

Абсолютные энкодеры угла поворота ACURO AC58/59/61

Технические характеристики

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Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
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TECHNICAL DATASHEET

Absolute Encoder AC 58 - Parallel



- Interface Parallel
- Gray or Binary code
- Compact design
- Aids for start up and operation: diagnostic LED, preset key with optical response (only with MT), status information
- Output Tristate short circuit-proof
- Encoder monitoring
- Wide temperature range of: -40°C ... +100°C
- Large number of variants available

ACURO®
industry



TECHNICAL DATA mechanical

Housing diameter	58 mm
Shaft diameter	Solid shaft: 6 mm / 8 mm / 9.52 mm (3/8 inch) Hub shaft: 9.52 mm (3/8 inch) / 10 mm / 12 mm Other sizes available upon request.
Mounting Flange	Synchro flange, Clamping flange, Tether flange, Square flange
Protection class shaft input (EN 60529)	IP64 or IP67
Protection class housing (EN 60529)	IP65 or IP67
Shaft load axial / radial	40 N / 60 N
Axial endplay of mating shaft (hub shaft only)	±1.5 mm
Radial runout of mating shaft (hub shaft only)	±0.2 mm
Max. speed	max. 10,000 rpm (continuous duty) max. 12,000 rpm (short term) (higher values available upon request)
Starting torque typ. ¹	≤ 0.01 Nm (lower values available upon request)
Moment of inertia	ca. 3,8 x 10 ⁻⁶ kgm ²
Vibration resistance (DIN EN 60068-2-6)	100 m/s ² (10 - 2000 Hz)
Shock resistance (DIN EN 60068-2-27)	1000 m/s ² (6 ms)
Operating temperature	-40 °C ... +100°C
Storage temperature	-40 °C ... +85 °C
Material shaft	Stainless Steel
Material housing	Aluminium
Weight	ca. 350 g (ST) / 400 g (MT)
Connection	Cable, axial or radial M23 connector (Conin), 17 pole, axial or radial Sub-D connector, 37 pole

¹ at 20 °C

TECHNICAL DATASHEET

Absolute Encoder AC 58 - Parallel

TECHNICAL DATA electrical

General design	As per DIN EN 61010-1, protection class III, contamination level 2, overvoltage class II
Supply voltage	DC 10 - 30 V On request: DC 5 V
Max. current w/o load	200 mA (ST), 300 mA (MT)
Resolution singleturn	10 - 14 Bit Gray Excess: 360, 720 increments
Resolution multiturn	12 Bit
Output code	Binary, Gray, Gray Excess
Linearity	$\pm \frac{1}{2}$ LSB
Output current	30 mA per Bit, short-circuit-proof
Control inputs	Latch, Direction, Tristate with ST, Tristate with MT
Alarm output	NPN-O.C., max. 5 mA
Status LED	Green = ok, Red = Alarm

Data output level

Supply voltage U_B	DC 5 V - 5 % +10 % ¹⁾	DC 10 - 30 V
Output level High	$\geq 3,5$ V (30 mA) $\geq 3,9$ V (10 mA)	$\geq U_B - 2,2$ V (30 mA) $\geq U_B - 1,8$ V (10 mA)
Output level Low	$\leq 1,6$ V (30 mA) $\leq 1,2$ V (10 mA)	$\leq 1,6$ V (30 mA) $\leq 1,2$ V (10 mA)
Rise time (1,5 m Cable)	$\leq 0,1$ μ s	$\leq 0,2$ μ s
Drop time (1,5 m Cable)	$\leq 0,05$ μ s	$\leq 0,1$ μ s

¹⁾ on request

Control inputs

Input	Level logical (physical)	Function
Direction	1 (+ U_B or open) 0 (0 V)	ascending code values when turning clockwise (cw) descending code values when turning clockwise (cw)
Latch	1 (+ U_B or open) 0 (0 V)	encoder data continuously changing at output encoder data stored and constant at output
Tristate (with singleturn)	1 (+ U_B or open) 0 (0 V)	outputs active outputs at high impedance (Tristate mode)
Tristate (with multiturn)	1 (+ U_B) 0 (0 V or open)	outputs at high impedance (Tristate mode) outputs active

Typical actuating delay time 10 μ s with push-pull selection; when selected via O.C., an external pull-down resistor (1 K Ω) is required

TECHNICAL DATASHEET

Absolute Encoder AC 58 - Parallel

ELECTRICAL CONNECTIONS

Singleturn, cable

Colour (PVC)	9 Bit / 360 incr.	10 Bit / 720 incr.	12 Bit	13 Bit	14 Bit
grey/pink	N.C.	N.C.	N.C.	N.C.	S0 (LSB)
brown/yellow	N.C.	N.C.	N.C.	S0 (LSB)	S1
brown/grey	N.C.	N.C.	S0 (LSB)	S1	S2
red/blue	N.C.	N.C.	S1	S2	S3
violet	N.C.	S0 (LSB)	S2	S3	S4
white/brown	S0 (LSB)	S1	S3	S4	S5
white/green	S1	S2	S4	S5	S6
white/yellow	S2	S3	S5	S6	S7
white/grey	S3	S4	S6	S7	S8
white/pink	S4	S5	S7	S8	S9
white/blue	S5	S6	S8	S9	S10
white/red	S6	S7	S9	S10	S11
white/black	S7	S8	S10	S11	S12
brown/green	S8 (MSB)	S9 (MSB)	S11 (MSB)	S12 (MSB)	S13 (MSB)
yellow	$\overline{\text{Tristate}} \text{ S0...S8}$	$\overline{\text{Tristate}} \text{ S0...S9}$	$\overline{\text{Tristate}} \text{ S0...S11}$	$\overline{\text{Tristate}} \text{ S0...S12}$	$\overline{\text{Tristate}} \text{ S0...S13}$
pink	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$
green	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$
black	0 V	0 V	0 V	0 V	0 V
red	DC 5 V / 10-30 V	DC 5 V / 10-30 V	DC 5 V / 10-30 V	DC 5 V / 10-30 V	DC 5 V / 10-30 V
brown	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$

ELECTRICAL CONNECTIONS

Singleturn, M23 connector (Conin),
17 pole

PIN	9 Bit / 360 incr.	10 Bit / 720 incr.	12 Bit	13 Bit	14 Bit
1	S0 (LSB)	S0 (LSB)	S0 (LSB)	S0 (LSB)	S0 (LSB)
2	S1	S1	S1	S1	S1
3	S2	S2	S2	S2	S2
4	S3	S3	S3	S3	S3
5	S4	S4	S4	S4	S4
6	S5	S5	S5	S5	S5
7	S6	S6	S6	S6	S6
8	S7	S7	S7	S7	S7
9	S8 (MSB)	S8	S8	S8	S8
10	N.C.	S9 (MSB)	S9	S9	S9
11	N.C.	N.C.	S10	S10	S10
12	$\overline{\text{Tristate}} \text{ S0...S8}$	$\overline{\text{Tristate}} \text{ S0...S9}$	S11 (MSB)	S11	S11
13	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$	S12 (MSB)	S12
14	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	S13 (MSB)
15	0 V	0 V	0 V	0 V	0 V
16	DC 5 V / 10-30 V	DC 5 V / 10-30 V	DC 5 V / 10-30 V	DC 5 V / 10-30 V	DC 5 V / 10-30 V
17	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Latch}} / \overline{\text{Alarm}}$	$\overline{\text{Latch}} / \overline{\text{Alarm}}$

TECHNICAL DATASHEET

Absolute Encoder AC 58 - Parallel

ANSCHLUSSBELEGUNG
Multiturn, Kabel

Cable (TPE)	10 cm cable with Sub-D connector, 37 pole		Kabel (TPE)	10 cm cable with Sub-D connector, 37 pole	
Colour	Pin	Connection	Colour	Pin	Connection
brown	2	S0	white/blue	14	M4 ¹⁾
green	21	S1	brown/blue	33	M5 ¹⁾
yellow	3	S2	white/red	15	M6 ¹⁾
grey	22	S3	brown/red	34	M7 ¹⁾
pink	4	S4	white/black	16	M8 ²⁾
violet	23	S5	brown/black	35	M9 ²⁾
grey/pink	5	S6	grey/green	17	M10 ²⁾
red/blue	24	S7	yellow/grey	38	M11 ²⁾
white/green	6	S8	pink/green	18	Alarm
brown/green	25	S9	yellow/pink	10	<u>Direction</u>
white/yellow	7	S10	green/blue	30	<u>Latch</u>
yellow/brown	26	S11	yellow/blue	12	<u>Tristate</u>
white/grey	8	M0	red (0.5mm ²)	13	DC 10-30 V
grey/brown	27	M1	white (0.5mm ²)	31	DC 10-30 V
white/pink	9	M2	blue (0.5mm ²)	1	0 V
pink/brown	28	M3	black (0.5mm ²)	20	0 V

¹⁾ N.C. with resolution 16 Bit (4 Bit MT)

²⁾ N.C. with resolution 16 Bit or 20 Bit (4 or 8 Bit MT)

TECHNICAL DATASHEET

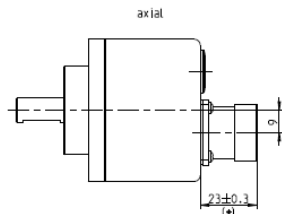
Absolute Encoder AC 58 - Parallel

DIMENSIONED DRAWINGS

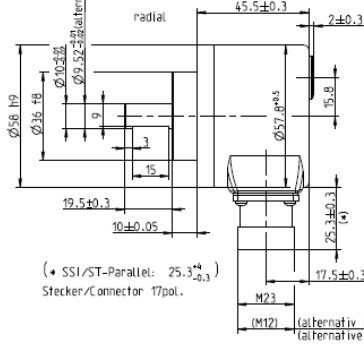
Clamping flange

Anschluss: M23-/Corin-Stecker / Connection: M23 connector

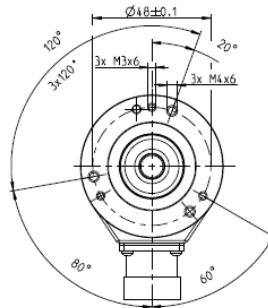
Schnittstelle/Interface:
BISS
SSI
ST-Parallel



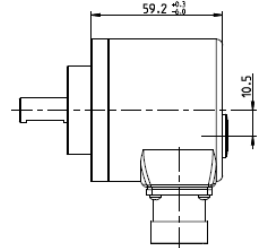
(• SSI/ST-Parallel: $23^{+4}_{-0.3}$)
Stecker/Connector 17pol.



(• SSI/ST-Parallel: $25.3^{+4}_{-0.3}$)
Stecker/Connector 17pol.

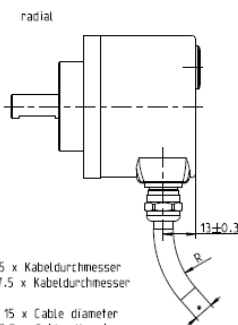
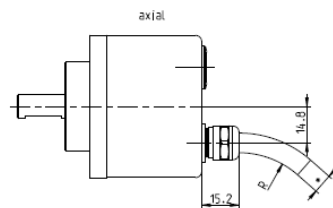


Schnittstelle/Interface:
Fieldbus/Fieldbus
SSI-P



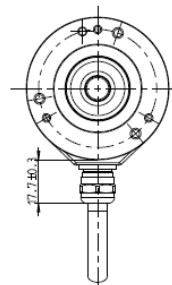
Anschluss: Kabel / Connection: cable

Schnittstelle/Interface:
BISS
SSI
ST-Parallel



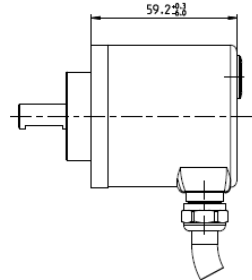
R bei bewegtem Einsatz => 15 x Kabeldurchmesser
R bei fester Veriegung => 7.5 x Kabeldurchmesser

R for alternating bending => 15 x Cable diameter
R for permanent bending => 7.5 x Cable diameter



• BISS/SSI/SSI-P: $\varnothing 7.1^{+1.2}_{-0.9}$
ST-P: $\varnothing 7.8^{+0.9}_{-0.3}$
MT-P: $\varnothing 9.3^{+1.3}_{-0.8}$
Fieldbus/Fieldbus: $\varnothing 7.1^{+1.2}_{-0.9}$

Schnittstelle/Interface:
MT-Parallel
Fieldbus/Fieldbus
SSHP



Flanschcode: "K" : Klemmflansch
Flange code: "K" : Clamping flange

Dimensions in mm

TECHNICAL DATASHEET

Absolute Encoder AC 58 - Parallel

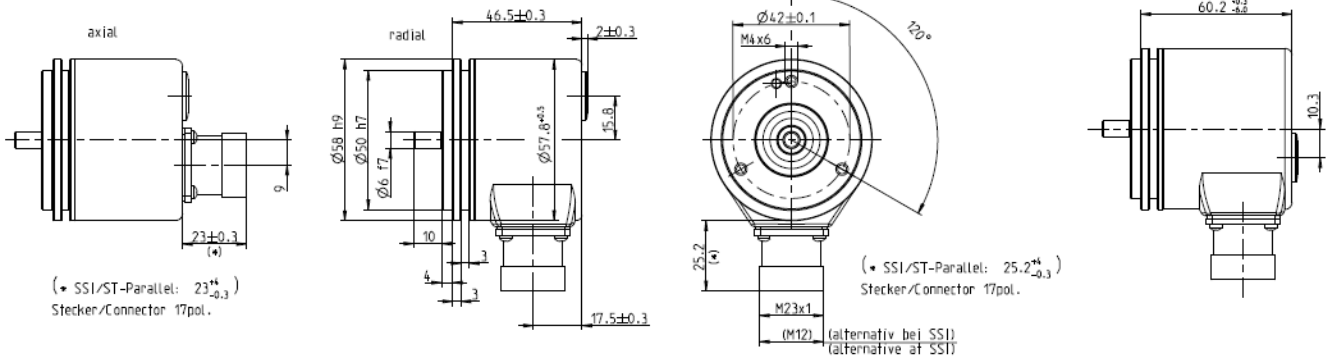
DIMENSIONED DRAWINGS (continued)

Synchro flange

Anschluss: M23-Connin-Stecker / Connection: M23 connector

Schnittstelle/Interface:
BISS
SSI
ST-Parallel

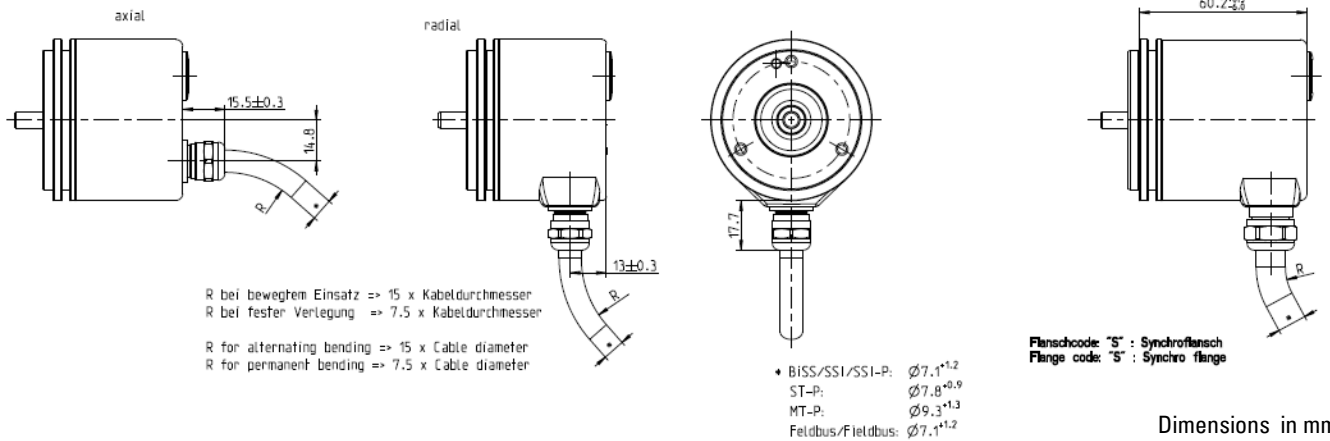
Schnittstelle/Interface:
Fieldbus/Fieldbus
SSI-P



Anschluss: Kabel / Connection: cable

Schnittstelle/Interface:
BISS
SSI
ST-Parallel

Schnittstelle/Interface:
MT-Parallel
Fieldbus/Fieldbus
SSI-P



TECHNICAL DATASHEET

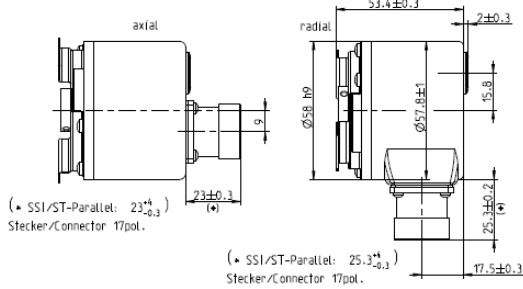
Absolute Encoder AC 58 - Parallel

DIMENSIONED DRAWINGS (continued)

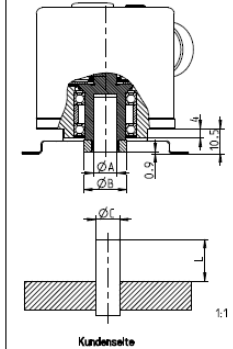
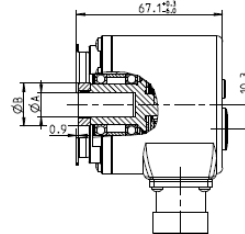
Hub shaft „F“

Anschluss: M23-Connit-Stecker / Connection: M23 connector

Schnittstelle/Interface:
BISS
SSI
ST-Parallel

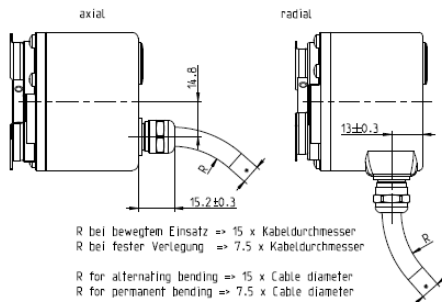


Schnittstelle/Interface:
Fieldbus/Fieldbus
SSI-P

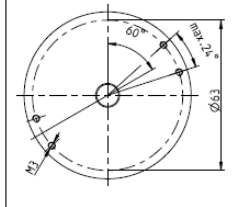
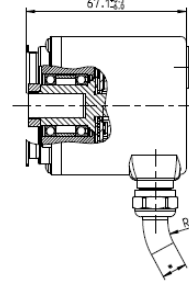


Schnittstelle/Interface:
BISS
SSI
ST-Parallel

Anschluss: Kabel / Connection: cable



Schnittstelle/Interface:
MT-Parallel
Fieldbus/Fieldbus
SSI-P



	Mass / dimension					Einh./unit
Hohlwellen-ØA/ hollow shaft-ØA	10 ^{+0.012} ₋₀	12 ^{+0.012} ₋₀	15 ^{+0.012} ₋₀	18 ^{+0.012} ₋₀	22 ^{+0.012} ₋₀	mm
Anschlusswellen-ØC/ connecting shaft-ØC	10p	12p	15p	18p	22p	mm
Klemmring-ØB/ clamping ring-ØB	18	20	22	24	26	mm
L min.	15	18	20	22	24	mm
L max.	20	22	24	26	28	mm
Wellen-Code / shaft code	"2"	"3"	"4"	"5"	"6"	mm

* BISS/SSI/SSI-P: Ø7.1^{+1.2}₋₀
ST-P: Ø7.8^{+0.9}₋₀
MT-P: Ø9.3^{+1.3}₋₀
Fieldbus/Fieldbus: Ø7.1^{+1.2}₋₀

L = Eintauchtiefe der Anschlusswelle in den Geber
L = Length of customers shaft inside of encoder

Flanschcode: "F" : Sack-Hohlwelle
Flange code: "F" : Hollow shaft

Dimensions in mm

TECHNICAL DATASHEET

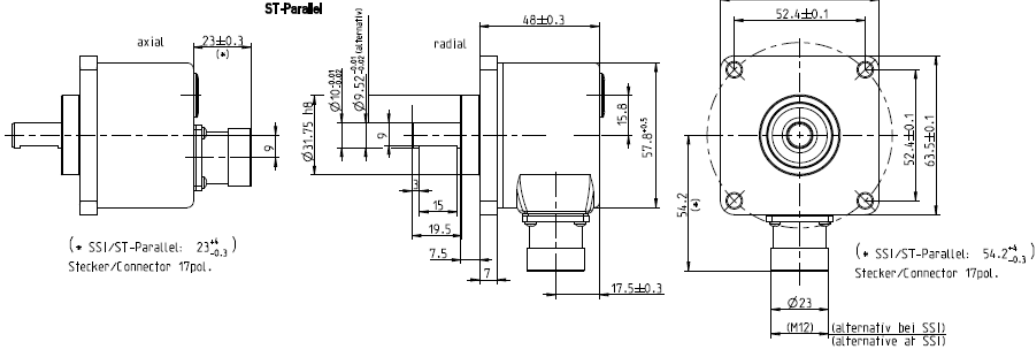
Absolute Encoder AC 58 - Parallel

DIMENSIONED DRAWINGS (continued)

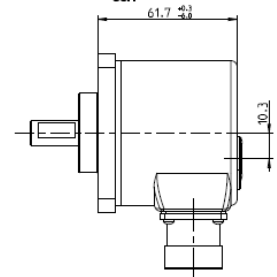
Square flange „Q“

Anschluss: M23-Connli-Stecker / Connection: M23 connector

Schnittstelle/Interface:
BISS
SSI
ST-Parallel

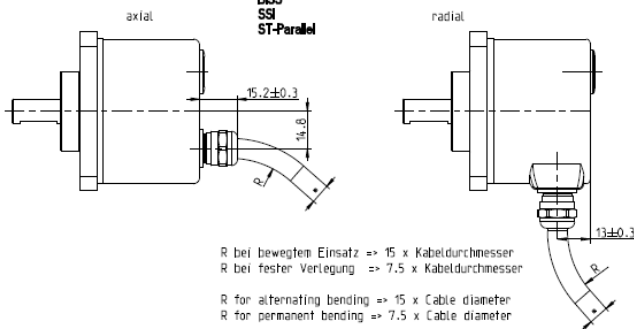


Schnittstelle/Interface:
Feldbus/Fieldbus
SSIP

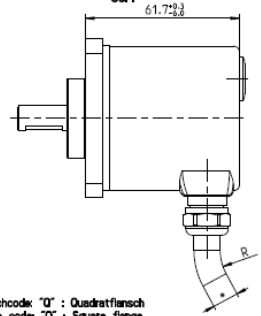


Anschluss: Kabel / Connection: cable

Schnittstelle/Interface:
BISS
SSI
ST-Parallel



Schnittstelle/Interface:
MT-Parallel
Feldbus/Fieldbus
SSIP



• BISS/SSI/SSIP: Ø7.1^{±1.2}
ST-P: Ø7.8^{±0.9}
MT-P: Ø9.3^{±1.3}
Feldbus/Fieldbus: Ø7.1^{±1.2}

Flanschcode: "Q" : Quadratflansch
Flange code: "Q" : Square flange

Dimensions in mm

TECHNICAL DATASHEET

Absolute Encoder AC 58 - Parallel

ORDERING INFORMATION Parallel

Type	Resolution ^{1,2}	Supply Voltage	Flange, Protection, Shaft ^{3,7,8}	Interface	Connection ^{4,5,6}
☐	☐	☐	☐	☐	☐
AC58	0010 10 Bit ST 0012 12 Bit ST 0013 13 Bit ST 0014 14 Bit ST 0360 360 Increments ST 0720 720 Increments ST 0412 4 Bit MT + 12 Bit ST 0812 8 Bit MT + 12 Bit ST 1212 12 Bit MT + 12 Bit ST	E DC 10 - 30 V	S.41 Synchro, IP65 ⁸ , 6 mm S.71 Synchro, IP67, 6 mm K.42 Klemm, IP65 ⁸ , 10 mm K.46 Clamping, IP65 ⁸ , 9,52 mm K.72 Clamping, IP67, 10 mm K.76 Clamping, IP67, 9,52 mm F.42 Spring tether, IP65 ¹ , hub shaft 10 mm, mounting with front clamping ring F.46 Spring tether, IP65 ¹ , hub shaft 9.52 mm, mounting with front clamping ring F.47 Spring tether, IP65 ¹ , hub shaft 12 mm, mounting with front clamping ring Q.42 Square, IP65 ¹ , 10 mm Q.46 Square, IP65 ¹ , 9.52 mm Q.72 Square, IP67, 10 mm Q.76 Square, IP67, 9.52 mm	PB Parallel Binary PG Parallel Gray	A Cable, axial B Cable, radial U M23 Connector (Conin), 17 pole, axial, ccw V M23 Connector (Conin), 17 pole, radial, ccw W M23 Connector (Conin), 17 pole, axial, cw Y M23 Connector (Conin), 17 pole, radial, cw A-A1-F 0,1 m cable with Sub-D connector, 37 pole axial B-B1-F 0,1 m cable with Sub-D connector, 37 pole radial

¹ Resolution 360 increments ST with Offset 76 (value range 76...435)

² Resolution 720 increments ST with Offset 152 (value range 152...871)

³ Protection class IP67 not available in combination with preset key and LED display

⁴ Connection code "A", "B" (cable): ST and MT

⁵ Connection code "U", "V", "W", "Y" (M23 connector): only ST

⁶ Connection code "A-A1-F" and "B-B1-F" (Sub-D connector): only MT

⁷ IP67 on cover with connector only if IP67 mating connector mounted properly

⁸ Protection class shaft input IP64 (according to EN 60529)

Preferably available versions are printed in bold type

ORDERING INFORMATION Selection of cable length

Versions with cable outlet (connection A, B, E or F) are available with various lengths of cable. To order your desired cable length, please add the respective code to the end of your ordering code. For variants with connector on cable end please add cable length code in between. Further cable lengths on request.

Code	Cable length
without Code	1.5 m
-D0	3 m
-F0	5 m
-K0	10 m
-P0	15 m
-U0	20 m
-V0	25 m

Example:

Cable 3 m length: ... B - D0

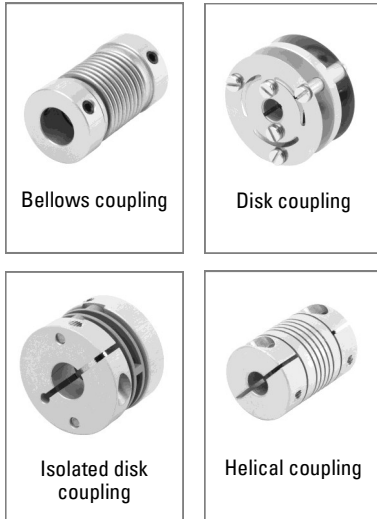
Cable 3 m length and M23 connector, cw: ... B - D0 - I

TECHNICAL DATASHEET

Absolute Encoder AC 58 - Parallel

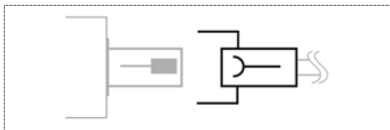
Accessories

FLEXIBLE COUPLINGS

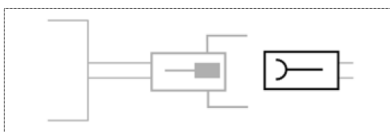


MOUNTING

CONNECTORS



CONNECTORS



	Hub diameter d1/d2	Ordering code
Bellows coupling	6 mm / 6 mm	3 520 068
Bellows coupling	8 mm / 10 mm	3 520 077
Bellows coupling	10 mm / 10 mm	3 520 037
Disk coupling	6 mm / 6 mm	0 070 663
Isolated disk coupling	6 mm / 6 mm	3 520 081
Isolated disk coupling	6 mm / 10 mm	3 520 082
Isolated disk coupling	10 mm / 10 mm	3 520 088
Helical coupling 19/28	5 mm / 6 mm	3 520 035
Helical coupling 19/28	6 mm / 6 mm	0 070 653
Helical coupling 25/32	6 mm / 9.53 mm	3 520 052
Helical coupling 25/32	6 mm / 10 mm	3 520 066
Helical coupling 25/32	10 mm / 10 mm	3 520 074
Helical coupling 25/32	10 mm / 12 mm	3 520 065

	Ordering code
Clamping eccentric, for M4 (set of three)	1 522 300
Right angle mounting bracket (plastic), for clamping flange RI 58, AC 58 (fastening material included)	1 522 329
Tether for hub shaft versions	1 531 188
Mounting bell (plastic), for synchro flange RI 58, AC 58 (clamping eccentric and fastening material included)	1 522 330
Square flange adapter 58 x 58 mm, for clamping flange RI 58, AC 58 (fastening material included)	1 522 326
Square flange adapter 80 x 80 mm, for clamping flange RI 58, AC 58 (fastening material included)	1 522 327
Synchro flange adapter , for clamping flange RI 58, AC 58 (fastening material included)	1 522 328
Clamping eccentric for synchro flange, d6,5 for M3 (set of three)	0 070 655

Connector (socket) matching with encoder connector	Ordering code
M23 (Conin), 17 pole, PG9, ccw, mating connector for connection U/V Singleturn	3 539 256
M23 (Conin), 17 pole, PG9, cw, mating connector for connection W/Y Singleturn	3 539 254

Coupling (socket) matching with encoder cable with connector	Ordering code
SUB-D, 37 pole, mating connector for connection -F (cable plug 1 542 045) Multiturn	1 542 024

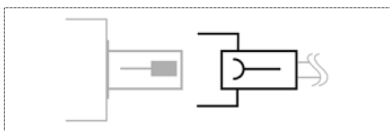
TECHNICAL DATASHEET

Absolute Encoder AC 58 - Parallel Accessories

CONNECTING CABLES

Connecting cables with plug (socket) on one end	Ordering code
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), cw, mating connector for connection W/Y, 3 m	1 540 100
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), cw, mating connector for connection W/Y, 5 m	1 540 101
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), cw, mating connector for connection W/Y, 10 m	1 540 102
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), cw, mating connector for connection W/Y, 15 m	1 540 142
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), cw, mating connector for connection W/Y, 20 m	1 540 143
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), cw, mating connector for connection W/Y, 25 m	1 540 144
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), cw, mating connector for connection W/Y, 30 m	1 540 145
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), cw, mating connector for connection W/Y, 40 m	1 540 205
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), cw, mating connector for connection W/Y, 50 m	1 540 206
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), ccw, mating connector for connection U/V, 3 m	1 540 097
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), ccw, mating connector for connection U/V, 5 m	1 540 098
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), ccw, mating connector for connection U/V, 10 m	1 540 099
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), ccw, mating connector for connection U/V, 15 m	1 540 138
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), ccw, mating connector for connection U/V, 20 m	1 540 139
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), ccw, mating connector for connection U/V, 25 m	1 540 140
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), ccw, mating connector for connection U/V, 30 m	1 540 141
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), ccw, mating connector for connection U/V, 40 m	1 540 207
M23 (Conin), 17 pole, PVC cable (Singleturn 12 Bit assignment!), ccw, mating connector for connection U/V, 50 m	1 540 208
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 1 m	1 542 163
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 3 m	1 542 020
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 5 m	1 542 021
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 10 m	1 542 022
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 15 m	1 542 172
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 20 m	1 542 173
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 25 m	1 542 174
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 30 m	1 542 175
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 40 m	1 542 176
SUB-D, 37 pole, TPE cable, mating connector for connection -F (cable plug), 50 m	1 542 177

CONNECTING CABLE



Cable not made up with connectors	Ordering code
PVC cable, 20-core + screen	3 280 100 + length
TPE cable, 32-core + screen	3 280 221 + length

TECHNICAL DATASHEET

Stainless Steel Encoders AC 59 / 61 - Parallel



Version AC 59 with cable outlet



Version AC 61 with bus cover

- Compact design
- Protection class IP67
- High corrosion resistance
- Robust design
- Resolution up to 26 Bit (14 Bit ST, 12 Bit MT)
- Gray or Binary code
- Encoder monitoring
- Output Tristate short circuit-proof
- Applications: packaging machine for food and beverage, ship equipment (e.g. cranes, winches, cable laying ships), offshore applications



GENERAL INFORMATION

The absolute stainless steel encoders with parallel interface are available in the Versions AC 59 and AC 61.

- AC 59: drawn stainless steel housing, only together with Singleturn
- AC 61: machined housing

TECHNICAL DATA mechanical

Housing diameter	AC 59: 58 mm AC 61: 61.5 mm
Shaft diameter	9.52 mm / 10 mm (Solid shaft)
Flange (Mounting of housing)	Square flange 63.5 mm
Protection class shaft input (EN 60529)	IP67
Protection class housing (EN 60529)	IP67
Shaft load axial / radial	40 N / 60 N
Max. speed	max. 6000 rpm (continuous), max. 10 000 rpm (short term)
Torque	≤ 1 Ncm
Moment of inertia	approx. 20 gcm ²
Vibration resistance (DIN EN 60068-2-6)	100 m/s ² (10 ... 500 Hz)
Shock resistance (DIN EN 60068-2-27)	1000 m/s ² (6 ms)
Operating temperature	-40 °C ... +100 °C
Storage temperature	-40 °C ... +85 °C
Material shaft	Stainless Steel
Material housing	Stainless Steel
Weight	AC 59: approx. 700 g with 1.5 m cable AC 61: approx. 980 g with 1.5 m cable

TECHNICAL DATASHEET

Stainless Steel Encoders AC 59 / 61 - Parallel

TECHNICAL DATA mechanical (continued)

TECHNICAL DATA electrical

Connection	Cable, axial or radial
Supply voltage	DC 10-30 V On request: DC 5 V
Max. current w/o load	200 mA (ST), 300 mA (MT)
Resolution singleturn	10 - 14 Bit Gray Excess: 360, 720 increments
Resolution multiturn	12 Bit
Output code	Binary, Gray, Gray Excess
Linearity	$\pm \frac{1}{2}$ LSB
Output current	30 mA per Bit, short-circuit-proof
Control inputs	$\overline{\text{Latch}}$, $\overline{\text{Direction}}$, $\overline{\text{Tristate}}$ with ST, $\overline{\text{Tristate}}$ with MT
Alarm output	NPN-O.C., max. 5 mA
Status LED	Green = ok, red = alarm

Note: preset key only with MT (IP64), preset value = 0

Data output level

Supply voltage U_B	DC 5 V - 5 % +10 % ¹	DC 10 - 30 V
Output level High	≥ 3.5 V (30 mA) ≥ 3.9 V (10 mA)	$\geq U_B - 2.2$ V (30 mA) $\geq U_B - 1.8$ V (10 mA)
Output level Low	≤ 1.6 V (30 mA) ≤ 1.2 V (10 mA)	≤ 1.6 V (30 mA) ≤ 1.2 V (10 mA)
Rise time (1.5 m Cable)	≤ 0.1 μ s	≤ 0.2 μ s
Drop time (1.5 m Cable)	≤ 0.05 μ s	≤ 0.1 μ s

¹ on request

Control inputs

Input	Level logical (physical)	Function
$\overline{\text{Direction}}$	1 (+ U_B or open) 0 (0 V)	ascending code values when turning clockwise (cw) descending code values when turning clockwise (cw)
$\overline{\text{Latch}}$	1 (+ U_B or open) 0 (0 V)	encoder data continuously changing at output encoder data stored and constant at output
$\overline{\text{Tristate}}$ (with singleturn)	1 (+ U_B or open) 0 (0 V)	outputs active outputs at high impedance (Tristate mode)
Tristate (with multiturn)	1 (+ U_B) 0 (0 V or open)	outputs at high impedance (Tristate mode) outputs active

Typical actuating delay time 10 μ s with push-pull selection; when selected via O.C., an external pull-down resistor (1 K Ω) is required

TECHNICAL DATASHEET

Stainless Steel Encoders AC 59 / 61 - Parallel

ELECTRICAL CONNECTIONS

Singleturn, cable

Colour (PVC)	9 Bit / 360 incr.	10 Bit / 720 incr.	12 Bit	13 Bit	14 Bit
grey/pink	N.C.	N.C.	N.C.	N.C.	S0 (LSB)
brown/yellow	N.C.	N.C.	N.C.	S0 (LSB)	S1
brown/grey	N.C.	N.C.	S0 (LSB)	S1	S2
red/blue	N.C.	N.C.	S1	S2	S3
violet	N.C.	S0 (LSB)	S2	S3	S4
white/brown	S0 (LSB)	S1	S3	S4	S5
white/green	S1	S2	S4	S5	S6
white/yellow	S2	S3	S5	S6	S7
white/grey	S3	S4	S6	S7	S8
white/pink	S4	S5	S7	S8	S9
white/blue	S5	S6	S8	S9	S10
white/red	S6	S7	S9	S10	S11
white/black	S7	S8	S10	S11	S12
brown/green	S8 (MSB)	S9 (MSB)	S11 (MSB)	S12 (MSB)	S13 (MSB)
yellow	$\overline{\text{Tristate S0...S8}}$	$\overline{\text{Tristate S0...S9}}$	$\overline{\text{Tristate S0...S11}}$	$\overline{\text{Tristate S0...S12}}$	$\overline{\text{Tristate S0...S13}}$
pink	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$	$\overline{\text{Latch}}$
green	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$
black	0 V	0 V	0 V	0 V	0 V
red	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V	DC 5 V/ 10-30 V
brown	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$

TECHNICAL DATASHEET

Stainless Steel Encoders AC 59 / 61 - Parallel

ELECTRICAL CONNECTIONS

Multiturn, cable (only AC 61 - Parallel)

Cable (TPE)			Cable (TPE)		
10 cm cable with Sub-D connector, 37 pole			10 cm cable with Sub-D connector, 37 pole		
Colour	Pin	Connection	Colour	Pin	Connection
brown	2	S0	white/blue	14	M4 ¹
green	21	S1	brown/blue	33	M5 ¹
yellow	3	S2	white/red	15	M6 ¹
grey	22	S3	brown/red	34	M7 ¹
pink	4	S4	white/black	16	M8 ²
violet	23	S5	brown/black	35	M9 ²
grey/pink	5	S6	grey/green	17	M10 ²
red/blue	24	S7	yellow/grey	36	M11 ²
white/green	6	S8	pink/green	18	Alarm
brown/green	25	S9	yellow/pink	10	Direction
white/yellow	7	S10	green/blue	30	Latch
yellow/brown	26	S11	yellow/blue	12	Tristate
white/grey	8	M0	red (0.5mm ²)	13	DC 10-30 V
grey/brown	27	M1	white (0.5mm ²)	31	DC 10-30 V
white/pink	9	M2	blue (0.5mm ²)	1	0 V
pink/brown	28	M3	black (0.5mm ²)	20	0 V

¹ N. C. with resolution 16 Bit (4 Bit MT)

² N. C. with resolution 16 Bit or 20 Bit (4 or 8 Bit MT)

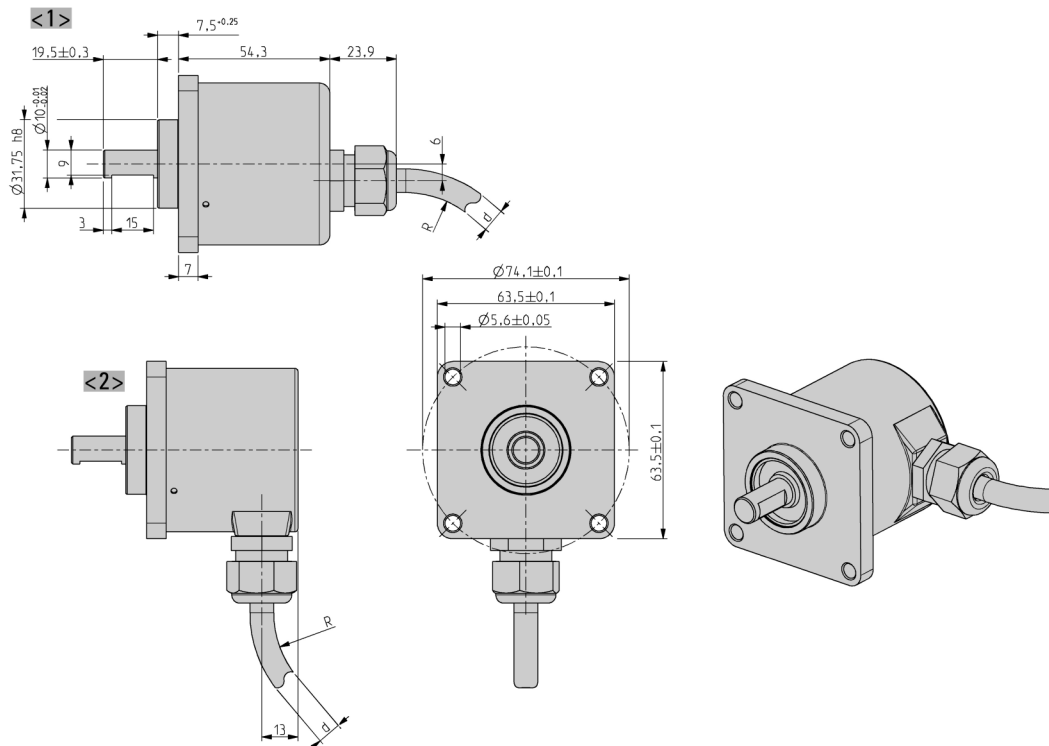
TECHNICAL DATASHEET

Stainless Steel Encoders AC 59 / 61 - Parallel

DIMENSIONED DRAWINGS

AC 59 Connection cable "A" / "B"

Dimensions in mm



<1> Connection cable "A"

<2> Connection cable "B"

Cable bending radius R for flexible installation $\geq 15 \times$ cable diameter

Cable bending radius R for fixed installation $\geq 7.5 \times$ cable diameter

Cable Ø d BiSS/SSI/SSI-P: $7.1^{+1.2}$

Cable Ø d ST-P: $7.8^{+0.9}$

TECHNICAL DATASHEET

Stainless Steel Encoders AC 59 / 61 - Parallel

ORDERING INFORMATION

Type	Resolution ^{1, 2, 3}	Supply voltage	Flange, Protection, Shaft	Interface	Connection
☐		☐	☐	☐	☐
AC59 AC61	0010 10 Bit ST 0012 12 Bit ST 0013 13 Bit ST 0014 14 Bit ST 0017 17 Bit ST 0360 360 increments ST 0720 720 increments ST 0412 4 Bit MT + 12 Bit ST (AC 61) 0812 8 Bit MT + 12 Bit ST (AC 61) 1212 12 Bit MT + 12 Bit ST (AC 61)	A DC 5 V E DC 10 - 30 V	Q.76 Square, IP67, 9.52 mm Q.72 Square, IP67, 10 mm	PB Parallel binary PG Parallel Gray	A Cable, axial B Cable, radial

¹ Resolution 360 increments ST with Offset 76 (value range 76...435)

² Resolution 720 increments ST with Offset 152 (value range 152...871)

³ AC59 only with ST (only AC 59)

ORDERING INFORMATION

Selection of cable length

Versions with cable outlet (connection A, B, E or F) are available with various lengths of cable. To order your desired cable length, please add the respective code to the end of your ordering code. Further cable lengths on request.

Code	Cable length
without code	1.5 m
-D0	3 m
-F0	5 m
-K0	10 m
-P0	15 m
-U0	20 m
-V0	25 m

TECHNICAL DATASHEET

Stainless Steel Encoders AC 59 / 61 - Parallel Accessories

FLEXIBLE COUPLINGS



Bellows coupling

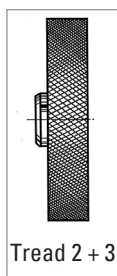


Helical coupling

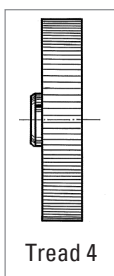


Isolated disk coupling

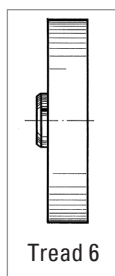
MEASURING WHEELS



Tread 2 + 3



Tread 4



Tread 6

		Ordering code
Bellows coupling	10 mm / 10 mm	3 520 037
Bellows coupling	8 mm / 10 mm	3 520 077
Helical coupling 25/32	6 mm / 10 mm	3 520 066
Helical coupling 25/32	10 mm / 12 mm	3 520 065
Helical coupling 25/32	10 mm / 10 mm	3 520 074
Isolated disk coupling	6 mm / 10 mm	3 520 082
Isolated disk coupling	10 mm / 10 mm	3 520 088

Tread 2 B

with glued-on rubber profile B = low-wear rubber surface with good grip (white)
Applications such as paper and cardboard, measuring cables, nongreasy metals, fleece, undressed or surface-treated wood, soft and hard plastics

Tread 3

vulcanized rubber surface with parallel knurl
Applications such as rubber, leather, fabrics, flooring and glass

Tread 4

Aluminum with parallel knurl
Applications such as rubber, soft plastics, wood with rough surface, and to a limited extent for fabrics

Tread 6

plastic surface
Applications such as wire, greasy metals and steel sections

Material	Bore diameter (mm) fitting to encoder shaft	Circumference	Tread	Width of bearing surface	Ordering code
Aluminum	10 mm	0.2 m	2 B	12 mm	0 601 049
Aluminum	10 mm	0.5 m	2 B	25 mm	0 601 151
Aluminum	10 mm	0.5 m	3	25 mm	0 601 156
Aluminum	12 mm	0.5 m	3	25 mm	0 601 159
Aluminum	10 mm	0.5 m	6	25 mm	0 601 163
Aluminum	10 mm	0.5 yd	4	25 mm	0 601 157

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