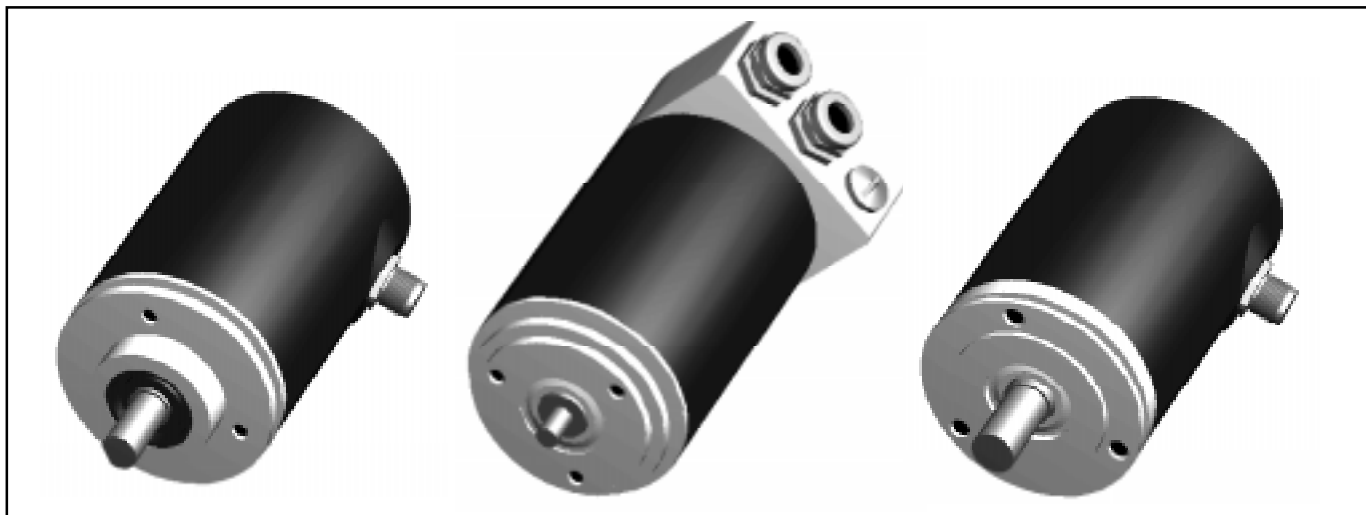


- **Compact and robust design for mechanical engineering and industrial plant applications**
- **To ODVA DeviceNet Specification Release 2.0**
- **Data rate up to: 500 Kbaud**
- **Output code: Natural binary**
- **Resolution: 8192 positions (steps) per revolution (13 Bit) max.**
- **Measuring range: 4096 revolutions (12 Bit) max.**
- **Total number of positions: 2²⁵ (25 Bit)**
- **Variant "M" with round connector**
- **Variant "Z" with connecting cap: Integral addressing facility and Baud rate selection switches**
- **To Protection grade IP 65 or IP 66**



Construction

Flange and housing of aluminium - shaft of stainless steel - 12 mm ball-bearings with Nilos ring seal or radial packing ring seal - code disc of glass or of deformation resistant plastic - GaAlAs diodes - photo-transistor array with comparator and trigger circuits for long-term stabilization of the sensor systems gate array - SMD technology.

General features

The CRN/D encoders conform to the relevant ODVA Specification Release No. 2.0. Two variants are available, i. e. the "Z" type comprising a rear connecting cap with integral node addressing facility (MAC ID) and Baud rate selection DIP switch. The "M" type features a lateral MICRO connector and requires addressing and Baud rate selection by software (ref. Instance Attributes of the DeviceNet object).

The implementation has been carried out according to the Predefined-Master-Slave-Connection-Set where the encoder figures as a Groupe 2 only server.

The following objects are supported:

- Identity Object
- Message Router Object
- DeviceNet Object
- Assembly Object
- Connection Object and the Position Sensor Object.

The Position Sensor Object (Class Code 23 Hex) comprises in addition to the instances attributes to ODVA (e. g. the position value of the encoder) several manufacturer specific programmable features such as scaling, resolution, measuring range, minimum and maximum working area and error signal.

The operating manual TZY 10771 contains the description of the relevant protocol. Data rates of 125, 250 and 500 kbaud are supported.

DeviceNet Features

- | | |
|------------------------------------|---------------------|
| ■ Device type: | Encoder (generic) |
| ■ Explicit Peer to Peer Messaging: | no |
| ■ I/O Peer to Peer Messaging: | no |
| ■ Configuration Consistency Value: | yes |
| ■ Faulted Node Recovery: | yes |
| ■ Baud Rates: | 125, 250, 500 kbaud |
| ■ Master/Scanner: | no |
| ■ I/O Slave Messaging | |
| □ Bit Strobe: | yes |
| □ Polling: | yes |
| □ Cyclic: | yes |
| □ Change of State (COS): | yes |

Encoder features

- | | |
|-------------------------------|--|
| ■ Resolution: | 1 to 4096 (or 8192) positions (steps) per revolution |
| ■ Measuring range: | 1 to 4096 revolutions |
| ■ Total Capacity (positions): | 16.777.216 (24 bit)
33.554.432 (25 bit) |
| ■ Output code: | Natural binary |
| ■ Code sense: | CW or CCW |
| ■ Reference value: | 0 to total capacity less 1 |
| ■ Working area status: | greater or smaller |
| ■ Lower limit: | 0 to total capacity less 1 |
| ■ High limit: | 1 to total capacity |

General parameters

- Vendor-ID: 407
- Data rate: 125, 250, 500 kBaud
Default: 125 kBaud
- Node address: 0-63, default: 1
- Scale function: on/off
- Alarms: Device Hardware
Hardware Memory Error,
Communication Error,
Device specific Error,
(e.g. EEPROM-error,
CRC-error, ...)

Electrical data

- Sensor system: GaAIAs-diodes - photo array,
photo transistors
- CAN-interface (connection): to ISO / DIS 11898
- Resolution: 4096 positions per rev. (12 bit)
8192 positions per rev. (13 bit)
- Max. position variance: $\leq \pm 2'38''$ for 12 bit version
 $\leq \pm 1'59''$ for 13 bit version
- Supply voltage range: + 11 to + 30 VDC
- Power consumption: $P_v \leq 3,5 \text{ W}$
(inrush current $\leq 300 \text{ mA}$)

Mechanical data

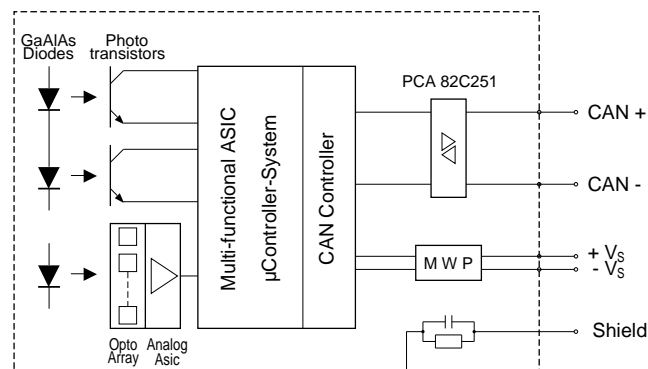
- Operating speed: 3000 rpm max. (continuous)
4000 rpm max. (short period)
- Angular acceleration: 10^5 rad/s^2 max.
- Moment of inertia (rotor): 45 gcm^2
- Operating torque: $\leq 5 \text{ Ncm}$ (8 Ncm - CRD 66)
(at 1000 rpm)
- Starting torque: $\leq 1 \text{ Ncm}$ (4 Ncm - CRD 66)
- Permissible shaft load: 250 N max. (axial and radial)
- Bearing life expectancy: 10^9 revolutions *
- Mass: ca. 0.5 kg with round connector
ca. 0.7 kg with connecting cap

* At max. shaft load and working temperature between - 20 °C and + 60 °C. Longer life can be expected at lower shaft loads.

Environmental data

- Operating temperature range: - 20 °C to + 60 °C
□ optional - 40 °C to + 85 °C
- Storage temperature range: - 20 °C to + 70 °C
□ optional - 40 °C to + 95 °C
- Permissible rel. humidity: 85 % without condensation
- Resistance to shock: 200 m/s²; 11 ms (DIN IEC 68)
- Resistance to vibration: 5 Hz to 1000 Hz; 100 m/s² (DIN IEC 68)
- Protection grade (DIN 40 050)
CRN/D 58, 65, 105: IP 65 (Nilos ring)
CRN/D 65: IP 66 (radial packing ring)
- Connecting cap: IP 00 (when not mounted)

Block diagram



MAC - ID and Baud rate

Variant "Z" with connection cap:

DIP-switch:

	1	2	3	4	5	6	7	8	9	10
On		X								
Off	X		X	X	X	X	X	X		

Configuration:

		Example
MAC-ID: switch 1-6	0-63	2
Baud rate switch 7-8	0x0 125 kBaud 0x1 250 kBaud 0x2 500 kBaud	125 kBaud

Variant "M" with round connector:

Baudrate: 125 kBaud, standard delivery status, can be changed via software (ref. to DeviceNet Object)

MAC-ID: 1, standard delivery status, can be changed via software (ref. to DeviceNet Object)

Status indication by LED's:

V _S	Combined Module/ Network Status LED (MNS)		To indicate
green	green	red	
on	off	off	Power on
	on	off	Device is not online
	flashing	off	Device operational and online, connected
		flashing	Device operational and online, not connected or device online and device needs commissioning
		on	Minor fault and/or connection time-out
	flashing	on	Critical fault or critical link failure
		flashing	Communication faulted and received an identify
			Comm Fault Request - long protocol

Specific Objects

DeviceNet Object Class Code 03_{hex}
Class Attributes

Attr. Id	Attribute	Access	Type of data	Remark
1	Revision	ro	UINT	

Instance Attributes

Attr. Id	Attribute	Access	Type of data	Remarks
1	MAC ID	rw	USINT	
2	Baudrate	rw	USINT	Range 0-2
3	BOI	ro	BOOL	Value = 0
4	Bus-Off Counter	rw	USINT	
5	Allocation Information	ro	STRUCT of: BYTE USINT	Allocation Choice Byte Master's MAC ID

Services

Service Code		Service Name
0E _{hex}	Get_Attribute_Single (read)	Returns the value of an attribute
10 _{hex}	Set_Attribute_Single (write)	Changes the value of an attribute
4B _{hex}	Allocate_Mater/Slave_Connection_Set	Requesting Master/Slave Connection Set
4C _{hex}	Release_Group_2_Identifier_Set	Connections via Master/Slave Connection Set are cancelled

Position Sensor Object Class Code 23_{hex}
Class Attributes no

Instance Attributes

ODVA specific:

Attr. Id	Attribute	Access	Type of data	Remark
3	Real position value	ro	UDINT	
11	Code sense	rw	BOOL	0 = cw/1 = ccw

Manufacture specific

Attr. Id	Attribute	Access	Type of data	Remarks
112	Scale function	rw	BOOL	0 = scaling disable/ 1 = scaling enable
113	Resolution	rw	UDINT	max. 8192 steps/rev.
114	Total capacity	rw	UDINT	max. 33554432 steps
115	Reference value	rw	UDINT	0 to total capacity -1
128	Area state register	ro	UDINT	Bit 1 : 0 = ok / 1 = Max. passed over Bit 2 : 0 = ok / 1 = Min. passed below
129	Work area low limit	rw	UDINT	default = 1048575 steps
130	Work area high limit	rw	UDINT	default = 32505856 steps
144	Operating status	ro	WORD	Bit 0 : 0 = cw / 1 = ccw Bit 2 : 0 = scaling disable 1 = scaling enable
145	max. Auflösung	ro	UINT	8192 steps/rev. (13 bit)
146	max. Meßbereich	ro	UINT	4096 rev. (12 bit)
147	Alarms	ro	WORD	EEPROM Error, CRC Error XRAM Error
148	Supported alarm	ro	WORD	
149	Warnings	ro	WORD	Bit 5 = 1 if Reference Value = Act. Position
150	Supported warnings	ro	WORD	
151	Profile and software version	ro	DWORD	
153	Offset Value	ro	UDINT	Not supported

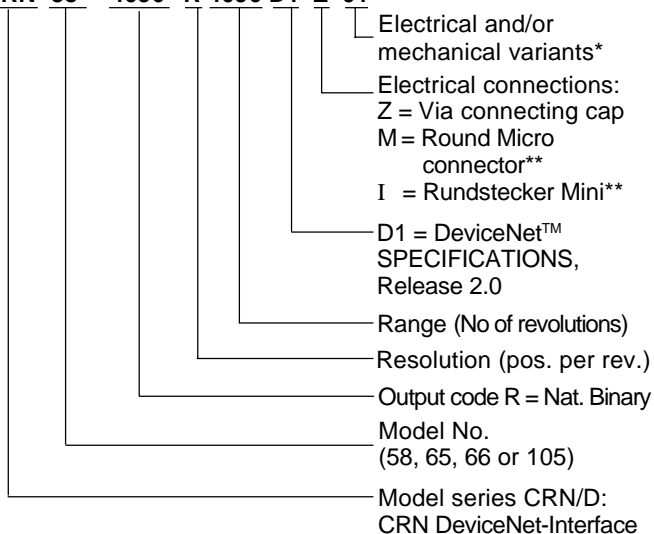
Services

ODVA specific

Service Code		Service Name
0E _{hex}	Get_Attribute_Single (read)	Returns the value of an attribute
10 _{hex}	Set_Attribute_Single (write)	Change the value of an attribute
15 _{hex}	Restore	Restores the default values to the EEPROM
16 _{hex}	Save	Writes non-volatile Attributes to the EEPROM

Order code format for encoder

CRN 58 - 4096 R 4096 D1 Z 01

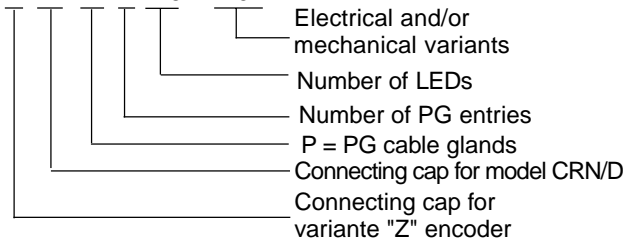


* The basic versions in accordance with the data sheet bear the code number 01. Variations from the basic version are indicated with a consecutive number and are documented in our works.

** To DeviceNet™ specifications

Order code format for connecting cap

Z N - P 2 L3 - D01



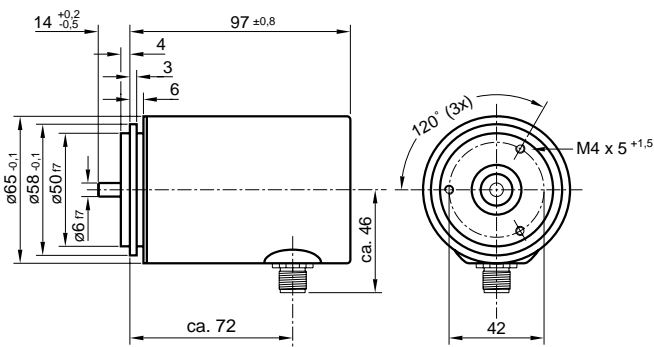
■ Supplier of DeviceNet™ specification:
Open DeviceNet Vendor Association, Inc.
20423 State Road 7, Suite 499
Boca Raton, FL 33498 USA

■ TWK operating manual TZY 10771, EDS-File and application examples for Allen-Bradly SPS-Controls are supplied on disk.

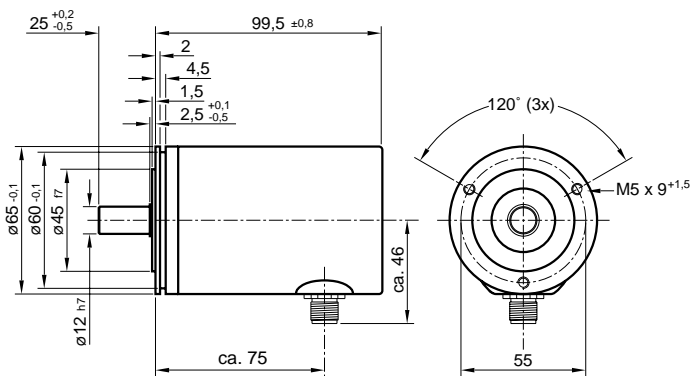
Dimensions in mm

Variant "M" with Micro connector (5 pins)

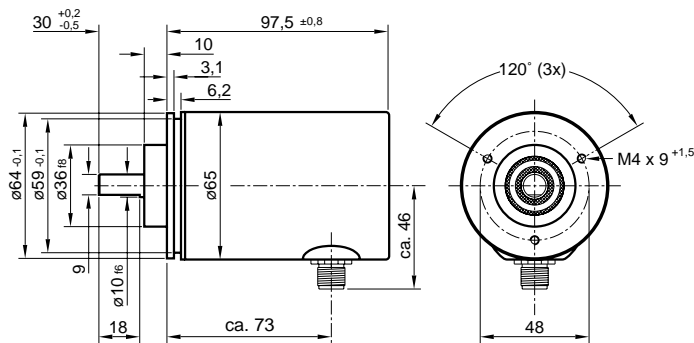
Model No. 58 with synchro-flange



Model No. 65 with synchro-flange



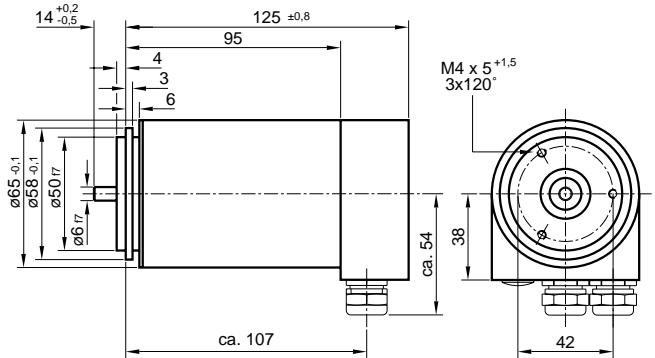
Model No. 66 with clamping flange and shaft with flat



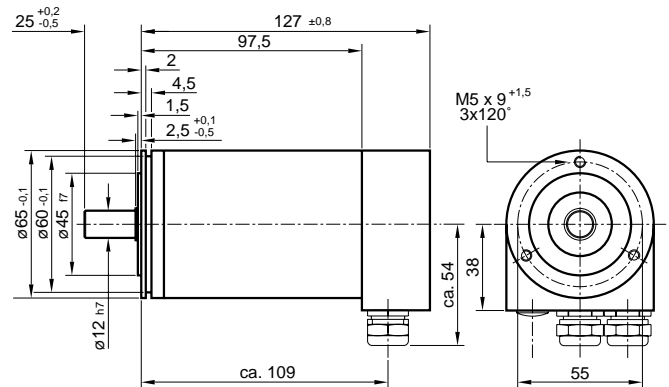
The mating plugs do not form part of the scope of delivery

Variant "Z" with connecting cap ZN

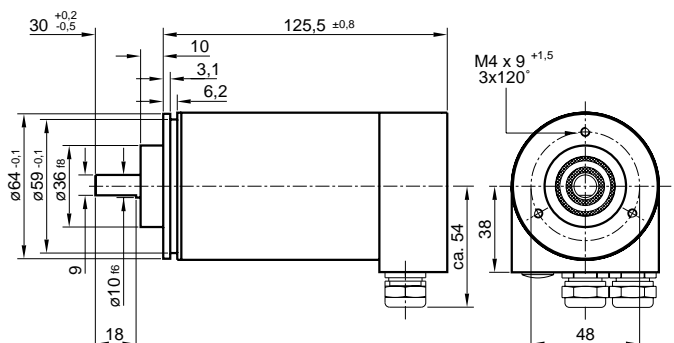
Model No. 58 with synchro-flange



Model No. 65 with synchro-flange



Model No. 66 with clamping flange and shaft with flat



Connecting cap ZN-P2L3-D01

The cap is listed and supplied as a separate item.

