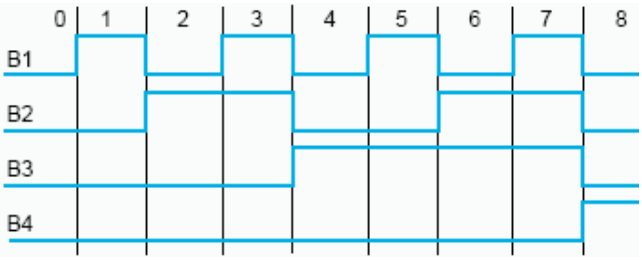
SINGLETURN ABSOLUTE ENCODERS

Absolute encoders can determine their physical position at any given moment by using a unique code within the same revolution, even without a reference index. This unique code is given with the individually reading of concentric optical tracks, thanks to an LED and a receiving system of photosensitive cells. These tracks are coded in GRAY which presents the advantage to change its state on only on a single track (one bit) at each step, and so ensures a reading without any error

Binary code



GRAY coded disk

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
2^4	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0
2^3	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0
2^2	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1
2^1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
2^0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1

An absolute encoder disk is made up with "N" concentric tracks divided into equal segments alternatively opaque and transparent. Each track is associated to one optical receiver

The interior track is made up of an opaque half and a transparent half. The reading of this track, the Most Significant Bit (MSB), makes it possible to determine in which half-revolution the shaft is oriented

The following track is divided into 4 quarters alternatively opaque and transparent. The reading of this track combined with the preceding one makes it possible to determine in which quarter of turn the shaft is located. The following tracks make it possible to determine in which eighth of turn, sixteenth of turn, etc...

The external track corresponding to the Least Significant Bit (LSB) gives the final precision. It is made up of 2n points corresponding to the resolution of the encoder. Thus for each angular shaft position, the disk information provides a code, which can be convert ed into either a binary code or Gray code

The same coded values are repeated at the end of a complete revolution of the shaft encoder. An absolute encoder permanently delivers a code which is the image of the real position of the moving body being controlled. At the first switching on even after a power down, the encoder will deliver directly its exploitable information to the subsequent electronic

Standard code type

In function of the subsequent electronic needs, the GRAY code can be converted in other codes thanks to internal transcoder

Binary code, is used predominantly by computer or PLCs, binary code is obtained by the transcription of the GRAY code

The Excess code is coded in decimal GRAY, each decade is represented by a GRAY code. The Excess code is a GRAY code presenting an even decimal value. It is constructed with the truncation of a power of 2 code, and permits standard resolutions of 360, 400, 720, 800, etc...

GRAY code

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2^4	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0
2^3	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0
2^2	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0
2^0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

	0	1	2	3	4	5	6	7	8	9
2^3	0	0	1	1	0	0	1	1	0	0
2^2	1	1	1	0	0	0	0	1	1	1
2^1	0	1	1	1	1	1	1	1	1	0
2^0	0	0	0	0	0	1	1	1	1	1

Excess GRAY code

SINGLETURN ABSOLUTE ENCODERS – STANDARD RANGE

CE

Range - 58mm

- European standards universal SSI an parallel encoder
- Encoder T° : –20 à +90°C (+100°C option)
- IP65 (IP67 with flange option)
- 5 to 30Vdc universal power supply
- High resolution possibility (20bits)

Range - 90mm

- Developed for extreme loads, shocks and vibrations
- 12mm solid shaft or 11mm with 115mm flange available 115 mm or with a 30mm through shaft
- Encoder T° : –20 to +90°C
- IP65 CHU9
- IP67 CHM9

Range - 200mm

- Developed for heavy industries, such as : steel, glass, cement mills, maritime oil rig…
- Encoder T° –20 to +90°C, cooling flange option
- IP65
- Duplex version available, (double electronic & optical system)

SINGLETURN		Shaft	Electronic		Code	Resolution	Connection
		**06** : 6mm **10** : 10mm **11** : 11mm **12** : 12mm **14** : 14mm **30** : 30mm	Supply: **2** : 5Vdc **5** : 11-30Vdc **P** : 5-30Vdc	Output: **CD** : driver 5Vdc **C5** : driver push-pull **CS** : SSI without parity CB : BiSS interface	**B** : Binary **G** : Gray	In powers of 2	**C6R / S6R** : radial 12 pins CW M23 connector **C8R / S8R** : radial 12 pins CCW M23 connector **C7R020** : 2m PUR radial cable **CPR** : radial 16 pins CW M23 connector (13 bits encoder) **C1R** : radial 17 pins CW M23 connector (14 bits encoders) **C3R– S5R020** : 2m radial cable
	**58mm** CHM5	Solid : 6 10	PCS PCB		B G	Standard : 13 Max : 20	S6R S8R S5R020
			PC5			15 max	CPR C1R C3R020
	**58mm** CHO5	Through : 14	PCS PCB		B G	Standard: 13 Max: 20	S6R S8R S5R020
			PC5			15 max	CPR C1R C3R020
	**90mm** CHM9	Solid : 11 12	5CS		B G	13 max	C6R C8R C7R020
			2CD 5C5			14 max	CPR C1R C3R020
	**90mm** CHU9	Through: 30	5CS		B G	13 max	C6R C8R C7R020
			2CD 5C5			14 max	CPR C1R C3R020
	**200mm** CHML	Solid : 14	5CS		B G	13 max	C6R C8R C7R020
			2CD 5C5			14 max	CPR C1R C3R020
Reference example	CHM9_	12 //	5CS		G //	13 //	C6R

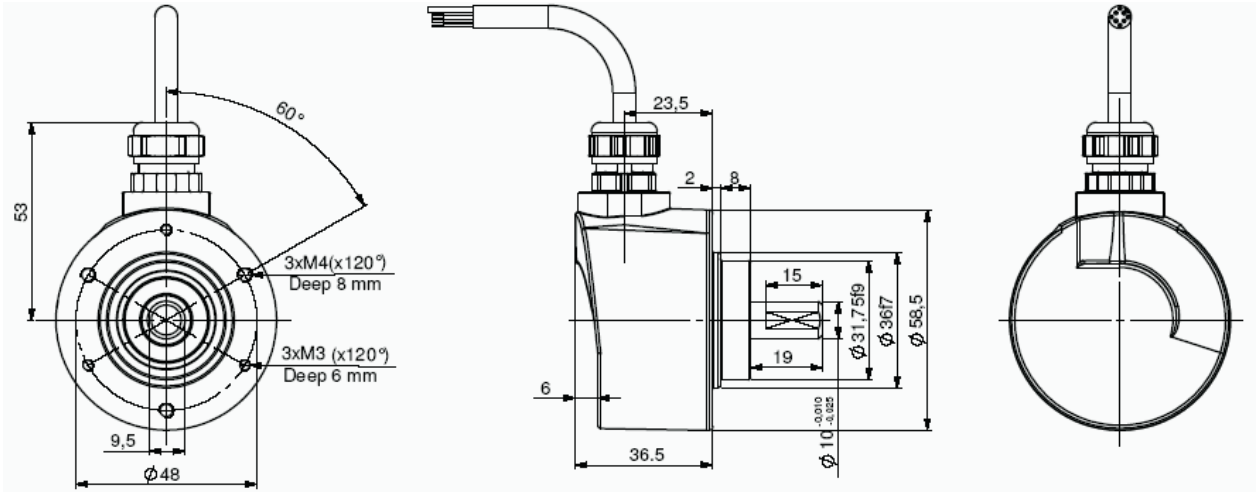
CHM5

SSI ABSOLUTE SINGLE TURN ENCODERS, CHM5 RANGE

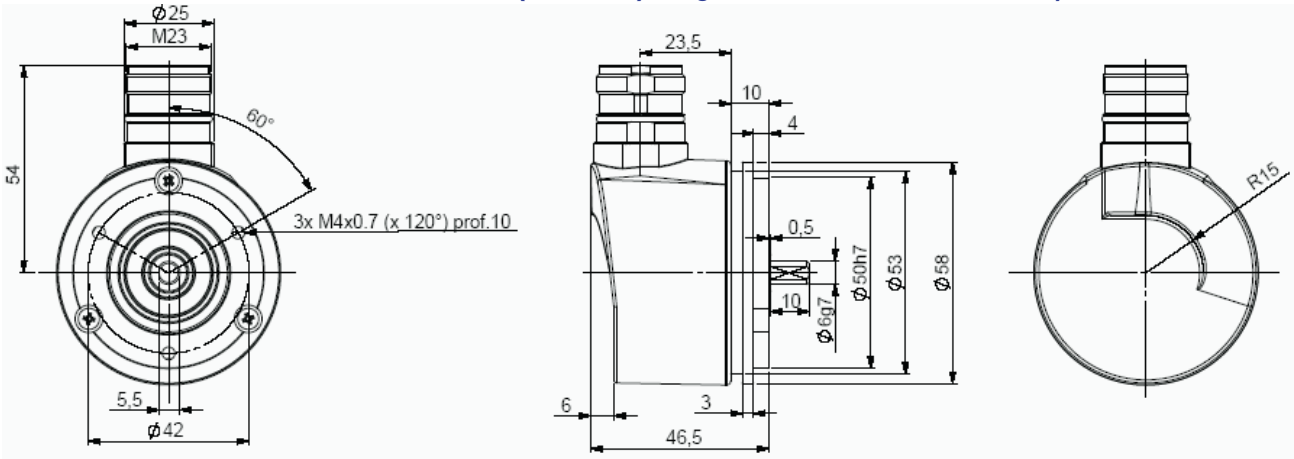
CHM5, the new generation of SSI absolute single turn encoders :

- Robustness and excellent resistance to shocks / vibrations
- High protection level IP65, IP67 option with a sealing flange
- High resolutions possibility: up to 20 bits (Gray or binary)
- Universal power supply from 5 to 30 Vdc
- High performances in temperature –20°C to 90°C (option –40°C to 100°C)
- Standard DIRECTION and RESET input
- Digital or sine incremental outputs option

CHM5_10 connection S5R (radial cable)



CHM5_06 connection S6R (radial M23), flange 9500/003* mounted on the body



* Accessories to be ordered separately

Material	Cover : zinc alloy
	Body: aluminium
	Shaft : stainless steel
Bearings	6 000 serie
Maximum loads	Axial : 50 N
	Radial : 100 N
Shaft inertia	≤ 1.10^{-6} kg.m²
Torque	≤ 4.10^{-3} N.m
Permissible max. speed	12 000 min^{-1}
Continuous max. speed	9 000 min^{-1}

Shocks (EN60068-2-27)	≤ 500 $m.s^{-2}$ (during 6 ms)
Vibrations (EN60068-2-6)	≤ 100 $m.s^{-2}$ (10 … 2 000 Hz)
EMC	EN 61000-6-4, EN 61000-6-2
Isolation	1 000 Veff
Encoder weight (approx.)	0,300 kg
Operating temperature	- 20 … + 90 °C (encoder T°)
Storage temperature	- 40 ... + 100 °C
Protection(EN 60529)	IP 65 (IP67 with flange option)
Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})	
25 N / 50 N : 99	50 N / 100 N : 12

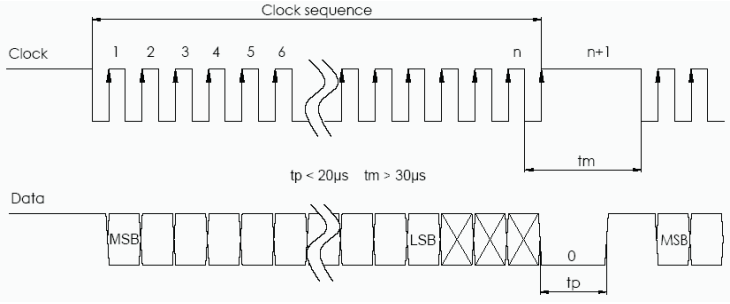
SSI ABSOLUTE SINGLE TURN ENCODERS, CHM5 RANGE

ELECTRICAL CHARACTERISTIC

Input signal clock CLK	per optocoupler
Output signal DATA	line - driver RS422
Power supply	5 – 30Vdc
Introduction	< 200ms
Consumption without load	Max. 100mA

Clock frequency CLK	• 100kHz to 1MHz for 13 bits encoder • 100kH – F_{max} = 10^6 / (resolution in bits –10) for encoder >13bits, ex : F_{max}=166kHz for 16 bits encoder
Interrogation frame	n=13 bits for 13 bits resolution n=21bits for >13bits resolution

SSI TRANSMISSION



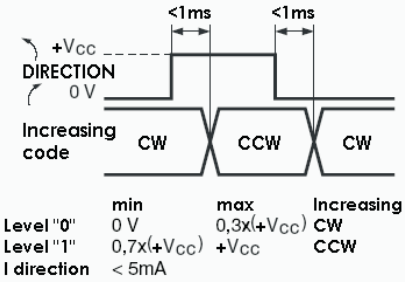
Transmission	Transmission up to 400m at 100kHz in function of the cable characteristics
Câble	High security of transmission by using shielded cable and twisted pairs

* Consult us for length > 100m

CONNECTIQUE STANDARD SSI

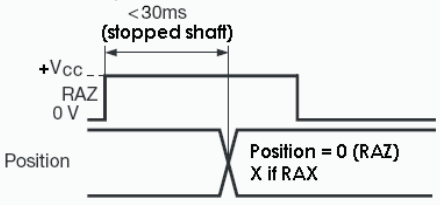
Type	+ Vcc	0 V	Clk+	Data+	RAZ	Data-	Clk-	DIRECTION
S6	1	2	3	4	5	6	7	9
S5	BN/GN Brown/Green	WH/GN White/Green	GN Green	GY Grey	BU Blue	PK Pink	BN Brown	WH White
S8	8	1	3	2	6	10	11	5

DIRECTION input



	min	max	Increasing
Level "0"	0 V	0,3x(+Vcc)	CW
Level "1"	0,7x(+Vcc)	+Vcc	CCW
I direction	< 5mA		

RAZ / RAX input



	min	max
Level "0"	0 V	0,3x(+Vcc)
Level "1"	0,7x(+Vcc)	+Vcc
I raz/rax	< 5mA	

Nota : Do not connect other pinouts, connect DIRECTION and RAZ to a potential (RAZ at 0V if not used)

ORDERING REFERENCE (Contact the factory for special versions, ex:special flanges, connections, electronics...)

	Shaft Ø	Supply	Output stage	Code	Resolution	Connection	Orientation
CHM5	**10** : 10mm **06** : 6mm	**P** : 5 to 30Vdc	**CS** : SSI without parity **CP** : SSI even parity **CI** : SSI odd parity	**B**: Binary **G** : Gray	Max: **20** bits, power of 2 **13**: 13 bits to **13**: 13 bits **20** bits: consult us	**S6** : M23 12pins CW for SSI transmission **S8**: M23 12pins CCW for SSI transmission	**R** : radial
						S5 : SSI cable, cable gland output	Example : **R020** : radial cable of 2m

CHM5 _ 10 // P CS G // 13 // S6 R

Monitoring function available as option:
- of the code coherence
- of the LED internal regulated current loop
- of temperature range with 2 limits

Consult us

Input / output available as option:
- RAX input (reset to a value X, manufacture setting)
- ERROR output for monitoring functions
- Sine & Cosine outputs without index, 2048ppr (option: 4096 ppr)
- A & B incremental outputs without index, 2048ppr (option: 4096 ppr)

Made in FRANCE

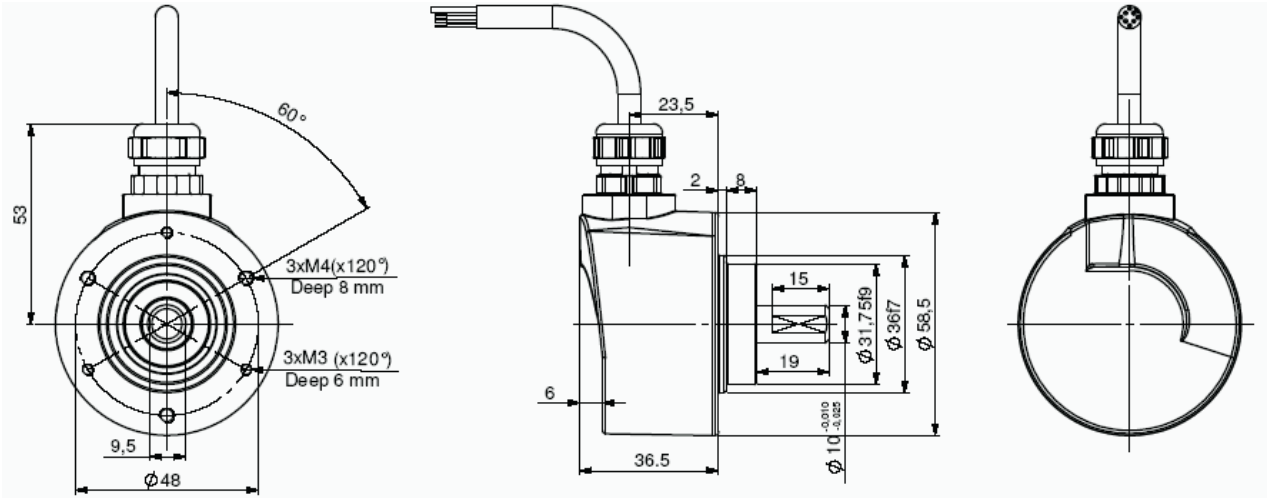
CHM5

PARALLEL SINGLE TURN ABSOLUTE ENCODER, CHM5 RANGE

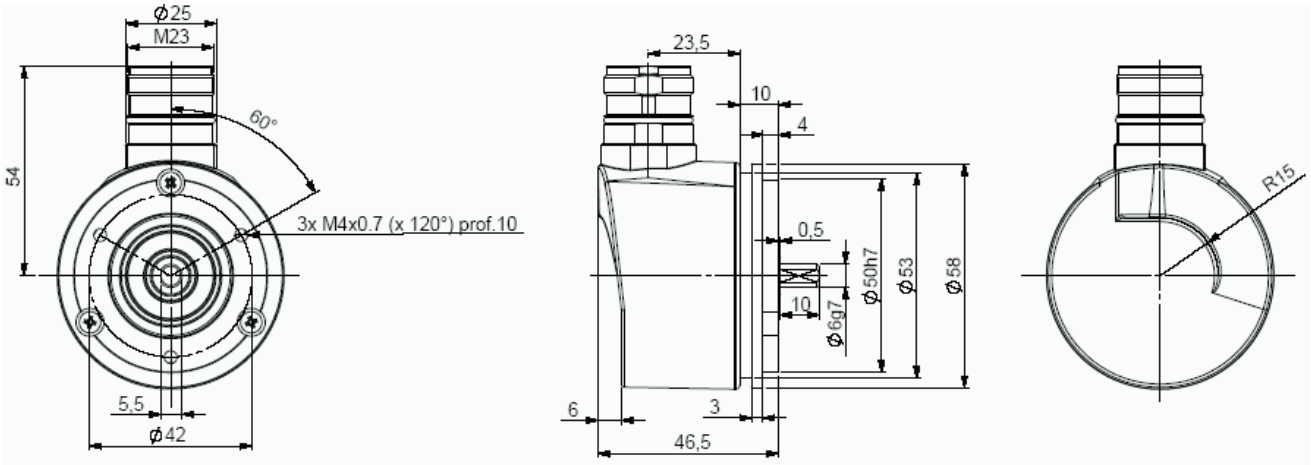
CHM5, the new generation of parallel absolute single turn encoders :

- Robustness and excellent resistance to shocks / vibrations
- High protection level IP65, IP67 option with a sealing flange
- High resolutions possibility: up to 15 bits (Gray or binary)
- Universal electronic circuits from 5 to 30 Vdc
- High performances in temperature –20°C to 90°C (option –40°C to 100°C)
- Standard DIRECTION entry, LATCH option

CHM5_10 connection C3R (radial cable)



CHM5_06 connection CPR / C1R (radial M23), flange 9500/003* mounted on the body



* Accessory to be ordered separately

Material	Cover : zinc alloy	Shocks (EN60068-2-27)	≤ 500 m.s^{-2} (during 6 ms)
	Body: aluminium	Vibrations (EN60068-2-6)	≤ 100 m.s^{-2} (10 … 2 000 Hz)
	Shaft : stainless steel	EMC	EN 61000-6-4, EN 61000-6-2
Bearings	6 000 serie	Isolation	1 000 Veff
Maximum loads	Axial : 50 N	Encoder weight (approx.)	0,300 kg
	Radial : 100 N	Operating temperature	- 20 … + 90 °C (encoder T°)
Shaft inertia	≤ 1.10^{-6} kg.m^2	Storage temperature	- 40 ... + 100 °C
Torque	≤ 4.10^{-3} N.m	Protection(EN 60529)	IP 65 (IP67 with flange option)
Permissible max. speed	12 000 min^{-1}	Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})	
Continuous max. speed	9 000 min^{-1}	25 N / 50 N : 99	50 N / 100 N : 12

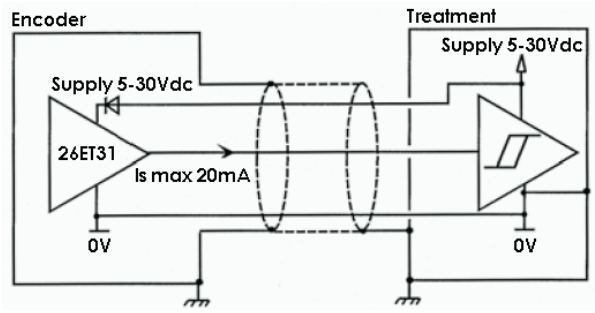
PARALLEL SINGLE TURN ABSOLUTE ENCODER, CHM5 RANGE

CONNECTION

	color	13 bits + DIRECTION CP or C3	14 bits + DIRECTION C1
1	white WH	0V	0V
2	brown BN	+Vcc	+Vcc
3	green GN	D0	D0
4	yellow YE	D1	D1
5	grey GY	D2	D2
6	pink PK	D3	D3
7	blue BU	D4	D4
8	red RD	D5	D5
9	black BK	D6	D6
10	violet VT	D7	D7
11	white/brown WH/BN	D8	D8
12	white/green WH/GN	D9	D9
13	white/yellow WH/YE	D10	D10
14	white/grey WH/GY	D11	D11
15	white/pink WH/PK	D12	D12
16	white/blue WH/BU	DIRECTION	D13
17	White/red WH/RD	/	DIRECTION

Example, 10 bits encoder : only MSB will be supplied (D3 to D12)

ELECTRONIC



Power supply : 5 to 30Vdc
Consumption without load : 100mA max
Current output per channel : Is=20mA max
Level ''0'' (Is=20mA) max : V_{ol} = 0,5Vdc
Level ''1'' (Is=20mA) min : V_{oh} = Vcc-2,5Vdc

Protection against short circuits and inversion of polarity

DIRECTION
CW increasing code: DIRECTION pin to +Vcc
CCW increasing code : DIRECTION pin to 0Vdc

LATCH (option)
Active data on the outputs : LATCH pin to 0V
Frozen data on the outputs: LATCH pin to +Vcc

Consult us for the connection of an encoder with this option

ORDERING REFERENCE (Contact the factory for special versions, ex: special flanges, connections, electronics...)

	Shaft Ø	Supply	Output stage	Code	Resolution	Connection	Orientation
CHM5	**10** : 10mm **06** : 6mm	**P** : 5 to 30Vdc	**C5** : push pull 5 to 30Vdc	**B**: Binary **G** : Gray	Power of 2: **1**: 1 bit to **14**: 14 bits Max: **15** bits Consult us	**CP** : M23 16 pins 13 bits + direction **C1** : M23 17 pins 14 bits + direction	**R** : radial
						C3 : cable gland + 16 wires cable	Example : **R020** : radial cable 2m
CHM5 _	**10** //	**P**	**C5**	**G** //	**13** //	**C3**	**R020**

Monitoring function available as option :
- of the code coherence
- of the LED internal regulated current loop
- of temperature range with 2 limits

Consult us

Entry / output available as option:
- LATCH entry
- ERROR output for monitoring functions

Made in FRANCE

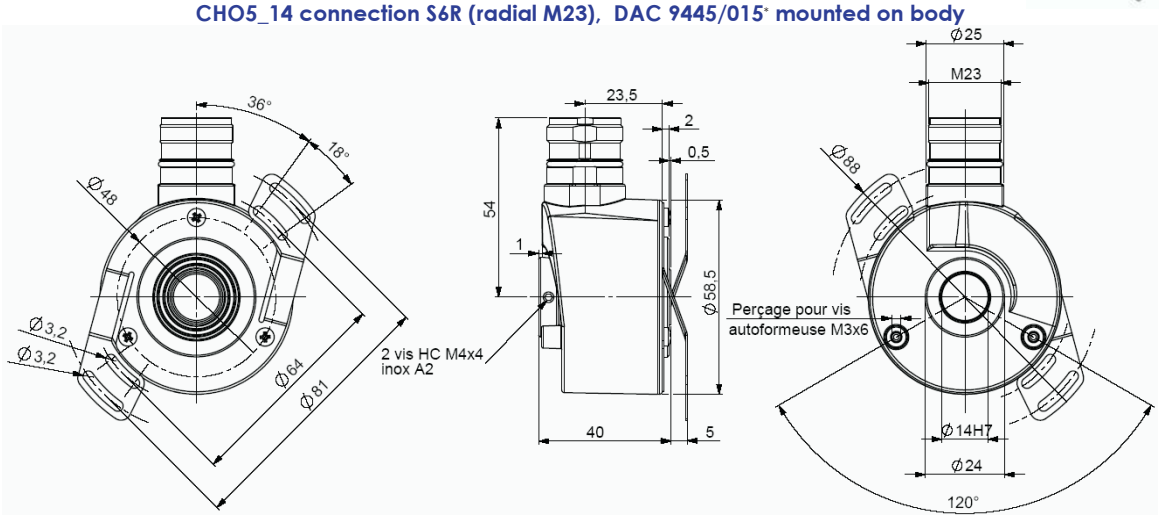
CHO5

SSI ABSOLUTE SINGLE TURN ENCODERS, CHO5 RANGE

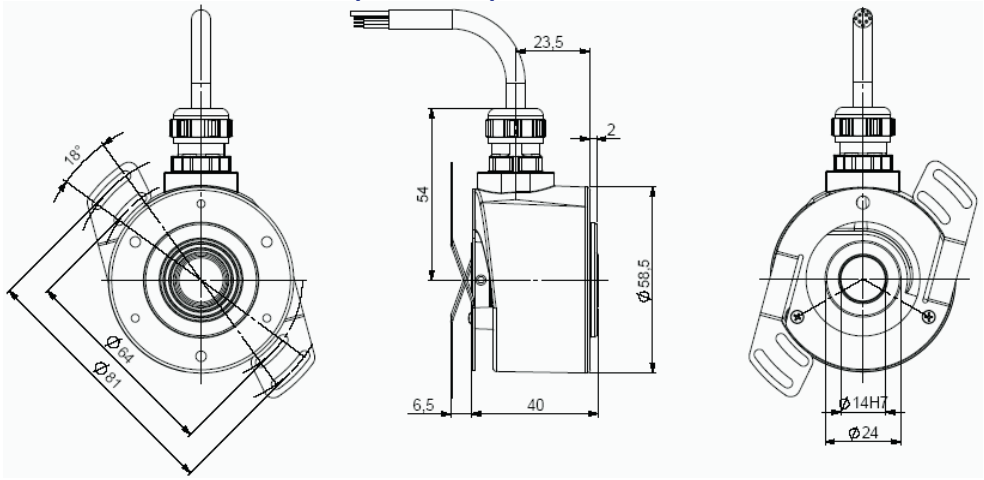
CHO5, the new generation of SSI absolute single turn encoders :

- Through hollow shaft version Ø14mm, with reduction hubs in aluminium of 6, 8, 10 and 12 mm
- Robustness and excellent resistance to shocks / vibrations
- High protection level IP65
- High resolutions possibility, up to 20 bits (Gray or binary)
- Universal power supply from 5 to 30 Vdc
- High performances in temperature –20°C to 90°C (option –40°C to 100°C)
- Standard DIRECTION and RESET input
- Numeric or sine incremental outputs option

CHO5_14 connection S6R (radial M23), DAC 9445/015* mounted on body



CHO5_14 connection S5R (radial cable), DAC 9445/015* mounted on the cover



* Accessory to be ordered separately

Material	Cover : zinc alloy
	Body: aluminium
	Shaft : stainless steel
Bearings	6 803 serie
Maximum loads	Axial : 20 N
	Radial : 50 N
Shaft inertia	≤ 2,2.10^{-6} kg.m^2
Torque	≤ 6.10^{-3} N.m
Permissible max. speed	9 000 min^{-1}
Continuous max. speed	6 000 min^{-1}
Shaft seal	Viton

Shocks (EN60068-2-27)	≤ 500 m.s^{-2} (during 6 ms)
Vibrations (EN60068-2-6)	≤ 100 m.s^{-2} (10 … 2 000 Hz)
EMC	EN 61000-6-4, EN 61000-6-2
Isolation	1 000 V eff
Encoder weight (approx.)	0,270 kg
Operating temperature	- 20 … + 90°C (Encoder T°)
Storage temperature	- 40... + 100°C
Protection (EN 60529)	IP 65
Torque (ring pressure screw)	nominal: 1.5 N.m, break: 2.0 N.m
Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})	
10N / 25N : 230	20N / 50N : 29

SSI ABSOLUTE SINGLE TURN ENCODERS, CHO5 RANGE

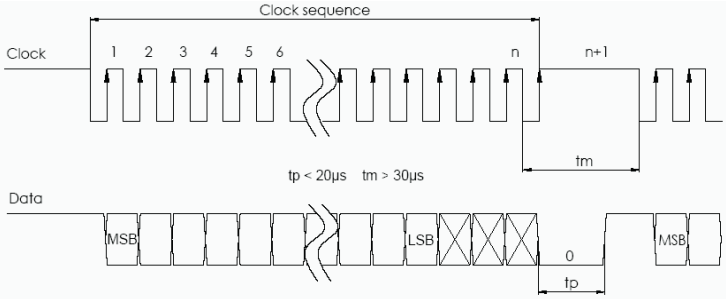
CE

ELECTRICAL CHARACTERISTIC

Input signal clock CLK	per optocoupler
Output signal DATA	line - driver RS422
Power supply	5 – 30Vdc
Introduction	< 200ms
Consumption without load	Max. 100mA

Clock frequency CLK	• 100kHz to 1MHz for 13 bits encoder • 100kH – F_{max} = 10^6 / (resolution in bits –10) for encoder >13bits, ex : F_{max}=166kHz for 16 bits encoder
Interrogation frame	n=13 bits for 13 bits resolution n=21bits for >13bits resolution

SSI TRANSMISSION

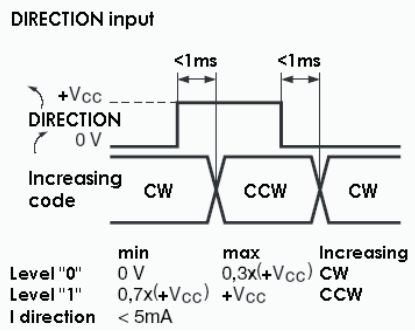


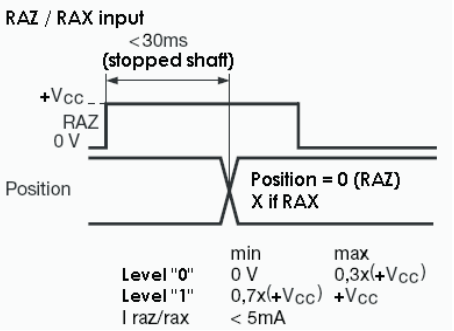
Transmission	Transmission up to 400m at 100kHz in function of the cable characteristics
Cable	High security of transmission by using shielded cable and twisted pairs

* Consult us for length > 100m

CONNECTIQUE STANDARD SSI

Type	+ Vcc	0 V	Clk+	Data+	RAZ	Data-	Clk-	DIRECTION
S6	1	2	3	4	5	6	7	9
S5	BN/GN Brown/Green	WH/GN White/Green	GN Green	GY Grey	BU Blue	PK Pink	BN Brown	WH White
S8	8	1	3	2	6	10	11	5





Nota : Do not connect other pinouts, connect DIRECTION and RAZ to a potential (RAZ at 0V if not used)

ORDERING REFERENCE (Contact the factory for special versions, ex:special flanges, connections, electronics...)

	Shaft Ø	Supply	Output stage	Code	Resolution	Connection	Orientation
CHO5	**14** : 14mm Shaft reduction hubs available up to 6mm	**P** : 5 to 30Vdc	**CS** : SSI without parity **CP** : SSI even parity **CI** : SSI odd parity	**B**: Binary **G** : Gray	Max: **20** bits, power of 2 **13**: 13 bits to **13**: 13 bits **20** bits: consult us	**S6** : M23 12pins CW for SSI transmission **S8**: M23 12pins CCW for SSI transmission	**R** : radial
						S5 : SSI cable, cable gland output	Example : **R020** : radial cable of 2m
CHO5 _	**10** //	**P**	**CS**	**G** //	**13** //	**S6**	**R**

Monitoring function available as option :
- of the code coherence
- of the LED internal regulated current loop
- of temperature range with 2 limits

Consult us

Entry / output available as option:
- RAX input (reset to a value X, manufacture setting)
- ERROR output for monitoring functions
- Sine & Cosine outputs without index, 2048ppr (option: 4096 ppr)
- A & B incremental outputs without index, 2048ppr (option: 4096 ppr)

Made in FRANCE

CHO5

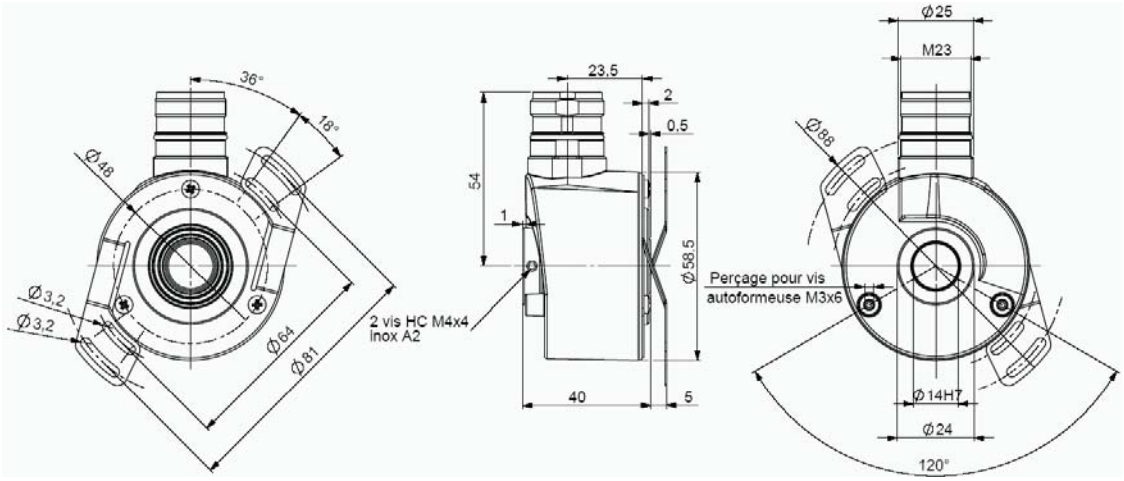
PARALLEL SINGLE TURN ABSOLUTE ENCODER, CHO5 RANGE

CE

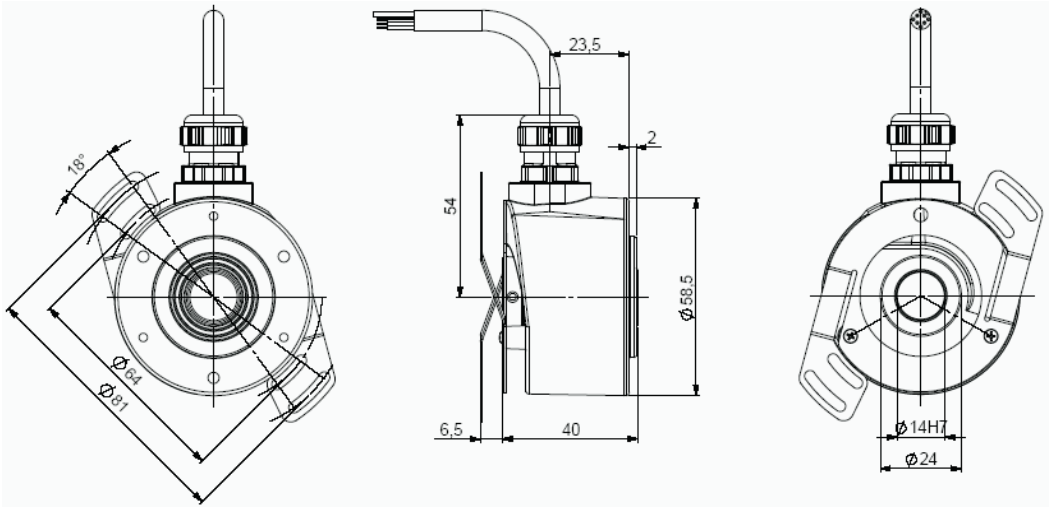
CHO5, the new generation of parallel absolute single turn encoders :

- Through hollow shaft version Ø14mm, with reduction hubs in aluminium of 6, 8, 10 and 12 mm
- Robustness and excellent resistance to shocks / vibrations
- High protection level IP65
- High resolutions possibility, up to 15 bits (Gray or binary)
- Universal electronic circuits from 5 to 30 Vdc
- High performances in temperature –20°C to 90°C (option –40°C to 100°C)
- Standard DIRECTION entry, LATCH option

CHO5_14 connection CPR / C1R (radial M23), DAC 9445/015* mounted on the body



CHO5_14 connection C3R (radial cable), DAC 9445/015* mounted on the cover



* Accessory to be ordered separately

Material	Cover : zinc alloy
	Body: aluminium
	Shaft : stainless steel
Bearings	6 803 serie
Maximum loads	Axial : 20 N
	Radial : 50 N
Shaft inertia	≤ 2,2.10^{-6} kg.m^2
Torque	≤ 6.10^{-3} N.m
Permissible max. speed	9 000 min^{-1}
Continuous max. speed	6 000 min^{-1}
Shaft seal	Viton

Shocks (EN60068-2-27)	≤ 500 m.s^{-2} (during 6 ms)
Vibrations (EN60068-2-6)	≤ 100 m.s^{-2} (10 … 2 000 Hz)
EMC	EN 61000-6-4, EN 61000-6-2
Isolation	1 000 V eff
Encoder weight (approx.)	0,270 kg
Operating temperature	- 20 … + 90°C (Encoder T°)
Storage temperature	- 40... + 100°C
Protection (EN 60529)	IP 65
Torque (ring pressure screw)	nominal: 1.5 N.m, break: 2.0 N.m
Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})	
10N / 25N : 230	20N / 50N : 29

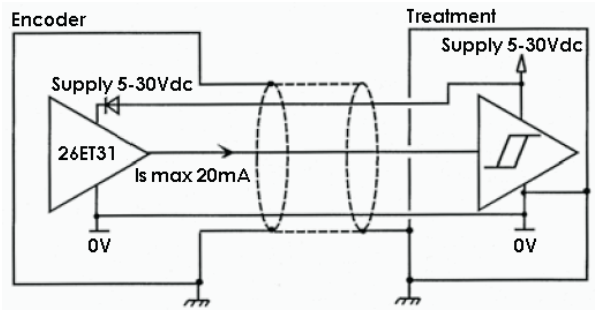
PARALLEL SINGLE TURN ABSOLUTE ENCODER, CHO5 RANGE

CONNECTION

	color	13 bits + DIRECTION CP or C3	14 bits + DIRECTION C1
1	white WH	0V	0V
2	brown BN	+Vcc	+Vcc
3	green GN	D0	D0
4	yellow YE	D1	D1
5	grey GY	D2	D2
6	pink PK	D3	D3
7	blue BU	D4	D4
8	red RD	D5	D5
9	black BK	D6	D6
10	violet VT	D7	D7
11	white/brown WH/BN	D8	D8
12	white/green WH/GN	D9	D9
13	white/yellow WH/YE	D10	D10
14	white/grey WH/GY	D11	D11
15	white/pink WH/PK	D12	D12
16	white/blue WH/BU	DIRECTION	D13
17	White/red WH/RD	/	DIRECTION

Example, 10 bits encoder : only MSB will be supplied (D3 to D12)

ELECTRONIC



Power supply : 5 to 30Vdc
Consumption without load : 100mA max
Current output per channel : Is=20mA max
Level ''0'' (Is=20mA) max : V_{ol} = 0,5Vdc
Level ''1'' (Is=20mA) min : V_{oh} = Vcc-2,5Vdc

Protection against short circuits and inversion of polarity

DIRECTION

CW increasing code: DIRECTION pin to +Vcc
CCW increasing code : DIRECTION pin to 0Vdc

LATCH (option)

Active data on the outputs : LATCH pin to 0V
Frozen data on the outputs: LATCH pin to +Vcc

Consult us for the connection of an encoder with this option

ORDERING REFERENCE (Contact the factory for special versions, ex: special flanges, connections, electronics...)

	Shaft Ø	Supply	Output stage	Code	Resolution	Connection	Orientation
CHO5	**14** : 14mm Shaft reduction hubs available up to 6mm	**P** : 5 to 30Vdc	**C5** : push pull 5 to 30Vdc	**B**: Binary **G** : Gray	Power of 2: **1**: 1 bit to **14**: 14 bits Max: **15** bits Consult us	**CP** : M23 16 pins 13 bits + direction **C1** : M23 17 pins 14 bits + direction	**R** : radial
						C3 : cable gland + 16 wires cable	Example : **R020** : radial cable 2m
CHO5 _	**14** //	**P**	**C5**	**G** //	**13** //	**C3**	**R020**

Monitoring function available as option :
- of the code coherence
- of the LED internal regulated current loop
- of temperature range with 2 limits

Consult us

Entry / output available as option:
- LATCH entry
- ERROR output for monitoring functions

Made in FRANCE

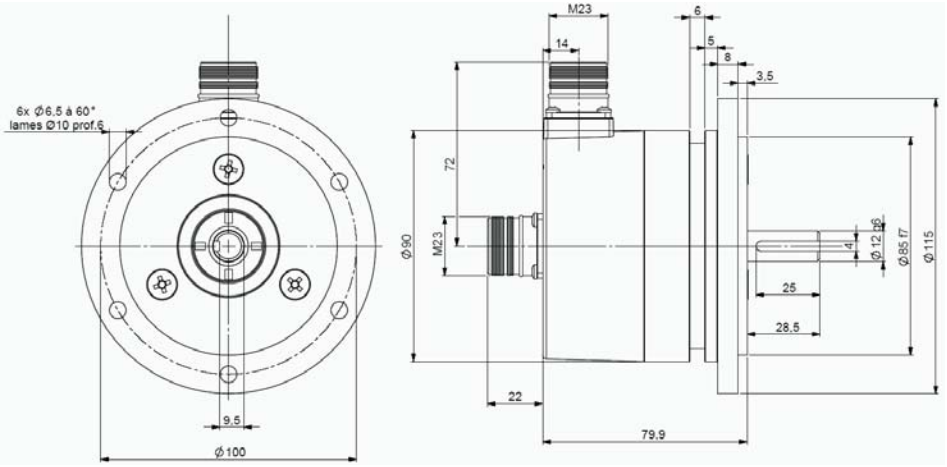
CHM9

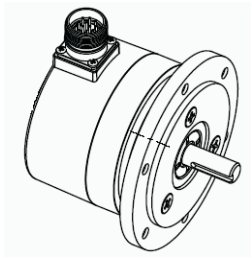
SSI ABSOLUTE SINGLETURN ENCODERS, CHM9 RANGE

Especially designed for heavy-duty (steel, paper, wood – mills, cranes ...) Compact and robust conception. Excellent resistance to shocks/vibrations and to extreme axial/radial loads

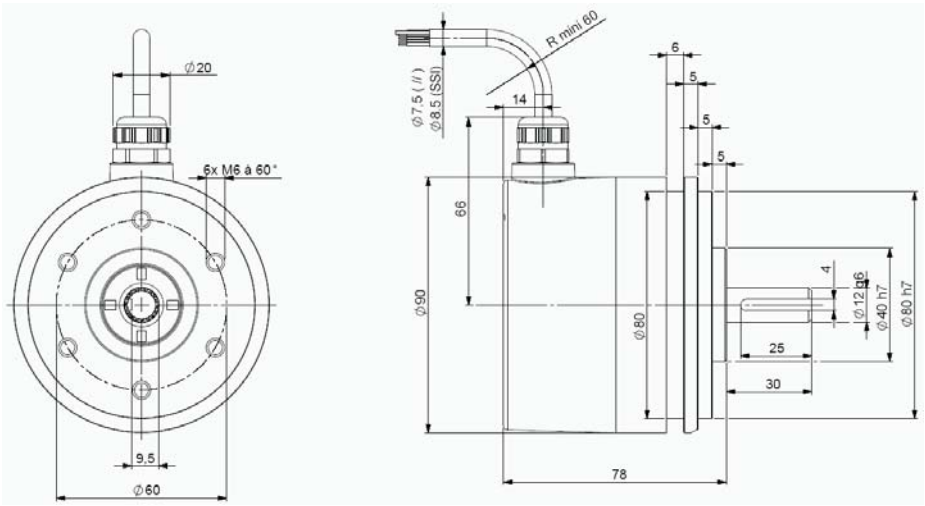
Also available in parallel output and fieldbus interface : CanOpen, DeviceNet, Profibus

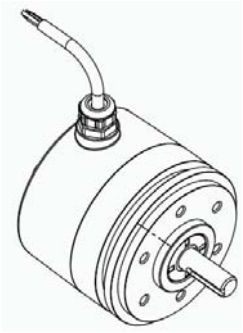
CHM9_11 connection C6 or C8 (radial or axial M23)





CHM9_12 connection C7R (radial cable)





Material Stainless steel option	Cover : zinc alloy
	Body : aluminium
Shaft material	Stainless steel
Bearings	6001 serie
Maximum loads	Axial : 100 N
	Radial : 200 N
Shaft inertia	≤ 15.10^{-6} kg.m²
Torque	≤ 10.10^{-3} N.m
Permissible max. speed	9 000 min^{-1}
Continuous max. speed	6 000 min^{-1}
Shaft seal	Viton double lips
Shocks (EN60068-2-27)	≤ 500 $m.s^{-2}$ (during 6ms)

Vibrations (EN60068-2-6)	≤ 200 $m.s^{-2}$ (10 ... 1 000 Hz)
EMC	EN 50081-1, EN 61000-6-2
Isolation	1 000 Veff
Encoder weight (approx)	1,100kg zinc alloy cover, alu body
	2,400kg zinc alloy cover, stainless steel body
	2,600kg stainless steel cover and body
Operating temperature	- 20 ... + 90 °C (encoder T°)
Storage temperature	- 30 ... + 95°C
Protection(EN 60529)	IP 67 (cable), IP 66 (connector)

Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})

20 N / 30 N	50 N / 100 N	100 N / 200 N
360	18	2,2

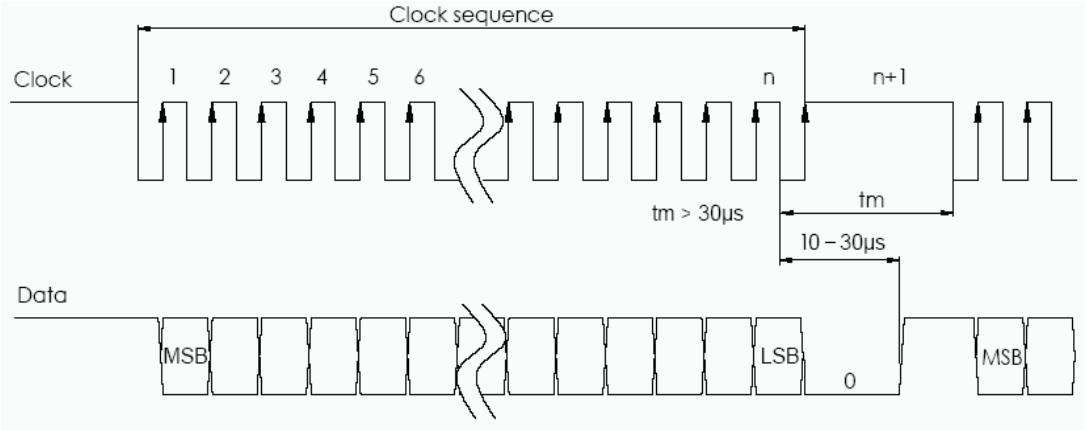
SSI ABSOLUTE SINGLETURN ENCODERS, CHM9 RANGE

ELECTRICAL CHARACTERISTIC

Input signal clock CLK	per opto-coupleur
Output signal DATA	line - driver RS422
Clock frequency CLK	100kHz – 1MHz
Precision	+ ½ LSB (13 bits)

Power supply	11 – 30Vdc
Introduction	< 1 s
Consumption without load	100mA max

SSI TRANSMISSION (n=13 bits)



Transmission	Transmission up to 400m at 100kHz in function of cable characteristics
Cable	High security of transmission by using shielded and twisted pair cable

* Consult us for length > 100m

STANDARD SSI CONNECTION

Type	Vcc	Gnd	Clk+	Data+	Data-	Clk-	DIRECTION
C6	1	2	3	4	6	7	9
C7	BN brown	WH white	GN green	GY grey	PK pink	YE yellow	RD red
C8	8	1	3	2	10	11	5

DIRECTION:
- CW increasing code: DIRECTION to 0V
- CCW increasing code : DIRECTION to +Vcc

ORDERING CODE (Special versions upon request, for ex. special flanges/electronics/connections...)

	Shaft Ø	Supply	Output stage	Code	Resolution	Connection	Connection orientation
CHM9 Cover : zinc Body : alu **CBM9** Cover : zinc Body : stainless steel **CXM9** Stainless steel cover & body	**11** : 11mm **12** : 12mm	**5** : 11 to 30Vdc	**CS** : SSI without parity **CP** : SSI even parity **CI** : SSI odd parity	**B**: Binary **G** : Gray	**13** : 13bits	**C6** : M23 12 pins CW for SSI **C8:** M23 12 pins CCW for SSI	**R** : radial **A** : axial
						C7 : PE + SSI cable	Example : **R020** : radial 2m cable **A020** : axial 5m cable
CHM9 _	**12** //	**5**	**CS**	**G** //	**13** //	**C7**	**R020**

Made in FRANCE

BEI IDEACOD

www.bei-ideacod.com

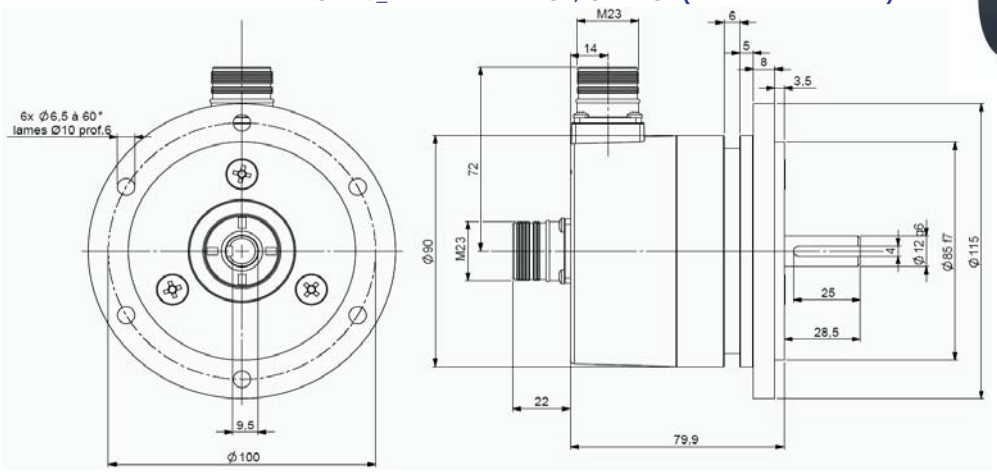
CHM9

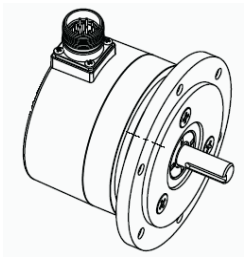
PARALLEL SINGLE TURN ABSOLUTE ENCODERS, CHM9 RANGE

Especially designed for heavy-duty (steel, paper, wood – mills, cranes …) Compact and robust conception. Excellent resistance to shocks/vibrations and to extreme axial/radial loads

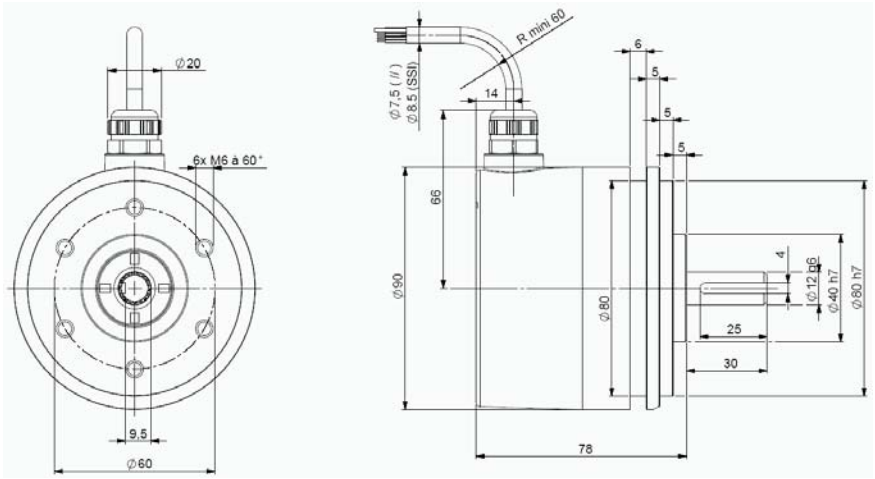
Also available in SSI serial interface and fielbus interfaces : CanOpen, DeviceNet, Profibus

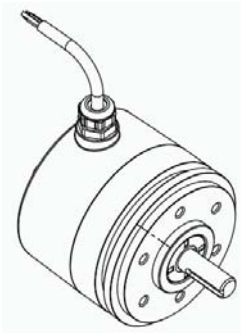
CHM9_11 connection C1, CP or CZ (radial or axial M23)





CHM9_12 connection C3 (radial cable)





CHARACTERISTICS

Material Stainless steel option	Cover : zinc alloy
	Body : aluminium
Shaft material	Stainless steel
Bearings	6001 serie
Maximum loads	Axial : 100 N
	Radial : 200 N
Shaft inertia	≤ 15.10^{-6} kg.m^2
Torque	≤ 10.10^{-3} N.m
Permissible max. speed	9 000 min^{-1}
Continuous max. speed	6 000 min^{-1}
Shaft seal	Viton double lips
Shocks (EN60068-2-27)	≤ 500 m.s^{-2} (during 6ms)

Vibrations (EN60068-2-6)	≤ 200 m.s^{-2} (10 … 1 000 Hz)	
EMC	EN 50081-1, EN 61000-6-2	
Isolation	1 000 Veff	
Encoder weight (approx)	1,100kg zinc alloy cover, alu body	
	2,400kg zinc alloy cover, stainless steel body	
	2,600kg stainless steel cover and body	
Operating temperature	- 20 ... + 90 °C (encoder T°)	
Storage temperature	- 30 ... + 95°C	
Protection(EN 60529)	IP 67 (cable), IP 66 (connector)	
Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})		
20 N / 30 N	50 N / 100 N	100 N / 200 N
360	18	2,2

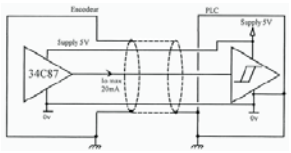
PARALLEL SINGLE TURN ABSOLUTE ENCODERS, CHM9 RANGE

PARALLEL OUTPUTS CONNECTION

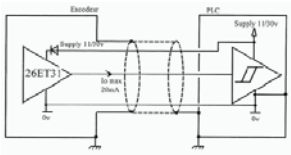
		13 bits + DIRECTION CP or C3	14 bits + DIRECTION C1	13 bits + DIRECTION + RAZ CZ
1	white WH	-	-	-
2	brown BN	+	+	+
3	green GN	D0	D0	D0
4	yellow YE	D1	D1	D1
5	grey GY	D2	D2	D2
6	pink PK	D3	D3	D3
7	blue BU	D4	D4	D4
8	red RD	D5	D5	D5
9	black BK	D6	D6	D6
10	violet VT	D7	D7	D7
11	white/brown WH/BN	D8	D8	D8
12	white/green WH/GN	D9	D9	D9
13	white/yellow WH/YE	D10	D10	D10
14	white/grey WH/GY	D11	D11	D11
15	white/pink WH/PK	D12	D12	D12
16	white/blue WH/BU	DIRECTION	D13	RAZ
17	white/red WH/RD	NC	DIRECTION	DIRECTION

Protection against inversion of polarity for the electronics 5CN and 5C5
Protection against short circuits for the electronic 5C5
Example 10 bits encoder : only most significant bits (D3 to D12) would be available

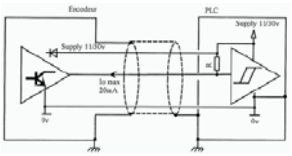
OUTPUT STAGE / SUPPLY - PARALLEL OUTPUT



Electronic 2CD
Supply : 5Vdc ± 10%
Cons. without load : 80mA max
Current per channel : Is = 20mA max
0 max (Is=20mA) : V_{ol} = 0,5Vdc
1 min (Is=20mA): V_{oh} = 2,5Vdc



Electronic 5C5
Supply : 11 to 30Vdc
Cons. without load : 100mA max
Current per channel : Is = 20mA max
0 max (Is=20mA): V_{ol} = 0,5Vdc
1 min (Is=20mA): V_{oh} = Vcc-3Vdc



Electronic 5CN
Supply : 11 to 30Vdc
Cons. without load : 100mA max
Current per channel : Is = 20mA max
0 max (Is=20mA): V_{ol} = 1,25Vdc

RAZ to be used with non turning shaft :
For an electrical reset / with push button (option) : give an impulse to the +Vcc during 1s minimum

DIRECTION
CW code : pin DIRECTION at +Vcc
CCW code : pin DIRECTION at 0V

ORDERING CODE (Special versions upon request, for ex. special flanges/electronics/connections...)

	Shaft Ø	Parallel output : 2CD, 5C5, 5CN, 2ED, 5E5		Code	Resolution	Connection	Connection orientation
CHM9 Cover : zinc Body : alu **CBM9** Cover : zinc Body : stainless steel **CXM9** Stainless steel cover & body	**11** : 11mm **12** : 12mm	**2**: 5Vdc **5**: 11 – 30Vdc	**CD**: driver 5Vdc **C5**: Push-Pull 11-30Vdc **CN**: NPNCO 11-30Vdc With electrical RAZ : **ED**: driver 5Vdc **E5**: push-pull 11-30Vdc	**B** : binary **G** : Gray	**14** **13** ... **1**	**CP** : M23 16 pins CW 13 bits + DIRECTION **C1** : M23 17 pins CW 14bits + DIRECTION **C3** : cable 16 fils **CZ** : M23 17 pins hor. 13bits + DIRECTION + RAZ	Ex connector : **A** : axial **R** : radial Ex cable : **A020** : cable 2m axial **R020** : cable 5m radial
Ex: CHM9 _	**12** //	**5 C5**		**G** //	**13** //	**C3**	**R020**

14 bits : only available in GRAY code and electronics 5C5 and 2CD

Made in FRANCE

CHU9

SSI ABSOLUTE SINGLE TURN ENCODERS, CHU9 RANGE

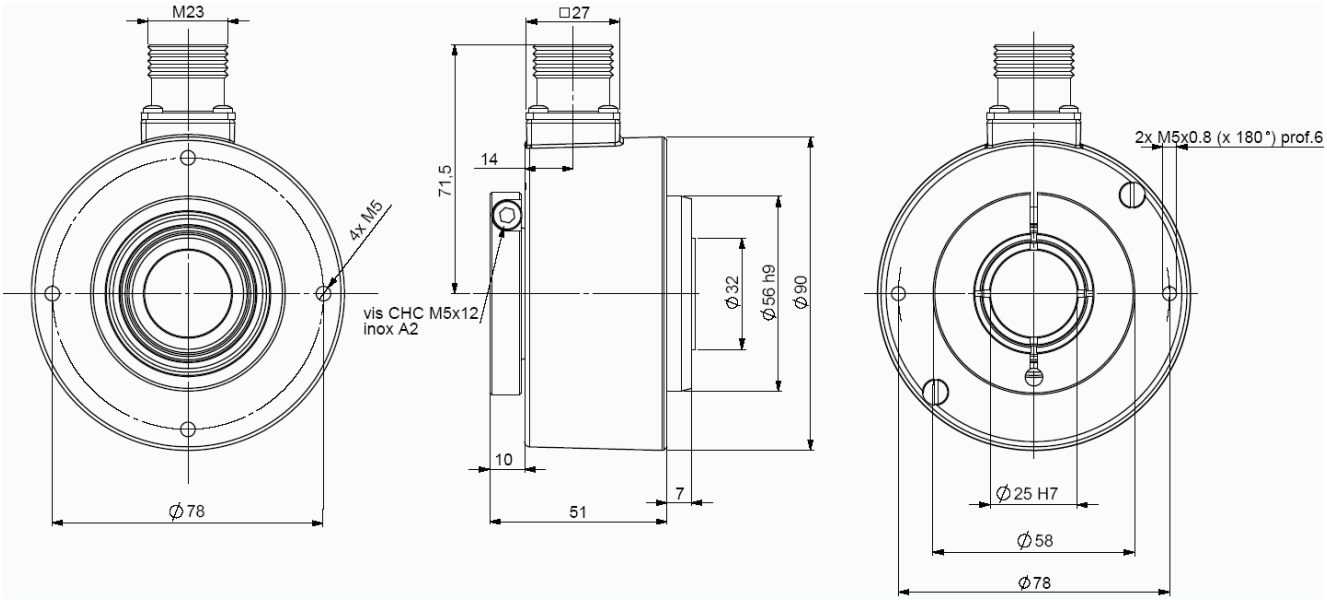
Especially designed for heavy-duty (steel, paper, wood – mills, cranes …) Compact and robust conception. Excellent resistance to shocks/vibrations and to extreme axial/radial loads

Hollow shaft of up to 30mm, adaptation of the bore size with composite hub for thermal and electric insulation (aluminium hubs in option)

Double/triple mounting in combinations of incremental, absolute, analogue signals

Also available in parallel output and fieldbus interface : CanOpen, DeviceNet, Profibus

CHU9_25 connection C6R (radial M23), with reduction hub 9418/I25 (25mm) mounted on the shaft



CHARACTERISTICS

Material Stainless steel option	Cover : zinc alloy	Vibrations (EN60068.2.6)	≤ 200m.s^{-2} (10 … 1 000Hz)
	Body : aluminium	EMC	EN 50081-1, EN 61000-6-2
Shaft	Inox	Isolation	1 000 Veff
Bearings	6807 serie	Encoder weight (approx.)	0,700kg zinc alloy cover, alu body
Maximum loads	Axial : 50 N		1,000kg zinc alloy cover, stainless steel body
	Radial : 80 N		1,200kg stainless steel cover and body
Shaft inertia	≤ 55.10^{-6} kg.m^2	Operating temperature	- 20 ... + 90 °C (encoder T°)
Torque	≤ 25.10^{-3} N.m	Storage temperature	- 30 ... + 95 °C
Permissible max. speed	6 000 min^{-1}	Protection(EN 60529)	IP 65
Continuous max. speed	3 600 min^{-1}	Torque (ring screw)	nominal: 3N.m, break: 4N.m
Shaft seal	Viton	Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})	
Shocks (EN60068.2.27)	≤ 500 m.s^{-2} (during 6 ms)	25 N / 40 N : 140	50 N / 80 N : 17

SSI ABSOLUTE SINGLE TURN ENCODERS, CHU9 RANGE

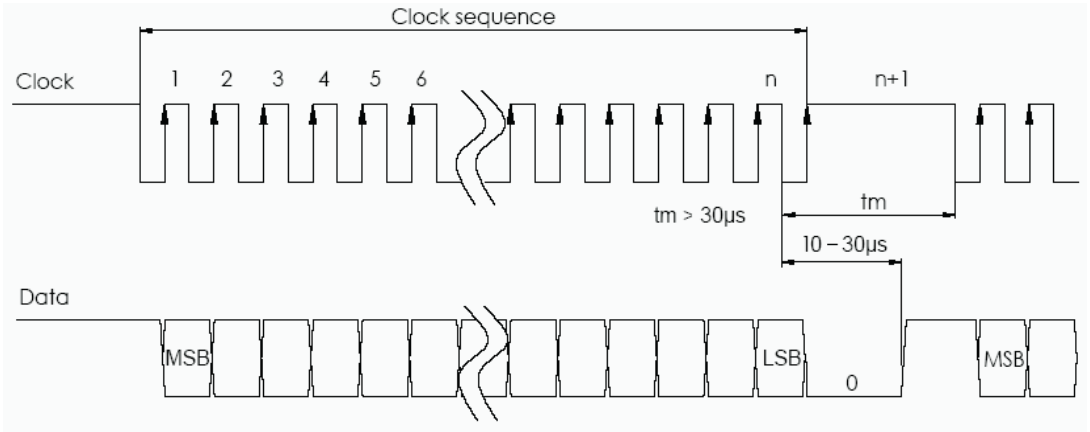
CE

ELECTRICAL CHARACTERISTIC

Input signal clock CLK	per opto-coupleur
Output signal DATA	line - driver RS422
Clock frequency CLK	100kHz – 1MHz
Precision	+ ½ LSB (13 bits)

Power supply	11 – 30Vdc
Introduction	< 1 s
Consumption without load	100mA max

SSI TRANSMISSION (n=13 bits)



Transmission	Transmission up to 400m at 100kHz in function of cable characteristics
Cable	High security of transmission by using shielded, twisted pair cable

* Consult us for length > 100m

STANDARD SSI CONNECTION

Type	Vcc	Gnd	Clk+	Data+	Data-	Clk-	DIRECTION
C6	1	2	3	4	6	7	9
C7	BN brown	WH white	GN green	GY grey	PK pink	YE yellow	RD red
C8	8	1	3	2	10	11	5

DIRECTION :
- CW increasing code: DIRECTION to 0V
- CCW increasing code : DIRECTION to +Vcc

ORDERING CODE (Special versions upon request, for ex. special flanges/electronics/connections...)

	Ø shaft	Supply	Output stage	Code	Resolution	Connection	Connection orientation
CHU9 Cover : zinc Body : alu **CBU9** Cover : zinc Body : stainless steel **CXU9** Stainless steel cover & body	**30**:30mm Reduction hubs available	**5** : 11 to 30Vdc	**CS :** SSI without parity **CP :** SSI even parity **CI :** SSI odd parity	**B**: binary **G** : Gray	**13** : 13bits	**C6** : M23 12 pins CW for SSI **C8:** M23 12 pins CCW for SSI	**R** : radial
						C7 : PE + cable SSI cable	Example : **R020** : 2m radial cable **R020** : 2m radial cable
CHU9 _	**30** //	**5**	**CS**	**G** //	**13** //	**C7**	**R020**

Made in FRANCE

CHU9

PARALLEL SINGLE TURN ABSOLUTE ENCODERS, CHU9 RANGE

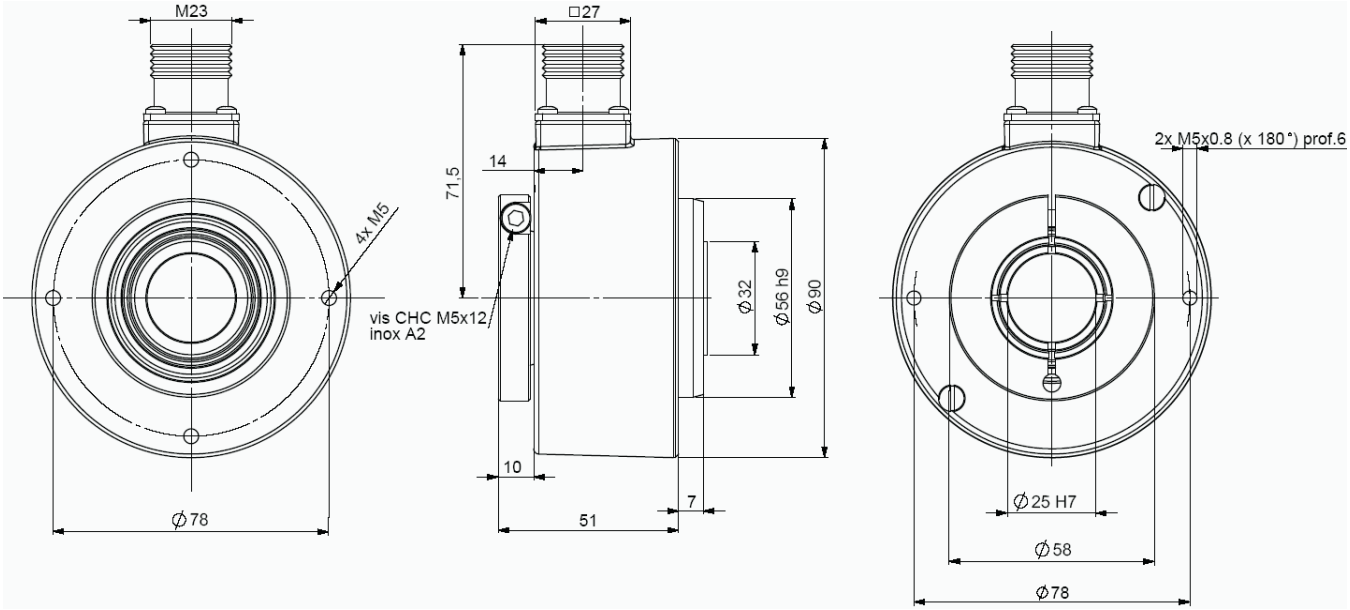
Especially designed for heavy-duty (steel, paper, wood – mills, cranes …) Compact and robust conception. Excellent resistance to shocks/vibrations and to extreme axial/radial loads

Hollow shaft of up to 30mm, adaptation of the bore size with composite hub for thermal and electric insulation (aluminium hubs in option)

Double/triple mounting in combinations of incremental, absolute, analogue signals

Also available in SSI serial interface and fieldbus interface : CanOpen, DeviceNet, Profibus

CHU9_25 connection CPR (radial M23), with reduction hub 9418/I25 (25mm) mounted on the shaft



CHARACTERISTICS

Material Stainless steel option	Cover : zinc alloy	Vibrations (EN60068.2.6)	≤ 200m.s^{-2} (10 … 1 000Hz)
	Body : aluminium	EMC	EN 50081-1, EN 61000-6-2
Shaft	Inox	Isolation	1 000 Veff
Bearings	6807 serie	Encoder weight (approx.)	0,700kg zinc alloy cover, alu body
Maximum loads	Axial : 50 N		1,000kg zinc alloy cover, stainless steel body
	Radial : 80 N		1,200kg stainless steel cover and body
Shaft inertia	≤ 55.10^{-6} kg.m^2	Operating temperature	- 20 ... + 90 °C (encoder T°)
Torque	≤ 25.10^{-3} N.m	Storage temperature	- 30 ... + 95 °C
Permissible max. speed	6 000 min^{-1}	Protection(EN 60529)	IP 65
Continuous max. speed	3 600 min^{-1}	Torque (ring screw)	nominal: 3N.m, break: 4N.m
Shaft seal	Viton	Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})	
Shocks (EN60068.2.27)	≤ 500 m.s^{-2} (during 6 ms)	25 N / 40 N: 140	50 N / 80 N : 17

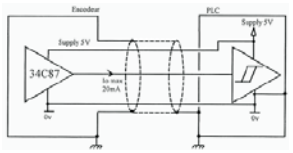
PARALLEL SINGLE TURN ABSOLUTE ENCODERS, CHU9 RANGE

PARALLEL OUTPUTS CONNECTION

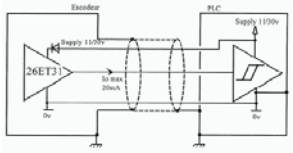
		13 bits + DIRECTION CP or C3	14 bits + DIRECTION C1	13 bits + DIRECTION + RAZ CZ
1	white WH	-	-	-
2	brown BN	+	+	+
3	green GN	D0	D0	D0
4	yellow YE	D1	D1	D1
5	grey GY	D2	D2	D2
6	pink PK	D3	D3	D3
7	blue BU	D4	D4	D4
8	red RD	D5	D5	D5
9	black BK	D6	D6	D6
10	violet VT	D7	D7	D7
11	white/brown WH/BN	D8	D8	D8
12	white/green WH/GN	D9	D9	D9
13	white/yellow WH/YE	D10	D10	D10
14	white/grey WH/GY	D11	D11	D11
15	white/pink WH/PK	D12	D12	D12
16	white/blue WH/BU	DIRECTION	D13	RAZ
17	white/red WH/RD	NC	DIRECTION	DIRECTION

Protection against inversion of polarity for the electronics 5CN and 5C5
Protection against short circuits for the electronic 5C5
Example 10 bits encoder : only most significant bits (D3 to D12) would be available

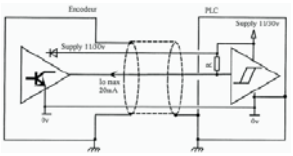
OUTPUT STAGE / SUPPLY - PARALLEL OUTPUT



Electronic 2CD
Supply : 5Vdc ± 10%
Cons. without load : 80mA max
Current per channel : Is = 20mA max
0 max (Is=20mA) : V_{ol} = 0,5Vdc
1 min (Is=20mA): V_{oh} = 2,5Vdc



Electronic 5C5
Supply : 11 to 30Vdc
Cons. without load : 100mA max
Current per channel : Is = 20mA max
0 max (Is=20mA): V_{ol} = 0,5Vdc
1 min (Is=20mA): V_{oh} = Vcc-3Vdc



Electronic 5CN
Supply : 11 to 30Vdc
Cons. without load : 100mA max
Current per channel : Is = 20mA max
0 max (Is=20mA): V_{ol} = 1,25Vdc

RAZ to be used with non turning shaft :
For an electrical reset / with push button (option) : give an impulse to the +Vcc during 1s minimum

DIRECTION
CW code : pin DIRECTION at +Vcc
CCW code : pin DIRECTION at 0V

ORDERING CODE (Special versions upon request, for ex. special flanges/electronics/connections...)

	Ø shaft	Parallel output : 2CD, 5C5, 5CN, 2ED, 5E5		Code	Resolution	Connection	Connection orientation
CHU9 Cover : zinc Body : alu **CBU9** Cover : zinc Body : stainless steel **CXU9** Stainless steel cover & body	**30** :30mm Reduction hubs available	**2**: 5Vdc **5**: 11 – 30Vdc	**CD**: driver 5Vdc **C5**: Push-Pull 11-30Vdc **CN**: NPNCO 11-30Vdc	**B** : binary **G** : Gray	**14** **13** ... **1**	**CP** : M23 16 pins CW 13 bits + DIRECTION **C1** : M23 17 pins CW 14bits + DIRECTION **C3** : 16 wires cable	Connector : **R** : radial
			With electrical RAZ: **ED**: driver 5Vdc **E5**: push-pull 11-30Vdc			**CZ** : M23 17 pins CW 13bits + DIRECTION + RAZ	Ex cable : **R020** : 2m radial cable
Ex: CHU9 _	**30** //	**5**	**C5**	**G** //	**13** //	**C3**	**R020**

14 bits : only available in GRAY code and electronics 5C5 and 2CD

Made in FRANCE

MULTITURN ABSOLUTE ENCODERS

Absolute encoders determine at any moment of their position due to a unique code within one revolution, even without a reference index. This unique code is given with the individual reading of concentric optical tracks, thanks to an LED emitting and a receiving system. These tracks are coded in GRAY which presents the advantage of changing its state only once per single track (one bit) for each step, and so ensures a reading without error

GRAY coded disk example

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
2^4	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0
2^3	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0
2^2	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1
2^1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
2^0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1

Mechanical version

The multi-turn absolute encoder, in addition to the reading of the position in the revolution, permits to count the number of revolutions which have been carried out. This counting is classically realized with the help of mechanical gears associated with one or more other coded discs (turn counting up to 16384 turns - 14 bits)

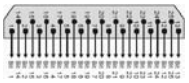
All electronic version

BEI IDEACOD has also developed a patented "all electronic" version based upon special sensors and dedicated electronics capable of counting the number of turns, both in normal operating mode and when the encoder is de-energized (turn counting up to 65536 - 16 bits). The reliability and the life duration of these method is now particularly high.

STANDARD INTERFACES

SSI

SSI involves synchronous transmission with data returned to the requesting unit which is controlled by the clock pulse. It only requires 4 signal wires, 2 for the clock (CLK + and CLK -) and 2 for the data (DATA + and DATA -) to which must be added two wires for the power supply. The clock signals are generated by the requester (logic controller, PC, display, etc.). The data signals are generated by the encoder. At the end of a data transfer, the line is held at 0 for 10 to 30 µs, then further interrogation is possible. To transmit the end of data bits, it requires N+1 clock periods. Transmission of parity calls for two supplementary clock periods. An absolute multi-turn encoder of 24 bits with parity requires 27 clock periods and 25 clock periods without parity



PARALLEL

The deserialisation extension cable allows the connection of a SSI encoder to parallel PLC input. The parallel outputs are push-pull types on a SUBD37 connector

PROFIBUS

Profibus is mainly used to automate industrial process / production lines, examples : automotive, chemical, food and beverage, logistics, safety or motion control... Devices connected to Profibus are 'smart', they deliver information about their 'health' and about the quality of the measured value. PROFIBUS is an international, open, nonproprietary fieldbus standard which is defined in the international standards.

CANOPEN

CANopen was developed as a standard embedded network with highly flexible configuration capabilities. CANopen was designed for motion-oriented machine control networks, such as handling systems. By now it is used in many various fields, such as medical equipment, off-road vehicles, maritime electronics, public transportation, building automation, etc... Standardized profiles (device, interface and application profiles) developed by CiA members simplify the system designer job of integrating a CANopen network system. CANopen is flexible and open enough to enable manufacturer-specific functionality in devices, which can be added to the generic functionality described in the profiles. It provides standardized communication objects for real-time data (Process Data Objects, PDO), configuration data (Service Data Objects, SDO), and special functions as well as network management data

DEVICENET

DeviceNet is manly used in industrial applications, in particular in factory automation. It's a standard communication link to connect industrial devices (such as encoders, but as well photoelectric sensors, bar code readers, variable frequency drive, panel displays) to a network that eliminates expensive hard wiring. The direct connectivity provides improved communication between devices as well as important device-level diagnostics

MULTITURN ABSOLUTE ENCODERS – STANDARD RANGE

POSI+™ - 58mm

- European standards universal SSI encoder
- Encoder T°: –20 to +85°C
- IP65 (IP67 with flange option)
- Universal power supply 5 to 30Vdc
- Programmable version available
- Position + incremental channels / limit switches

Range – 90mm

- Developed for extreme loads, shocks and vibrations
- 12mm solid shaft or 11mm with 115mm flange available 115 mm or with a 30mm through shaft
- Encoder T°: –20 à +75°C (+85°C option)
- IP65 SHU9
- IP67 PHM9 / SHM9

Range – 58mm – Field bus

- European standard field bus encoder
- Encoder T°: –40 to +85°C
- IP64 (IP66 with sealing shaft option)
- Resolution up to 16 bits per turn and 14 bits for the number of turns
- Two diagnostic LED on the connection cap allow to check simply the encoder functioning
- Available in stock, they can be delivered in 24hours

MULTITURN	Shaft	Electronic		Code	Resolution	Connection
	**06** : 6mm **10** : 10mm **12** : 12mm **15** : 15mm **30** : 30mm	Power supply : **5** : 11-30Vdc **P** : 5-30Vdc	Sortie : **SS** : SSI without parity **BG** : Profibus **BB** : CANopen **BA** : DeviceNet Programmable: **PX**: SSI programmable	**B** : Binary **G** : Gray	Standard: **13B12D5** 13 bits: resolution 12 bits:nbr of turn **13B16** 13 bits: resolution 16 bits:nbr of turn	**S6R** : radial 12 pins CW M23 connector **S8R** : radial 12 pins CCW M23 connector **S7R020** : radial 2m PUR cable **B4R010** : radial 1m cable **BBR010** : radial 1m cable, DB9 CANopen welded at the end **BAR010** : radial 1m cable , MiniC DeviceNet welded at the end **P6R** : radial 12 pins CW M23 connector (programmable encoder)

MULTITURNS ABSOLUT ENCODER – ALL ELECTRONIC VERSION

	***POSI+™*** **58mm** PHM5	Solid : 6 10	PSS	B G	13B12D5	S6R, S8R
			PPX	G	13B12D5	P6R
	***POSI+™*** **58mm** PHO5	Through : 14	PSS	B G	13B12D5	S6R, S8R
			PPX	G	13B12D5	P6R
	**90mm** PHM9 - SHM9	Solid : 12	PSS	B, G	13B12D5	S6R, S8R
			5BG	B	13B16	B4R010
			5BB	B	13B16	BBR010
			5BA	B	13B16	BAR010
	**90mm** PHU9 - SHU9	Through: 30	PSS	B, G	13B12D5	S6R, S8R
			5BG	B	13B16	B4R010
			5BB	B	13B16	BBR010
			5BA	B	13B16	BAR010
Reference example	PHM5_	10 //	PSS	G //	13B12D5 //	S6R
	Deserialisation cable Ref : **EAA-005**	The deserialisation cable allows the connection of a synchronous serial encoder on PLC parallel inputs The parallel outputs are push-pull type on a SUBD37 connector				

MULTITURN ABSOLUTE ENCODERS – MECHANICAL VERSIONS

	**58mm** MHM5	Solid: 10	Profibus , connection cap , ref : MHM510 - PROF - 001 CANopen , connection cap , ref : MHM510 - CANO- 001 DeviceNet , connection cap , ref : MHM510 - DNET - 001	Standard encoder : 13 bits per revolution, 12bits for the number of turns
	**58mm** MHK5	Blind : 15	Profibus , connection cap , ref : MHK515 - PROF - 001 CANopen , connection cap , ref : MHK515 - CANO- 001 DeviceNet , connection cap , ref : MHK515 - DNET - 001	Standard encoder : 13 bits per revolution, 12bits for the number of turns
Reference example	MHM510 – PROF - 001			

EAA-005

DESERIALISATION CABLE, SSI -> PARALLEL OUTPUTS

The deserialisation cable allows the connection of an SSI serial interface encoder to a PLC with parallel inputs

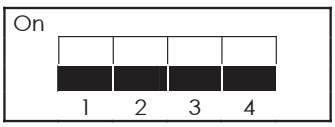
The reduced number of wires in the encoder connecting cable allows the customer to mount the card near the controller at a lower cost than an equivalent parallel encoder

Parallel outputs are push-pull type

Power supply	11 to 30 Vdc
Introduction	< 1 s
Encoder output	RS422 Level (SSI standards)
Encoder input	RS422 Level (Clock)
Parallel outputs	Push-pull, protection against short circuits
Transmission frequency	260kHz (switch 3 on OFF), 100kHz (switch 3 on ON)
Interrogation period	250µs (switch 3 on OFF), 390µs (switch 3 on ON)
Transmission	25 bits encoder without parity
	With or without transcoding Gray >> Binary, Binary >> Gray
Operating temperature	0 à 50°C

The different possible configurations are switch-programmable directly in the DB37. We would recommend to set all switches to 'Off', and then to configure the encoder using the following table:

Default configuration:



Gray parallel output	1 : OFF
Binary parallel output	1 : ON

Gray code encoder	2 : OFF
Binary code encoder	2 : ON

260kHz frequency	3 : OFF
100kHz frequency	3 : ON

Push-Pull, replacement PNP (inverse NPN)	4 : OFF
Push-Pull, replacement NPN (inverse PNP)	4 : ON*

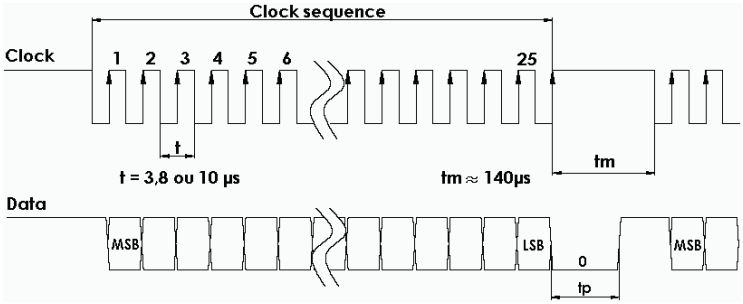
* The switch 4 on ON inverse the bits

The switch configuration is taken in account when the deserialisation cable is power on

EAA-005

DESERIALISATION CABLE, SSI -> PARALLEL OUTPUTS,

SSI TRANSMISSION



STANDARD SSI CONNECTION: 12 pinouts female M23 connector

Type	Vcc	Gnd	Clk+	Data+	RAZ / RAX	Data-	Clk-	DIRECTION
S6	1	2	3	4	5	6	7	9

Pinouts 8, 10, 11 et 12 : reserved, do not connect

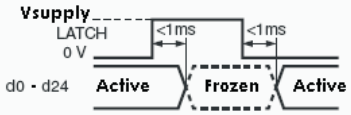
PARALLEL CONNECTION: 37 pinouts male SUBD connector

1	Bit 0 output
2	Bit 1 output
3	Bit 2 output
4	Bit 3 output
5	Bit 4 output
6	Bit 5 output
7	Bit 6 output
8	Bit 7 output
9	Bit 8 output
10	Bit 9 output
11	Bit 10 output
12	Bit 11 output
13	Bit 12 output
14	Bit 13 output
15	Bit 14 output
16	Bit 15 output
17	Bit 16 output
18	Bit 17 output
19	Bit 18 output

20	Bit 19 output
21	Bit 20 output
22	Bit 21 output
23	Bit 22 output
24	Bit 23 output
25	Bit 24 output
26	Reserved
27	RAZ / RAX
28	SELECT
29	LATCH
30	DIRECTION
31	Reserved
32	Reserved
33	Reserved
34	Reserved
35	Reserved
36	+ 11 to 30Vdc
37	0 Vdc
Reserved :	Do not connect

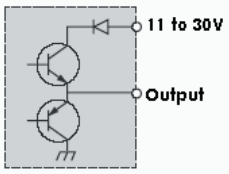
Electronic

Latch input



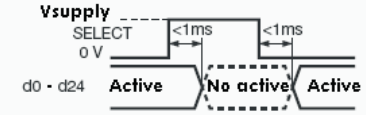
	min	max
"0" level	0V	0,3 x Vsupply
"1" level	0,7 x Vsupply	Vsupply
I LATCH	< 5mA	

PUSH - PULL
Power supply: 11 to 30Vdc
Max. ondulation: 500mV
Protection against inversion of polarity
Cons. without load: 50mA max.
(typically 30mA at 24V)



Max. current: 20mA
"0" level: 1,5V max.
"1" level: Vsupply - 2,5V
Protection against short circuits

SELECT input



	min	max
"0" level	0V	0,3 x Vsupply
"1" level	0,7 x Vsupply	Vsupply
I SELECT	< 5mA	

SELECT and LATCH inputs must be connected to the 0Vdc(do not leave unconnected)

Nota : Pinouts 27 and 30 of the SUBD37 connector are respectively directly connected to the pinouts 5 and 9 of the M23 connector

ORDERING REFERENCE: EAA-005 (1m cable, weight : 230g)

Nota : extension cable for SSI encoder available on simple request

Made in FRANCE

BEI IDEACOD

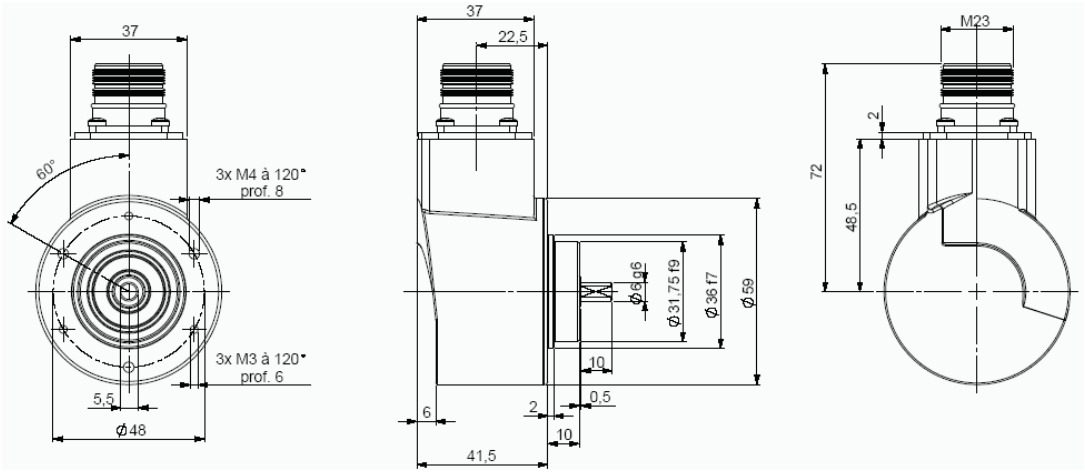
www.bei-ideacod.com

PHM5

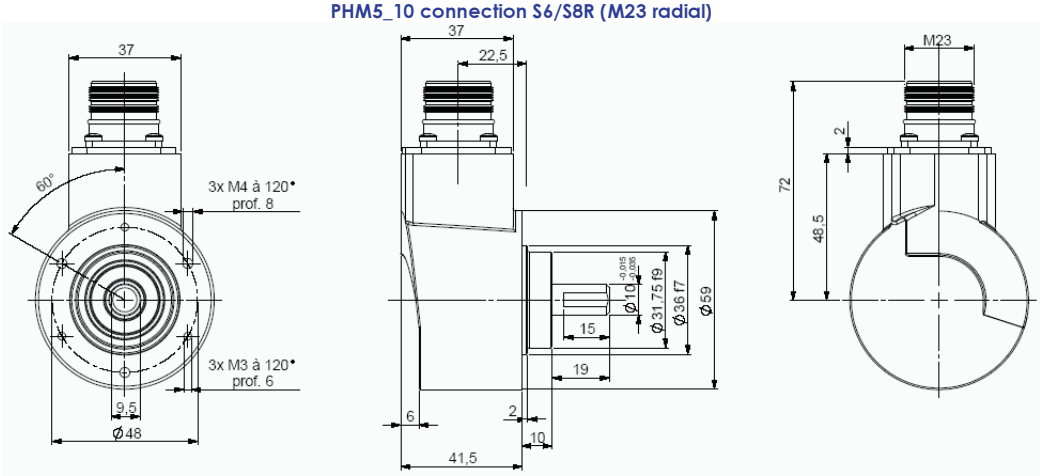
ABSOLUTE MULTITURN ENCODER, PHM5 RANGE, *POSI+*™

- Solid shaft Ø 6 and Ø 10 mm
- Robustness and excellent resistance to shocks / vibrations
- High protection level IP65, IP67 option with a sealing flange
- High performances in temperature –20°C to +85°C
- Isolated SSI interface, clock from 100 to 500 kHz
- Universal electronic circuits from 5 to 30Vdc
- Protection against short-circuits and inversion of polarity
- High resolutions available: 8192 (13 bits) per turn
- Turn counting up to 65 536 (16 bits)
- 2 inputs : DIRECTION and RAZ
- Available with incremental channels – 2048 points – 5 to 30 Vdc
- Option: push-button on the cover for a encoder reset to a value X

PHM5_06 connection S6/S8R (M23 radial)



PHM5_10 connection S6/S8R (M23 radial)



Material	Cover : treated steel
	Body: aluminium
	Shaft : stainless steel
Bearings	6 000 serie
Maximum load	Axial : 50 N
	Radial : 100 N
Shaft inertia	≤ 1.10^{-6} kg.m²
Torque	≤ 4.10^{-3} N.m
Permissible max. speed	6 000 min^{-1}
Continuous max. speed	6 000 min^{-1}

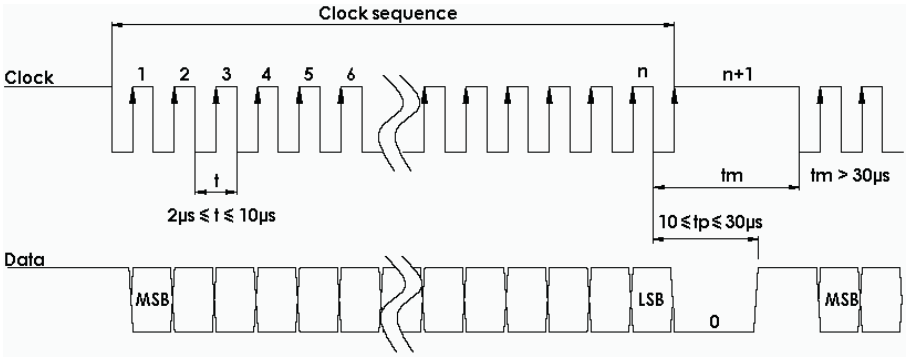
Shock (EN60068-2-27)	≤ 500 $m.s^{-2}$ (during 6 ms)
Vibration (EN60068-2-6)	≤ 100 $m.s^{-2}$ (10… 2 000 Hz)
EMC	EN 61000-6-4, EN 61000-6-2
Isolation	100V (1 min.)
Weight (connector)	0,520 kg
Operating temperature	- 20 ... + 85 °C (encoder T°)
Storage temperature	- 20 ... + 85 °C
Protection(EN 60529)	IP 65 (IP67 with flange option)
Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})	
25 N / 50 N : 99	50 N / 100 N : 12

ABSOLUTE MULTITURN ENCODER, PHM5 RANGE, *POSI+*™

ELECTRICAL CHARACTERISTIC

Input signal clock CLK	per opto-coupleur	Power supply	5 – 30Vdc
Output signal DATA	line - driver selon RS422	Introduction	< 1 s
Clock frequency CLK	100kHz – 500kHz	Cons. without load	< 100mA (typically 50-60mA at 24Vdc)
Precision	± ½ LSB (13 bits)	Position refresh	< 200µs

SSI TRANSMISSION



Transmission	Transmission up to 400m* at 100kHz in function of the cable characteristics
Cable	High security of transmission by using shielded cable and twisted pairs

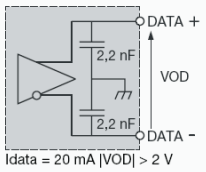
*Consult us for length > 100m

SSI CONNECTION (TYPE S6 : BEI IDEACOD STANDARD)

Type	Vcc	Gnd	Clk+	Data+	RAZ	Data-	Clk-	DIRECTION
S6	1	2	3	4	5	6	7	9
S8	8	1	3	2	6	10	11	5

Nota : Do not connect other pinouts, connect DIRECTION and RAZ to a potential (RAZ at 0V if not used)

Data output RS422

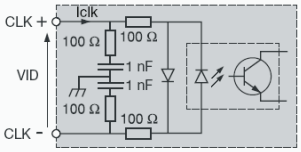


Idata = 20 mA |VOD| > 2 V

Protection against short circuits

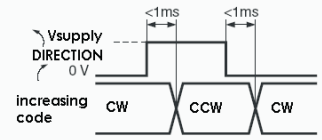
Isolated Clk input

Power supply: 5 to 30 V
Max ond. : 500mV for 11 to 30Vdc power supply
Protection against inversion of polarity
Cons. without load: 100mA max.



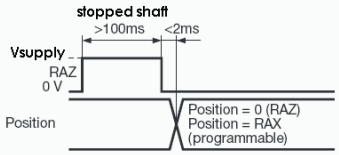
|VID| maxi : 5 V
|Iclk| maxi : 15 mA

DIRECTION input



	min	max	increasing
Level "0"	0V	0,3xVsupply	CW
Level "1"	0,7xVsupply	Vsupply	CCW
I direction	< 5mA		

RAZ / RAX input



	min	max
Level "0"	0 V	0,3xVsupply
Level "1"	0,7xVsupply	Vsupply
I RAZ/RAX	< 5mA	

ORDERING REFERENCE (Contact the factory for special versions, ex: special flanges, connections, electronics…)

	Shaft Ø	Supply	Output stage	Code	Resolution			Connection	Orientation
					13 B12 D5				
					Resolution	Nb of turn	Nb data		
PHM5	**10** : 10mm **06** : 6mm	**P** : 5 to 30Vdc	**SS** : SSI without parity	**B**: binary **G**: Gray	**13:** 13 bits	**B12:** 12 bits	**D5:** 25 bits	**S6** : M23 12pins CW for SSI transmission **S8:** M23 12pins CCW for SSI transmission	**R** : radiale
PHM5 _	**10** //	**P**	**SS**	**G** //	**13**	**B12**	**D5** //	**S6**	**R**

Made in France

BEI IDEACOD

www.bei-ideacod.com

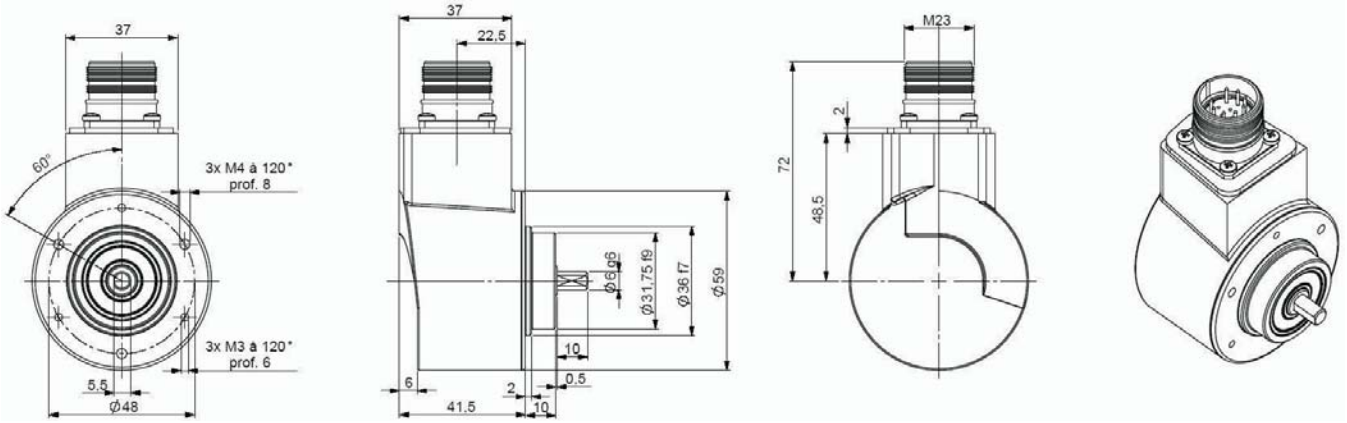
PHM5

PROGRAMMABLE MULTITURN ABSOLUTE ENCODER, PHM5 RANGE, *POSI+™*

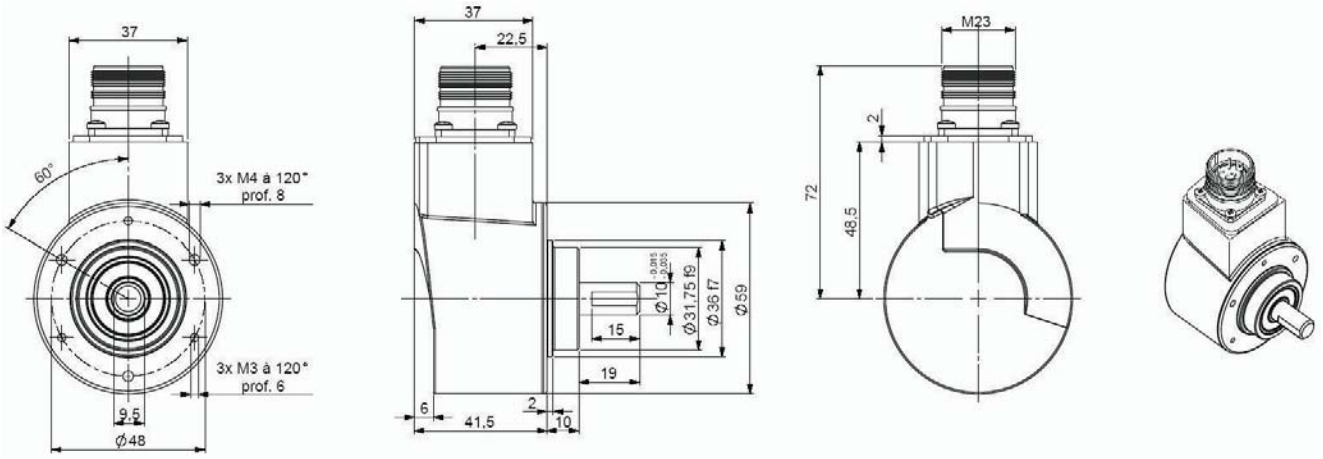
- Solid shaft Ø 6 and Ø 10 mm
- Robustness and excellent resistance to shocks / vibrations
- High protection level IP65, IP67 option with a sealing flange
- High performances in temperature –20°C to +85°C
- Isolated SSI interface, clock from 100 to 500 kHz
- Universal electronic circuits from 5 to 30Vdc
- Protection against short-circuits and inversion of polarity
- High resolutions available: 8192 (13 bits) per turn
- Turn counting up to 65 536 (16 bits)
- 2 inputs : DIRECTION and RAZ
- Type choice of the wished limit value : position, rotation speed, temperature
- Diagnostic functions: temperature, rotation speed, position, input/output level
- Programmation of the encoder with a serial transmission RS232 directly with the serial PC connection: resolution, number of turn, output code, parity, SSI frame bit number, reset value, functions of the 2 outputs : (OUT 1 and OUT 2): limit switch, incremental channels

RS232

PHM5_06 connection P6R (M23 radial)



PHM5_10 connection P6R (M23 radial)



Material	Cover : treated steel
	Body: aluminium
	Shaft : stainless steel
Bearings	6 000 serie
Maximum load	Axial : 50 N
	Radial : 100 N
Shaft inertia	≤ 1.10^{-6} kg.m²
Torque	≤ 4.10^{-3} N.m
Permissible max. speed	6 000 min^{-1}
Continuous max. speed	6 000 min^{-1}

Shock (EN60068-2-27)	≤ 500 $m.s^{-2}$ (during 6 ms)
Vibration (EN60068-2-6)	≤ 100 $m.s^{-2}$ (10… 2 000 Hz)
EMC	EN 61000-6-4, EN 61000-6-2
Isolation	100V (1 min.)
Weight (connector)	0,520 kg
Operating temperature	- 20 ... + 85 °C (encoder T°)
Storage temperature	- 20 ... + 85 °C
Protection(EN 60529)	IP 65 (IP67 with flange option)
Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})	
25 N / 50 N : 99	50 N / 100 N : 12

PROGRAMMABLE MULTITURN ABSOLUTE ENCODER, PHM5 RANGE, *POSI+™*

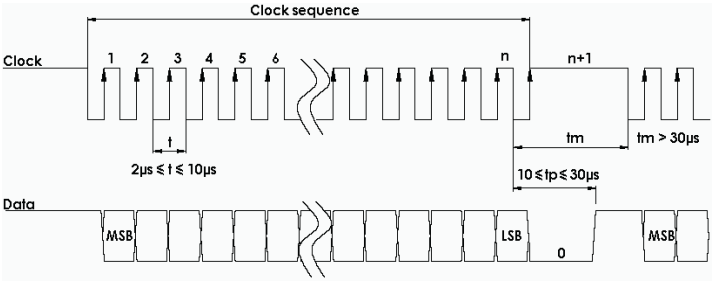
In order to optimize the installation times of SSI encoders, BEI IDEACOD has developed a friendly software package, easy to use, with which is possible to program your encoder under WINDOWS in only 2 minutes. With a simple connection to the serial connector of your PC, you can :
- configure : the number of steps per revolution, the number of turns, the code type, SSI frame bit number, the parity, reset value
- read : type of selected encoder, the serial number of the encoder, the position of the encoder, the temperature, the speed of rotation, the level of the input/output
- save the chosen configuration, load saved configurations
- function of the outputs and limit value : position, speed of rotation, temperature, incremental channels 2048 ppr

ELECTRICAL CHARACTERISTIC

Input signal clock CLK	per opto-coupleur
Output signal DATA	line - driver RS422
Clock frequency CLK	100kHz – 500kHz
Precision	± ½ LSB (13 bits)

Power supply	5 – 30Vdc
Introduction	< 1 s
Cons. without load	< 100mA (typically 60-70mA at 24Vdc)
Position refresh	< 200µs

SSI TRANSMISSION



Transmission	Transmission up to 400m* at 100kHz in function of the cable characteristics
Cable	High security of transmission by using shielded cable and twisted pairs

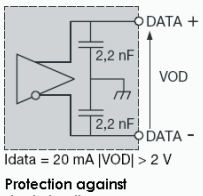
* consult us for length > 100m

SSI CONNECTION

Type	Vcc	Gnd	Clk+	Data+	RAZ	Data-	Clk-	DIR.	OUT1	OUT2	TXD Encoder RXD RS232	RXD Encoder TXD RS232
P6	1	2	3	4	5	6	7	9	10	11	8	12

The pinouts TXD and RXD are used for the encoder programming
Connect the entry DIRECTION and RAZ to a potential (RAZ to the 0V if not used)

Data output RS422

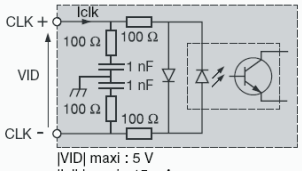


Idata = 20 mA |VOD| > 2 V

Protection against short circuits

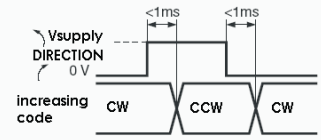
Isolated Clk input

Power supply: 5 to 30 V
Max ond. : 500mV for 11 to 30Vdc power supply
Protection against inversion of polarity
Cons. without load: 100mA max.



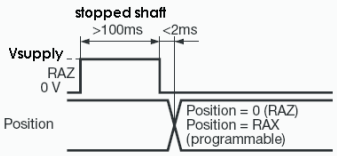
|VID| maxi : 5 V
|Iclk| maxi : 15 mA

DIRECTION input



	min	max	increasing
Level "0"	0V	0,3xVsupply	CW
Level "1"	0,7xVsupply	Vsupply	CCW
I direction	< 5mA		

RAZ / RAX input



	min	max
Level "0"	0 V	0,3xVsupply
Level "1"	0,7xVsupply	Vsupply
I RAZ/RAX	< 5mA	

Output : - Max current: 20m A
- Level "0" max : 0.5V, Level "1" min : Vsupply-2,5V
- Limit switch time answer : < 400µs
- Incremental channels : 100kHz max

Programmation cable : PC RS232
- Supply : 230Vac / 12Vdc
- Cable SubD9 (serial PC) / M23 12 pins (encoder)

Reference : PRO-020S001

ORDERING REFERENCE (Contact the factory for special versions, ex:special flanges, connections, electronics...)

	Shaft Ø	Supply	Output stage	Code	Resolution			Connection	Orientation
					13 B12 D5				
PHM5_	**06**:6mm **10**:10mm	**P** : 5 to 30Vdc	**PX** : SSI programmable Nota : without parity by default	**G** : Gray default	**Resolution** **13:** 13 bits default	**Nb of turn** **B12:** 12 bits default	**Nb data** **D5:** 25 bits default	**P6:** M23 12pins CW for SSI transmission	**R** : radial
PHM5 _	**10 //**	**P**	**PX**	**G //**	**13**	**B12**	**D5 //**	**P6**	**R**

SOFTWARE / CONFIGURATION MANUAL: consult us

Encoder available in stock, manufacture setting: 8192pts/turn, 4096 turns (25bits) - Gray

Made in FRANCE

BEI IDEACOD

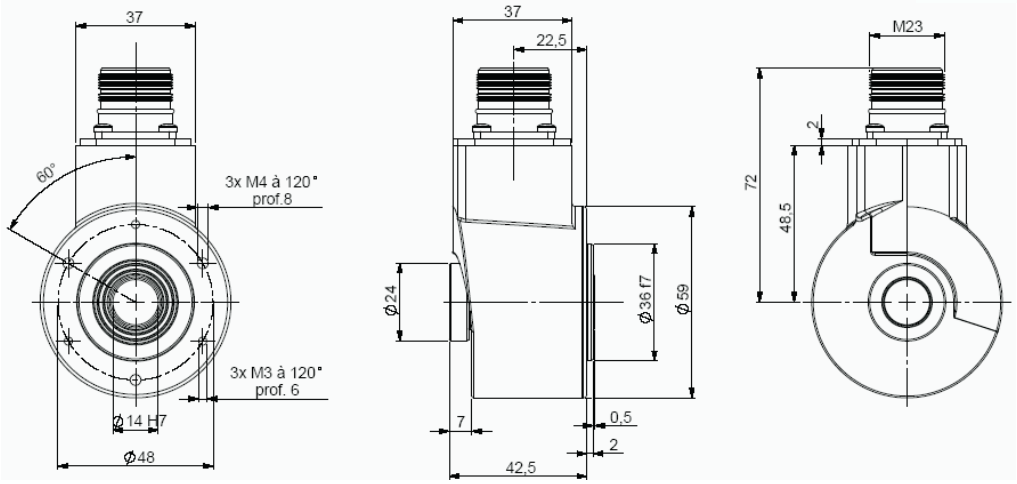
www.bei-ideacod.com

PHO5

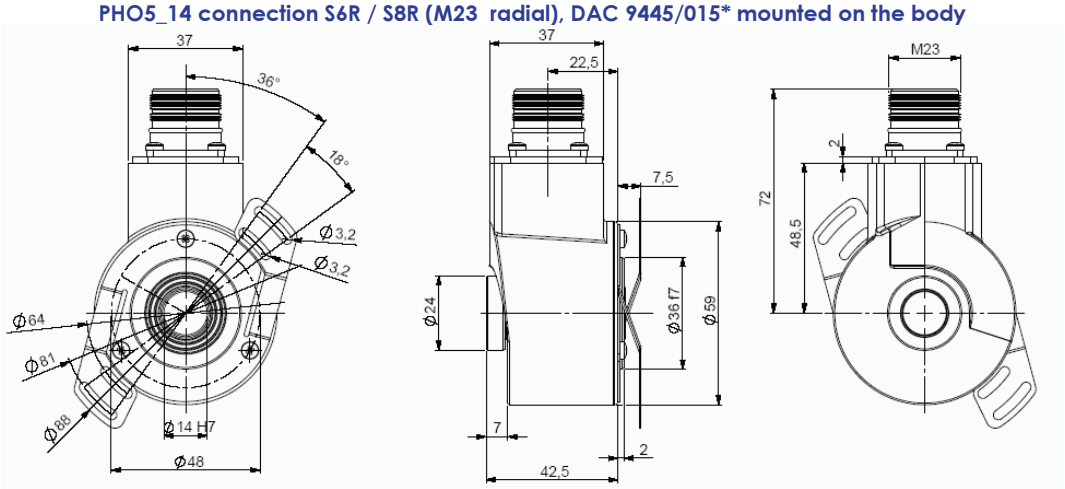
ABSOLUTE MULTITURN ENCODER, PHM5 RANGE, *POSI+™*

- Extra-flat encoder, through shaft Ø 14 mm, reduction hubs available: 6, 8, 10, 12mm
- Robustness and excellent resistance to shocks / vibrations
- High performances in temperature –20°C to +85°C
- Isolated SSI interface, clock from 100 to 500 kHz
- Universal electronic circuits from 5 to 30Vdc
- Protection against short-circuits and inversion of polarity
- High resolutions available: 8192 (13 bits) per turn
- Turn counting up to 65 536 (16 bits)
- 2 inputs : DIRECTION and RAZ
- Available with incremental channels – 2048 points – 5 to 30 Vdc

PHO5_14 connection S6R / S8R (M23 radial)



PHO5_14 connection S6R / S8R (M23 radial), DAC 9445/015* mounted on the body



* Accessories to be ordered separately

Material	Cover : treated steel	Shock (EN60068-2-27)	≤ 500m.s^{-2} (during 6 ms)
	Body: aluminium	Vibration (EN60068-2-6)	≤ 100m.s^{-2} (10 … 2 000 Hz)
	Shaft : stainless steel	EMC	EN 61000-6-4, EN 61000-6-2
Bearings	6 803 serie	Isolation	100V (1 min)
Maximum load	Axial : 20 N	Weight	0,480 kg
	Radial : 50 N	Operating temperature	- 20 ... + 85 °C (encoder T°)
Shaft inertia	≤ 2,2.10^{-6} kg.m^2	Storage temperature	- 20 ... + 85 °C
Torque	≤ 6.10^{-3} N.m	Protection(EN 60529)	IP 65
Permissible max. speed	6 000 min^{-1}	Torque (ring pressure screw)	nominal: 1.5N.m, break: 2.0N.m
Continuous max. speed	6 000 min^{-1}	Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})	
Shaft seal	Viton	10 N / 25 N : 185	20 N / 50 N : 24

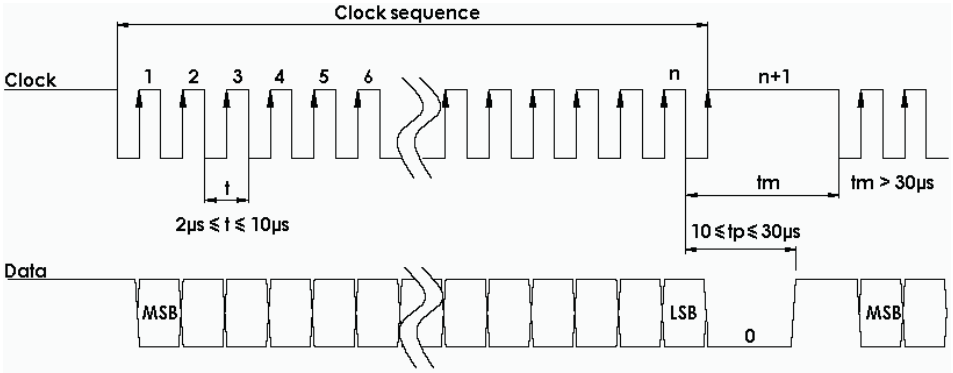
ABSOLUTE MULTITURN ENCODER, PHO5 RANGE, *POSI+*™

CE

ELECTRICAL CHARACTERISTIC

Input signal clock CLK	per opto-coupler	Power supply	5 – 30Vdc
Output signal DATA	line - driver RS422	Introduction	< 1 s
Clock frequency CLK	100kHz – 500kHz	Cons. Without load	< 100mA (typically 50-60mA at 24Vdc)
Precision	± ½ LSB (13 bits)	Position refresh	< 200µs

SSI TRANSMISSION



Transmission	Transmission up to 400m* at 100kHz in function of the cable characteristics
Cable	High security of transmission by using shielded twisted pair cable

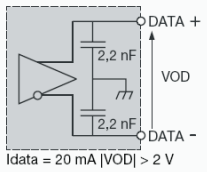
Consult us for length > 100m

SSI CONNECTION (TYPE S6 : BEI IDEACOD STANDARD)

Type	Vcc	Gnd	Clk+	Data+	RAZ	Data-	Clk-	DIRECTION
S6	1	2	3	4	5	6	7	9
S8	8	1	3	2	6	10	11	5

Note : Do not connect other pinouts, connect DIRECTION and RAZ to a potential (RAZ at 0V if not used)

Data output RS422

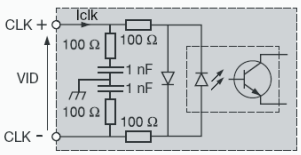


Idata = 20 mA |VOD| > 2 V

Protection against short circuits

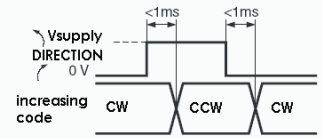
Isolated Clk input

Power supply: 5 to 30 V
Max ond. : 500mV for 11 to 30Vdc power supply
Protection against inversion of polarity
Cons. without load: 100mA max.



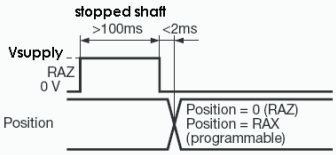
|VID| maxi : 5 V
|Iclk| maxi : 15 mA

DIRECTION input



	min	max	increasing
Level "0"	0V	0,3xVsupply	CW
Level "1"	0,7xVsupply	Vsupply	CCW
I direction	< 5mA		

RAZ / RAX input



	min	max
Level "0"	0 V	0,3xVsupply
Level "1"	0,7xVsupply	Vsupply
I RAZ/RAX	< 5mA	

ORDERING REFERENCE (Contact the factory for special versions, ex: special flanges, connections, electronics…)

	Shaft Ø	Supply	Output stage	Code	Resolution			Connection	Orientation
					13 B12 D5				
					Resolution	Nb of turn	Nb data		
PHO5	**14** : 14mm Nota: reduction hubs available	**P** : 5 to 30Vdc	**SS** : SSI without parity	**B**: binary **G**: Gray	**13:** 13 bits	**B12:** 12 bits	**D5:** 25 bits	**S6** : M23 12pins CW for SSI transmission **S8:** M23 12pins CCW for SSI transmission	**R** : radiale
PHO5 _	**14** //	**P**	**SS**	**G** //	**13**	**B12**	**D5** //	**S6**	**R**

Made in FRANCE

BEI IDEACOD

www.bei-ideacod.com

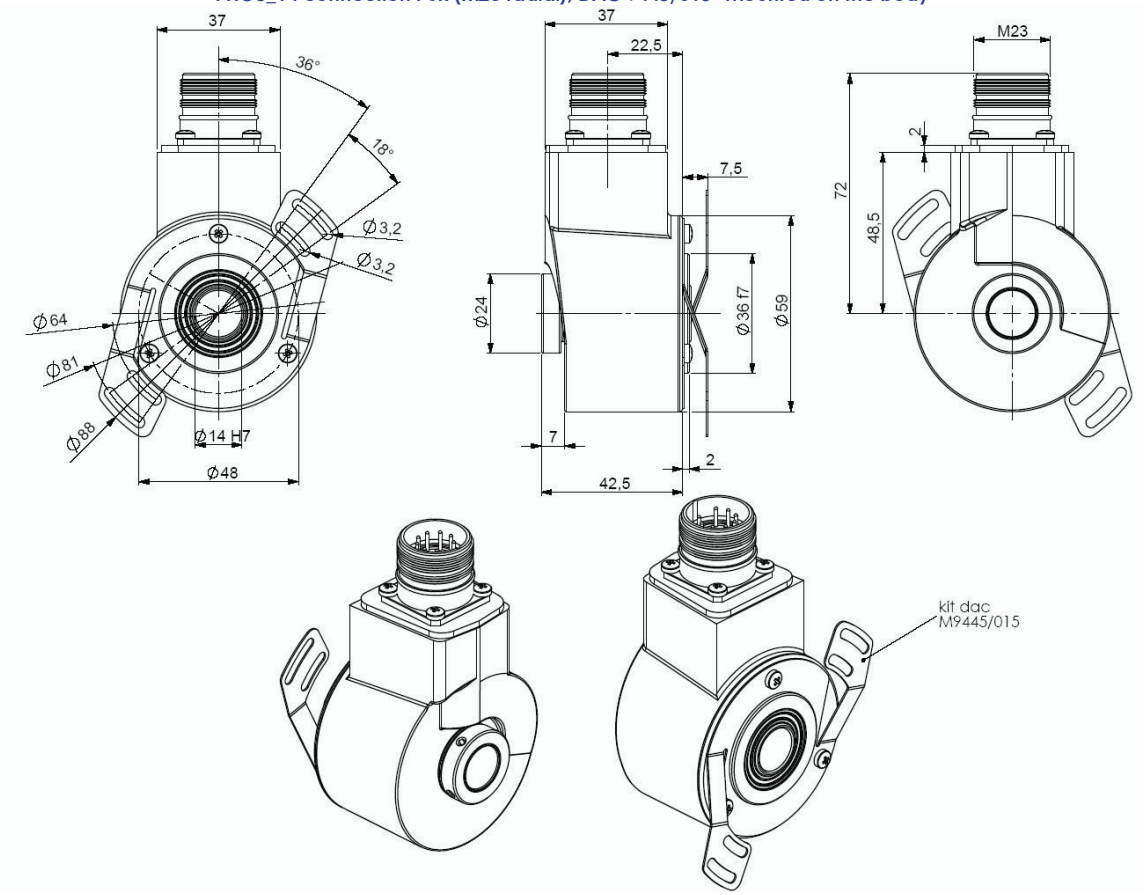
PHO5

PROGRAMMABLE MULTITURN ABSOLUTE ENCODER, PHO5 SERIE, *POSI+™*

- Extra flat encoder, through shaft Ø 14 mm, reduction hubs available: 6, 8, 10, 12mm
- Robustness and excellent resistance to shocks / vibrations
- High performances in temperature –20°C to +85°C
- Isolated SSI interface, clock from 100 to 500 kHz
- Universal electronic circuits from 5 to 30Vdc
- Protection against short-circuits and inversion of polarity
- High resolutions available: 8192 (13 bits) per turn
- Turn counting up to 65 536 (16 bits)
- 2 inputs : DIRECTION and RAZ
- Type choice of the wished limit value : position, rotation speed, temperature
- Diagnostic functions: temperature, rotation speed, position, input/output level
- Programming of the encoder with a serial transmission RS232 directly with the serial PC connection: resolution, number of turn, output code, parity, SSI frame bit number, reset value, functions of the 2 outputs : (OUT 1 and OUT 2): limit switch, incremental channels

RS232

PHO5_14 connection P6R (M23 radial), DAC 9445/015* mounted on the body



* accessories to be ordered separately

Material	Cover : treated steel
	Body: aluminium
	Shaft : stainless steel
Bearings	6 803 serie
Maximum loads	Axial : 20 N
	Radial : 50 N
Shaft inertia	≤ $2{,}2.10^{-6}$ kg.m²
Torque	≤ 6.10^{-3} N.m
Permissible max. speed	6 000 min^{-1}
Continuous max. speed	6 000 min^{-1}
Shaft seal	Viton

Shock (EN60068-2-27)	≤ 500m.s^{-2} (during 6 ms)
Vibration (EN60068-2-6)	≤ 100m.s^{-2} (10 … 2 000 Hz)
EMC	EN 61000-6-4, EN 61000-6-2
Isolation	100V (1 min)
Weight	0,480 kg
Operating temperature	- 20 ... + 85 °C (encoder T°)
Storage temperature	- 20 ... + 85 °C
Protection(EN 60529)	IP 65
Torque (ring pressure screw)	nominal: 1.5N.m, break: 2.0N.m
Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})	
10 N / 25 N : 185	20 N / 50 N : 24

PHO5

PROGRAMMABLE MULTITURN ABSOLUTE ENCODER, PHO5 SERIE, *POSI+™*

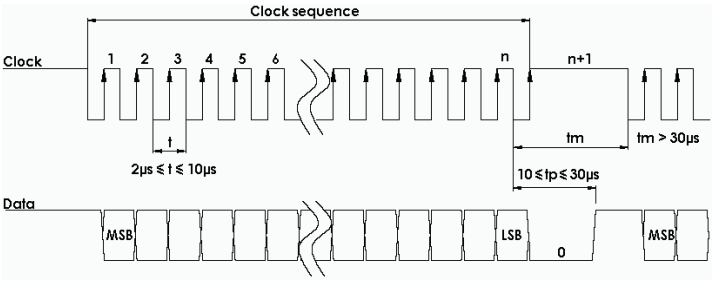
In order to optimize the installation times of SSI encoders, BEI IDEACOD has developed a friendly software, easy to use, with which it's possible to program your encoder under WINDOWS in only 2 minutes. With a simple connection to the serial connector of your PC, you can :
- configure : the number of points per revolution, the number of turns, the code type, SSI frame bit number, the parity, reset value
- read : type of selected encoder, the serial number of the encoder, the position of the encoder, the temperature, the speed of rotation, the level of the input/output
- save the chosen configuration, load saved configurations
- function of the outputs and limit value: position, speed of rotation, temperature, incremental channels 2048 ppr

ELECTRICAL CHARACTERISTIC

Input signal clock CLK	per opto-coupler
Output signal DATA	line - driver RS422
Clock frequency CLK	100kHz – 500kHz
Precision	± ½ LSB (13 bits)

Power supply	5 – 30Vdc
Introduction	< 1 s
Cons. without load	< 100mA (typically 60-70mA at 24Vdc)
Position refresh	< 200µs

SSI TRANSMISSION



Transmission	Transmission up to 400m* at 100kHz in function of the cable characteristics
Cable	High security of transmission by using shielded cable and twisted pairs

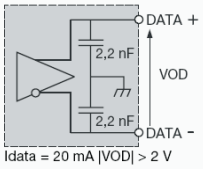
* consult us for length > 100m

SSI CONNECTION

Type	Vcc	Gnd	Clk+	Data+	RAZ	Data-	Clk-	DIR.	OUT1	OUT2	TXD Encoder RXD RS232	RXD Encoder TXD RS232
P6	1	2	3	4	5	6	7	9	10	11	8	12

The pinouts TXD and RXD are used for the encoder programming
Connect the entry DIRECTION and RAZ to a potential (RAZ to the 0V if not used)

Data output RS422

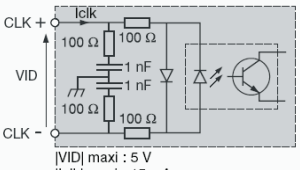


Idata = 20 mA |VOD| > 2 V

Protection against short circuits

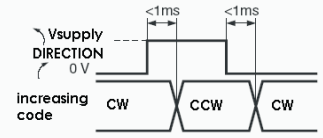
Isolated Clk input

Power supply: 5 to 30 V
Max ond. : 500mV for 11 to 30Vdc power supply
Protection against inversion of polarity
Cons. without load: 100mA max.



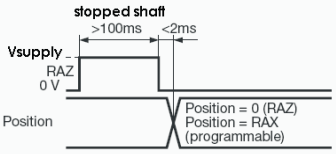
|VID| maxi : 5 V
|Iclk| maxi : 15 mA

DIRECTION input



	min	max	increasing
Level "0"	0V	0,3xVsupply	CW
Level "1"	0,7xVsupply	Vsupply	CCW
I direction	< 5mA		

RAZ / RAX input



	min	max
Level "0"	0 V	0,3xVsupply
Level "1"	0,7xVsupply	Vsupply
I RAZ/RAX	< 5mA	

Output : - Max current: 20m A
- Level "0" max : 0.5V, Level "1" min : Vsupply-2,5V
- Limit switch time answer : < 400µs
- Incremental channels : 100kHz max

Programmation cable : PC RS232
- Supply : 230Vac / 12Vdc
- Cable SubD9 (serial PC) / M23 12 pins (encoder)

Reference: PRO-020S001

ORDERING REFERENCE (Contact the factory for special versions, ex: special flanges, connections, electronics...)

	Shaft Ø	Supply	Output stage	Code	Resolution			Connection	Orientation
					13 B12 D5				
PHO5_	**14**:14mm	**P** : 5 to 30Vdc	**PX** : SSI programmable Nota : without parity by default	**G** : Gray default	Resolution	Nb of turn	Nb data	**P6**: M23 12pins CW for SSI transmission	**R** : radial
					13: 13 bits default	**B12**: 12 bits default	**D5**: 25 bits default		
PHO5 _	**14 //**	**P**	**PX**	**G //**	**13**	**B12**	**D5 //**	**P6**	**R**

SOFTWARE / CONFIGURATION MANUAL: consult us

Encoder available in stock, manufacture setting: 8192pts/turn, 4096 turns (25bits) - Gray

Made in FRANCE

BEI IDEACOD

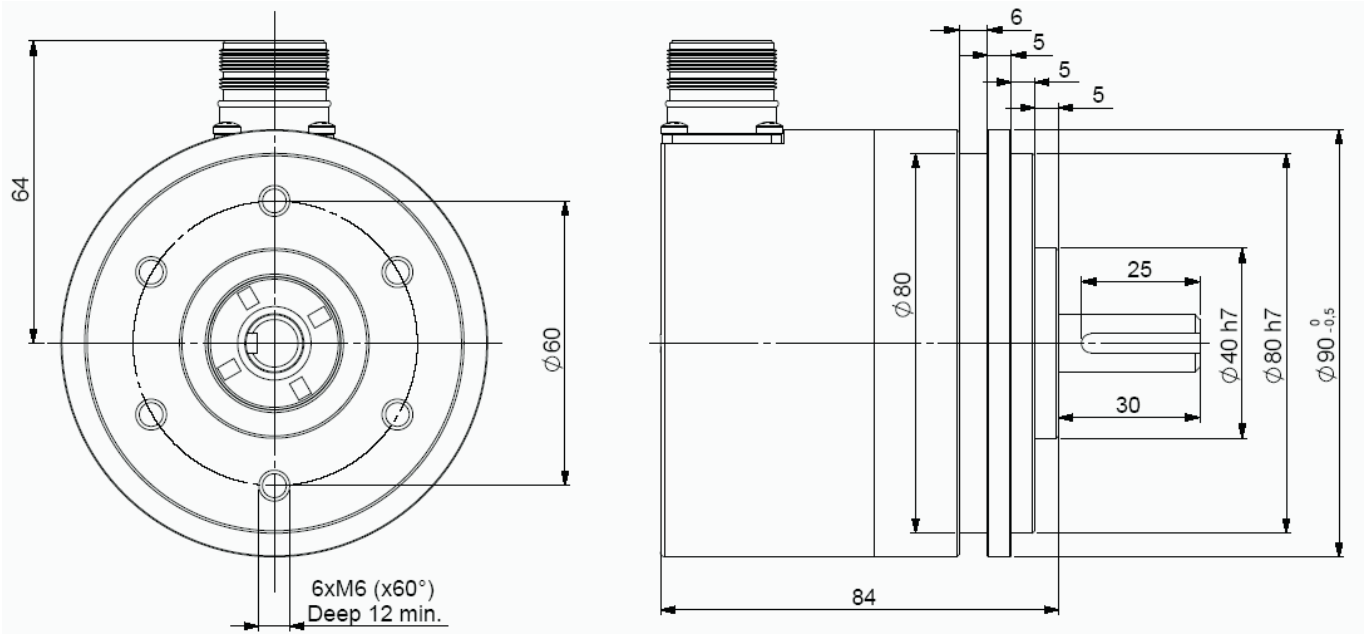
www.bei-ideacod.com

PHM9

SSI ABSOLUTE MULTITURN ENCODER, PHM9 RANGE

- Heavy Duty version, Ø 30mm through shaft, reduction hubs available
- Robustness and excellent resistance to shocks / vibrations
- High protection level IP66
- High performances in temperature –20°C to +85°C
- Isolated SSI interface, clock from 100 to 500 kHz
- Universal electronic circuits from 5 to 30Vdc
- Protection against short-circuits and inversion of polarity
- High resolutions available: 8192 (13 bits) per turn
- Turn counting up to 65 536 (16 bits)
- 2 inputs : DIRECTION and RAZ
- Available with incremental channels – 2048 points – 5 to 30 Vdc
- Option: push-button on the cover for a encoder reset to a value X

PHM9_12 connection S6/S8R (radial M23)



CARACTERISTIQUES

Material	Cover : zinc alloy
	Body: aluminium
Shaft	Stainless steel
Bearings	6001 serie
Maximum loads	Axial : 100 N
	Radial : 200 N
Shaft inertia	≤ 15.10^{-6} kg.m²
Torque	≤ 10.10^{-3} N.m
Permissible max. speed	6 000 min^{-1}
Continuous max. speed	6 000 min^{-1}
Shaft seal	Viton double lips

Shocks (EN60068.2.27)	≤ 500m.s^{-2} (during 6 ms)
Vibrations (EN60068.2.6)	≤ 100m.s^{-2} (10 ... 2 000 Hz)
EMC	EN 61000-6-4, EN 61000-6-2
Isolation	100V (1 min.)
Encoder weight (approx.)	1,600 kg
Operating temperature	- 20 ... + 85 °C (encoder T°)
Storage temperature	- 20 ... + 85 °C
Protection(EN 60529)	IP 66

Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})

20 N / 30 N	50 N / 100 N	100 N / 200 N
360	18	2,2

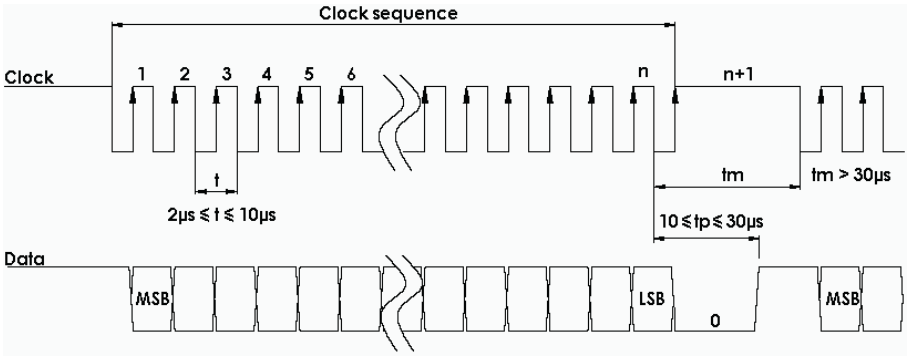
SSI ABSOLUTE MULTITURN ENCODER, PHM9 RANGE

ELECTRICAL CHARACTERISTIC

Input signal clock CLK	per opto-coupleur
Output signal DATA	line - driver selon RS422
Clock frequency CLK	100kHz – 500kHz
Precision	± ½ LSB (13 bits)

Power supply	5 – 30Vdc
Introduction	< 1 s
Cons. without load	< 100mA (typically 50-60mA at 24Vdc)
Position refresh	< 200µs

SSI TRANSMISSION



Transmission	Transmission up to 400m* at 100kHz in function of the cable characteristics
Cable	High security of transmission by using shielded cable and twisted pairs

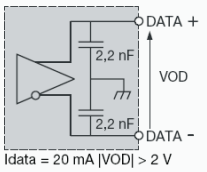
*Consult us for length > 100m

SSI CONNECTION (TYPE S6 : BEI IDEACOD STANDARD)

Type	Vcc	Gnd	Clk+	Data+	RAZ	Data-	Clk-	DIRECTION
S6	1	2	3	4	5	6	7	9
S8	8	1	3	2	6	10	11	5

Note : Do not connect other pinouts, connect DIRECTION and RAZ to a potential (RAZ at 0V if not used)

Data output RS422

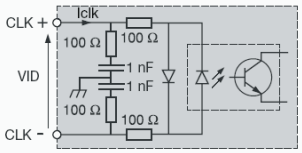


Idata = 20 mA |VOD| > 2 V

Protection against short circuits

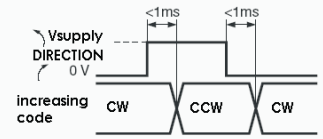
Isolated Clk input

Power supply: 5 to 30 V
Max ond. : 500mV for 11 to 30Vdc power supply
Protection against inversion of polarity
Cons. without load: 100mA max.



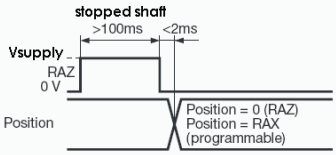
|VID| maxi : 5 V
|Iclk| maxi : 15 mA

DIRECTION input



	min	max	increasing
Level "0"	0V	0,3xVsupply	CW
Level "1"	0,7xVsupply	Vsupply	CCW
I direction	< 5mA		

RAZ / RAX input



	min	max
Level "0"	0 V	0,3xVsupply
Level "1"	0,7xVsupply	Vsupply
I RAZ/RAX	< 5mA	

ORDERING REFERENCE (Contact the factory for special versions, ex:special flanges, connections, electronics...)

	Shaft Ø	Supply	Output stage	Code	Resolution			Connection	Orientation
					13 B12 D5				
					Resolution	Nb of turn	Nb data		
PHM9	**11** : 11mm **12** : 12mm	**P** : 5 to 30Vdc	**SS** : SSI without parity	**B**: binary **G**: Gray	**13:** 13 bits	**B12:** 12 bits	**D5:** 25 bits	**S6** : M23 12pins CW for SSI transmission **S8:** M23 12pins CCW for SSI transmission	**R** : radiale
PHM9 _	**12** //	**P**	**SS**	**G** //	**13**	**B12**	**D5** //	**S6**	**R**

Made in France

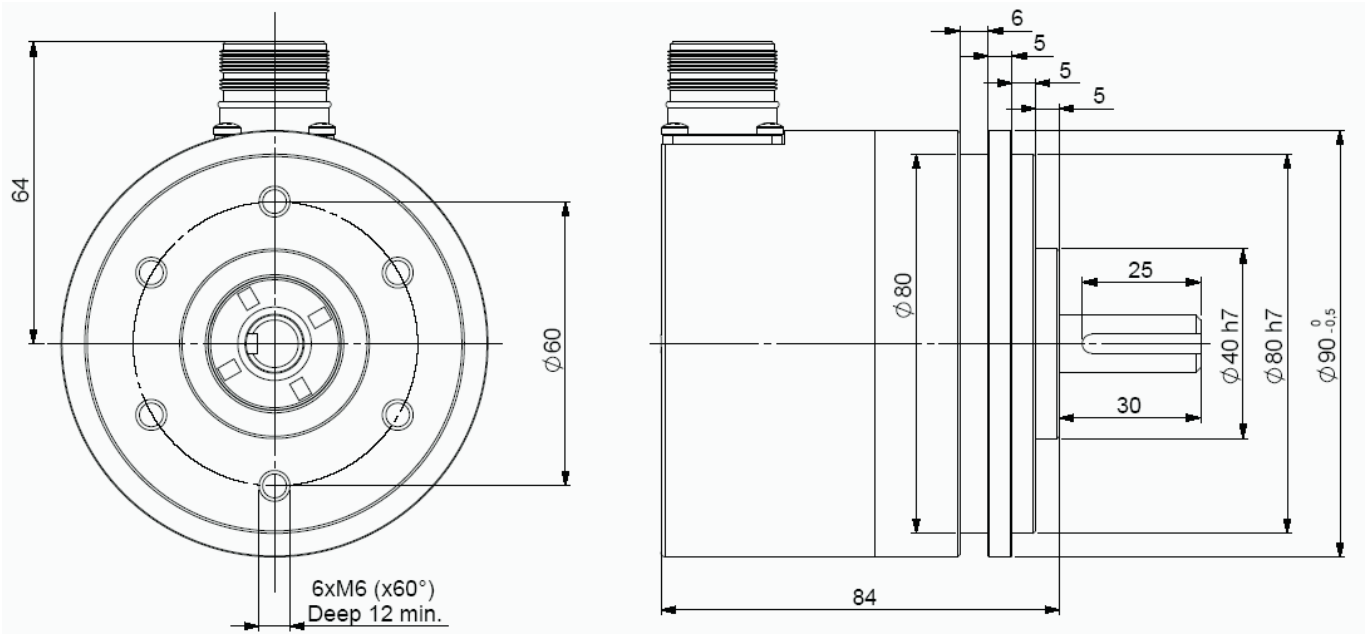
PHM9

SSI PROGRAMMABLE MULTITURN ABSOLUTE ENCODER, PHM9 RANGE

- Heavy Duty version, Ø 11 or 12 mm shaft diameter
- Robustness and excellent resistance to shocks / vibrations
- High protection level IP66
- High performances in temperature –20°C to +85°C
- Isolated SSI interface, clock from 100 to 500 kHz
- Universal electronic circuits from 5 to 30Vdc
- Protection against short-circuits and inversion of polarity
- High resolutions available: 8192 (13 bits) per turn
- Turn counting up to 65 536 (16 bits)
- 2 inputs : DIRECTION and RAZ
- Type choice of the desired limit value : position, rotation speed, temperature
- Diagnostic functions: temperature, rotation speed, position, input/output level
- Programming of the encoder with a serial transmission RS232 directly with the serial PC connection: resolution, number of turn, output code, parity, SSI frame bit number, reset value, functions of the 2 outputs : (OUT 1 and OUT 2): limit switch, incremental channels

RS232

PHM9_12 connection P6R (radial M23)



CHARACTERISTICS

Material	Cover : zinc alloy
	Body: aluminium
Shaft	Stainless steel
Bearings	6001 serie
Maximum loads	Axial : 100 N
	Radial : 200 N
Shaft inertia	≤ 15.10^{-6} kg.m²
Torque	≤ 10.10^{-3} N.m
Permissible max. speed	6 000 min^{-1}
Continuous max. speed	6 000 min^{-1}
Shaft seal	Viton double lips

Shocks (EN60068.2.27)	≤ 500m.s^{-2} (during 6 ms)
Vibrations (EN60068.2.6)	≤ 100m.s^{-2} (10 ... 2 000 Hz)
EMC	EN 61000-6-4, EN 61000-6-2
Isolation	100V (1 min.)
Encoder weight (approx.)	1,600 kg
Operating temperature	- 20 ... + 85 °C (encoder T°)
Storage temperature	- 20 ... + 85 °C
Protection(EN 60529)	IP 66

Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})

20 N / 30 N	50 N / 100 N	100 N / 200 N
360	18	2,2

PHM9

SSI PROGRAMMABLE MULTITURN ABSOLUTE ENCODER, PHM9 RANGE

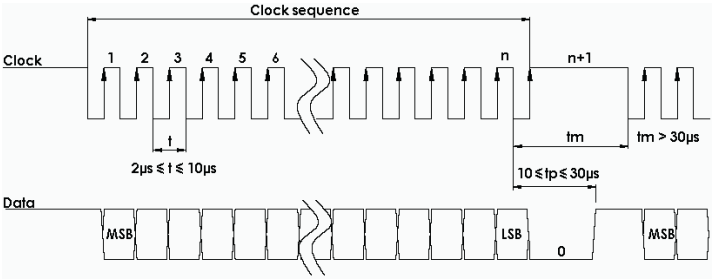
In order to optimize the installation times of SSI encoders, BEI IDEACOD has developed a friendly software package, easy to use, with which it's possible to program your encoder under WINDOWS in only 2 minutes. With a simple connection to the serial connector of your PC, you can :
- configure : the number of points per revolution, the number of turns, the code type, SSI frame bit number, the parity, reset value
- read : type of selected encoder, the serial number of the encoder, the position of the encoder, the temperature, the speed of rotation, the level of the input/output
- save the chosen configuration, load saved configurations
- function of the outputs and limit value : position, speed of rotation, temperature, incremental channels 2048 ppr

ELECTRICAL CHARACTERISTIC

Input signal clock CLK	per opto-coupler
Output signal DATA	line - driver RS422
Clock frequency CLK	100kHz – 500kHz
Precision	± ½ LSB (13 bits)

Power supply	5 – 30Vdc
Introduction	< 1 s
Cons. without load	< 100mA (typically 60-70mA at 24Vdc)
Position refresh	< 200µs

SSI TRANSMISSION



Transmission	Transmission up to 400m* at 100kHz in function of the cable characteristics
Cable	High security of transmission by using shielded cable and twisted pairs

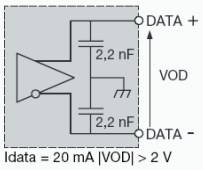
* consult us for length > 100m

SSI CONNECTION

Type	Vcc	Gnd	Clk+	Data+	RAZ	Data-	Clk-	DIR.	OUT1	OUT2	TXD Encoder RXD RS232	RXD Encodeur TXD RS232
P6	1	2	3	4	5	6	7	9	10	11	8	12

The pinouts TXD and RXD entries used for the encoder programming
Connect the entry DIRECTION and RAZ to a potential (RAZ to the 0V if not used)

Data output RS422

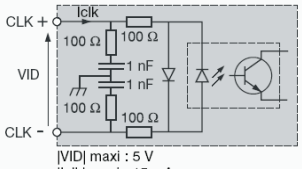


Idata = 20 mA |VOD| > 2 V

Protection against short circuits

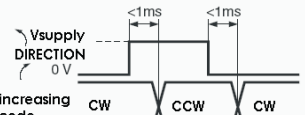
Isolated Clk input

Power supply: 5 to 30 V
Max ond. : 500mV for 11 to 30Vdc power supply
Protection against inversion of polarity
Cons. without load: 100mA max.



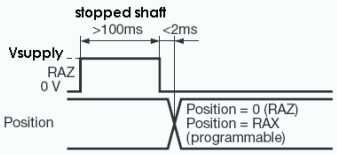
|VID| maxi : 5 V
|Iclk| maxi : 15 mA

DIRECTION input



	min	max	increasing
Level ''0''	0V	0,3xVsupply	CW
Level ''1''	0,7xVsupply	Vsupply	CCW
I direction	< 5mA		

RAZ / RAX input



	min	max
Level ''0''	0 V	0,3xVsupply
Level ''1''	0,7xVsupply	Vsupply
I RAZ/RAX	< 5mA	

Output : - Max current: 20m A
- Level ''0'' max : 0.5V, Level ''1'' min : Vsupply-2,5V
- Limit switch time answer : < 400µs
- Incremental channels : 100kHz max

Programmation cable : PC RS232
- Supply : 230Vac / 12Vdc
- Cable SubD9 (serial PC) / M23 12 pins (encoder)

Reference : PRO-020S001

ORDERING REFERENCE (Contact the factory for special versions, ex:special flanges, connections, electronics...)

	Shaft Ø	Supply	Output stage	Code	Resolution			Connection	Orientation
					13 B12 D5				
					Resolution	Nb of turn	Nb data		
PHM9_	**11**:11mm **12**:12mm	**P** : 5 to 30Vdc	**PX** : SSI programmable Nota : without parity by default	**G** : Gray default	**13:** 13 bits default	**B12:** 12 bits default	**D5:** 25 bits default	**P6:** M23 12pins CW for SSI transmission	**R** : radial
PHM9 _	**10 //**	**P**	**PX**	**G //**	**13**	**B12**	**D5 //**	**P6**	**R**

SOFTWARE / CONFIGURATION MANUAL: consult us

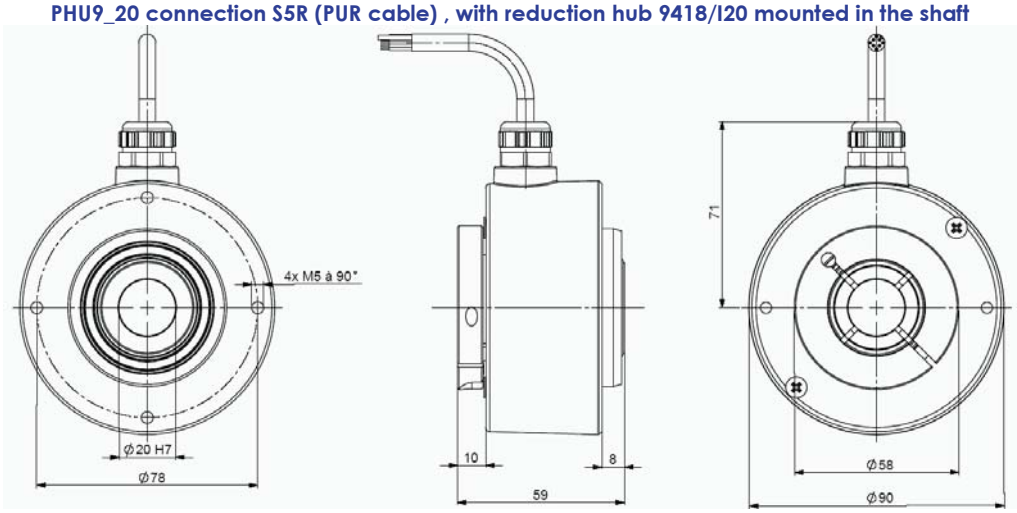
Made in FRANCE

PHU9

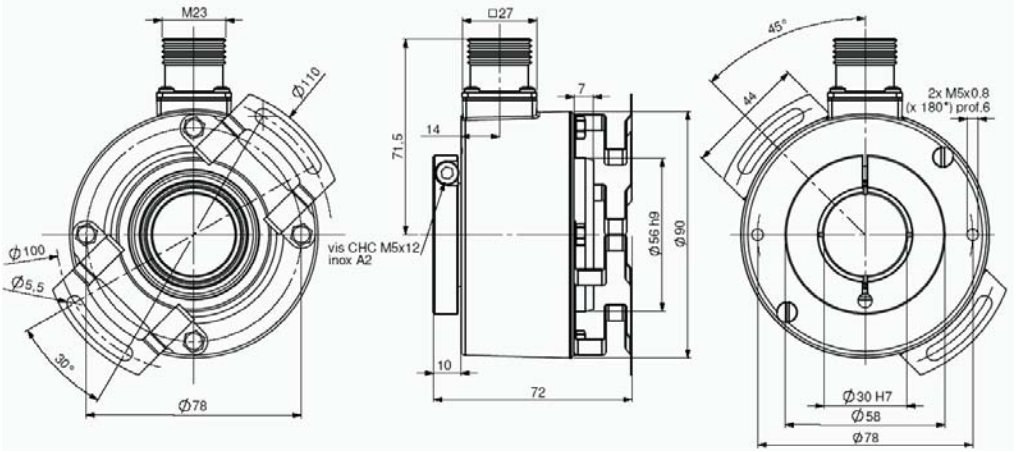
SSI ABSOLUTE MULTITURN ENCODER, PHU9 RANGE

- Version Heavy-Duty, axe traversant Ø 30mm, bagues de réduction d'axe disponibles
- Robustness and excellent resistance to shocks / vibrations
- High performances in temperature –20°C to +85°C
- Isolated SSI interface, clock from 100 to 500 kHz
- Universal electronic circuits from 5 to 30Vdc
- Protection against short-circuits and inversion of polarity
- High resolutions available: 8192 (13 bits) per turn
- Turn counting up to 65 536 (16 bits)
- 2 inputs : DIRECTION and RAZ
- Available with incremental channels – 2048 points – 5 to 30 Vdc

PHU9_20 connection S5R (PUR cable) , with reduction hub 9418/I20 mounted in the shaft



PHU9_25 connection S6R / S8R (radial M23), with reduction hubs 9418/I25 and DAC 9445/009* on the body



* Accessory to be ordered separately

Material	Cover : zinc alloy	Shocks (EN60068-2-27)	≤ 500 m.s^{-2} (during 6 ms)
	Body : aluminium	Vibrations (EN60068-2-6)	≤ 100 m.s^{-2} (10 … 2 000 Hz)
	Shaft : stainless steel	EMC	EN 61000-6-4, EN 61000-6-2
Bearings	6 807 serial	Isolation	100V (1 min)
Maximum loads	Axial : 50 N	Encoder weight (approx)	0,700 kg
	Radial : 80 N	Operating temperature	- 20... + 85 °C (encoder T°)
Shaft inertia	≤ 55.10^{-6} kg.m^2	Storage temperature	- 20... + 85 °C
Torque	≤ 25.10^{-3} N.m	Protection(EN 60529)	IP 65
Permissible max. speed	6 000 min^{-1}	Torque (ring pressure screw)	nominal: 3N.m, break: 4N.m
Continuous max. speed	3 600 min^{-1}	Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})	
Shaft seal	Viton	25 N / 40 N : 140	50 N / 80 N : 17

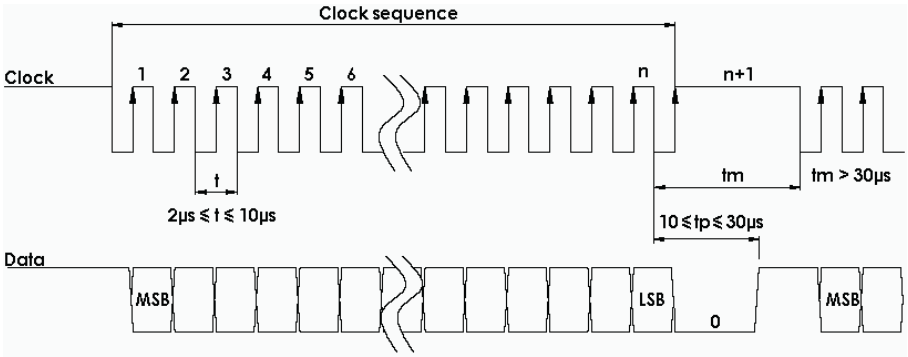
PRELIMINARY - SSI ABSOLUTE MULTITURN ENCODER, PHU9 RANGE

CE

ELECTRICAL CHARACTERISTIC

Input signal clock CLK	per opto-coupler	Power supply	5 – 30Vdc
Output signal DATA	line - driver RS422	Introduction	< 1 s
Clock frequency CLK	100kHz – 500kHz	Cons. without load	< 100mA (typically 50-60mA at 24Vdc)
Precision	± ½ LSB (13 bits)	Position refresh	< 200µs

SSI TRANSMISSION



Transmission	Transmission up to 400m* at 100kHz in function of the cable characteristics
Cable	High security of transmission by using shielded cable and twisted pairs

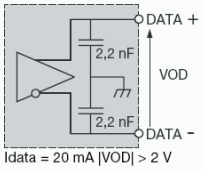
*Consult us for length > 100m

SSI CONNECTION (TYPE S6 : BEI IDEACOD STANDARD)

Type	Vcc	Gnd	Clk+	Data+	RAZ	Data-	Clk-	DIRECTION
S6	1	2	3	4	5	6	7	9
S8	8	1	3	2	6	10	11	5

Note : Do not connect other pinouts, connect DIRECTION and RAZ to a potential (RAZ at 0V if not used)

Data output RS422

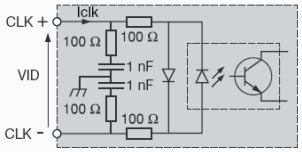


Idata = 20 mA |VOD| > 2 V

Protection against short circuits

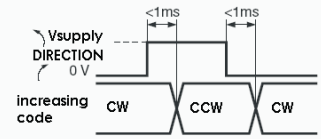
Isolated Clk input

Power supply: 5 to 30 V
Max ond. : 500mV for 11 to 30Vdc power supply
Protection against inversion of polarity
Cons. without load: 100mA max.



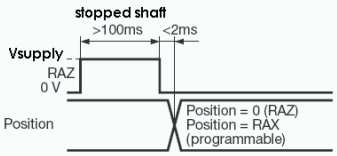
|VID| maxi : 5 V
|Iclk| maxi : 15 mA

DIRECTION input



	min	max	increasing
Level "0"	0V	0,3xVsupply	CW
Level "1"	0,7xVsupply	Vsupply	CCW
I direction	< 5mA		

RAZ / RAX input



	min	max
Level "0"	0 V	0,3xVsupply
Level "1"	0,7xVsupply	Vsupply
I RAZ/RAX	< 5mA	

ORDERING REFERENCE (Contact the factory for special versions, ex:special flanges, connections, electronics...)

	Shaft Ø	Supply	Output stage	Code	Resolution			Connection	Orientation
					13 B12 D5				
					Resolution	Nb of turn	Nb data		
PHU9	**30** : 30mm Reduction hub available	**P** : 5 to 30Vdc	**SS** : SSI sans parité	**B**: binary **G**: Gray	**13:** 13 bits	**B12:** 12 bits	**D5:** 25 bits	**S6**: M23 12 broches sens horaire **S8** : M23 12 broches sens anti-horaire **S5R** : câble PUR	**R** : radial Example: **R020**: radial cable 2m
PHU9 _	**30** //	**P**	**SS**	**G** //	**13**	**B12**	**D5** //	**S6**	**R**

Made in France

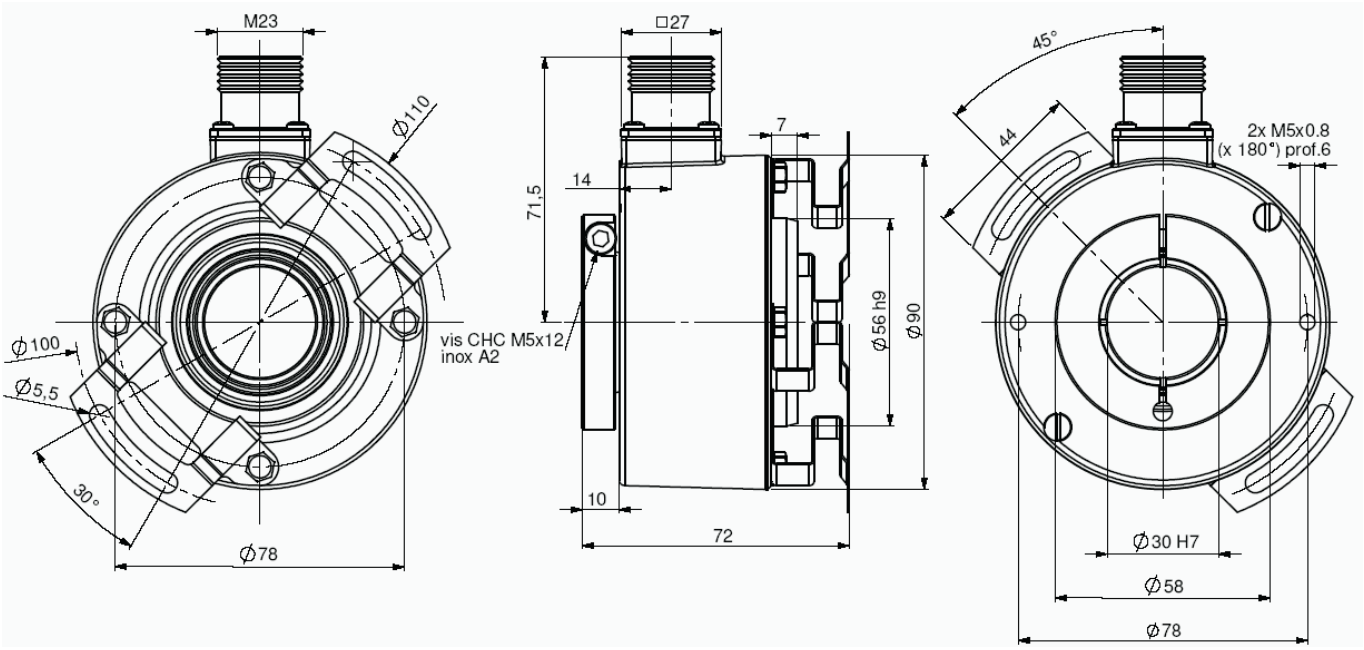
PHU9

SSI PROGRAMMABLE MULTITURN ABSOLUTE ENCODER, PHU9 RANGE

- Heavy duty version, Ø 30mm through shaft, reduction hubs available
- Robustness and excellent resistance to shocks / vibrations
- High performances in temperature –20°C to +85°C
- Isolated SSI interface, clock from 100 to 500 kHz
- Universal electronic circuits from 5 to 30Vdc
- Protection against short-circuits and inversion of polarity
- High resolutions available: 8192 (13 bits) per turn
- Turn counting up to 65 536 (16 bits)
- 2 inputs : DIRECTION and RAZ
- Type choice of the desired limit value : position, rotation speed, temperature
- Diagnostic functions: temperature, rotation speed, position, input/output level
- Programming of the encoder with a serial transmission RS232 directly with the serial PC connection: resolution, number of turn, output code, parity, SSI frame bit number, reset value, functions of the 2 outputs : (OUT 1 and OUT 2): limit switch, incremental channels

RS232

PHU9_30 connection P6R (radial M23), DAC9445/009* mounted on body



* Accessory to be ordered separately

CHARACTERISTICS

Material	Cover : zinc alloy	Shocks (EN60068-2-27)	≤ 500 m.s^{-2} (during 6 ms)
	Body : aluminium	Vibrations (EN60068-2-6)	≤ 100 m.s^{-2} (10 … 2 000 Hz)
	Shaft : stainless steel	EMC	EN 61000-6-4, EN 61000-6-2
Bearings	6 807 serie	Isolation	100V (1 min)
Maximal loads	Axial : 50 N	Encoder weight (approx)	0,700 kg
	Radial : 80 N	Operating temperature	- 20... + 85 °C (encoder T°)
Shaft inertia	≤ 55.10^{-6} kg.m^2	Storage temperature	- 20... + 85 °C
Torque	≤ 25.10^{-3} N.m	Protection(EN 60529)	IP 65
Permissible max. speed	6 000 min^{-1}	Torque (ring screw)	nominal: 3N.m, break: 4N.m
Continuous max. speed	3 600 min^{-1}	Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})	
Shaft seal	Viton	25 N / 40 N : 140	50 N / 80 N : 17

PHU9

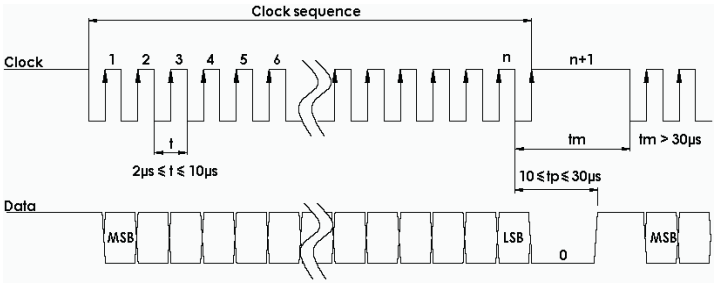
PRELIMINARY - SSI PROGRAMMABLE MULTITURN ABSOLUTE ENCODER, PHU9 RANGE CE

In order to optimize the installation times of SSI encoders, BEI IDEACOD has developed a friendly software, easy to use, with which it's possible to program your encoder under WINDOWS in only 2 minutes. With a simple connection to the serial connector of your PC, you can :
- configure : the number of points per revolution, the number of turns, the code type, SSI frame bit number, the parity, reset value
- read : type of selected encoder, the serial number of the encoder, the position of the encoder, the temperature, the speed of rotation, the level of the input/output
- save the chosen configuration, load saved configurations
- function of the outputs and limit value : position, speed of rotation, temperature, incremental channels 2048 ppr

ELECTRICAL CHARACTERISTIC

Input signal clock CLK	per opto-coupleur	Power supply	5 – 30Vdc
Output signal DATA	line - driver RS422	Introduction	< 1 s
Clock frequency CLK	100kHz – 500kHz	Cons. without load	< 100mA (typically 60-70mA at 24Vdc)
Precision	± ½ LSB (13 bits)	Position refresh	< 200µs

SSI TRANSMISSION



Transmission	Transmission up to 400m* at 100kHz in function of the cable characteristics
Cable	High security of transmission by using shielded cable and twisted pairs

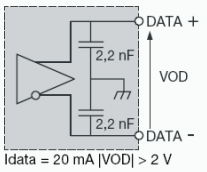
* consult us for length > 100m

SSI CONNECTION

Type	Vcc	Gnd	Clk+	Data+	RAZ	Data-	Clk-	DIR.	OUT1	OUT2	TXD Encoder RXD RS232	RXD Encodeur TXD RS232
P6	1	2	3	4	5	6	7	9	10	11	8	12

The pinouts TXD and RXD entries used for the encoder programming
Connect the entry DIRECTION and RAZ to a potential (RAZ to the 0V if not used)

Data output RS422

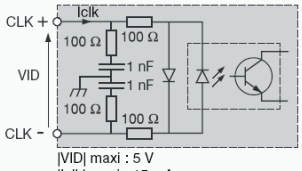


Idata = 20 mA |VOD| > 2 V

Protection against short circuits

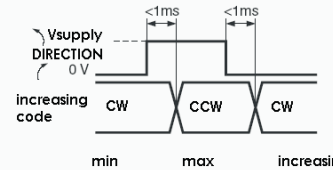
Isolated Clk input

Power supply: 5 to 30 V
Max ond. : 500mV for 11 to 30Vdc power supply
Protection against inversion of polarity
Cons. without load: 100mA max.



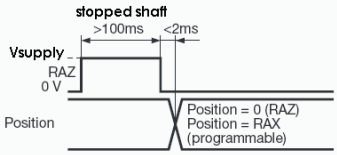
|VID| maxi : 5 V
|Iclk| maxi : 15 mA

DIRECTION input



	min	max	increasing
Level "0"	0V	0,3xVsupply	CW
Level "1"	0,7xVsupply	Vsupply	CCW
I direction	< 5mA		

RAZ / RAX input



	min	max
Level "0"	0 V	0,3xVsupply
Level "1"	0,7xVsupply	Vsupply
I RAZ/RAX	< 5mA	

Output : - Max current: 20m A
- Level "0" max : 0.5V, Level "1" min : Vsupply-2,5V
- Limit switch time answer : < 400µs
- Incremental channels : 100kHz max

Programmation cable : PC RS232
- Supply : 230Vac / 12Vdc
- Cable SubD9 (serial PC) / M23 12 pins (encoder)

Reference : PRO-020S001

ORDERING REFERENCE (Contact the factory for special versions, ex:special flanges, connections, electronics...)

	Shaft Ø	Supply	Output stage	Code	Resolution			Connection	Orientation
					13 B12 D5				
					Resolution	Nb of turn	Nb data		
PHU9_	**30**:30mm reduction hubs available	**P** : 5 to 30Vdc	**PX** : SSI programmable Nota : without parity by default	**G** : Gray default	**13:** 13 bits default	**B12:** 12 bits default	**D5:** 25 bits default	**P6:** M23 12pins CW for SSI transmission	**R** : radial
PHU9 _	**30 //**	**P**	**PX**	**G //**	**13**	**B12**	**D5 //**	**P6**	**R**

SOFTWARE / CONFIGURATION MANUAL: consult us

Made in FRANCE

BEI IDEACOD

www.bei-ideacod.com

BEI Sensors SAS
Espace Européen de l'Entreprise
9, rue de Copenhague
B.P. 70044 Schiltigheim
F 67013 Strasbourg Cedex

Tél : +33 (0)3 88 20 80 80
Fax : +33 (0)3 88 20 87 87
Mail : info@beisensors.com
Web : www.beisensors.com

PHM9

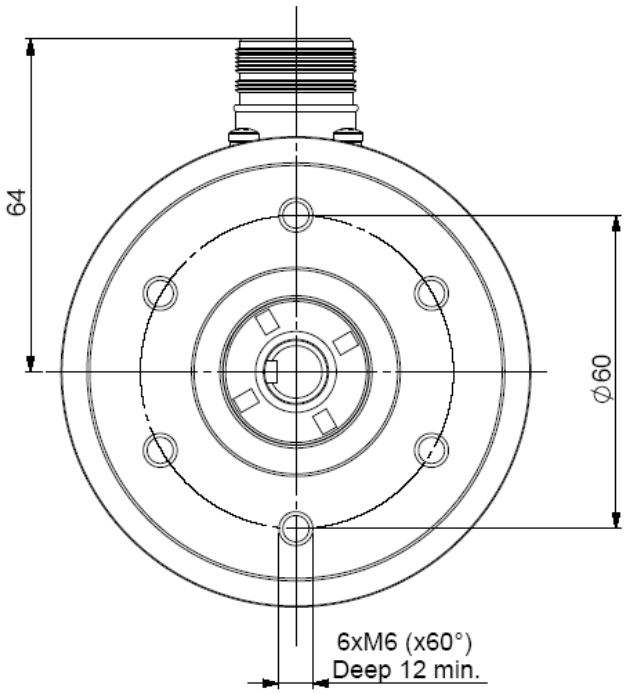
CANopen ABSOLUTE MULTI-TURN ENCODERS, PHM9 RANGE

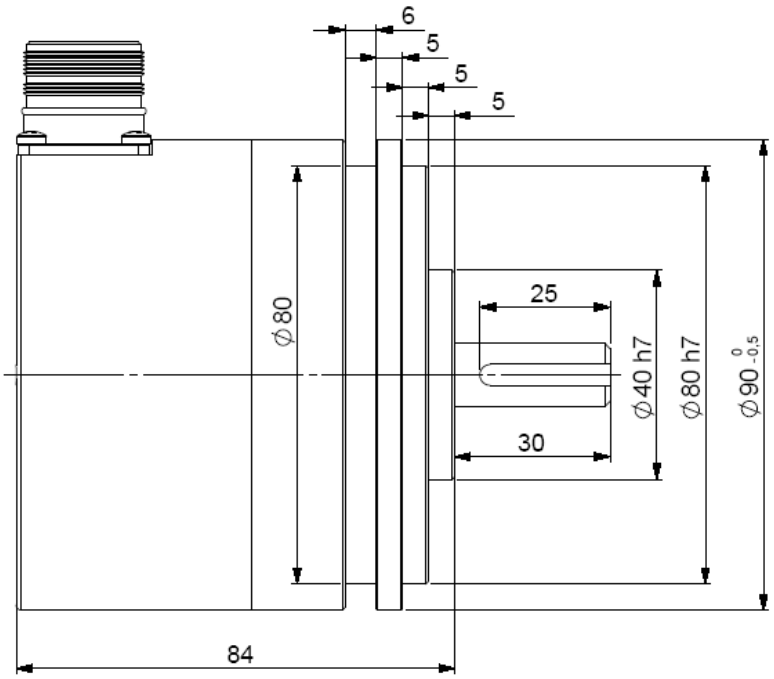
PHM9, 90mm encoder, the new generation of CANopen multi-turn encoder:

- Heavy Duty version, 11 & 12 mm solid shaft.
- Robustness and excellent resistance to shocks / vibrations.
- High protection level IP66.
- High performances in temperature –20°C to +85°C.
- Universal electronic circuits from 5 to 30Vdc.
- High resolutions available: 8192 (13 bits) per turn.
- Turn counting up to 65 536 (16 bits).
- Available with incremental channels – 2048 points – 5 to 30 Vdc.
- Also available with SSI, Profibus and RS232 interface.

CANopen
DS 301 V4.02
DS 406 V3.1

PHM9_12 connection BCR (M23 radial)





MECHANICAL CHARACTERISTICS

Material	Cover : steel
	Body: aluminium
Shaft	Stainless steel
Bearings	6001 serie
Maximal loads	Axial : 100 N
	Radial : 200 N
Shaft inertia	≤ 15.10^{-6} kg.m²
Torque	≤ 10.10^{-3} N.m
Permissible max. speed	6 000 min^{-1}
Continuous max. speed	6 000 min^{-1}
Shaft seal	Viton double lips

Shocks (EN60068.2.27)	≤ 500m.s^{-2} (during 6 ms)
Vibrations (EN60068.2.6)	≤ 100m.s^{-2} (10 ... 2 000 Hz)
EMC	EN 61000-6-4, EN 61000-6-2
Isolation	100V (1 min.)
Encoder weight (approx.)	1,600 kg
Operating temperature	- 20 ... + 85 °C (encoder T°)
Storage temperature	- 20 ... + 85 °C
Protection(EN 60529)	IP 65

Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})

20 N / 30 N	50 N / 100 N	100 N / 200 N
360	18	2,2

BEI Sensors SAS
Espace Européen de l'Entreprise
9, rue de Copenhague
B.P. 70044 Schiltigheim
F 67013 Strasbourg Cedex

Tél : +33 (0)3 88 20 80 80
Fax : +33 (0)3 88 20 87 87
Mail : info@beisensors.com
Web : www.beisensors.com

PHM9

CANopen ABSOLUTE MULTI-TURN ENCODERS, PHM9 RANGE

ELECTRICAL CHARACTERISTICS

Power supply	5 – 30Vdc
Introduction	< 1 s
Consumption (without load)	< 50mA (at 24Vdc)
Accuracy	± ½ LSB (13 bits)

Programmable parameters

Resolution: defines the resolution per revolution (0 to 8 192),
Global resolution : total amount of codes for the encoder (2 to 536 870 912),
Transmission speed : programmable from 10kBaud (1000m) to 1 Mbaud (40 m) ; value per default: 20 Kbaud,
Address: define the software address of the encoder on the bus (1 to 127, value by default: id = 1),
Direction : define the direction of count of the encoder ,
RAX : defines the value of its preset position (non turning shaft),
CAM: Low and High Limits.

Communication modes

3 modes are available to interrogate the encoder :
POLLING mode: (Response to a RTR message): The position value is only given upon request (SDO mode),
CYCLIC mode: the encoder transmits its position in an asynchronous manner. The frequency of the transmission is defined by the programmable cyclical timer register from 0 to 65 535 ms,
SYNCHRO mode: the encoder transmits its position on a synchronous demand by the master.

CANOPEN CONNECTION

1	2	3	4	5	6	7	8, 9, 11	10	12
Reserved	CAN LOW	CAN GND	Reserved	Reserved	Reserved	CAN HIGH	Reserved	0V	+ 5/30Vdc

Pinout 3 (CAN GND) and 10 (0V) are connected together (intern the encoder).

Nota : Refer to the bus standards for the maximal derivation length.

ORDERING CODE (Special versions upon request, for ex. special flanges/electronics/connections…)

	Shaft Ø	Power supply	Output stages	Code	Resolution	Nb of turns	Connection	Connection orientation
PHM9	**12** 12mm	**P** : 5 to 30Vdc	**BB** : CANopen	**B**: Binary	**13** : 8192 points per turn (2^{13})	**B16** : 65 536 turns (2^{16})	**BC:** M23 12 pinouts clockwise	**R** : radial
PHM9 _	**12 //**	**P**	**BB**	**B //**	**13**	**B16 //**	**BC**	**R**

Made in France

BEI Sensors SAS
Espace Européen de l'Entreprise
9, rue de Copenhague
B.P. 70044 Schiltigheim
F 67013 Strasbourg Cedex

Tél : +33 (0)3 88 20 80 80
Fax : +33 (0)3 88 20 87 87
Mail : info@beisensors.com
Web : www.beisensors.com

PHU9

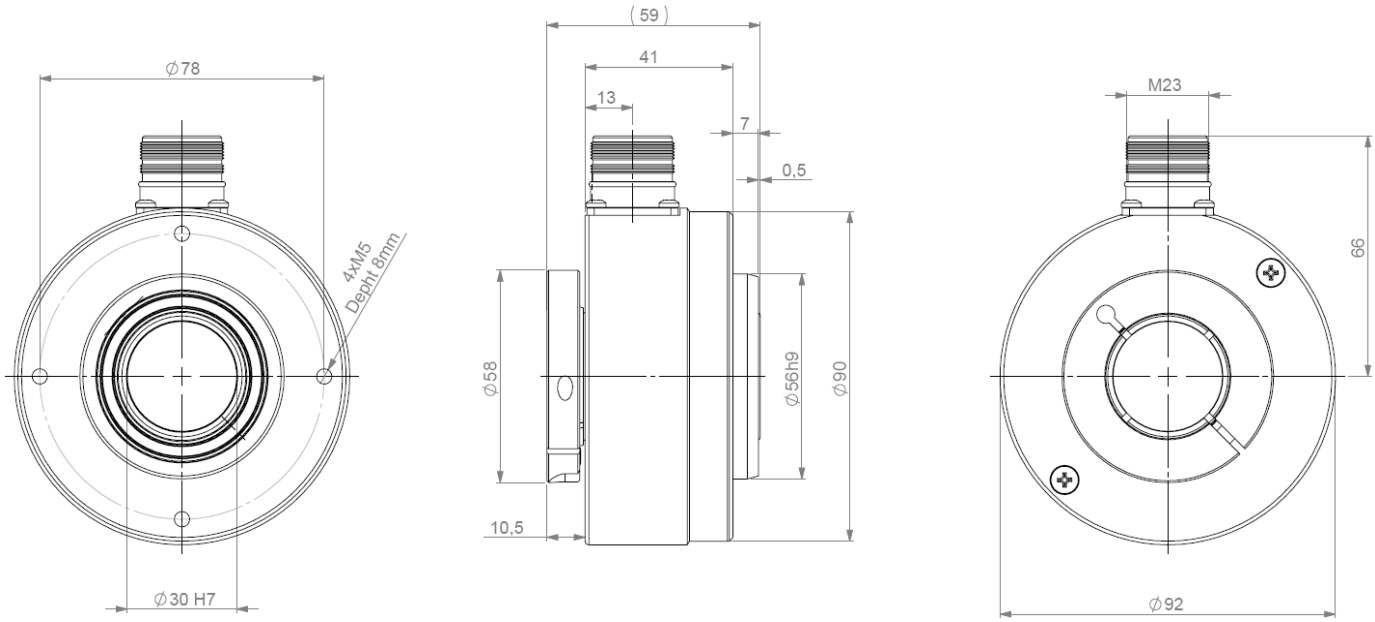
CANopen ABSOLUTE MULTI-TURN ENCODERS, PHU9 RANGE

PHU9, the new generation of CANopen absolute multi-turn encoders :

- 90mm encoder, extra-flat,
- Ø30mm through shaft version, reduction hubs available,
- Robustness and excellent resistance to shocks / vibrations,
- High protection level IP65,
- High performances in temperature –20°C to 85°,
- Universal power supply from 5 to 30 Vdc,
- High resolutions up to 8192 points per turn (2^{13}),
- Turns numerisation up to 65 536 (16 bits).

CANopen
DS 301 V4.02
DS 406 V3.1

PHU9 connection BCR (radial M23)



MECHANICAL CHARACTERISTICS

Material	Cover : steel	Shocks (EN60068-2-27)	≤ 500 m.s^{-2} (during 6 ms)
	Body : aluminium	Vibrations (EN60068-2-6)	≤ 100 m.s^{-2} (10 … 2 000 Hz)
	Shaft : stainless steel	EMC	EN 61000-6-4, EN 61000-6-2
Bearings	6 807 serial	Isolation	100V (1 min)
Maximum loads	Axial : 50 N	Encoder weight (approx)	0,700 kg
	Radial : 80 N	Operating temperature	- 20... + 80 °C (encoder T°)
Shaft inertia	≤ 55.10^{-6} kg.m^2	Storage temperature	- 20... + 80 °C
Torque	≤ 25.10^{-3} N.m	Protection(EN 60529)	IP 65
Permissible max. speed	6 000 min^{-1}	Torque (ring pressure screw)	nominal: 3N.m, break: 4N.m
Continuous max. speed	3 600 min^{-1}	Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})	
Shaft seal	Viton	25 N / 40 N : 140	50 N / 80 N : 17

BEI Sensors SAS
Espace Européen de l'Entreprise
9, rue de Copenhague
B.P. 70044 Schiltigheim
F 67013 Strasbourg Cedex

Tél : +33 (0)3 88 20 80 80
Fax : +33 (0)3 88 20 87 87
Mail : info@beisensors.com
Web : www.beisensors.com

PHU9

CANopen ABSOLUTE MULTI-TURN ENCODERS, PHU9 RANGE

ELECTRICAL CHARACTERISTICS

Power supply	5 – 30Vdc
Introduction	< 1 s
Consumption (without load)	< 50mA (at 24Vdc)
Accuracy	± ½ LSB (13 bits)

Programmable parameters

Resolution: defines the resolution per revolution (0 to 8 192),
Global resolution : total amount of codes for the encoder (2 to 536 870 912),
Transmission speed : programmable from 10kBaud (1000m) to 1 Mbaud (40 m) ; value per default: 20 Kbaud,
Address: define the software address of the encoder on the bus (1 to 127, value by default: id = 1),
Direction : define the direction of count of the encoder ,
RAX : defines the value of its preset position (non turning shaft),
CAM: Low and High Limits.

Communication modes

3 modes are available to interrogate the encoder :
POLLING mode: (Response to a RTR message): The position value is only given upon request (SDO mode),
CYCLIC mode: the encoder transmits its position in an asynchronous manner. The frequency of the transmission is defined by the programmable cyclical timer register from 0 to 65 535 ms,
SYNCHRO mode: the encoder transmits its position on a synchronous demand by the master.

CANOPEN CONNECTION

1	2	3	4	5	6	7	8, 9, 11	10	12
Reserved	CAN LOW	CAN GND	Reserved	Reserved	Reserved	CAN HIGH	Reserved	0V	+ 5/30Vdc

Pinout 3 (CAN GND) and 10 (0V) are connected together (intern the encoder).

Nota : Refer to the bus standards for the maximal derivation length.

ORDERING CODE (Special versions upon request, for ex. special flanges/electronics/connections…)

	Shaft Ø	Power supply	Output stages	Code	Resolution	Nb of turns	Connection	Connection orientation
PHU9	**30** : 30mm Reduction hubs available	**P** : 5 to 30Vdc	**BB** : CANopen	**B**: Binary	**13** : 8192 points per turn (2^{13})	**B16** : 65 536 turns (2^{16})	**BC:** M23 12 pinouts clockwise	**R** : radial
PHU9 _	**30 //**	**P**	**BB**	**B //**	**13**	**B16 //**	**BC**	**R**

Made in France

BEI Sensors SAS
Espace Européen de l'Entreprise
9, rue de Copenhague
B.P. 70044 Schiltigheim
F 67013 Strasbourg Cedex

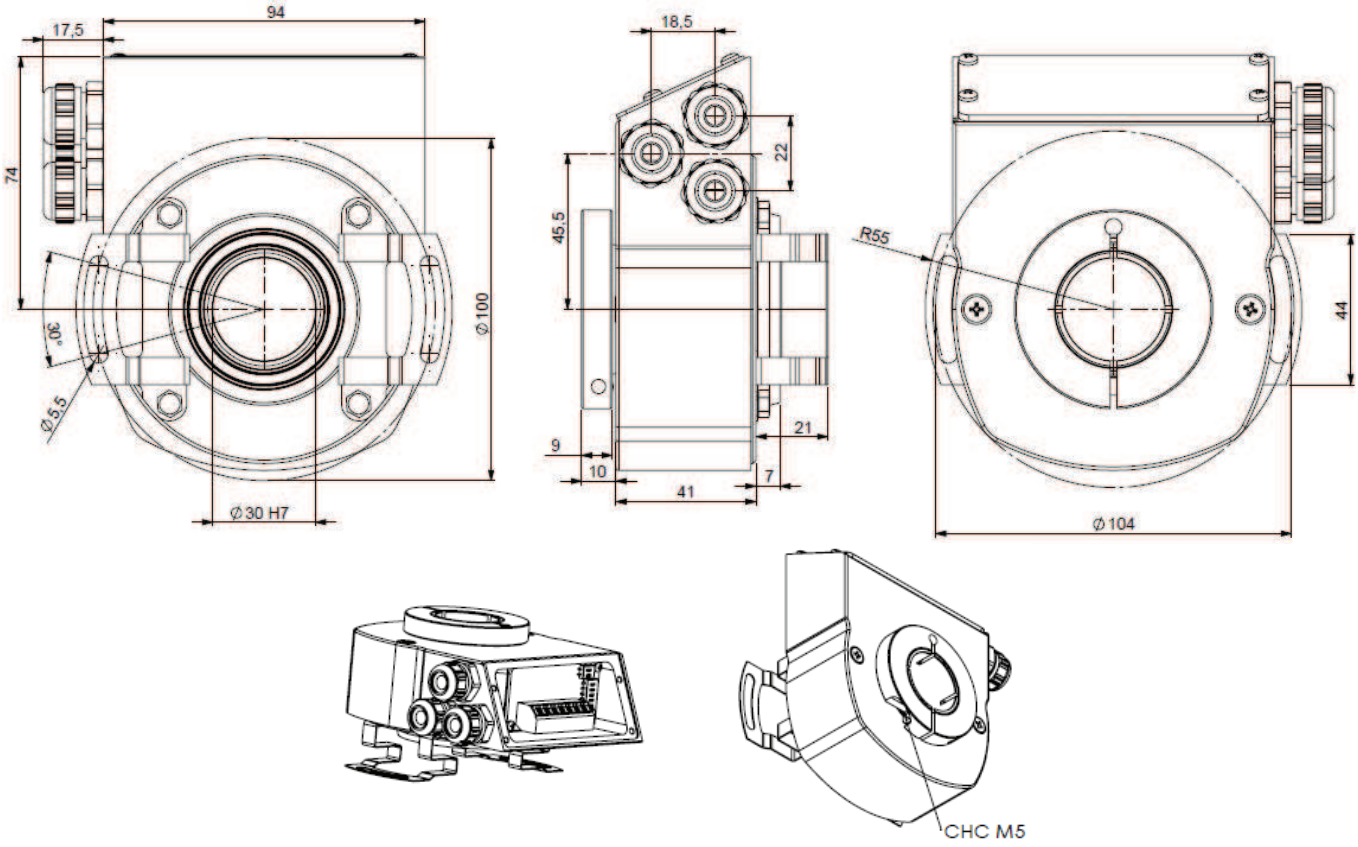
Tél : +33 (0)3 88 20 80 80
Fax : +33 (0)3 88 20 87 87
Mail : info@beisensors.com
Web : www.beisensors.com

PHU9

ABSOLUTE MULTI-TURN ENCODER, PROFIBUS INTERFACE, PHU9 SERIE

- Profibus encoder - Ø30mm through shaft version
- PEEK or aluminium reduction hubs available : 10 to 28mm,
- Robustness and excellent resistance to shocks / vibrations,
- Double or triple mounting possibility (incremental – tacho or absolute interfaces),
- High protection level IP65,
- High performances in temperature –20°C to +80°C
- 5 to 30 Vdc power supply,
- High resolution available: 8 192 points par revolution (13 bits resolution),
- Turns numerisation up to 65 536 (16 bits),
- DPV0, Class 2, encoder profile 3.062.
- PHU9 also available with SSI, programmable SSI, RS232 & CANopen interface.

DIMENSION : PHU9 Profibus connection BTR (Terminal box) - with DACs 9445/009* mounted on bearings housing



* : accessory to be ordered separately.

MECHANICAL CHARACTERISTICS

Material	Cover : steel	Shock (EN60068-2-27)	≤ 500 m.s^{-2} (during 6 ms)
	Body : aluminium	Vibration (EN60068-2-6)	≤ 100 m.s^{-2} (10 … 2 000 Hz)
	Shaft : stainless steel	EMC	EN 61000-6-4, EN 61000-6-2
Bearings	6 807 serie	Isolation	500V (1 min)
Maximal load	Axial : 50 N	Weight (approx.)	1,200 kg
	Radial : 80 N	Operating temperature	- 20... + 80 °C (Encoder T°)
Shaft inertia	≤ 55.10^{-6} kg.m^2	Storage temperature	- 20... + 80 °C
Torque	≤ 25.10^{-3} N.m	Protection(EN 60529)	IP 65
Permissible max. speed	6 000 min^{-1}	Torque (ring pressure screw)	nominal: 3N.m, break: 4N.m
Continuous max. speed	3 600 min^{-1}	Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})	
Shaft seal	Viton	25 N / 40 N : 140	50 N / 80 N : 17

BEI Sensors SAS
Espace Européen de l'Entreprise
9, rue de Copenhague
B.P. 70044 Schiltigheim
F 67013 Strasbourg Cedex

Tél : +33 (0)3 88 20 80 80
Fax : +33 (0)3 88 20 87 87
Mail : info@beisensors.com
Web : www.beisensors.com

PHU9

ABSOLUTE MULTI-TURN ENCODER, PROFIBUS INTERFACE, PHU9 SERIE

CE

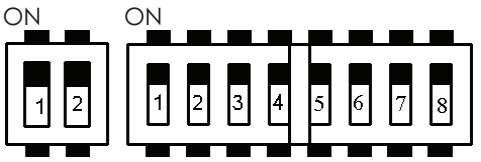
GENERALITY

Power supply : 5-30V consumption <200 mA (160mA typ).

Transmission frequency: from 9.6Kbaud to 12Mbaud.

Electronic interface: opto-isolated RS 485.

Adress: permits the addressing of each encoder in an installation (32 master stations or slaves stations per segment without repetitor, 127 maximum with repetitor).



Adress: 0 to 126 (Binary code)

End line resistance termination: 1, 2 ''ON'' (Beginning or end line)

Switch - on ''ON''	1	2	3	4	5	6	7
=	1	2	4	8	16	32	64

Switch 8 on ''OFF''.
Example: Adress 5: Switch 1 & 3 on ''ON'', other on ''OFF''.

PARAMETRES PROGRAMMABLES

Direction : Permits the definition of the counting direction of the encoder (CW or CCW) following its mechanical position.
Resolution : the number or points per turn can be between 0 and 8192.
Global resolution (MAX RANGE) : Total number of codes of the encoder (2 to 536 870 912).
Reset : defines the value of its actual position.
Time base : defines the base time for the speed calculation (10 ms , 100 ms, 1 s, speed in rpm).

CONNECTION

Integrated terminal box on encoder – ''push-in'' connection – max 1,5mm².

ORDERING CODE (Special versions upon request, for ex. special flanges/electronics/connections…)

	Shaft Ø	Supply	Interface	Code	Resolution	Tunrs Nb	Connection	Connection orientation
PHU9 Codeur embase alu. **PBU9** Codeur embase inox	**30**: 30mm 10 to 28mm reduction hub available	**P** : 5 to 30Vdc	**BG :** Profibus	**B**: Binary	**13 :** 8192 points per turn (2^{13})	**B16** : 65 536 turns (2^{16})	**BT :** Terminal box	**R** : Radial
Ex: PHU9 _	**30 //**	**P**	**BG**	**B //**	**13**	**B16 //**	**BT**	**R**

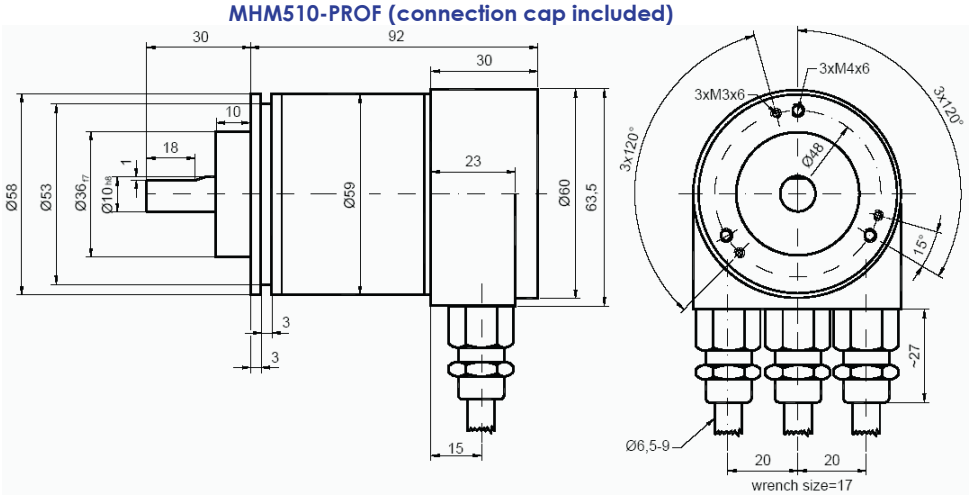
Made in France

MHM5

PROFIBUS ABSOLUTE MULTI-TURN ENCODER, MHM510-PROF RANGE

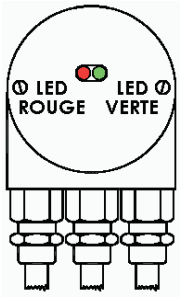
- MHM10-PROF, standard encoder Ø58mm with Profibus interface:
- Robust and compact conception
- Solid shaft version Ø 10 mm (06 mm available upon request)
- Precision ball bearings with sealing flange
- High temperatures performances –40°C … +85°C
- Code disc made of unbreakable and durable plastic
- Mechanical memorisation of the number of turns by gears
- Resolution : 13 bits = 8192 steps/turn (max 16 bits)
- Number of turns : 12 bits = 4096 turns (max 14 bits)
- Polarity inversion and short circuit protection
- Highly integrated circuit in SMD-technology

MHM510-PROF (connection cap included)



Red LED	Green LED	Status / possible cause
Dark	Dark	No power supply
Bright	Bright	Encoder is ready for operation but it has not received any configuration data after power on. Possible causes: address setting incorrect, Bus lines not connected correctly
Bright	Flashing	Parameter or configuration error. The encoder receives configuration or parameter dc incorrect length or inconsistent data Possible cause: parameter value "total measuring range" too high
Flashing	Bright	The encoder is ready for operation but not addressed by the master (e.g. incorrect address in configuration).
Bright	Dark	Encoder has not received any data for a longer period (about 40 sec.) Possible cause: bus line has been interrupted
Dark	Bright	Normal operation in data exchange mode
Dark	Flashing	Commissioning mode

Led status at the front of the connection cap



MECHANICAL DATA

Material	Cover : aluminum
	Body : aluminum
	Shaft: stainless steel
Max. shaft loading	Axial : 40 N
	Radial : 110 N
Shaft Inertia	≤ 30 g.cm²
Torque	≤ 3 N.cm
RPM (continuous operation))	6 000 rpm
Shock (EN 60068-2-27))	≤ 100 g (halfsinus, 6 ms)
Shock (EN 60028-2-29)	≤ 10 g (half-sinus, 16ms)

Vibrations (EN 60068-2-6)	≤ 10 g (10Hz... 1 000Hz)
Weight	600 g
Operating temperature	- 40 … + 85°C
Storage temperature	- 40 ... + 85°C
Humidity	98 % sans condensation
Protection class (EN 60529)	IP65: cover
	IP64: shaft

Lifetime in 10^8 revolutions with F_a / F_r (axial/radial)		
40 N / 60 N	40 N / 80 N	40 N / 110 N
25	10	4

MHM5

PROFIBUS ABSOLUTE MULTI-TURN ENCODER, MHM510-PROF RANGE

ELECTRICAL DATA

Interface	ISO 11898
Transmission rate	Max 1 MBauds
Device addressing	by rotary switches
Power supply	10 – 30Vdc
Current consumption	max 100mA (24Vdc)

Power consumption	max 2,5W
Step Frequency LSB	800 kHz
Accuracy	+ ½ LSB
EMC	EN 61000-6-4 EN 61000-6-2
Electrical lifetime	> 10^5 h

PROGRAMMABLE PARAMETERS

The Profibus-DP interface supports CLASS 1 and CLASS 2 functionality according to the encoder profile . In addition to these functions the GSD-file supports further features, for example software limit switches. Further more, the following encoder parameters can be programmed directly via the Profibus-DP network without any extra device

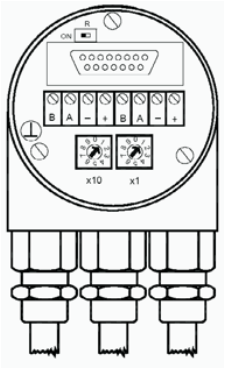
Counting Direction	This parameter counting direction defines whether the output code increases or decreases when the shaft rotates clockwise.
Resolution (positions per turns)	The parameter 'resolution per revolution' is used to program the desired number of steps per revolution. Each value between 1 and the physical resolution per revolution can be programmed
Total Resolution "Max-RANGE"	This parameter is used to program the desired number of measuring units over the total measuring range. This value may not exceed the total physical resolution of the absolute rotary encoder
Reset (RAX)	The preset value is the desired position value, which should be reached at a certain physical position of the axis. The position value is set to the desired process value by the parameter preset
Velocity	The implemented software can additionally deliver the current velocity. This value is transmitted in binary code, 16 Bit, in addition to the process value It is possible to choose between four different units: steps per 10 ms, per 100 ms, per 1000 ms and revolutions per minute
Software limit switches function	Two software limit switches can be set. If the position value falls below the lower or exceeds the higher limit switch, a status bit in the process value is set
Teach-in (Online parameterization)	A special mode is available for commissioning phase of the device. This makes it possible to change parameters while the encoder is in data exchange mode

INTERFACE

The rotary encoder is connected by two or three cables, depending on whether the power supply is integrated into the bus cable or connected separately. If the power supply is integrated into the bus cable one of the cable glands can be fitted with a plug. The cable glands are suitable for cable diameters from 6.5 up to 9 mm

The Profibus-DP device address is set by user-friendly rotary switches in the connection cap. Allowed addresses are between 1 and 99, each can only be used once. The connection cap can easily be opened for installation by removing the two cap screws

Termination resistors are integrated in the connection cap. These must be switched on if the encoder is connected at the end or the beginning of the bus



ORDERING REFERENCE Contact the factory for special versions, ex: electronics, special flanges, connections…)

MHM5	DP	B1	B	12	13	C	10	0	0CC
Absolute multi turn encoder	Profibus	Version	Code : Binary	Number of turns 2^{12} (4 096)	Resolution (pos./turn) 2^{13} (8 192)	Clamp Flange	Shat diameter : 10mm	Without mechanical option	Connection Cap

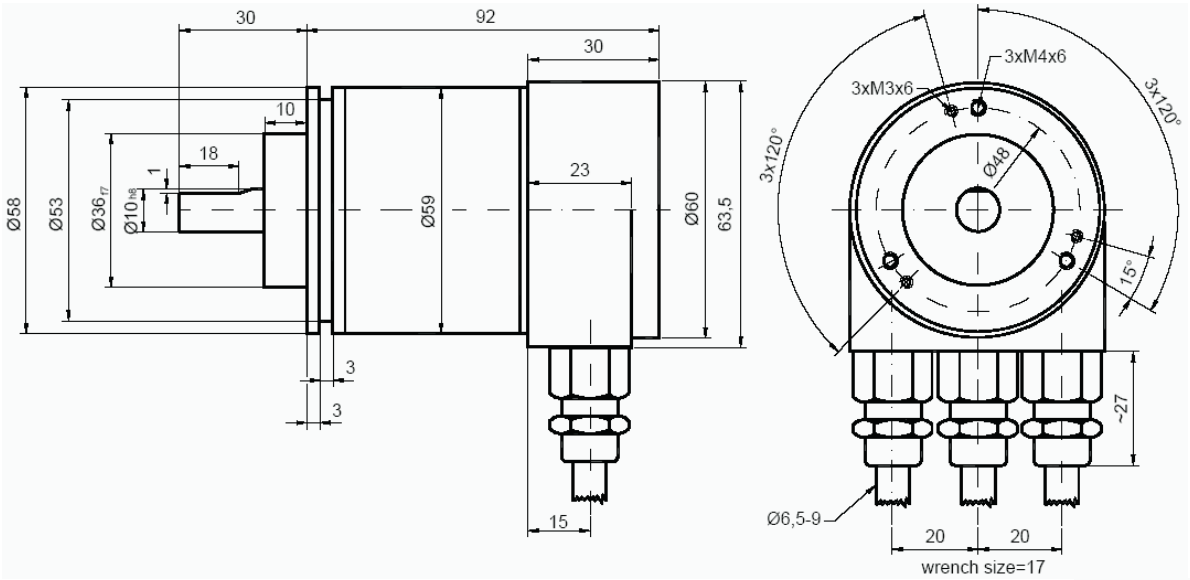
Ordering code : MHM510-PROF-001 = MHM5 – DP B1 B – 12 13 - C10 0 - 0CC

MHM5

CANOPEN ABSOLUTE MULTI-TURN ENCODER, MHM510-CANO RANGE

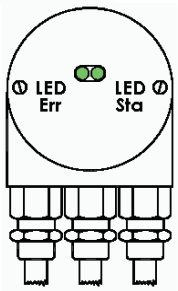
- MHM510-CANO, standard encoder Ø58mm with CANopen interface:
- Robust and compact design
- Solid shaft version Ø 10 mm (06 mm available upon request)
- Precision ball bearings with sealing flange
- High temperatures performances –40°C … +85°C
- Code disc made of unbreakable and durable plastic
- Mechanical memorisation of the number of turns by gears
- Resolution : 13 bits = 8192 steps/turn (max 16 bits)
- Number of turns : 12 bits = 4096 turns (max 14 bits)
- Polarity inversion and short circuit protection
- Highly integrated circuit in SMD-technology

MHM510-CANO (connection cap included)



Status indication with two LED's in the connection cap

Err - Green LED	*Sta - Green LED*	*Meaning*
off	off	No power supply
off	on	Encoder is ready, Boot Up message not sent (no further device on network, wrong baud rate) or encoder in prepared status
flashing	on	Boot Up message sent, device configuration is possible
on	on	Normal operation mode, Encoder in Operational Status



MECHANICAL DATA

Material Stainless steel option	Cover : aluminum
	Body : aluminum
	Shaft: stainless steel
Max. shaft loading	Axial : 40 N
	Radial : 110 N
Shaft Inertia	≤ 30 g.cm²
Torque	≤ 3 N.cm
RPM (continuous operation))	6 000 rpm
Shock (EN 60068-2-27))	≤ 100 g (halfsinus, 6 ms)
Shock (EN 60028-2-29)	≤ 10 g (half-sinus, 16ms)

Vibrations (EN 60068-2-6)	≤ 10 g (10Hz… 1 000Hz)
Weight	600 g
Operating temperature	- 40 … + 85°C
Storage temperature	- 40 ... + 85°C
Humidity	98 % without condensation
Protection class (EN 60529)	IP 65: body
	IP 64: shaft

Lifetime in 10^8 revolutions with F_a / F_r (axial / radial)		
40 N / 60 N	40 N / 80 N	40 N / 110 N
25	10	4

CANOPEN ABSOLUTE MULTI-TURN ENCODER, MHM510-CANO RANGE

ELECTRICAL DATA

Interface	ISO 11898
Transmission rate	Max 1 MBauds
Device addressing	by rotary switches
Power supply	10 – 30Vdc
Current consumption	max 100mA (24Vdc)

Power consumption	max 2,5W
Step Frequency LSB	800 kHz
Accuracy	+ ½ LSB
EMC	EN 61000-6-4 EN 61000-6-2
Electrical lifetime	> 10^5 h

TRANSMISSION MODES

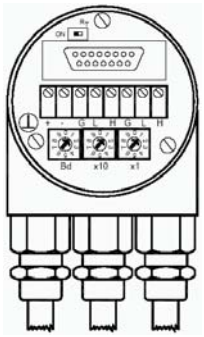
POLLED Mode	By a remote-transmission-request telegram the connected host calls for the current process value. The absolute rotary encoder reads the current position value, calculates eventually set-parameters and sends back the obtained process value by the same identifier
CYCLIC Mode	The absolute rotary encoder transmits cyclically - without being called by the host - the current process value. The cycle time can be programmed in milliseconds for values between 1 ms and 65536 ms
SYNC Mode	After receiving a sync telegram by the host, the absolute rotary encoder answers with the current process value. If more than one node number (encoder) shall answer after receiving a sync telegram, the answer telegrams of the nodes will be received by the host in order of their node numbers. The programming of an offset-time is not necessary. If a node should not answer after each sync telegram on the CAN network, the parameter sync counter can be programmed to skip a certain number of sync telegrams before answering again

PROGRAMMABLE PARAMETERS

Operating Parameters	This parameter determines the counting direction, in which the output code increases or decreases. As an important operating parameter the code sequence (complement) can be programmed
Resolution per turn	Value between 1 and 8192 can be programmed
Total resolution ''Max range''	This parameter is used to program the desired number of measuring units over the total measuring range. This value may not exceed the total resolution of the absolute rotary encoder.
Preset Value	The preset value is the desired position value, which should be reached at a certain physical position of the axis
Limit Switch, Min. and Max	Two position values can be programmed as limit switches. By reaching these values one bit of the 32 bit process value is set to high level
Cam	One free programmable cam can be set in the total measuring range

INSTALLATION

The rotary encoder is connected by two or three cables depending on whether the power supply is integrated into the bus cable or connected separately. If the power supply is integrated into the bus cable, one of the cable glands can be fitted
with a plug. The cable glands are suitable for cable diameters from 5.5 up to 9 mm



CONFIGURATION

The setting of the node number is achieved by 2 turn-switches in the connection cap. Possible addresses lie between 0 and 89 whereby every address can only be used once. Inside the encoder the defined address is increased by one. The connection cap can easily be opened for installation by removing the two cap screws
A termination resistor is integrated in the connection cap. The resistor must be switched on if the encoder is connected at the end or at the beginning of the bus

ORDERING REFERENCE (Contact the factory for special versions ex:electronics, special flanges, connections...)

MHM5	C2	B1	B	12	13	C	10	0	0CC
Absolute multi turn encoder	CANopen	Version	Code : Binary	Number of turns 2^{12} (4 096)	Resolution : 2^{13} (8 192)	Clamp flange	Shaft diameter : 10mm	Without mechanical option	Connection Cap

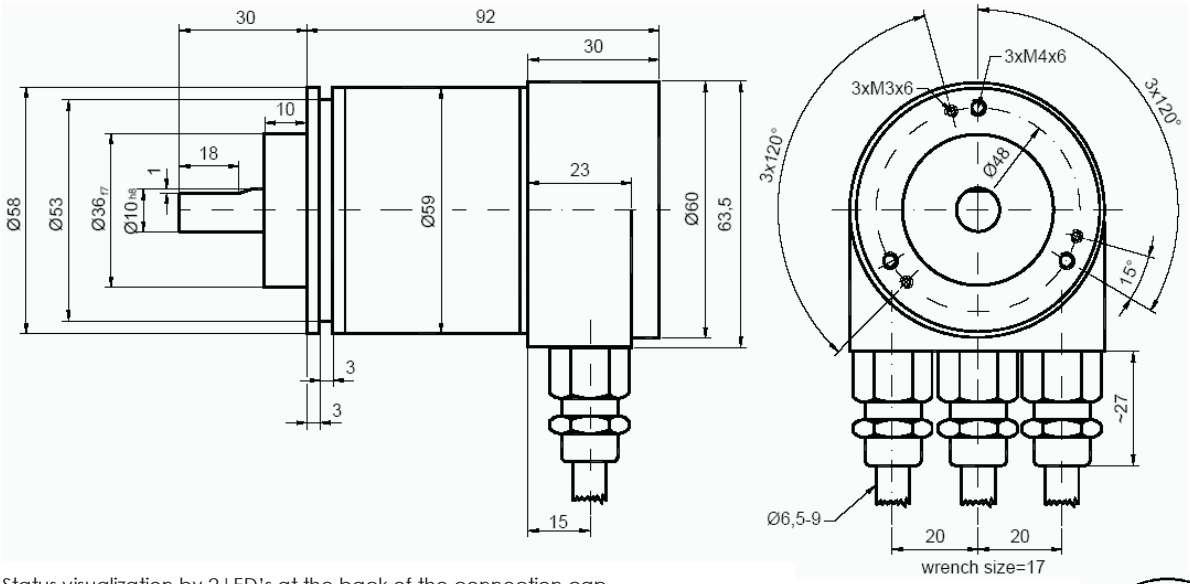
Ordering code: MHM510-CANO-001 = MHM5 - C2 B1 B – 12 13 - C10 0 - 0CC

MHM5

DEVICE NET ABSOLUTE MULTI-TURN ENCODER, MHM510-DNET RANGE

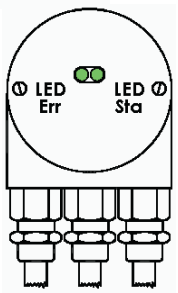
- MHM510-DEVICE NET, standard encoder Ø58mm with DeviceNet interface:
- Robust and compact design
- Solid shaft version Ø 10 mm (06 mm available upon request)
- Precision ball bearings with sealing flange
- High temperatures performances –40°C … +85°C
- Code disc made of unbreakable and durable plastic
- Mechanical memorisation of the number of turns by gears
- Resolution : 13 bits = 8192 steps/turn (max 16 bits)
- Number of turns : 12 bits = 4096 turns (max 14 bits)
- Polarity inversion and short circuit protection
- Highly integrated circuit in SMD-technology

MHM510-DNET (connection cap included)



Status visualization by 2 LED's at the back of the connection cap

Err - Green LED	*Sta - Green LED*	*Meaning*
off	off	No power supply
off	on	Encoder is ready, Boot Up message not sent (no further device on network, wrong baud rate) or encoder in prepared status
flashing	on	Boot Up message sent, device configuration is possible
on	on	Normal operation mode, Encoder in Operational Status



MECHANICAL DATA

Material	Cover : aluminum
	Body : aluminum
	Shaft: stainless steel
Max. shaft loading	Axial : 40 N
	Radial : 110 N
Shaft Inertia	≤ 30 g.cm²
Torque	≤ 3 N.cm
RPM (continuous operation))	6 000 tr/min
Shock (EN 60068-2-27))	≤ 100 g (halfsinus, 6 ms)
Shock (EN 60028-2-29)	≤ 10 g (half-sinus, 16ms)

Vibrations (EN 60068-2-6)	≤ 10 g (10Hz… 1 000Hz)
Weight	600 g
Operating temperature	- 40 … + 85°C
Storage temperature	- 40 ... + 85°C
Humidity	98 % without condensation
Protection class (EN 60529)	IP65: cover
	IP64: flange

Lifetime in 10^8 revolutions with F_a / F_r (axial / radial)		
40 N / 60 N	40 N / 80 N	40 N / 110 N
25	10	4

DEVICE NET ABSOLUTE MULTI-TURN ENCODER, MHM510-DNET RANGE

ELECTRICAL DATA

Interface	Transceiver according ISO/DIS 11898	Power consumption	max 2,5W
Transmission rate	Max 500KBauds	Step frequency LSB	800 kHz
Device addressing	By rotary switches	Accuracy of division	+ ½ LSB
Power Supply	10 – 30Vdc	EMC	EN 61000-6-4 EN 61000-6-2
Current consumption	max. 100mA (24Vdc)	Electrical lifetime	> 10^5 h

TRANSMISSION MODE

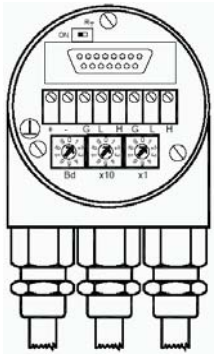
Polled Mode	By a telegram the connected host calls for the current process value. The absolute rotary encoder reads the current position value, calculates eventually set-parameters and sends back the obtained process value by the same identifier
Change of State	The absolute rotary encoder transmits the actual process value. The process value is transmitted when the position changes. This is useful to reduce the bus activity
CYCLIC Mode	The absolute rotary encoder transmits the actual process value event controlled by an internal timer. This is also useful to reduce the bus activity

PROGRAMMABLES PARAMETRES

Operating Parameters	As operating parameters the code sequence (complement) can be programmed. This parameter determines the counting direction, in which the output code increases or decreases
Resolution (pos./turn)	The parameter resolution per revolution is used to program the desired number of steps per revolution. Value between 1 and 8 192 can be programmed
Total Resolution "Max-RANGE"	This parameter is used to program the desired number of measuring units over the total measuring range. This value may not exceed the total resolution of the absolute rotary encoder. If the encoder is used in a continuous measuring application, certain rules for the setting of this parameter must be followed. These rules are outlined in the manual
Preset Value	The preset value is the desired position value, which should be reached at a certain physical position of the axis. The position value is set to the desired process value by the parameter pre-set

INSTALLATION

The rotary encoder is connected by three cables. The power supply is achieved with a two-wire connection cable through one PG 9. Each one of the twisted-pair and shielded bus lines are guided in and out through two PG 9 on the right side (as seen on clamps)



CONFIGURATION

The setting of the node number is achieved by 2 turn-switches in the connection cap. Possible addresses lie between 0 and 63 whereby every address can only be used once. 2 LEDs on the backside of the connection cap show the operating status of the encoder

There is a resistor provided in the connection cap, which must be used as a line termination on the last device

ORDERING REFERNCE (Contact the factory for special versions, ex: electronics, special flanges, connections…)

MHM5	D2	B1	B	12	13	C	10	0	0CC
Absolute multi turn encoder	DEVICE NET	Version	Code : Binary	Number of turns 2^{12} (4 096)	Resolution : 2^{13} (8 192)	Clamp flange	Shaft diameter : 10mm	Without mechanical option	Connection Cap

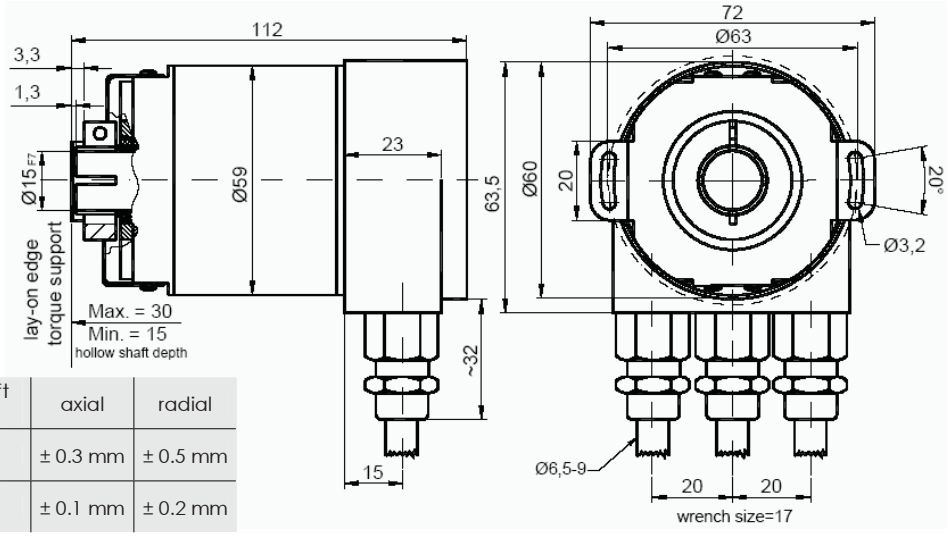
Ordering code: MHM510-DNET-001 = MHM5 - D2 B1 B – 12 13 - C10 0 - 0CC

MHK5

PROFIBUS ABSOLUTE MULTI-TURN ENCODER, MHK515-PROF RANGE

- MHK15-PROF, standard encoder Ø58mm with Profibus interface:
- Robust and compact conception
- Solid shaft version Ø 10 mm (06 mm available upon request)
- Precision ball bearings with sealing joint
- High temperatures performances –40°C … +85°C
- Code disc made of unbreakable and durable plastic
- Mechanical memorization of the number of turns by gears
- Resolution : 13 bits = 8192 steps/turn (max 16 bits)
- Number of turns : 12 bits = 4096 turns (max 14 bits)
- Polarity inversion and short circuit protection
- Highly integrated circuit in SMD-technology

MHK515-PROF (connection cap included)

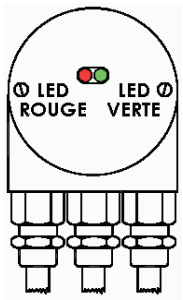


Allowed shaft movements	axial	radial
static	± 0.3 mm	± 0.5 mm
dynamic	± 0.1 mm	± 0.2 mm

Shaft diameter can be reduced at 12mm, 10mm or 8mm by reduction ring (by inserting them into the hollow shaft)

Red LED	Green LED	Status / possible cause
Dark	Dark	No power supply
Bright	Bright	Encoder is ready for operation but it has not received any configuration data after power on. Possible causes: address setting incorrect, Bus lines not connected correctly
Bright	Flashing	Parameter or configuration error. The encoder receives configuration or parameter dc incorrect length or inconsistent data Possible cause: parameter value "total measuring range" too high
Flashing	Bright	The encoder is ready for operation but not addressed by the master (e.g. incorrect address in configuration).
Bright	Dark	Encoder has not received any data for a longer period (about 40 sec.) Possible cause: bus line has been interrupted
Dark	Bright	Normal operation in data exchange mode
Dark	Flashing	Commissioning mode

Led status at the front of the connection cap



MECHANICAL DATA

Material (option stainless steel)	Cover : aluminum	Shocks (EN 60068-2-27)	≤ 100 g (half sine, 6 ms)
	Body : aluminium	Perm. shocks(EN 60028-2-29)	≤ 10 g (half sine, 16ms)
	Shaft: Stainless steel	Vibration (EN 60068-2-6)	≤ 10 g (10Hz… 1 000Hz)
Max. shaft loading	Axial : 40 N	Weight (Aluminium Version)	600 g
	Radial : 110 N	Operating temperature	- 40 … + 85°C
Shaft Inertia	≤ 30 g.cm²	Storage temperature	- 40 ... + 85°C
Torque	≤ 3 N.cm	Humidity	98 % without condensation
Speed (continuous)	6 000 RPM	Protection (EN 60529)	Cover: IP65, Shaft: IP64

PROFIBUS ABSOLUTE MULTI-TURN ENCODER, MHK515-PROF RANGE

CE

ELECTRICAL DATA

Interface	ISO 11898
Transmission rate	Max 1 MBauds
Device addressing	by rotary switches
Power supply	10 – 30Vdc
Current consumption	max 100mA (24Vdc)

Power consumption	max 2,5W
Step Frequency LSB	800 kHz
Accuracy	+ ½ LSB
EMC	EN 61000-6-4 EN 61000-6-2
Electrical lifetime	> 10^5 h

PROGRAMMABLE PARAMETERS

The Profibus-DP interface supports CLASS 1 and CLASS 2 functionality according to the encoder profile . In addition to these functions the GSD-file supports further features, for example software limit switches. Further more, the following encoder parameters can be programmed directly via the Profibus-DP network without any extra device

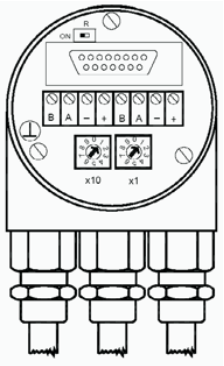
Counting Direction	This parameter counting direction defines whether the output code increases or decreases when the shaft rotates clockwise.
Resolution (positions per turns)	The parameter 'resolution per revolution' is used to program the desired number of steps per revolution. Each value between 1 and the physical resolution per revolution can be programmed
Total Resolution "Max-RANGE"	This parameter is used to program the desired number of measuring units over the total measuring range. This value may not exceed the total physical resolution of the absolute rotary encoder
Reset (RAX)	The preset value is the desired position value, which should be reached at a certain physical position of the axis. The position value is set to the desired process value by the parameter preset
Velocity	The implemented software can additionally deliver the current velocity. This value is transmitted in binary code, 16 Bit, in addition to the process value It is possible to choose between four different units: steps per 10 ms, per 100 ms, per 1000 ms and revolutions per minute
Software limit switches function	Two software limit switches can be set. If the position value falls below the lower or exceeds the higher limit switch, a status bit in the process value is set
Teach-in (Online parameterization)	A special mode is available for commissioning phase of the device. This makes it possible to change parameters while the encoder is in data exchange mode

INTERFACE

The rotary encoder is connected by two or three cables, depending on whether the power supply is integrated into the bus cable or connected separately. If the power supply is integrated into the bus cable one of the cable glands can be fitted with a plug. The cable glands are suitable for cable diameters from 6.5 up to 9 mm

The Profibus-DP device address is set by user-friendly rotary switches in the connection cap. Allowed addresses are between 1 and 99, each can only be used once. The connection cap can easily be opened for installation by removing the two cap screws

Termination resistors are integrated in the connection cap. These must be switched on if the encoder is connected at the end or the beginning of the bus



ORDERING REFERENCE Contact the factory for special versions, ex: electronics, special flanges, connections…)

MHK5	DP	B1	B	12	13	B	15	0	0CC
Absolute multi turn encoder	Profibus	Version	Code : Binary	Number of turns 2^{12} (4 096)	Resolution (pos./turn) 2^{13} (8 192)	Clamp Flange	Shat diameter : 15mm	Without mechanical option	Connection Cap

Ordering code : MHK515-PROF-001 = MHK5 - DP B1 B - 12 13 - B 15 0 - 0CC

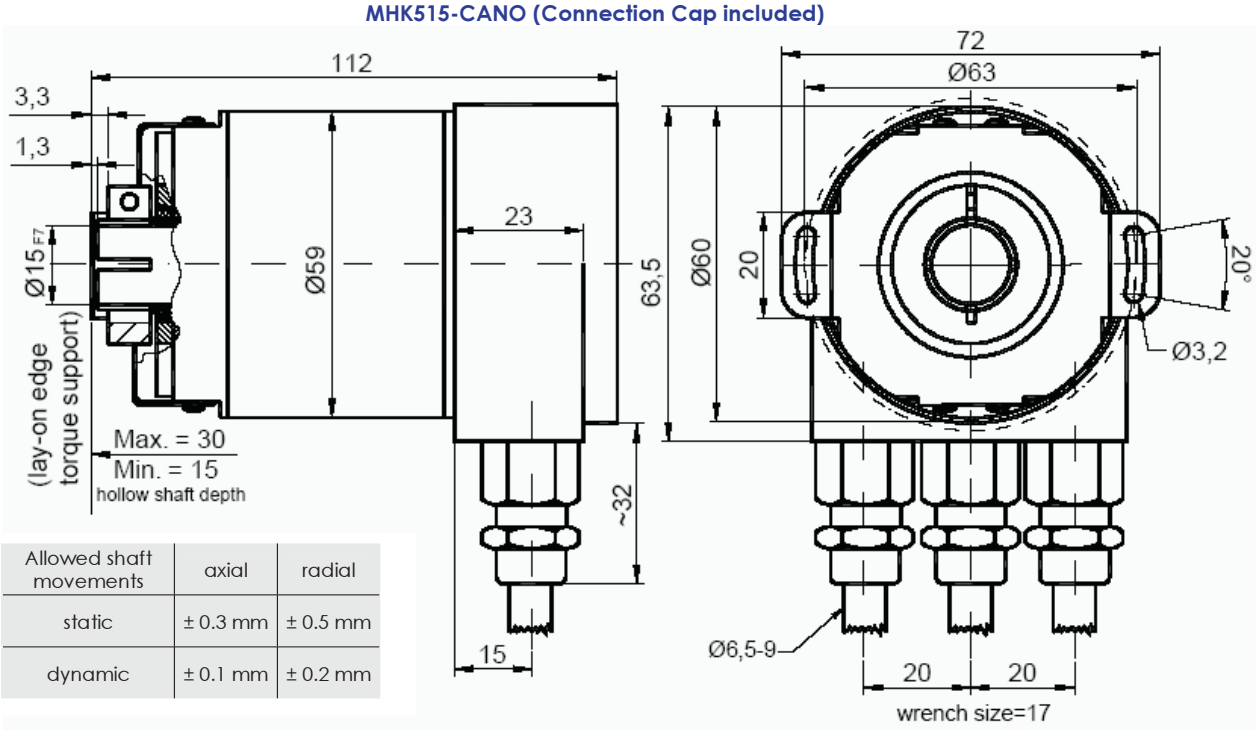
MHK5

CANOPEN ABSOLUTE MULTI-TURN ENCODER, MHK515-CANO RANGE

MHK515-CANO, standard encoder Ø58mm with CANopen interface:

- Robust and compact conception
- Blind shaft version Ø 15 mm (reduction hubs available)
- Precision ball bearings with sealing flange
- High temperatures performances –40°C … +85°C
- Code disc made of unbreakable and durable plastic
- Mechanical memorisation of the number of turns by gears
- Resolution : 13 bits=8192 steps/turn (max 16 bits)
- Number of turns : 12 bits=4096 turns (max 14 bits)
- Polarity inversion and short circuit protection
- Highly integrated circuit in SMD-technology

MHK515-CANO (Connection Cap included)

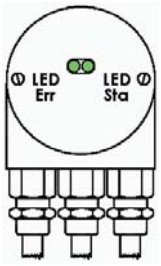


Allowed shaft movements	axial	radial
static	± 0.3 mm	± 0.5 mm
dynamic	± 0.1 mm	± 0.2 mm

Shaft diameter can be reduced to 12mm, 10mm or 8mm by reduction ring (by inserting them into the hollow shaft)

Status indication with two LED's in the connection cap

Err - Green LED	*Sta - Green LED*	*Meaning*
off	off	No power supply
off	on	Encoder is ready, Boot Up message not sent (no further device on network, wrong baud rate) or encoder in prepared status
flashing	on	Boot Up message sent, device configuration is possible
on	on	Normal operation mode, Encoder in Operational Status



MECHANICAL DATA

Material (Stainless steel option)	Cover : aluminum	Shock (EN 60068-2-27)	≤ 100 g (half sine, 6 ms)
	Body : aluminium	Shock (EN 60028-2-29)	≤ 10 g (half sine, 16ms)
	Shaft: Stainless steel	Vibration (EN 60068-2-6)	≤ 10 g (10Hz… 1 000Hz)
Max. shaft loading	Axial : 40 N	Weight (Aluminium Version)	600 g
	Radial : 110 N	Operating temperature	- 40 … + 85°C
Shaft Inertia	≤ 30 g.cm²	Storage temperature	- 40 ... + 85°C
Torque	≤ 3 N.cm	Humidity	98 % without condensation
Speed (continuous)	6 000 RPM	Protection (EN 60529)	Cover: IP65, Shaft: IP64

CANOPEN ABSOLUTE MULTI-TURN ENCODER, MHK515-CANO RANGE

ELECTRICAL DATA

Interface	ISO 11898
Transmission rate	Max 1 MBauds
Device addressing	by rotary switches
Power supply	10 – 30Vdc
Current consumption	max 100mA (24Vdc)

Power consumption	max 2,5W
Step Frequency LSB	800 kHz
Accuracy	+ ½ LSB
EMC	EN 61000-6-4 EN 61000-6-2
Electrical lifetime	> 10^5 h

TRANSMISSION MODES

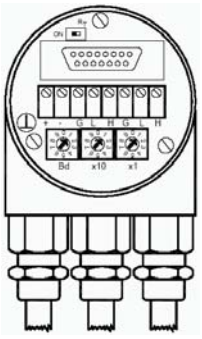
POLLED Mode	By a remote-transmission-request telegram the connected host calls for the current process value. The absolute rotary encoder reads the current position value, calculates eventually set-parameters and sends back the obtained process value by the same identifier
CYCLIC Mode	The absolute rotary encoder transmits cyclically - without being called by the host - the current process value. The cycle time can be programmed in milliseconds for values between 1 ms and 65536 ms
SYNC Mode	After receiving a sync telegram by the host, the absolute rotary encoder answers with the current process value. If more than one node number (encoder) shall answer after receiving a sync telegram, the answer telegrams of the nodes will be received by the host in order of their node numbers. The programming of an offset-time is not necessary. If a node should not answer after each sync telegram on the CAN network, the parameter sync counter can be programmed to skip a certain number of sync telegrams before answering again

PROGRAMMABLE PARAMETERS

Operating Parameters	This parameter determines the counting direction, in which the output code increases or decreases. As an important operating parameter the code sequence (complement) can be programmed
Resolution per turn	Value between 1 and 8192 can be programmed
Total resolution ''Max range''	This parameter is used to program the desired number of measuring units over the total measuring range. This value may not exceed the total resolution of the absolute rotary encoder.
Preset Value	The preset value is the desired position value, which should be reached at a certain physical position of the axis
Limit Switch, Min. and Max	Two position values can be programmed as limit switches. By reaching these values one bit of the 32 bit process value is set to high level
Cam	One free programmable cam can be set in the total measuring range

INSTALLATION

The rotary encoder is connected by two or three cables depending on whether the power supply is integrated into the bus cable or connected separately. If the power supply is integrated into the bus cable, one of the cable glands can be fitted
with a plug. The cable glands are suitable for cable diameters from 5.5 up to 9 mm



CONFIGURATION

The setting of the node number is achieved by 2 turn-switches in the connection cap. Possible addresses lie between 0 and 89 whereby every address can only be used once. Inside the encoder the defined address is increased by one. The connection cap can easily be opened for installation by removing the two cap screws
A termination resistor is integrated in the connection cap. The resistor must be switched on if the encoder is connected at the end or at the beginning of the bus

ORDERING REFERENCE (Contact the factory for special versions, ex:electronics, special flanges, connections...)

MHK5	C2	B1	B	12	13	B	15	0	0CC
Absolute multi turn encoder	CAN Open	Version	Code : Binary	Number of turns 2^{12} (4 096)	Resolution (steps/turn) : 2^{13} (8 192)	Blind Shaft	Shaft diameter (reduction ring available upon request)	Without mechanical options	Connection Cap output

Ordering code : MHK515-CANO-001 = MHK5 - C2 B1 B- 12 13 - B 15 0 - 0CC

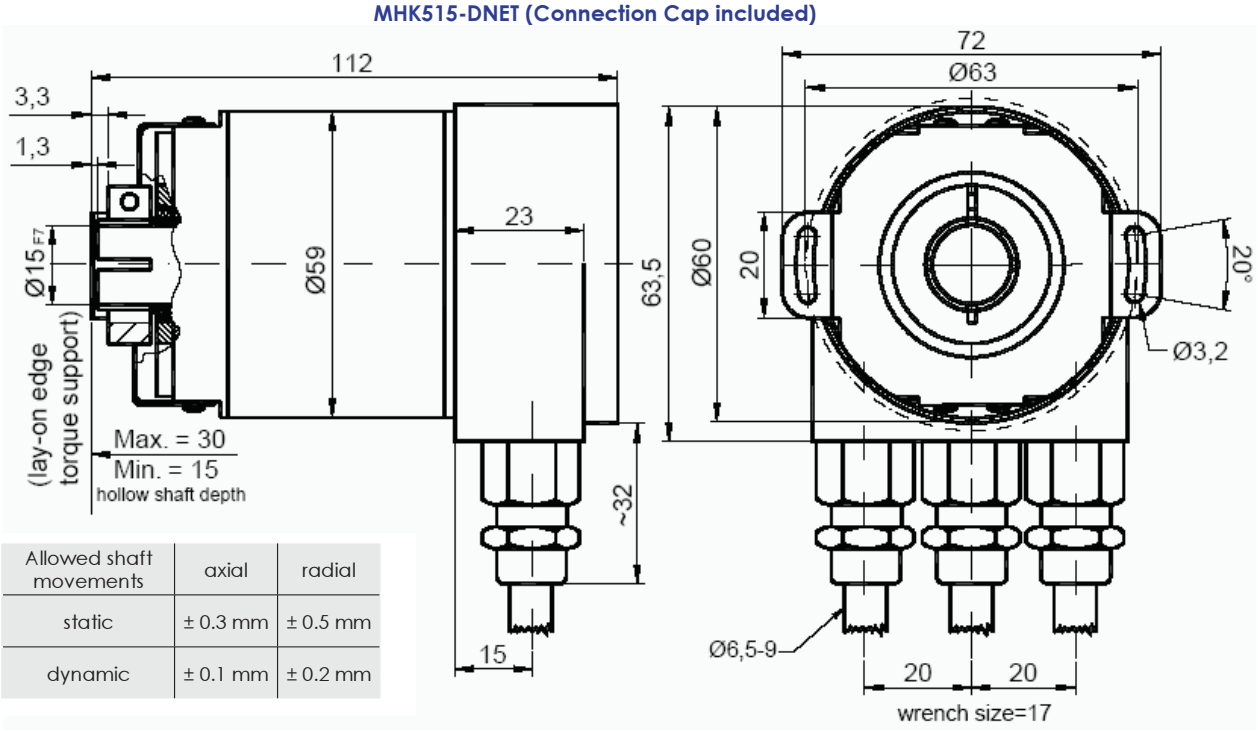
MHK5

DEVICE NET ABSOLUTE MULTI-TURN ENCODER, MHK515-DNET RANGE

MHK515-DNET, standard encoder Ø58mm with DeviceNet interface:

- Robust and compact conception
- Blind shaft version Ø 15 mm (reduction ring available)
- Precision ball bearings with sealing flange
- High temperatures performances –40°C … +85°C
- Code disc made of unbreakable and durable plastic
- Mechanical memorisation of the number of turns by gears
- Resolution : 13 bits=8192 steps/turn (max 16 bits)
- Number of turns : 12 bits=4096 turns (max 14 bits)
- Polarity inversion and short circuit protection
- Highly integrated circuit in SMD-technology

MHK515-DNET (Connection Cap included)

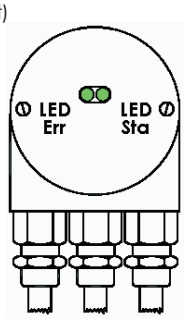


Allowed shaft movements	axial	radial
static	± 0.3 mm	± 0.5 mm
dynamic	± 0.1 mm	± 0.2 mm

Shaft diameter can be reduced at 12mm, 10mm or 8mm by reduction ring (by slipping them into the hollow shaft)

Status indication with two LED's in the connection cap

Err - Green LED	*Sta - Green LED*	*Meaning*
off	off	No power supply
off	on	Encoder is ready, Boot Up message not sent (no further device on network, wrong baud rate) or encoder in prepared status
flashing	on	Boot Up message sent, device configuration is possible
on	on	Normal operation mode, Encoder in Operational Status



MECHANICAL DATA

Material (option stainless steel)	Cover : aluminum	Shocks (EN 60068-2-27)	≤ 100 g (half sine, 6 ms)
	Body : aluminium	Perm. shocks(EN 60028-2-29)	≤ 10 g (half sine, 16ms)
	Shaft: Stainless steel	Vibration (EN 60068-2-6)	≤ 10 g (10Hz… 1 000Hz)
Max. shaft loading	Axial : 40 N	Weight (Aluminium Version)	600 g
	Radial : 110 N	Operating temperature	- 40 … + 85°C
Shaft Inertia	≤ 30 g.cm²	Storage temperature	- 40 ... + 85°C
Torque	≤ 3 N.cm	Humidity	98 % without condensation
Speed (continuous)	6 000 RPM	Protection (EN 60529)	Cover: IP65, Shaft: IP64

DEVICE NET ABSOLUTE MULTI-TURN ENCODER, MHK515-DNET RANGE

CE

ELECTRICAL DATA

Interface	Transceiver according ISO/DIS 11898	Power consumption	max 2,5W
Transmission rate	Max 500KBauds	Step frequency LSB	800 kHz
Device addressing	By rotary switches	Accuracy of division	+ ½ LSB
Power Supply	10 – 30Vdc	EMC	EN 61000-6-4 EN 61000-6-2
Current consumption	max. 100mA (24Vdc)	Electrical lifetime	> 10^5 h

TRANSMISSION MODE

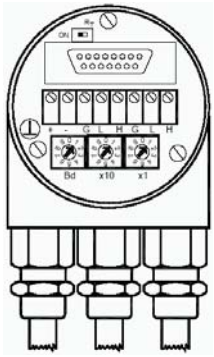
Polled Mode	By a telegram the connected host calls for the current process value. The absolute rotary encoder reads the current position value, calculates eventually set-parameters and sends back the obtained process value by the same identifier
Change of State	The absolute rotary encoder transmits the actual process value. The process value is transmitted when the position changes. This is useful to reduce the bus activity
CYCLIC Mode	The absolute rotary encoder transmits the actual process value event controlled by an internal timer. This is also useful to reduce the bus activity

PROGRAMMABLES PARAMETRES

Operating Parameters	As operating parameters the code sequence (complement) can be programmed. This parameter determines the counting direction, in which the output code increases or decreases
Resolution (pos./turn)	The parameter resolution per revolution is used to program the desired number of steps per revolution. Value between 1 and 8 192 can be programmed
Total Resolution "Max-RANGE"	This parameter is used to program the desired number of measuring units over the total measuring range. This value may not exceed the total resolution of the absolute rotary encoder. If the encoder is used in a continuous measuring application, certain rules for the setting of this parameter must be followed. These rules are outlined in the manual
Preset Value	The preset value is the desired position value, which should be reached at a certain physical position of the axis. The position value is set to the desired process value by the parameter pre-set

INSTALLATION

The rotary encoder is connected by three cables. The power supply is achieved with a two-wire connection cable through one PG 9. Each one of the twisted-pair and shielded bus lines are guided in and out through two PG 9 on the right side (as seen on clamps)



CONFIGURATION

The setting of the node number is achieved by 2 turn-switches in the connection cap. Possible addresses lie between 0 and 63 whereby every address can only be used once. 2 LEDs on the backside of the connection cap show the operating status of the encoder

There is a resistor provided in the connection cap, which must be used as a line termination on the last device

ORDERING REFERNCE (Contact the factory for special versions, ex: electronics, special flanges, connections…)

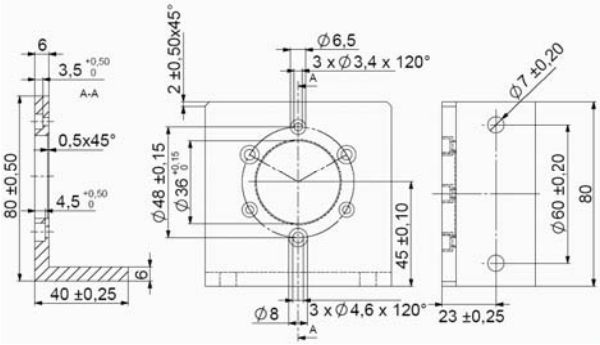
MHK5	D2	B1	B	12	13	B	15	0	0CC
Absolute multi turn encoder	DEVICE NET	Version	Code : Binary	Number of turns 2^{12} (4 096)	Resolution (steps/turn) : 2^{13} (8 192)	Blind Shaft	Shaft diameter (reduction ring available upon request)	Without mechanical options	Connection Cap output

Ordering code: MHK515-DNET-001 = MHK5 - D2 B1 B – 12 13 - B15 0 - 0CC

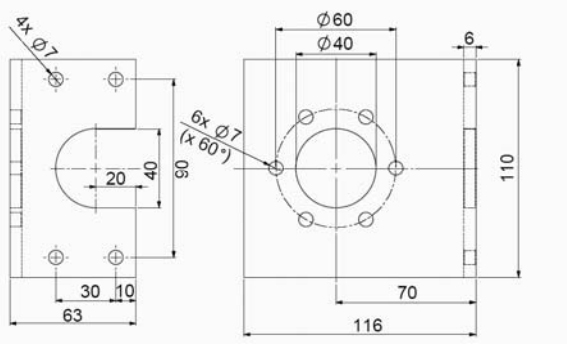
STANDARD MECHANICAL ACCESSORIES

Square flange for solid shaft encoder

Ref : **9202**

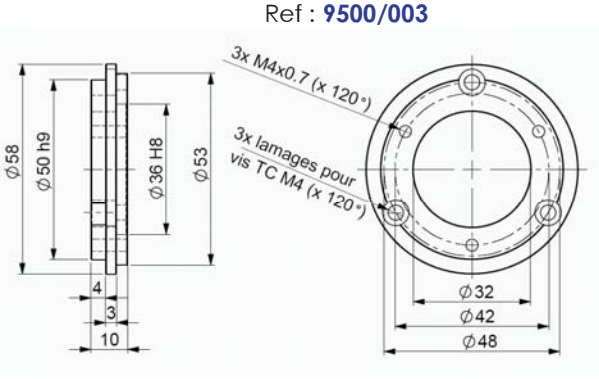


Ref : **9302**

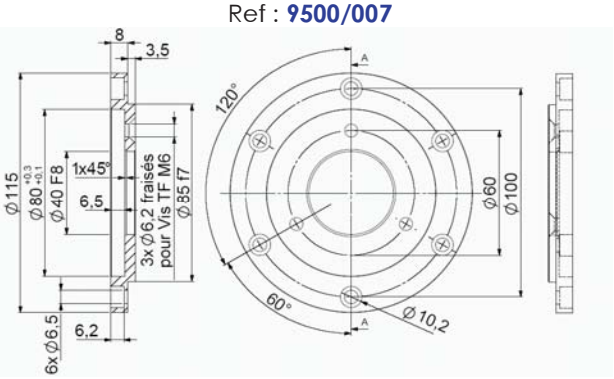


Flange for solid shaft encoder

Ref : **9500/003**

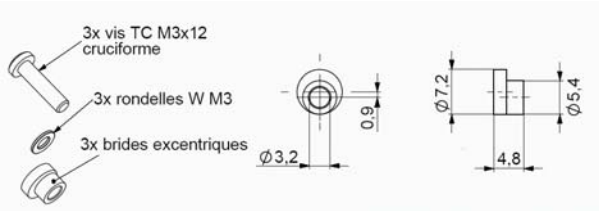


Ref : **9500/007**

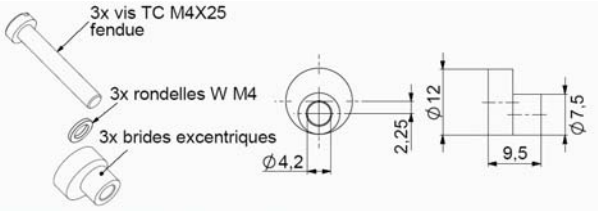


Mounting screws for synchro mounting

Ref : **9500/014**

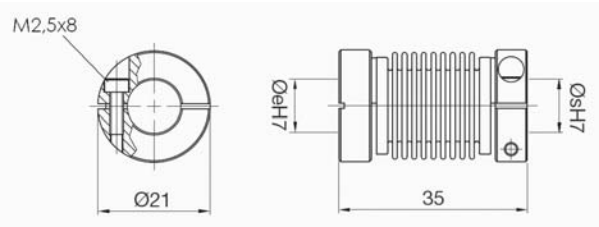


Ref : **9500/015**



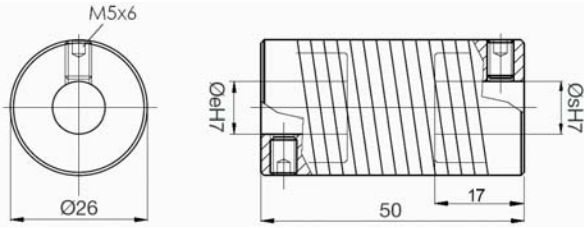
Couplings for solid shaft encoders

Ref : **9403**



Bellow coupling

Ref : **9401**



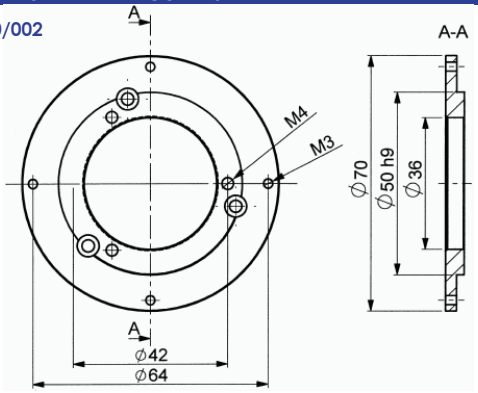
Spring coupling

COMPLEMENTARY MECHANICAL ACCESSORIES - FLANGES

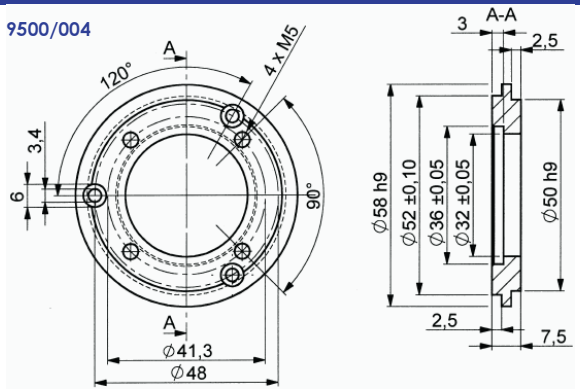
Large choice of adaptation flange – mounting system for all standard encoders

FLANGE FOR 58mm ENCODERS

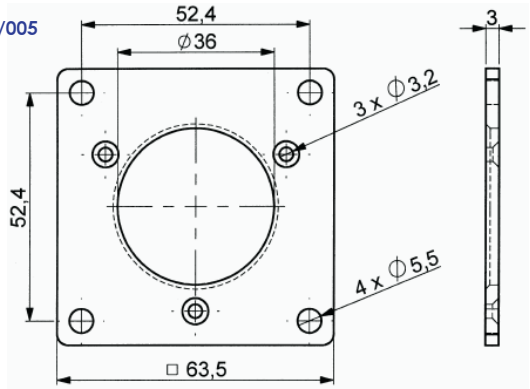
9500/002



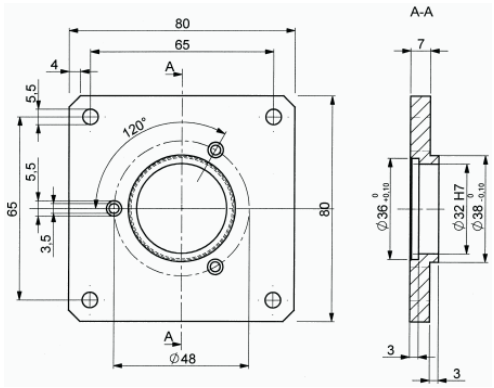
9500/004



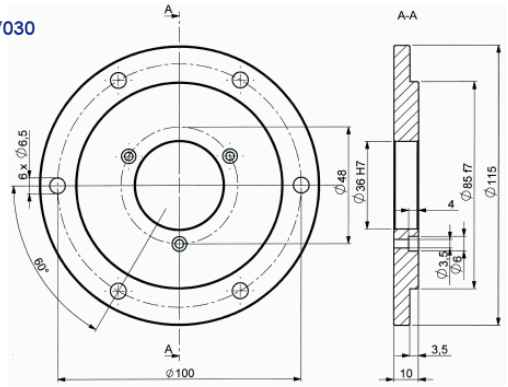
9500/005



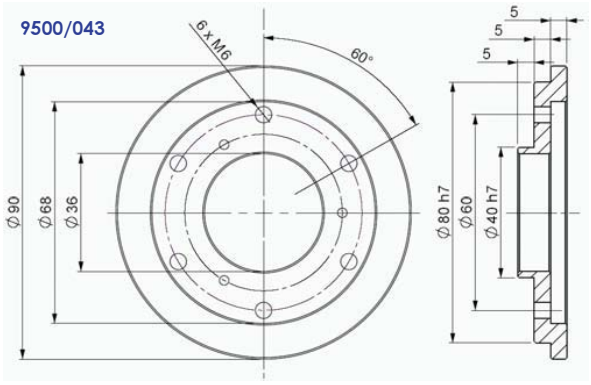
9500/006



9500/030

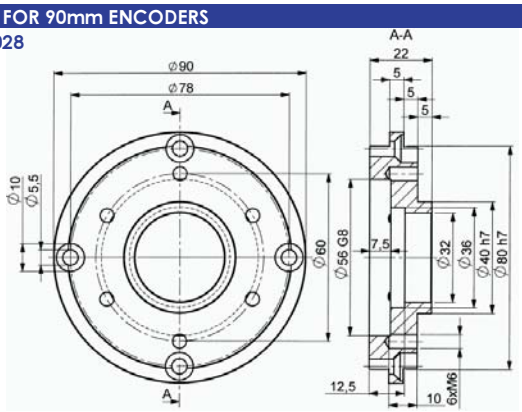


9500/043

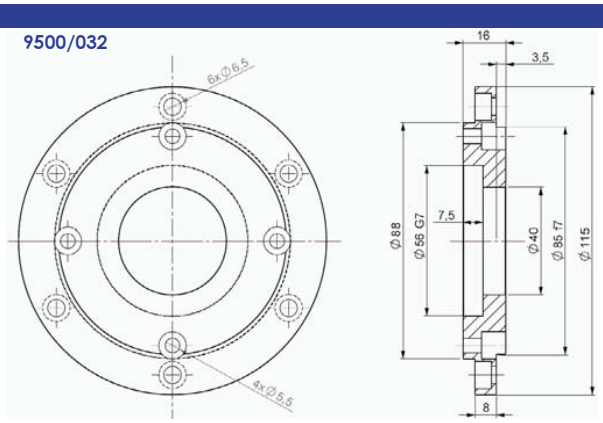


FLANGE FOR 90mm ENCODERS

9500/028



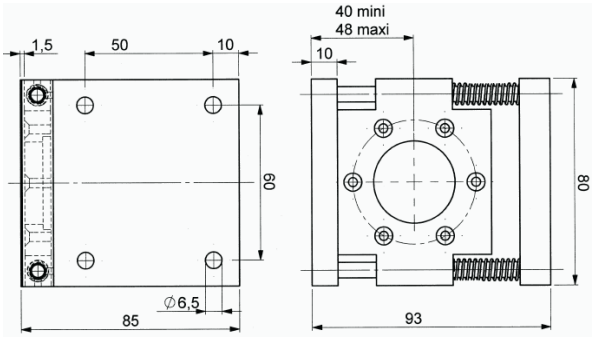
9500/032



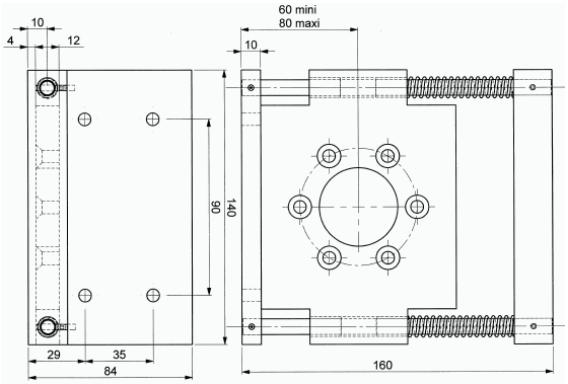
COMPLEMENTARY MECHANICAL ACCESSORIES

Ajustable spring brackets

9212 : For 58mm encoder, 36mm centering



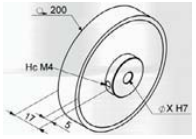
9213 : For 90mm encoder



Measuring whells

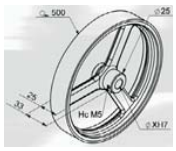
200mm circumference, 6 to 10mm shaft

9108	Polyurethane plastic
9109	Knobbled rubber
9110	Knurled aluminium



500mm circumference, 8 to 12mm shaft

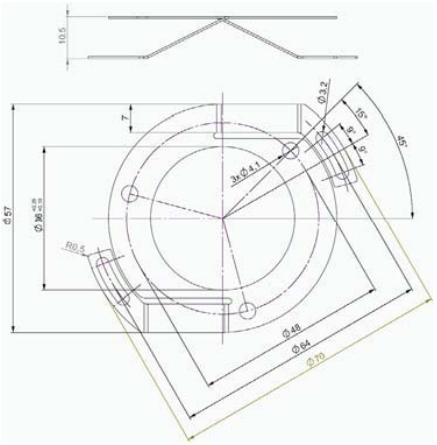
9101	Polyurethane plastic
9102	Knobbled rubber
9103	Knurled aluminium



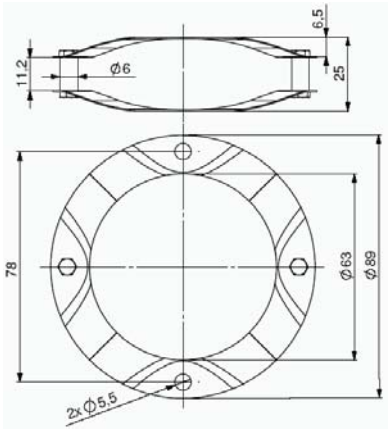
Pinions / racks also available for linear measure : consult us

Anti-rotation system

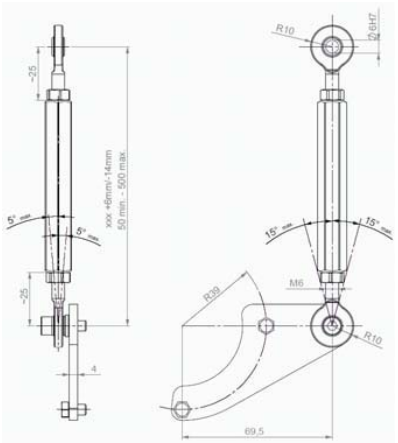
9445/016
For DHK / DHO5SOM



9445/004 MEFLEX
For Duplex mounting

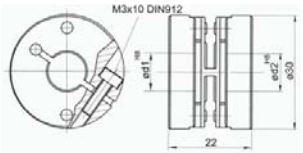


M9230 torque arm system
For 90mm encoder

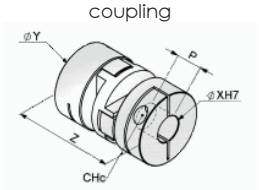


Specific coupling

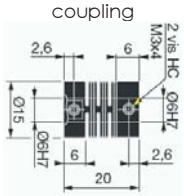
9400 : flexible washer coupling



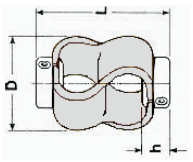
9410 : ''OLDHAM'' coupling



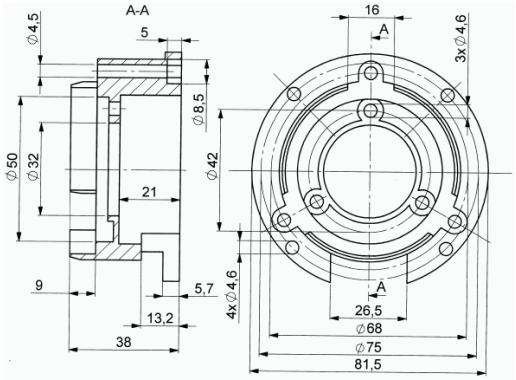
9417 : plastic coupling



Paguflex : high flexibility Plastic coupling



Fixing bell, ref : 9616



STANDARD CONNECTOR – EXTENSION CABLE

Connection	Female counter connector	Connector cable gland		Extension cable of 2m ...-020 Extension cable of 5m ...-050 
		min	max	
BA	9416/073	6	8	Consult us
BB	E8213/011	4	9	Consult us
C (3pins)	CB3	3	6	RCB3-1M (1m)
C (8pins)	CB8	3	6	RCB8-1M (1m)
C1	9416/025	5	13.5	Consult us
C6	9416/076	5	10	9416/076 - 8230/070 - S6 -020
C8	9416/055	8	9	9416/055 - 8230/070 - S8 -020
CP	9416/006P	7	10	9416/006P- 8230/004 - CP -020
G1	9412/F	5.5	8	9412/F - 8230/020 - G1 -020
G2	9414/F5	3	6	9414/F5 - 8230/020 - G2 -020
G6	9416/076	5	10	9416/076 - 8230/020 - G6 -020
G8	9416/055	8	9	9416/055 - 8230/050 - G8 -020
GD	9414/F8	3	6	9414/F8 - 8230/020 - GD -020
N6	9416/076	5	10	9416/076 - 8230/050 - N6 -020
P6 POSI+™	9416/011	8	10	9416/011 - 8230/132A - P6 -020
S3	E 8212/053	4	9	8212/053 - 8230/119 - S3 -020
S6	9416/076	5	10	9416/076 - 8230/070 - S6 -020
S6 POSI+™	9416/076	5	10	9416/076 - 8230/165 - S6 -020
S8	9416/055	8	9	9416/055 - 8230/070 - S8 -020
V6	9416/076	5	10	9416/076 - 8230/050 - N6 -020
B3 (female)	9416/010A (male)	7	10	Consult us

Ex : The extension cable 9416/076-8230/020-G6-020 is composed of : 2m of cable 8230/020, at its end, the connector 9416/076 is welded, flying leads at the other end

Cable	Type	Cable diameter	Caracteristics
8230/004	16 wires, PVC	7.5	16 x 0.14mm²
8230/020	8 wires, PVC	5.8	6 x 0.14mm² + 2 x 0.22mm²
8230/050	12 wires, PUR	6.4	4 x (2 x 0.15mm²) + 4 x 0.25mm²
8230/070	8 wires, PUR	8.5	3 x (2 x 0.14mm²) + 2 x 0.5mm²
8230/132A	16 wires, PVC	9.5	16 x 0.22mm²
8230/119	36 wires, PVC	9.9	36 x 0.14mm²
8230/165	8 wires, PUR	8.5	2 x 0.5mm² + 3 x (2 x 0.14mm²)

Female connector	Male counter-connector	Male counter-connector cable gland		Example of prewired extension cable 
		min	max	
CB3	9414/M3/P	3	6	Consult us
CB8	9414/M8/P	3	6	Consult us
9414/F5	9414/M5/P	3	6	9414/F5 - 8230/020 - G2 -020 -9414/M5/P
9414/F8	9414/M8/P	3	6	9414/F8 - 8230/020 - GD -020 -9414/M8/P
9416/006P	9416/012	6.35	13.5	9416/006P- 8230/020 - GD -020 -9416/012
9416/011	9416/013	3	7	9416/011P- 8230/165 - S6 -020 -9416/013
9416/055	9416/083	3.5	10.5	9416/055 - 8230/050 - G8 -020 -9416/083
9416/073	9416/072	6	8	Consult us
9416/076	9416/010A	7	10	9416/076 - 8230/020 - G6 -020 -9416/010A
E8213/011	E8213/008	3	7.5	Consult us
E8212/053	E8212/062	4	9	E8213/053- 8230/119 - S9 -020 -E8212/062

The extension cable 9416/055-8230/050-G8-020-9416/083 is composed of 2m of cable 8230/050, at one end the connector 9416/055 is welded, at the other end the connector 9416/083 is welded

9416/076


9416/010A


9416/055


9416/083


9416/F5


9416/M5/P


9412/F


E8212/053


E8212/008


9416/073

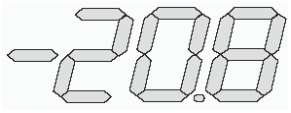

PRODUCT RANGE FOR AUTOMATION AND MOVEMENT CONTROL

In addition to our range of incremental and absolute industrial encoders, we market a large choice of electrical an electronic accessories, contact us ! We will offer you the right device for your application, ex :

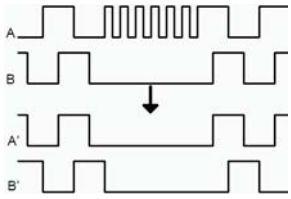
- Digital displays for incremental and absolute encoder: measure and display of angular positions, linear movement, positioning systems, cut to length, rotary and linear speed, etc...

- Signal processing devices : multi-channel amplifiers, D/A converters, etc...

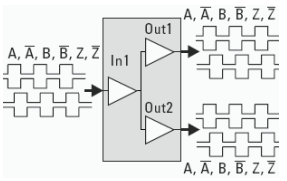
- A large choice of cables, connectors, counter connector, extension cables cut to length...



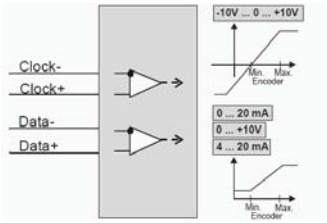
Multi-function indicators
- for all types of encoders (incremental, SSI, parallel, analog…)
- adjustable scaling factor
- analog output, relay…



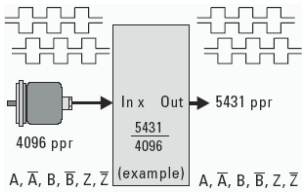
Anti-dither module
- 24Vdc power supply
- universal impulse input TTL/RS422 or HTL
- output level TTL/RS422 or HTL can be selected
- for start/stop or high vibrations application



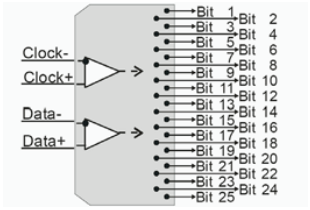
Changeover switch, distributor and splitter for encoder signals
- 5-30Vdc power supply
- input levels optional TTL/RS422 or HTL
- output levels individually adjustable to TTL/RS422 or HTL (10/30V)
- also available for SSI encoders



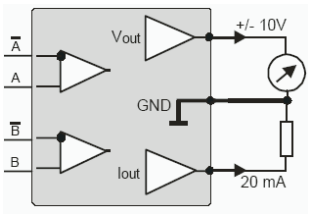
Converter SSI → analog
- 18-30Vdc power supply
- suitable for use with SSI encoders
- analog outputs proportional to the encoder position
- also available for incremental encoders



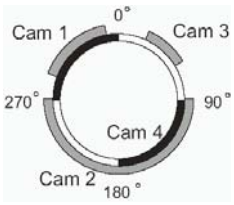
Universal level converter, frequency division/multiplication, direction detection…
- 18-30Vdc power supply
- universal impulse inputs TTL/RS422 or HTL
- programmable quadrature frequency divider for error free division of the inputs signals



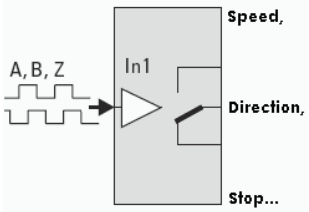
Deserialisation interface
- 18-30Vdc power supply
- SSI input
- Gray , binary, BCD output, HTL lor TTL level



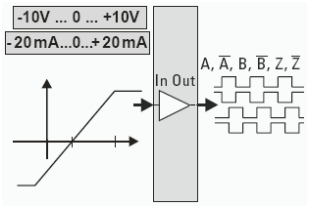
Signal converter frequency → analog/RS232
- 18 – 30Vdc power supply
- universal impulse input TTL/RS422 (A, A/, B, B/) or HTL (A/B or only A)
- wide input range : 1Hz to 500kHz
- bipolar output +/-10Vdc and 0-20mA or 4-20mA



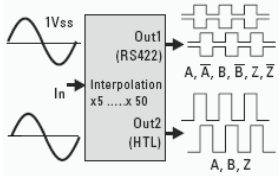
Cam controller
- 24Vdc power supply
- for incremental and absolute SSI encoders
- from 8 to 24 cams output



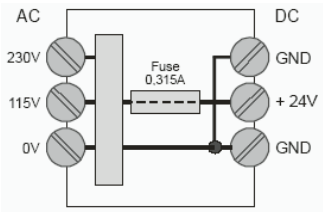
Monitor for speed, direction of rotation and standstill
- 115/230Vac or 18/30Vdc power supply
- impulse input A & B type TTL or HTL
- wide range of input frequency



Signal converter analog → frequency/RS232
- 12-30Vdc power supply
- analog input –10…+10Vdc / 0/4-20mA
- frequency output HTL and RS422 up to 500kHz
- programmable 0 index



Sine/cosine interpolator for 1Vpp encoder
- 18 – 30Vdc power supply
- incremental signal channel RS422 and HTL level
- adjustable interpolation rate from X5 to x50



24Vdc power supply
- input : 115 / 230VAC +/- 15%, 7,5VA, 50-60 Hz
- output : 24VDC / 300mA (-15%)
- protection against short-circuits

PRO-020S001 – CONFIGURATION CABLE FOR *POSI+*™

The **PRO-020S001** extension cable permits to connect simply your programmable ***POSI+***™ encoder to you PC, it is composed of:

- A power supply to be plugged into the mains (230Vac/12Vdc), this powers the encoder
- At one side: a M23 12 pins connector to be screwed on the programmable encoder (PHM5, PHO5, PHM9 or PHU9)
- AT the other side a SUBD9 female connector to be plugged on a serial port of your PC

Ordering reference : **PRO-020S001**

Note / connecting cautions :
The connection / disconnection of the connectors have to be done only after having disconnect the mains power (230Vac/12Vdc)

The programming software is downloadable from our web site :

www.bei-ideacod.com

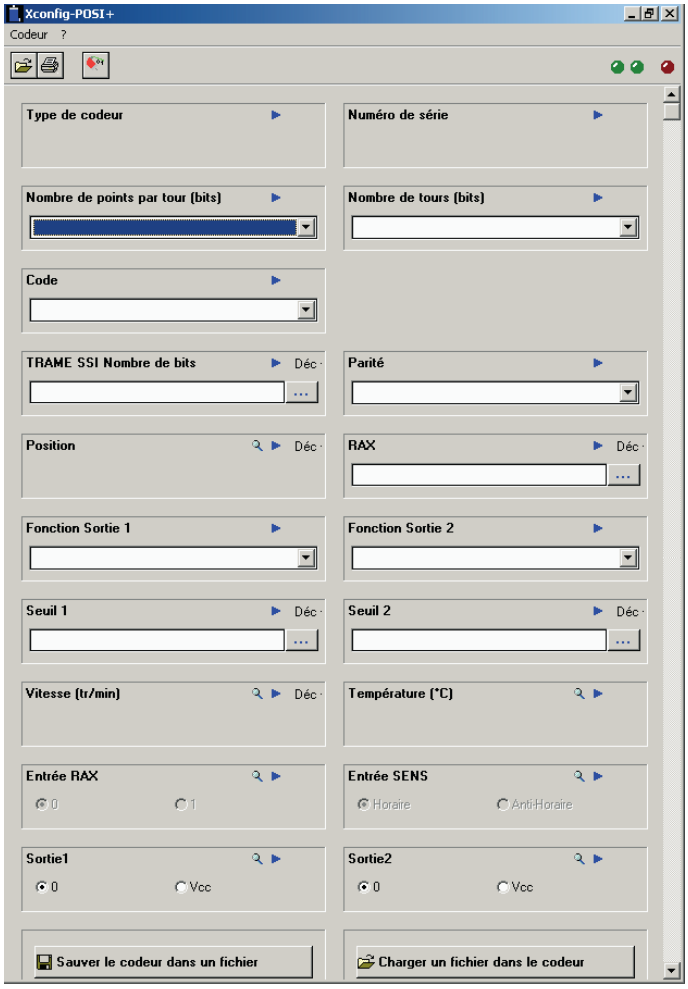
In order to optimize the installation times of SSI encoders, BEI IDEACOD has developed a user friendly software package, easy to use, with which it's possible to program your encoder in WINDOWS in only 2 minutes. With a simple connection to the serial connector of your PC, you can :

- configure : the number of points per revolution, the number of turns, the code type, SSI frame bit number, the parity, reset value

- read : type of selected encoder, the serial number of the encoder, the position of the encoder, the temperature, the speed of rotation, the level of the input/output

- save the chosen configuration, load saved configurations

- function of the outputs and limit value : position, speed of rotation, temperature, incremental channels 2048 ppr



Made in FRANCE

CUSTOMIZED PRODUCTS : OUR SPECIALTY

If you haven't found the right product in our standard catalogue, never mind, send us your specifications, we will be able to propose you the solution which will answer best to your needs :

- single manufacture possibility on the base of a standard encoder
- complete customized product for small batches

Below a ''check list'' which can help you to define the different points of your project

DESCRIPTION OF THE APPLICATION OR THE PROJECT		(X)
Application: The encoder will be mounted on:	Incremental	
	Tacho-encoder	
	Singleturn	
	Multiturn	

MECHANICAL SPECIFICATIONS	
Dimension : diameter / total length	
Shaft : syze / type / material	
Body : Fixation / Centering / Material	
Cover : material appearance	
Ingress protection IP	
Rotation speed / acceleration / torque	
Axial / radial load	
T°C of use : min / nominal / max	
Shocks / vibrations	
Other	

ELECTRICAL AND OPTICAL SPECIFICATIONS	
Power supply nominal / max	
Protection (power supply / output)	
Maximal consumption	
Electronic (incremental, ex: RS422, open collector)	
Frequency min / nominal / max (incremental)	
Current consumption (mA, incremental)	
Number of period (ppr, incremental encoder)	
Number of channels (incremental encoder, ex:A,A/,B,B/,0,0/)	
Commutation channels (brushless engine, nbre of pole)	
Number of points per turn (singleturn and multiturn)	
Number of turns (multiturn)	
Code (absolute encoder, ex : Gray, binary...)	
Transmission type (absolute encoder, ex : serial, CAN...)	
Speed data output (tacho-encoder, ex : 4-20mA, serial...)	
Needed accuracy	
Other	

WIRING - CONNECTION	
Connection : type / orientation / Lg.(cable)	
Wiring : fct / colour / pinout n°	
Other	

APPLICABLE STANDARDS	
Standard (ex : ATEX)	
Other	

PROJECT DATAS			
Potential (qty/year - month)		Target price	
Prototypes (qty)		Prototype target price	

Do not hesitate to send us mechanical, electrical drawings, software...