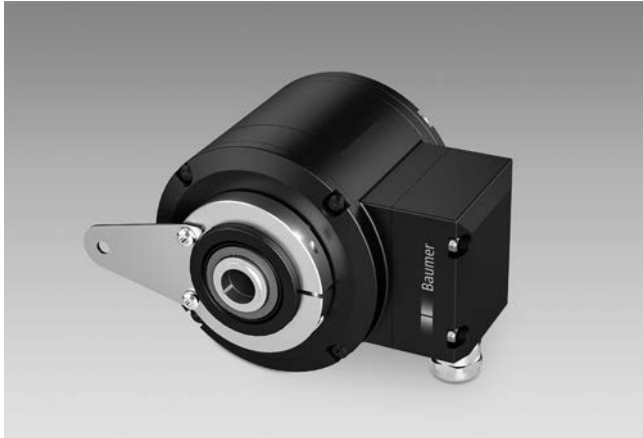# Absolute encoders - bus interfaces
Blind hollow shaft or cone shaft (1:10)
Profibus-DPV0 or DPV2 / 13 bit ST / 16 bit MT / Speed switch

HMG10-B - Profibus DP

HMG10-B - picture similar

Features

– **Magnetic sensing method**
– **Function display via LEDs**
– **Multiturn sensing with Energy Harvesting technology, without gear or battery**
– **Two-sided bearing system with hybrid bearings**
– **Special protection against corrosion C5-M**

Optional

– **Integrated speed switch**
– **Additional output incremental with zero pulse**

Technical data - electrical ratings

Voltage supply	10...30 VDC
Short-circuit proof	Yes
Consumption w/o load	≤200 mA
Initializing time	≤500 ms after power on
Interface	Profibus-DPV0/V2
Function	Multiturn
Transmission rate	9.6...12000 kBaud
Device adress	Rotary switches in bus connecting box
Steps per revolution	8192 / 13 bit
Number of revolutions	65536 / 16 bit
Additional outputs	Square-wave TTL/HTL,TTL/RS422
Sensing method	Magnetic
Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3
Programmable parameters	Steps per revolution Number of revolutions Preset, scaling, rotating direction
Diagnostic function	Position or parameter error
Status indicator	DUO-LED (bus connecting box) 4 LEDs in device back side
Approvals	CE, UL approval / E256710

Technical data - electrical ratings (speed switches)

Switching accuracy	±2 % (or 1 Digit)
Switching outputs	1 output (Open collector, solid state relay on request)
Output switching capacity	30 VDC; ≤100 mA
Switching delay time	≤20 ms

Technical data - mechanical design

Size (flange)	ø105 mm
Shaft type	ø16...20 mm (blind hollow shaft) ø17 mm (cone shaft 1:10)
Flange	Support plate, 360° freely positionable
Protection DIN EN 60529	IP 66/IP 67
Operating speed	≤6000 rpm
Range of switching speed	ns (off) = ±2...6000 rpm, factory setting 6000 rpm
Operating torque typ.	10 Ncm
Rotor moment of inertia	950 gcm²
Admitted shaft load	≤450 N axial ≤650 N radial
Materials	Housing: aluminium alloy Shaft: stainless steel
Corrosion protection	IEC 60068-2-52 Salt mist for ambient conditions C5-M (CX) according to ISO 12944-2
Operating temperature	-40...+85 °C
Relative humidity	95 % non-condensing
Resistance	IEC 60068-2-6 Vibration 30 g, 10-2000 Hz IEC 60068-2-27 Shock 400 g, 1 ms
Weight approx.	2.2 kg (depending on version)
Connection	Bus connecting box Terminal box incremental

Absolute encoders - bus interfaces
Blind hollow shaft or cone shaft (1:10)
Profibus-DPV0 or DPV2 / 13 bit ST / 16 bit MT / Speed switch

HMG10-B - Profibus DP

Part number

HMG10 | -B H | . | | | .3 | 00 | .A

Additional output*
0 Without
5 1024 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated
6 1024 ppr TTL/RS422, 6 channels
See also table "Additional output*"

Resolution multiturn
0 Without
6 16 bit

Voltage supply / interface
P0 10…30 VDC, Profibus-DPV0
P2 10…30 VDC, Profibus-DPV2

Connection
5 1x bus connecting box with 3 cable glands M16, radial
3 1x bus connecting box with 3 connectors M12, radial
F 1x bus connecting box with 3 cable glands M16, radial + 1x terminal box with 1 cable gland M20, radial
G 1x bus connecting box with 3 connectors M12, radial + 1x terminal box with 1 cable gland M20, radial

Shaft diameter
6 ø16 mm, central screw
7 ø17 mm cone 1:10, central screw
Z ø20 mm, central screw

Protection
D IP 66 and IP 67, optimized for dusty environments
L IP 66 and IP 67, optimized for oily and wet environments

Flange
H Support for torque arm, shaft insulation hybrid bearing

Speed switch*
Without
D With speed switch *)**)
(Standard: Open collector, solid state relay on request)

* Only for connection with 1x bus connecting + 1x terminal box (F or G)
** Please specify the exact switching speed in addition to the part number (factory setting).

Absolute encoders - bus interfaces
Blind hollow shaft or cone shaft (1:10)
Profibus-DPV0 or DPV2 / 13 bit ST / 16 bit MT / Speed switch

HMG10-B - Profibus DP

Part number - tables

Additional output*

  0 (Without)

  Q (8192 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)

  P (8192 ppr TTL/RS422, 6 channels)

  G (5000 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)

  H (5000 ppr TTL/RS422, 6 channels)

  K (4096 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)

  J (4096 ppr TTL/RS422, 6 channels)

  7 (3072 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)

  8 (3072 ppr TTL/RS422, 6 channels)

  9 (2048 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)

  4 (2048 ppr TTL/RS422, 6 channels)

  5 (1024 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)

  6 (1024 ppr TTL/RS422, 6 channels)

  1 (512 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)

  2 (512 ppr TTL/RS422, 6 channels)

Accessories

Mounting accessories

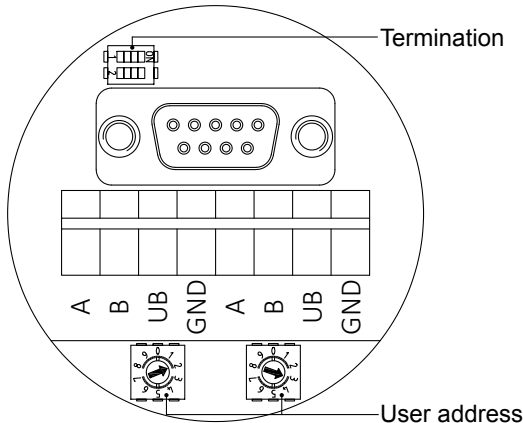|	
11043628	Torque arm M6, length 67-70 mm
11004078	Torque arm M6, length 120-130 mm (shortenable ≥71 mm)
11002915	Torque arm M6, length 425-460 mm (shortenable ≥131 mm)
11054917	Torque arm M6 insulated, length 67-70 mm
11072795	Torque arm M6 insulated, length 120-130 mm (shortenable ≥71 mm)
11082677	Torque arm M6 insulated, length 425-460 mm (shortenable ≥131 mm)
11077197	Mounting kit for torque arm size M6 and earthing strap
11077087	Mounting and dismounting set

Absolute encoders - bus interfaces
Blind hollow shaft or cone shaft (1:10)
Profibus-DPV0 or DPV2 / 13 bit ST / 16 bit MT / Speed switch
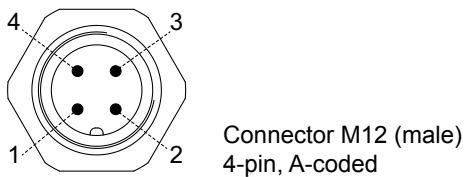
HMG10-B - Profibus DP

Profibus-DP V0 - Terminal assignment
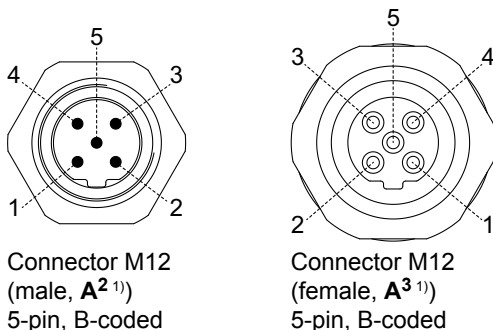
View A [1] - View inside bus connecting box

Termination

User address

View A1 [1] - View into connector „Voltage supply"

male	Connection	Description
1	UB	Voltage supply 10...30 VDC
3	GND	Ground connection for UB

Connector M12 (male)
4-pin, A-coded

View A2 [1] **and A3** [1] - View into connector „Data transmission"

male / female	Connection	Description
2	A	Negative serial data transmission
4	B	Positive serial data transmission

Connector M12
(male, **A2** [1])
5-pin, B-coded

Connector M12
(female, **A3** [1])
5-pin, B-coded

Terminals of the same significance are internally connected and identical in their functions. Max. load on the internal terminal connections UB-UB and GND-GND is 1 A each.

Profibus-DP V0 - Features

Bus protocol	Profibus-DP V0
Profibus-Features	Device Class 1 and 2
Data Exch. functions	Input: Position value Output: Preset value
Preset value	The „Preset" parameter can be used to set the encoder to a pre-defined value that corresponds to a specific axis position of the system.
Parameter functions	Rotating direction: The relationship between the rotating direction and rising or falling output code values can be set in the operating parameter. Scaling: The parameter values set the number of steps per turn and the overall resolution.
Diagnostic	The encoder supports the following error messages: - Position error
Factory setting	User address 00

Profibus-DP V0 - Termination

both ON = final user
both OFF = user xx
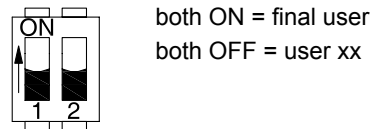
Profibus-DP V0 - User address
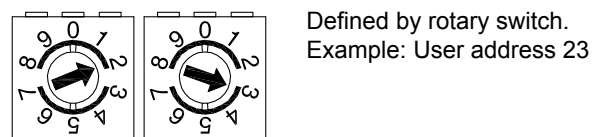
Defined by rotary switch.
Example: User address 23

[1] See dimensions
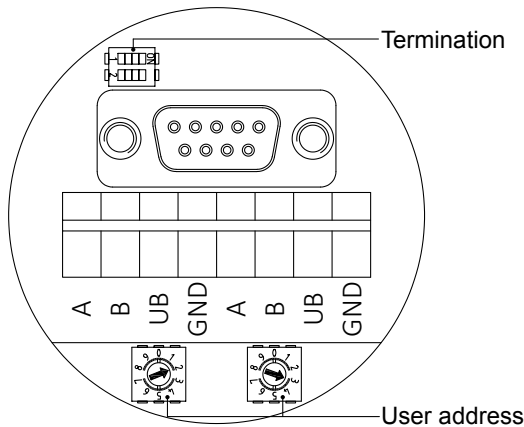
Absolute encoders - bus interfaces
Blind hollow shaft or cone shaft (1:10)
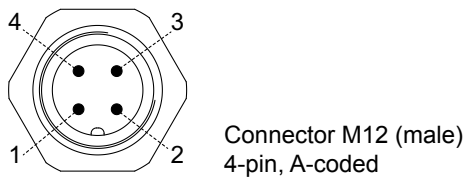## Profibus-DPV0 or DPV2 / 13 bit ST / 16 bit MT / Speed switch

HMG10-B - Profibus DP

Profibus-DP V2 - Terminal assignment
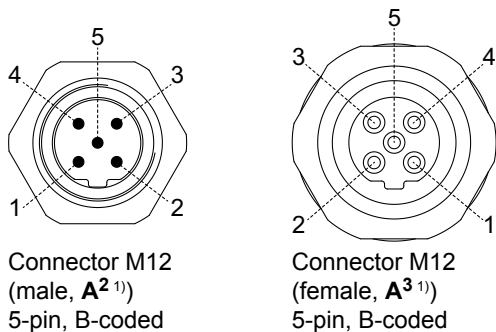
View A [1] - View inside bus connecting box

Profibus-DP V2 - Features

Bus protocol	Profibus-DP V2
Profibus-Features	Device Class 3 and 4
Data Exch. functions	Input: Position value Output: Preset value
Preset value	The „Preset" parameter can be used to set the encoder to a pre-defined value that corresponds to a specific axis position of the system.
Parameter functions	Rotating direction: The relationship between the rotating direction and rising or falling output code values can be set in the operating parameter. Scaling: The parameter values set the number of steps per turn and the overall resolution.
Diagnostic	The encoder supports the following error messages: - Position error
Factory setting	User address 00

View A¹ [1] - View into connector „Voltage supply"

male	Connection	Description
1	UB	Voltage supply 10...30 VDC
3	GND	Ground connection for UB

Connector M12 (male)
4-pin, A-coded

View A² [1] **and A³** [1] - View into connector „Data transmission"

male / female	Connection	Description
2	A	Negative serial data transmission
4	B	Positive serial data transmission

Connector M12 (male, **A²** [1])
5-pin, B-coded

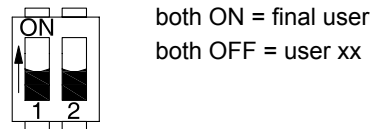Connector M12 (female, **A³** [1])
5-pin, B-coded

Terminals of the same significance are internally connected and identical in their functions. Max. load on the internal terminal connections UB-UB and GND-GND is 1 A each.
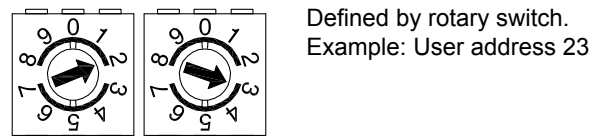
Profibus-DP V2 - Termination

both ON = final user
both OFF = user xx

Profibus-DP V2 - User address

Defined by rotary switch.
Example: User address 23

[1] See dimensions

Absolute encoders - bus interfaces
Blind hollow shaft or cone shaft (1:10)
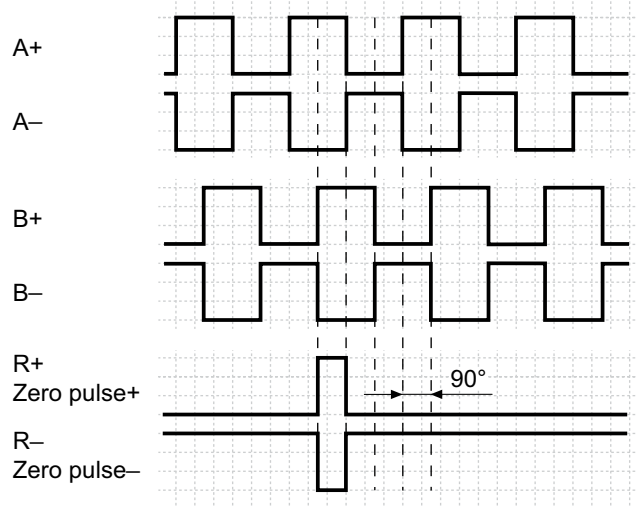### Profibus-DPV0 or DPV2 / 13 bit ST / 16 bit MT / Speed switch

HMG10-B - Profibus DP

Speed switch / additional output incremental - Terminal significance

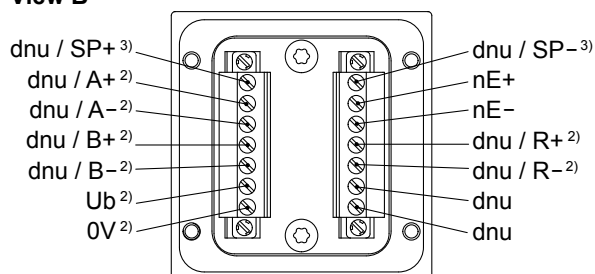| Ub [2]	Voltage supply
0V [2]	Ground
A+ [2]	Output signal channel 1
A− [2]	Output signal channel 1 inverted
B+ [2]	Output signal channel 2 (offset by 90° to channel 1)
B− [2]	Output signal channel 2 inverted
R+ [2]	Zero pulse (reference signal)
R− [2]	Zero pulse inverted
nE+	System OK+ / error output
nE−	System OK− / error output inverted
SP+ [3]	DSL_OUT1 / speed switch (Open collector, solid state relay on request)
SP− [3]	DSL_OUT2 / speed switch (0V, solid state relay on request)
dnu	Do not use

Speed switch / additional output incremental - Terminal assignment terminal box

View B [1]

dnu / SP+ [3]
dnu / A+ [2]
dnu / A− [2]
dnu / B+ [2]
dnu / B− [2]
Ub [2]
0V [2]

dnu / SP− [3]
nE+
nE−
dnu / R+ [2]
dnu / R− [2]
dnu
dnu

Additional output incremental - Trigger level

Trigger level	TTL/RS422
High / Low	≥2.5 V / ≤0.5 V
Transmission length	≤550 m @ 100 kHz
Output frequency	≤600 kHz
Trigger level	**TTL/HTL (Vin = Vout)**
High / Low	≥2.5 V / ≤0.5 V (TTL) ≥Ub -3 V / ≤1.5 V (HTL)
Transmission length	≤550 m @ 100 kHz (TTL) ≤350 m @ 100 kHz (HTL)
Output frequency	≤600 kHz (TTL); ≤350 kHz (HTL)

Electrically isolated:
The output TTL/HTL (Vin = Vout) at the additional output incremental is electrically isolated and requires a separate power supply.

[1] See dimensions

[2] Additional output incremental (option)

[3] Speed switch (option)

Additional output incremental - Output signals

Version with additional output incremental at positive rotating direction [1]

A+

A−

B+

B−
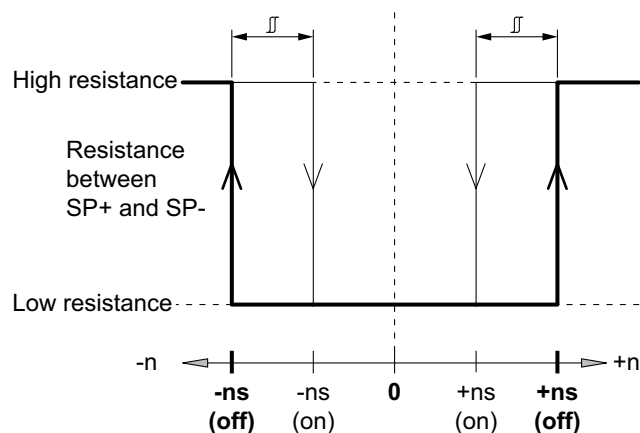
R+ Zero pulse+

R− Zero pulse−

Speed switch - Switching characteristics

High resistance

Resistance between SP+ and SP-

Low resistance

-n   -ns (off)   -ns (on)   0   +ns (on)   +ns (off)   +n

n	=	Speed
+ns (off)	=	Switch-off speed at shaft rotation in positive rotating direction [1].
-ns (off)	=	Switch-off speed at shaft rotation in negative rotating direction [1].

Switching hysteresis ⎍:
5...100 % (factory setting = 10 % min. 1 Digit)

+ns (on)	=	Switch-on speed at shaft rotation in positive rotating direction [1].
-ns (on)	=	Switch-on speed at shaft rotation in negative rotating direction [1].

Absolute encoders - bus interfaces
Blind hollow shaft or cone shaft (1:10)
Profibus-DPV0 or DPV2 / 13 bit ST / 16 bit MT / Speed switch

HMG10-B - Profibus DP

Dimensions

Cone shaft

Blind hollow shaft

Drawing 90° rotated

Jack-screw thread

17 a/f

14.6

~5

~5.5

ø14
M8

ø12.5

ø17 JS8
1:10

ø69.5

ø50

ød H7

M8

ø105

2

20

22.5

37.5

111

ød	L1	L2
16	53	65.5
20	35	50

L1

L2

111.5

3x M16x1.5
(Cable ø5-9)

A^1 A^2 A^3

Additional output incremental (option)
Speed switch (option)

Positive rotating direction

79.5

69.5

67

86.5

86.5

B

R10

A

Profibus

±15°

Accessory

ø6.5

Baumer

www.baumer.com/motion