

### Industrial encoders incremental

Size up to  $\varnothing 58$  mm

Size ( $\varnothing$ )	Precise optical	Solid shaft	Blind hollow shaft	Through hollow shaft	TTL/RS422	HTL/push-pull	Pulses per revolution	Programmable	Product family	Page
24 mm	■	■			■	■			ITD 01 B14	6
24 mm	■		■		■	■			ITD 01 A 4 Y1	6
58 mm	■	■			■	■			EIL580-SC	7
58 mm	■	■			■	■			EIL580P-SC	7
58 mm	■	■			■	■			EIL580-SY	7
58 mm	■	■			■	■			EIL580P-SY	7
58 mm	■		■		■	■			EIL580-B	7
58 mm	■		■		■	■			EIL580P-B	7
58 mm	■			■	■	■			EIL580-T	7
58 mm	■			■	■	■			EIL580P-T	7



### Large hollow shaft

Size ( $\varnothing$ )	Hollow shaft ( $\varnothing$ max.)	Through hollow shaft	TTL/RS422	HTL/push-pull	Pulses per revolution	Programmable	Product family	Page
27 mm	■	■	■				ITD 40 A 4	8
30 mm	■	■	■				ITD 40 A 4 Y79	8
25,4 mm	■	■	■				HS35F	8
25,4 mm	■	■	■		■		HS35P	8
50 mm	■	■	■				ITD 70 A 4 Y 7	9
65 mm	■	■	■				ITD 70 A 4 Y 9	9
85 mm	■	■	■				ITD 75 A 4	9



### Sine/Cosine

Size ( $\varnothing$ )	Through hollow shaft	Sine periods per revolution	Product family	Page
58 mm	■	■	EIL576S-T	10
80 mm	■	■	HS35S	10
80 mm	■	■	ITD 42 A4	10



# Industrial encoders absolute

Size up to  $\varnothing 36$  mm

Size ( $\varnothing$ )	Solid shaft	Blind hollow shaft	Singleturn	Multiturn	SSI	Analog	CANopen*	CANopen* redundant	SAE J1939	Corrosion protection CX (C5-M)	Product family	Page
28 mm	■		■			■	■	■			EAM280	14
30 mm	■	■	■	■		■					EAM300	14
36 mm	■		■	■		■		■			EAM360-SW	14
36 mm	■		■	■		■			■	■	EAM360R-SW	14
36 mm		■	■	■		■		■			EAM360-B	15
36 mm		■	■	■		■			■	■	EAM360R-B	15



Size  $\varnothing 58$  mm - robust magnetic sensing

Size ( $\varnothing$ )	Solid shaft	Blind hollow shaft	Singleturn	Multiturn	Integrated interface	Modular bus cover	SSI	Analog	CANopen@	CANopen* redundant	Profinet	SAE J1939	EtherCAT / EtherNet/IP	Profibus	Corrosion protection CX (C5-M)	Product family	Page
58 mm	■		■	■			■		■	■		■	■			EAM580-S	16
58 mm	■		■	■			■		■	■		■		■		EAM580R-S	16
58 mm		■	■	■			■		■	■		■	■			EAM580-B	16
58 mm		■	■	■			■		■	■		■		■		EAM580R-B	16



# Industrial encoders absolute

Size  $\varnothing$ 58 mm - precise optical sensing

Size ( $\varnothing$ )	Solid shaft	Blind hollow shaft	Through hollow shaft	Multiturn	Singleturn	Resolution up to 18 bits/rev.	SSI / SSI + incremental	CANopen	EtherCAT	EtherNet/IP	Profinet	Product family	Page
58 mm	■			■				■	■	■		EAL580-SC	18
58 mm	■			■				■	■	■		EAL580-SV	18
58 mm		■		■				■	■	■		EAL580-B	18
58 mm			■	■				■	■	■		EAL580-T	18
58 mm	■			■								GM400	19
58 mm	■			■								GM401	19
58 mm	■				■							GA240	19
58 mm	■				■							GA241	19
58 mm		■		■								GXM2S	19
58 mm			■	■								GOM2H	19



EAL580-SC



EAL580-SV



EAL580-B



EAL580-T



GM400  
GA240



GM401  
GA241



GXM2S



GOM2H

# HeavyDuty encoders incremental

Size up to  $\varnothing 120$  mm / solid shaft

Size ( $\varnothing$ )	Shaft ( $\varnothing$ max.)	TTL/RS422	HTL /push-pull	HTL-P/Power Linedriver	LWL (Outdoor-Box)	EURO flange B10	Terminal box	Redundant sensing	EMS	Ex II 3G/3D (ATEX)	Ex II 2G (ATEX/IECEX)	Product family	Page
115 mm	11 mm	■	■	■	■	■	■	■	■	■	■	POG 86E	22
115 mm	11 mm	■	■	■	■	■	■	■	■	■	■	POG 86	22
115 mm	11 mm	■	■	■	■	■	■	■	■	■	■	OG 9	22
115 mm	11 mm	■	■	■	■	■	■	■	■	■	■	POG 9	22
115 mm	11 mm	■	■	■	■	■	■	■	■	■	■	POG 90	23
115 mm	11 mm	■	■	■	■	■	■	■	■	■	■	POG 10	23
115 mm	11 mm	■	■	■	■	■	■	■	■	■	■	POG 11	23
120 mm	11 mm	■	■	■	■	■	■	■	■	■	■	EEx OG 9	23



Size up to  $\varnothing 105$  mm / hollow shaft

Size ( $\varnothing$ )	Hollow shaft( $\varnothing$ max.)	TTL/RS422	HTL /push-pull	HTL-P/Power Linedriver	LWL (Outdoor-Box)	Terminal box	Redundant sensing	EMS	Ex II 3G/3D (ATEX)	Product family	Page
99 mm	16 mm	■	■	■	■	■	■	■	■	HOG 86E	24
99 mm	16 mm	■	■	■	■	■	■	■	■	HOG 86	24
97 mm	16 mm	■	■	■	■	■	■	■	■	HOG 9	24
105 mm	20 mm	■	■	■	■	■	■	■	■	HOG 10	25
105 mm	20 mm	■	■	■	■	■	■	■	■	HOG 11	25
105 mm	20 mm	■	■	■	■	■	■	■	■	HOG 100	25



Large hollow shaft

Size ( $\varnothing$ )	Hollow shaft ( $\varnothing$ max.)	TTL/RS422	HTL /push-pull	HTL-P/Power Linedriver	LWL (Outdoor-Box)	Terminal box	Redundant sensing	Ex II 3G/3D (ATEX)	Product family	Page
158 mm	38 mm	■	■	■	■	■	■	■	HOG 16	26
158 mm	75 mm	■	■	■	■	■	■	■	HOG 163	26



Sine/Cosine

Size ( $\varnothing$ )	Shaft ( $\varnothing$ max.)	Solid shaft	Hollow shaft	EURO flange B10	Terminal box	Ex II 3G/3D (ATEX)	Product family	Page
115 mm	11 mm	■	■	■	■	■	POGS 90	28
105 mm	20 mm	■	■	■	■	■	HOGS 100	28



# HeavyDuty encoders absolute

Size up to ø115 mm

Size (ø)	SSI	CANopen®	DeviceNet	Profibus-DP	EtherCAT	EtherNet/IP	Profinet	EURO-Flange B10	Terminal box	Ex II 3G/3D (ATEX)	Programmable	Speed switches	Product family	Page
115 mm	■	■	■	■	■	■	■	■	■	■	■	■	PMG 10	30
115 mm	■	■	■	■	■	■	■	■	■	■	■	■	PMG 10P	30
105 mm	■	■	■	■	■	■	■	■	■	■	■	■	HMG 10	30
105 mm	■	■	■	■	■	■	■	■	■	■	■	■	HMG 10P	30



PMG 10  
PMG 10P



HMG 10  
HMG 10P

Size up to ø160 mm

Size (ø)	SSI	CANopen®	DeviceNet	Profibus-DP	Terminal box	Ex II 3G/3D (ATEX)	Product family	Page
160 mm	■	■	■	■	■	■	HMG 161	31



HMG 161

# HeavyDuty speed monitoring switches

Mechanical / electronic

Size (ø)	Mechanical	Electronic	Solid shaft	Switching outputs	EURO-Flange B10	Terminal box	Product family	Page
115 mm	■	■	1	■	■	■	FS 90	32
115 mm	■	■	1	■	■	■	ES 90	32
115 mm	■	■	3	■	■	■	ES 93	32



FS 90



ES 90  
ES 93

Digital / Stand-alone

Size	Digital/programmable	Switching outputs	Top mount housing	Product family	Page
100 mm	■	4	■	GMM2xxS	70



GMM2xxS

Digital / encoder-integrated / incremental & absolute

Size (ø)	Digital/progr.	Solid shaft	Hollow shaft	TTL/RS422	HTL/push-pull	Switching outputs	EURO-Flange B10	Terminal box	M23	Ex II 3G/3D (ATEX)	Transistor output	Optical	Magnetic	Product family	Page
105 mm	■	■	■	■	2	■	■	■	■	■	■	■	■	HOG 10 + DSL.E	36
165 mm	■	■	■	■	2	■	■	■	■	■	■	■	■	HOG 165 + DSL.E	36
120 mm	■	■	■	■	2	■	■	■	■	■	■	■	■	POG 10 + DSL.E	37
115 mm	■	■	■	■	■	■	■	■	■	■	■	■	■	PMG 10D UO	38
105 mm	■	■	■	■	■	■	■	■	■	■	■	■	■	HMG 10D UO	38
115 mm	■	■	■	■	■	■	■	■	■	■	■	■	■	PMG 10PD	38
105 mm	■	■	■	■	■	■	■	■	■	■	■	■	■	HMG 10PD	38



HOG 10 + DSL.E



HOG 165 + DSL.E



POG 10 + DSL.E



PMG 10D UO  
PMG 10DP



HMG 10D UO  
HMG 10DP

### HeavyDuty tacho generators

Size (ø max.)	Solid shaft	EURO-flange B10	Terminal box	LongLife embedded	Product family	Page
115 mm	■	■	■	■	GTF 7.08	40
115 mm	■	■	■	■	GTF 7.16	40
85 mm	■	■	■	■	TDP 0,09	40
85 mm	■	■	■	■	TDPZ 0,09	40
115 mm	■	■	■	■	TDP 0,2	40
115 mm	■	■	■	■	TDPZ 0,2	40
175 mm	■	■	■	■	TDP 13	40
175 mm	■	■	■	■	TDPZ 13	40



Size (ø max.)	Hollow shaft	Bearingless variant	LongLife embedded	Product family	Page
52 mm	■	■	■	GT 5	42
85 mm	■	■	■	GT 7.08	40
85 mm	■	■	■	GT 7.16	40
89 mm	■	■	■	GT 9	42
95 mm	■	■	■	GTB 9.06	42
95 mm	■	■	■	GTB 9.16	42
95 mm	■	■	■	GTR 9	43
86 mm	■	■	■	KTD 4	43



### HeavyDuty combinations

Incremental twin encoder

Size (ø)	Solid shaft	Hollow shaft	TTL/RS422	HTL/push-pull	EURO flange B10	Terminal box	Redundant sensing	EMS	Ex II 3G/3D (ATEX)	Corrosion protection CX (C5-M)	Product family	Page
115 mm	■	■	■	■	■	■	■	■	■	■	POG 9 G	22
115 mm	■	■	■	■	■	■	■	■	■	■	POG 10 G	44
115 mm	■	■	■	■	■	■	■	■	■	■	POG 11 G	44
97 mm	■	■	■	■	■	■	■	■	■	■	HOG 9 G	44
105 mm	■	■	■	■	■	■	■	■	■	■	HOG 10 G	44
105 mm	■	■	■	■	■	■	■	■	■	■	HOG 11 G	44



# HeavyDuty combinations

## Tacho generator

Size (ø)	Centrifugal switch (FSL)	Speed switch (ESL)	Incremental encoder	Solid shaft	EURO-Flange B10	Terminal box	Product family	Page
85 mm	■		■	■	■		TDP 0,09 + FSL	45
115 mm	■		■	■	■		TDP 0,2 + FSL	45
115 mm	■		■	■	■		TDPZ 0,2 + FSL	45
115 mm		■	■	■	■		TDP 0,2 + ESL	45
115 mm		■	■	■	■		TDPZ 0,2 + ESL	45
115 mm			■	■	■	■	TDP 0,2 + OG9	45



## Incremental encoders with speed switch

Size (ø)	Incremental	Mechanical (FSL)	Electronic (ESL)	Solid shaft	Blind hollow shaft	TTL/RS422	HTL/push-pull	Product family	Page
115 mm	■	■		■	■	■		POG 9 + FSL	46
115 mm	■		■	■	■	■		POG 9 + ESL	46
115 mm	■	■		■	■	■		POG 10 + FSL	46
115 mm	■		■	■	■	■		POG 10 + ESL	46
115 mm	■	■		■	■	■		POG 11 + FSL	46
115 mm	■		■	■	■	■		POG 11 + ESL	46
105 mm	■	■		■	■	■		HOG 10 + FSL	47
105 mm	■		■	■	■	■		HOG 10 + ESL	47
105 mm	■	■		■	■	■		HOG 11 + FSL	47
105 mm	■		■	■	■	■		HOG 11 + ESL	47



# Bearingless encoders

## Incremental

Size (ø max.)	TTL/RS422	HTL/push-pull	SinCos 1 Vpp	DNV certification	Product family	Page
47,8 mm	■				EB200E	50
47,8 mm	■	■			MIR 10	50
28 mm	■	■			ITD49H	50
28 mm			■		ITD49H Sine	50
65 mm	■	■			ITD69H	51
65 mm			■		ITD69H Sine	51
140 mm	■	■			ITD89H	51
140 mm			■		ITD89H Sine	51
80 mm	■	■	■	■	MHGE 100	27
180 mm	■	■	■	■	MHGE 200	27
340 mm	■	■	■	■	MHGE 400	27
740 mm	■	■	■	■	MHGE 800	27
80 mm	■	■	■		MHGP 100	53
180 mm	■	■	■		MHGP 200	53
340 mm	■	■	■		MHGP 400	53



# Bearingless encoders

## Absolute

	Hollow shaft (ø max.)	Absolute singleturn	Absolute multiturn	SSI	Analogue	CANopen*	SAE J1939	EtherCAT / EtherNet/IP	Powerlink / Profinet	TTL/RS422	HTL/ push-pull	SinCos 1 Vpp	Corrosion protection CX (C5-M)	Product family	Page
12 mm	■	■	■	■	■									EAM360 Kit	56
12 mm	■	■	■	■	■	■						■		EAM360R Kit	56
12 mm	■	■	■	■	■		■	■						EAM580 Kit	56
12 mm	■	■	■	■	■							■		EAM580R Kit	56
8 mm	■			■	■							■		EAM500R Kit	57
80 mm	■		■					■	■	■				MHAP 100	54
180 mm	■		■					■	■	■				MHAP 200	54
340 mm	■		■					■	■	■				MHAP 400	54



## For large shaft diameters

	Hollow shaft (ø max.)	Incremental	Quasi-absolute	TTL/RS422	HTL/ push-pull	HTL-Pi Power Linedriver	SinCos 1 Vpp	Product family	Page
340 mm	■		■	■	■	■	■	MIR 350F	55
3183 mm	■		■	■	■	■	■	MIR 3000F	55
340 mm		■	■	■	■	■	■	MQR 350F	55
3183 mm		■	■	■	■	■	■	MQR 3000F	55



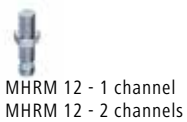
## Analog magnetic rotary encoders

	Cylindrical design	Cubical design	Angular range 360°	Angular range 270°	Current output	Voltage output	Product family	Page
■		■	■	■	■		EAM500	57
■			■	■			MDRM 18I	57
■		■			■		MDRM 18U	57
	■		■	■			MDFM 20I	57
	■				■		MDFM 20U	57



# Hall and speed sensors

	Design M12	Design M18	Switching frequency 0 to 15 kHz	Switching frequency 0 to 20 kHz	Push-pull output	PNP output	Product family	Page
■		■	■				MHRM 12 - 1 channel	59
■		■	■				MHRM 12 - 2 channels	59



# Programmable encoders

	Size (ø)	Solid shaft	Blind hollow shaft	Through hollow shaft	Pulses per revolution	Output signal level	Zero pulse	TTL/RS422	HTL/ push-pull	Outputs	Speed switches	HeavyDuty applications	Programmable Handheld, PC	WLAN adapter / browser	Product family	Page
58 mm	■	■	■	■	■	■	■	■	1		■			EIL580P	62	
80 mm		■	■	■	■	■	■	■	1		■			HS35P	8	
105 mm	■			■	■	■	■	■	2	■	■			PMG 10P U0	30	
115 mm		■	■	■	■	■	■	■	2	■	■			HMG 10P	30	





# For special applications

## Encoders for hazardous environments

Size (ø)	Ex II 2G (ATEX/IECEx)	Ex II 2D/2G (ATEX)	Ex II 3D (ATEX)	Incremental	Absolute	Solid shaft	Hollow shaft	Programmable	TTL/RS422	HTL/push-pull	SinCos 1 Vpp	SSI	Profibus-DP	HeavyDuty applications	Product family	Page
115 mm	■			■	■				■	■			■		EEx OG 9	23
115 mm	■			■	■						■		■		EEx OG 9 S	66
160 mm	■			■		■			■	■			■		EEx HOG 161	66
58 mm		■		■	■	■			■	■			■		ExEIL580	66
58 mm		■		■	■	■	■		■	■			■		ExEIL580P	66
70 mm			■		■	■						■			X 700 - SSI	67
70 mm			■		■	■						■			X 700 - Profibus-DP	67



EEx OG 9  
EEx OG 9 S

EEx HOG 161

ExEIL580  
ExEIL580P



X 700 - SSI

X 700 - Profibus-DPV0

## Redundant absolute encoders

Size (ø)	Solid shaft	Hollow shaft	Bearingless encoders	Analog redundant	CANopen™ redundant	Corrosion protection CX (C5-M)	Product family	Page
28,6 mm	■		■	■			EAM280	14
50 mm		■	■	■	■		EAM500R Kit	68
58 mm	■	■		■	■		EAM580R	68



EAM280

EAM500R Kit

EAM580R

## SIL encoders incremental

Size	SIL3	SIL2	Solid shaft	Hollow shaft	TTL/RS422	HTL/push-pull	SinCos 1 Vpp	Product family	Page
ø58 mm		■	■		■	■		EIL576S-S	69
ø58 mm	■	■		■			■	EIL576S-T	69
ø105 mm		■		■	■	■		HOGS 100S	28
100 mm	■	■		■	■			GMM2xxS	70



EIL576S-S

EIL576S-T

HOGS 100S

GMM2xxS

# For special applications

## Offshore encoders

Size (ø)	Inkremental	Absolut Singleturn	Absolut Multiturn	Solid shaft	Hollow shaft	TTL/RS422	HTL-PPower Linedriver	SimCos 1 Vpp	SSI / SSI + incremental	CANopen*	DeviceNet	EtherCAT / EtherNet/IP	Profinet	Profibus-DP	Speed switches	Product family	Page
115 mm	■		■		■	■										POG 10	23
115 mm	■		■		■	■								■		POG 11	23
115 mm	■		■		■											POG 83	72
105 mm	■			■	■	■										HOG 10	25
105 mm	■			■	■	■								■		HOG 11	25
100 mm	■			■	■	■	■									MHGE 100	72
813 mm	■			■	■	■	■									MHGE 800	72
105 mm	■	■	■		■	■	■		■	■	■	■	■	■	■	HMG 10	30
115 mm	■	■	■		■	■	■		■	■	■	■	■	■	■	PMG 10	30



HOG 10



HOG 11



MHGE 100



MHGE 800



HMG 10

## Inclination sensors

Size	Measuring range 1-dim. / 0...360°	Measuring range 2-dim. / up to ±90°	Analog	CANopen*	SAE J1939	Corrosion protection CX (C5-M)	ISO 13849 compliant firmware	Dynamic inclination sensors	Product family	Page
45 mm	■	■	■	■					GIM140R	76
48 mm	■	■	■	■					GIM500R	77
62 mm	■	■		■			■		GIM700DR	78



GIM140R



GIM500R



GIM700DR

## Acceleration sensors

Size	Redundant	SIL2/PLd Certification	Analog	CANopen*	Product family	Page
48 mm		■	■		GAM500	79
55 mm			■	■	GAM900	79
55 mm	■	■	■	■	GAM900AS	79



GAM500



GAM900



GAM900AS

## Distance measurement

### Cable transducers

Size	Measuring length max.	Absolute	SSI	Analog / redundant	CANopen* / redundant	DeviceNet	Profibus-DP / EtherCAT	EtherCAT / EtherNet/IP	Powerlink / Profinet	Product family	Page
88 mm	4,7 m	■		■	■					GCA3	82
88 mm	7,8 m	■		■	■					GCA5	82
126 mm	8 m	■		■	■					GCA8	82
126 mm	12 m	■		■	■					GCA12	82
222 mm	20 m	■		■	■					GCA20	82
60 mm	2,4 m	■	■		■	■	■	■	■	GCA2	83
96 mm	3 m	■	■		■	■	■	■	■	GCA4	83
115 mm	15 m	■	■		■	■	■	■	■	GCA15	83
200 mm	50 m	■	■		■	■	■	■	■	GCA50	83



GCA3



GCA5



GCA8  
GCA12



GCA20



GCA2



GCA4



GCA15



GCA50

### Linear magnetic encoders / encoders with measuring wheels

Product family	Page	Product family	Page	Product family	Page
MIL10	84	MA20	85	EIL580P	62

