Standard, optical | **Sendix 5863 / 5883 (Shaft / Hollow shaft)** | **SSI / BiSS**

The Sendix 5863 and 5883 multiturn encoders with SSI or BiSS interface and optical sensor technology can achieve a resolution of max. 29 bits.

A through hollow shaft up to 14 mm and a blind hollow shaft up to 15 mm are available, as well as versions with additional SinCos or RS422 incremental track.

Ex 2/22 | cULus | RoHS | SSI | BiSS INTERFACE

Mechanical drive | Safety-Lock™ | High rotational speed | Temperature | High IP value | High shaft load capacity | Shock / vibration resistant | Magnetic field proof | Reverse polarity protection | SinCos | Seawater-resistant version on request

Reliable

- Tried-and-tested in applications with the highest demands, such as in wind energy or mobile automation
- Absolutely reliable operation in areas with strong magnetic fields, thanks to mechanical gear with optical sensor technology
- Rugged die-cast housing, remains sealed even in harsh everyday use
- -40°C up to +90°C: use in wide temperature range. Protection IP67

Versatile

- Available with SSI or BISS interface and combined with SinCos incremental signals
- The right fixing solution or type of connection available for every application.
- SET button and LED for simple start-up

Order code Shaft version

8.5863	.	X	X	X	X	.	X	X	2	X
Type		a	b	c	d		e	f	g	h

If for each parameter of an encoder the **underlined preferred option** is selected, then the delivery time will be 10 working days for a maximum of 10 pieces. Qts. up to 50 pcs. of these types generally have a delivery time of 15 working days.

10 by 10

a *Flange*
1 = clamping flange, ø 58 mm, IP65
2 = synchro flange, ø 58 mm, IP65
3 = clamping flange, ø 58 mm, IP67
4 = synchro flange, ø 58 mm, IP67
5 = square flange, 63,5 mm (2,5“), IP65
7 = square flange, 63,5 mm (2,5“), IP67

b *Shaft (ø x L), with flat*
1 = 6 x 10 mm [1]
2 = 10 x 20 mm [2]
3 = 6,35 x 22,2 mm (1/4“ x 7/8“)
4 = 9,5 x 22,2 mm (3/8“ x 7/8“)

c *Interface / Power supply*
1 = SSI or BiSS / 5 V DC
2 = SSI or BiSS / 10 ... 30 V DC
3 = SSI or BiSS, 2048 ppr SinCos / 5 V DC
4 = SSI or BiSS, 2048 ppr SinCos / 10 ... 30 V DC
5 = SSI or BiSS / 5 V DC, with sensor output for monitoring the voltage on the encoder
6 = SSI or BiSS, 2048 ppr SinCos / 5 V DC, with sensor output for monitoring the voltage on the encoder
7 = SSI or BiSS and 2048 ppr incremental signals RS422 (TTL-comp.) / 5 V DC
8 = SSI or BiSS and 2048 ppr incremental signals RS422 (TTL-comp.) / 10 ... 30 V DC
9 = SSI or BiSS and 2048 ppr incremental signals RS422 (TTL-comp.) / 5 V DC, with sensor output for monitoring the voltage on the encoder

d *Type of connection*
1 = axial cable (1 m PVC)
2 = radial cable (1 m PVC)
3 = M23 connector, 12-pin, axial
4 = M23 connector, 12-pin, radial
5 = M12 connector, 8-pin, axial [3]
6 = M12 connector, 8-pin, radial [3]

e *Code*
B = SSI, Binary
C = BiSS, Binary
G = SSI, Gray

f *Resolution* [4]
A = 10 bit ST + 12 bit MT
1 = 11 bit ST + 12 bit MT
2 = 12 bit ST + 12 bit MT
3 = 13 bit ST + 12 bit MT
4 = 14 bit ST + 12 bit MT
7 = 17 bit ST + 12 bit MT

g *Inputs / Outputs* [4]
2 = SET, DIR input additional status output

h *Options (Service)*
1 = no option
2 = status LED
3 = SET button and status LED

optional on request
- Ex 2/22
- seawater-resistant
- special cable length

1) Preferred type only in conjunction with Flange type 2
2) Preferred type only in conjunction with Flange type 1
3) Can be combined only with output circuits 1 and 2
4) Resolution, preset value and counting direction factory-programmable

Absolute Encoders – Multiturn

Standard, optical | **Sendix 5863 / 5883 (Shaft / Hollow shaft)** | **SSI / BiSS**

Order code Hollow shaft

8.5883 . XXXX . XX2X
Type — a b c d — e f g h

If for each parameter of an encoder the **underlined preferred option** is selected, then the delivery time will be 10 working days for a maximum of 10 pieces. Qts. up to 50 pcs. of these types generally have a delivery time of 15 working days.

10 by 10

a *Flange*
1 = with torque stop set, IP65
2 = with torque stop set, IP67
3 = with stator coupling, ø 65, IP65
4 = with stator coupling, ø 65, IP67
5 = with stator coupling, ø 63, IP65
6 = with stator coupling, ø 63, IP67

b *Hollow shaft*
3 = ø 10 mm
4 = ø 12 mm
5 = ø 14 mm
6 = ø 15 mm (Blind hollow shaft)
8 = ø 9.52 mm [3/8"]
9 = ø 12.7 mm [1/2"]

c *Output circuit / Power supply*
1 = SSI or BiSS / 5 V DC
2 = SSI or BiSS / 10 ... 30 V DC
3 = SSI or BiSS, 2048 ppr SinCos / 5 V DC
4 = SSI or BiSS, 2048 ppr SinCos / 10 ... 30 V DC
5 = SSI or BiSS / 5 V DC, with sensor output for monitoring the voltage on the encoder
6 = SSI or BiSS, 2048 ppr SinCos / 5 V DC, with sensor output for monitoring the voltage on the encoder
7 = SSI or BiSS and 2048 ppr incremental signals RS422 (TTL-comp.) / 5 V DC
8 = SSI or BiSS and 2048 ppr incremental signals RS422 (TTL-comp.) / 10 ... 30 V DC
9 = SSI or BiSS and 2048 ppr incremental signals RS422 (TTL-comp.) / 5 V DC, with sensor output for monitoring the voltage on the encoder

d *Type of connection*
2 = radial cable (1 m PVC)
4 = M23 connector, 12-pin, radial
6 = M12 connector, 8-pin, radial [2]
E = tangential cable outlet cable length 1 m (PVC cable)

e *Code*
B = SSI, Binary
C = BiSS, Binary
G = SSI, Gray

f *Resolution* [1]
A = 10 bit ST + 12 bit MT
1 = 11 bit ST + 12 bit MT
2 = 12 bit ST + 12 bit MT
3 = 13 bit ST + 12 bit MT
4 = 14 bit ST + 12 bit MT
7 = 17 bit ST + 12 bit MT

g *Inputs / Outputs* [1]
2 = SET, DIR input additional status output

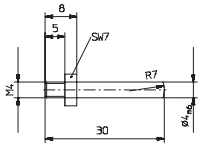
h *Options (Service)*
1 = no option
2 = status LED
3 = SET button and Status LED

optional on request
- Ex 2/22
- seawater-resistant
- special cable length

Mounting accessory for shaft encoders

Coupling	Bellows coupling ø 19 mm for shaft 6 mm	**8.0000.1101.0606**
	Bellows coupling ø 19 mm for shaft 10 mm	**8.0000.1101.1010**

Mounting accessory for hollow shaft encoders

Cylindrical pin, long for torque stops		With fixing thread	**8.0010.4700.0000**

Connection Technology

Connector, self-assembly	M12	**05.CMB-8181-0**
	M23	**8.0000.5012.0000**
Cordset, pre-assembled with 2 m PVC cable	M12	**05.WAKS8-2/P00**
	M23	**8.0000.6901.0002.0031**

Further accessories can be found in the Accessories section or in the Accessories area of our website at: www.kuebler.com/accessories.
Additional connectors can be found in the Connection Technology section or in the Connection Technology area of our website at: www.kuebler.com/connection_technology.

Mechanical characteristics

Max. speed, shaft version	
without shaft seal (IP65) up to 70°C	12 000 min^{-1}, 10 000 min^{-1} (continuous)
without shaft seal (IP65) up to T_{max}	8 000 min^{-1}, 5 000 min^{-1} (continuous)
with shaft seal (IP67) up to 70°C	11 000 min^{-1}, 9 000 min^{-1} (continuous)
with shaft seal (IP67) up to T_{max}	8 000 min^{-1}, 5 000 min^{-1} (continuous)
Max. speed, hollow shaft version	
without shaft seal (IP65) up to 70°C	9 000 min^{-1}, 6 000 min^{-1} (continuous)
without shaft seal (IP65) up to T_{max}	6 000 min^{-1}, 3 000 min^{-1} (continuous)
with shaft seal (IP67) up to 70°C	8 000 min^{-1}, 4 000 min^{-1} (continuous)
with shaft seal (IP67) up to T_{max}	4 000 min^{-1}, 2 000 min^{-1} (continuous)
Starting torque, shaft version	
without shaft seal (IP65)	< 0.01 Nm
with shaft seal (IP67)	< 0.05 Nm
Starting torque, hollow shaft version	
without shaft seal (IP65)	< 0.03 Nm

Moment of inertia		
Shaft version		4.0 x 10^{-6} kgm^2
Hollow shaft version		7.0 x 10^{-6} kgm^2
Load capacity of shaft	radial	80 N
	axial	40 N
Weight		approx. 0.45 kg
Protection EN 60 529	housing side	IP67
	shaft side	IP65, opt. IP67
EX approval for hazardous areas		optional Zone 2 and 22
Working temperature range		–40°C ... +90°C [3]
Materials	shaft / hollow shaft	stainless steel
	flange	aluminium
	housing	zinc die-cast housing
	cable	PVC
Shock resistance acc. EN 60068-2-27		2500 m/s^2, 6 ms
Vibration resistance acc. EN 60068-2-6		100 m/s^2, 55 ... 2000 Hz

1) Resolution, preset value and counting direction factory-programmable
2) Can be combined only with output circuits 1 and 2
3) Cable version: -30°C ... + 75°C

Standard, optical | **Sendix 5863 / 5883 (Shaft / Hollow shaft)** | **SSI / BiSS**

General electrical characteristics

Power supply		5 V DC + 5% or 10 ... 30 V DC
Current consumption (no load)	5 V DC	max. 80 mA
	10 ... 30 V DC	max. 50 mA
Reverse connection of the supply voltage (U_B)		yes (at 10 ... 30 V DC)
UL-certified		File 224618
CE compliant acc. to		EN 61000-6-2, EN 61000-6-4 and EN 61000-6-3
RoHS compliant acc. to		EU guideline 2002/95/EG

General interface characteristics

Output driver		RS485 transceiver type
Permissible load / channel		max. 20 mA
Signal level	high	typ. 3.8 V
	low at I_{Load} = 20 mA	typ 1.3 V
Short circuit proof outputs		yes [1]

SSI Interface

Singleturn resolution		10 ... 14 bit and 17 bit [2]
Number of revolutions		4096 (12 bit)
Code		Binary or Gray
SSI clock rate	≤ 14 bit	50 kHz ... 2 MHz
	≥ 15 bit	50 kHz ... 125 kHz
Monoflop time		≥ 15 µs

Note: If the clock starts cycling within the monoflop time, a second data transfer starts with the same data. If the clock starts cycling after the monoflop time, the data transfer starts with the new values The update rate is dependent on the clock speed, data length and monoflop-time.

Data refresh rate	< 1 µs	up to 14 bit
	4 µs	for 15 ... 17 bit
Status and Parity bit		on request

BiSS Interface

Singleturn resolution	10 ... 14 bit and 17 bit, Programmable at the customer [2]
Number of revolutions	4096 (12 bit)
Code	Binary
Clock rate	up to 10 MHz
Max. update rate	< 10 µs, depends on the clock rate and the data length
Data refresh rate	≤ 1 µs

Note::
- Bidirectional, programmable parameters are: resolution, code, direction, alarms and warnings
- Multi-cyclic data output, e.g. for temperature
- CRC data verification

SET input or SET button

Input		active high
Input type		comparator
Signal level	high	min: 60 % of +V (supply voltage) max: +V
	low	max: 25 % of +V (supply voltage)
Input current		< 0.5 mA
Min. pulse duration (SET)		10 ms
Timeout after SET signal		14 ms
Response time (DIR input)		1 ms

The encoder can be set to zero at any position by means of a HIGH signal on the SET input or by pressing the optional SET button (with a pencil, ball-point pen or similar).
Other preset values can be factory-programmed. The SET input has a signal processing time of approx. 1 ms. Once the SET function has been triggered, the encoder requires an internal processing time of approx. 15 ms before the new position data can be read. During this time the status output is at LOW.

Status output and LED

Output driver		Open Collector, internal pull up resistor 22 kOhm
Permissible load		max. 20 mA
Signal level	high	+V
	low	< 1 V
Active		low

The optional LED (red) and the status output serve to display various alarm or error messages. In normal operation the LED is OFF and the status output is HIGH (Open Collector with int. pull-up 22k).

An active status output (LOW) displays:
- Sensor error, singleturn or multiturn (soiling, glass breakage etc.)
- LED fault (failure or ageing)
- over- or under-temperature

In the SSI mode, the fault indication can only be reset by switching off the power-supply to the device.

DIR input

A HIGH signal switches the direction of rotation from the default CW to CCW. This function can also be factory-programmed to be inverted. If DIR is changed when the device is already switched on, then this will be interpreted as an error. The LED will come ON and the status output will switch to LOW.

Power-on delay

After Power-ON the encoder requires a time of approx. 150 ms before valid data can be read.

Option Incremental outputs (A/B), 2048 ppr

	SinCos	RS422 TTL-compatible
Max. frequency -3dB	400 kHz	400 kHz
Signal level	1 Vpp (± 20%)	high: min. 2.5 V low: max. 0.5 V
Short circuit proof	yes	yes

1) Short circuit to 0V or to output, one channel at a time, supply voltage correctly applied
2) Other options upon request

Standard, optical | **Sendix 5863 / 5883 (Shaft / Hollow shaft)** | **SSI / BiSS**

Terminal assignment

for output circuit 1 or 2 and type of connection 1, 2, 3 or 4 (2 control inputs, 1 status output)

Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	Stat	N/C	N/C	N/C	PE
Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	-	-	-	Shield
M23 connector:	1	2	3	4	5	6	7	8	9	10	11	12	PH

for output circuit 5 and type of connection 1, 2, 3 or 4 (2 control inputs, 1 status output, sensor outputs for voltage)

Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	Stat	N/C	0 V sens	$+U_B$ sens	PE
Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	-	GY-PK	RD-BU	Shield
M23 connector:	1	2	3	4	5	6	7	8	9	10	11	12	PH

for output circuit 3, 4, 7 or 8 and type of connection 1, 2, 3 or 4 (2 control inputs, incremental track RS422 or SinCos)

Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	A	A inv	B	Binv	PE
Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	Shield
M23 connector:	1	2	3	4	5	6	7	8	9	10	11	12	PH

for output circuit 6 or 9 and type of connection 1, 2, 3 or 4 (SinCos or incremental track, sensor outputs for voltage)

Signal:	GND	+V	+C	-C	+D	-D	A	A inv	B	B inv	0 V sens	$+U_B$ sens	PE
Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	Shield
M23 connector:	1	2	3	4	5	6	7	8	9	10	11	12	PH

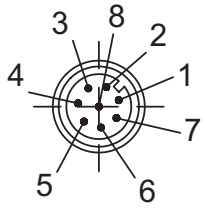
for output circuit 1 or 2 and type of connection 5 or 6 (2 control inputs)

Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	Shield/PE
M12 connector:	1	2	3	4	5	6	7	8	PH

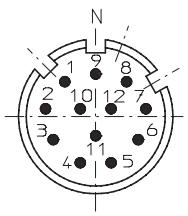
+V: Encoder Power Supply +V DC
GND: Encoder Power Supply Ground (0V)
+C, -C: Clock signal
+D, -D: Data signal
SET: Set input. The current position is set to zero
DIR: Direction input: If this input is active, the output values are counted backwards (decrease) when the shaft is turning clockwise.

Stat: Status output
PE: Protective earth
PH: Plug connector housing (shield)
A, Ainv: Sin output (incremental)
B, Binv: Cos output (incremental)

Top view of mating side, male contact base



M12 connector, 8-pin



M23 connector, 12-pin

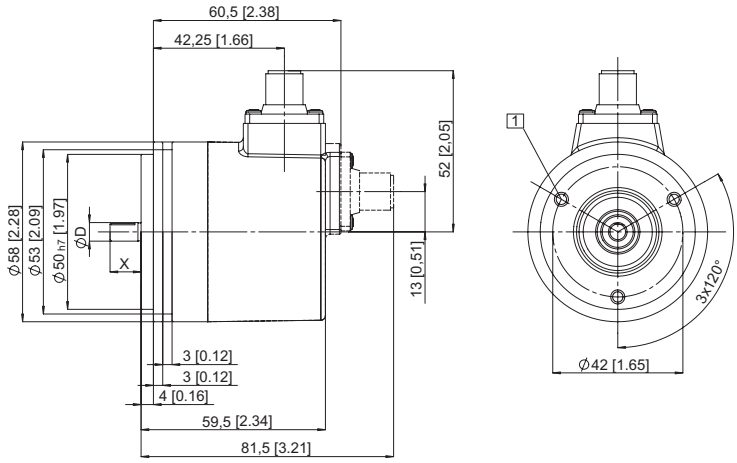
Standard, optical | **Sendix 5863 / 5883 (Shaft / Hollow shaft)** | **SSI / BiSS**

Dimensions shaft version

Synchro flange, ø 58 mm
M12, M23 connector, cable version
Flange type 2 and 4

(Drawing with M12 connector)

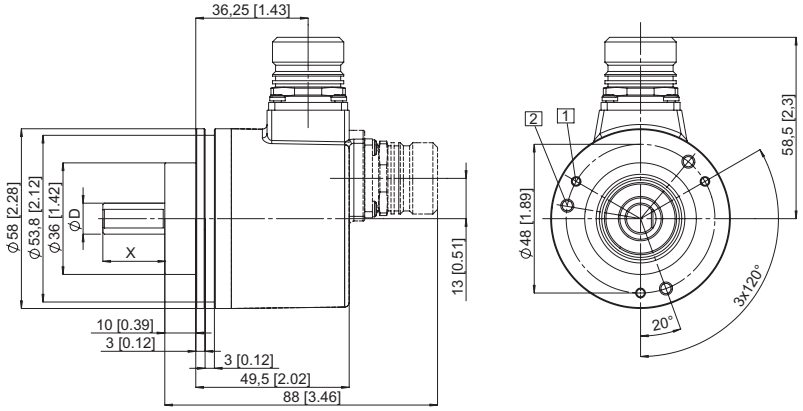
1 3 x M4, 6 [0.24] deep



Clamping flange, ø 58 mm
M12, M23 connector, cable version
Flange type 1 and 3

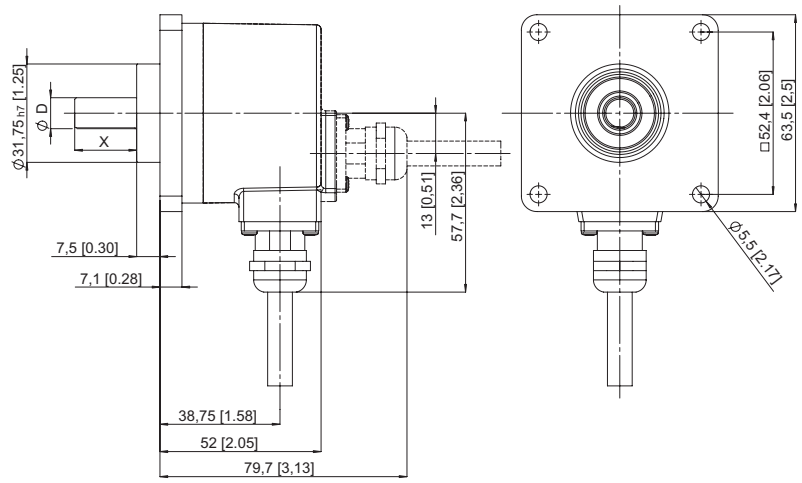
(Drawing with M23 connector)

1 3 x M3, 6 [0.24] deep
2 3 x M4, 8 [0.32] deep



Square flange, □ 63.5 mm
M12, M23 connector, cable version
Flange type 5 and 7

(Drawing with cable)



Standard, optical | **Sendix 5863 / 5883 (Shaft / Hollow shaft)** | **SSI / BiSS**

Dimensions hollow shaft version

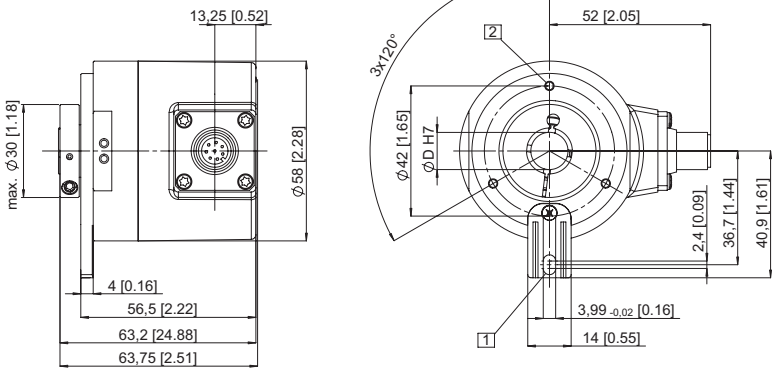
Flange with torque stop set, long, ø 58 mm
M12, M23 connector, cable version

Flange type 1 and 2

(Drawing with M12 connector)

1 Torque stop slot,
Recommendation: Cylindrical pin DIN7, ø 4 mm

2 3 x M3, 6 [0.24] deep



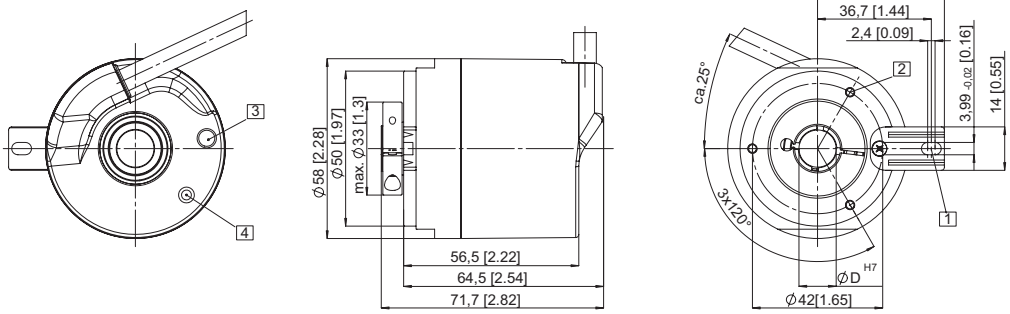
M12, M23 connector, cable version
tangential cable outlet

1 Torque stop slot,
Recommendation:
Cylindrical pin DIN7, ø 4 mm

2 M3, 5.5 [0.21] deep

3 Status LED

4 4 SET button

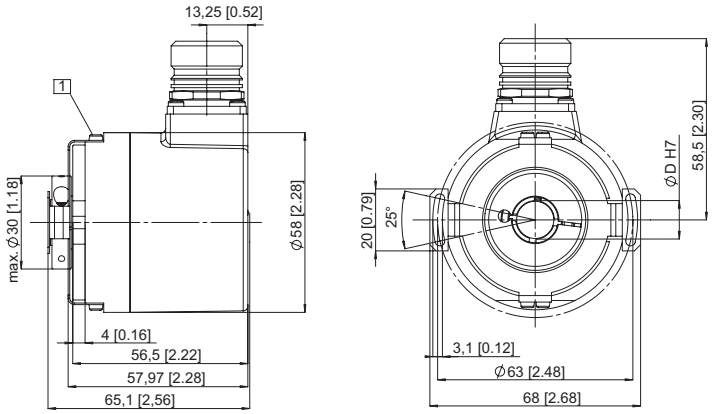


Flange with stator coupling, ø 58 mm
M12-, M23-connector, cable version

Flange type 5 and 6

Pitch circle diameter for fixing screws 63 mm
(Drawing with M23 connector)

1 Fixing screws DIN 912 M3 x 8
(Washer included in delivery)



Flange with stator coupling, ø 58 mm
Flange type 3 and 4

Pitch circle diameter for fixing screws 65 mm
(Drawing with cable)