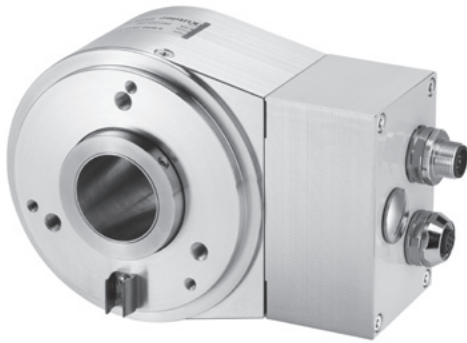# Absolute Encoders – Multiturn

Standard, optical / magnetic	9080 (Large hollow shaft)	CANopen / DeviceNet

The multiturn encoder 9080 with CANopen interface and combined optical / mechanical sensor technology is perfect for CANopen applications, where a large hollow shaft is required.

This through hollow shaft is available with a diameter up to 28 mm. The maximum resolution of the 9080 is 25 bits.

High rotational speed	Temperature - 10° + 70°	High IP value	High shaft load capacity	Shock / vibration resistant	Short circuit proof	Reverse polarity protection

Adaptable

- With cable gland or M12 connector
- Hollow shaft of 12 up to 28 mm
- Programmable over the bus

User-friendly

- All relevant parameters programmable
- Wide selection of shafts and fixing options

Order code
Hollow shaft

8.9080 . **XXXX** . **XXXX**
Type   a b c d   e

a *Flange*
1 = without mounting aid
2 = with short spring device
3 = with long spring device
4 = with mounting flange
5 = with tether arm long

b *Hollow shaft*
1 = ø 12 mm
2 = ø 15 mm
3 = ø 20 mm
4 = ø 24 mm
5 = ø 28 mm
6 = ø 15,875 mm (5/8")
7 = ø 25,4 mm (1")
9 = ø 16 mm
C = ø 25 mm

c *Interface / Power supply*
1 = DeviceNet / 10 ... 30 V DC
2 = CANopen / 10 ... 30 V DC

d *Type of connection*
1 = terminal box with
cable gland fitting M16 [1]
2 = M12 connector

Includes EDS-file and documentation on CD
Use **couplings** for the **BUS-IN** connection and **connectors** for the **BUS-OUT** connection.

e *Fieldbus profile*
1001 = DeviceNet
2001 = CANopen
Encoder Profile DSP 406

Standard, optical / magnetic	9080 (Large hollow shaft)	CANopen / DeviceNet

Mounting accessory for hollow shaft encoders

Cylindrical pin, long		With fixing thread	8.0010.4700.0000
for torque stops			

Connection Technology

Connector, self-assembly (straight)	M12 for Bus in	8.0000.5116.0000
	M12 for Bus out	8.0000.5111.0000
Cordset, pre-assembled with 5 m PVC cable	Bus in	8.0000.6V81.0005
	Bus out	8.0000.6V88.0005

Programming set

Including:
- Interface converter USB-CAN
- Connection cable from interface converter to encoder
- Power supply 90 ... 250 V AC
- DVD with Ezturn® software

Minimum System Requirements:
Operating system: Windows XP SP3 or higher
Win7 in preparation
Processor: 1 GHz
RAM : 512 MB
Required disk space: 500 MB

8.0010.9000.0015

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	6 000 min^{-1}, 3 000 min^{-1} (continuous)
Rotor moment of inertia	approx. 72 x 10^{-6} kgm^2
Starting torque	< 0.05 Nm
Weight	approx. 0.9 kg
Protection EN 60 529	IP65
Working temperature range	-10°C ... +70°C
Materials hollow shaft	stainless steel H7
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

General electrical characteristics

Power supply (U$_B$)	10 ... 30 V DC
Power consumption	290 mA
Recommended fuse	T 0.315 A
Linearity	± 1/2 LSB (±1 LSB at 13, 14, 25 bit resolution)
Code	Binary
Interface	CAN HIGH-Speed acc. to ISO/DIS 11898, Basic and Full-CAN; CAN specification 2.0 B (11 and 29 bit Identifier)
Protocol	CANopen according to profile DSP 406 with additional functions. DeviceNet Profile for Encoder Release V 2.0
Baud rate	programmable via DIP switches 10 ... 1000 Kbit/s
Basic identifier/node	programmable via DIP switches
CE compliant acc. to	EN 61000-6-2, EN 61000-6-4, EN 61000-6-3
Performance against magnetic influence acc. to	EN 61000-4-8, Severity level 5
UL-certified	File 224618
RoHS compliant acc. to	EU guideline 2002/95/EG

1) At shaft version only (at shaft end)

Standard, optical / magnetic	9080 (Large hollow shaft)	CANopen / DeviceNet

CANopen - Device Profile

General description

The CANopen Device Profiles describe the functionality of the communication and of that part of the CANopen fieldbus system specific to the manufacturer. Device Profile 406 applies to encoders and defines the individual objects independently of the manufacturer. In addition the profile makes provision for additional extended functions specific to the manufacturer; using devices that interface with CANopen offers the advantage of acquiring systems today that are prepared for the needs of the future.

The following functionality is integrated:

- Class C2 functionality
- NMT Slave
- Diagnostics (internal) 2 bit
- CAN-LED for Bus status
- CAN-LED for operating mode

The following parameters can be programmed::

- Polling mode or auto mode with adjustable time
- Code sequence (Direction)
- Number of pulses/rotation 1 ... 8192
- Number of revolutions 1 ... 4096
- Total resolution
- Preset
- Offset
- Number of revolutions

DeviceNet Encoder profile

General description

The DeviceNet Device Profile describes the functionality of the communication and of that part of the DeviceNet fieldbus system specific to the manufacturer. The Encoder Profile applies to encoders and defines the individual objects independently of the manufacturer. In addition the profile makes provision for additional extended functions specific to the manufacturer.

The following parameters can be programmed:

- Direction of rotation
- Scaling factor
  - Number of pulses/rotation
  - Total resolution
- Number of revolutions
- Preset value
- Diagnostics mode
- Resolution

The following functionality is integrated:

- Galvanic isolation of the Fieldbus-stage with DC/DC converter
- Addressing via DIP switches or software
- Diagnostic LED for network and mode
  Baud rate 125, 250 and 500 kbit/s programmable via DIP switches
- Node address 0 ... 63 and baud rate programmable via DIP switches
- Polled mode
- Cyclic mode
- Change of state mode (COS)
- Combination of Polled mode and Cyclic mode
- Combination of Polled mode and COS mode
- Offline connection set
- Device heartbeat
- "Out of box" Configuration
- MAC-ID and Baud rate preset value, MAC-ID = 63
- Baud rate = 125 kbit/s
- 2 I/O Assembly: Position value / Position value and status

Fieldbus encoders can be used in following applications:

CANopen

- Elevators
- Construction plant
- Cranes
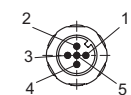- Agricultural vehicles
- Mobile plant
- Special-purposes vehicles

DeviceNet

Especially suitable for applications in the USA.

Terminal assignment terminal box

Signal	ENC.		BUS IN			BUS OUT			ENC.		Shield	
	+V DC	GND	GND	B	A	A	B	GND	GND	+V DC		
Terminal	1	2	3	4	5	6	7	8	9	10	11	12

Terminal assignment M12 connector

Bus in:

Signal	DRAIN	+ V DC	– V DC	CAN_H	CAN_L
Pin	1	2	3	4	5
Colour	GY	RD	BK	WH	BU

Bus out:
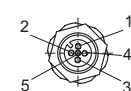
Signal	DRAIN	+ V DC	– V DC	CAN_H	CAN_L
Pin	1	2	3	4	5
Colour	GY	RD	BK	WH	BU

Absolute Encoders Multiturn

Standard, optical / magnetic	9080 (Large hollow shaft)	CANopen / DeviceNet

Dimensions hollow shaft version

1. Cable gland fitting
2. Spring device short (flange Nr. 2) for cyl. pin DIN 6325, ø 6 mm
3. Spring device long (flange Nr. 3) for cyl. pin DIN 6325, ø 6 mm
4. Mounting flange (flange Nr. 4)
5. Tether arm long (flange Nr. 5)
6. Slotted hole for screw M4
7. 2.5 mm deep
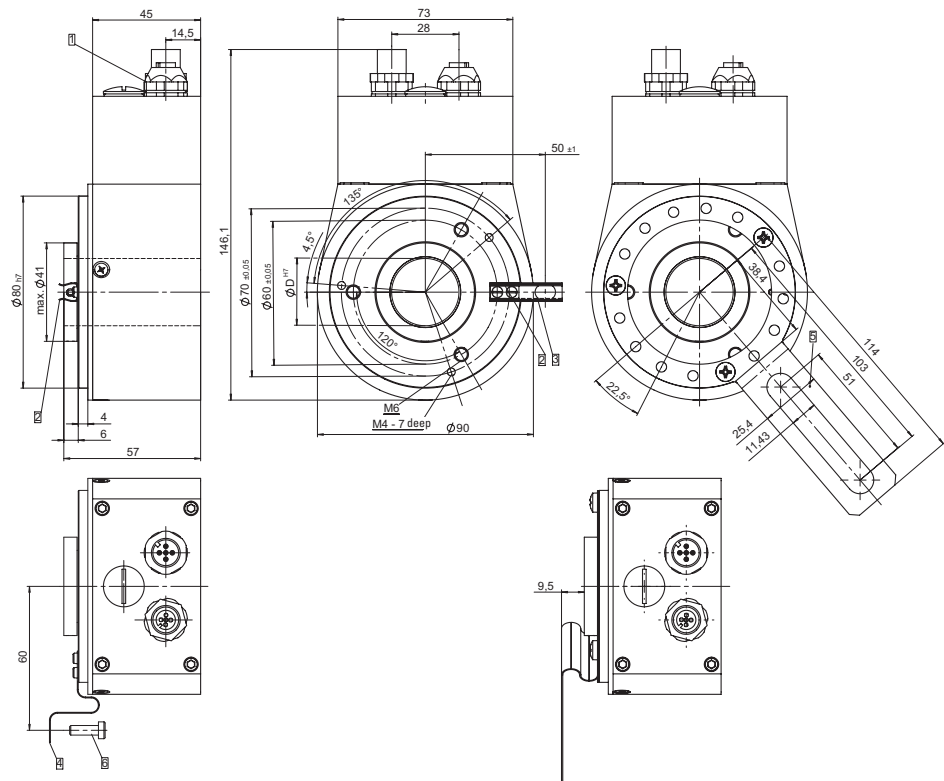
Mounting advice:

The flanges and shafts of the encoder and drive should not both be rigidly coupled together at the same time!