up to 24 bits**
- **External diameter 58 mm**
- **Shaft Ø 10 mm**
- **Protection class IP67 according to DIN EN 40050**
- **Connection by cable (other cable length available)**

Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP67 | Temperature range | Express Delivery



Drawing shaft type 2, connection type 11, without flange

REFERENCE

Reference example: CM10-21110523S-1024/1024

Serie	Solid shaft	Flange	Connection	Interface	Code	IP	Power Supply / Electronic output	Parameters config.	Singleturn resolution	Multiturn resolution	Special customer
CM10 -	☐	☐	☐☐	☐	☐	☐	☐	☐	-☐☐☐☐	/☐☐☐.☐☐	.☐☐
	2. Ø 10x20 mm	**1.** None **2.** 90.1002 **3.** 90.1003 **4.** 90.1004 **5.** 90.1005 **6.** 90.1006	**11.** Axial cable	**0.** Parallel	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW **5.** Gray excess CW **6.** Gray excess CCW	**2.** Stainless steel IP67 **3.** IP67	**2.** 10...30 VDC / NPN **3.** 10...30 VDC / Push-Pull **4.** 10...30 VDC / NPN OC	**Blank.** None **S.** Direction			

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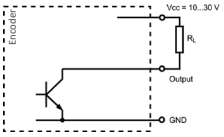
MULTITURN ABSOLUT ENCODER FOR SEVERE APPLICATIONS

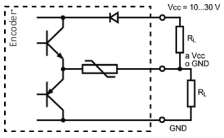
PARALLEL

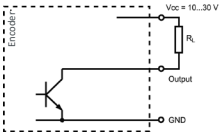
MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium (IP type 3) / Stainless steel (IP type 2) Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Shaft diameter	10 mm
Maximum number of revolutions permitted mechanically	6000 rpm
Protection according to DIN EN 40050	IP67
Rotor inertia moment	30 gcm²
Starting torque at 20°C (68°F)	≤ 0,02 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	60 N
Weight aprox.	0,5 Kg
Operating temperature range	-10°C to +70°C
Vibration	100 m/s² (10Hz...2000Hz)
Shock	1000 m/s² (6ms)
Axial connection	2 meters cable (other cable lengths available on order)

OUTPUT SIGNALS







OUTPUT CIRCUIT	**NPN**	**Push-Pull**	**NPN Open Collector**
Reference code	*2*	*3*	*4*
Power supply	10...30 VDC	10...30 VDC	10...30 VDC
Consumption max.	150 mA	150 mA	150 mA
Max. load capability / channel	40 mA	±30 mA	40 mA
“Low” signal level	VOL < 2.5 VDC	VOL < 2.5 VDC	VOL < 2.5 VDC
“High” signal level	VOH > VCC - 3V	VOH > VCC - 3V	VOH > VCC - 3V
Frequency	200 kHz	200 kHz	200 kHz

ELECTRICAL SPECIFICATIONS

Interface	Parallel
Inputs	Opto-coupled
Code	Binary Gray
Singleturn resolution	up to 8192 points per turn (13 bits) (*)
Multiturn resolution	up to 4096 turns (12 bits)
Linearity	± 1/2 LSB
Parameters config.	Direction

(*) 8192 points per turn (13 bits) only available for multiturn resolution up to 2048 points per turn (11 bits).

SERIE CM10 IP67

MULTITURN ABSOLUT ENCODER FOR SEVERE APPLICATIONS

PARALLEL

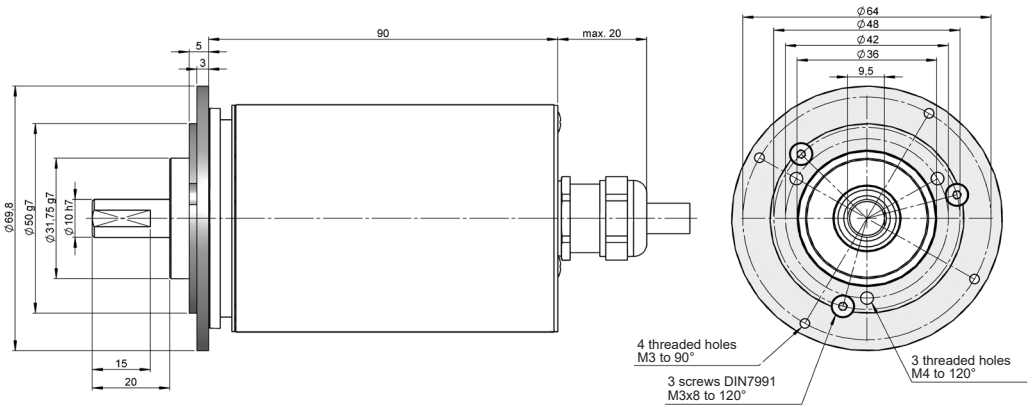
CONNECTION



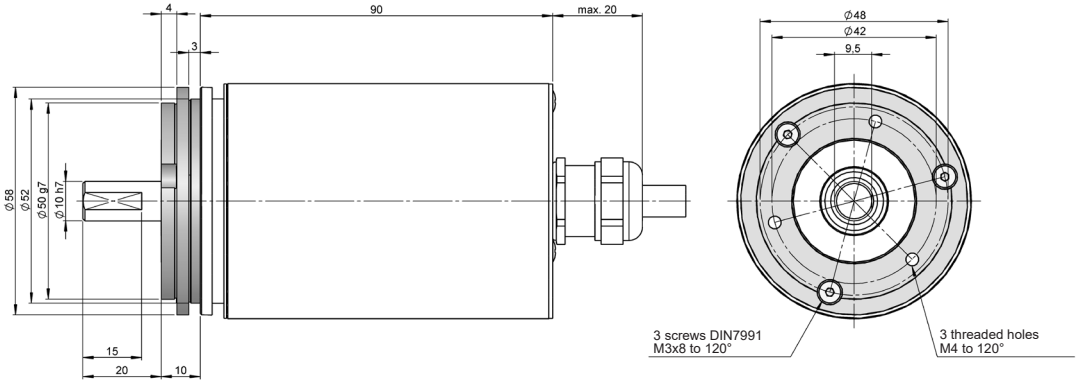
	Cable 15 x 0.14 mm² 95.0008031	**Cable** 25 x 0.14 mm² 95.0008030	**Cable** 36 x 0.14 mm² 95.0008032
GND	Black	Black	Black
VCC	Red	Red	Red
Bit 0	Brown	Brown	Brown
Bit 1	White	White	White
Bit 2	Yellow	Yellow	Yellow
Bit 3	Green	Green	Green
Bit 4	Orange	Pink	Pink
Bit 5	Violet	Orange	Orange
Bit 6	Grey	Grey	Grey
Bit 7	Blue	Blue	Blue
Bit 8	White - Black	Yellow - Black	Yellow - Black
Bit 9	White - Red	Yellow - Red	Yellow - Red
Bit 10	White - Brown	Yellow - Brown	Yellow - Brown
Bit 11	White - Yellow	Yellow - Green	Yellow - Green
Bit 12	White - Blue	Yellow - Grey	Yellow - Pink
Bit 13		Yellow - Blue	Yellow - Grey
Bit 14		White - Black	Yellow - Blue
Bit 15		White - Red	White - Black
Bit 16			White - Red
Bit 17			White - Brown
Bit 18			White - Green
Bit 19			White - Pink
Bit 20			White - Orange
Bit 21			White - Grey
Bit 22			White - Blue
Bit 23			Green - Black
DIR	White - Yellow	White - Pink	Grey - Brown
RES	White - Blue	White - Blue	Grey - Blue

FLANGE DIMENSIONS

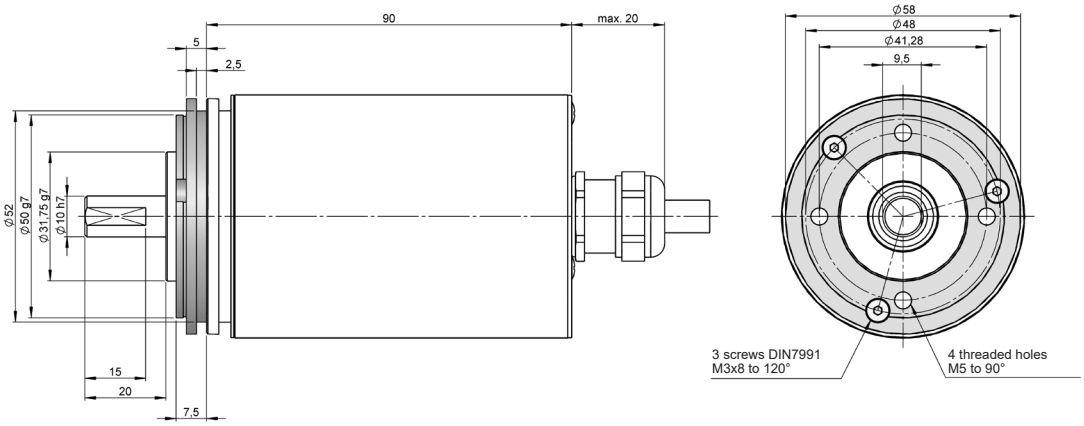
Flange 2
90.1002



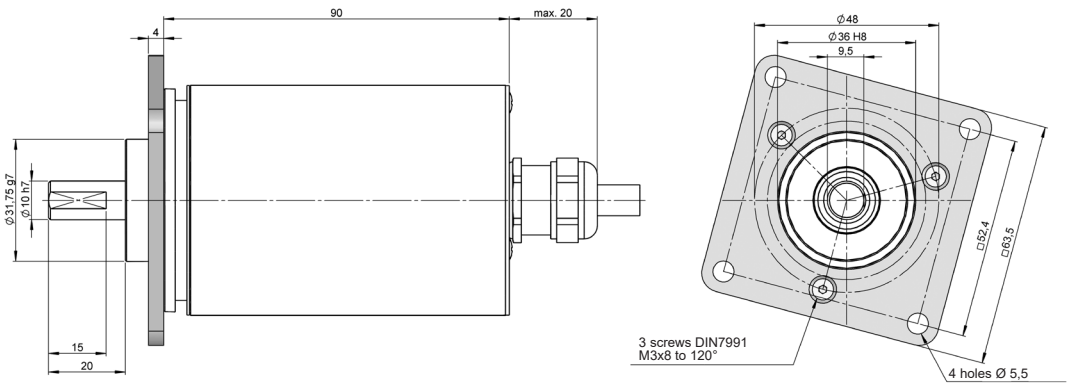
Flange 3
90.1003



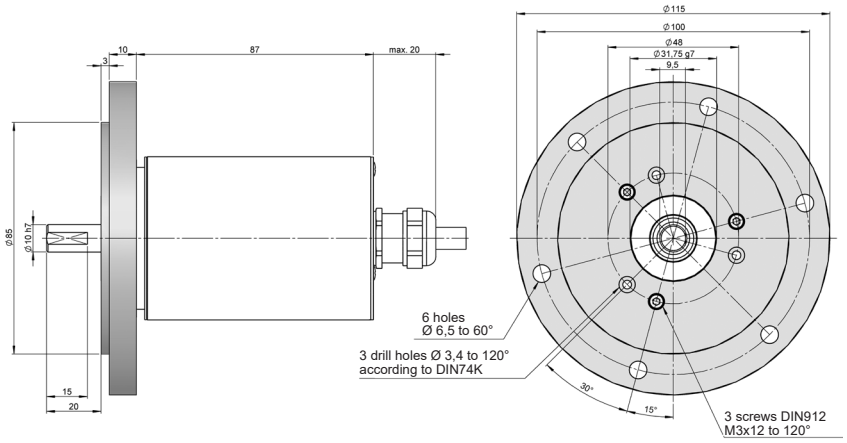
Flange 4
90.1004



Flange 5
90.1005



Flange 6
90.1006

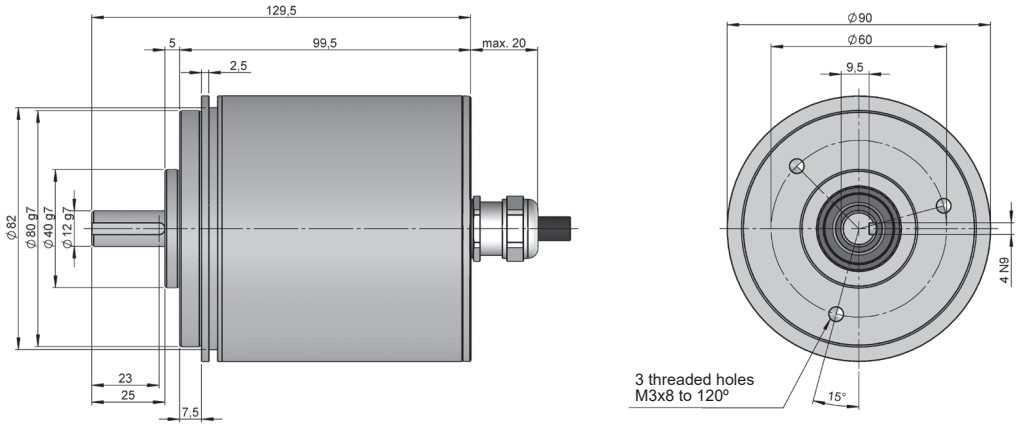


SERIE CS30 IP67

ABSOLUT ENCODER FOR SEVERE AND HEAVY DUTY INDUSTRIAL APPLICATIONS PARALLEL

- Parallel
- Singleturn resolution up to 13 bits
- External diameter 90 mm
- Shaft Ø 12 mm
- Protection class IP67 according to DIN EN 40050
- Connection by cable (other cable length available)

Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP67 | Temperature range | Express Delivery



Drawing shaft type 2, connection type 11, without flange

REFERENCE

Reference example: CS30-21110123S-1024

Serie	Solid shaft	Flange	Connection	Interface	Code	IP	Power Supply / Electronic output	Parameters config.	Singleturn resolution	Special customer
CS30 -	☐	☐	☐☐	☐	☐	☐	☐	☐	-☐☐☐☐	.☐☐
	2. Ø 12x25 mm	**1.** None **3.** 90.1008	**11.** Axial cable	**0.** Parallel	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW **5.** Gray excess CW **6.** Gray excess CCW **7.** BDC CW **8.** BDC CCW	**2.** Stainless steel IP67 **3.** IP67	**2.** 10...30 VDC / NPN **3.** 10...30 VDC / Push-Pull **4.** 10...30 VDC / NPN OC	**Blank.** None **S.** Direction		

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SERIE CS30 IP67

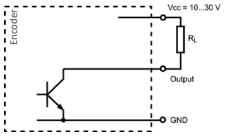
ABSOLUT ENCODER FOR SEVERE AND HEAVY DUTY INDUSTRIAL APPLICATIONS

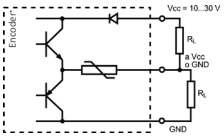
PARALLEL

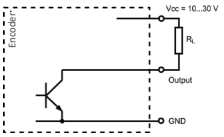
MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium (IP type 3) / Stainless steel (IP type 2) Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Shaft diameter	12 mm
Maximum number of revolutions permitted mechanically	6000 rpm
Protection according to DIN EN 40050	IP67
Rotor inertia moment	270 gcm²
Starting torque at 20°C (68°F)	≤ 0,05 Nm
Maximum load permitted on axial shaft	80 N
Maximum load permitted on radial shaft	100 N
Weight aprox.	1,2 kg
Operating temperature range	-10°C to +70°C
Vibration	100 m/s² (10Hz...2000Hz)
Shock	1000 m/s² (6ms)
Axial connection	2 meters cable (other cable lengths available on order)

OUTPUT SIGNALS







OUTPUT CIRCUIT	**NPN**	**Push-Pull**	**NPN Open Collector**
Reference code	*2*	*3*	*4*
Power supply	10...30 VDC	10...30 VDC	10...30 VDC
Consumption max.	100 mA	100 mA	100 mA
Max. load capability / channel	40 mA	±30 mA	40 mA
“Low” signal level	VOL < 2.5 VDC	VOL < 2.5 VDC	VOL < 2.5 VDC
“High” signal level	VOH > VCC - 3V	VOH > VCC - 3V	VOH > VCC - 3V
Frequency	200 kHz	200 kHz	200 kHz

ELECTRICAL SPECIFICATIONS

Interface	Parallel
Inputs	Opto-coupled
Code	Binary Gray BCD
Singleturn resolution	up to 8192 points per turn (13 bits)
Linearity	±1/2 LSB
Parameters config.	Direction

SERIE CS30 IP67

ABSOLUT ENCODER FOR SEVERE AND HEAVY DUTY INDUSTRIAL APPLICATIONS

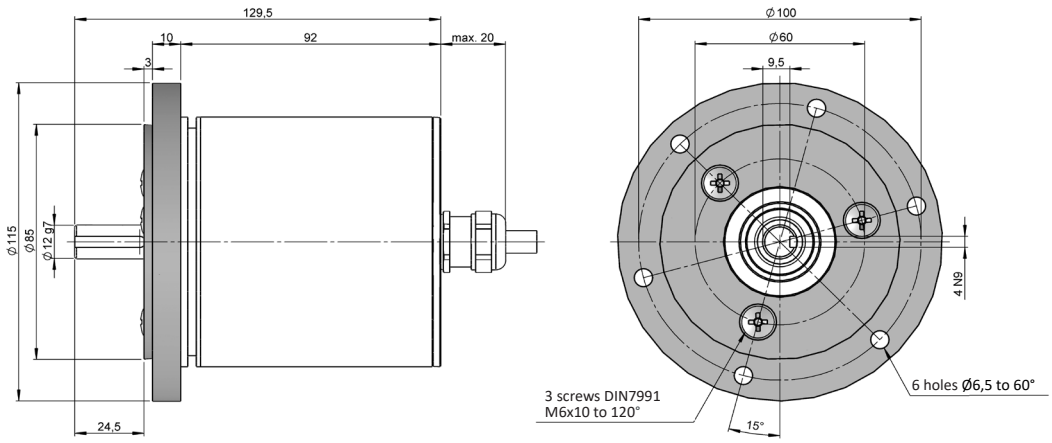
PARALLEL

CONNECTION

	Cable 15 x 0.14 mm² 95.0008031	**Cable** 25 x 0.14 mm² 95.0008030
GND	Black	Black
VCC	Red	Red
Bit 0	Brown	Brown
Bit 1	White	White
Bit 2	Yellow	Yellow
Bit 3	Green	Green
Bit 4	Orange	Pink
Bit 5	Violet	Orange
Bit 6	Grey	Grey
Bit 7	Blue	Blue
Bit 8	White - Black	Yellow - Black
Bit 9	White - Red	Yellow - Red
Bit 10	White - Brown	Yellow - Brown
Bit 11	White - Yellow	Yellow - Green
Bit 12	White - Blue	Yellow - Grey
Bit 13		Yellow - Blue
Bit 14		White - Black
Bit 15		White - Red
DIR	White - Yellow	Yellow - Pink
RES	White - Blue	White - Blue

FLANGE DIMENSIONS

Flange 3
90.1008

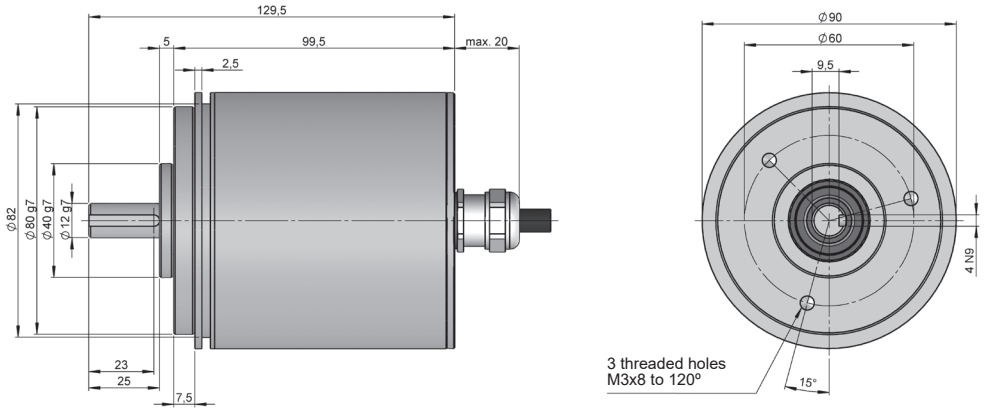


SERIE CM30 IP67

ABSOLUT ENCODER FOR SEVERE AND HEAVY DUTY INDUSTRIAL APPLICATIONS PARALLEL

- Parallel
- Singleturn resolution up to 13 bits
- Multiturn resolution up to 24 bits
- External diameter 90 mm
- Shaft Ø 12 mm
- Protection class IP67 according to DIN EN 40050
- Connection by cable (other cable length available)

Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP67 | Temperature range | Express Delivery



Drawing shaft type 2, connection type 11, without flange

REFERENCE

Reference example: CM30-21110123S-1024/2048

Serie	Solid shaft	Flange	Connection	Interface	Code	IP	Power Supply / Electronic output	Parameters config.	Singleturn resolution	Multiturn resolution	Special customer
CM30 -	☐	☐	☐☐	☐	☐	☐	☐	☐	-☐☐☐☐	/☐☐☐☐	.☐☐
	2. Ø 12x25 mm	**1.** None **3.** 90.1008	**11.** Axial cable	**0.** Parallel	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW **5.** Gray excess CW **6.** Gray excess CCW	**2.** Stainless steel IP67 **3.** IP67	**2.** 10...30 VDC / NPN **3.** 10...30 VDC / Push-Pull **4.** 10...30 VDC / NPN OC	**Blank.** None **S.** Direction			

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SERIE CM30 IP67

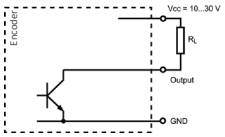
ABSOLUT ENCODER FOR SEVERE AND HEAVY DUTY INDUSTRIAL APPLICATIONS

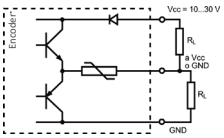
PARALLEL

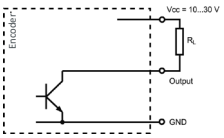
MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium (IP type 3) / Stainless steel (IP type 2) Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Shaft diameter	12 mm
Maximum number of revolutions permitted mechanically	6000 rpm
Protection according to DIN EN 40050	IP67
Rotor inertia moment	270 gcm²
Starting torque at 20°C (68°F)	≤ 0,05 Nm
Maximum load permitted on axial shaft	80 N
Maximum load permitted on radial shaft	100 N
Weight aprox.	1,3 kg
Operating temperature range	-10°C to +70°C
Vibration	100 m/s² (10Hz...2000Hz)
Shock	1000 m/s² (6ms)
Axial connection	2 meters cable (other cable lengths available on order)

OUTPUT SIGNALS







OUTPUT CIRCUIT	**NPN**	**Push-Pull**	**NPN Open Collector**
Reference code	*2*	*3*	*4*
Power supply	10...30 VDC	10...30 VDC	10...30 VDC
Consumption max.	150 mA	150 mA	150 mA
Max. load capability / channel	40 mA	±30 mA	40 mA
"Low" signal level	VOL < 2.5 VDC	VOL < 2.5 VDC	VOL < 2.5 VDC
"High" signal level	VOH > VCC - 3V	VOH > VCC - 3V	VOH > VCC - 3V
Frequency	200 kHz	200 kHz	200 kHz

ELECTRICAL SPECIFICATIONS

Interface	Parallel
Inputs	Opto-coupled
Code	Binary Gray
Singleturn resolution	up to 8192 points per turn (13 bits) (*)
Multiturn resolution	up to 4096 turns (12 bits)
Linearity	±1/2 LSB
Parameters config.	Direction

(*) 8192 points per turn (13 bits) only available for multiturn resolution up to 2048 points per turn (11 bits).

SERIE CM30 IP67

ABSOLUT ENCODER FOR SEVERE AND HEAVY DUTY INDUSTRIAL APPLICATIONS

PARALLEL

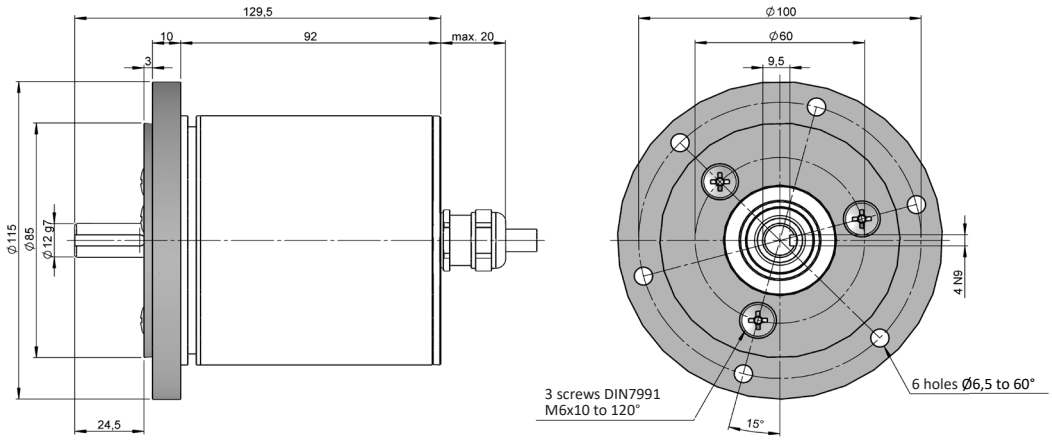
CONNECTION



	Cable 15 x 0.14 mm² 95.0008031	**Cable** 25 x 0.14 mm² 95.0008030	**Cable** 36 x 0.14 mm² 95.0008032
GND	Black	Black	Black
VCC	Red	Red	Red
Bit 0	Brown	Brown	Brown
Bit 1	White	White	White
Bit 2	Yellow	Yellow	Yellow
Bit 3	Green	Green	Green
Bit 4	Orange	Pink	Pink
Bit 5	Violet	Orange	Orange
Bit 6	Grey	Grey	Grey
Bit 7	Blue	Blue	Blue
Bit 8	White - Black	Yellow - Black	Yellow - Black
Bit 9	White - Red	Yellow - Red	Yellow - Red
Bit 10	White - Brown	Yellow - Brown	Yellow - Brown
Bit 11	White - Yellow	Yellow - Green	Yellow - Green
Bit 12	White - Blue	Yellow - Grey	Yellow - Pink
Bit 13		Yellow - Blue	Yellow - Grey
Bit 14		White - Black	Yellow - Blue
Bit 15		White - Red	White - Black
Bit 16		White - Brown	White - Red
Bit 17		White - Green	White - Brown
Bit 18		White - Pink	White - Green
Bit 19		White - Orange	White - Pink
Bit 20		White - Grey	White - Orange
Bit 21		White - Blue	White - Grey
Bit 22			White - Blue
Bit 23			Green - Black
DIR	White - Yellow	Yellow - Pink	Grey - Brown
RES	White - Blue	White - Blue	Grey - Blue

FLANGE DIMENSIONS

Flange 3
90.1008

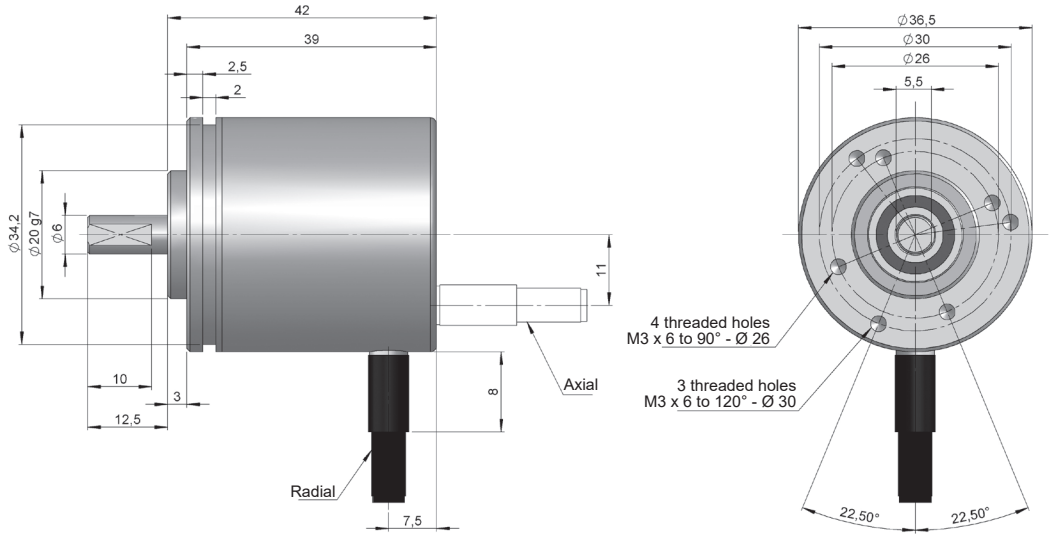


SERIE E36 CM

MINIATURE SOLID SHAFT ABSOLUTE MULTITURN ENCODER

- Singleturn resolution up to 13 bits
- Multiturn resolution up to 24 bits
- Magnetic technology
- External diameter 36,5 mm
- Shaft Ø 6 mm
- Protection class IP64 according to DIN EN 60529
- Connection by cable (other cable length available)

Magnetic Encoder | Absolute Encoder | Miniature Encoder | Vibration and shock resistant | IP64 | Temperature range | Express Delivery



REFERENCE

Reference example: E36CM-SSI-1231-1212

Serie	Interface	Solid shaft	Connection	Code	Power Supply / Electronic output	Singleturn resolution	Multiturn resolution	Special customer
E36CM -	SSI -	☐	☐	☐	☐ -	☐☐	☐☐	.☐☐
	SSI. SSI	**1.** Ø 6 mm	**1.** Axial cable **2.** Radial cable	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW	**1.** 4,75...30 VDC / RS422	**09.** 9 bits **10.** 10 bits **11.** 11 bits **12.** 12 bits **13.** 13 bits	**12.** 12 bits **16.** 16 bits **20.** 20 bits **24.** 24 bits	**LN.** +105°C

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SERIE E36 CM

MINIATURE SOLID SHAFT ABSOLUTE MULTITURN ENCODER

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Maximum number of revolutions permitted mechanically	6000 rpm - Standard 10000 rpm - Upon request 12000 rpm (≤ 12 bits) - Upon request
Protection against dust and splashes according to DIN EN 60529	IP64
Rotor inertia moment	2 gcm^2
Starting torque at 20°C (68°F)	≤ 0,01 Nm
Maximum load permitted on axial shaft	20 N
Maximum load permitted on radial shaft	40 N
Weight aprox.	0,08 Kg
Operating temperature range	-40°C to +85°C - Standard -40°C to +105°C - Special Customer LN
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Axial or radial connection	2 meters cable (other cable lengths available on order)

ELECTRICAL SPECIFICATIONS

Interface SSI

Electronic output	RS422
Power supply (VCC)	4,75...30 VDC
Consumption	≤ 100 mA
Code	Binary Gray
Protocol	SSI
Singleturn resolution	up to 13 bits
Multiturn resolution	up to 24 bits
Absolute accuracy	±0,35°
Relative accuracy	±1,5 LSB
Max. load capability / channel	±20 mA
“Low” signal level	< 0,8 VDC
“High” signal level	2 ... 5,5 VDC
Frequency	50 kHz...2 MHz
Short circuit protection	Yes
Protection polarity inversion	Yes

CONNECTION

	Cable 8x0,14 mm^2 95.0008052
GND	White
VCC	Brown
DATA+	Yellow
DATA-	Pink
CLK+	Green
CLK-	Grey
PRESET*	Red
DIR**	Blue

(*) Apply a 4,75...30 VDC pulse (more than 1 ms) to set the encoder to Zero and reboot the encoder (turn off and then turn on the power supply).

(**) Connect to 4,75...30 VDC to change direction from default. If this input is not used, it should be connected to GND in order to avoid interferences. The encoder must be always rebooted (turn off and then turn on the power supply) after switching.

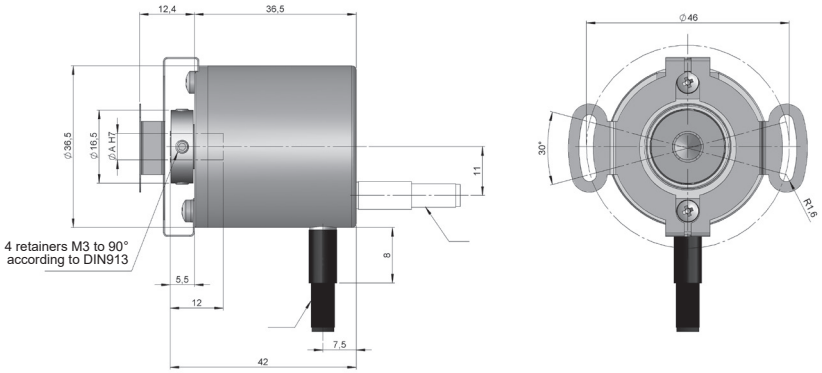
SERIE E36 HM

MINIATURE BLIND HOLLOW SHAFT ABSOLUTE MULTITURN ENCODER

- Singleturn resolution up to 13 bits
- Multiturn resolution up to 24 bits
- Magnetic technology
- External diameter 36,5 mm
- Blind hollow shaft Ø 6 mm or 8 mm
- Protection class IP64 according to DIN EN 60529
- Connection by cable (other cable length available)

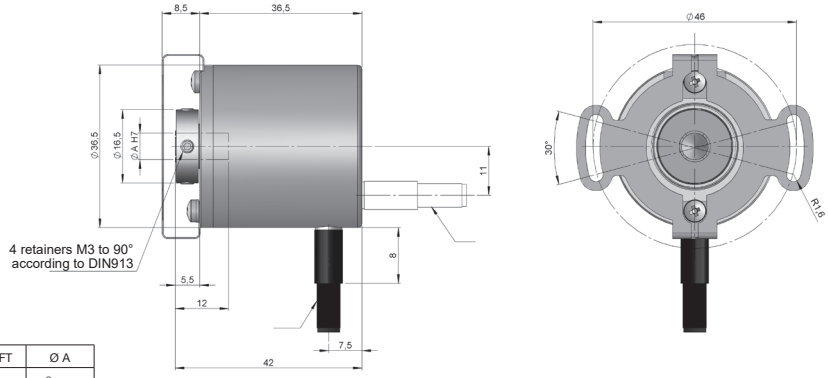
Magnetic Encoder | Absolute Encoder | Miniature Encoder | Vibration and shock resistant | IP64 | Temperature range | Express Delivery

Setscrew / Flexible flange (90.1037)



BLIND HOLLOW SHAFT	Ø A
1	6 mm
2	8 mm

Setscrew / Flexible flange (90.1111)



BLIND HOLLOW SHAFT	Ø A
1	6 mm
2	8 mm

SERIE E36 HM

MINIATURE BLIND HOLLOW SHAFT ABSOLUTE MULTITURN ENCODER

REFERENCE

Reference example: E36HM-SSI-11231-1212

Serie	Interface	Anti-rotation system	Blind-Hollow shaft	Connection	Code	Power Supply / Electronic output	Singleturn resolution	Multiturn resolution	Special customer
E36HM -	SSI -	☐	☐	☐	☐	☐ -	☐☐	☐☐	. ☐☐
	SSI. SSI	**1.** Flexible flange (90.1037) **2.** Flexible flange (90.1111) (*)	**1.** Ø 6 mm **2.** Ø 8 mm	**1.** Axial cable **2.** Radial cable	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW	**1.** 4,75...30 VDC / RS422	**09.** 9 bits **10.** 10 bits **11.** 11 bits **12.** 12 bits **13.** 13 bits	**12.** 12 bits **16.** 16 bits **20.** 20 bits **24.** 24 bits	**LN.** +105°C

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(*) Anti-rotation system type 1 (Flexible flange 90.1037) and 2 (Flexible flange 90.1111) supplied assembled.

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Housing fixing	Flexible flange (included)
Permitted misalignment	±0.3 mm axial, ±0.2 mm radial (90.1037) ±0.2 mm axial, ±0.1 mm radial (90.1111)
Shaft fixing	Setscrew
Blind hollow shaft diameter	6 mm or 8 mm
Maximum number of revolutions permitted mechanically	6000 rpm - Standard 10000 rpm - Upon request 12000 rpm (≤ 12 bits) - Upon request
Protection against dust and splashes according to DIN EN 60529	IP64
Rotor inertia moment	10 gcm^2
Starting torque at 20°C (68°F)	≤ 0,01 Nm
Maximum load permitted on axial shaft	20 N
Maximum load permitted on radial shaft	40 N
Weight aprox.	0,08 Kg
Operating temperature range	-40°C to +85°C - Standard -40°C to +105°C - Special Customer LN
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Axial or radial connection	2 meters cable (other cable lengths available on order)

SERIE E36 HM

MINIATURE BLIND HOLLOW SHAFT ABSOLUTE MULTITURN ENCODER

ELECTRICAL SPECIFICATIONS

Interface	SSI
Electronic output	RS422
Power supply (VCC)	4,75...30 VDC
Consumption	≤ 100 mA
Code	Binary Gray
Protocol	SSI
Singleturn resolution	up to 13 bits
Multiturn resolution	up to 24 bits
Absolute accuracy	±0,35°
Relative accuracy	±1,5 LSB
Max. load capability / channel	±20 mA
“Low” signal level	< 0,8 VDC
“High” signal level	2 ... 5,5 VDC
Frequency	50 kHz...2 MHz
Short circuit protection	Yes
Protection polarity inversion	Yes

CONNECTION

	Cable 8x0,14 mm² 95.0008052
GND	White
VCC	Brown
DATA+	Yellow
DATA-	Pink
CLK+	Green
CLK-	Grey
PRESET*	Red
DIR**	Blue

(*) Apply a 4,75...30 VDC pulse (more than 1 ms) to set the encoder to Zero and reboot the encoder (turn off and then turn on the power supply).

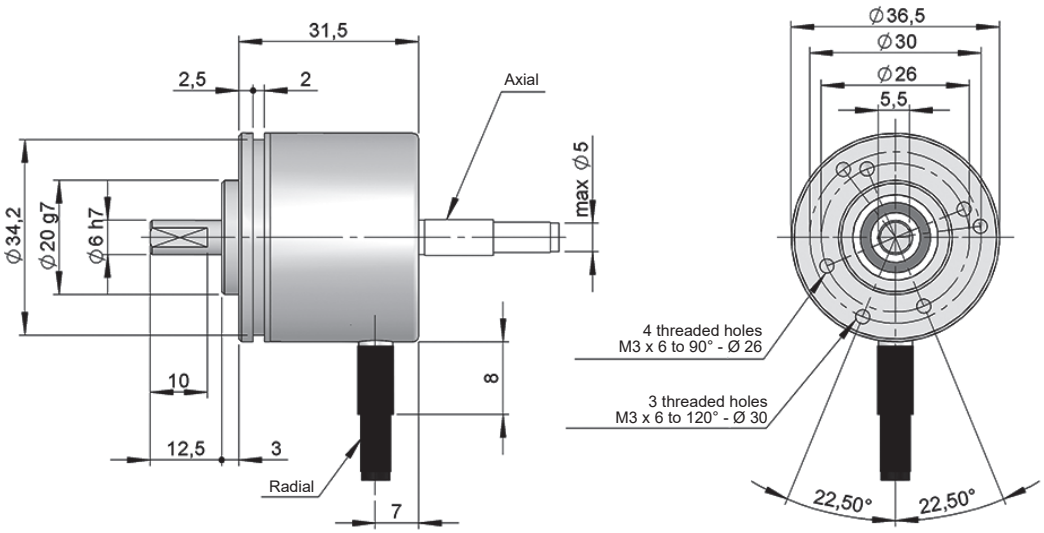
(**) Connect to 4,75...30 VDC to change direction from default. If this input is not used, it should be connected to GND in order to avoid interferences. The encoder must be always rebooted (turn off and then turn on the power supply) after switching.

SERIE E36 CS

MINIATURE SOLID SHAFT ABSOLUTE SINGLETURN ENCODER

- Singleturn resolution up to 13 bits
- Magnetic technology
- External diameter 36,5 mm
- Shaft Ø 6 mm
- Protection class IP64 according to DIN EN 60529
- Connection by cable (other cable length available)

Magnetic Encoder | Absolute Encoder | Miniature Encoder | Vibration and shock resistant | IP64 | Temperature range | Express Delivery



Drawing shaft type 1, connection type 1/2

REFERENCE

Reference example: E36CS-SSI-1231-12

Serie	Interface	Solid shaft	Connection	Code	Power Supply / Electronic output	Singleturn resolution	Special customer
E36CS -	SSI -	☐	☐	☐	☐ -	☐☐	.☐☐
	SSI. SSI	**1.** Ø 6 mm	**1.** Axial cable **2.** Radial cable	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW	**1.** 4,75...30 VDC / RS422	**09.** 9 bits **10.** 10 bits **11.** 11 bits **12.** 12 bits **13.** 13 bits	

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SERIE E36 CS

MINIATURE SOLID SHAFT ABSOLUTE SINGLETURN ENCODER

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Maximum number of revolutions permitted mechanically	6000 rpm - Standard 10000 rpm - Upon request 12000 rpm (≤ 12 bits) - Upon request
Protection against dust and splashes according to DIN EN 60529	IP64
Rotor inertia moment	2 gcm²
Starting torque at 20°C (68°F)	≤ 0,01 Nm
Maximum load permitted on axial shaft	20 N
Maximum load permitted on radial shaft	40 N
Weight aprox.	0,08 Kg
Operating temperature range	-40°C to +105°C
Vibration according to DIN EN 60068-2-6	100 m/s² (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s² (6ms)
Axial or radial connection	2 meters cable (other cable lengths available on order)

ELECTRICAL SPECIFICATIONS

Interface SSI

Electronic output	RS422
Power supply (VCC)	4,75...30 VDC
Consumption	≤ 100 mA
Code	Binary Gray
Protocol	SSI
Singleturn resolution	up to 13 bits
Absolute accuracy	±0,35°
Relative accuracy	±1,5 LSB
Max. load capability / channel	±20 mA
“Low” signal level	< 0,8 VDC
“High” signal level	2 ... 5,5 VDC
Frequency	50 kHz...2 MHz
Short circuit protection	Yes
Protection polarity inversion	Yes

CONNECTION

	Cable 8x0,14 mm² 95.0008052
GND	White
VCC	Brown
DATA+	Yellow
DATA-	Pink
CLK+	Green
CLK-	Grey
PRESET*	Red
DIR**	Blue

(*) Apply a 4,75...30 VDC pulse (more than 1 ms) to set the encoder to Zero and reboot the encoder (turn off and then turn on the power supply).

(**) Connect to 4,75...30 VDC to change direction from default. If this input is not used, it should be connected to GND in order to avoid interferences. The encoder must be always rebooted (turn off and then turn on the power supply) after switching.

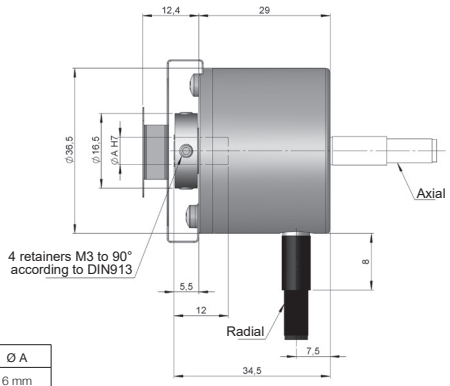
SERIE E36 HS

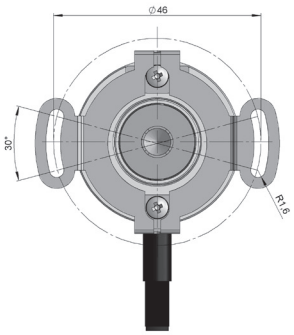
MINIATURE BLIND HOLLOW SHAFT ABSOLUTE SINGLETURN ENCODER

- Singleturn resolution up to 13 bits
- Magnetic technology
- External diameter 36,5 mm
- Blind hollow shaft Ø 6 mm or 8 mm
- Protection class IP64 according to DIN EN 60529
- Connection by cable (other cable length available)

Magnetic Encoder | Absolute Encoder | Miniature Encoder | Vibration and shock resistant | IP64 | Temperature range | Express Delivery

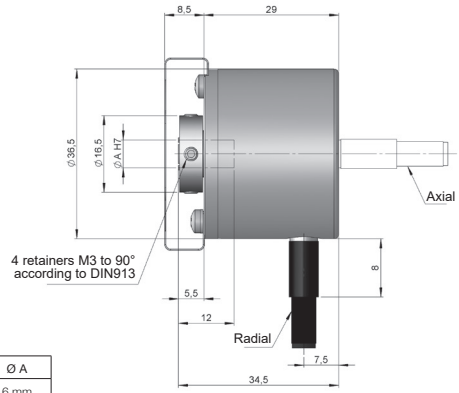
Setscrew / Flexible flange (90.1037)

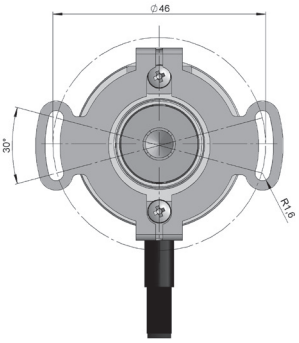




BLIND HOLLOW SHAFT	Ø A
1	6 mm
2	8 mm

Setscrew / Flexible flange (90.1111)





BLIND HOLLOW SHAFT	Ø A
1	6 mm
2	8 mm

SERIE E36 HS

MINIATURE BLIND HOLLOW SHAFT ABSOLUTE SINGLETURN ENCODER

REFERENCE

Reference example: E36HS-SSI-11231-12

Serie	Interface	Anti-rotation system	Blind-Hollow shaft	Connection	Code	Power Supply / Electronic output	Singleturn resolution	Special customer
E36HS -	SSI -	☐	☐	☐	☐	☐ -	☐☐	.☐☐
	SSI. SSI	**1.** Flexible flange (90.1037) **2.** Flexible flange (90.1111) (*)	**1.** Ø 6 mm **2.** Ø 8 mm	**1.** Axial cable **2.** Radial cable	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW	**1.** 4,75...30 VDC / RS422	**09.** 9 bits **10.** 10 bits **11.** 11 bits **12.** 12 bits **13.** 13 bits	

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(*) Anti-rotation system type 1 (Flexible flange 90.1037) and 2 (Flexible flange 90.1111) supplied assembled.

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Housing fixing	Flexible flange (included)
Permitted misalignment	±0.3 mm axial, ±0.2 mm radial (90.1037) ±0.2 mm axial, ±0.1 mm radial (90.1111)
Shaft fixing	Setscrew
Blind hollow shaft diameter	6 mm or 8 mm
Maximum number of revolutions permitted mechanically	6000 rpm - Standard 10000 rpm - Upon request 12000 rpm (≤ 12 bits) - Upon request
Protection against dust and splashes according to DIN EN 60529	IP64
Rotor inertia moment	10 gcm^2
Starting torque at 20°C (68°F)	≤ 0,01 Nm
Maximum load permitted on axial shaft	20 N
Maximum load permitted on radial shaft	40 N
Weight aprox.	0,08 Kg
Operating temperature range	-40°C to +105°C
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Axial or radial connection	2 meters cable (other cable lengths available on order)

SERIE E36 HS

MINIATURE BLIND HOLLOW SHAFT ABSOLUTE SINGLETURN ENCODER

ELECTRICAL SPECIFICATIONS

Interface	SSI
Electronic output	RS422
Power supply (VCC)	4,75...30 VDC
Consumption	≤ 100 mA
Code	Binary Gray
Protocol	SSI
Singleturn resolution	up to 13 bits
Absolute accuracy	±0,35°
Relative accuracy	±1,5 LSB
Max. load capability / channel	±20 mA
“Low” signal level	< 0,8 VDC
“High” signal level	2 ... 5,5 VDC
Frequency	50 kHz...2 MHz
Short circuit protection	Yes
Protection polarity inversion	Yes

CONNECTION

	Cable 8x0,14 mm² 95.0008052
GND	White
VCC	Brown
DATA+	Yellow
DATA-	Pink
CLK+	Green
CLK-	Grey
PRESET*	Red
DIR**	Blue

(*) Apply a 4,75...30 VDC pulse (more than 1 ms) to set the encoder to Zero and reboot the encoder (turn off and then turn on the power supply).

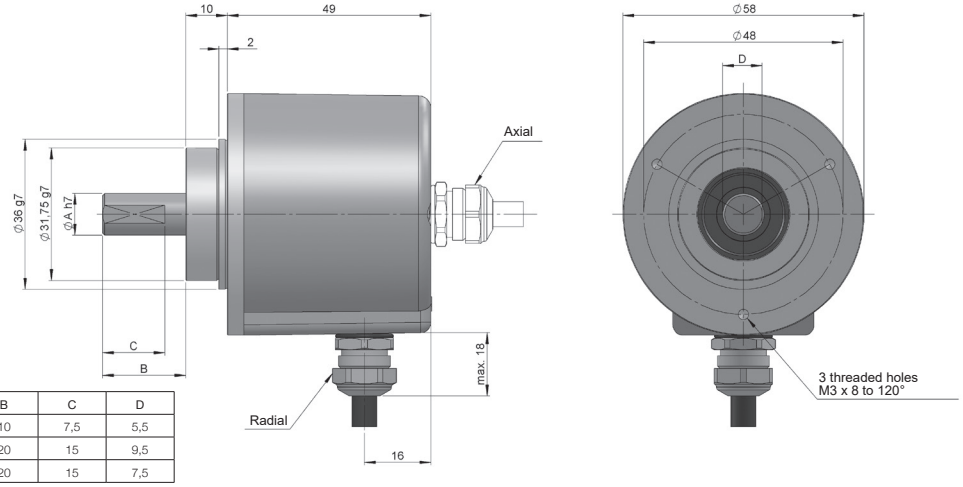
(**) Connect to 4,75...30 VDC to change direction from default. If this input is not used, it should be connected to GND in order to avoid interferences. The encoder must be always rebooted (turn off and then turn on the power supply) after switching.

SERIE E58 CM

SOLID SHAFT ABSOLUTE MULTITURN ENCODER

- Singleturn resolution up to 13 bits
- Multiturn resolution up to 24 bits
- Magnetic technology
- External diameter 58 mm
- Solid shaft Ø 6, 8 and 10 mm
- Protection class IP65 according to DIN EN 60529
- Connection by cable (other cable length available) or industrial connector M23

Magnetic Encoder | Absolute Encoder | Vibration and shock resistant | IP65 | Temperature range | Express Delivery



SOLID SHAFT	Ø A	B	C	D
1	6	10	7,5	5,5
2	10	20	15	9,5
3	8	20	15	7,5

Drawing connection type 1/2, without flange

REFERENCE

Reference example: E58CM-SSI-12321-1212

Serie	Interface	Solid shaft	Flange	Connection	Code	Power Supply / Electronic output	Singleturn resolution	Multiturn resolution	Special customer
E58CM -	SSI -	☐	☐	☐	☐	☐ -	☐☐	☐☐	.☐☐
	SSI. SSI	**1.** Ø 6 mm **2.** Ø 10 mm **3.** Ø 8 mm	**1.** None **2.** 90.1002 **3.** 90.1003 **4.** 90.1004 **5.** 90.1005 **6.** 90.1006	**1.** Axial cable **2.** Radial cable **3.** Radial M23 12p **5.** Axial M23 12p	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW	**1.** 4,75...30 VDC / RS422	**09.** 9 bits **10.** 10 bits **11.** 11 bits **12.** 12 bits **13.** 13 bits	**12.** 12 bits **16.** 16 bits **20.** 20 bits **24.** 24 bits	**LN.** +105°C

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SERIE E58 CM

SOLID SHAFT ABSOLUTE MULTITURN ENCODER

MECHANICAL SPECIFICATIONS

Materials	Housing: Zamac Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Maximum number of revolutions permitted mechanically	6000 rpm - Standard 10000 rpm - Upon request 12000 rpm (≤ 12 bits) - Upon request
Protection against dust and splashes according to DIN EN 60529	IP65
Rotor inertia moment	2 gcm^2
Starting torque at 20°C (68°F)	≤ 0,01 Nm
Maximum load permitted on axial shaft	20 N
Maximum load permitted on radial shaft	40 N
Weight aprox.	0,08 Kg
Operating temperature range	-40°C to +85°C - Standard -40°C to +105°C - Special Customer LN
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Axial or radial connection	2 meters cable or industrial connector M23 (other cable lengths available on order) Female connector not included

ELECTRICAL SPECIFICATIONS

Interface SSI

Electronic output	RS422
Power supply (VCC)	4,75...30 VDC
Consumption	≤ 100 mA
Code	Binary Gray
Protocol	SSI
Singleturn resolution	up to 13 bits
Multiturn resolution	up to 24 bits
Absolute accuracy	±0,35°
Relative accuracy	±1,5 LSB
Max. load capability / channel	±20 mA
"Low" signal level	< 0,8 VDC
"High" signal level	2 ... 5,5 VDC
Frequency	50 kHz...2 MHz
Short circuit protection	Yes
Protection polarity inversion	Yes

CONNECTION

	Cable 8x0,14 mm^2 95.0008052	**Connector** M23 12p CW
GND	White	1
VCC	Brown	2
DATA+	Yellow	3
DATA-	Pink	4
CLK+	Green	5
CLK-	Grey	6
PRESET*	Red	7
DIR**	Blue	8

(*) Apply a 4,75...30 VDC pulse (more than 1 ms) to set the encoder to Zero and reboot the encoder (turn off and then turn on the power supply).
(**) Connect to 4,75...30 VDC to change direction from default. If this input is not used, it should be connected to GND in order to avoid interferences. The encoder must be always rebooted (turn off and then turn on the power supply) after switching.

SERIE E58 CM

SOLID SHAFT ABSOLUTE MULTITURN ENCODER

CONNECTION DIMENSIONS

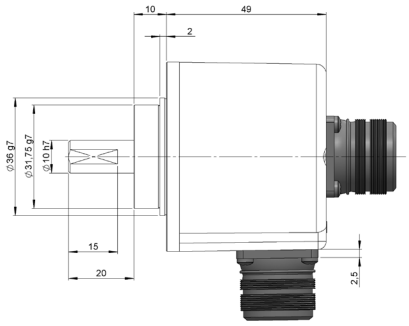
Female connector not included

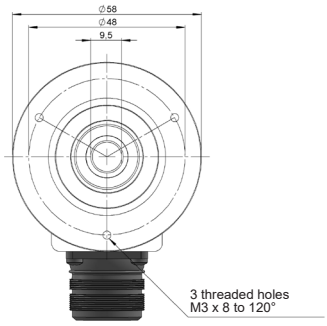
Connection 3

Radial
M23 12p
male panel
clockwise

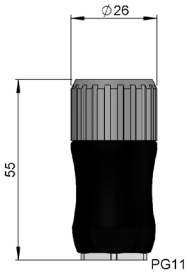
Connection 5

Axial
M23 12p
male panel
clockwise





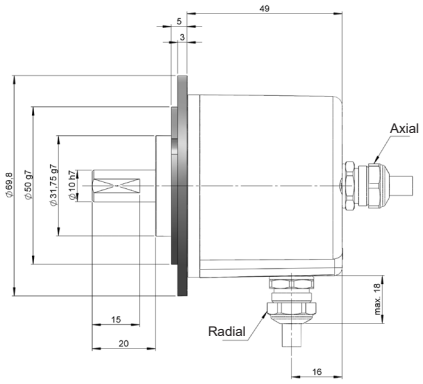
Female connector
95.0007131

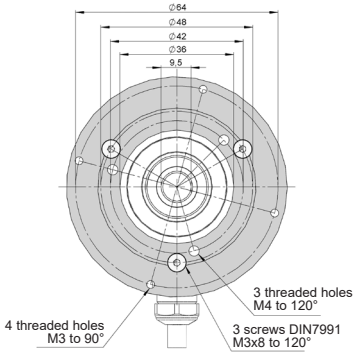


FLANGE DIMENSIONS

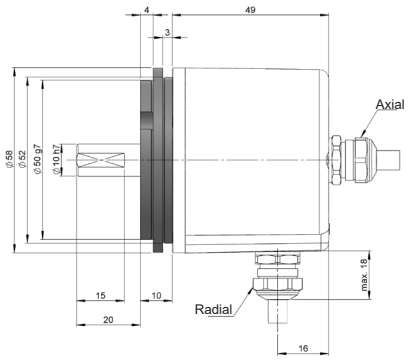
Flange mounting included

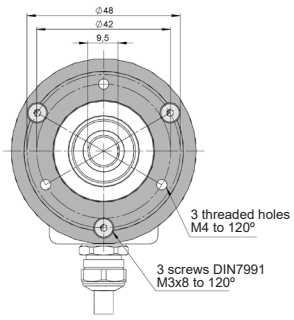
Flange 2
90.1002



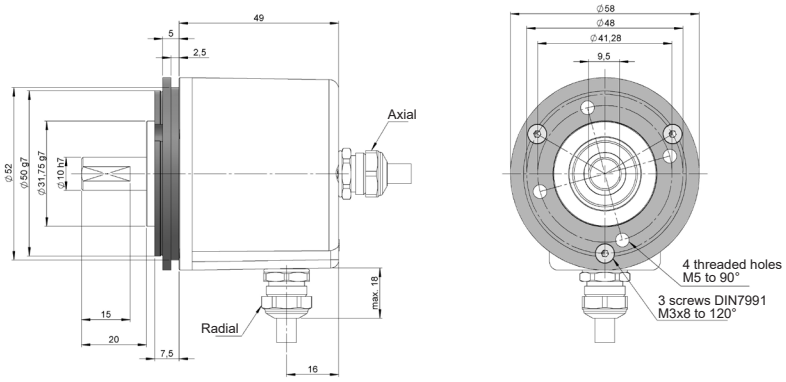


Flange 3
90.1003
Synchro

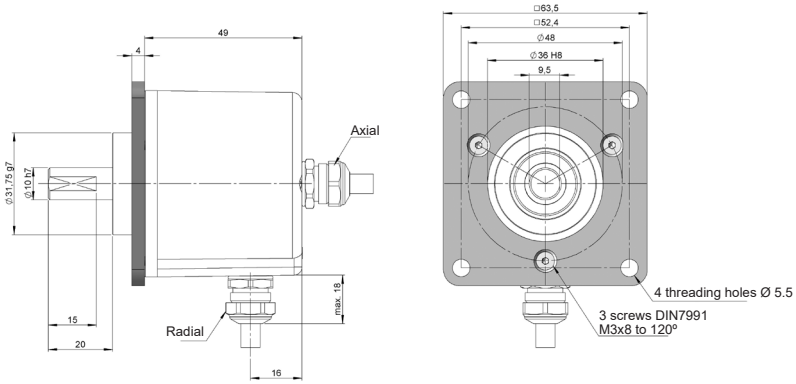




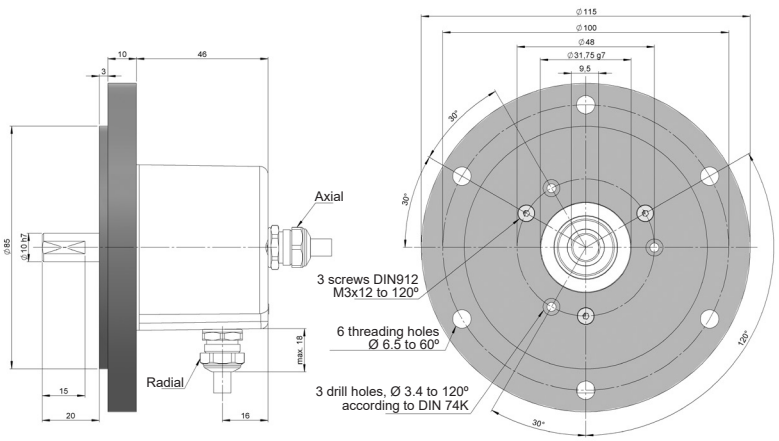
Flange 4
90.1004



Flange 5
90.1005



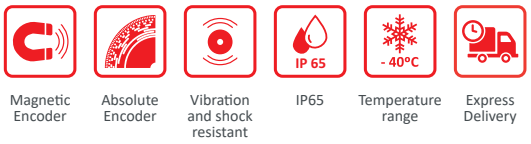
Flange 6
90.1006



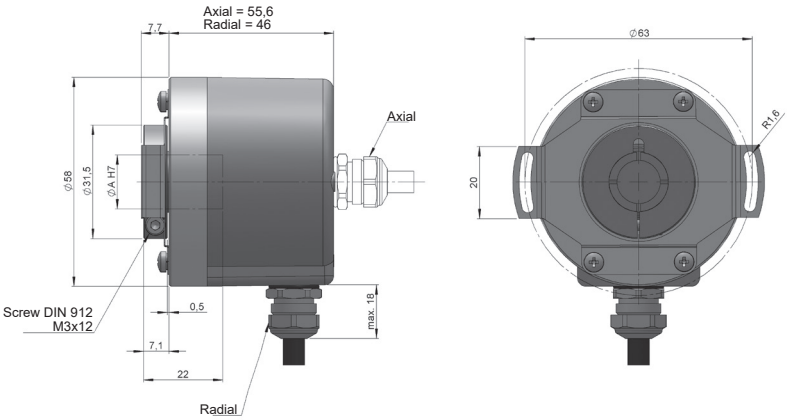
SERIE E58 HM

BLIND HOLLOW SHAFT ABSOLUTE MULTITURN ENCODER

- Singleturn resolution up to 13 bits
- Multiturn resolution up to 24 bits
- Magnetic technology
- External diameter 58 mm
- Blind hollow shaft Ø 8, 10, 12, 14 and 15 mm
- Protection class IP65 according to DIN EN 60529
- Connection by cable (other cable length available) or industrial connector M23



Magnetic Encoder | Absolute Encoder | Vibration and shock resistant | IP65 | Temperature range | Express Delivery



HOLLOW SHAFT	Ø A
3	8
4	10
5	12
7	14
8	15

Drawing connection type 1/2, anti-rotation system type 3 (flexible flange 90.1027)

REFERENCE

Reference example: E58HM-SSI-31221-1212

Serie	Interface	Anti-rotation system	Hollow shaft	Connection	Code	Power Supply / Electronic output	Singleturn resolution	Multiturn resolution	Special customer
E58HM -	SSI -	☐	☐	☐	☐	☐ -	☐☐	☐☐	.☐☐
	SSI. SSI	**1.** None **2.** Flexible flange (90.1018) **3.** Flexible flange (90.1027) **4.** Flexible flange (90.1075) (*)	**3.** Ø 8 mm **4.** Ø 10 mm **5.** Ø 12 mm **7.** Ø 14 mm **8.** Ø 15 mm	**1.** Axial cable **2.** Radial cable **3.** Radial M23 12p **5.** Axial M23 12p	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW	**1.** 4,75...30 VDC / RS422	**09.** 9 bits **10.** 10 bits **11.** 11 bits **12.** 12 bits **13.** 13 bits	**12.** 12 bits **16.** 16 bits **20.** 20 bits **24.** 24 bits	**LN.** +105°C

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(*) Anti-rotation system type 3 (flexible flange 90.1027) and 4 (flexible flange 90.1075) supplied assembled.
Anti-rotation system type 2 (flexible flange 90.1018) supplied disassembled and includes the screws required for assembly.

SERIE E58 HM

BLIND HOLLOW SHAFT ABSOLUTE MULTITURN ENCODER

MECHANICAL SPECIFICATIONS

Materials	Housing: Zamac Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Housing fixing	Flexible flange (included)
Permitted misalignment	±0.5 mm axial, ±0.3 mm radial (90.1018) ±0.5 mm axial, ±0.3 mm radial (90.1027) ±0.5 mm axial, ±0.2 mm radial (90.1075)
Shaft fixing	Clamp
Blind hollow shaft diameter	8, 10, 12, 14 and 15 mm
Maximum number of revolutions permitted mechanically	6000 rpm - Standard 10000 rpm - Upon request 12000 rpm (≤ 12 bits) - Upon request
Protection against dust and splashes according to DIN EN 60529	IP65
Rotor inertia moment	2 gcm^2
Starting torque at 20°C (68°F)	≤ 0,01 Nm
Maximum load permitted on axial shaft	20 N
Maximum load permitted on radial shaft	40 N
Weight aprox.	0,08 Kg
Operating temperature range	-40°C to +85°C - Standard -40°C to +105°C - Special Customer LN
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Axial or radial connection	2 meters cable or industrial connector M23 (other cable lengths available on order) Female connector not included

ELECTRICAL SPECIFICATIONS

Interface SSI

Electronic output	RS422
Power supply (VCC)	4,75...30 VDC
Consumption	≤ 100 mA
Code	Binary Gray
Protocol	SSI
Singleturn resolution	up to 13 bits
Multiturn resolution	up to 24 bits
Absolute accuracy	±0,35°
Relative accuracy	±1,5 LSB
Max. load capability / channel	±20 mA
"Low" signal level	< 0,8 VDC
"High" signal level	2 ... 5,5 VDC
Frequency	50 kHz...2 MHz
Short circuit protection	Yes
Protection polarity inversion	Yes

CONNECTION

	Cable 8x0,14 mm^2 95.0008052	**Connector** M23 12p CW
GND	White	1
VCC	Brown	2
DATA+	Yellow	3
DATA-	Pink	4
CLK+	Green	5
CLK-	Grey	6
PRESET*	Red	7
DIR**	Blue	8

(*) Apply a 4,75...30 VDC pulse (more than 1 ms) to set the encoder to Zero and reboot the encoder (turn off and then turn on the power supply).
(**) Connect to 4,75...30 VDC to change direction from default. If this input is not used, it should be connected to GND in order to avoid interferences. The encoder must be always rebooted (turn off and then turn on the power supply) after switching.

SERIE E58 HM

BLIND HOLLOW SHAFT ABSOLUTE MULTITURN ENCODER

CONNECTION DIMENSIONS

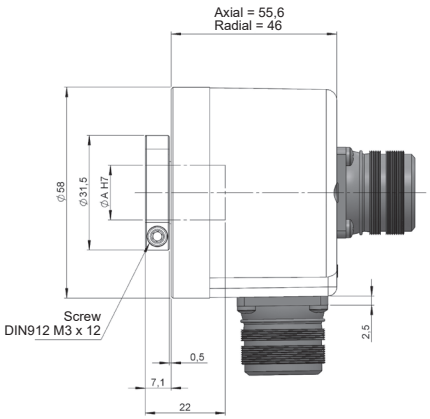
Female connector not included

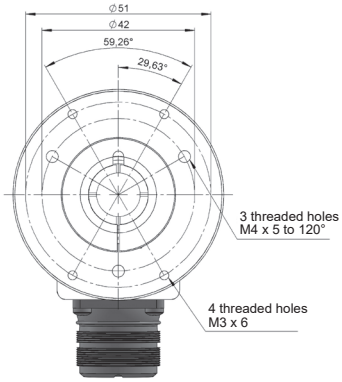
Connection 3

Radial
M23 12p
male panel
clockwise

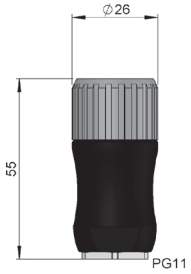
Connection 5

Axial
M23 12p
male panel
clockwise





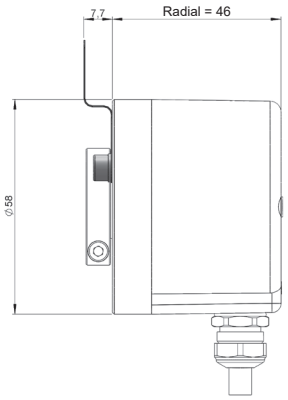
Female connector
95.0007131

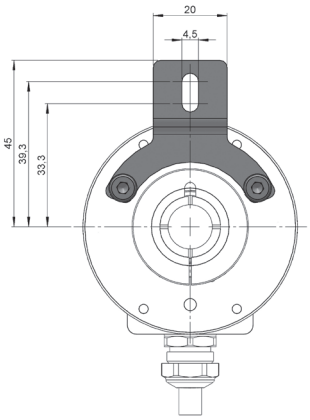


ANTI-ROTATION SYSTEMS DIMENSIONS

Anti-rotation system 2
Flexible flange
90.1018

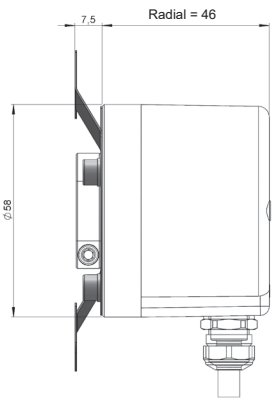
90.1018

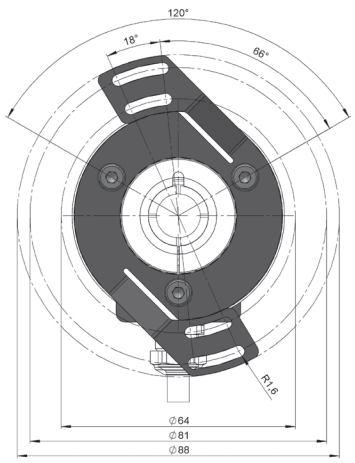




Anti-rotation system 3
Flexible flange
90.1075

90.1075

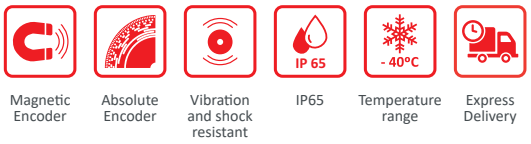




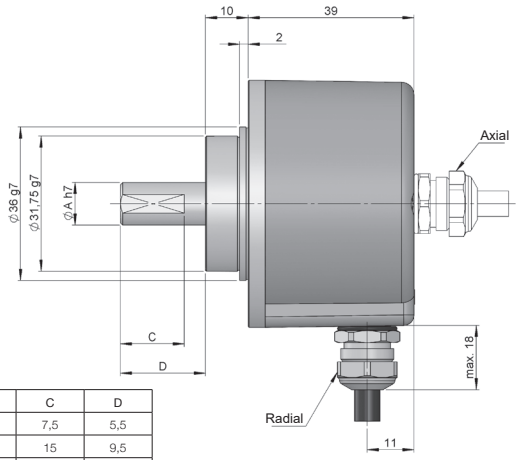
SERIE E58 CS

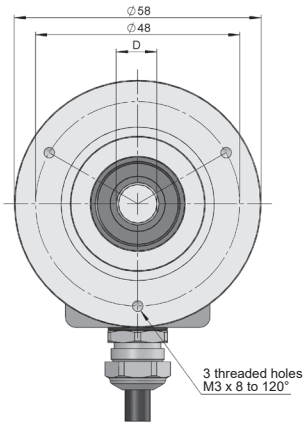
SOLID SHAFT ABSOLUTE SINGLETURN ENCODER

- Singleturn resolution up to 13 bits
- Magnetic technology
- External diameter 58 mm
- Solid shaft Ø 6, 8 and 10 mm
- Protection class IP65 according to DIN EN 60529
- Connection by cable (other cable length available) or industrial connector M23



Magnetic Encoder | Absolute Encoder | Vibration and shock resistant | IP65 | Temperature range | Express Delivery





SOLID SHAFT	Ø A	B	C	D
1	6	10	7,5	5,5
2	10	20	15	9,5
3	8	20	15	7,5

Drawing connection type 1/2, without flange

REFERENCE

Reference example: E58CS-SSI-12231-12

Serie	Interface	Solid shaft	Flange	Connection	Code	Power Supply / Electronic output	Singleturn resolution	Special customer
E58CS -	**SSI -**	☐	☐	☐	☐	☐ -	☐☐	.☐☐
	SSI. SSI	**1.** Ø 6 mm **2.** Ø 10 mm **3.** Ø 8 mm	**1.** None **2.** 90.1002 **3.** 90.1003 **4.** 90.1004 **5.** 90.1005 **6.** 90.1006	**1.** Axial cable **2.** Radial cable **3.** Radial M23 12p **5.** Axial M23 12p	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW	**1.** 4,75...30 VDC / RS422	**09.** 9 bits **10.** 10 bits **11.** 11 bits **12.** 12 bits **13.** 13 bits	

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SERIE E58 CS

SOLID SHAFT ABSOLUTE SINGLETURN ENCODER

MECHANICAL SPECIFICATIONS

Materials	Housing: Zamac Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Maximum number of revolutions permitted mechanically	6000 rpm - Standard 10000 rpm - Upon request 12000 rpm (≤ 12 bits) - Upon request
Protection against dust and splashes according to DIN EN 60529	IP65
Rotor inertia moment	2 gcm^2
Starting torque at 20°C (68°F)	≤ 0,01 Nm
Maximum load permitted on axial shaft	20 N
Maximum load permitted on radial shaft	40 N
Weight aprox.	0,08 Kg
Operating temperature range	-40°C to +105°C
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Axial or radial connection	2 meters cable or industrial connector M23 (other cable lengths available on order) Female connector not included

ELECTRICAL SPECIFICATIONS

Interface	SSI
Electronic output	RS422
Power supply (VCC)	4,75...30 VDC
Consumption	≤ 100 mA
Code	Binary Gray
Protocol	SSI
Singleturn resolution	up to 13 bits
Absolute accuracy	±0,35°
Relative accuracy	±1,5 LSB
Max. load capability / channel	±20 mA
“Low” signal level	< 0,8 VDC
“High” signal level	2 ... 5,5 VDC
Frequency	50 kHz...2 MHz
Short circuit protection	Yes
Protection polarity inversion	Yes

CONNECTION

	Cable 8x0,14 mm^2 95.0008052	**Connector** M23 12p CW
GND	White	1
VCC	Brown	2
DATA+	Yellow	3
DATA-	Pink	4
CLK+	Green	5
CLK-	Grey	6
PRESET*	Red	7
DIR**	Blue	8

(*) Apply a 4,75...30 VDC pulse (more than 1 ms) to set the encoder to Zero and reboot the encoder (turn off and then turn on the power supply).
(**) Connect to 4,75...30 VDC to change direction from default. If this input is not used, it should be connected to GND in order to avoid interferences. The encoder must be always rebooted (turn off and then turn on the power supply) after switching.

SERIE E58 CS

SOLID SHAFT ABSOLUTE SINGLETURN ENCODER

CONNECTION DIMENSIONS

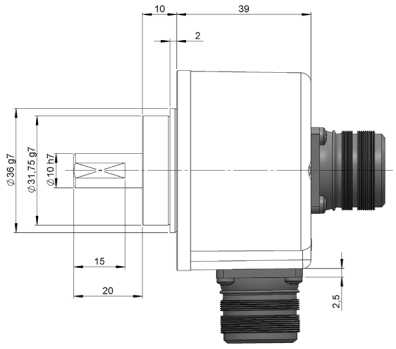
Female connector not included

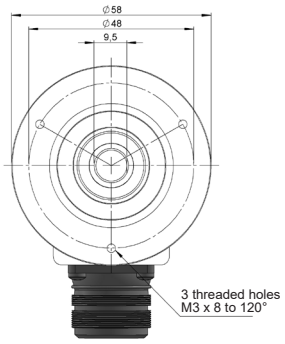
Connection 3

Radial
M23 12p
male panel
clockwise

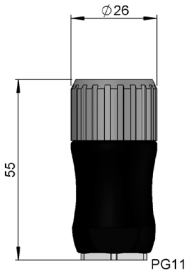
Connection 5

Axial
M23 12p
male panel
clockwise





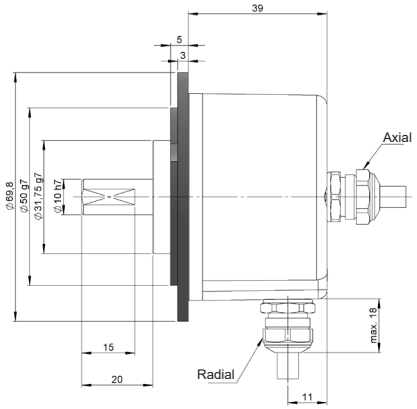
Female connector
95.0007131

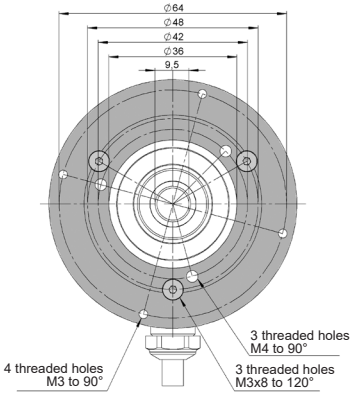


FLANGE DIMENSIONS

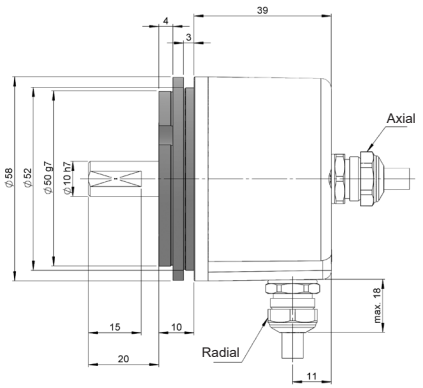
Flange mounting included

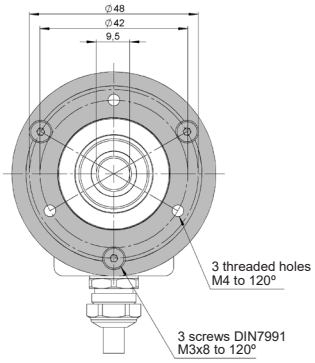
Flange 2
90.1002



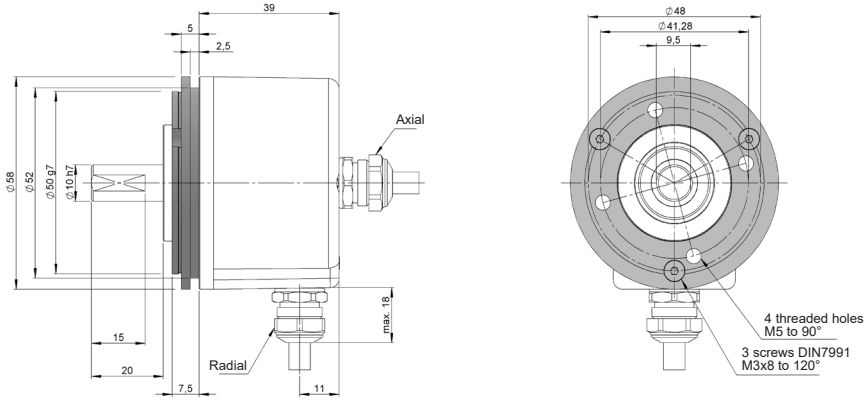


Flange 3
90.1003
Synchro

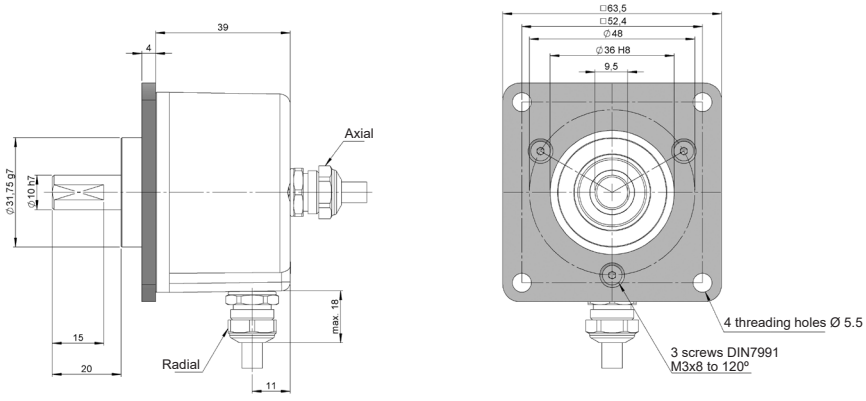




Flange 4
90.1004



Flange 5
90.1005



Flange 6
90.1006

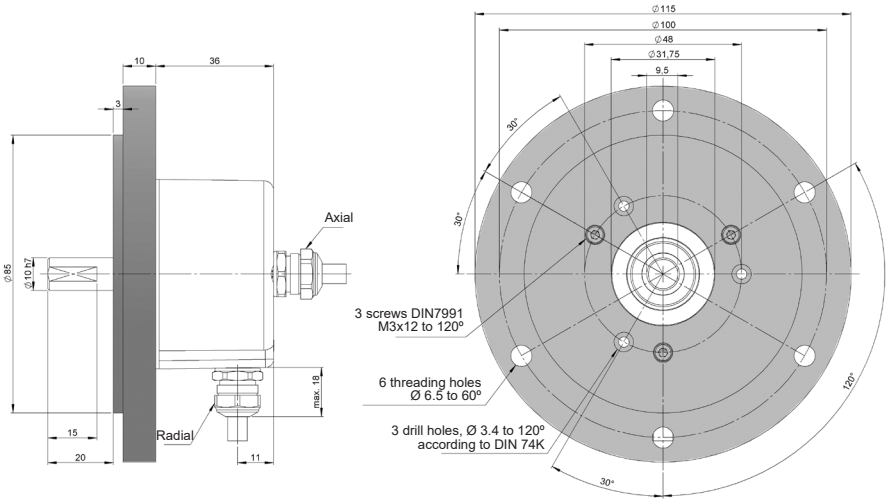
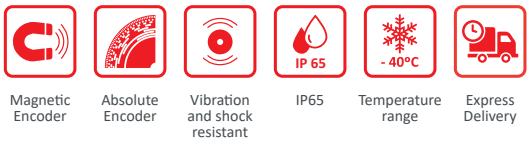



Image with flexible flange (90.1018)

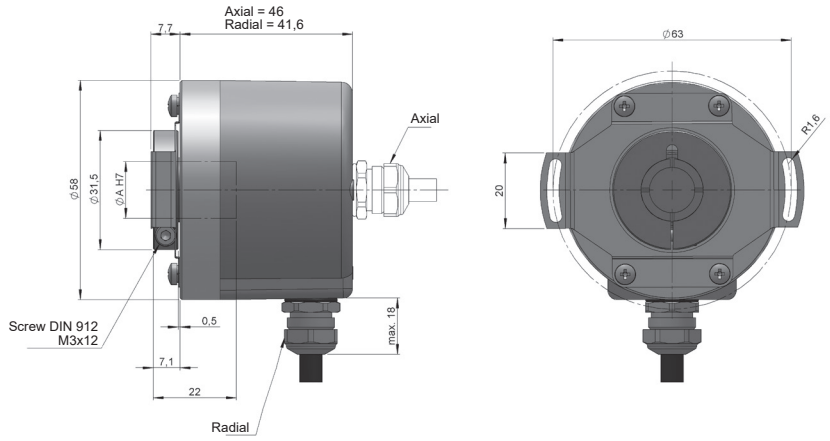
SERIE E58 HS

BLIND HOLLOW SHAFT ABSOLUTE SINGLETURN ENCODER

- Singleturn resolution up to 13 bits
- Magnetic technology
- External diameter 58 mm
- Blind hollow shaft Ø 8, 10, 12, 14 and 15 mm
- Protection class IP65 according to DIN EN 60529
- Connection by cable (other cable length available) or industrial connector M23



Magnetic Encoder | Absolute Encoder | Vibration and shock resistant | IP65 | Temperature range | Express Delivery



HOLLOW SHAFT	Ø A
3	8
4	10
5	12
7	14
8	15

Drawing connection type 1/2, anti-rotation system type 3 (flexible flange 90.1027)

REFERENCE

Reference example: E58HS-SSI-31231-12

Serie	Interface	Anti-rotation system	Hollow shaft	Connection	Code	Power Supply / Electronic output	Singleturn resolution	Special customer
E58HS -	**SSI -**	☐	☐	☐	☐	☐ -	☐☐	.☐☐
	SSI. SSI	**1.** None **2.** Flexible flange (90.1018) **3.** Flexible flange (90.1027) **4.** Flexible flange (90.1075) (*)	**3.** Ø 8 mm **4.** Ø 10 mm **5.** Ø 12 mm **7.** Ø 14 mm **8.** Ø 15 mm	**1.** Axial cable **2.** Radial cable **3.** Radial M23 12p **5.** Axial M23 12p	**1.** Binary CW **2.** Binary CCW **3.** Gray CW **4.** Gray CCW	**1.** 4,75...30 VDC / RS422	**09.** 9 bits **10.** 10 bits **11.** 11 bits **12.** 12 bits **13.** 13 bits	

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(*) Anti-rotation system type 3 (Flexible flange 90.1027) and 4 (Flexible flange 90.1075) supplied assembled.
Anti-rotation system type 2 (Flexible flange 90.1018) supplied disassembled and includes the screws required for assembly.

SERIE E58 HS

BLIND HOLLOW SHAFT ABSOLUTE SINGLETURN ENCODER

MECHANICAL SPECIFICATIONS

Materials	Housing: Zamac Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Housing fixing	Flexible flange (included)
Permitted misalignment	±0.5 mm axial, ±0.3 mm radial (90.1018) ±0.5 mm axial, ±0.3 mm radial (90.1027) ±0.5 mm axial, ±0.2 mm radial (90.1075)
Shaft fixing	Clamp
Blind hollow shaft diameter	8, 10, 12, 14 and 15 mm
Maximum number of revolutions permitted mechanically	6000 rpm - Standard 10000 rpm - Upon request 12000 rpm (≤ 12 bits) - Upon request
Protection against dust and splashes according to DIN EN 60529	IP65
Rotor inertia moment	2 gcm^2
Starting torque at 20°C (68°F)	≤ 0,01 Nm
Maximum load permitted on axial shaft	20 N
Maximum load permitted on radial shaft	40 N
Weight aprox.	0,08 Kg
Operating temperature range	-40°C to +105°C
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Axial or radial connection	2 meters cable or industrial connector M23 (other cable lengths available on order) Female connector not included

ELECTRICAL SPECIFICATIONS

Interface	SSI
Electronic output	RS422
Power supply (VCC)	4,75...30 VDC
Consumption	≤ 100 mA
Code	Binary Gray
Protocol	SSI
Singleturn resolution	up to 13 bits
Absolute accuracy	±0,35°
Relative accuracy	±1,5 LSB
Max. load capability / channel	±20 mA
"Low" signal level	< 0,8 VDC
"High" signal level	2 ... 5,5 VDC
Frequency	50 kHz...2 MHz
Short circuit protection	Yes
Protection polarity inversion	Yes

CONNECTION

	Cable 8x0,14 mm^2 95.0008052	**Connector** M23 12p CW
GND	White	1
VCC	Brown	2
DATA+	Yellow	3
DATA-	Pink	4
CLK+	Green	5
CLK-	Grey	6
PRESET*	Red	7
DIR**	Blue	8

(*) Apply a 4,75...30 VDC pulse (more than 1 ms) to set the encoder to Zero and reboot the encoder (turn off and then turn on the power supply).
(**) Connect to 4,75...30 VDC to change direction from default. If this input is not used, it should be connected to GND in order to avoid interferences. The encoder must be always rebooted (turn off and then turn on the power supply) after switching.

SERIE E58 HS

BLIND HOLLOW SHAFT ABSOLUTE SINGLETURN ENCODER

CONNECTION DIMENSIONS

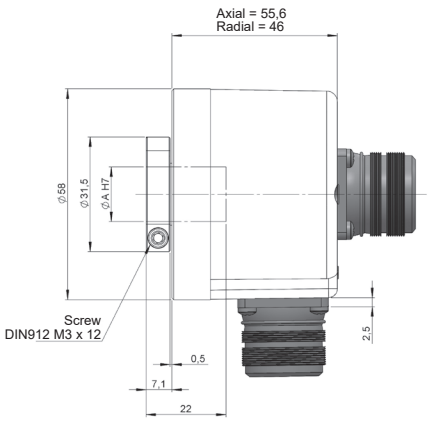
Female connector not included

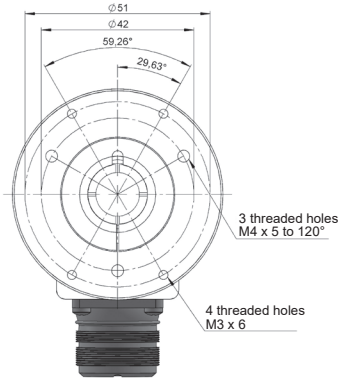
Connection 3

Radial
M23 12p
male panel
clockwise

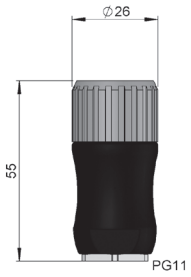
Connection 5

Axial
M23 12p
male panel
clockwise



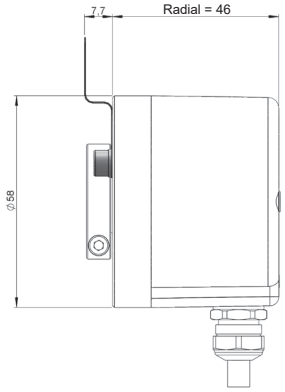


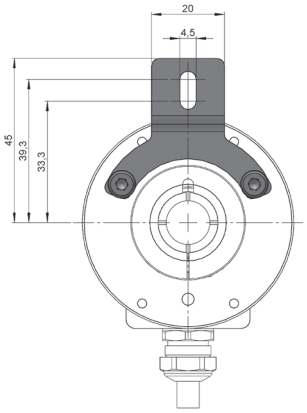
Female connector
95.0007131



ANTI-ROTATION SYSTEMS DIMENSIONS

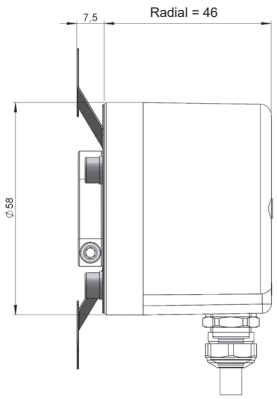
Anti-rotation system 2
Flexible flange
90.1018

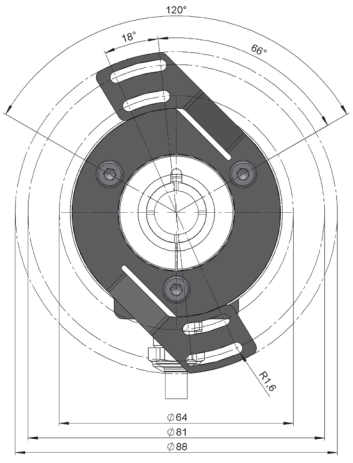




90.1018

Anti-rotation system 3
Flexible flange
90.1075





90.1075

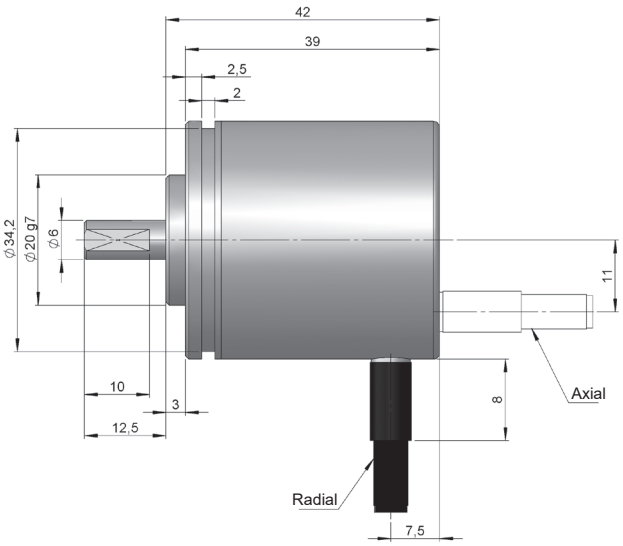
SERIE E36 CM

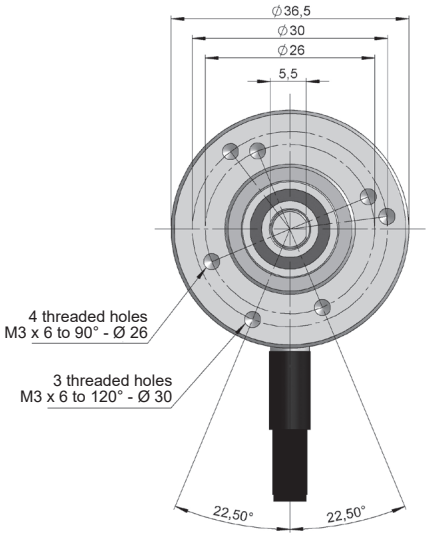
MINIATURE SOLID SHAFT ABSOLUTE MULTITURN ENCODER

BiSS INTERFACE

- Singleturn resolution up to 13 bits
- Multiturn resolution up to 24 bits
- Magnetic technology
- External diameter 36,5 mm
- Shaft Ø 6 mm
- Protection class IP64 according to DIN EN 60529
- Connection by cable (other cable length available)

Magnetic Encoder | Absolute Encoder | Miniature Encoder | Vibration and shock resistant | IP64 | Temperature range | Express Delivery





REFERENCE

Reference example: E36CM-BIS-1211-1212

Serie	Interface	Solid shaft	Connection	Code	Power Supply / Electronic output	Singleturn resolution	Multiturn resolution	Special customer
E36CM -	BIS -	☐	☐	☐	☐ -	☐☐	☐☐	.☐☐
	BIS. BISS-C	**1.** Ø 6 mm	**1.** Axial cable **2.** Radial cable	**1.** Binary CW **2.** Binary CCW	**1.** 4,75...30 VDC / RS422	**09.** 9 bits **10.** 10 bits **11.** 11 bits **12.** 12 bits **13.** 13 bits	**12.** 12 bits **16.** 16 bits **20.** 20 bits **24.** 24 bits	**LN.** +105°C

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Step file 3D

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SERIE E36 CM

MINIATURE SOLID SHAFT ABSOLUTE MULTITURN ENCODER

BiSS INTERFACE

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Maximum number of revolutions permitted mechanically	6000 rpm - Standard 10000 rpm - Upon request 12000 rpm (≤ 12 bits) - Upon request
Protection against dust and splashes according to DIN EN 60529	IP64
Rotor inertia moment	2 gcm^2
Starting torque at 20°C (68°F)	≤ 0,01 Nm
Maximum load permitted on axial shaft	20 N
Maximum load permitted on radial shaft	40 N
Weight aprox.	0,08 Kg
Operating temperature range	-40°C to +85°C - Standard -40°C to +105°C - Special Customer LN
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Axial or radial connection	2 meters cable (other cable lengths available on order)

ELECTRICAL SPECIFICATIONS

Interface	BiSS INTERFACE
Electronic output	RS422
Power supply (VCC)	4,75...30 VDC
Consumption	≤ 100 mA
Code	Binary
Protocol	BISS-C
Singleturn resolution	up to 13 bits
Multiturn resolution	up to 24 bits
Absolute accuracy	±0,35°
Relative accuracy	±1,5 LSB
Max. load capability / channel	±20 mA
“Low” signal level	< 0,8 VDC
“High” signal level	2 ... 5,5 VDC
Frequency	50 kHz...2 MHz
Short circuit protection	Yes
Protection polarity inversion	Yes

CONNECTION

	Cable 8x0,14 mm^2 95.0008052
GND	White
VCC	Brown
DATA+	Yellow
DATA-	Pink
CLK+	Green
CLK-	Grey
PRESET*	Red
DIR**	Blue

(*) Apply a 4,75...30 VDC pulse (more than 1 ms) to set the encoder to Zero and reboot the encoder (turn off and then turn on the power supply).

(**) Connect to 4,75...30 VDC to change direction from default. If this input is not used, it should be connected to GND in order to avoid interferences. The encoder must be always rebooted (turn off and then turn on the power supply) after switching.

SERIE E36 HM

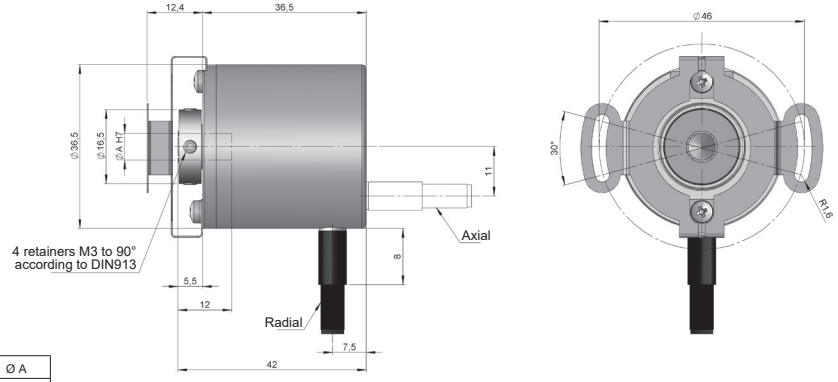
MINIATURE BLIND HOLLOW SHAFT ABSOLUTE MULTITURN ENCODER

BiSS INTERFACE

- Singleturn resolution up to 13 bits
- Multiturn resolution up to 24 bits
- Magnetic technology
- External diameter 36,5 mm
- Blind hollow shaft Ø 6 mm or 8 mm
- Protection class IP64 according to DIN EN 60529
- Connection by cable (other cable length available)

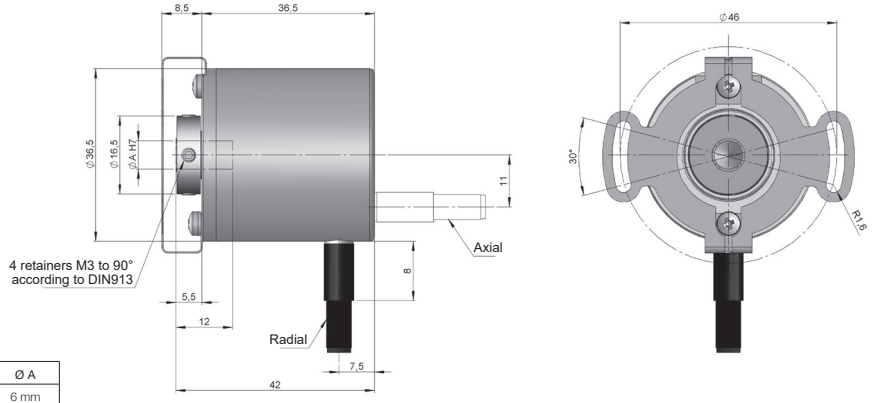
Magnetic Encoder | Absolute Encoder | Miniature Encoder | Vibration and shock resistant | IP64 | Temperature range | Express Delivery

Setscrew / Flexible flange (90.1037)



BLIND HOLLOW SHAFT	Ø A
1	6 mm
2	8 mm

Setscrew / Flexible flange (90.1111)



BLIND HOLLOW SHAFT	Ø A
1	6 mm
2	8 mm

SERIE E36 HM

MINIATURE BLIND HOLLOW SHAFT ABSOLUTE MULTITURN ENCODER

BiSS INTERFACE

REFERENCE

Reference example: E36HM-BIS-11211-1212

Serie	Interface	Anti-rotation system	Blind-Hollow shaft	Connection	Code	Power Supply / Electronic output	Singleturn resolution	Multiturn resolution	Special customer
E36HM -	BIS -	☐	☐	☐	☐	☐ -	☐☐	☐☐	.☐☐
	BIS. BISS-C	**1.** Flexible flange (90.1037) **2.** Flexible flange (90.1111) (*)	**1.** Ø 6 mm **2.** Ø 8 mm	**1.** Axial cable **2.** Radial cable	**1.** Binary CW **2.** Binary CCW	**1.** 4,75...30 VDC / RS422	**09.** 9 bits **10.** 10 bits **11.** 11 bits **12.** 12 bits **13.** 13 bits	**12.** 12 bits **16.** 16 bits **20.** 20 bits **24.** 24 bits	**LN.** +105°C

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(*) Anti-rotation system type 1 (Flexible flange 90.1037) and 2 (Flexible flange 90.1111) supplied assembled.

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Housing fixing	Flexible flange (included)
Permitted misalignment	±0.3 mm axial, ±0.2 mm radial (90.1037) ±0.2 mm axial, ±0.1 mm radial (90.1111)
Shaft fixing	Setscrew
Blind hollow shaft diameter	6 mm or 8 mm
Maximum number of revolutions permitted mechanically	6000 rpm - Standard 10000 rpm - Upon request 12000 rpm (≤ 12 bits) - Upon request
Protection against dust and splashes according to DIN EN 60529	IP64
Rotor inertia moment	10 gcm^2
Starting torque at 20°C (68°F)	≤ 0,01 Nm
Maximum load permitted on axial shaft	20 N
Maximum load permitted on radial shaft	40 N
Weight aprox.	0,08 Kg
Operating temperature range	-40°C to +85°C - Standard -40°C to +105°C - Special Customer LN
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Axial or radial connection	2 meters cable (other cable lengths available on order)

SERIE E36 HM

MINIATURE BLIND HOLLOW SHAFT ABSOLUTE MULTITURN ENCODER

ELECTRICAL SPECIFICATIONS

Interface	BiSS INTERFACE
Electronic output	RS422
Power supply (VCC)	4,75...30 VDC
Consumption	≤ 100 mA
Code	Binary
Protocol	BISS-C
Singleturn resolution	up to 13 bits
Multiturn resolution	up to 24 bits
Absolute accuracy	±0,35°
Relative accuracy	±1,5 LSB
Max. load capability / channel	±20 mA
“Low” signal level	< 0,8 VDC
“High” signal level	2 ... 5,5 VDC
Frequency	50 kHz...2 MHz
Short circuit protection	Yes
Protection polarity inversion	Yes

CONNECTION

	Cable 8x0,14 mm² 95.0008052
GND	White
VCC	Brown
DATA+	Yellow
DATA-	Pink
CLK+	Green
CLK-	Grey
PRESET*	Red
DIR**	Blue

(*) Apply a 4,75...30 VDC pulse (more than 1 ms) to set the encoder to Zero and reboot the encoder (turn off and then turn on the power supply).

(**) Connect to 4,75...30 VDC to change direction from default. If this input is not used, it should be connected to GND in order to avoid interferences. The encoder must be always rebooted (turn off and then turn on the power supply) after switching.

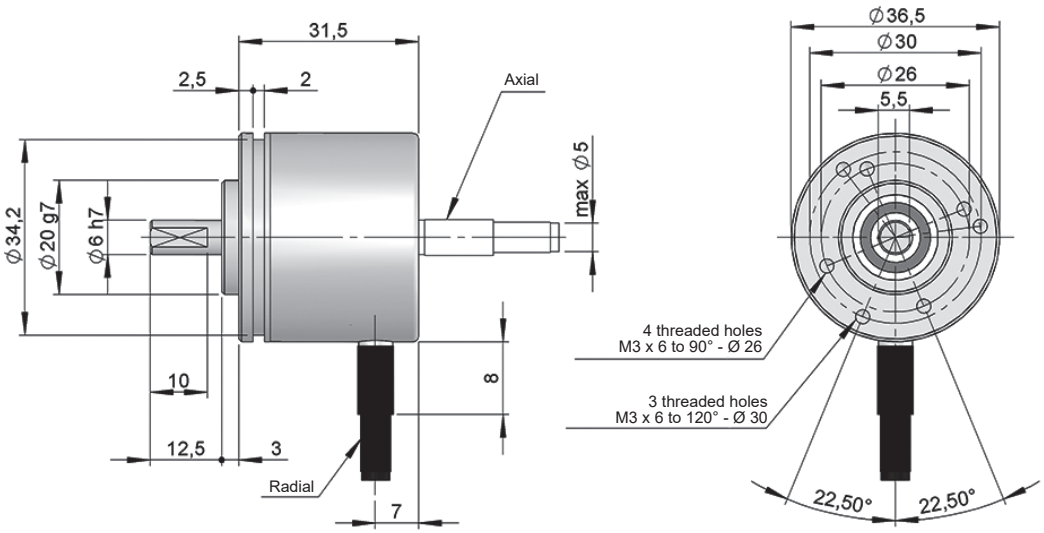
SERIE E36 CS

MINIATURE SOLID SHAFT ABSOLUTE SINGLETURN ENCODER

BiSS INTERFACE

- Singleturn resolution up to 13 bits
- Magnetic technology
- External diameter 36,5 mm
- Shaft Ø 6 mm
- Protection class IP64 according to DIN EN 60529
- Connection by cable (other cable length available)

Magnetic Encoder | Absolute Encoder | Miniature Encoder | Vibration and shock resistant | IP64 | Temperature range | Express Delivery



Drawing shaft type 1, connection type 1/2

REFERENCE

Reference example: E36CS-BIS-1211-12

Serie	Interface	Solid shaft	Connection	Code	Power Supply / Electronic output	Singleturn resolution	Special customer
E36CS -	BIS -	☐	☐	☐	☐ -	☐☐	.☐☐
	BIS. BISS	**1.** Ø 6 mm	**1.** Axial cable **2.** Radial cable	**1.** Binary CW **2.** Binary CCW	**1.** 4,75...30 VDC / RS422	**09.** 9 bits **10.** 10 bits **11.** 11 bits **12.** 12 bits **13.** 13 bits	

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SERIE E36 CS

MINIATURE SOLID SHAFT ABSOLUTE SINGLETURN ENCODER

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Maximum number of revolutions permitted mechanically	6000 rpm - Standard 10000 rpm - Upon request 12000 rpm (≤ 12 bits) - Upon request
Protection against dust and splashes according to DIN EN 60529	IP64
Rotor inertia moment	2 gcm^2
Starting torque at 20°C (68°F)	≤ 0,01 Nm
Maximum load permitted on axial shaft	20 N
Maximum load permitted on radial shaft	40 N
Weight aprox.	0,08 Kg
Operating temperature range	-40°C to +105°C
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Axial or radial connection	2 meters cable (other cable lengths available on order)

ELECTRICAL SPECIFICATIONS

Interface

Electronic output	RS422
Power supply (VCC)	4,75...30 VDC
Consumption	≤ 100 mA
Code	Binary
Protocol	BISS-C
Singleturn resolution	up to 13 bits
Absolute accuracy	±0,35°
Relative accuracy	±1,5 LSB
Max. load capability / channel	±20 mA
“Low” signal level	< 0,8 VDC
“High” signal level	2 ... 5,5 VDC
Frequency	50 kHz...2 MHz
Short circuit protection	Yes
Protection polarity inversion	Yes

CONNECTION

	Cable 8x0,14 mm^2 95.0008052
GND	White
VCC	Brown
DATA+	Yellow
DATA-	Pink
CLK+	Green
CLK-	Grey
PRESET*	Red
DIR**	Blue

(*) Apply a 4,75...30 VDC pulse (more than 1 ms) to set the encoder to Zero and reboot the encoder (turn off and then turn on the power supply).

(**) Connect to 4,75...30 VDC to change direction from default. If this input is not used, it should be connected to GND in order to avoid interferences. The encoder must be always rebooted (turn off and then turn on the power supply) after switching.

SERIE E36 HS

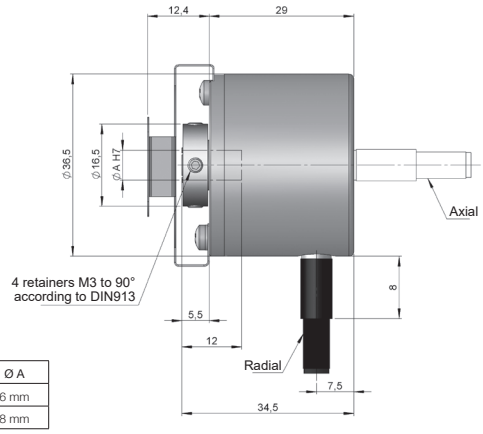
MINIATURE BLIND HOLLOW SHAFT ABSOLUTE SINGLETURN ENCODER

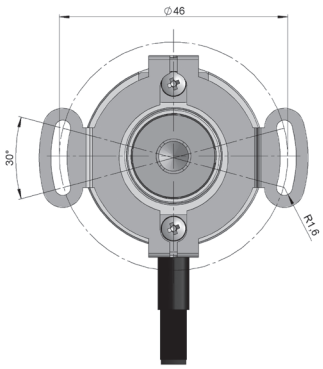
BiSS INTERFACE

- Singleturn resolution up to 13 bits
- Magnetic technology
- External diameter 36,5 mm
- Blind hollow shaft Ø 6 mm or 8 mm
- Protection class IP64 according to DIN EN 60529
- Connection by cable (other cable length available)

Magnetic Encoder | Absolute Encoder | Miniature Encoder | Vibration and shock resistant | IP64 | Temperature range | Express Delivery

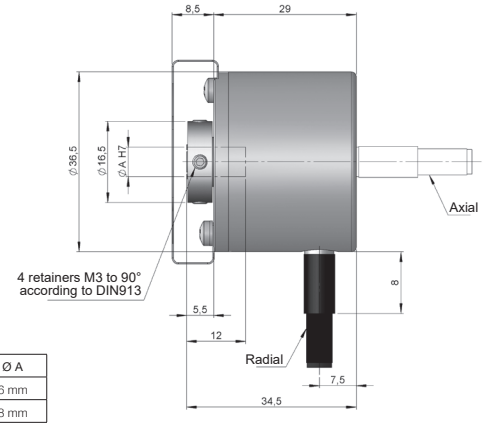
Setscrew / Flexible flange (90.1037)

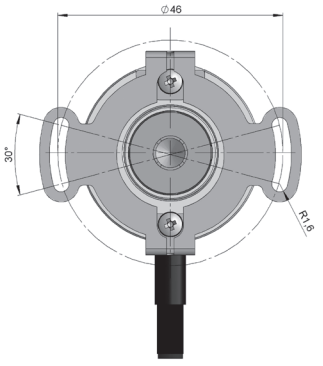




BLIND HOLLOW SHAFT	Ø A
1	6 mm
2	8 mm

Setscrew / Flexible flange (90.1111)





BLIND HOLLOW SHAFT	Ø A
1	6 mm
2	8 mm

SERIE E36 HS

MINIATURE BLIND HOLLOW SHAFT ABSOLUTE SINGLETURN ENCODER

BiSS INTERFACE

REFERENCE

Reference example: E36HS-BIS-11211-12

Serie	Interface	Anti-rotation system	Blind-Hollow shaft	Connection	Code	Power Supply / Electronic output	Singleturn resolution	Special customer
E36HS -	BIS -	☐	☐	☐	☐	☐ -	☐☐	.☐☐
	BIS. BISS-C	**1.** Flexible flange (90.1037) **2.** Flexible flange (90.1111) (*)	**1.** Ø 6 mm **2.** Ø 8 mm	**1.** Axial cable **2.** Radial cable	**1.** Binary CW **2.** Binary CCW	**1.** 4,75...30 VDC / RS422	**09.** 9 bits **10.** 10 bits **11.** 11 bits **12.** 12 bits **13.** 13 bits	

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(*) Anti-rotation system type 1 (Flexible flange 90.1037) and 2 (Flexible flange 90.1111) supplied assembled.

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Housing fixing	Flexible flange (included)
Permitted misalignment	±0.3 mm axial, ±0.2 mm radial (90.1037) ±0.2 mm axial, ±0.1 mm radial (90.1111)
Shaft fixing	Setscrew
Blind hollow shaft diameter	6 mm or 8 mm
Maximum number of revolutions permitted mechanically	6000 rpm - Standard 10000 rpm - Upon request 12000 rpm (≤ 12 bits) - Upon request
Protection against dust and splashes according to DIN EN 60529	IP64
Rotor inertia moment	10 gcm^2
Starting torque at 20°C (68°F)	≤ 0,01 Nm
Maximum load permitted on axial shaft	20 N
Maximum load permitted on radial shaft	40 N
Weight aprox.	0,08 Kg
Operating temperature range	-40°C to +105°C
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Axial or radial connection	2 meters cable (other cable lengths available on order)

SERIE E36 HS

MINIATURE BLIND HOLLOW SHAFT ABSOLUTE SINGLETURN ENCODER

ELECTRICAL SPECIFICATIONS

Interface	BiSS INTERFACE
Electronic output	RS422
Power supply (VCC)	4,75...30 VDC
Consumption	≤ 100 mA
Code	Binary
Protocol	BISS-C
Singleturn resolution	up to 13 bits
Absolute accuracy	±0,35°
Relative accuracy	±1,5 LSB
Max. load capability / channel	±20 mA
“Low” signal level	< 0,8 VDC
“High” signal level	2 ... 5,5 VDC
Frequency	50 kHz...2 MHz
Short circuit protection	Yes
Protection polarity inversion	Yes

CONNECTION

	Cable 8x0,14 mm² 95.0008052
GND	White
VCC	Brown
DATA+	Yellow
DATA-	Pink
CLK+	Green
CLK-	Grey
PRESET*	Red
DIR**	Blue

(*) Apply a 4,75...30 VDC pulse (more than 1 ms) to set the encoder to Zero and reboot the encoder (turn off and then turn on the power supply).

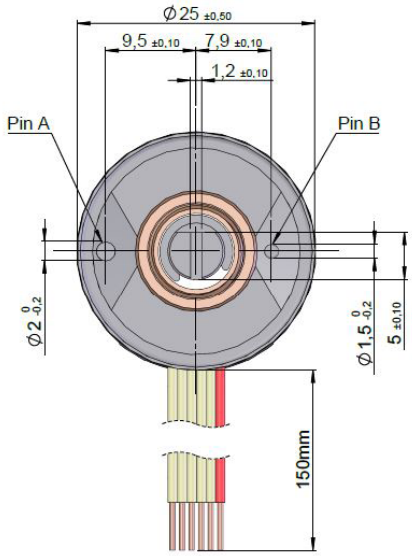
(**) Connect to 4,75...30 VDC to change direction from default. If this input is not used, it should be connected to GND in order to avoid interferences. The encoder must be always rebooted (turn off and then turn on the power supply) after switching.

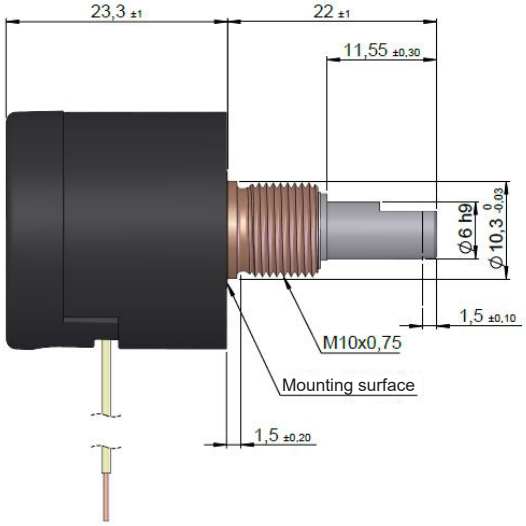
SERIE CM26M

ABSOLUTE MULTITURN MAGNETIC ENCODER

- System contactless Hall Effect which guarantees over 100 million turns of life
- Programmable up to 72000° (200 turns)
- Resolution 12 bits
- External diameter 25 mm
- Shaft Ø 6 mm
- Analog output 0...10V
- Mechanically 100% interchangeable with available potentiometers in the market

Magnetic Encoder | Absolute Encoder | Analog output | IP40 | Temperature range | Express Delivery





REFERENCE

Reference example: CM26M-22-3600

Serie	Mechanical option	Output signal	Measurement range (in degrees)	Special Customer
CM26M -	☐	☐ -	3 6 0 0	. ☐☐
	2. Thread 10x0,75 mm / Shaft Ø 6 mm Pin A - Pin B	**2.** Analog output 0...10V	**3600.** Standard (3600° - 10 turns) (*)	

Order your reference Step file 3D

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service available in 24 h

(*) Programmable up to 72000° (200 turns).
The CM26M series enables easy, flexible and perfect adjustment of start and end points of the analog output signal and the sense of rotation direction by the user.

Previous assembly and installation reading "Programming Manual CM26M" is recommended:
www.encoderhohner.com/product/cm26m/

SERIE CM26M

ABSOLUTE MULTITURN MAGNETIC ENCODER

MECHANICAL SPECIFICATIONS

Materials	Housing: Plastic / Bronze Shaft: Stainless Steel
Bearings	Sleeve bearing
Mechanical angle	Endless
Lifetime	> $100x10^6$ shaft rotating movements
Maximum number of revolutions permitted mechanically	100 rpm
Protection against dust and splashes according to DIN EN 60529	IP 40
Operational torque	0,1 ≤ M ≤ 0,6 Ncm
Maximum load permitted on radial shaft	1 N
Mounting parts (included)	Hexagonal nut, 14 mm + tooth washer
Torque nut assembly	≤ 3 Nm
Weight aprox.	0,3 Kg
Operating temperature range	-40°C to +85°C
Vibration according to DIN EN 60068-2-6	±1,5 mm / 20 g / 10...2000 Hz / 16 frequency cycles (3x4 h)
Shock according to DIN EN 60068-2-27	50 g / 11 ms / halfsine (3x6 shocks)
Radial connection	Flat ribbon cable (0,15 m)

ELECTRICAL SPECIFICATIONS

Measuring range	0...72000° (200 turns)
Independent linearity	±0.05 % (3600°)
Absolute linearity	±0.1 % (3600°)
Resolution	12 bits
Update rate	3 ms
Max. number of programming cycles	10.000
Output signal	0...10 V
Power supply	9...30 VDC 15...30 VDC
Power consumption (without load)	< 10 mA
Output load	≥ 5KΩ
Insulation voltage	1000 VAC (50 Hz, 1 min)
Insulation resistance	2 MΩ (500 VDC, 1 min)

(*) For detecting absolute position (> 360°) the sensor should not be turned more than 179° without supply voltage.

CONNECTION

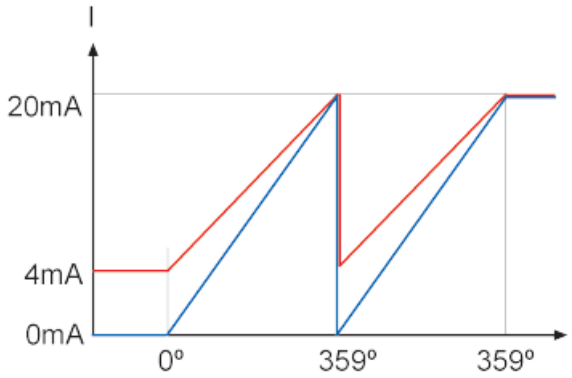
	Flat ribbon cable AWG28 RM / 1.27
DIR	1 (red)
END (programming cable)	2
START (programming cable)	3
VCC	4
OUT	5
GND	6

ABSOLUT AND PROGRAMMABLE ABSOLUT ANALOG ENCODERS

Analog interface

The analog interface has two outputs: one provides the absolut position measurement as a voltage (0/10v), and the other as a current (0/20mA or 4/20mA). Both outputs come from a singleturn absolut encoder with a 12bit resolution, with the 0 absolut position (0 degrees) havin a value of 0v at the V+ output and 4 or 0 mA at the I+ output.

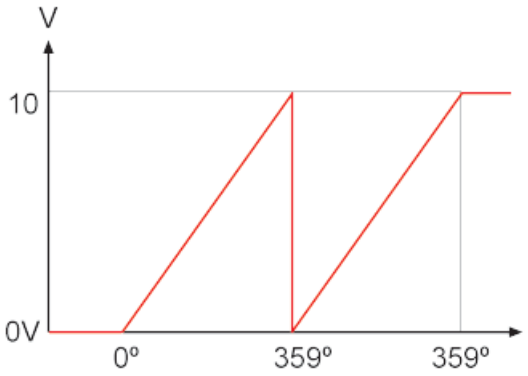
When the absolut position is 4095 (359 degrees) the V+ output will be 10v and the I+ output will be 20mA. These outputs consist of four wires (two per output): I+, I- and V+, V-, being I- and V- referenced internally to negative (GND), and thus forming two measurement loops. Depending on the measurement system implemented by the customer, one or the other output will be used (current or voltage).



Current output

Electrical specifications

Output form	0/20mA o 4/20mA
Resolution	Up to 12 bits (4096 positions) for 360º
Thermal stability	±20 ppm/ºC
Update frequency	100KHz
Linearity error	0.07% of the active angle
R_{LOAD} máx.	(V_{IN} - 2 V)/20mA)
R_{LOAD} min.	150Ω



Voltage output

Electrical specifications

Output form	0/10V (Vcc min.=12V)
Resolution	Up to 12 bits (4096 positions) for 360º
Slew Rate	0.7V/us
Update frequency	100KHz
Linearity error	0.05% of the active angle
Load resistance	>5kΩ
Protection against shortcircuit	Yes

ABSOLUT ENCODERS ANALOG

- Interface analog current loop output 4..20mA, 0..20mA and 0..10 V voltage output
- Resolution 10 or 12 bits
- Solid or blind hollow shaft
- Protection class IP65 or IP67 according to DIN 40050
- Direction and range selectable
- Radial or axial connection, cable or connector output

OVERVIEW

	Diameter 58 mm		Diameter 90 mm
	Solid shaft	Hollow shaft	Solid shaft
Singleturn	CS10 CS10 IP67 	HS10 	CS30 CS30 IP67 
Multiturn	CM10 CM10 IP67 	HM10 	CM30 CM30 IP67 
Multiturn programmable	CMP10 	HMP10 	

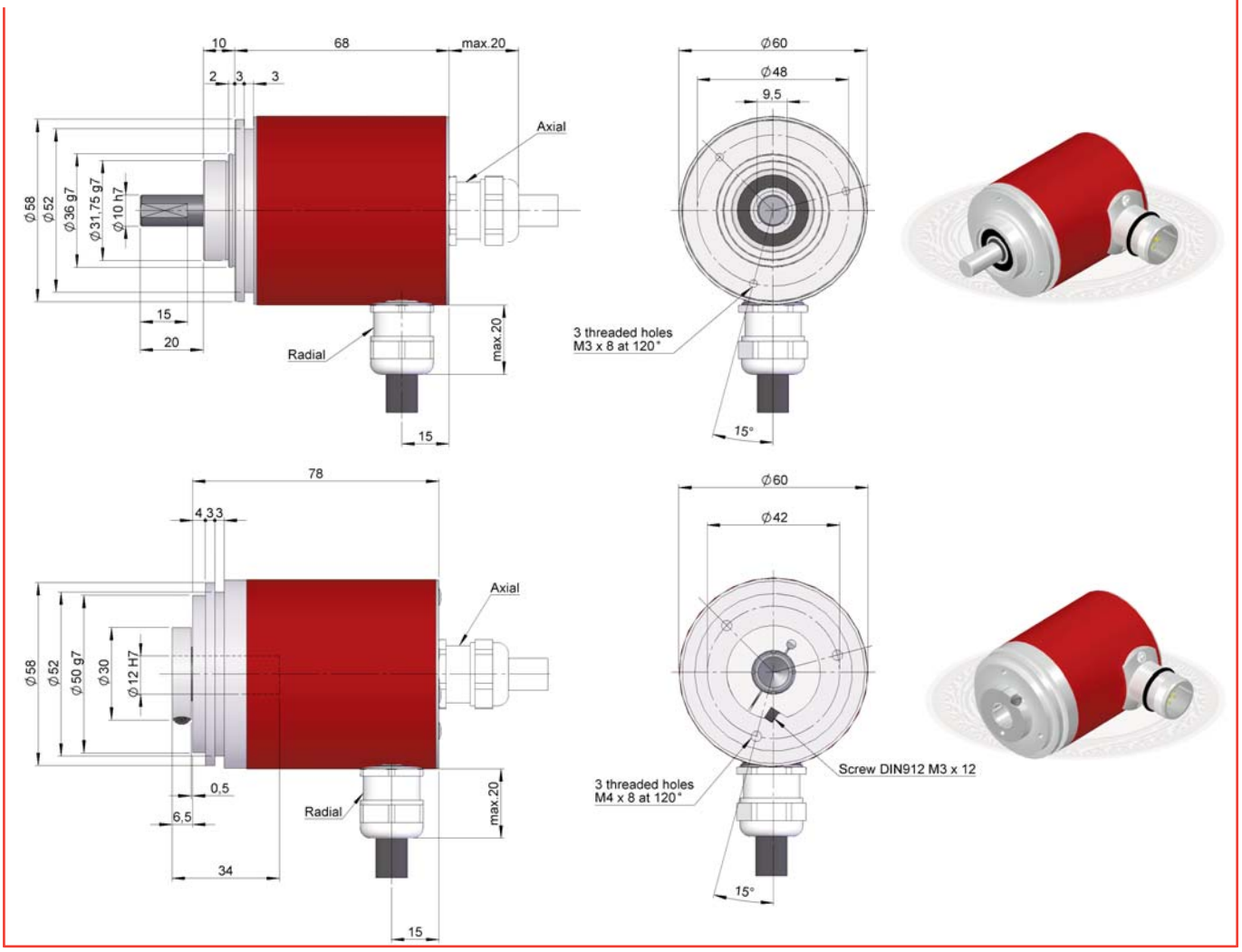
TECHNICAL SPECIFICATIONS

	Diameter 58 mm	Diameter 90 mm
Housing	Aluminium/Stainless steel	
Shaft	Stainless steel	
Bearings	Ballraces	
Bearings lifetime	$1x10^{10}$ rev.	
Maximum number of revolutions permitted mechanically	6000 rpm.	
Protection against dust and splashes according to DIN 40050	IP65 / IP67.	
Rotor inertia moment	30 gcm^2	270 gcm^2
Starting torque 20ºC (68ºF)	Máx. 2,0 Ncm	Máx. 5,0 Ncm
Maximum load permitted on axial shaft	40 N	80 N
Maximum load permitted on radial shaft	60 N	100 N
Misalignment permitted axial (blind hollow shaft)	±0.5 mm	-
Misalignment permitted radial (blind hollow shaft)	±0.3 mm	-
Weight aprox.	400 g ST, 500 g MT	1,2 kg ST, 1,3 kg MT
Operating temperature range	-10ºC a +70ºC	
Vibration	100 m/s^2 (10Hz...2000Hz)	
Shock	1000 m/s^2 (6ms)	
Consumption max.	100 mA (CS/HS), 150 mA (CM/HM)	
Power supply	10..30Vdc	
Interface	Analogue	
Electrical output	0..20mA, 0..10v, 4..20mA	
Configurable parameter (programmable series)	Range	
Configurable parameters	Direction	
Resolution	10 or 12 bits	
Maximum range	4096 turns	
Radial and axial connection	2 metres cable or industrial connector	

ST: Singleturn MT: Multiturn

SINGLETURN ABSOLUT ENCODER

- Singleturn resolution up to 12 bits
- Protection class IP65 according to DIN 40050
- External diameter 58 mm
- Solid shaft (CS) and blind hollow shaft (HS)



Previous mounting and installation of the encoder is recommended to read the section “TECHNICAL CONSIDERATIONS”.

ORDERING CODE

TYPE	SERIE	SHAFT	FLANGE	CONNEC-TION	AXIAL RADIAL	INTERFACE	CODE	IP	POWER SUPPLY OUTPUT	CONFIG. PARAMETERS	RESOLUTION	RANGE	SPECIAL CUSTOMER
●●	10	●	●	●	●	●	●	●	●	●	●●●●	●●●	●●

CS- Singleturn Solid shaft
HS- Singleturn Blind hollow shaft

1- Solid Ø6x10 mm
2- Solid Ø10x20 mm
3- Blind hollow Ø12 mm
4- Blind hollow Ø10 mm

1- None
2- 90.1002
3- 90.1003
4- 90.1004
5- 90.1005
6- 90.1006

1- Cable
3- 95.0007131

1- Axial
2- Radial

2- Analog

1- Clockwise
2- Counter clockwise

1- IP65

5- 0...20mA, 15-30V
6- 4...20mA, 15-30V
7- 0...10V, 15-30V

S- Direction (*)

1024- 10 bits
4096- 12 bits

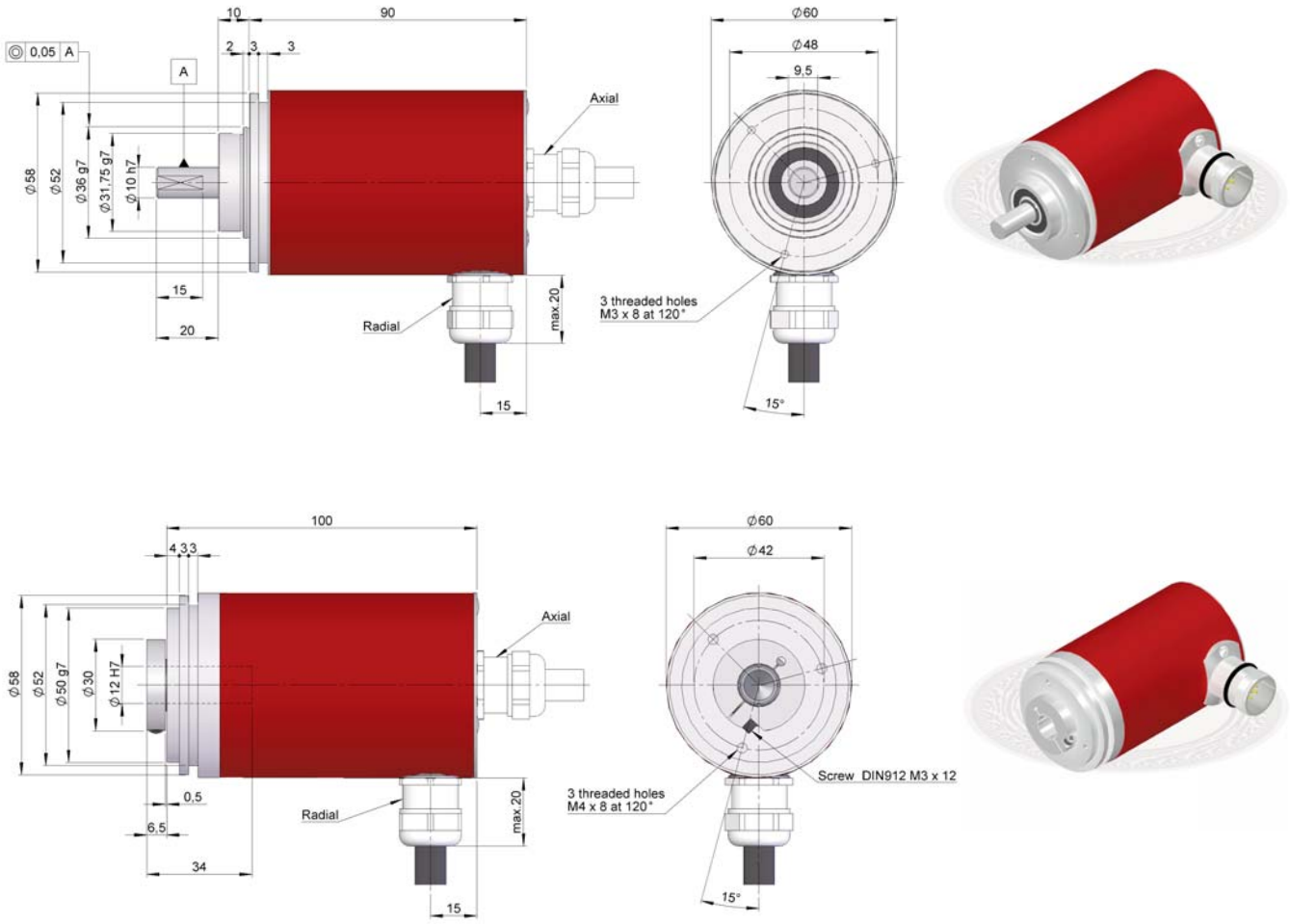
Blank-360 degrees
180- 180 degrees
90- 90 degrees
45- 45 degrees

(*) Only available for clockwise code.

ANA_02E

MULTITURN ABSOLUT ENCODER

- Resolution up to 12 bits
- Protection class IP65 according to DIN 40050
- External diameter 58 mm
- Solid shaft (CM) and blind hollow shaft (HM)



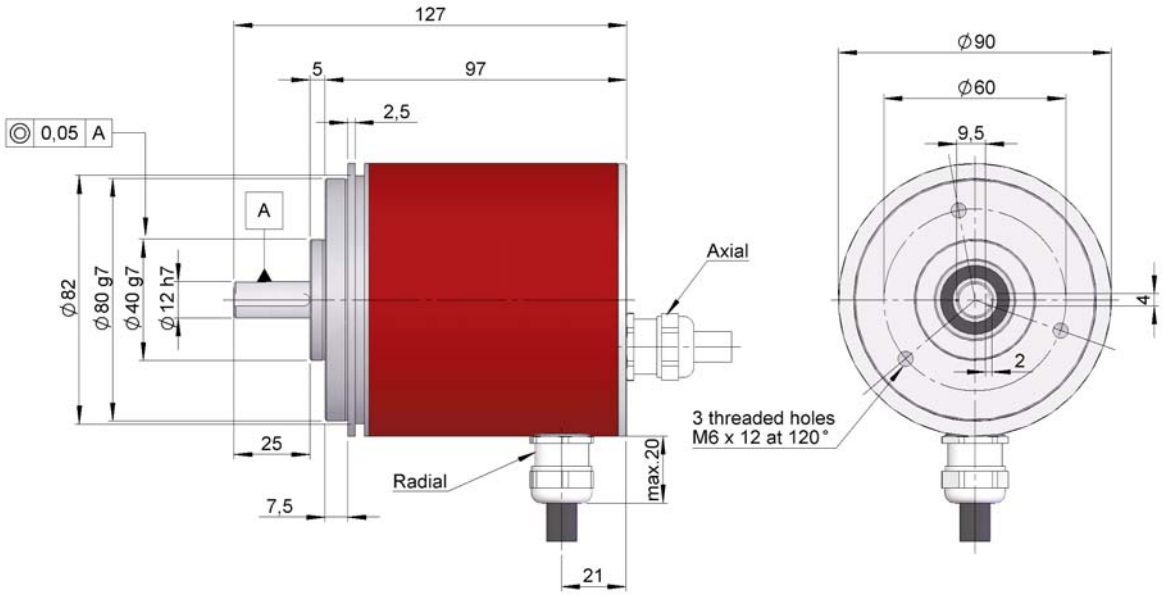
Previous mounting and installation of the encoder is recommended to read the section “TECHNICAL CONSIDERATIONS”.

ORDERING CODE

TYPE	SERIE	SHAFT	FLANGE	CONNEC-TION	AXIAL RADIAL	INTERFACE	CODE	IP	POWER SUPPLY OUTPUT	RESOLUTION	RANGE	SPECIAL CUSTOMER
●●	10	●	●	●	●	●	●	●	●	●●●●	●●●	●●
CM- Multiturn Solid shaft **HM**- Multiturn Blind hollow shaft		**1**- Solid Ø10x20 mm **2**- Solid Ø6x10 mm **3**- Blind hollow Ø12 mm **4**- Blind hollow Ø10 mm	**1**- None **2**- 90.1002 **3**- 90.1003 **4**- 90.1004 **5**- 90.1005 **6**- 90.1006	**1**- Cable **3**- 95.0007131	**1**- Axial **2**- Radial	**2**- Analog	**1**- Clockwise **2**- Counter clockwise	**1**- IP65	**5**- 0...20mA, 15-30V **6**- 4...20mA, 15-30V **7**- 0...10V, 15-30V	**1024**- 10 bits **4096**- 12 bits	**2**- 2 turns **4**- 4 turns **8**- 8 turns **16**- 16 turns **32**- 32 turns **64**- 64 turns **128**- 128 turns **256**- 256 turns **512**- 512 turns **1024**- 1024 turns **2048**- 2048 turns **4096**- 4096 turns	

ABSOLUT ENCODER FOR HEAVY DUTY INDUSTRIAL APPLICATIONS

- Singleturn resolution (CS) or multiturn (CM) up to 12 bits
- Protection class IP65 according to DIN 40050
- External diameter 90 mm
- Solid shaft



Previous mounting and installation of the encoder is recommended to read the section “TECHNICAL CONSIDERATIONS”.

ORDERING CODE

TYPE	SERIE	SHAFT	FLANGE	CONNEC-TION	AXIAL RADIAL	INTERFACE	CODE	IP	POWER SUPPY OUTPUT	CONFIG. PARAMETERS	RESOLUTION	RANGE	SPECIAL CUSTOMER
CS- Singleturn **CM**- Multiturn	30	**2**- Ø12 x 25 mm	**1**- None **3**- 90.1008	**1**- Cable **3**- 95.0007131	**1**- Axial **2**- Radial	**2**- Analog	**1**- Clockwise **2**- Counter clockwise	**1**- IP65	**5**- 0...20mA, 15-30V **6**- 4...20mA, 15-30V **7**- 0...10V, 15-30V	**S**- Direction (*)	**1024**- 10 bits **4096**- 12 bits	CS-singleturn: **45**- 1/8 turn; **90**- 1/4 turn; **180**- 1/2 turn; **Blank**- 1 turn CM-multiturn: **2**- 2 turns; **4**- 4 turns; **8**- 8 turns; **16**- 16 turns; **32**- 32 turns; **64**- 64 turns; **128**- 128 turns; **256**- 256 turns; **512**- 512 turns; **1024**- 1024 turns; **2048**- 2048 turns; **4096**- 4096 turns	

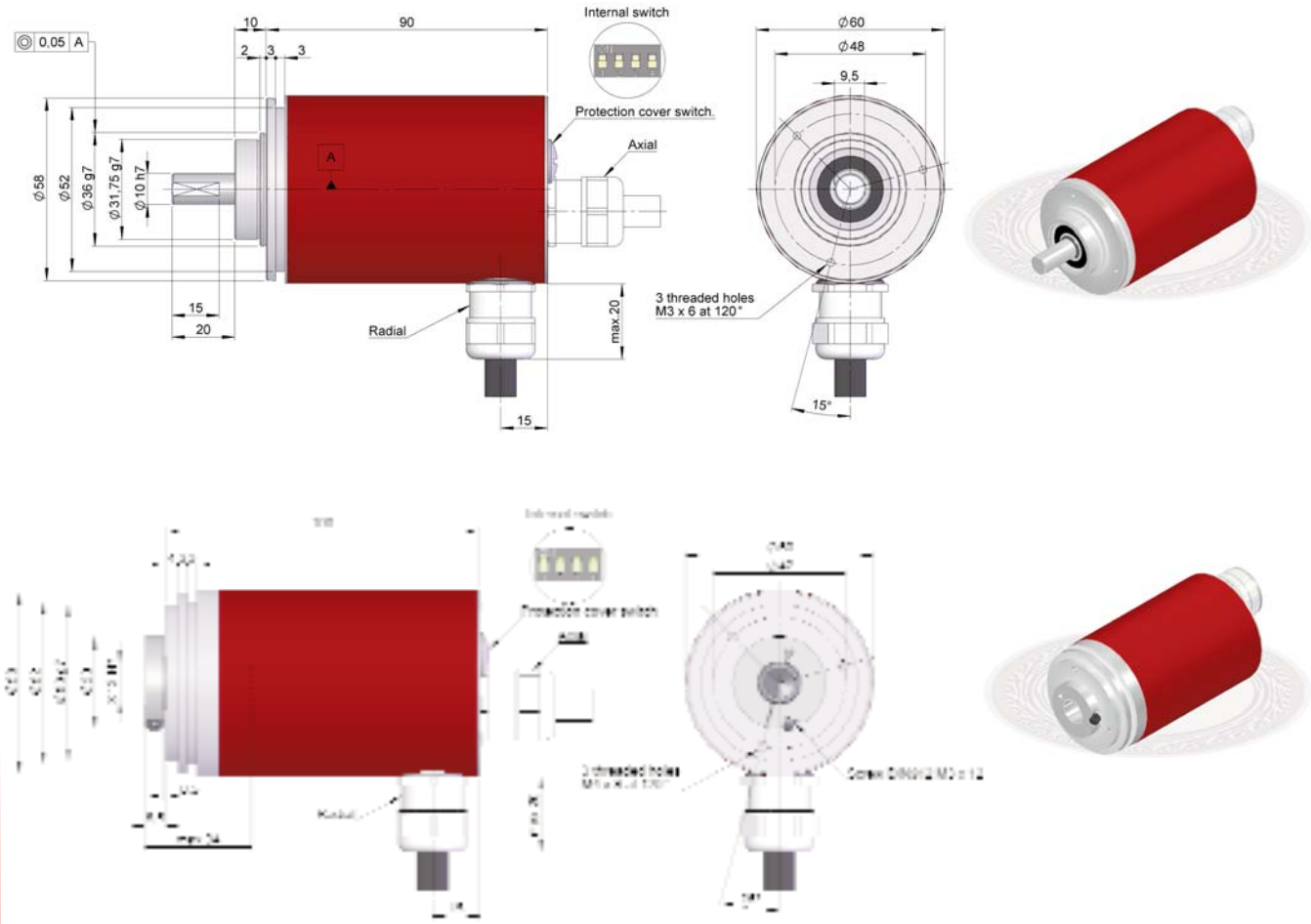
(*) Only available for singleturn and clockwise code.

ANA_02E

CONFIGURABLE ANALOG SERIES CMP10 / HMP10

CONFIGURABLE ABSOLUT MULTITURN ENCODER

- Resolution up to 12 bits
- Configurable range by switch up to 4096 turns
- Protection class IP65 according to DIN 40050
- External diameter 58 mm
- Solid shaft (CMP) and blind hollow shaft (HMP)



Previous mounting and installation of the encoder is recommended to read the section “TECHNICAL CONSIDERATIONS”.

ORDERING CODE

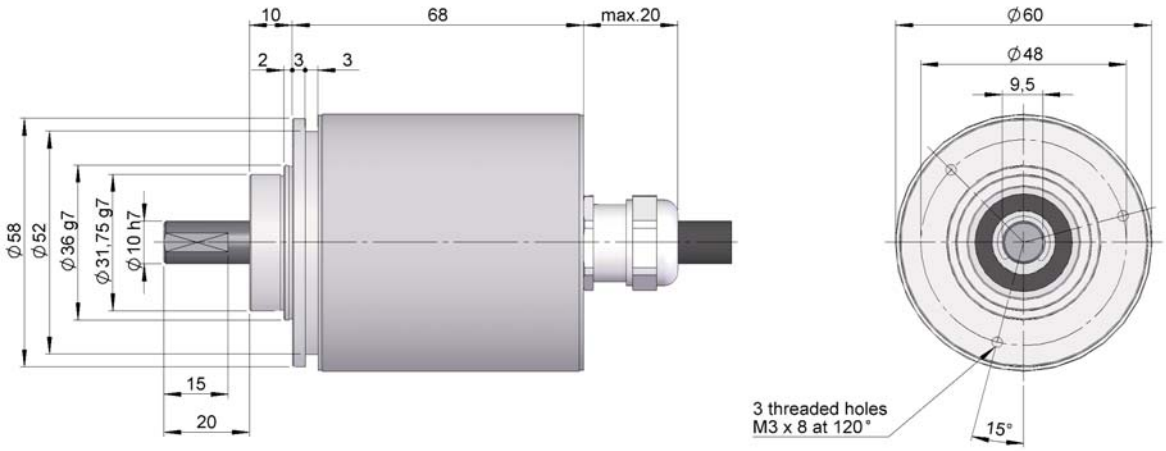
TYPE	SERIE	SHAFT	FLANGE	CONNEC-TION	AXIAL RADIAL	INTERFACE	CODE	IP	POWER SUPPLY OUTPUT	RESOLUTION	SPECIAL CUSTOMER
● ●	10	●	●	●	●	●	●	●	●	● ● ● ●	● ●
CMP- Solid shaft **HMP**- Blind hollow shaft		**1**- Solid Ø10x20 mm **2**- Solid Ø6x10 mm **3**- Blind hollow Ø12 mm **4**- Blind hollow Ø10 mm	**1**- None **2**- 90.1002 **3**- 90.1003 **4**- 90.1004 **5**- 90.1005 **6**- 90.1006	**1**- Cable **3**- 95.0007131	**1**- Axial **2**- Radial	**2**- Analog	**1**- Clockwise **2**- Counter clockwise	**1**- IP65	**5**- 0...20mA, 15-30V **6**- 4...20mA, 15-30V **7**- 0...10V, 15-30V	**1024**- 10 bits **4096**- 12 bits	

CONFIGURABLE RANGE

Switch 1	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
Switch 2	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF
Switch 3	ON	ON	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF
Switch 4	ON	ON	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Analog output range	**1/8 turn**	**1/4 turn**	**1/2 turn**	**1 turn**	**2 turns**	**4 turns**	**8 turns**	**16 turns**	**32 turns**	**64 turns**	**128 turns**	**256 turns**	**512 turns**	**1024 turns**	**2048 turns**	**4096 turns**

SINGLETURN ABSOLUT ENCODER FOR SEVERE INDUSTRIAL APPLICATIONS

- Singleturn resolution up to 12 bits
- Protection class IP67 according to DIN 40050
- External diameter 58 mm
- Solid shaft



Previous mounting and installation of the encoder is recommended to read the section “TECHNICAL CONSIDERATIONS”.

ORDERING CODE

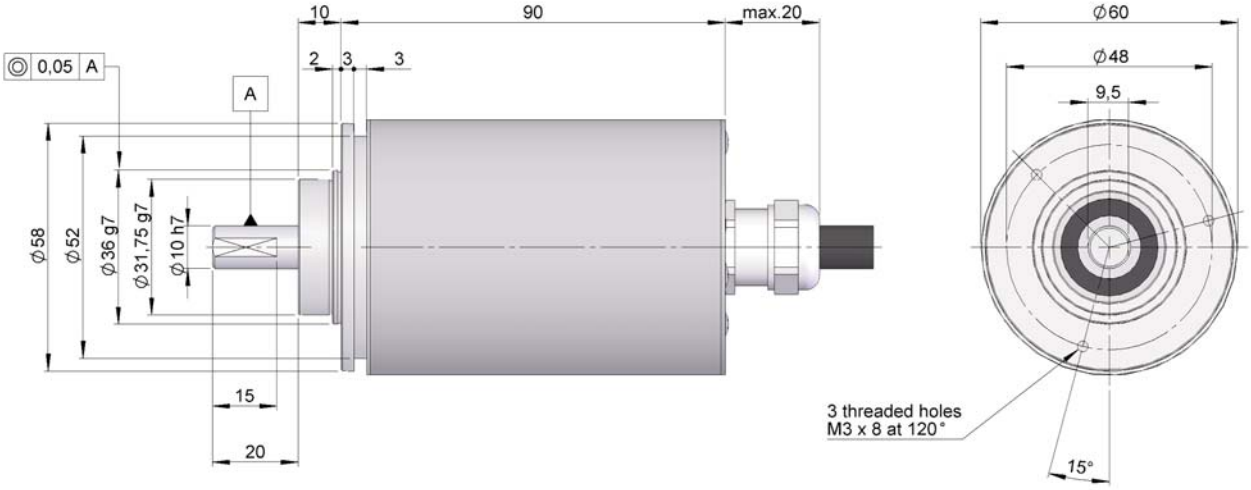
TYPE	SERIE	SHAFT	FLANGE	CONNEC-TION	AXIAL RADIAL	INTERFACE	DIRECTIO	IP	POWER SUPPLY OUTPUT	CONFIG. PARAMETERS	RESOLUTION	RANGE	SPECIAL CUSTOMER
●●●	10	●	●	●	●	●	●	●	●	●	●●●●	●●●	●●
CS- Singleturn		**1**- Ø6 x 10 mm **2**- Ø10 x 20 mm	**1**- None **2**- 90.1002 **3**- 90.1003 **4**- 90.1004 **5**- 90.1005 **6**- 90.1006	**1**- Cable	**1**- Axial	**2**- Analog	**1**- Clockwise **2**- Counter clockwise	**2**- Stainless steel IP67 **3**- IP67	**5**- 0...20mA, 15-30V **6**- 4...20mA, 15-30V **7**- 0...10V, 15-30V	**S**- Direction (*)	**1024**- 10 bits **4096**- 12 bits	**Blank**- 360 degrees **180**- 180 degrees **90**- 90 degrees **45**- 45 degrees	

(*) Only available for clockwise code.

ANA_02E

MULTITURN ABSOLUT ENCODER FOR SEVERE INDUSTRIAL APPLICATIONS

- Multiturn resolution up to 12 bits
- Protection class IP67 according to DIN 40050
- External diameter 58 mm
- Solid shaft



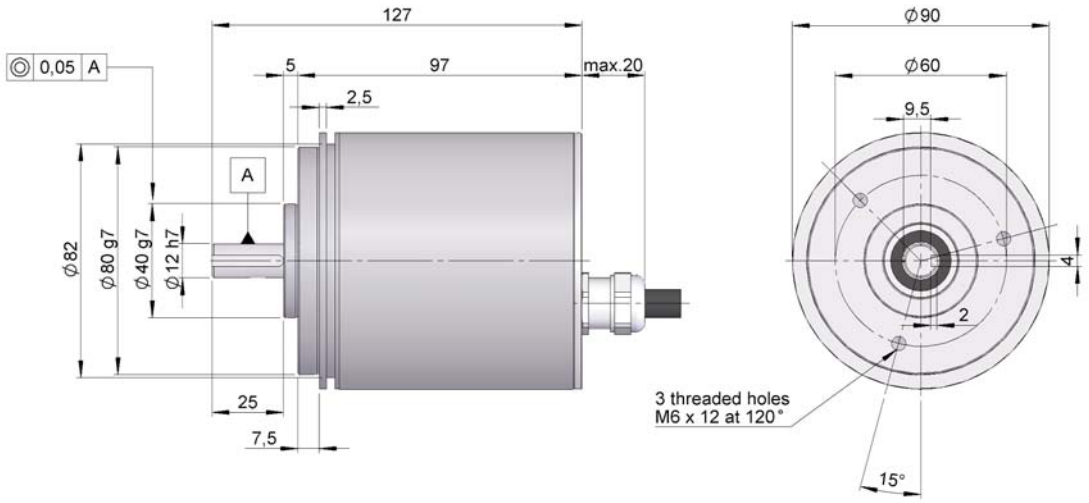
Previous mounting and installation of the encoder is recommended to read the section “TECHNICAL CONSIDERATIONS”.

ORDERING CODE

TYPE	SERIE	SHAFT	FLANGE	CONNEC-TION	AXIAL RADIAL	INTERFACE	CODE	IP	POWER SUPPLY OUTPUT	RESOLUTION	RANGE	SPECIAL CUSTOMER
●●	10	●	●	●	●	●	●	●	●	●●●●	●●●	●●
CM- Multiturn		**1**- Ø10 x 20 mm	**1**- None **2**- 90.1002 **3**- 90.1003 **4**- 90.1004 **5**- 90.1005 **6**- 90.1006	**1**- Cable	**1**- Axial	**2**- Analog	**1**- Clockwise **2**- Counter clockwise	**2**- Stainless steel IP67 **3**- IP67	**5**- 0...20mA, 15-30v **6**- 4...20mA, 15-30v **7**- 0...10v, 15-30v	**1024**- 10 bits **4096**- 12 bits	**2**- 2 turns **4**- 4 turns **8**- 8 turns **16**- 16 turns **32**- 32 turns **64**- 64 turns **128**- 128 turns **256**- 256 turns **512**- 512 turns **1024**- 1024 turns **2048**- 2048 turns **4096**- 4096 turns	

ABSOLUT ENCODER FOR EXTREME AND SEVERE INDUSTRIAL APPLICATIONS

- Singleturn resolution (CS) or multiturn (CM) up to 12 bits
- Protection class IP67 according to DIN 40050
- External diameter 90 mm
- Solid shaft



Previous mounting and installation of the encoder is recommended to read the section “TECHNICAL CONSIDERATIONS”.

ORDERING CODE

TYPE	SERIE	SHAFT	FLANGE	CONNEC-TION	AXIAL RADIAL	INTERFACE	CÓDIGO	IP	POWER SUPPLY OUTPUT	CONFIG. PARAMETERS	RESOLUTION	RANGE	SPECIAL CUSTOMER
●●	30	●	●	●	●	●	●	●	●	●	●●●●	●●●	●●

CS- Singleturn
CM- Multiturn

2- Ø12 x 25 mm

1- None
3- 90.1008

1- Cable

1- Axial

2- Analog

1- Clockwise
2- Counter clockwise

2- Stainless steel IP67
3- IP67

5- 0...20mA, 15-30V
6- 4...20mA, 15-30V
7- 0...10V, 15-30V

S- Direction (*)

1024- 10 bits
4096- 12 bits

CS-singleturn:
45- 1/8 turn
90- 1/4 turn
180- 1/2 turn
Blank- 1 turn

CM-multiturn:
2- 2 turns
4- 4 turns
8- 8 turns
16- 16 turns
32- 32 turns
64- 64 turns
128- 128 turns
256- 256 turns
512- 512 turns
1024- 1024 turns
2048- 2048 turns
4096- 4096 turns

(*) Only available for singleturn and clockwise code.

ANA_02E

CONNECTION AND CONNECTORS

ANALOG OUTPUT CONNECTIONS

	Cable 5 x 0.14 Output current	Cable 5 x 0.14 Output voltage	95.0007131 M23 12p
GND	Yellow	Yellow	1
Vcc	White	White	2
I +	Brown	-	3
I -	Green	-	4
V +	-	Brown	5
V -	-	Green	6
DIR	Grey	Grey	7
Screen	Screen	Screen	12

FIELDBUS ABSOLUT ENCODERS

PROFIBUS

Profibus DP is a digital communications network that connects and is useful as a communication network between industrial controllers and Input/Output devices. Each device is a node in the network and should be identified unmistakably. Profibus DO is a network in the form of “master-server” with a token bus that is compatible with multiple hierarchies and message prioritizations.
We can connect up to 32 elements (master or slave) in one sole network segment. If you wish to install more than 32 elements, repeaters should be used in order to interconnect the different segments. The network should be finished at the beginning and the end of each segment with an active bus termination.
The encoder presents a bus termination in the inside of it or an external one can be installed.

The following functionalities are integrated in the encoders Profibus Hohner:
• Galvanic isolation of the bus with DC/DC
• Line Driver according to RS-485. max. 12MB
• Diagnosis led: Indication led of functioning state and the power supply led.
• Direction programmable by micro switches. The allowed value range is from 1...126. Each node number should be used one sole time in one network. During the initialization of the encoder, the micro switches are read by the firmware.
• The communication velocity is adjusted by the software. Normally the master of the system adjusts it. All of the modules in the same segment of the Profibus network should be adjusted to the same communication velocity.
• They can be programmed in accordance with the profile of the Profibus encoder in Class 1 and Class 2.

Configurable parameters:
• Rotation direction
• Scaling factor
Number of positions per turn and total resolution
• Preset value.
• Diagnosis mode.

DEVICENET

DeviceNet is a digital communications network that connects and is useful as a communication network between industrial controllers and Input/Output devices. Each device is a node in the network and should be identified unmistakably. DeviceNet is a network in the form of “producer-consumer” with a token bus that is compatible with multiple hierarchies and message prioritizations. DeviceNet can be configured to operate in the “master-slave” mode using “point to point” messages. Device Net supports the capacity of having a power supply integrated in its bus, which allows reducing the connection points

The following functionalities are integrated in the Devicenet Hohner encoders:
• We can have up to 64 nodes (0...63). Each Node Number should be used one sole time in one network. During the initialization of the devices the Node Number micro switches are read by the firmware.
• Galvanic isolation with DC/DC
• A Bus termination resistance is available and can be selected by the micro switch
• Communication modes: polled, cyclic and cos.
• Communication velocity selectable through micro switches: 125 kBits/sec, 250 kBits/sec or 500 kBits/sec.

Configurable parameters:
• Rotation direction.
• Scaling factor
Number of positions per turn and total resolution
• Preset.
• Diagnosis mode.

CANOPEN

CANOpen is a digital communications network that connects and is useful as a communication network between industrial controllers and Input/Output devices. Each device is a node in the network and should be identified unmistakably.
CANOpen is a network in the form of “producer-consumer” with a token bus that is compatible with multiple hierarchies and message prioritizations.
CANOpen can be configured to operate in the “master-slave” mode using “point to point” messages.
CANOpen supports the capacity of having a power supply integrated in its bus, which allows reducing the connection points

The following functionalities are integrated in the CANOpen encoders:
• We can have up to 64 nodes (0...63). Each Node Number should be used one sole time in one network.
During the initialization of the devices the Node Number micro switches are read by the firmware.
• A Bus termination resistance is available and can be selected by the micro switch
• Communication modes: polled, cyclic and cos.
• Communication velocity selectable through micro switches: 10...1000 kBits/sec

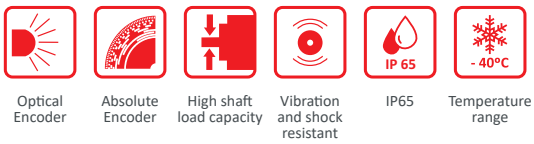
Configurable parameters:
• Rotation direction.
• Scaling.
Number of pulses per turn and number of turns
• Total resolution
• Preset.
• Offset

SERIE CS10/CM10

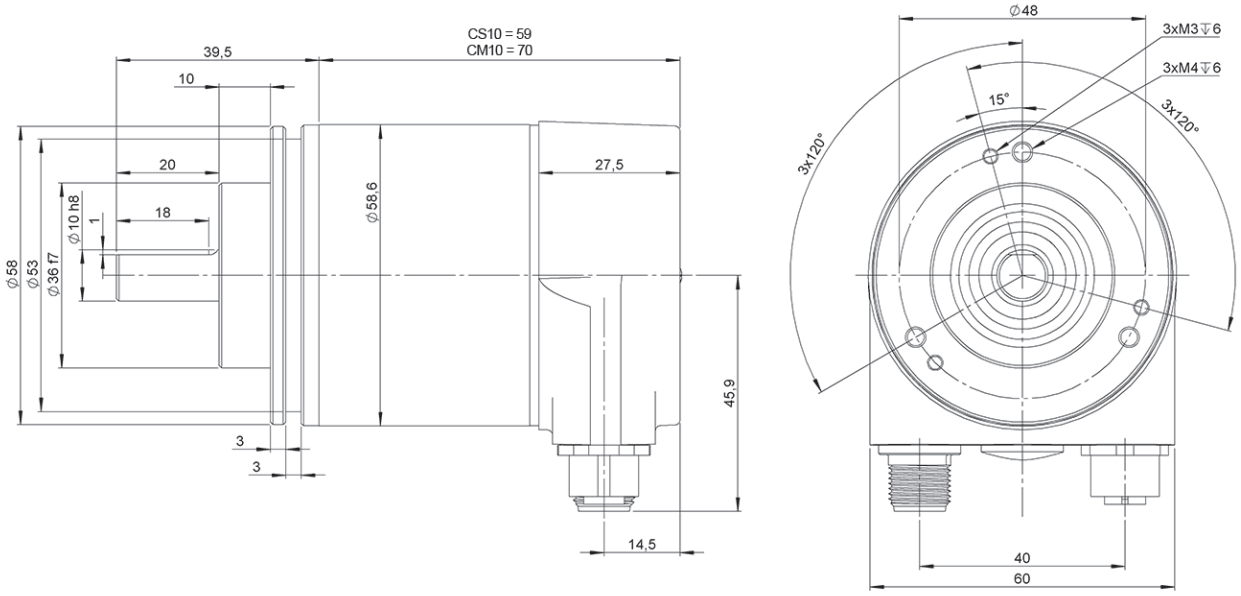
SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

DeviceNet

- DeviceNet
- Programmable up to 30 bits (65.536 points per turn, 16.384 turns)
- External diameter 58 mm
- Shaft Ø 6 or 10 mm
- Protection class IP65 according to DIN EN 60529
- Connection by industrial connector 2 x M12



Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP65 | Temperature range



Drawing shaft type 2, connection type 1, clamping

REFERENCE

Reference example: CS10-1212-13 | CM10-2112-1312

Serie	Flange	Solid shaft	Interface	Connection	Singleturn resolution	Multiturn resolution	Special customer
CS10/CM10 -	□	□	□	□	- □□	□□	. □□
CS10. Singleturn **CM10.** Multiturn	**1.** Clamping **2.** Synchro	**1.** Ø 6x10 mm **2.** Ø 10x20 mm	**1.** DeviceNet	**2.** 2 x M12 Connector	up to 16 bits (Standard: 13 bits)	up to 14 bits (Standard: 12 bits)	

Order your reference
Step file 3D
info@encoderhohner.com
service available in 24 h

SERIE CS10/CM10

SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

DeviceNet

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$55x10^8$ rev. (Clamping) [40 N / 110 N] $150x10^8$ rev. (Clamping) [40 N / 60 N] $85x10^8$ rev. (Synchro) [40 N / 110 N] $195x10^8$ rev. (Synchro) [40 N / 60 N]
Shaft diameter	6 or 10 mm
Maximum number of revolutions permitted mechanically	≤ 12000 rpm
Protection according to DIN EN 60529	IP65
Rotor inertia moment	≤ 30 gcm^2
Starting torque at 20°C (68°F)	≤ 0,03 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	110 N
Weight aprox.	470 g
Operating temperature range	-40°C to +85°C
Storage temperature range	-40°C to +85°C
Humidity	98% RH, not condensed
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...1000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Radial connection	2 x M12 Connector **Mating connectors not included**

INTERFACE

DeviceNet

Profile	CIP
Programming functions	Resolution, preset, complement, transmission mode (polled mode, cyclic mode, sync mode)
Manual functions	Address selector switch 0-99 and terminal resistor (with connection cap)
Transmission rate	150, 250, 500 kBaud
Interface cycle time	≥ 10 ms

ELECTRICAL SPECIFICATIONS

Output Driver	Transceiver (ISO 11898), Galvanically Isolated by Opto-Couplers
Power supply	10...30 VDC
Consumption	≤ 230 mA (10 VDC) ≤ 100 mA (24 VDC)
Power Consumption	≤ 2.5 W
Start time	< 250 ms
Singleturn resolution	up to 16 bits
Multiturn resolution	up to 14 bits
Accuracy (INL)	±0.0220° (14 – 16 bits) ±0.0439° (≤13 bits)
Code	Binary
Short circuit protection	Yes
Protection polarity inversion	Yes
EMC: Emitted interference	DIN EN 61000-6-4
EMC: Noise immunity	DIN EN 61000-6-2
MTTF	13,5 years

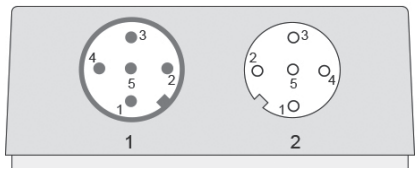
SERIE CS10/CM10

SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

DeviceNet

CONNECTION

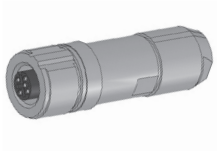
Mating connectors not included



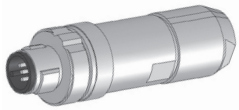
	M12 5p Male a coded	M12 5p Female a coded	
VCC	2	2	
GND	3	3	
CAN High	4	4	
CAN Low	5	5	
CAN GND	1	1	

ACCESSORIES

90.9550
M12 5p
Female

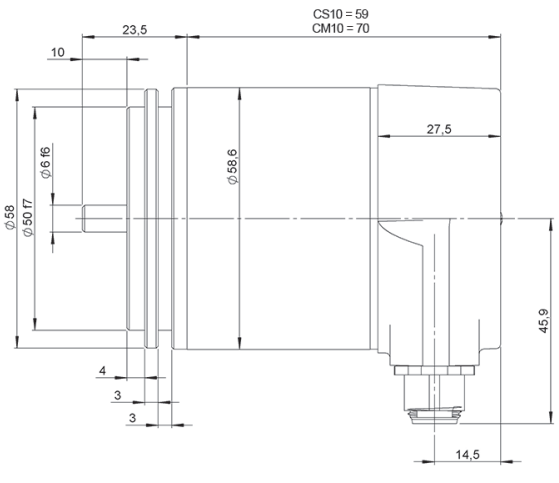


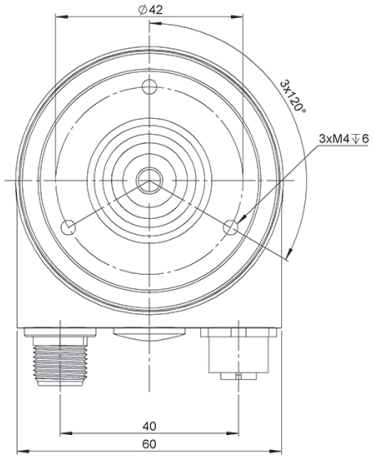
90.9551
M12 5p
Male



FLANGE DIMENSIONS

Flange 2
Synchro



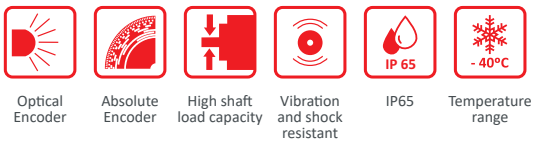


SERIE HS10/HM10

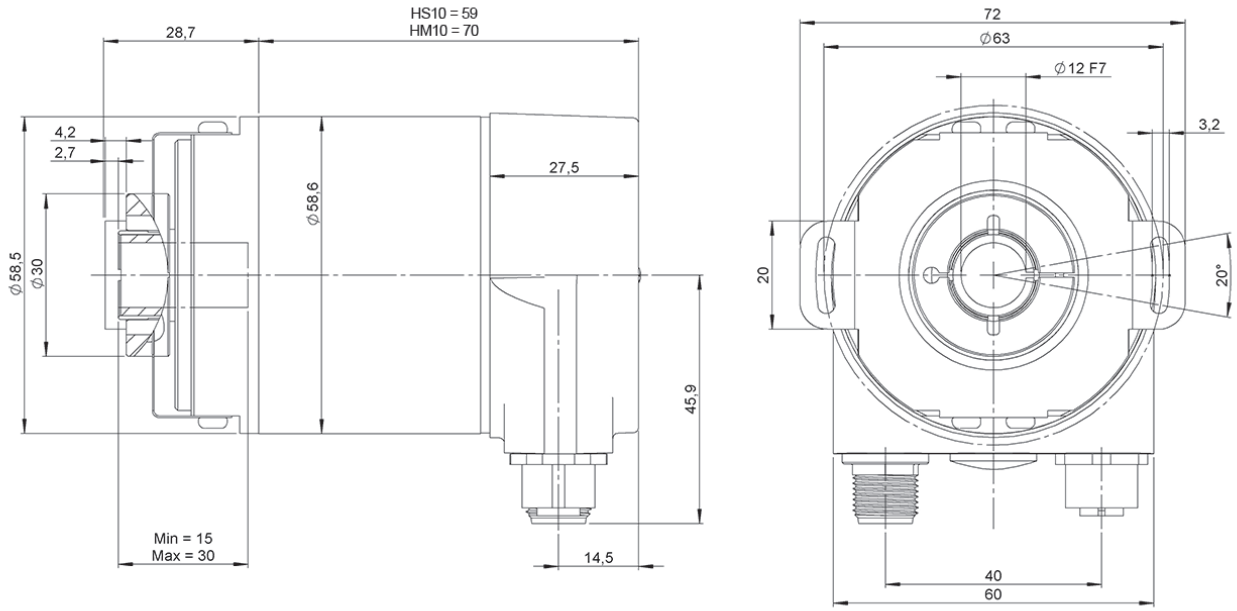
SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

DeviceNet

- DeviceNet
- Programmable up to 30 bits (65.536 points per turn, 16.384 turns)
- External diameter 58 mm
- Blind hollow shaft Ø 10 or 12 mm
- Protection class IP65 according to DIN EN 60529
- Connection by industrial connector 2 x M12



Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP65 | Temperature range



Drawing blind hollow shaft type 4, connection type 2

REFERENCE

Reference example: HS10-4312-13 | HM10-4412-1312

Serie	Flange	Blind-Hollow shaft	Interface	Connection	Singleturn resolution	Multiturn resolution	Special customer
HS10/HM10 -	☐	☐	☐	☐	-☐☐	☐☐	.☐☐
HS10. Singleturn **HM10.** Multiturn	**4.** Blind-Hollow shaft	**3.** Ø 10 mm **4.** Ø 12 mm	**1.** DeviceNet	**2.** 2 x M12 Connector	up to 16 bits (Standard: 13 bits)	up to 14 bits (Standard: 12 bits)	

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SERIE HS10/HM10

SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

DeviceNet

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Blind hollow shaft diameter	10 or 12 mm
Maximum number of revolutions permitted mechanically	≤ 12000 rpm
Protection according to DIN EN 60529	IP65
Rotor inertia moment	≤ 30 gcm²
Starting torque at 20°C (68°F)	≤ 0,03 Nm
Weight aprox.	475 g
Operating temperature range	-40°C to +85°C
Storage temperature range	-40°C to +85°C
Humidity	98% RH, not condensed
Vibration according to DIN EN 60068-2-6	100 m/s² (10Hz...1000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s² (6ms)
Radial connection	2 x M12 Connector **Mating connectors not included**

INTERFACE

DeviceNet

Profile	CIP
Programming functions	Resolution, preset, complement, transmission mode (polled mode, cyclic mode, sync mode)
Manual functions	Address selector switch 0-99 and terminal resistor (with connection cap)
Transmission rate	150, 250, 500 kBaud
Interface cycle time	≥ 10 ms

ELECTRICAL SPECIFICATIONS

Output Driver	Transceiver (ISO 11898), Galvanically Isolated by Opto-Couplers
Power supply	10...30 VDC
Consumption	≤ 230 mA (10 VDC) ≤ 100 mA (24 VDC)
Power Consumption	≤ 2.5 W
Start time	< 250 ms
Singleturn resolution	up to 16 bits
Multiturn resolution	up to 14 bits
Accuracy (INL)	±0.0220° (14 – 16 bits) ±0.0439° (≤13 bits)
Code	Binary
Short circuit protection	Yes
Protection polarity inversion	Yes
EMC: Emitted interference	DIN EN 61000-6-4
EMC: Noise immunity	DIN EN 61000-6-2
MTTF	13,5 years

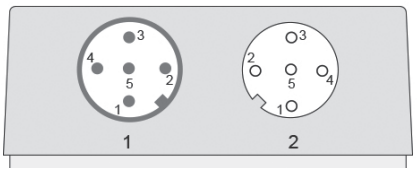
SERIE HS10/HM10

SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

DeviceNet

CONNECTION

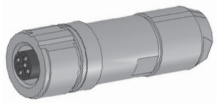
Mating connectors not included



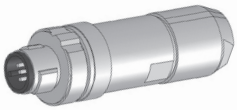
	M12 5p Male a coded	M12 5p Female a coded	
VCC	2	2	
GND	3	3	
CAN High	4	4	
CAN Low	5	5	
CAN GND	1	1	

ACCESSORIES

90.9550
M12 5p
Female



90.9551
M12 5p
Male

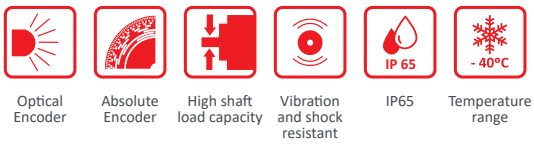


SERIE CS10/CM10

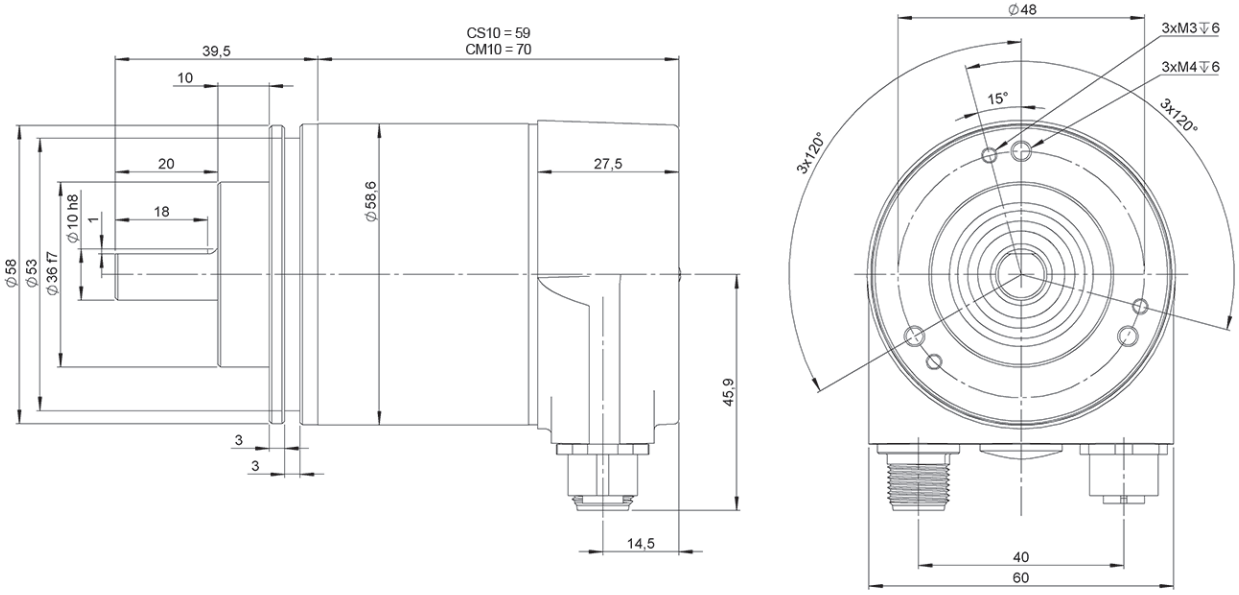
SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

CANopen

- CANOpen
- Programmable up to 30 bits (65.536 points per turn, 16.384 turns)
- External diameter 58 mm
- Shaft Ø 6 or 10 mm
- Protection class IP65 according to DIN EN 60529
- Connection by industrial connector 2 x M12



Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP65 | Temperature range



Drawing shaft type 2, connection type 2, clamping

REFERENCE

Reference example: CS10-1222-13 | CM10-2122-1312

Serie	Flange	Solid shaft	Interface	Connection	Singleturn resolution	Multiturn resolution	Special customer
CS10/CM10 -	☐	☐	☐	☐	-☐☐	☐☐	.☐☐
CS10. Singleturn **CM10.** Multiturn	**1.** Clamping **2.** Synchro	**1.** Ø 6x10 mm **2.** Ø 10x20 mm	**2.** CANOpen	**2.** 2 x M12 Connector	up to 16 bits (Standard: 13 bits)	up to 14 bits (Standard: 12 bits)	

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SERIE CS10/CM10

SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

CANopen

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$55x10^8$ rev. (Clamping) [40 N / 110 N] $150x10^8$ rev. (Clamping) [40 N / 60 N] $85x10^8$ rev. (Synchro) [40 N / 110 N] $195x10^8$ rev. (Synchro) [40 N / 60 N]
Shaft diameter	6 or 10 mm
Maximum number of revolutions permitted mechanically	≤ 12000 rpm
Protection according to DIN EN 60529	IP65
Rotor inertia moment	≤ 30 gcm^2
Starting torque at 20°C (68°F)	≤ 0,03 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	110 N
Weight aprox.	470 g
Operating temperature range	-40°C to +85°C
Storage temperature range	-40°C to +85°C
Humidity	98% RH, not condensed
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...1000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Radial connection	2 x M12 Connector **Mating connectors not included**

INTERFACE

CANopen

Profile	DS-406
Programming functions	Resolution, preset, 2 limit switches, 8 CAMS, baud rate, CAN-Identifier, bootloader, transmission modes (polled, cyclic, sync)
Manual functions	Address selector switch 0-99 and terminal resistor (with connection cap)
Features	Round axis
Transmission rate	min. 20 kBaud max. 1 MBaud
Interface cycle time	≥ 1 ms

ELECTRICAL SPECIFICATIONS

Output Driver	Transceiver (ISO 11898), Galvanically Isolated by Opto-Couplers
Power supply	10...30 VDC
Consumption	≤ 230 mA (10 VDC) ≤ 100 mA (24 VDC)
Power Consumption	≤ 2.5 W
Start time	< 250 ms
Singleturn resolution	up to 16 bits
Multiturn resolution	up to 14 bits
Accuracy (INL)	±0.0220° (14 – 16 bits) ±0.0439° (≤13 bits)
Code	Binary
Short circuit protection	Yes
Protection polarity inversion	Yes
EMC: Emitted interference	DIN EN 61000-6-4
EMC: Noise immunity	DIN EN 61000-6-2
MTTF	13,5 years

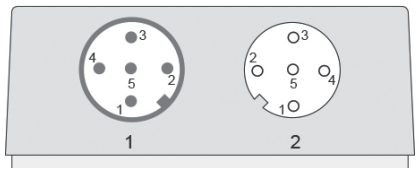
SERIE CS10/CM10

SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

CANopen

CONNECTION

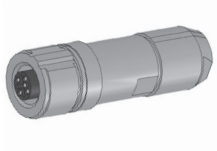
Mating connectors not included



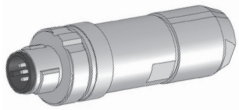
	M12 5p Male a coded	M12 5p Female a coded	
VCC	2	2	
GND	3	3	
CAN High	4	4	
CAN Low	5	5	
CAN GND	1	1	

ACCESSORIES

90.9550
M12 5p
Female

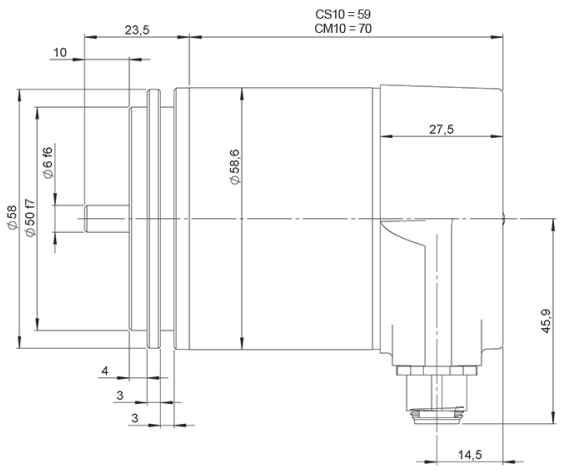


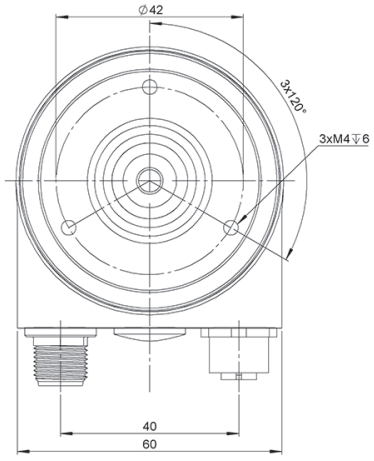
90.9551
M12 5p
Male



FLANGE DIMENSIONS

Flange 2
Synchro



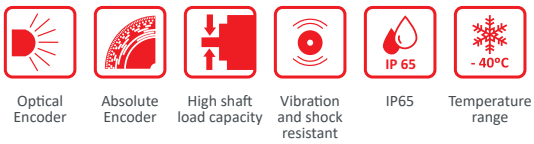


SERIE HS10/HM10

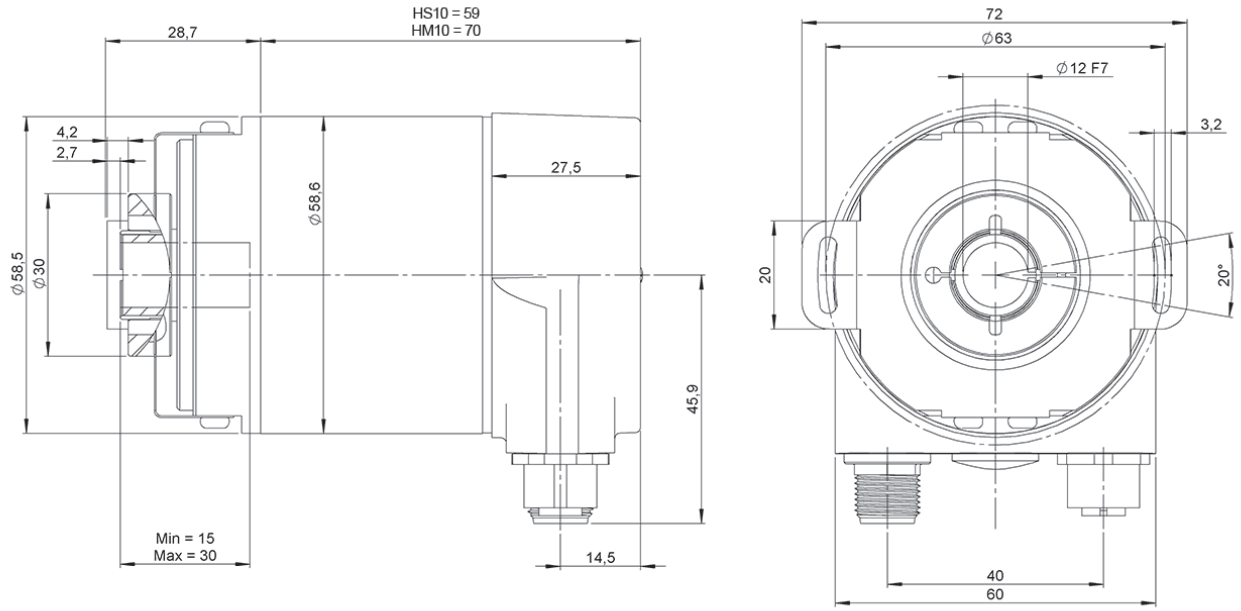
SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

CANopen

- CANOpen
- Programmable up to 30 bits (65.536 points per turn, 16.384 turns)
- External diameter 58 mm
- Blind hollow shaft Ø 10 or 12 mm
- Protection class IP65 according to DIN EN 60529
- Connection by industrial connector 2 x M12



Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP65 | Temperature range



Drawing blind hollow shaft type 4, connection type 2

REFERENCE

Reference example: HS10-4322-13 | HM10-4422-1312

Serie	Flange	Blind-Hollow shaft	Interface	Connection	Singleturn resolution	Multiturn resolution	Special customer
HS10/HM10 -	☐	☐	☐	☐	-☐☐	☐☐	.☐☐
HS10. Singleturn **HM10.** Multiturn	**4.** Blind-Hollow shaft	**3.** Ø 10 mm **4.** Ø 12 mm	**2.** CANOpen	**2.** 2 x M12 Connector	up to 16 bits (Standard: 13 bits)	up to 14 bits (Standard: 12 bits)	

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SERIE HS10/HM10

SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

CANopen

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Blind hollow shaft diameter	10 or 12 mm
Maximum number of revolutions permitted mechanically	≤ 12000 rpm
Protection according to DIN EN 60529	IP65
Rotor inertia moment	≤ 30 gcm²
Starting torque at 20°C (68°F)	≤ 0,03 Nm
Weight aprox.	475 g
Operating temperature range	-40°C to +85°C
Storage temperature range	-40°C to +85°C
Humidity	98% RH, not condensed
Vibration according to DIN EN 60068-2-6	100 m/s² (10Hz...1000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s² (6ms)
Radial connection	2 x M12 Connector **Mating connectors not included**

INTERFACE

CANopen

Profile	DS-406
Programming functions	Resolution, preset, 2 limit switches, 8 CAMS, baud rate, CAN-Identifier, bootloader, transmission modes (polled, cyclic, sync)
Manual functions	Address selector switch 0-99 and terminal resistor (with connection cap)
Features	Round axis
Transmission rate	min. 20 kBaud max. 1 MBaud
Interface cycle time	≥ 1 ms

ELECTRICAL SPECIFICATIONS

Output Driver	Transceiver (ISO 11898), Galvanically Isolated by Opto-Couplers
Power supply	10...30 VDC
Consumption	≤ 230 mA (10 VDC) ≤ 100 mA (24 VDC)
Power Consumption	≤ 2.5 W
Start time	< 250 ms
Singleturn resolution	up to 16 bits
Multiturn resolution	up to 14 bits
Accuracy (INL)	±0.0220° (14 – 16 bits) ±0.0439° (≤13 bits)
Code	Binary
Short circuit protection	Yes
Protection polarity inversion	Yes
EMC: Emitted interference	DIN EN 61000-6-4
EMC: Noise immunity	DIN EN 61000-6-2
MTTF	13,5 years

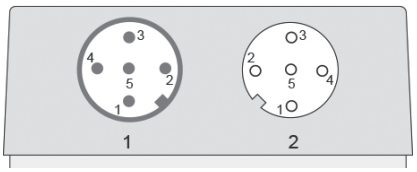
SERIE HS10/HM10

SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

CANopen

CONNECTION

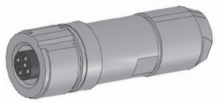
Mating connectors not included



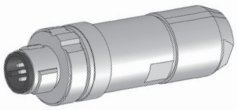
	M12 5p Male a coded	M12 5p Female a coded	
VCC	2	2	
GND	3	3	
CAN High	4	4	
CAN Low	5	5	
CAN GND	1	1	

ACCESSORIES

90.9550
M12 5p
Female



90.9551
M12 5p
Male

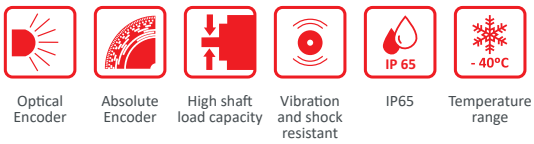


SERIE CS10/CM10

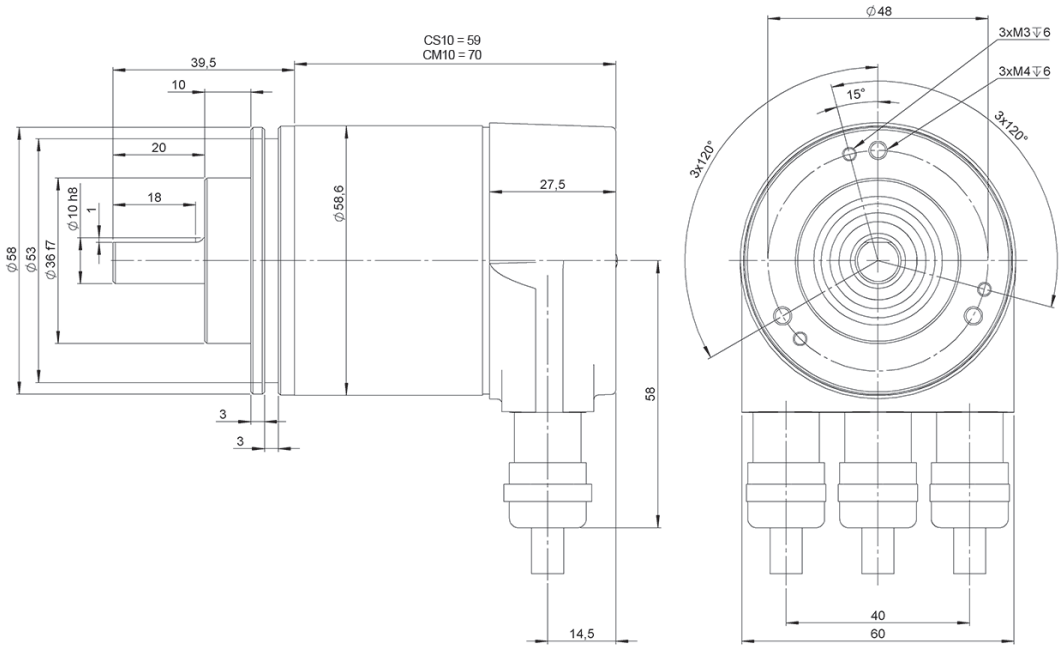
SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

PROFIBUS®

- Profibus DP
- Programmable up to 30 bits (65.536 points per turn, 16.384 turns)
- External diameter 58 mm
- Shaft Ø 6 or 10 mm
- Protection class IP65 according to DIN EN 60529
- Connection by cable or industrial connector 3 x M12



Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP65 | Temperature range



Drawing shaft type 2, connection type 1, clamping

REFERENCE

Reference example: CS10-1232-13 | CM10-2131-1312

Serie	Flange	Solid shaft	Interface	Connection	Singleturn resolution	Multiturn resolution	Special customer
CS10/CM10 -	☐	☐	☐	☐	-☐☐	☐☐	.☐☐
CS10. Singleturn **CM10.** Multiturn	**1.** Clamping **2.** Synchro	**1.** Ø 6x10 mm **2.** Ø 10x20 mm	**3.** Profibus DP	**1.** 3 x Cable Gland Terminal Box **2.** 3 x M12 Connector	up to 16 bits (Standard: 13 bits)	up to 14 bits (Standard: 12 bits)	

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SERIE CS10/CM10

SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$55x10^8$ rev. (Clamping) [40 N / 110 N] $150x10^8$ rev. (Clamping) [40 N / 60 N] $85x10^8$ rev. (Synchro) [40 N / 110 N] $195x10^8$ rev. (Synchro) [40 N / 60 N]
Shaft diameter	6 or 10 mm
Maximum number of revolutions permitted mechanically	≤ 12000 rpm
Protection according to DIN EN 60529	IP65
Rotor inertia moment	≤ 30 gcm^2
Starting torque at 20°C (68°F)	≤ 0,03 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	110 N
Weight aprox.	475 g
Operating temperature range	-40°C to +85°C
Storage temperature range	-40°C to +85°C
Humidity	98% RH, not condensed
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...1000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Radial connection	3 x Cable Gland (Terminal Box) 3 x M12 Connector **Mating connectors not included**

INTERFACE

Profile	DPV0, DPV1 and DPV2 Class 2 (EN50170 + EN50254)
Diagnostics	Memory
Programming functions	Resolution, gearing factor (physical resolution), velocity scaling + filter, preset (zero point), counting direction, limit switches , node number, teach-in, diagnosis
Manual functions	Address selector switch 0-99 and terminal resistor (with connection cap)
Features	Round axis
Transmission rate	≤ 12 Mbaud
Interface cycle time	≥ 1 ms

ELECTRICAL SPECIFICATIONS

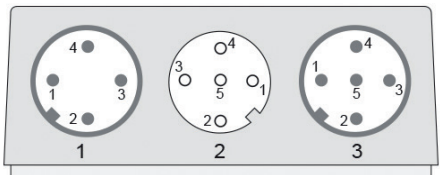
Output Driver	Profibus Data Interface, galvanically isolated via opto-couplers
Power supply	10...30 VDC
Consumption	≤ 115 mA (10 VDC) ≤ 50 mA (30 VDC)
Power Consumption	≤ 1.5 W
Start time	< 1 s
Singleturn resolution	up to 16 bits
Multiturn resolution	up to 14 bits
Accuracy (INL)	±0.0220° (14 – 16 bits) ±0.0439° (≤13 bits)
Code	Binary
Short circuit protection	Yes
Protection polarity inversion	Yes
EMC: Emitted interference	DIN EN 61000-6-4
EMC: Noise immunity	DIN EN 61000-6-2
MTTF	13,5 years

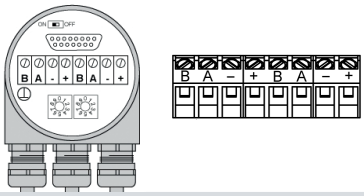
SERIE CS10/CM10

SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

CONNECTION

Mating connectors not included





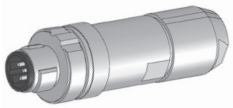
	M12 4p Male a coded	M12 5p Female b coded	M12 5p Male b coded	3 x Cable Gland Terminal Box*
VCC	1	-	-	(+)
GND	3	-	-	(-)
BUS Line A (Bus out)	-	2	-	A (right)
BUS Line B (Bus out)	-	4	-	B (right)
BUS Line A (Bus in)	-	-	2	A (left)
BUS Line B (Bus in)	-	-	4	B (left)
Not connected	2, 4	1, 3, 5	1, 3, 5	

(*) The power supply has to be connected once (no matter which clamps). If the terminating resistor is switched on, the outgoing bus lines are disconnected.

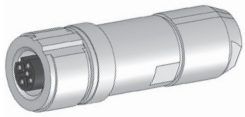
ACCESSORIES

90.9554
M12 4p
Female

90.9553
M12 5p
Male



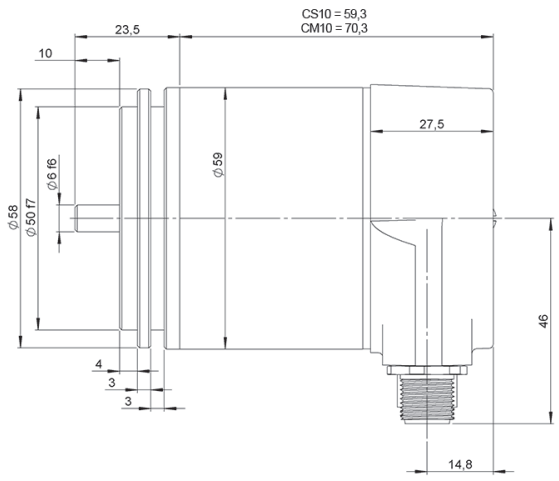
90.9552
M12 5p
Female

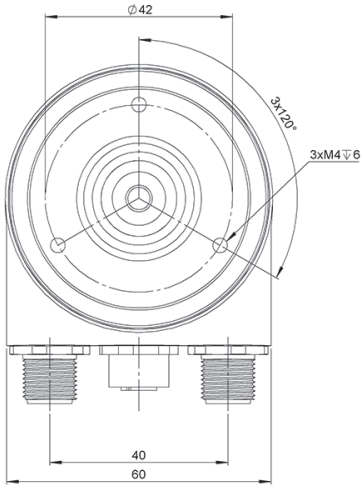


FLANGE DIMENSIONS

Flange 2
Synchro

Connection 2
3 x M12



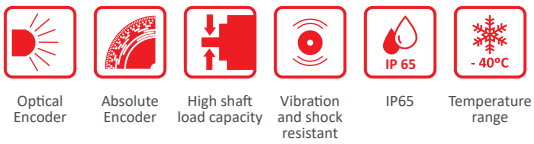


SERIE HS10/HM10

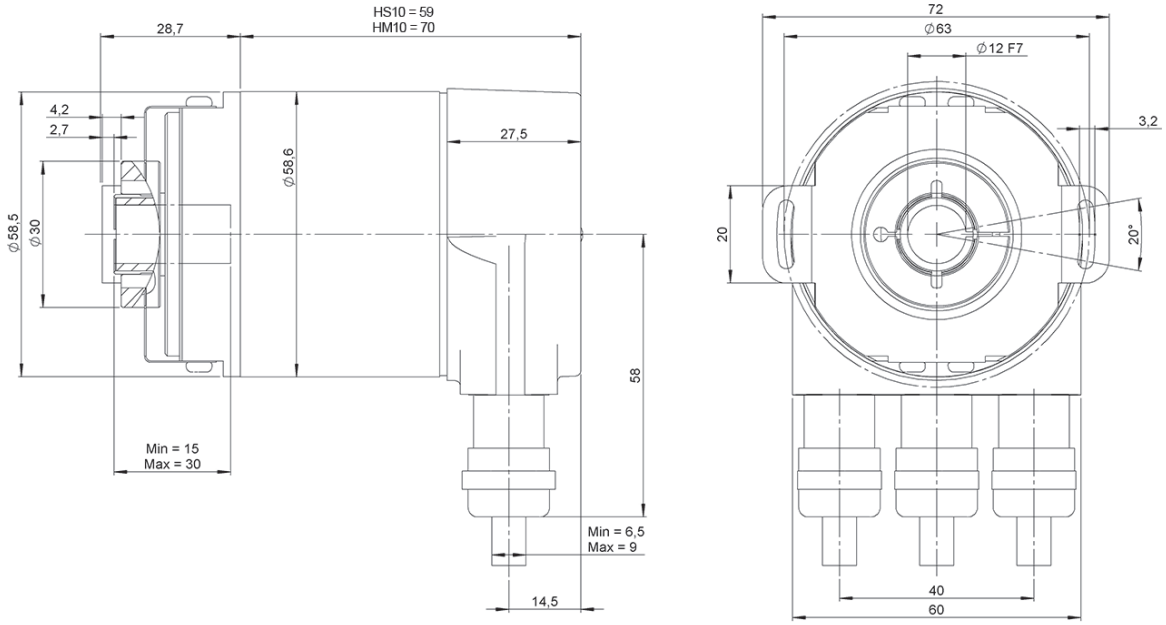
SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

PROFIBUS

- Profibus DP
- Programmable up to 30 bits (65.536 points per turn, 16.384 turns)
- External diameter 58 mm
- Blind hollow shaft Ø 10 or 12 mm
- Protection class IP65 according to DIN EN 60529
- Connection by cable or industrial connector 3 x M12



Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP65 | Temperature range



Drawing blind hollow shaft type 3, connection type 1

REFERENCE

Reference example: HS10-4432-13 | HM10-4331-1312

Serie	Flange	Blind-Hollow shaft	Interface	Connection	Singleturn resolution	Multiturn resolution	Special customer
HS10/HM10 -	☐	☐	☐	☐	-☐☐	☐☐	.☐☐
HS10. Singleturn **HM10.** Multiturn	**4.** Blind-Hollow shaft	**3.** Ø 10 mm **4.** Ø 12 mm	**3.** Profibus DP	**1.** 3 x Cable Gland Terminal Box **2.** 3 x M12 Connector	up to 16 bits (Standard: 13 bits)	up to 14 bits (Standard: 12 bits)	

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SERIE HS10/HM10

SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Blind hollow shaft diameter	10 or 12 mm
Maximum number of revolutions permitted mechanically	≤ 12000 rpm
Protection according to DIN EN 60529	IP65
Rotor inertia moment	≤ 30 gcm²
Starting torque at 20°C (68°F)	≤ 0,03 Nm
Weight aprox.	480 g
Operating temperature range	-40°C to +85°C
Storage temperature range	-40°C to +85°C
Humidity	98% RH, not condensed
Vibration according to DIN EN 60068-2-6	100 m/s² (10Hz...1000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s² (6ms)
Radial connection	3 x Cable Gland (Terminal Box) 3 x M12 Connector **Mating connectors not included**

INTERFACE

Profile	DPV0, DPV1 and DPV2 Class 2 (EN50170 + EN50254)
Diagnostics	Memory
Programming functions	Resolution, gearing factor (physical resolution), velocity scaling + filter, preset (zero point), counting direction, limit switches , node number, teach-in, diagnosis
Manual functions	Address selector switch 0-99 and terminal resistor (with connection cap)
Features	Round axis
Transmission rate	≤ 12 Mbaud
Interface cycle time	≥ 1 ms

ELECTRICAL SPECIFICATIONS

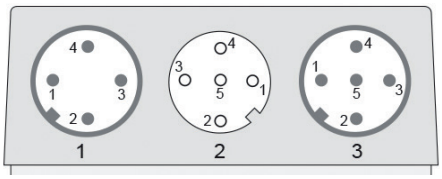
Output Driver	Profibus Data Interface, galvanically isolated via opto-couplers
Power supply	10...30 VDC
Consumption	≤ 115 mA (10 VDC) ≤ 50 mA (30 VDC)
Power Consumption	≤ 1.5 W
Start time	< 1 s
Singleturn resolution	up to 16 bits
Multiturn resolution	up to 14 bits
Accuracy (INL)	±0.0220° (14 – 16 bits) ±0.0439° (≤13 bits)
Code	Binary
Short circuit protection	Yes
Protection polarity inversion	Yes
EMC: Emitted interference	DIN EN 61000-6-4
EMC: Noise immunity	DIN EN 61000-6-2
MTTF	13,5 years

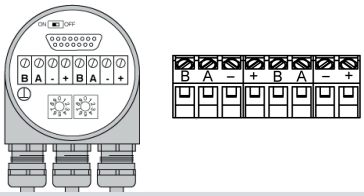
SERIE HS10/HM10

SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

CONNECTION

Mating connectors not included





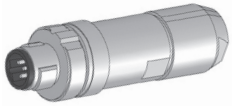
	M12 4p Male a coded	M12 5p Female b coded	M12 5p Male b coded	3 x Cable Gland Terminal Box*
VCC	1	-	-	(+)
GND	3	-	-	(-)
BUS Line A (Bus out)	-	2	-	A (right)
BUS Line B (Bus out)	-	4	-	B (right)
BUS Line A (Bus in)	-	-	2	A (left)
BUS Line B (Bus in)	-	-	4	B (left)
Not connected	2, 4	1, 3, 5	1, 3, 5	

(*) The power supply has to be connected once (no matter which clamps). If the terminating resistor is switched on, the outgoing bus lines are disconnected.

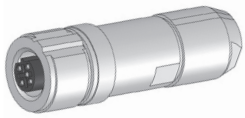
ACCESSORIES

90.9554
M12 4p
Female

90.9553
M12 5p
Male

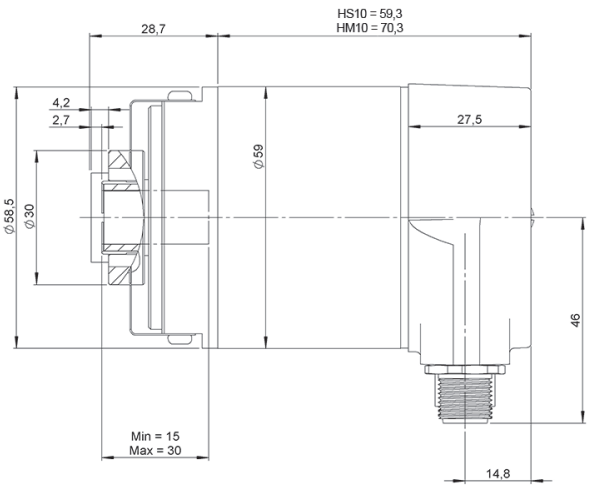


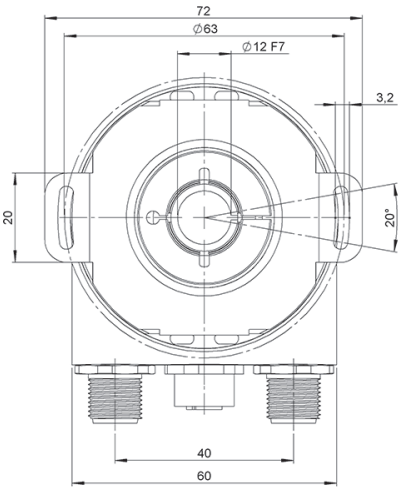
90.9552
M12 5p
Female



CONNECTION DIMENSIONS

Connection 2
3 x M12

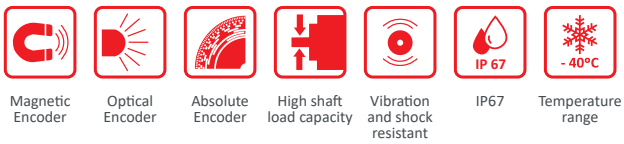




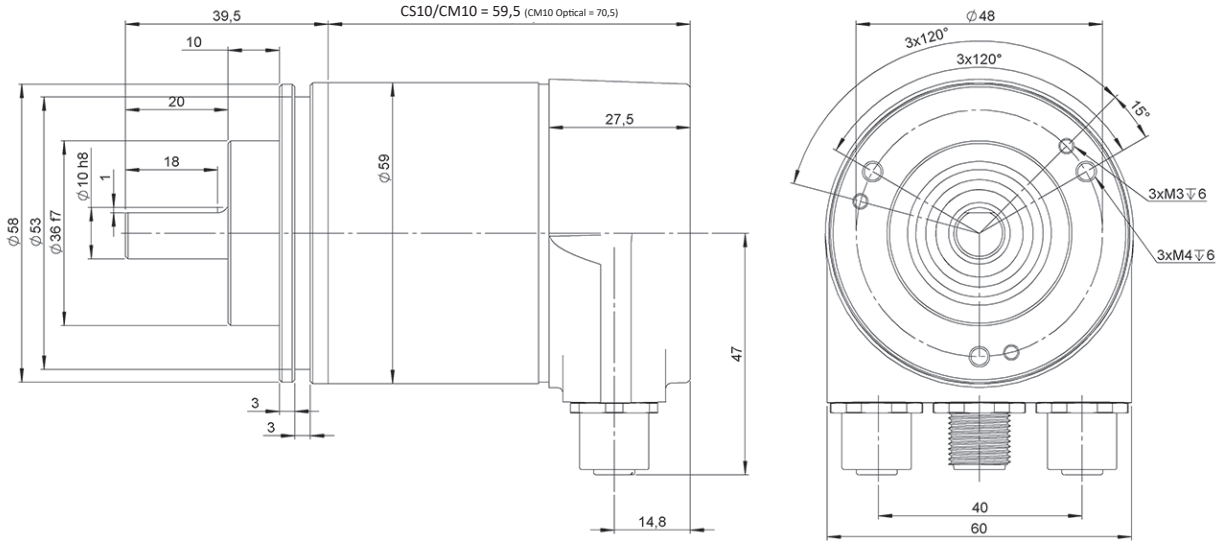
SERIE CS10/CM10

SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

- Profinet
- Singleturn resolution up to 16 bits
- Multiturn resolution up to 30 bits
- External diameter 58 mm
- Shaft Ø 6, 10 or 12 mm
- Protection class IP67 according to DIN EN 60529
- Connection by industrial connector 3 x M12



Magnetic Encoder | Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP67 | Temperature range



Drawing shaft type 2, Connection 2 (Radial), Clamping

REFERENCE

Reference example: CM10-PFN-12112-1312

Serie	Interface	Flange	Solid shaft	IP	Technology	Connection	Singleturn resolution	Multiturn resolution	Special customer
CS10/CM10 -	PFN -	☐	☐	☐	☐	☐	-☐☐	☐☐	.☐☐
CS10. Singleturn **CM10.** Multiturn		**1.** Clamping **2.** Synchro	**1.** Ø 6x10 mm **2.** Ø 10x20 mm **8.** Ø 12x20 mm	**1.** IP65 **2.** IP67	**1.** Magnetic **2.** Optical	**2.** Radial 3 x M12 **3.** Axial 3 x M12 (*)	**13.** 13 bits **16.** 16 bits	**12.** 12 bits (**) **14.** 14 bits	**I3.** INOX 303

(*) Only available for magnetic technology.
(**) Only available for singleturn resolution 13 bits.

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SERIE CS10/CM10

SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

MECHANICAL SPECIFICATIONS

Materials	Housing: Steel Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$55x10^8$ rev. (Clamping) [40 N / 110 N] $150x10^8$ rev. (Clamping) [40 N / 60 N] $85x10^8$ rev. (Synchro) [40 N / 110 N] $195x10^8$ rev. (Synchro) [40 N / 60 N]
Shaft diameter	6, 10 or 12 mm
Maximum number of revolutions permitted mechanically	≤ 12000 rpm
Protection according to DIN EN 60529	IP65, IP67
Rotor inertia moment	≤ 30 gcm^2
Starting torque at 20°C (68°F)	≤ 0,03 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	110 N
Weight aprox.	350 g (connection type 2) 415 g (connection type 3)
Operating temperature range	-40°C to +85°C (connection type 2) -40°C to +70°C (connection type 3)
Storage temperature range	-40°C to +85°C
Humidity	98% RH, not condensed
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...1000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Connection	3 x M12 Connector **Mating connectors not included**

INTERFACE

Profile	Profidrive Profile 4.x Encoder Profile 4.x
Diagnostics	Memory
Programming functions	Resolution, time base and filter for velocity, preset, counting direction, IP-Address
Features	Boot-Loader, Round Axis, Flashing LEDs
Transmission rate	10 / 100 Mbit
Interface cycle time	≥ 1 ms

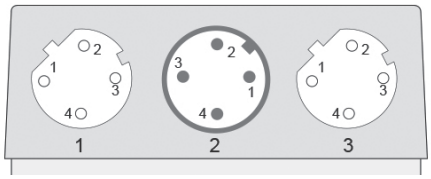
ELECTRICAL SPECIFICATIONS

Output Driver	Ethernet
Power supply	10...30 VDC
Consumption	≤ 230 mA (10 VDC) ≤ 100 mA (24 VDC)
Power Consumption	≤ 2.5 W
Start time	< 250 ms
Singleturn resolution	13 bits - 16 bits
Multiturn resolution	12 bits - 14 bits
Accuracy (INL)	±0.0878° (Magnetic) ±0.0439° (Optical)
Code	Binary
Short circuit protection	Yes
Protection polarity inversion	Yes
EMC: Emitted interference	DIN EN 61000-6-4
EMC: Noise immunity	DIN EN 61000-6-2
MTTF	65 years

SERIE CS10/CM10

SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

CONNECTION



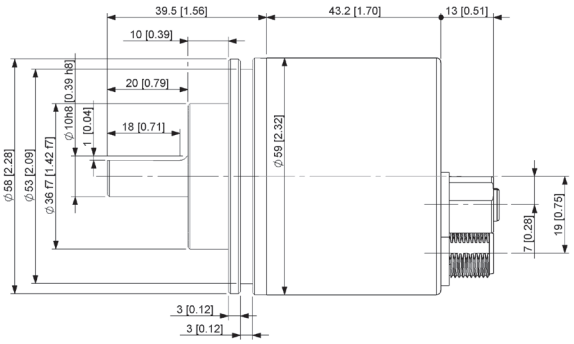
	M12 4p Female d coded	M12 4p Male a coded	M12 4p Female d coded	
VCC	-	1	-	
GND	-	3	-	
Tx+	1	-	1	
Rx+	2	-	2	
Tx-	3	-	3	
Rx-	4	-	4	
Not connected	-	2, 4	-	

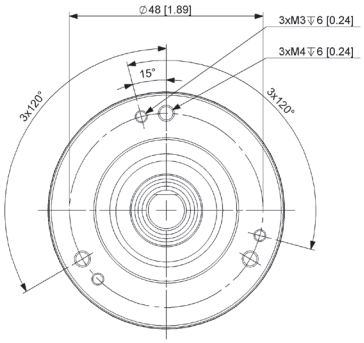
CONNECTION DIMENSIONS

Mating connectors not included

Connection 3

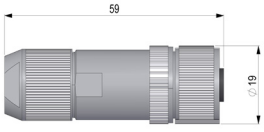
Axial
3 x M12



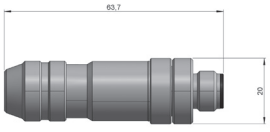


ACCESSORIES

95.0007076
M12 4p
Female

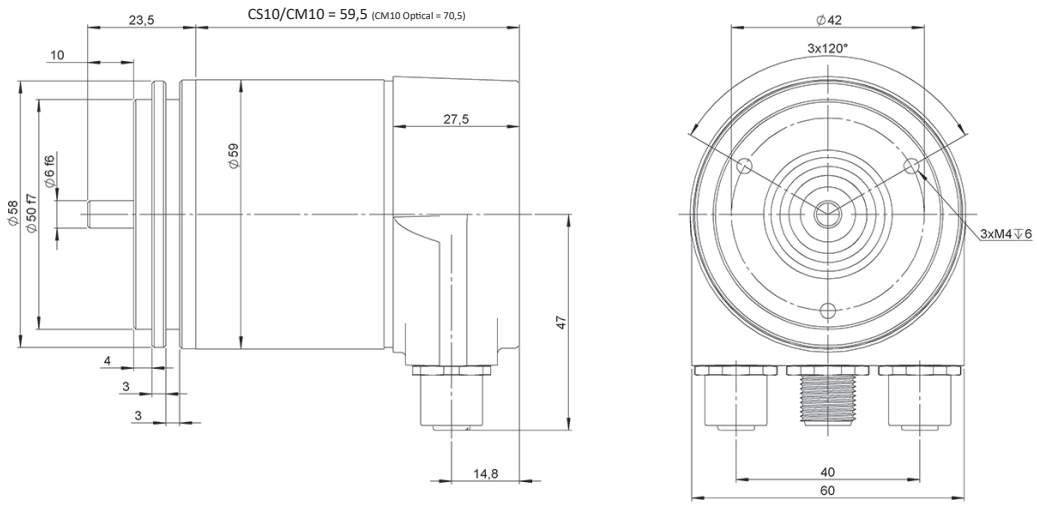


95.0007077
M12 4p
Male



FLANGE DIMENSIONS

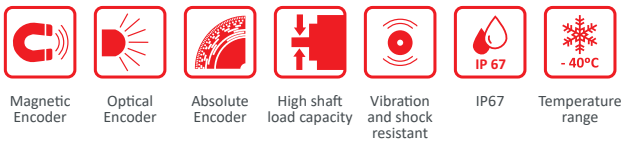
Flange 2
Synchro



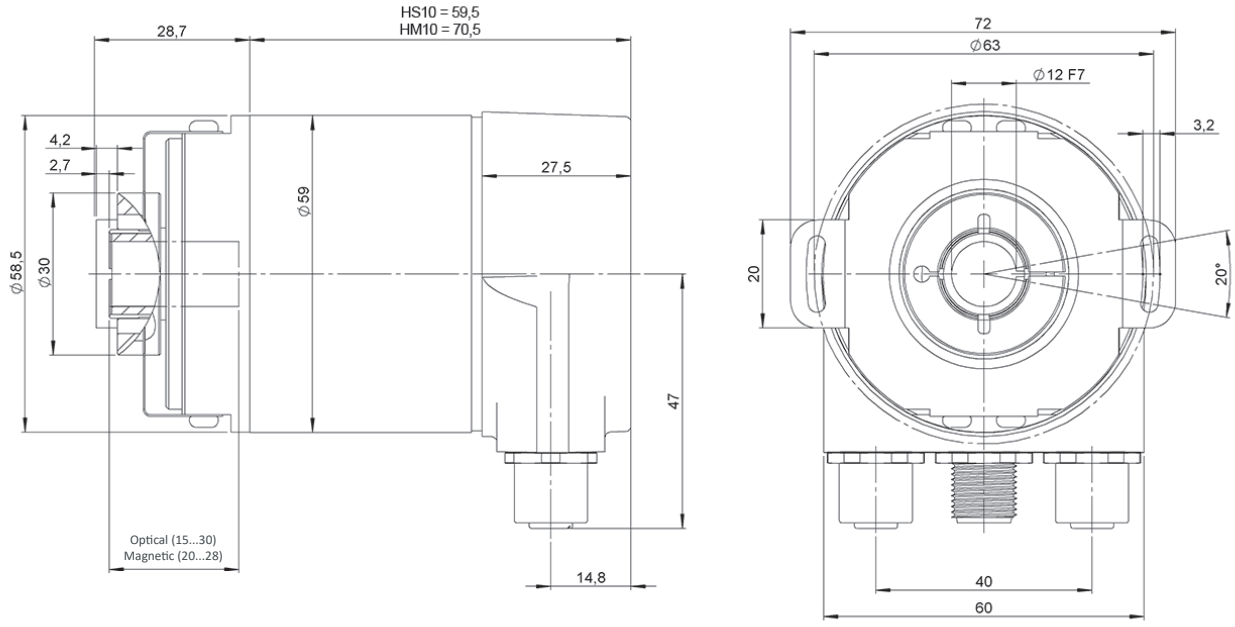
SERIE HS10/HM10

SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

- Profinet
- Singleturn resolution up to 16 bits
- Multiturn resolution up to 30 bits
- External diameter 58 mm
- Blind hollow shaft Ø 6, 8, 10, 12, 14 or 15 mm
- Protection class IP67 according to DIN EN 60529
- Connection by industrial connector 3 x M12



Magnetic Encoder | Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP67 | Temperature range



Drawing shaft type 4, Connection 2 (Radial)

REFERENCE

Reference example: HM10-PFN-34112-1312

Serie	Interface	Flange	Blind-Hollow shaft	IP	Technology	Connection	Singleturn resolution	Multiturn resolution	Special customer
HS10/HM10 -	**PFN -**	☐	☐	☐	☐	☐	**-**☐☐	☐☐	**.**☐☐
HS10. Singleturn **HM10.** Multiturn		**3.** Flexible flange	**1.** Ø 6 mm **2.** Ø 8 mm **3.** Ø 10 mm **4.** Ø 12 mm **5.** Ø 14 mm **6.** Ø 15 mm	**1.** IP65 **2.** IP67	**1.** Magnetic **2.** Optical	**2.** Radial 3 x M12 **3.** Axial 3 x M12 (*)	**13.** 13 bits **16.** 16 bits	**12.** 12 bits (**) **14.** 14 bits	**I3.** INOX 303

(*) Only available for magnetic technology.
(**) Only available for singleturn resolution 13 bits.

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SERIE HS10/HM10

SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

MECHANICAL SPECIFICATIONS

Materials	Housing: Steel Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Shaft diameter	6, 8, 10, 12, 14 or 15 mm
Maximum number of revolutions permitted mechanically	≤ 12000 rpm
Protection according to DIN EN 60529	IP65, IP67
Rotor inertia moment	≤ 30 gcm²
Starting torque at 20°C (68°F)	≤ 0,03 Nm
Weight aprox.	380 g (connection type 2) 465 g (connection type 3)
Operating temperature range	-40°C to +85°C (connection type 2) -40°C to +70°C (connection type 3)
Storage temperature range	-40°C to +85°C
Humidity	98% RH, not condensed
Vibration according to DIN EN 60068-2-6	100 m/s² (10Hz...1000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s² (6ms)
Connection	3 x M12 Connector **Mating connectors not included**

INTERFACE

Profile	Profidrive Profile 4.x Encoder Profile 4.x
Diagnostics	Memory
Programming functions	Resolution, time base and filter for velocity, preset, counting direction, IP-Address
Features	Boot-Loader, Round Axis, Flashing LEDs
Transmission rate	10 / 100 Mbit
Interface cycle time	≥ 1 ms

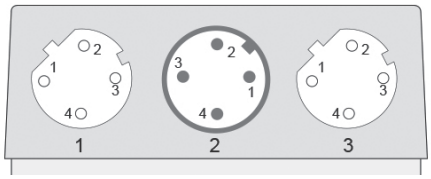
ELECTRICAL SPECIFICATIONS

Output Driver	Ethernet
Power supply	10...30 VDC
Consumption	≤ 230 mA (10 VDC) ≤ 100 mA (24 VDC)
Power Consumption	≤ 2.5 W
Start time	< 250 ms
Singleturn resolution	13 bits - 16 bits
Multiturn resolution	12 bits - 14 bits
Accuracy (INL)	±0.0878° (Magnetic) ±0.0439° (Optical)
Code	Binary
Short circuit protection	Yes
Protection polarity inversion	Yes
EMC: Emitted interference	DIN EN 61000-6-4
EMC: Noise immunity	DIN EN 61000-6-2
MTTF	65 years

SERIE HS10/HM10

SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

CONNECTION



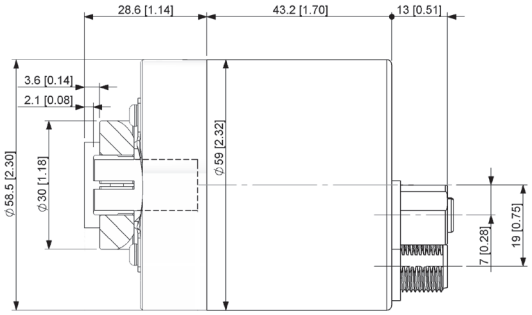
	M12 4p Female d coded	M12 4p Male a coded	M12 4p Female d coded	
VCC	-	1	-	
GND	-	3	-	
Tx+	1	-	1	
Rx+	2	-	2	
Tx-	3	-	3	
Rx-	4	-	4	
Not connected	-	2, 4	-	

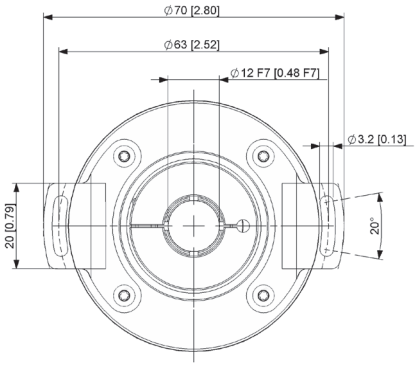
CONNECTION DIMENSIONS

Mating connectors not included

Connection 3

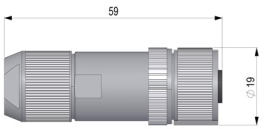
Axial
3 x M12



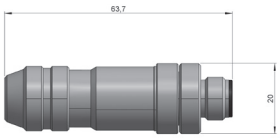


ACCESSORIES

95.0007076
M12 4p
Female



95.0007077
M12 4p
Male



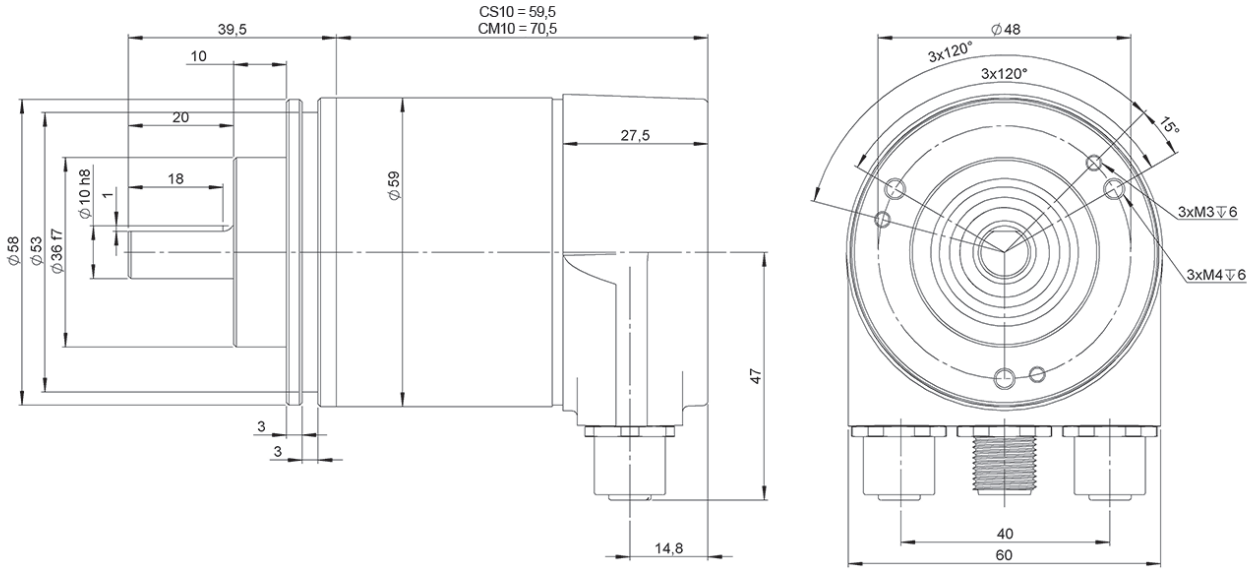
SERIE CS10/CM10

SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

EtherNet/IP

- EtherNet/IP
- Programmable up to 30 bits (65.536 points per turn, 16.384 turns)
- External diameter 58 mm
- Shaft Ø 6 or 10 mm
- Protection class IP65 according to DIN EN 60529
- Connection by industrial connector 3 x M12

Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP65 | Temperature range



Drawing shaft type 2, connection type 2, clamping

REFERENCE

Reference example: CS10-1252-16 | CM10-2152-1614

Serie	Flange	Solid shaft	Interface	Connection	Singleturn resolution	Multiturn resolution	Special customer
CS10/CM10 -	☐	☐	☐	☐	-☐☐	☐☐	.☐☐
CS10. Singleturn **CM10.** Multiturn	**1.** Clamping **2.** Synchro	**1.** Ø 6x10 mm **2.** Ø 10x20 mm	**5.** EtherNet/IP	**2.** 3 x M12 Connector	up to 16 bits (Standard: 13 bits)	up to 14 bits (Standard: 12 bits)	

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SERIE CS10/CM10

SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

EtherNet/IP

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$55x10^8$ rev. (Clamping) [40 N / 110 N] $150x10^8$ rev. (Clamping) [40 N / 60 N] $85x10^8$ rev. (Synchro) [40 N / 110 N] $195x10^8$ rev. (Synchro) [40 N / 60 N]
Shaft diameter	6 or 10 mm
Maximum number of revolutions permitted mechanically	≤ 12000 rpm
Protection according to DIN EN 60529	IP65
Rotor inertia moment	≤ 30 gcm^2
Starting torque at 20°C (68°F)	≤ 0,03 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	110 N
Weight aprox.	370 g
Operating temperature range	-40°C to +85°C
Storage temperature range	-40°C to +85°C
Humidity	98% RH, not condensed
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...1000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Radial connection	3 x M12 Connector **Mating connectors not included**

INTERFACE

EtherNet/IP

Profile	CIP
Diagnostics	Memory
Programming functions	Resolution, time base and filter for velocity, preset, counting direction, IP-Address
Features	Boot-Loader, Round Axis
Transmission rate	10 / 100 Mbit
Interface cycle time	≥ 1 ms

ELECTRICAL SPECIFICATIONS

Output Driver	Ethernet
Power supply	10...30 VDC
Consumption	≤ 230 mA (10 VDC) ≤ 100 mA (24 VDC)
Power Consumption	≤ 2.5 W
Start time	< 250 ms
Singleturn resolution	up to 16 bits
Multiturn resolution	up to 14 bits
Accuracy (INL)	±0.0220° (16 bits) ±0.0439° (13 bits)
Code	Binary
Short circuit protection	Yes
Protection polarity inversion	Yes
EMC: Emitted interference	DIN EN 61000-6-4
EMC: Noise immunity	DIN EN 61000-6-2
MTTF	65 years

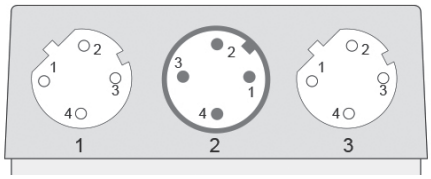
SERIE CS10/CM10

SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

EtherNet/IP

CONNECTION

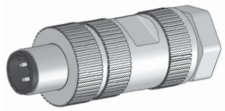
Mating connectors not included



	M12 4p Female d coded	M12 4p Male a coded	M12 4p Female d coded	
VCC	-	1	-	
GND	-	3	-	
Tx+	1	-	1	
Rx+	2	-	2	
Tx-	3	-	3	
Rx-	4	-	4	
Not connected	-	2, 4	-	

ACCESSORIES

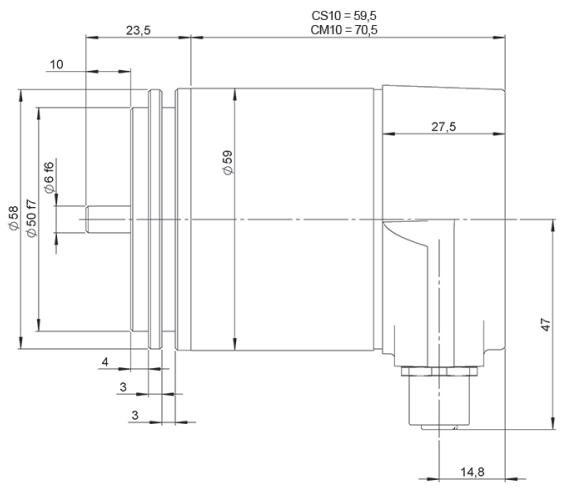
90.9556
M12 4p
Male

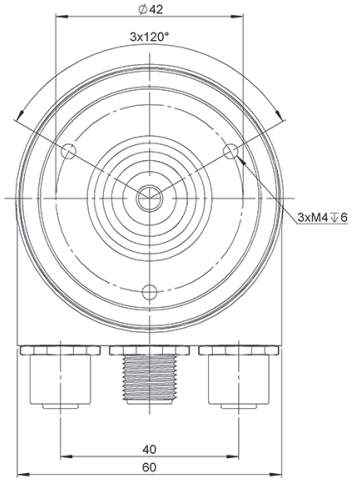


90.9555
M12 4p
Female

FLANGE DIMENSIONS

Flange 2
Synchro



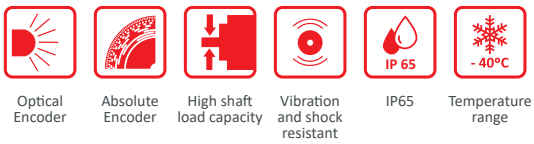


SERIE HS10/HM10

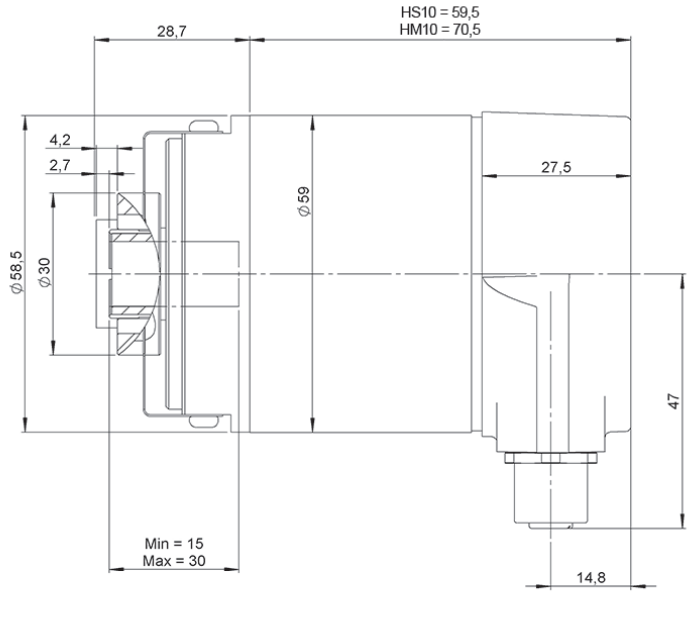
SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

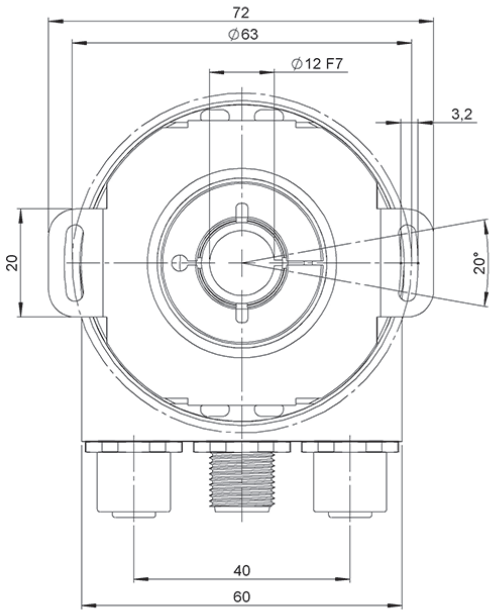
EtherNet/IP

- EtherNet/IP
- Programmable up to 30 bits (65.536 points per turn, 16.384 turns)
- External diameter 58 mm
- Blind hollow shaft Ø 10 or 12 mm
- Protection class IP65 according to DIN EN 60529
- Connection by industrial connector 3 x M12



Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP65 | Temperature range





Drawing blind hollow shaft type 4, connection type 2

REFERENCE

Reference example: HS10-4352-16 | HM10-4452-1614

Serie	Flange	Blind-Hollow shaft	Interface	Connection	Singleturn resolution	Multiturn resolution	Special customer
HS10/HM10 -	☐	☐	☐	☐	-☐☐	☐☐	.☐☐
HS10. Singleturn **HM10.** Multiturn	**4.** Blind-Hollow shaft	**3.** Ø 10 mm **4.** Ø 12 mm	**5.** EtherNet/IP	**2.** 3 x M12 Connector	up to 16 bits (Standard: 13 bits)	up to 14 bits (Standard: 12 bits)	

Order your reference
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info@encoderhohner.com
service available in 24 h

SERIE HS10/HM10

SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

EtherNet/IP

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Shaft diameter	10 or 12 mm
Maximum number of revolutions permitted mechanically	≤ 12000 rpm
Protection according to DIN EN 60529	IP65
Rotor inertia moment	≤ 30 gcm²
Starting torque at 20°C (68°F)	≤ 0,03 Nm
Weight aprox.	380 g
Operating temperature range	-40°C to +85°C
Storage temperature range	-40°C to +85°C
Humidity	98% RH, not condensed
Vibration according to DIN EN 60068-2-6	100 m/s² (10Hz...1000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s² (6ms)
Radial connection	3 x M12 Connector **Mating connectors not included**

INTERFACE

EtherNet/IP

Profile	CIP
Diagnostics	Memory
Programming functions	Resolution, time base and filter for velocity, preset, counting direction, IP-Address
Features	Boot-Loader, Round Axis
Transmission rate	10 / 100 Mbit
Interface cycle time	≥ 1 ms

ELECTRICAL SPECIFICATIONS

Output Driver	Ethernet
Power supply	10...30 VDC
Consumption	≤ 230 mA (10 VDC) ≤ 100 mA (24 VDC)
Power Consumption	≤ 2.5 W
Start time	< 250 ms
Singleturn resolution	up to 16 bits
Multiturn resolution	up to 14 bits
Accuracy (INL)	±0.0220° (16 bits) ±0.0439° (13 bits)
Code	Binary
Short circuit protection	Yes
Protection polarity inversion	Yes
EMC: Emitted interference	DIN EN 61000-6-4
EMC: Noise immunity	DIN EN 61000-6-2
MTTF	65 years

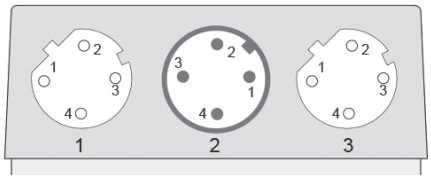
SERIE HS10/HM10

SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

EtherNet/IP

CONNECTION

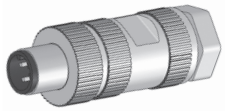
Mating connectors not included



	M12 4p Female d coded	M12 4p Male a coded	M12 4p Female d coded	
VCC	-	1	-	
GND	-	3	-	
Tx+	1	-	1	
Rx+	2	-	2	
Tx-	3	-	3	
Rx-	4	-	4	
Not connected	-	2, 4	-	

ACCESSORIES

90.9556
M12 4p
Male



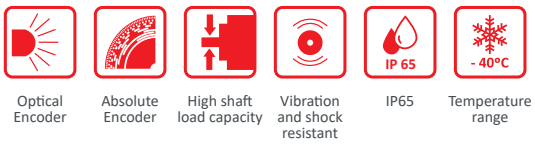
90.9555
M12 4p
Female

SERIE CS10/CM10

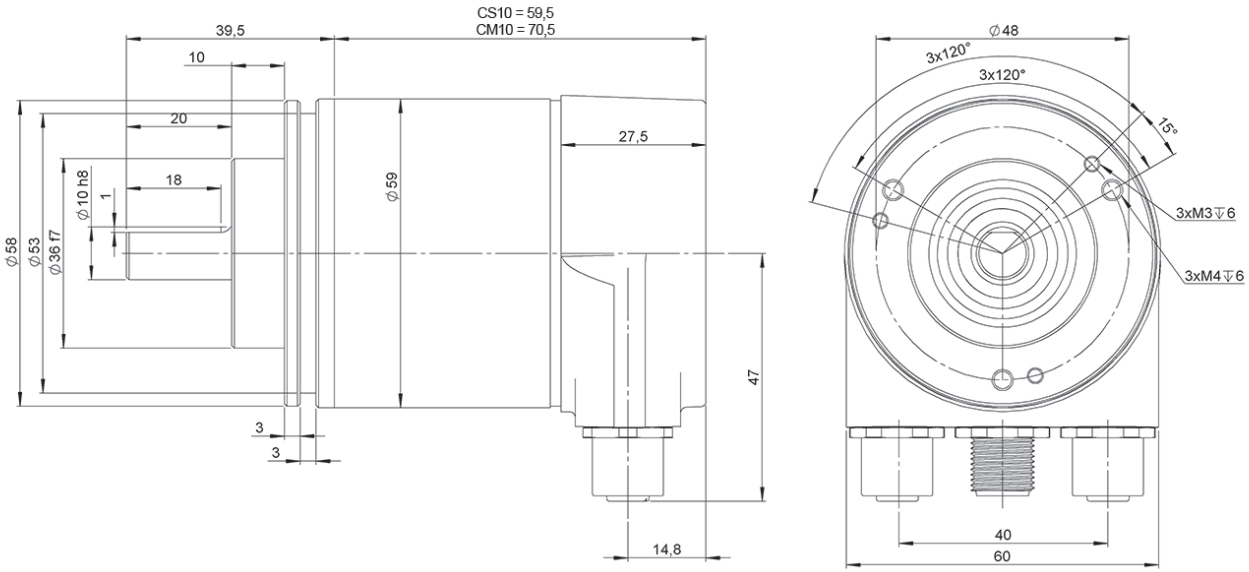
SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

EtherCAT

- EtherCAT
- Programmable up to 30 bits (65.536 points per turn, 16.384 turns)
- External diameter 58 mm
- Shaft Ø 6 or 10 mm
- Protection class IP65 according to DIN EN 60529
- Connection by industrial connector 3 x M12



Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP65 | Temperature range



Drawing shaft type 2, connection type 2, clamping

REFERENCE

Reference example: CS10-1262-16 | CM10-2162-1614

Serie	Flange	Solid shaft	Interface	Connection	Singleturn resolution	Multiturn resolution	Special customer
CS10/CM10 -	☐	☐	☐	☐	- ☐☐	☐☐	. ☐☐
CS10. Singleturn **CM10.** Multiturn	**1.** Clamping **2.** Synchro	**1.** Ø 6x10 mm **2.** Ø 10x20 mm	**6.** EtherCAT	**2.** 3 x M12 Connector	up to 16 bits (Standard: 13 bits)	up to 14 bits (Standard: 12 bits)	

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SERIE CS10/CM10

SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

EtherCAT

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$55x10^8$ rev. (Clamping) [40 N / 110 N] $150x10^8$ rev. (Clamping) [40 N / 60 N] $85x10^8$ rev. (Synchro) [40 N / 110 N] $195x10^8$ rev. (Synchro) [40 N / 60 N]
Shaft diameter	6 or 10 mm
Maximum number of revolutions permitted mechanically	≤ 12000 rpm
Protection according to DIN EN 60529	IP65
Rotor inertia moment	≤ 30 gcm^2
Starting torque at 20°C (68°F)	≤ 0,03 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	110 N
Weight aprox.	370 g
Operating temperature range	-40°C to +85°C
Storage temperature range	-40°C to +85°C
Humidity	98% RH, not condensed
Vibration according to DIN EN 60068-2-6	100 m/s^2 (10Hz...1000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s^2 (6ms)
Radial connection	3 x M12 Connector **Mating connectors not included**

INTERFACE

EtherCAT

Profile	CoE (CANopen over EtherCAT, DS-301+DS-406)
Diagnostics	OptoAsic, Memory, LED
Programming functions	Resolution, preset, counting direction
Features	Boot-Loader, Round Axis
Transmission rate	10 / 100 Mbit
Interface cycle time	≥ 62,5 µs

ELECTRICAL SPECIFICATIONS

Output Driver	Ethernet
Power supply	10...30 VDC
Consumption	≤ 230 mA (10 VDC) ≤ 100 mA (24 VDC)
Power Consumption	≤ 2.5 W
Start time	< 250 ms
Singleturn resolution	up to 16 bits
Multiturn resolution	up to 14 bits
Accuracy (INL)	±0.0220° (16 bits) ±0.0439° (13 bits)
Code	Binary
Short circuit protection	Yes
Protection polarity inversion	Yes
EMC: Emitted interference	DIN EN 61000-6-4
EMC: Noise immunity	DIN EN 61000-6-2
MTTF	65 years

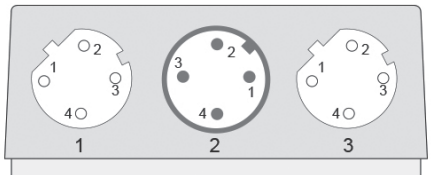
SERIE CS10/CM10

SINGLETURN AND MULTITURN ABSOLUTE SOLID SHAFT ENCODER

EtherCAT

CONNECTION

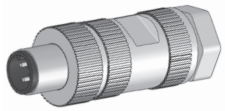
Mating connectors not included



	M12 4p Female d coded	M12 4p Male a coded	M12 4p Female d coded	
VCC	-	1	-	
GND	-	3	-	
Tx+	1	-	1	
Rx+	2	-	2	
Tx-	3	-	3	
Rx-	4	-	4	
Not connected	-	2, 4	-	

ACCESSORIES

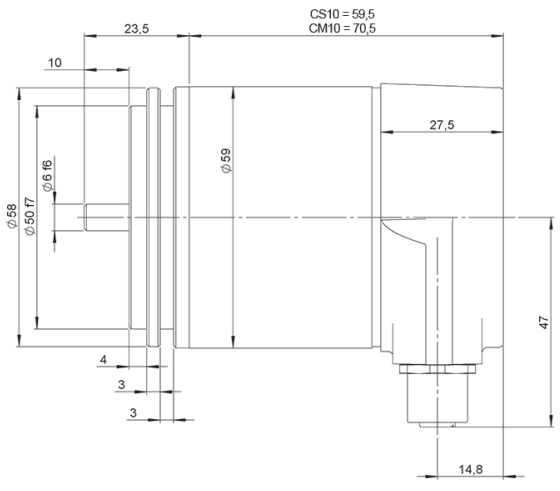
90.9556
M12 4p
Male

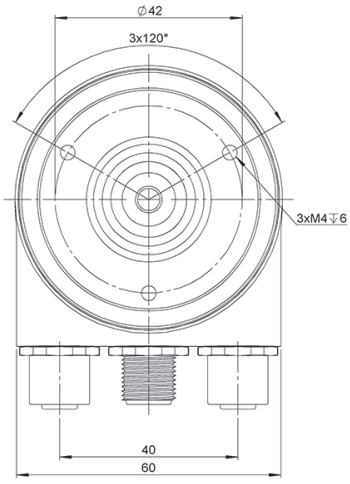


90.9555
M12 4p
Female

FLANGE DIMENSIONS

Flange 2
Synchro



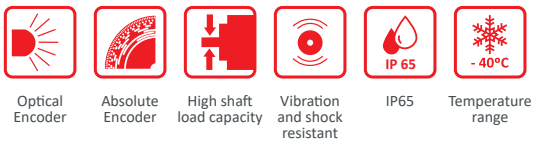


SERIE HS10/HM10

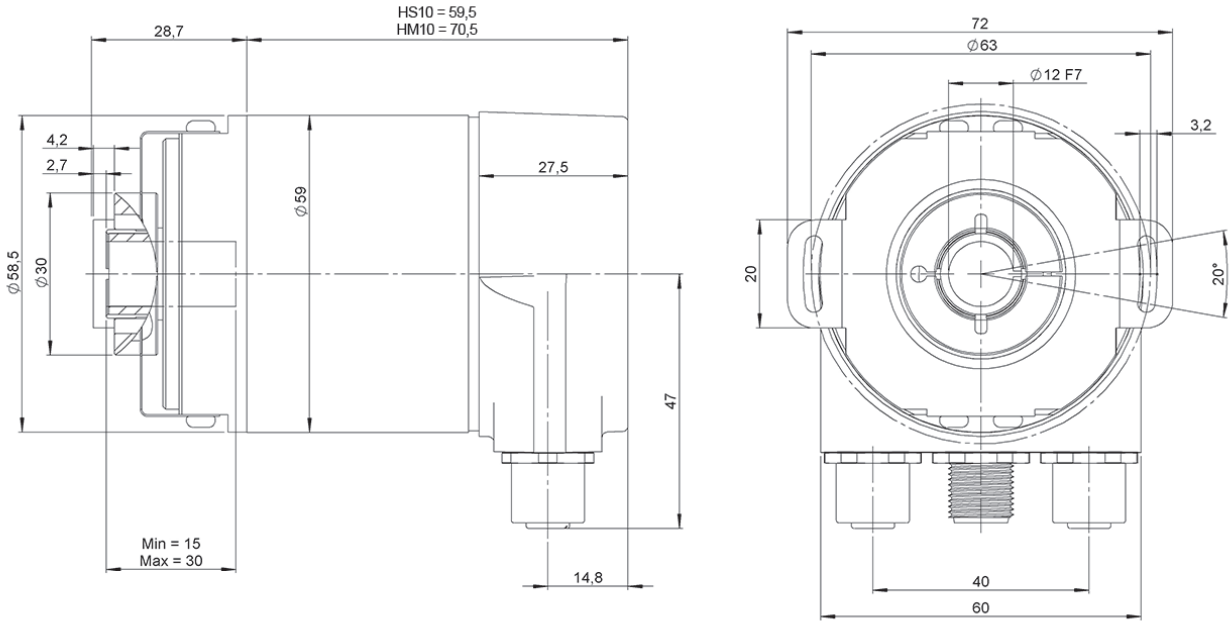
SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

EtherCAT

- EtherCAT
- Programmable up to 30 bits (65.536 points per turn, 16.384 turns)
- External diameter 58 mm
- Blind hollow shaft Ø 10 or 12 mm
- Protection class IP65 according to DIN EN 60529
- Connection by industrial connector 3 x M12



Optical Encoder | Absolute Encoder | High shaft load capacity | Vibration and shock resistant | IP65 | Temperature range



Drawing blind hollow shaft type 4, connection type 2

REFERENCE

Reference example: HS10-4362-16 | HM10-4462-1614

Serie	Flange	Blind-Hollow shaft	Interface	Connection	Singleturn resolution	Multiturn resolution	Special customer
HS10/HM10 -	☐	☐	☐	☐	-☐☐	☐☐	.☐☐
HS10. Singleturn **HM10.** Multiturn	**4.** Blind-Hollow shaft	**3.** Ø 10 mm **4.** Ø 12 mm	**6.** EtherCAT	**2.** 3 x M12 Connector	up to 16 bits (Standard: 13 bits)	up to 14 bits (Standard: 12 bits)	

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SERIE HS10/HM10

SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

EtherCAT

MECHANICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Shaft diameter	10 or 12 mm
Maximum number of revolutions permitted mechanically	≤ 12000 rpm
Protection according to DIN EN 60529	IP65
Rotor inertia moment	≤ 30 gcm²
Starting torque at 20°C (68°F)	≤ 0,03 Nm
Weight aprox.	375 g
Operating temperature range	-40°C to +85°C
Storage temperature range	-40°C to +85°C
Humidity	98% RH, not condensed
Vibration according to DIN EN 60068-2-6	100 m/s² (10Hz...1000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s² (6ms)
Radial connection	3 x M12 Connector **Mating connectors not included**

INTERFACE

EtherCAT

Profile	CoE (CANopen over EtherCAT, DS-301+DS-406)
Diagnostics	OptoAsic, Memory, LED
Programming functions	Resolution, preset, counting direction
Features	Boot-Loader, Round Axis
Transmission rate	10 / 100 Mbit
Interface cycle time	≥ 62,5 µs

ELECTRICAL SPECIFICATIONS

Output Driver	Ethernet
Power supply	10...30 VDC
Consumption	≤ 230 mA (10 VDC) ≤ 100 mA (24 VDC)
Power Consumption	≤ 2.5 W
Start time	< 250 ms
Singleturn resolution	up to 16 bits
Multiturn resolution	up to 14 bits
Accuracy (INL)	±0.0220° (16 bits) ±0.0439° (13 bits)
Code	Binary
Short circuit protection	Yes
Protection polarity inversion	Yes
EMC: Emitted interference	DIN EN 61000-6-4
EMC: Noise immunity	DIN EN 61000-6-2
MTTF	65 years

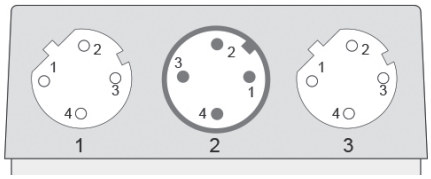
SERIE HS10/HM10

SINGLETURN AND MULTITURN ABSOLUTE BLIND HOLLOW SHAFT ENCODER

EtherCAT

CONNECTION

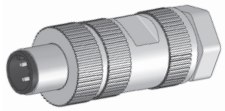
Mating connectors not included



	M12 4p Female d coded	M12 4p Male a coded	M12 4p Female d coded	
VCC	-	1	-	
GND	-	3	-	
Tx+	1	-	1	
Rx+	2	-	2	
Tx-	3	-	3	
Rx-	4	-	4	
Not connected	-	2, 4	-	

ACCESSORIES

90.9556
M12 4p
Male

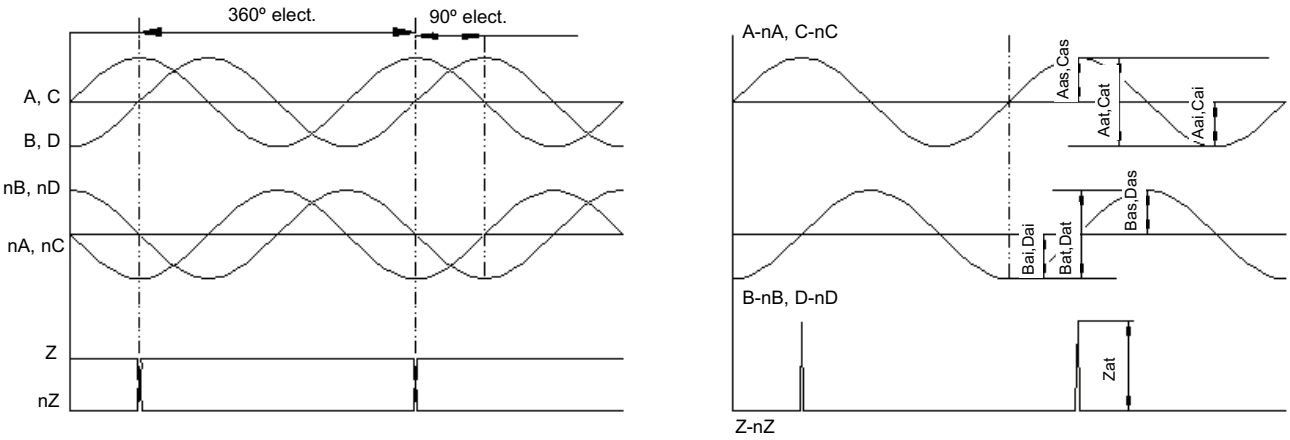


90.9555
M12 4p
Female

INTRODUCTION

SmarSens is a range of Hohner encoders that give a single encoder the possibility of absolute and incremental signals.
Its compact and robust design with numerous communication interfaces available make SmarSens a product that adapts to the real needs of the client. The implementation through an OptoASIC provides a high degree of optoelectronic integration.
The range of SmarSens encoders is applicable to a great variety of applications such as wind turbines, elevators, etc.

INCREMENTAL SIGNALS / ABSOLUT SIGNALS 1Vpp



	Amplitude Vpp	Offset / Asymmetry	Amplitude ratio A/B	Phase A to B
A, nA, B, nB C, nC, D, nD	0,5±20%	2,5±10%	-	-
A - nA	1±20%	|Aas-Aai|/(2*(|Aas|+|Aai|))≤0.065	0.8 to 1.25	90º±10º
B - nB	1±20%	|Bas-Bai|/(2*(|Bas|+|Bai|))≤0.065		
C - nC	1±20%	|Cas-Cai|/(2*(|Cas|+|Cai|))≤0.065		
D - nD	1±20%	|Das-Dai|/(2*(|Das|+|Dai|))≤0.065		
Z, nZ	0,5±20%	2,5±10%		
Z - nZ	1±20%			

A: Incremental cosinus signal
B: Incremental sinus signal
C: Absolute cosinus signal
D: Absolute sinus signal
Z: Index signal

Aas, Bas, Cas, Das: Channel A, B, C and D, upper peak voltage amplitude
Aai, Bai, Cai, Dai: Channel A, B, C and D, lower peak voltage amplitude
Aat, Bat, Cat, Dat: Channel A, B, C and D, peak to peak voltage amplitude

Sinusoidals outputs are a very useful system to make interpolations that give high resolution to the single turn part. There are incremental signals, A and B, the signal A (cosine) moves in front of B (sine) 90º degrees, and there are absolute signals, C and D, the signal C (cosine) moves in front of D (sine) 90º degrees. The median value of signals A, B, C, D, nA, nB, nC and nD,is 2.5 Vdc. The nA/nCOS_inc signal is 180 degrees from A/COS_inc, just nB/nSIN_inc is to B/SIN_inc, like nC/COS_abs is to C/COS_abs and D/SIN_abs is to D/SIN_abs. The peak to peak of the senoidals is from 0.4 to 0.6 Vpp. These sine and cosine signals, in the control input, adapt the interpolate signals to 1 Vpp in the A-nA, B-nB, C-nC and D-nD.

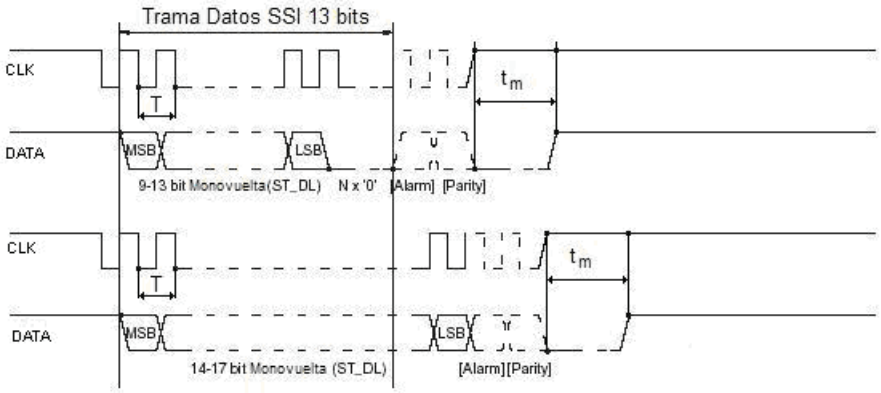
SSI INTERFACE

In many cases, the data transmitted from one system to another are exposed to magnetic fields and noise. When using a standard interface like the RS-422, the effects produced by these disruptions are reduced. The SSI “Synchronous Serial Interface” is an industrial output standard that only needs 4 lines to carry out data transmission. This transmission system for absolute encoders provides diverse advantages in comparison to the traditional parallel transmission and asynchronous serial methods:

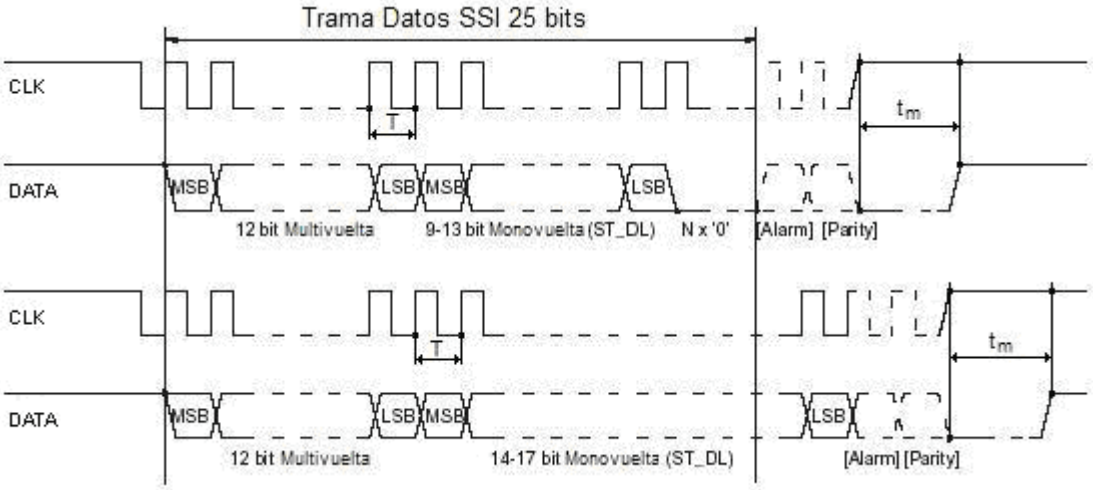
- Inferior number of components.
- Easy wiring system.
- Data transmission between the encoder and the receiver are controlled by the receivers clock signal.
- High transmission speeds based on distance and data block to be transmitted.

The SSI interface requires a Master (for example, a SSI data acquisition card) and a Slave (the encoder) for communication.
The Master generates the CLK and their inverted signals, while the slave generates the DATA and their inverted signals. The communication is one-way. When in idle mode, CLK and DATA have the value “1”(high value). In the data acquisition mode, the Master generates a burst of pulses of the same period T and the Slave will respond with an information bit for each pulse also with a T duration. The CLK and DATA signals are synchronized. To start the transmission, the Master will set the CLK signal to “0”(low value) and then send the pulses. To end the block, the master will maintain during tm seconds the CLK signal at “1” and then the SLO signal will also become “1”. At this point, the Master can interrogate the Slave again. The bits sent during a burst of pulses by the Master are called a block. In the SSI, the standard size of the blocks is 13 or 25 bits, although other sizes are possible.

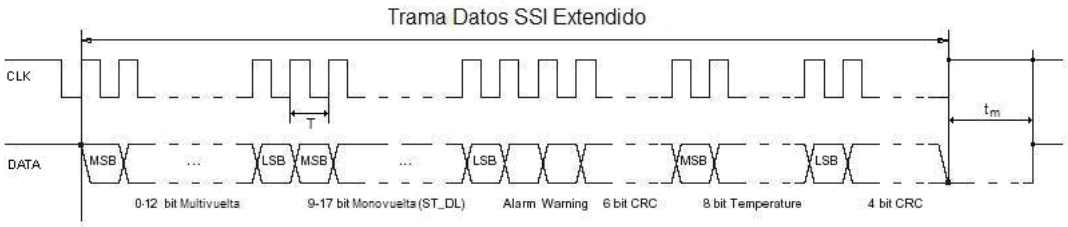
In the single-turn mode, the information is transmitted in SSI blocks of at least 13 standard bits. If the single-turn resolution is higher than 13 bits, the block will last n bits, with n being the number of single-turn resolution bits. In the serial delivery, the first bit of data transmitted deals with the most significant bit (MSB) of the block and the last one with the least significant bit (LSB). If the resolution is less than 13 bits, the remaining space up to the 13 bits is filled with zeros. In the SSI1 Figure, you can see the block sent when the resolution is lower than 13 bits and also when it is higher.
In all the SSI blocks, in single-turn, multi-turn, or extended modes, you can add the Alarm and Parity bits activating the relevant configuration bits. By default, these bits are not sent in the block.



In the multiturn mode, the information is transmitted in standard SSI blocks of 25 bits for singleturn resolutions of less than 14 bits. The 12 bits of the multiturn part are transmitted at the beginning, starting from the most significant bit to the least. Next, the singleturn part bits are transmitted, starting from the most significant bit of the block. If the resolution singleturn is inferior to 13 bits, the bits left over from the block will become zeros. If the singleturn resolution is higher than 13 bits, the size of the block will be 25+(n-13) bits, where n is the number of singleturn resolution bits. In the SSI2 figure, you can see the case for a single-turn resolution equal to or less than 13 bits and the case for resolutions higher than 13 singleturn bits.



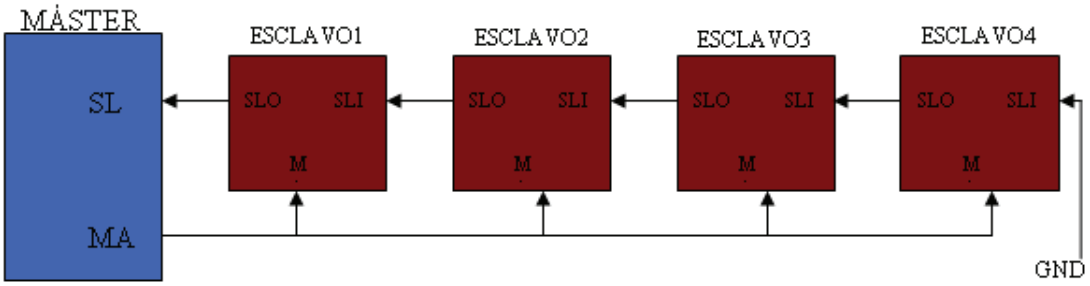
In the SSI extended mode, the length of block is variable, depending on the information sent. First, it transmits the data of the multiturn part, with a variable length of 0 (only single-turn) or 12 bits, from the most significant to the least significant bit. Next, the single-turn part also transmits from the most to the least significant bit. The length can vary depending on the resolution of the part single-turn, from 10 bits to 14 bits. Once transmitted, the least significant bit will send the Alarm and Warning bits. As a method to detect errors in the transmission, a 6 bit CRC will be generated, with the 43h polynomial, of the information processed up to that point (multiturn+singleurn+Alarm+Warning) that will be transmitted after the Warning bit. Next, it will send the information on the sensor temperature encapsulated in 8 bits, and lastly, it will calculate a CRC, with the 4 bits 13h polynomial, that will close the block to transmit, for the 8 bits of sensor temperature data. In the SSI3 figure, you can see the format of the extended SSI block.



In all cases, the value of T should be from 1µs to 10µs, and tm should be higher than 40µs. To correctly operate, you should set up the encoder configuration record to allow SSI-BISS compatibility..

BISS INTERFACE

This multipoint serial communication standard is open and simple to use. It is similar to the SSI but the control (or master) interacts with the sensors programming the different parameters for each sensor, as well as reading its different status record. For this reason, the BiSS “Bidirectional interface Serial Synchronous”, unlike the SSI, is bidirectional. The communication can be from 17KHz to 4MHz frequencies under ideal conditions. For longer sensor-control distances, this frequency gradually diminishes. The maximum number of slaves for each master, like this encoder, that can be connected to a control is four. The BISS1 figure graphically shows the connection of four slaves with the master. The last slave of the chain has to have the SLI to GND input. Physically, this means that SLI+ should connect to GND and SLI- to 5V. When the encoders interact with other slaves that are not encoders, they must be located on the chain with the lowest identifiers, starting from one. The use of more than one slave with the master implies that the maximum work frequency of the encoder is divided by the number of slaves connected, due to the time that they take in transmitting data to other slaves.



The encoder data reading by the Master (MA) is always one-way, using PWM codification and following the BISS2 figure format. The Master starts the communication with start bit (start, lowering the signal from “1” to “0”), next, it waits for the encoder’s answer, also called slave (SLO) that, before the synchronism signal or clock sent by the master, begins to send data after a start signal. The encoder starts to send data from the most to the least significant bit, and then sends the Error, Alarm and CRC bits of 6 0x43h polynomial generator bits. Lastly, it sends a data bit called a multi-block (MCD). The size of the block depends on the encoder’s resolution. After each block, the encoder’s position is given

The multi-cycle or multi-block bit does not have any purpose in a single block, but it does when in various blocks, and provides the information on the encoder’s temperature.
This temperature is encoded into 8 bits and each bit is transmitted in a different data reading block of the encoder. Also, the entire multi-block cycle includes a start bit to indicate the MCD start, next the 8 bits, the 4 bit CRC with a 0x13h polynomial generator and lastly, a stop bit. Overall, the encoder’s temperature reading takes up 16 blocks of data reading. In the BISS3 figure, you can see the details of this type of transmission.

EXTERNALLY CONFIGURABLE PARAMETERS AND DIAGNOSIS LED (OPTIONAL)

Unscrewing the top of the rear cover, you will find the reset/preset button to position the absolute value of the encoder to a known value.
In the case of a SSI encoder, pushing the button will update the position to 0 (Reset). In the case of a BiSS encoder, when we push the button, we can update the position to any previously programmed value (Preset).
You can also change the direction using the external nDIR input, that when we connected to the GND inverts the encoder’s default rotation direction.
The diagnosis LED can also be reached by unscrewing the top. When the encoder and the communication with the master are working correctly, the LED is green. The led is red (in SSI mode) when the communication fails with the master, when the lamps stop working, when the communication fails with the multi-turn part or when the encoder exceeds the recommended work temperature values.
In the BiSS communication mode, the diagnosis LED is configurable with the 0x30h record (error mask) where we can choose what are/is the error/s that we are interested in detecting.
When there is an error in the encoder (diagnosis LED is red), the 8 bit record with direction 0x68h specifies the reason for the error, according to the active bit. The table of errors is :

Bit7	Operation temperate exceeded
Bit6	Error external system sent to NERRR
Bit5	Error in the serial interface
Bit4	Invalid position or data conversion is not ready
Bit3	Configuration error EEPROM interface
Bit2	Error in the pitch codification
Bit1	Error in the multi-turn part
Bit0	Failure in the LED power control

The “Error in the pitch codification” usually causes problems with the disc (breakage, condensation or dirt) or mechanical overload (excess in the rotation speed).
The “Failure in the LED power control” originates when there are problems with heat, dirt, condensation or fatigue.

SERIE SMRS 10

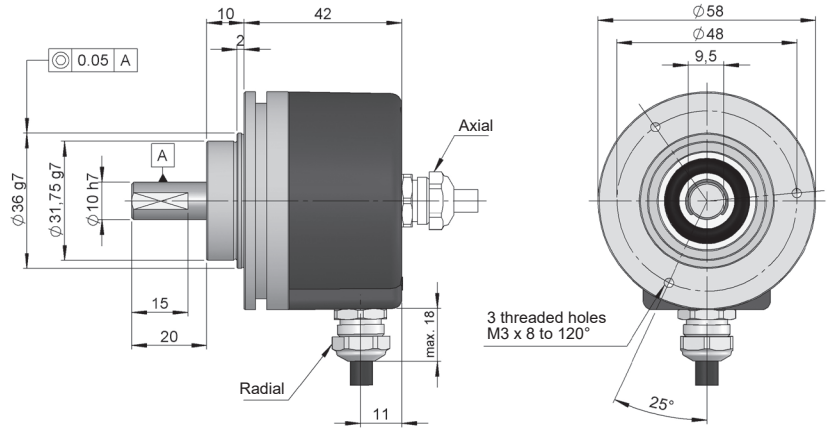
SINGLETURN ABSOLUTE AND INCREMENTAL SOLID SHAFT ENCODER

SSI
SSI + SinCos

BiSS-C
BiSS-C + SinCos

- **Singleturn resolution up to 19 bits**
- **Incremental resolution 2048 SIN/COS**
- **External diameter 58 mm**
- **Solid shaft Ø 6, 8 or 10 mm**
- **Operating temperature range up to 100°C**
- **Protection class IP65 according to DIN EN 60529**
- **Connection by cable (other cable length available) or industrial connector**

Optical Encoder | Absolute and incremental encoder | Electronic output SIN/COS | Vibration and shock resistant | IP65 | Temperature range | Express Delivery



Drawing shaft type 2, connection type 11/12, cable 95.0008003, without flange

REFERENCE

Reference example: SMRS10-21121311S-17

Serie	Solid shaft	Flange	Connection	Interface	IP	Power supply	Parameters config.	Absolute resolution	Special customer
SMRS10 -	☐	☐	☐☐	☐☐	☐	☐	☐ -	☐☐	.☐☐
	1. Ø 6 mm **2.** Ø 10 mm **3.** Ø 8 mm	**1.** None **2.** 90.1002 **3.** 90.1003 **4.** 90.1004 **5.** 90.1005 **6.** 90.1006	**10.** Helicoidal cable **11.** Axial cable **12.** Radial cable **21.** 30 cm axial cable + connector D-Sub 15p **22.** 30 cm radial cable + connector D-Sub 15p **31.** Axial M23 12p **32.** Radial M23 12p **41.** Axial M12 8p **42.** Radial M12 8p **71.** Axial M23 17p **72.** Radial M23 17p	**11.** SSI Binary CW **12.** SSI Binary CCW **13.** SSI Gray CW **14.** SSI Gray CCW **21.** SSI + 2048 SIN/COS Binary CW **22.** SSI + 2048 SIN/COS Binary CCW **23.** SSI + 2048 SIN/COS Gray CW **24.** SSI + 2048 SIN/COS Gray CCW **35.** BiSS-C **45.** BiSS-C + 2048 SIN/COS	**1.** IP65 (*)	**1.** 4..30 VDC **2.** 5 VDC	**S.** Direction **R.** Reset	**09.** 9 bits **10.** 10 bits **12.** 12 bits **13.** 13 bits **14.** 14 bits **17.** 17 bits **19.** 19 bits (**)	**KD.** Halogen-free cable **MB.** -40°C

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Step file 3D
info@encoderhohner.com
service available in 24 h

(*) For helicoidal cable IP54.
(**) 21 bits - Upon request.
Other extension cable options available with specific connectors mounted at the end of the cable for different market drives, on request.

SERIE SMRS 10

SINGLETURN ABSOLUTE AND INCREMENTAL SOLID SHAFT ENCODER

SSI / SSI + SinCos
BiSS-C / BiSS-C + SinCos

TECHNICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Maximum number of revolutions permitted mechanically	6000 rpm
Protection against dust and splashes according to DIN EN 60529	IP65 - Standard IP54 - Helicoidal connection
Rotor inertia moment	≤ $3x10^{-6}$ Kgm²
Starting torque at 20°C (68°F)	≤ 0,02 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	60 N
Weight aprox.	0,4 Kg
Operating temperature range	-10°C to +100°C - Standard -40°C to +100°C - Special Customer MB
Vibration according to DIN EN 60068-2-6	100 m/s² (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s² (6ms)
Consumption	≤ 90 mA
Power supply	5 VDC ±10% / 10...30 VDC
Linearity	± ½ LSB
Helicoidal connection	2 meters cable (other cable lengths available or connector mounted at the end of the cable, upon request)
Axial or radial connection	2 meters cable or industrial connector M23 or M12 (other cable lengths available on order) or 30 cm cable + connector D-Sub 15p Female connector not included

SSI / BiSS INTERFACE

	SSI	BiSS INTERFACE (*)
Electronic output	RS485	RS485
Max. load capability / channel	±20 mA	±20 mA
Resolution	9...19 bits 21 bits - Upon request	9...19 bits 21 bits - Upon request
Code	Binary Gray	Binary
Clock frequency	50 kHz ... 2 MHz	50 kHz ... 10 MHz
Protocol	SSI	BiSS-C

(*) BiSS protocol allows to configure CRC, Alarm messages, Warnings, Sense, Reset and Absolute resolution by BUS. Default configuration: Binary CW.

INCREMENTAL OUTPUT

	SIN/COS
Electronic output	Differential 1 Vpp
Signal offset	2,5 VDC
Resolution	2048 ppr
Cutoff frequency (-3 db)	>500 kHz

SERIE SMRS 10

SINGLETURN ABSOLUTE AND INCREMENTAL SOLID SHAFT ENCODER

SSI / SSI + SinCos
BiSS-C / BiSS-C + SinCos

CONNECTION

	Cable (**) 3x2x0,14+2x0,34 95.0008003	**Cable (**)** 6x2x0,14 mm² 95.0008072	**Cable (**)** 6x2x0,14mm² Halogen-free cable up to 90°C 95.0008073	**Connector** BiSS M23 12p CW	**Connector** SSI M23 12p CW	**Connector** BiSS / SSI M23 17p CW	**Connector** M12 8p CCW	**Connector** D-Sub 15p High density
GND	Black	White	White	1	1	10	1	13
VCC	Red	Brown	Brown	8	2	7	2	12
DATA+	Yellow	Pink	Pink	2	3	14	3	7
DATA-	Green	Grey	Grey	7	4	17	4	2
CLOCK+	Brown	Yellow	Yellow	3	5	8	5	6
CLOCK-	Blue	Green	Green	6	6	9	6	1
SLI+	-	-	-	-	-	1		
SLI-	-	-	-	-	-	4		
DIR or RESET	Grey	Red-Blue	Red-Blue	9	9	2	7	11
A+(cos)	-	Red	Red	10	10	15		8
B+(sin)	-	Black	Black	4	7	12		9
A-(cos)	-	Blue	Blue	12	12	16		3
B-(sin)	-	Violet	Violet	5	8	13		4
Shield (*)	Shield	Shield	Shield	11	11	11	8	Housing

(*) Shield connected to the encoder housing. It is recommended to connect the end of the wire shield to the ground of the equipment where the encoder is connected. ⏚
(**) The recommended maximum cable length is 10 meters. The 95.0008003 cable for Interfaces types 11, 12, 13, 14 and 35 and the 95.0008072 cable for Interface types 21, 22, 23, 24 and 45. The 95.0008073 cable for special customer KD.

SSI						
	Cable length	< 25 m	< 50 m	< 100 m	< 200 m	< 400 m
	Transmission speed	< 1 MHz	< 400 kHz	< 300 kHz	< 200 kHz	< 100 kHz

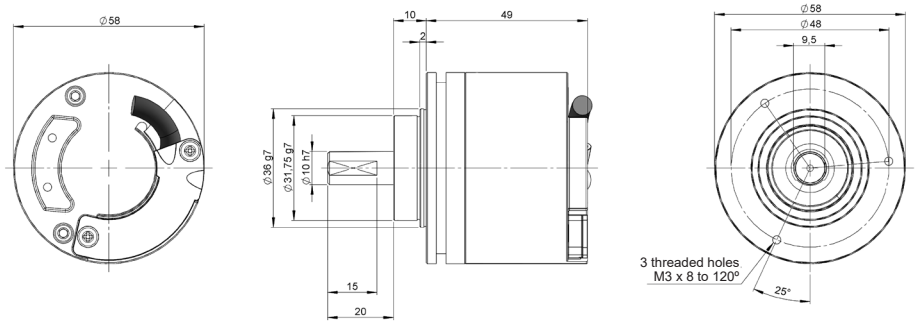
BiSS INTERFACE					
Cable length	< 10 m	< 25 m	< 60 m	< 100 m	
Transmission speed	< 10 MHz	< 5 MHz	< 2 MHz	< 1 MHz	

CONNECTION DIMENSIONS

Female connector not included

Connection 10

Helicoidal cable



SERIE SMRS 10

SINGLETURN ABSOLUTE AND INCREMENTAL SOLID SHAFT ENCODER

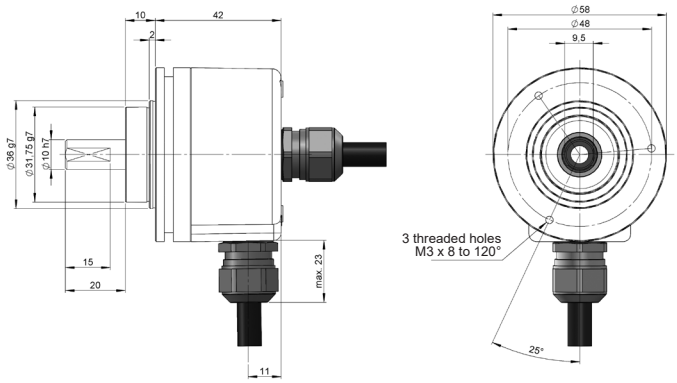
SSI / SSI + SinCos
BiSS-C / BiSS-C + SinCos

Connection 11

Axial cable
95.0008072
95.0008073

Connection 12

Radial cable
95.0008072
95.0008073

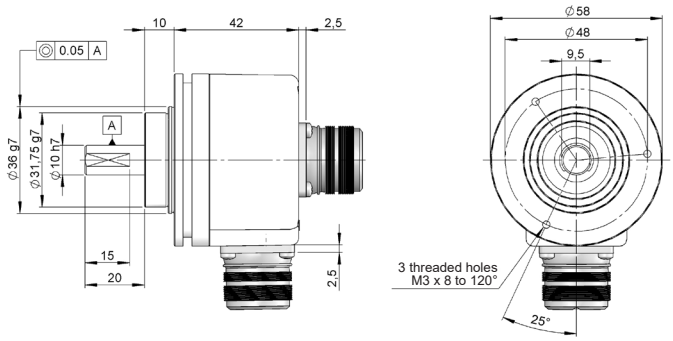


Connection 31

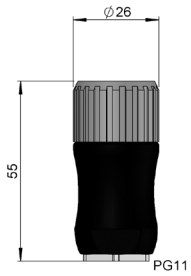
Axial
M23 12p
male panel
clockwise

Connection 32

Radial
M23 12p
male panel
clockwise



Female connector
95.0007131

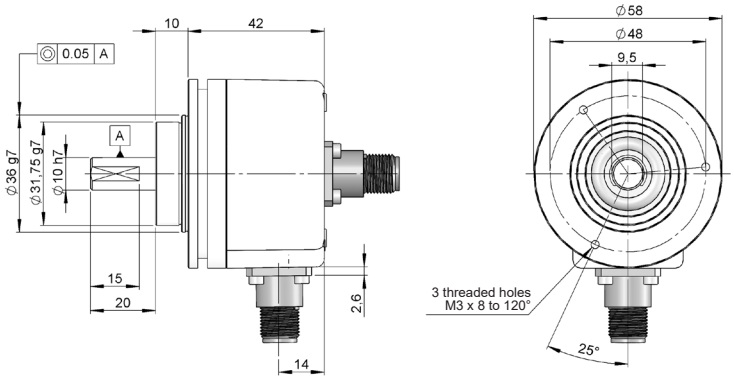


Connection 41

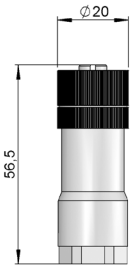
Axial
M12 8p
male panel
clockwise

Connection 42

Radial
M12 8p
male panel
clockwise



Female connector
95.0007152



SERIE SMRS 10

SINGLETURN ABSOLUTE AND INCREMENTAL SOLID SHAFT ENCODER

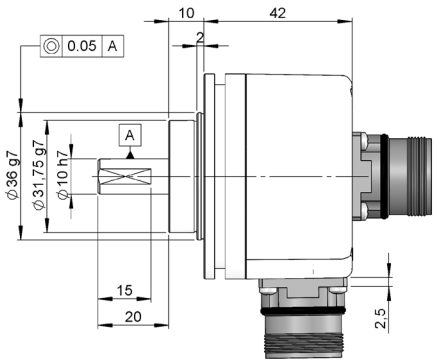
SSI / SSI + SinCos
BiSS-C / BiSS-C + SinCos

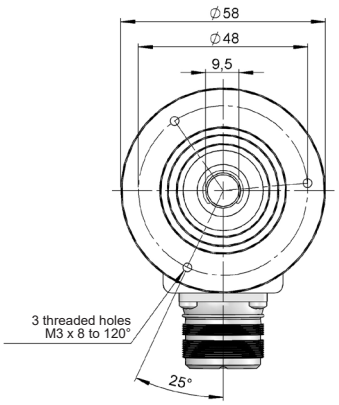
Connection 71

Axial
M23 17p
male panel
clockwise

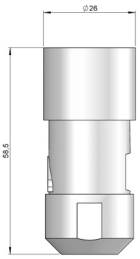
Connection 72

Radial
M23 17p
male panel
clockwise





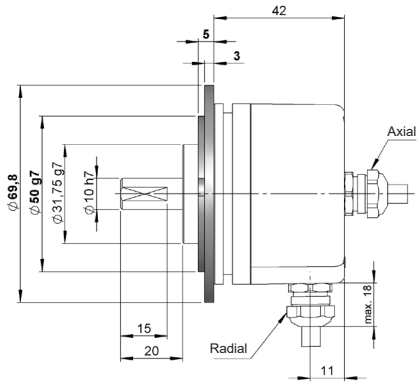
Female connector
95.0007196

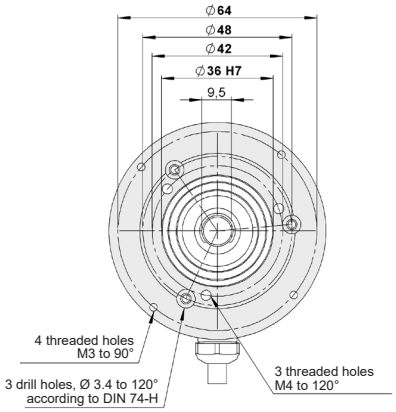


FLANGE DIMENSIONS

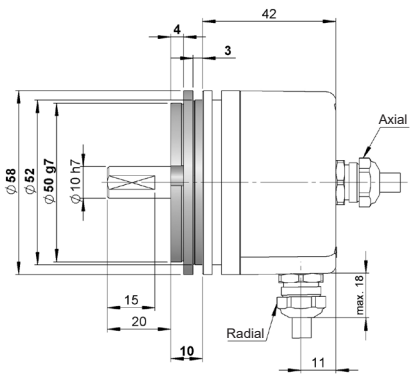
Flange mounting included

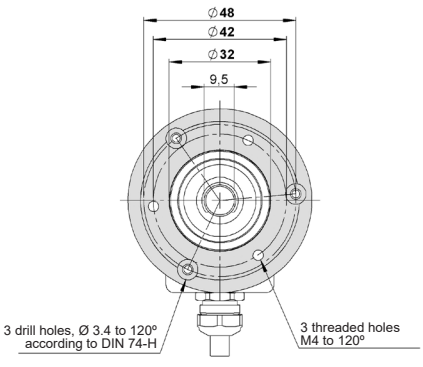
Flange 2
90.1002



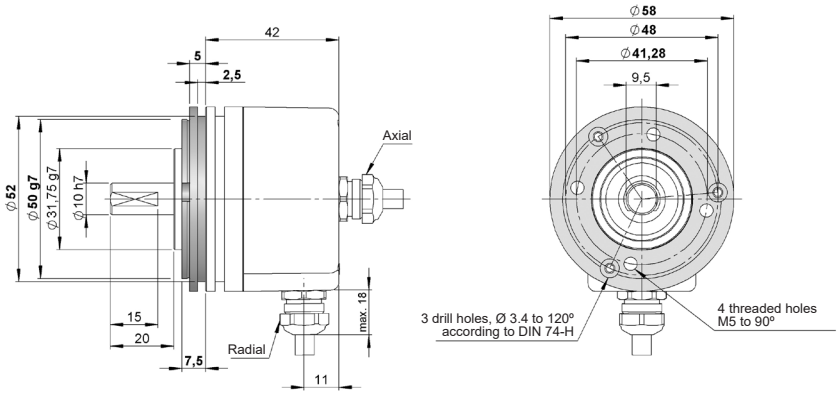


Flange 3
90.1003

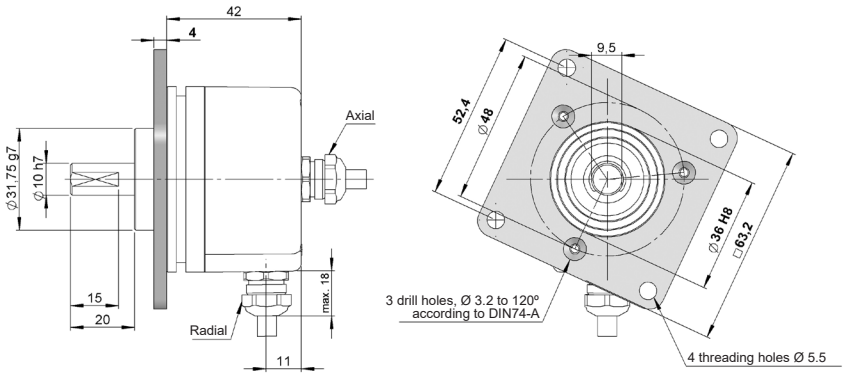




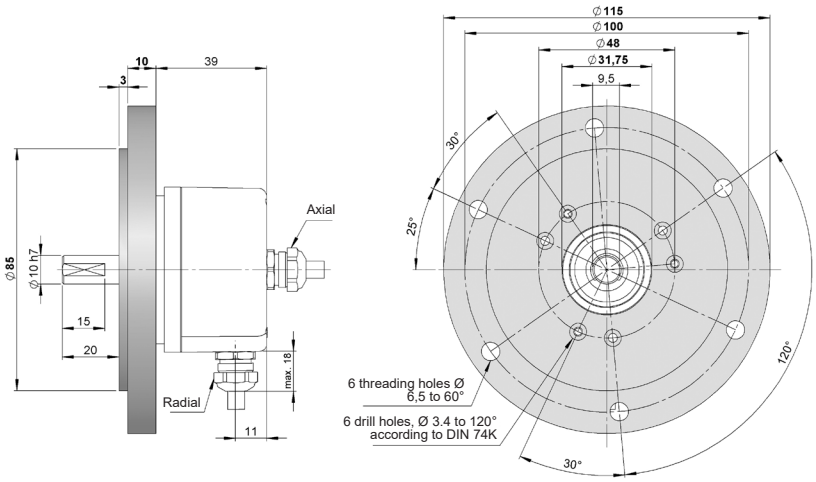
Flange 4
90.1004



Flange 5
90.1005



Flange 6
90.1006



SERIE SMRS 19

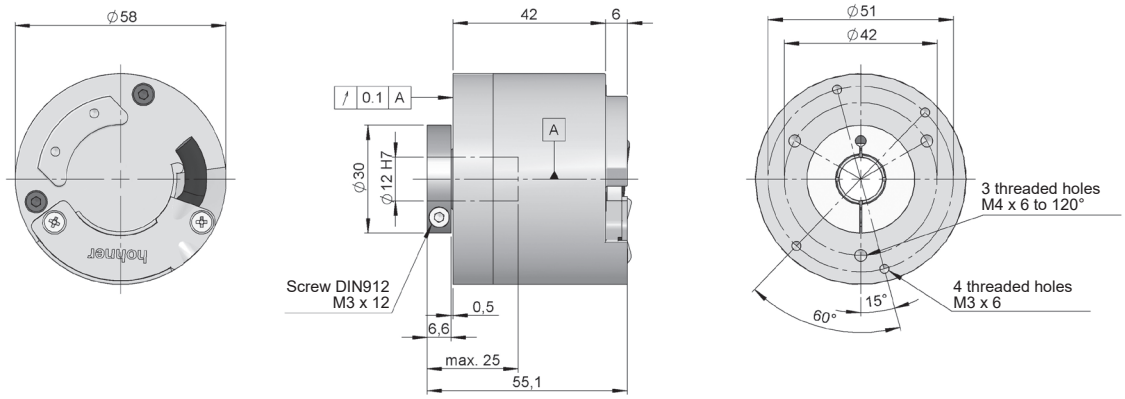
SINGLETURN ABSOLUTE AND INCREMENTAL BLIND HOLLOW SHAFT ENCODER

SSI
SSI + SinCos

BiSS-C
BiSS-C + SinCos

- Singleturn resolution up to 19 bits
- Incremental resolution 2048 SIN/COS
- External diameter 58 mm
- Blind hollow shaft Ø 8, 10, 12, 14 or 15 mm
- Operating temperature range up to 100°C
- Protection class IP65 according to DIN EN 60529
- Connection by cable (other cable length available) or industrial connector

Optical Encoder | Absolute and incremental encoder | Electronic output SIN/COS | Vibration and shock resistant | IP65 | Temperature range | Express Delivery



Drawing blind hollow shaft type 3, connection type 10, without flange

REFERENCE

Reference example: SMRS19-31121311S-17

Serie	Blind-Hollow shaft	Anti-rotation system	Connection	Interface	IP	Power supply	Parameters config.	Absolute resolution	Special customer
SMRS19 -	☐	☐	☐☐	☐☐	☐	☐	☐ -	☐☐	.☐☐
	3. Ø 12 mm **4.** Ø 10 mm **5.** Ø 8 mm **6.** Ø 14 mm **7.** Ø 15 mm	**1.** None **2.** Flexible flange (90.1018) **3.** Flexible flange (90.1027) **4.** Flexible flange (90.1075) (*)	**10.** Helicoidal cable **12.** Radial cable **20.** 30 cm helicoidal cable + connector D-Sub 15p **22.** 30 cm radial cable + connector D-Sub 15p **32.** Radial M23 12p **42.** Radial M12 8p **72.** Radial M23 17p	**11.** SSI Binary CW **12.** SSI Binary CCW **13.** SSI Gray CW **14.** SSI Gray CCW **21.** SSI + 2048 SIN/COS Binary CW **22.** SSI + 2048 SIN/COS Binary CCW **23.** SSI + 2048 SIN/COS Gray CW **24.** SSI + 2048 SIN/COS Gray CCW **35.** BiSS-C **45.** BiSS-C + 2048 SIN/COS	**1.** IP65 (**)	**1.** 4..30 VDC **2.** 5 VDC	**S.** Direction **R.** Reset	**09.** 9 bits **10.** 10 bits **12.** 12 bits **13.** 13 bits **14.** 14 bits **17.** 17 bits **19.** 19 bits (***)	**KD.** Halogen-free cable **MB.** -40°C

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service available in 24 h

(*) Anti-rotation system type 3 (Flexible flange 90.1027) and 4 (Flexible flange 90.1075) supplied assembled. Anti-rotation system type 2 (flexible flange 90.1018) supplied disassembled and includes the screws required for assembly.
(**) For helicoidal cable IP54.
(***) 21 bits - Upon request.
Other extension cable options available with specific connectors mounted at the end of the cable for different market drives, on request.

SERIE SMRS 19

SINGLETURN ABSOLUTE AND INCREMENTAL BLIND HOLLOW SHAFT ENCODER

SSI / SSI + SinCos
BiSS-C / BiSS-C + SinCos

TECHNICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Maximum number of revolutions permitted mechanically	6000 rpm
Protection against dust and splashes according to DIN EN 60529	IP65 - Standard IP54 - Helicoidal connection
Rotor inertia moment	≤ $3x10^{-6}$ Kgm²
Starting torque at 20°C (68°F)	≤ 0,02 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	60 N
Weight aprox.	0,4 Kg
Operating temperature range	-10°C to +100°C - Standard -40°C to +100°C - Special Customer MB
Vibration according to DIN EN 60068-2-6	100 m/s² (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s² (6ms)
Consumption	≤ 90 mA
Power supply	5 VDC ±10% / 4...30 VDC
Linearity	± ½ LSB
Helicoidal connection	2 meters cable (other cable lengths available or connector mounted at the end of the cable, upon request)
Axial or radial connection	2 meters cable or industrial connector M23 or M12 (other cable lengths available on order) or 30 cm cable + connector D-Sub 15p Female connector not included

SSI / BiSS INTERFACE

	SSI	BiSS INTERFACE (*)
Electronic output	RS485	RS485
Max. load capability / channel	±20 mA	±20 mA
Resolution	9...19 bits 21 bits - Upon request	9...19 bits 21 bits - Upon request
Code	Binary Gray	Binary
Clock frequency	50 kHz ... 2 MHz	50 kHz ... 10 MHz
Protocol	SSI	BiSS-C

(*) BiSS protocol allows to configure CRC, Alarm messages, Warnings, Sense, Reset and Absolute resolution by BUS. Default configuration: Binary CW.

INCREMENTAL OUTPUT

	SIN/COS
Electronic output	Differential 1 Vpp
Signal offset	2,5 VDC
Resolution	2048 ppr
Cutoff frequency (-3 db)	>500 kHz

SERIE SMRS 19

SINGLETURN ABSOLUTE AND INCREMENTAL BLIND HOLLOW SHAFT ENCODER

SSI / SSI + SinCos
BiSS-C / BiSS-C + SinCos

CONNECTION






	Cable (**) 3x2x0,14+2x0,34 95.0008003	**Cable (**)** 6x2x0,14 mm² 95.0008072	**Cable (**)** 6x2x0,14mm² Halogen-free cable up to 90°C 95.0008073	**Connector** BiSS M23 12p CW	**Connector** SSI M23 12p CW	**Connector** BiSS / SSI M23 17p CW	**Connector** M12 8p CCW	**Connector** D-Sub 15p High density
GND	Black	White	White	1	1	10	1	13
VCC	Red	Brown	Brown	8	2	7	2	12
DATA+	Yellow	Pink	Pink	2	3	14	3	7
DATA-	Green	Grey	Grey	7	4	17	4	2
CLOCK+	Brown	Yellow	Yellow	3	5	8	5	6
CLOCK-	Blue	Green	Green	6	6	9	6	1
SLI+	-	-	-	-	-	1		
SLI-	-	-	-	-	-	4		
DIR or RESET	Grey	Red-Blue	Red-Blue	9	9	2	7	11
A+(cos)	-	Red	Red	10	10	15		8
B+(sin)	-	Black	Black	4	7	12		9
A-(cos)	-	Blue	Blue	12	12	16		3
B-(sin)	-	Violet	Violet	5	8	13		4
Shield (*)	Shield	Shield	Shield	11	11	11	8	Housing

(*) Shield connected to the encoder housing. It is recommended to connect the end of the wire shield to the ground of the equipment where the encoder is connected. ⏚
(**) The recommended maximum cable length is 10 meters. The 95.0008003 cable for Interfaces types 11, 12, 13, 14 and 35 and the 95.0008072 cable for Interface types 21, 22, 23, 24 and 45. The 95.0008073 cable for special customer KD.

Cable length	< 25 m	< 50 m	< 100 m	< 200 m	< 400 m
Transmission speed	< 1 MHz	< 400 kHz	< 300 kHz	< 200 kHz	< 100 kHz

Cable length	< 10 m	< 25 m	< 60 m	< 100 m
Transmission speed	< 10 MHz	< 5 MHz	< 2 MHz	< 1 MHz

SERIE SMRS 19

SINGLETURN ABSOLUTE AND INCREMENTAL BLIND HOLLOW SHAFT ENCODER

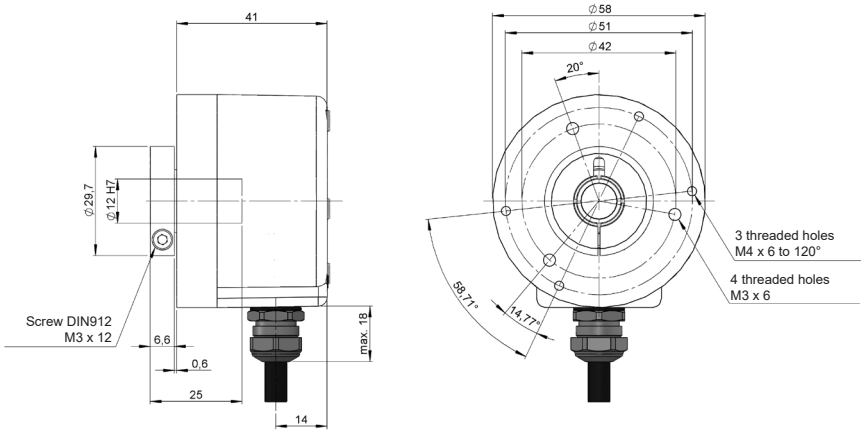
SSI / SSI + SinCos
BiSS-C / BiSS-C + SinCos

CONNECTION DIMENSIONS

Female connector not included

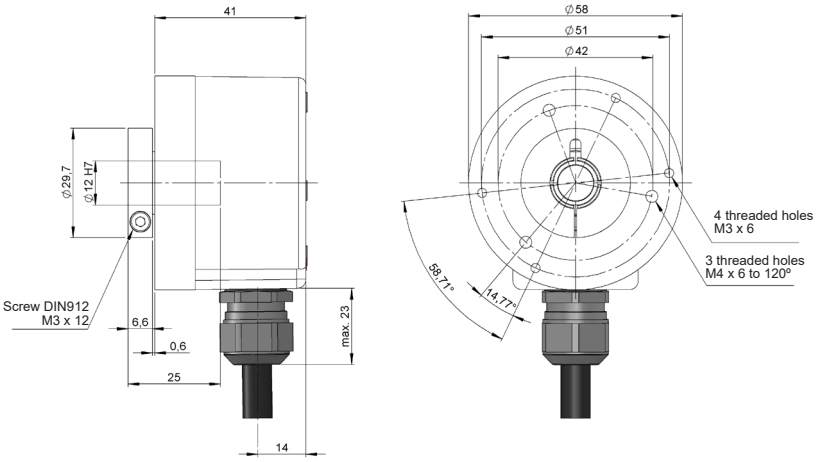
Connection 12

Radial cable
95.0008003



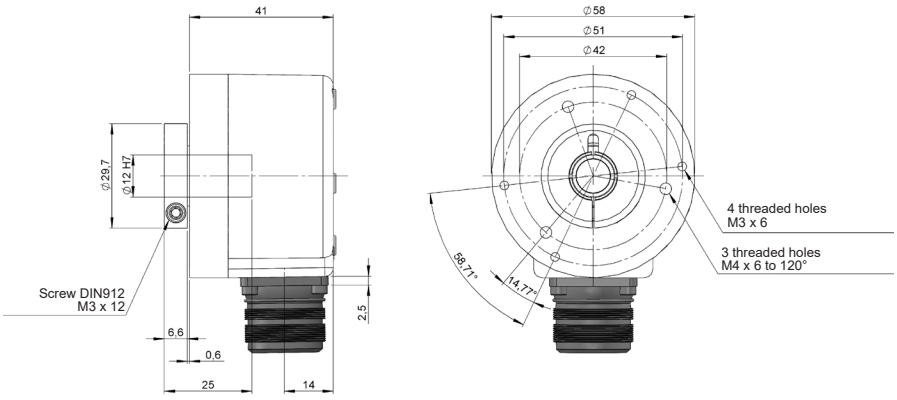
Connection 12

Radial cable
95.0008072
95.0008073

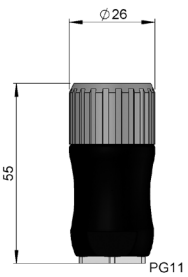


Connection 32

Radial
M23 12p
male panel



Female connector
95.0007131



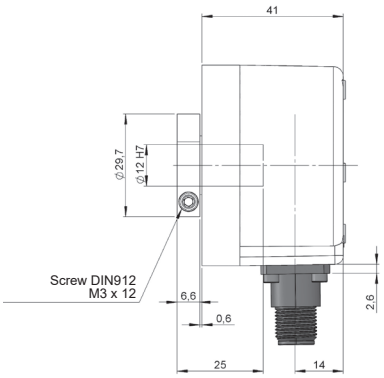
SERIE SMRS 19

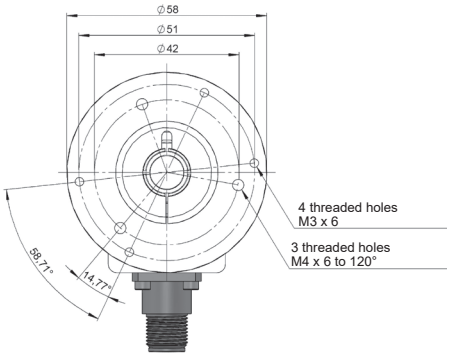
SINGLETURN ABSOLUTE AND INCREMENTAL BLIND HOLLOW SHAFT ENCODER

SSI / SSI + SinCos
BiSS-C / BiSS-C + SinCos

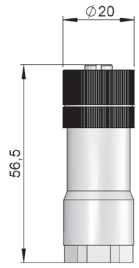
Connection 42

Radial
M12 8p
male panel



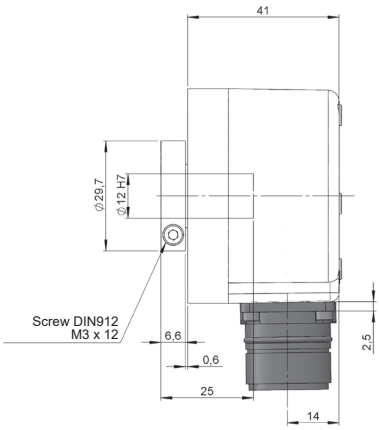


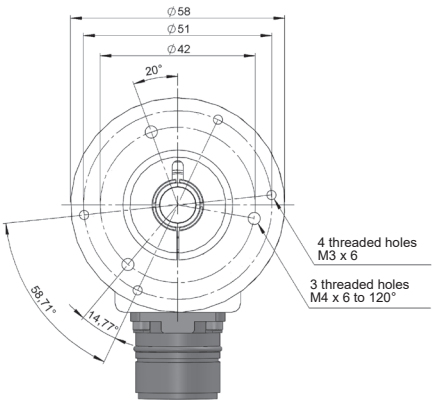
Female connector
95.0007152



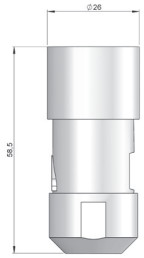
Connection 72

Radial
M23 17p
male panel





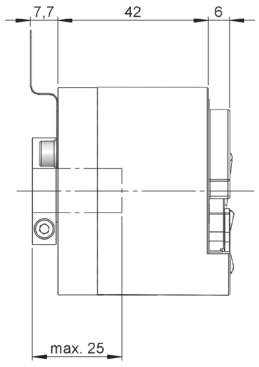
Female connector
95.0007196

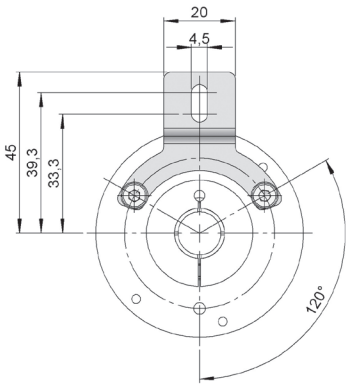


ANTI-ROTATION SYSTEMS DIMENSIONS

Anti-rotation system 2

Flexible flange 90.1018



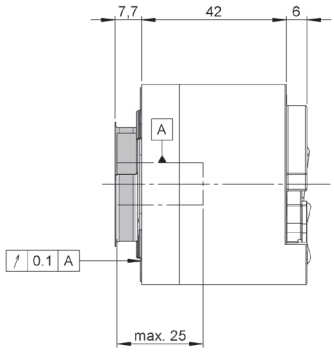


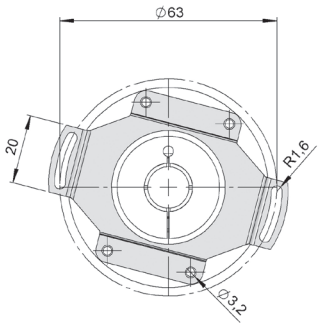
90.1018

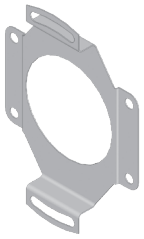
Anti-rotation system 3

Flexible flange 90.1027

90.1027



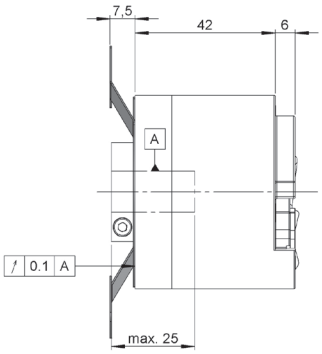


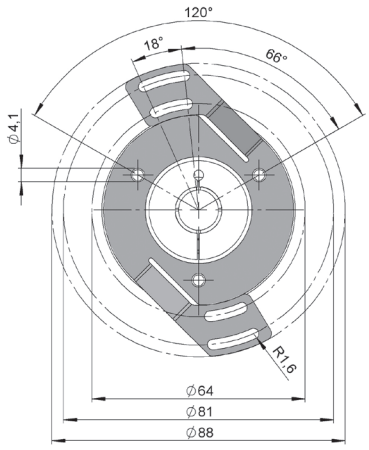


Anti-rotation system 4

Flexible flange 90.1075

90.1075





SERIE SMRS 59

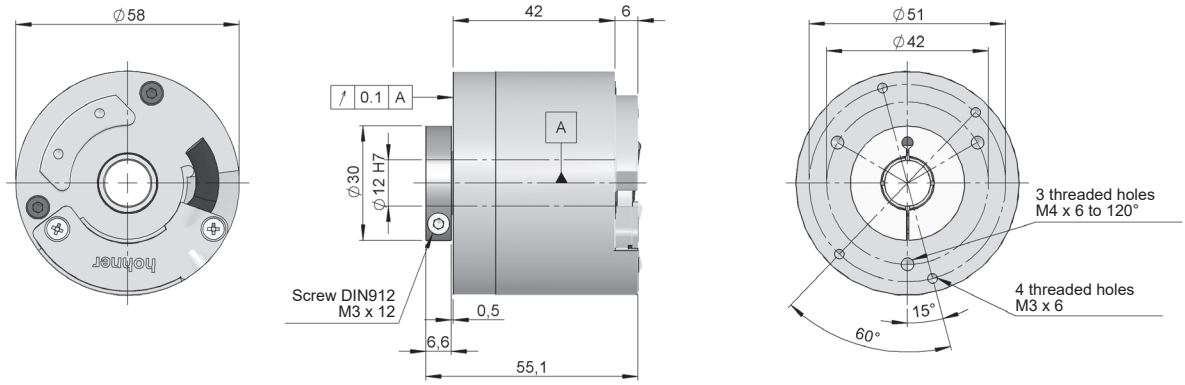
SINGLETURN ABSOLUTE AND INCREMENTAL HOLLOW SHAFT ENCODER

SSI
SSI + SinCos

BiSS-C
BiSS-C + SinCos

- **Singleturn resolution up to 19 bits**
- **Incremental resolution 2048 SIN/COS**
- **External diameter 58 mm**
- **Hollow shaft Ø 8, 10, 12, 14 or 15 mm**
- **Operating temperature range up to 100°C**
- **Protection class IP65 according to DIN EN 60529**
- **Connection by cable (other cable length available) or industrial connector**

Optical Encoder | Absolute and incremental encoder | Electronic output SIN/COS | Vibration and shock resistant | IP65 | Temperature range | Express Delivery



Drawing hollow shaft type 3, connection type 10, without flange

REFERENCE

Reference example: SMRS59-31121311S-17

Serie	Hollow shaft	Anti-rotation system	Connection	Interface	IP	Power supply	Parameters config.	Absolute resolution	Special customer
SMRS59 -	☐	☐	☐☐	☐☐	☐	☐	☐ -	☐☐	.☐☐
	3. Ø 12 mm **4.** Ø 10 mm **5.** Ø 8 mm **6.** Ø 14 mm **7.** Ø 15 mm	**1.** None **2.** Flexible flange (90.1018) **3.** Flexible flange (90.1027) **4.** Flexible flange (90.1075) (*)	**10.** Helicoidal cable **12.** Radial cable **20.** 30 cm helicoidal cable + connector D-Sub 15p **22.** 30 cm radial cable + connector D-Sub 15p **32.** Radial M23 12p **42.** Radial M12 8p **72.** Radial M23 17p	**11.** SSI Binary CW **12.** SSI Binary CCW **13.** SSI Gray CW **14.** SSI Gray CCW **21.** SSI + 2048 SIN/COS Binary CW **22.** SSI + 2048 SIN/COS Binary CCW **23.** SSI + 2048 SIN/COS Gray CW **24.** SSI + 2048 SIN/COS Gray CCW **35.** BiSS-C **45.** BiSS-C + 2048 SIN/COS	**1.** IP65 (**)	**1.** 4..30 VDC **2.** 5 VDC	**S.** Direction **R.** Reset	**09.** 9 bits **10.** 10 bits **12.** 12 bits **13.** 13 bits **14.** 14 bits **17.** 17 bits **19.** 19 bits (***)	**KD.** Halogen-free cable **MB.** -40°C

Order your reference
Step file 3D
info@encoderhohner.com
service available in 24 h

(*) Anti-rotation system type 3 (Flexible flange 90.1027) and 4 (Flexible flange 90.1075) supplied assembled. Anti-rotation system type 2 (flexible flange 90.1018) supplied disassembled and includes the screws required for assembly.
(**) For helicoidal cable IP54.
(***) 21 bits - Upon request.
Other extension cable options available with specific connectors mounted at the end of the cable for different market drives, on request.

SERIE SMRS 59

SINGLETURN ABSOLUTE AND INCREMENTAL HOLLOW SHAFT ENCODER

SSI / SSI + SinCos
BiSS-C / BiSS-C + SinCos

TECHNICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Maximum number of revolutions permitted mechanically	6000 rpm
Protection against dust and splashes according to DIN EN 60529	IP65 - Standard IP54 - Helicoidal connection
Rotor inertia moment	≤ $3x10^{-6}$ Kgm²
Starting torque at 20°C (68°F)	≤ 0,02 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	60 N
Weight aprox.	0,4 Kg
Operating temperature range	-10°C to +100°C - Standard -40°C to +100°C - Special Customer MB
Vibration according to DIN EN 60068-2-6	100 m/s² (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s² (6ms)
Consumption	≤ 90 mA
Power supply	5 VDC ±10% / 4...30 VDC
Linearity	± ½ LSB
Helicoidal connection	2 meters cable (other cable lengths available or connector mounted at the end of the cable, upon request)
Axial or radial connection	2 meters cable or industrial connector M23 or M12 (other cable lengths available on order) or 30 cm cable + connector D-Sub 15p Female connector not included

SSI / BiSS INTERFACE

	SSI	BiSS INTERFACE (*)
Electronic output	RS485	RS485
Max. load capability / channel	±20 mA	±20 mA
Resolution	9...19 bits 21 bits - Upon request	9...19 bits 21 bits - Upon request
Code	Binary Gray	Binary
Clock frequency	50 kHz ... 2 MHz	50 kHz ... 10 MHz
Protocol	SSI	BiSS-C

(*) BiSS protocol allows to configure CRC, Alarm messages, Warnings, Sense, Reset and Absolute resolution by BUS. Default configuration: Binary CW.

INCREMENTAL OUTPUT

	SIN/COS
Electronic output	Differential 1 Vpp
Signal offset	2,5 VDC
Resolution	2048 ppr
Cutoff frequency (-3 db)	>500 kHz

SERIE SMRS 59

SINGLETURN ABSOLUTE AND INCREMENTAL HOLLOW SHAFT ENCODER

SSI / SSI + SinCos
BiSS-C / BiSS-C + SinCos

CONNECTION






	Cable (**) 3x2x0,14+2x0,34 95.0008003	**Cable (**)** 6x2x0,14 mm² 95.0008072	**Cable (**)** 6x2x0,14mm² Halogen-free cable up to 90°C 95.0008073	**Connector** BiSS M23 12p CW	**Connector** SSI M23 12p CW	**Connector** BiSS / SSI M23 17p CW	**Connector** M12 8p CCW	**Connector** D-Sub 15p High density
GND	Black	White	White	1	1	10	1	13
VCC	Red	Brown	Brown	8	2	7	2	12
DATA+	Yellow	Pink	Pink	2	3	14	3	7
DATA-	Green	Grey	Grey	7	4	17	4	2
CLOCK+	Brown	Yellow	Yellow	3	5	8	5	6
CLOCK-	Blue	Green	Green	6	6	9	6	1
SLI+	-	-	-	-	-	1		
SLI-	-	-	-	-	-	4		
DIR or RESET	Grey	Red-Blue	Red-Blue	9	9	2	7	11
A+(cos)	-	Red	Red	10	10	15		8
B+(sin)	-	Black	Black	4	7	12		9
A-(cos)	-	Blue	Blue	12	12	16		3
B-(sin)	-	Violet	Violet	5	8	13		4
Shield (*)	Shield	Shield	Shield	11	11	11	8	Housing

(*) Shield connected to the encoder housing. It is recommended to connect the end of the wire shield to the ground of the equipment where the encoder is connected. ⏚
(**) The recommended maximum cable length is 10 meters. The 95.0008003 cable for Interfaces types 11, 12, 13, 14 and 35 and the 95.0008072 cable for Interface types 21, 22, 23, 24 and 45. The 95.0008073 cable for special customer KD.

	Cable length	< 25 m	< 50 m	< 100 m	< 200 m	< 400 m
SSI	Transmission speed	< 1 MHz	< 400 kHz	< 300 kHz	< 200 kHz	< 100 kHz

	Cable length	< 10 m	< 25 m	< 60 m	< 100 m
BiSS INTERFACE	Transmission speed	< 10 MHz	< 5 MHz	< 2 MHz	< 1 MHz

SERIE SMRS 59

SINGLETURN ABSOLUTE AND INCREMENTAL HOLLOW SHAFT ENCODER

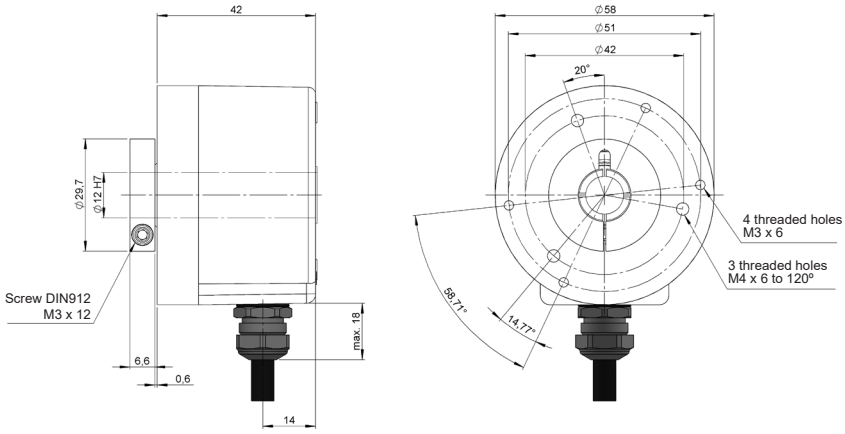
SSI / SSI + SinCos
BiSS-C / BiSS-C + SinCos

CONNECTION DIMENSIONS

Female connector not included

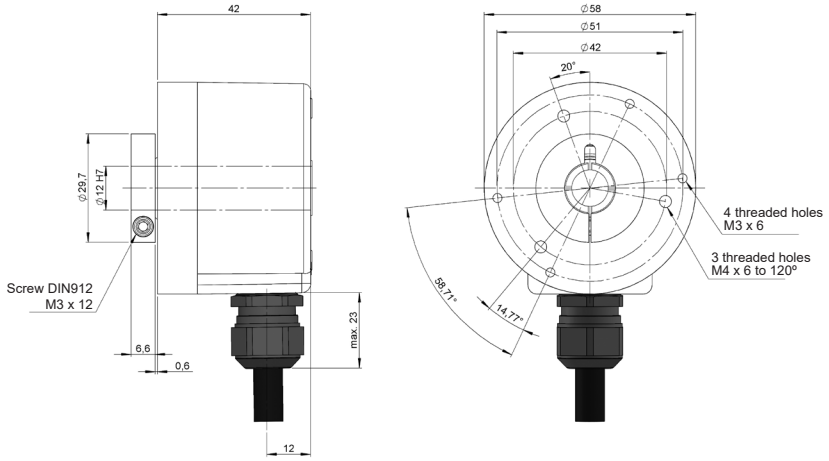
Connection 12

Radial cable
95.0008003



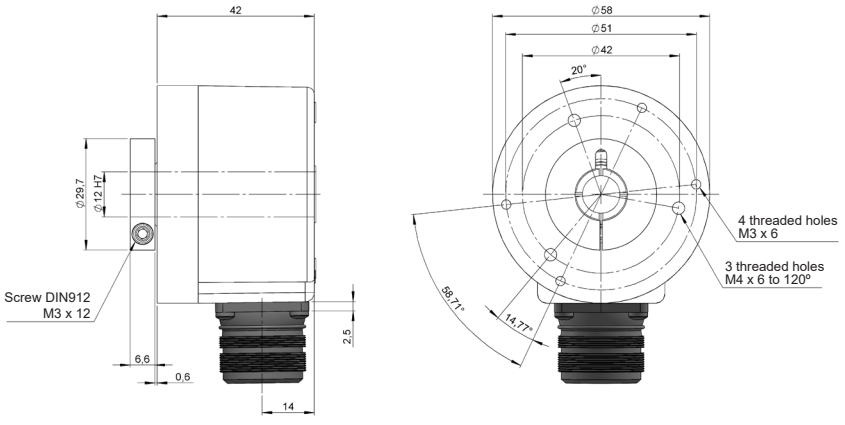
Connection 12

Radial cable
95.0008072
95.0008073

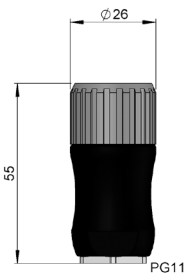


Connection 32

Radial
M23 12p
male panel

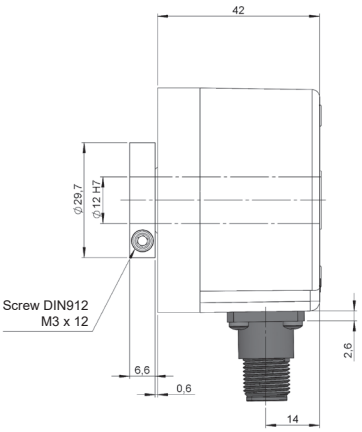


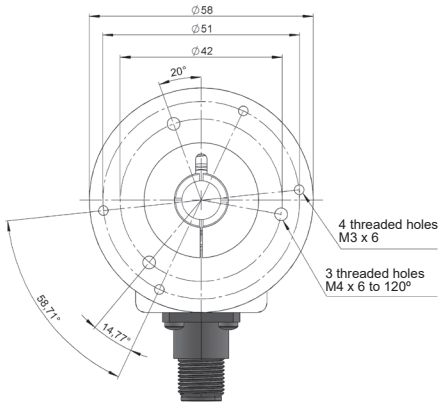
Female connector
95.0007131



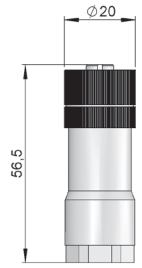
Connection 42

Radial
M12 8p
male panel



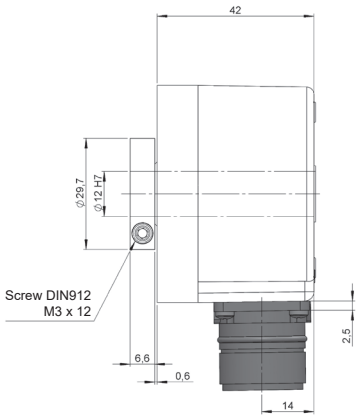


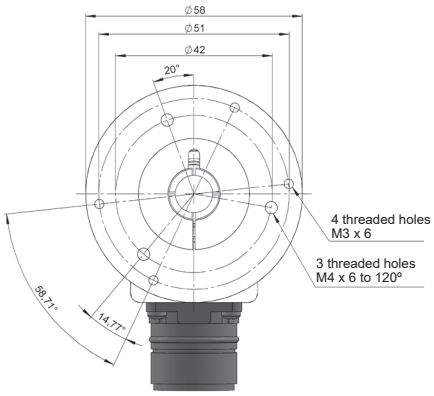
Female connector
95.0007152



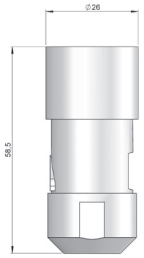
Connection 72

Radial
M23 17p
male panel





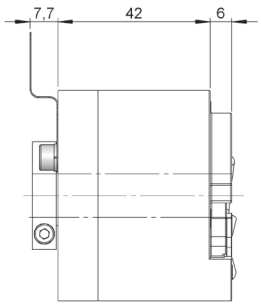
Female connector
95.0007196

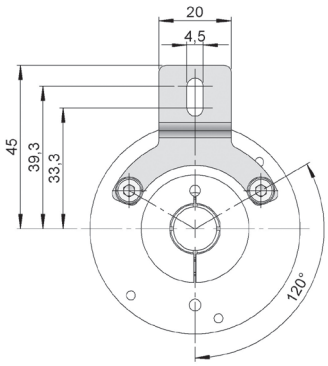


ANTI-ROTATION SYSTEMS DIMENSIONS

Anti-rotation system 2

Flexible flange 90.1018



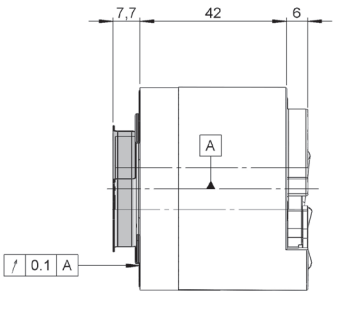


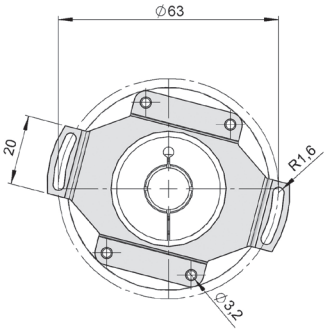
90.1018

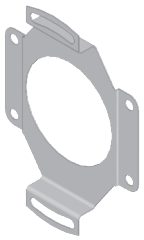
Anti-rotation system 3

Flexible flange 90.1027

90.1027



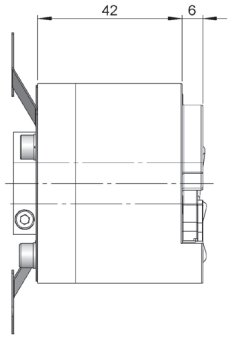


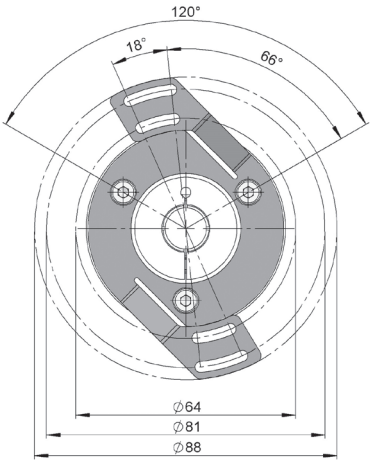


Anti-rotation system 4

Flexible flange 90.1075

90.1075





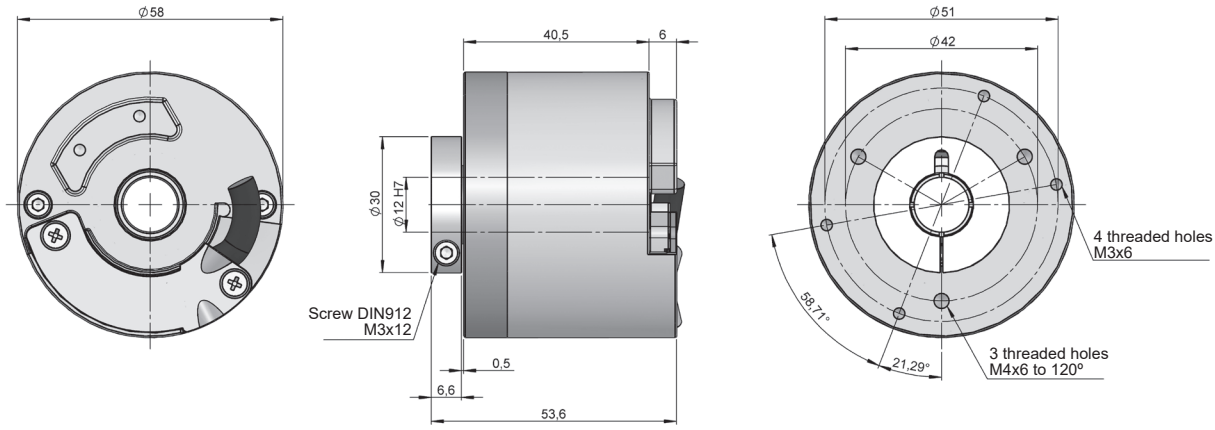
SERIE SMRS 59S

SINGLETURN ABSOLUTE AND INCREMENTAL HOLLOW SHAFT ENCODER

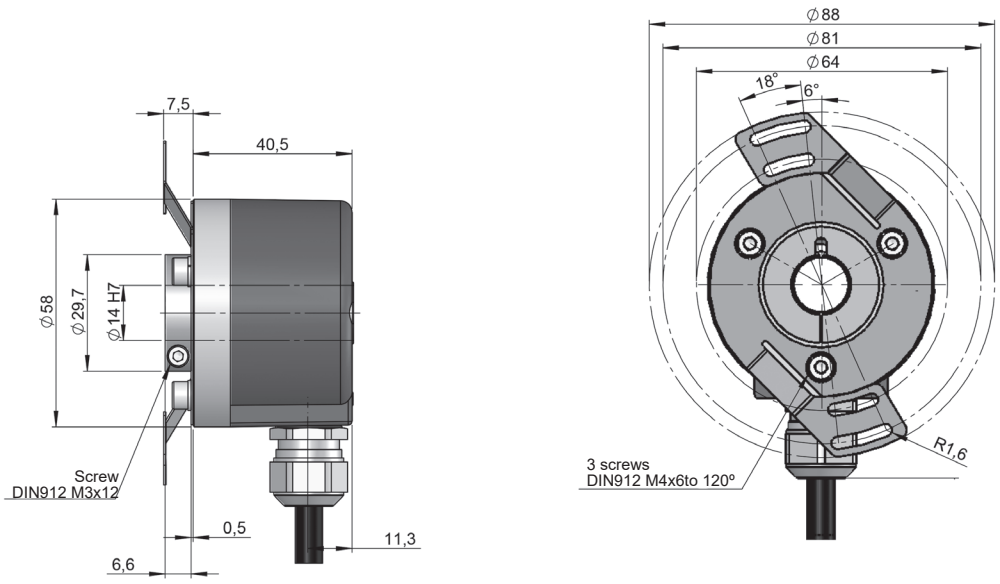
SIN/COS + SIN/COS

- **Absolute resolution 1 SIN/COS per turn**
- **Incremental resolution 2048 SIN/COS per turn**
- **External diameter 58 mm**
- **Hollow shaft Ø 12 or 14 mm**
- **Protection class IP65 according to DIN EN 60529**
- **Anti-rotation system through flexible flange**
- **Connection by cable (other cable length available)**

Optical Encoder | Absolute and incremental encoder | SIN/COS | Vibration and shock resistant | IP54 | Express Delivery



Drawing anti-rotation system type 0, hollow shaft type 12 mm, connection type 10



Drawing anti-rotation system type 0, hollow shaft type 14 mm, connection type 12

SERIE SMRS 59S

SINGLETURN ABSOLUTE AND INCREMENTAL HOLLOW SHAFT ENCODER

SIN/COS + SIN/COS

REFERENCE

Reference example: SMRS59S-10106012-2048

Serie	Hollow shaft	Anti-rotation system	Connection	Interface	IP	Power supply	Pulses number	Special customer
SMRS59S -	☐	☐	☐☐	☐☐	☐	☐-	2048	.☐☐
	1. Ø 12 mm **2.** Ø 14 mm	**0.** None **1.** Flexible flange 90.1027 **2.** Flexible flange 90.1075 (*)	**10.** Helicoidal cable **12.** Radial cable **20.** 30 cm cable + connector D-Sub 15p	**60.** Absolute 1 SIN/COS in 360° and incremental 2048 SIN/COS	**1.** IP65 (**)	**2.** 5 VDC		**KD.** Halogen-free cable

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info@encoderhohner.com

service available in 24 h

(*) Anti-rotation system type 1 (Flexible flange 90.1027) and 2 (Flexible flange 90.1075) supplied assembled.
(**) For helicoidal cable IP54.
Other extension cable options available with specific connectors mounted at the end of the cable for different market drives, on request.
All systems and required assembly and disassembly screws available in the section "ACCESSORIES".

TECHNICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Housing fixing	Flexible flange 90.1027 Flexible flange 90.1075
Permitted misalignment	±0.5 mm axial, ±0.3 mm radial (90.1027) ±0.5 mm axial, ±0.2 mm radial (90.1075)
Maximum number of revolutions permitted mechanically	6000 rpm
Protection against dust and splashes according to DIN EN 60529	IP65 - Standard IP54 - Helicoidal connection
Rotor inertia moment	≤ $3x10^{-6}$ Kgm²
Starting torque at 20°C (68°F)	≤ 0,02 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	80 N
Weight aprox.	0,4 Kg
Operating temperature range	-20°C to +80°C - Standard KD
Vibration according to DIN EN 60068-2-6	100 m/s² (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s² (6ms)
Consumption	≤ 90 mA
Power supply	5 VDC ±10%
Electronic incremental output	SIN/COS, 1 Vpp ±20%
Incremental resolution	2048 SIN/COS
Electronic absolute output	SIN/COS, 1 Vpp ±20%
Absolute resolution	1 SIN/COS in 360°
Frequency (-3 dB)	≤ 200 kHz
Signal offset	2,5 VDC
Helicoidal cable	2 meters cable (other cable lengths available or connector mounted at the end of the cable, upon request) or 30 cm cable + connector D-Sub 15p
Radial connection	2 meters cable (other cable lengths available or connector mounted at the end of the cable, upon request)

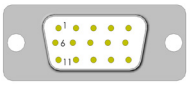
SERIE SMRS 59S

SINGLETURN ABSOLUTE AND INCREMENTAL HOLLOW SHAFT ENCODER

SIN/COS + SIN/COS

CONNECTION





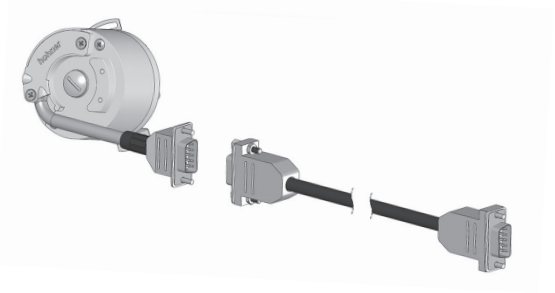
	Cable 6x2x0,14 mm² (**) up to 100°C 95.0008072	**Cable** 6x2x0,14 mm² (**) Halogen-free cable up to 90°C 95.0008073	D-Sub 15p HD
POWER SUPPLY			
GND	White	White	7
VCC	Brown	Brown	9
INCREMENTAL SIGNALS			
A+	Green	Green	5
A-	Yellow	Yellow	6
B+	Blue	Blue	8
B-	Red	Red	1
Z+	Grey-Pink	Grey-Pink	3
Z-	Red-Blue	Red-Blue	4
ABSOLUTE SIGNALS			
C+	Grey	Grey	11
C-	Pink	Pink	10
D+	Black	Black	12
D-	Violet	Violet	13
Shield*	Shield	Shield	Housing

(*) Shield connected to the encoder housing. It is recommended to connect the end of the wire shield to the ground of the equipment where the encoder is connected. ⏚

(**) The recommended maximum cable length is 10 meters.
For longer lengths use connection option type 20 connection with extension accessories.

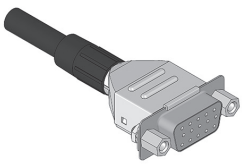
ACCESSORIES

Extension cable connection



Other extension cable options available with specific connectors mounted at the end of the cable for different market drives, on request.

Female connector (not included)



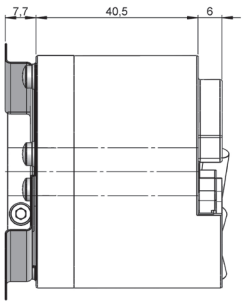
90.9546H
(D-Sub 15p)
The female connector is supplied disassembled, with the assembly instruction manual.

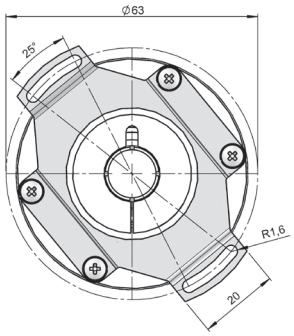
ANTI-ROTATION SYSTEMS DIMENSIONS

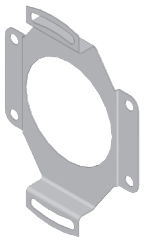
Anti-rotation system 1

Flexible flange
90.1027

90.1027



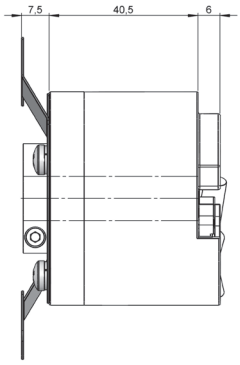




Anti-rotation system 2

Flexible flange
90.1075

90.1075



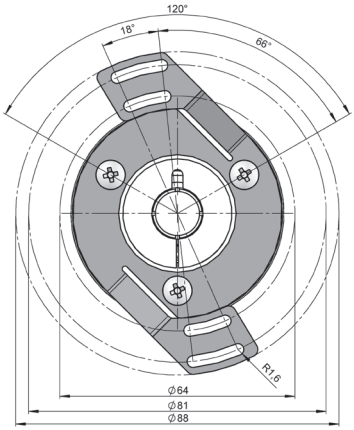


Image with Expanding coupling 90.1101

SERIE SMRS 64

SINGLETURN ABSOLUTE AND INCREMENTAL CONIC SHAFT ENCODER

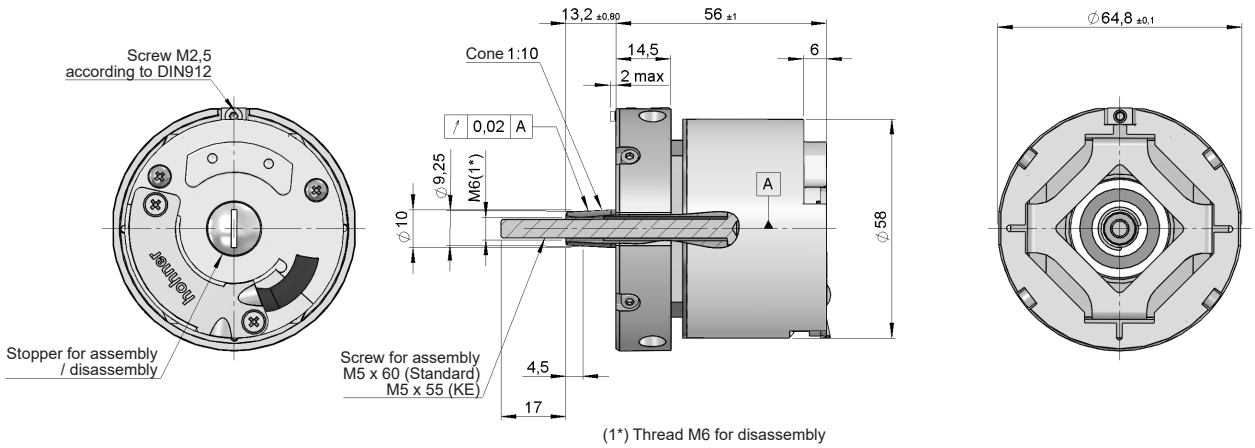
SSI
SSI + SinCos

BiSS-C
BiSS-C + SinCos

- Singleturn resolution up to 19 bits
- Incremental resolution 2048 SIN/COS per turn
- External diameter 58 mm
- Conic shaft 1:10
- Operating temperature range up to +100°C
- Protection class IP54 according to DIN EN 60529
- Anti-rotation system through flexible flange or expanding coupling
- Connection by cable (other cable length available)

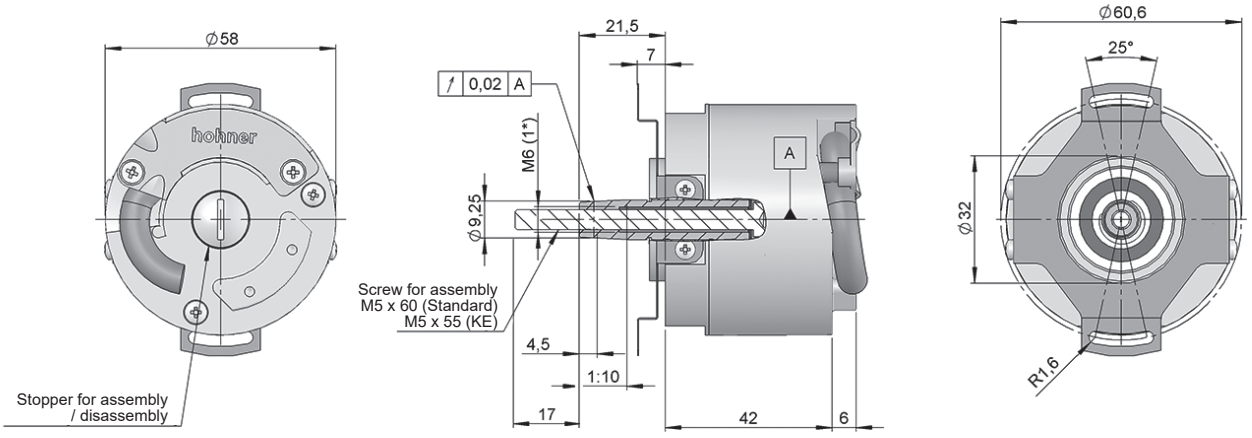
Optical Encoder | Absolute and incremental encoder | SIN/COS | Vibration and shock resistant | IP54 | Temperature range | Express Delivery

Expanding coupling (90.1101)



Drawing mechanical option type 2, conic shaft 1:10, connection type 10

Flexible flange (90.1038)



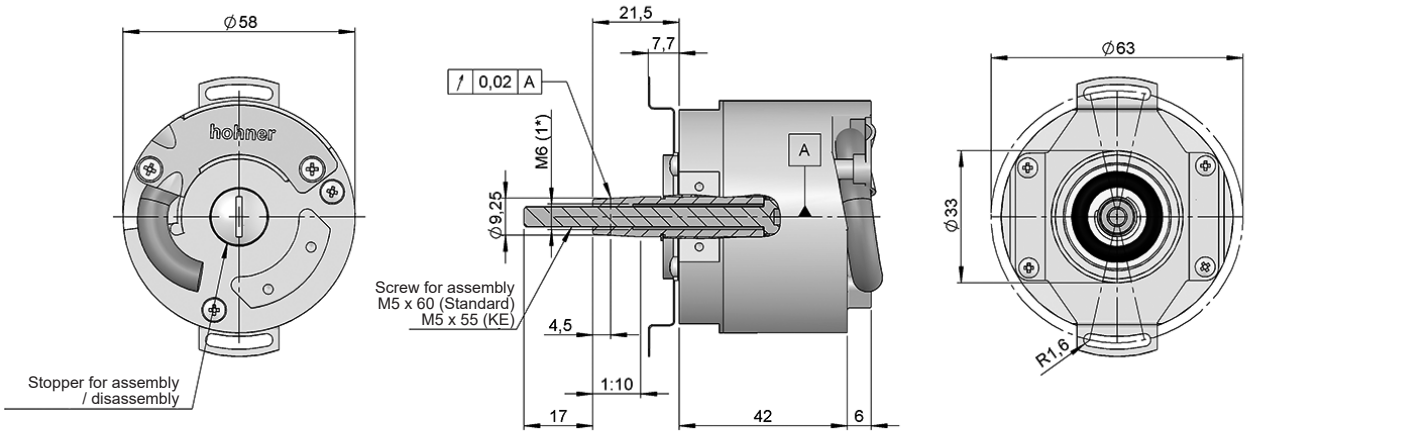
Drawing mechanical option type 1, conic shaft 1:10, connection type 10

SERIE SMRS 64

SINGLETURN ABSOLUTE AND INCREMENTAL CONIC SHAFT ENCODER

SSI
SSI + SinCos
BiSS-C
BiSS-C + SinCos

Flexible flange (90.1027)



(1*) Thread M6 for disassembly

Drawing mechanical option type 3, conic shaft 1:10, connection type 10

REFERENCE

Reference example: SMRS64-13101311S-17

Serie	Conic shaft	Mechanical option	Connection	Interface	IP	Power supply	Parameters config.	Absolute resolution	Special customer
SMRS64 -	☐	☐	☐☐	☐☐	☐	☐	☐ -	☐☐	. ☐☐
	1. Conic 1:10	**1.** Flexible flange 90.1038 **2.** Expanding coupling 90.1101 **3.** Flexible flange 90.1027 (*)	**10.** Helicoidal cable **20.** 30 cm cable + connector D-Sub 15p	**11.** SSI Binary CW **12.** SSI Binary CCW **13.** SSI Gray CW **14.** SSI Gray CCW **21.** SSI + 2048 SIN/COS Binary CW **22.** SSI + 2048 SIN/COS Binary CCW **23.** SSI + 2048 SIN/COS Gray CW **24.** SSI + 2048 SIN/COS Gray CCW **35.** BiSS-C **45.** BiSS-C + 2048 SIN/COS	**1.** IP54	**1.** 4..30 VDC **2.** 5 VDC	**S.** Direction **R.** Reset	**09.** 9 bits **10.** 10 bits **12.** 12 bits **13.** 13 bits **14.** 14 bits **17.** 17 bits **19.** 19 bits (**)	**KD.** Halogen-free cable **KE.** Screw for assembly M5x55 95.0004099

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(*) Anti-rotation system type 1 (Flexible flange 90.1038), 2 (Expanding coupling 90.1101) and 3 (Flexible flange 90.1027) supplied assembled.
(**) 21 bits - Upon request.

Other extension cable options available with specific connectors mounted at the end of the cable for different market drives, on request.
All systems and required assembly and disassembly screws available in the section “ACCESSORIES”.

Assembly and disassembly instruction manual available in:
www.encoderhohner.com/product/serie-smrs64/

SERIE SMRS 64

SINGLETURN ABSOLUTE AND INCREMENTAL CONIC SHAFT ENCODER

SSI
SSI + SinCos
BiSS-C
BiSS-C + SinCos

TECHNICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Housing fixing	Expanding coupling 90.1101 (assembled) Flexible flange 90.1038 (assembled) Flexible flange 90.1027 (assembled)
Permitted misalignment	±0.5 mm axial (90.1101) ±0.5 mm axial, ±0.3 mm radial (90.1038, 90.1027)
Maximum number of revolutions permitted mechanically	6000 rpm
Protection against dust and splashes according to DIN EN 60529	IP54
Rotor inertia moment	≤ $3x10^{-6}$ Kgm²
Starting torque at 20°C (68°F)	≤ 0,02 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	60 N
Weight aprox.	0,4 Kg
Operating temperature range	-20°C to +100°C
Vibration according to DIN EN 60068-2-6	100 m/s² (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s² (6ms)
Consumption	≤ 90 mA
Power supply	5 VDC ±10% / 4...30 VDC
Linearity	± ½ LSB
Helicoidal cable	2 meters cable (other cable lengths available or connector mounted at the end of the cable, upon request) or 30 cm cable + connector D-Sub 15p

SSI / BiSS INTERFACE

	SSI	BiSS INTERFACE (*)
Electronic output	RS485	RS485
Max. load capability / channel	±20 mA	±20 mA
Resolution	9...19 bits 21 bits - Upon request	9...19 bits 21 bits - Upon request
Code	Binary Gray	Binary
Clock frequency	50 kHz ... 2 MHz	50 kHz ... 10 MHz
Protocol	SSI	BiSS-C

(*) BiSS protocol allows to configure CRC, Alarm messages, Warnings, Sense, Reset and Absolute resolution by BUS. Default configuration: Binary CW.

INCREMENTAL OUTPUT

	SIN/COS
Electronic output	Differential 1 Vpp
Signal offset	2,5 VDC
Resolution	2048 PPR
Cutoff frequency (-3 db)	>500 kHz

SERIE SMRS 64

SINGLETURN ABSOLUTE AND INCREMENTAL CONIC SHAFT ENCODER

SSI
SSI + SinCos
BiSS-C
BiSS-C + SinCos

CONNECTION

	Cable 3x2x0,14+2x0,34 (**) 95.0008003	**Cable** 6x2x0,14 mm² (**) up to 100°C 95.0008072	**Cable** 6x2x0,14 mm² (**) Halogen-free cable up to 90°C 95.0008073	D-Sub 15p HD
GND	Black	White	White	13
VCC	Red	Brown	Brown	12
DATA+	Yellow	Pink	Pink	7
DATA-	Green	Grey	Grey	2
CLOCK+	Brown	Yellow	Yellow	6
CLOCK-	Blue	Green	Green	1
DIR or RESET	Grey	Red-Blue	Red-Blue	11
A+(cos)	-	Red	Red	8
B+(sin)	-	Black	Black	9
A-(cos)	-	Blue	Blue	3
B-(sin)	-	Violet	Violet	4
Shield*	Shield	Shield	Shield	Housing

(*) Shield connected to the encoder housing. It is recommended to connect the end of the wire shield to the ground of the equipment where the encoder is connected. ⏚
(**) The recommended maximum cable length is 10 meters. The 95.0008003 cable for Interfaces types 11, 12, 13, 14 and 35 and the 95.0008072 cable for Interface types 21, 22, 23, 24 and 45. The 95.0008073 cable for special customer KD.

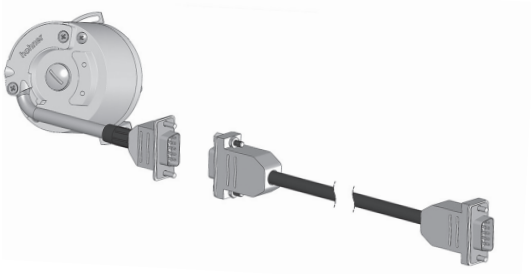
For longer lengths use connection option type 20 connection with extension accessories.

SSI	Cable length:	< 25 m	< 50 m	< 100 m	< 200 m	< 400 m
	Transmission speed	< 1 MHz	< 400 kHz	< 300 kHz	< 200 kHz	< 100 kHz

BiSS INTERFACE	Cable length	< 10 m	< 25 m	< 60 m	< 100 m
	Transmission speed	< 10 MHz	< 5 MHz	< 2 MHz	< 1 MHz

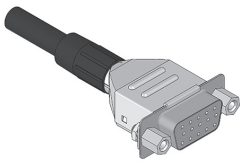
ACCESSORIES

Extension cable connection



Other extension cable options available with specific connectors mounted at the end of the cable for different market drives, on request.

Female connector (not included)



D-Sub 15p
The female connector is supplied disassembled, with the assembly instruction manual.

Screw for assembly (included)

95.0004105
M5x60
(Standard)

95.0004099
M5 x 55
(Special Customer KE)

Screw for disassembly (not included)

95.0004106
M6x55

95.0004420
Grub screw M5 x 20
45H DIN913


Image with Expanding coupling 90.1101

SERIE SMRS 64S

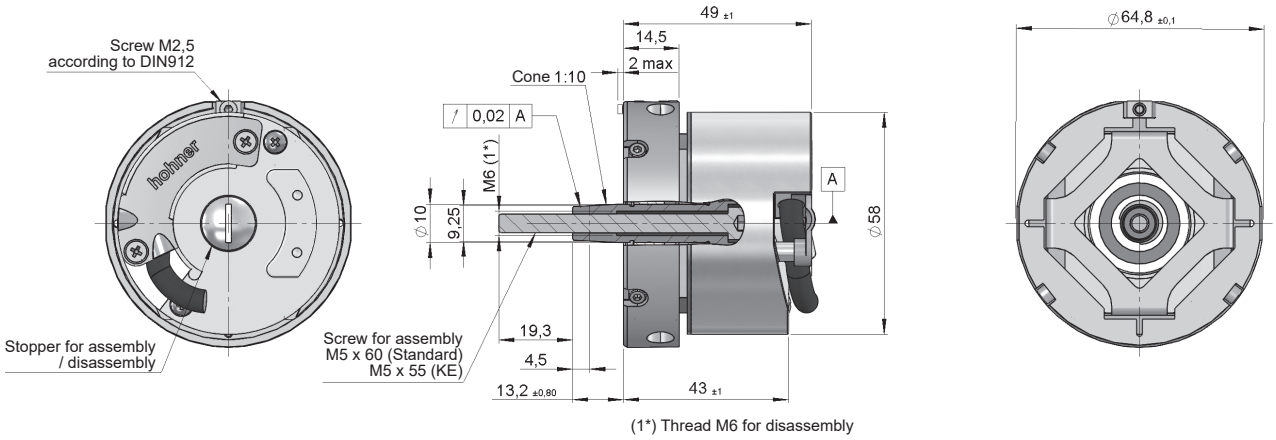
SINGLETURN ABSOLUTE AND INCREMENTAL CONIC SHAFT ENCODER

SIN/COS + SIN/COS

- **Absolute resolution 1 SIN/COS per turn**
- **Incremental resolution 2048 SIN/COS per turn**
- **External diameter 58 mm**
- **Conic shaft 1:10**
- **Protection class IP54 according to DIN EN 60529**
- **Anti-rotation system through flexible flange or expanding coupling**
- **Connection by cable (other cable length available)**

Optical Encoder | Absolute and incremental encoder | SIN/COS | Vibration and shock resistant | IP54 | Express Delivery

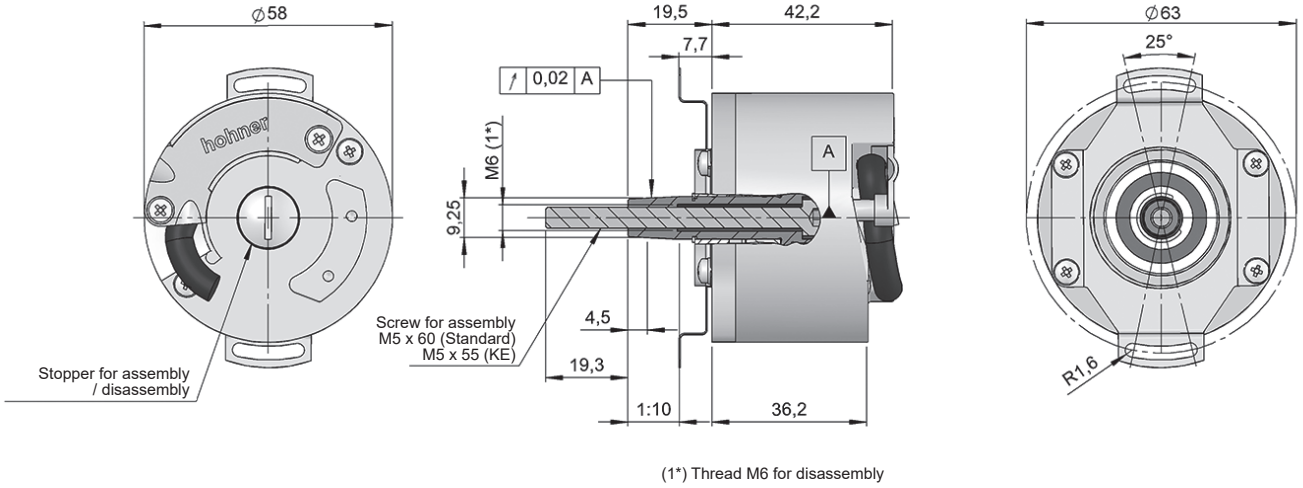
Expanding coupling (90.1101)



(1*) Thread M6 for disassembly

Drawing mechanical option type 2, conic shaft 1:10, connection type 10

Flexible flange (90.1027)



(1*) Thread M6 for disassembly

Drawing mechanical option type 1, conic shaft 1:10, connection type 10

SERIE SMRS 64S

SINGLETURN ABSOLUTE AND INCREMENTAL CONIC SHAFT ENCODER

SIN/COS + SIN/COS

REFERENCE

Reference example: SMRS64S-12106012-2048

Serie	Conic shaft	Mechanical option	Connection	Interface	IP	Power supply	Pulses number	Special customer
SMRS64S -	☐	☐	☐☐	☐☐	☐	☐	2048	.☐☐
	1. Conic 1:10	**1.** Flexible flange 90.1027 **2.** Expanding coupling 90.1101 (*)	**10.** Helicoidal cable **20.** 30 cm cable + connector D-Sub 15p	**60.** Absolute 1 SIN/COS in 360° and incremental 2048 SIN/COS	**1.** IP54	**2.** 5 VDC		**KD.** Halogen-free cable **KE.** Screw for assembly M5x55 95.0004099

(*) Anti-rotation system type 1 (Flexible flange 90.1027) and 2 (Expanding coupling 90.1101) supplied assembled.

Other extension cable options available with specific connectors mounted at the end of the cable for different market drives, on request.
All systems and required assembly and disassembly screws available in the section “ACCESSORIES”.

Order your reference
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info@encoderhohner.com
service available in 24 h

Assembly and disassembly instruction manual available in:
www.encoderhohner.com/product/serie-smrs64s/

TECHNICAL SPECIFICATIONS

Materials	Housing: Aluminium Flange: Aluminium Shaft: Stainless Steel
Bearings	Ballraces
Bearings lifetime	$1x10^{10}$ rev.
Housing fixing	Expanding coupling 90.1101 (assembled) Flexible flange 90.1027 (assembled)
Permitted misalignment	±0.5 mm axial (90.1101) ±0.5 mm axial, ±0.3 mm radial (90.1027)
Maximum number of revolutions permitted mechanically	6000 rpm
Protection against dust and splashes according to DIN EN 60529	IP54
Rotor inertia moment	≤ $3x10^{-6}$ Kgm²
Starting torque at 20°C (68°F)	≤ 0,02 Nm
Maximum load permitted on axial shaft	40 N
Maximum load permitted on radial shaft	60 N
Weight aprox.	0,4 Kg
Operating temperature range	-20°C to +80°C
Vibration according to DIN EN 60068-2-6	100 m/s² (10Hz...2000Hz)
Shock according to DIN EN 60068-2-27	1000 m/s² (6ms)
Consumption	≤ 90 mA
Power supply	5 VDC ±10%
Electronic incremental output	SIN/COS, 1 Vpp ±20%
Incremental resolution	2048 SIN/COS
Electronic absolute output	SIN/COS, 1 Vpp ±20%
Absolute resolution	1 SIN/COS in 360°
Frequency (-3 dB)	≤ 200 kHz
Signal offset	2,5 VDC
Helicoidal cable	2 meters cable (other cable lengths available or connector mounted at the end of the cable, upon request) or 30 cm cable + connector D-Sub 15p

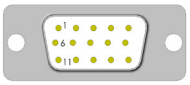
SERIE SMRS 64S

SINGLETURN ABSOLUTE AND INCREMENTAL CONIC SHAFT ENCODER

SIN/COS + SIN/COS

CONNECTION





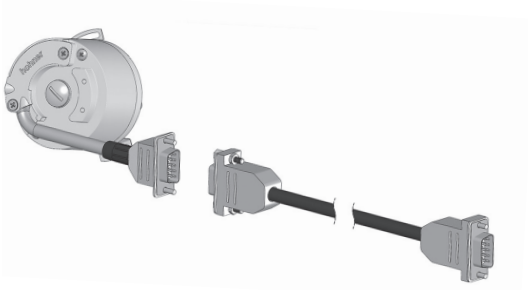
	Cable 6x2x0,14 mm² (**) up to 100°C 95.0008072	**Cable** 6x2x0,14 mm² (**) Halogen-free cable up to 90°C 95.0008073	D-Sub 15p HD
POWER SUPPLY			
GND	White	White	7
VCC	Brown	Brown	9
INCREMENTAL SIGNALS			
A+	Green	Green	5
A-	Yellow	Yellow	6
B+	Blue	Blue	8
B-	Red	Red	1
Z+	Grey-Pink	Grey-Pink	3
Z-	Red-Blue	Red-Blue	4
ABSOLUTE SIGNALS			
C+	Grey	Grey	11
C-	Pink	Pink	10
D+	Black	Black	12
D-	Violet	Violet	13
Shield*	Shield	Shield	Housing

(*) Shield connected to the encoder housing. It is recommended to connect the end of the wire shield to the ground of the equipment where the encoder is connected.

(**) The recommended maximum cable length is 10 meters.
For longer lengths use connection option type 20 connection with extension accessories.

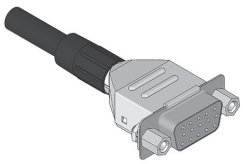
ACCESSORIES

Extension cable connection



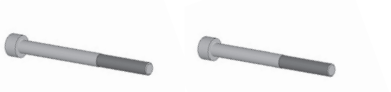
Other extension cable options available with specific connectors mounted at the end of the cable for different market drives, on request.

Female connector (not included)



(D-Sub 15p)
The female connector is supplied disassembled, with the assembly instruction manual.

Screw for assembly (included)



95.0004105
M5x60
(Standard)

95.0004099
M5 x 55
(Special Customer KE)

Screw for disassembly (not included)

95.0004106
M6x55

95.0004420
Grub screw M5 x 20
45H DIN913