

Encoder WDG absolute Profibus-DP



Specifications

Mechanical Data

Housing:	Aluminium
Maximum Shaft loading:	axial 40 N, radial 110 N
Drag torque:	3 Ncm
Speed (continuous operation)	max. 12000 ⁻¹ min Singleturn max. 6000 ⁻¹ min Multiturn
Weight:	Singleturn: approx. 550 g, Multiturn: approx. 600 g

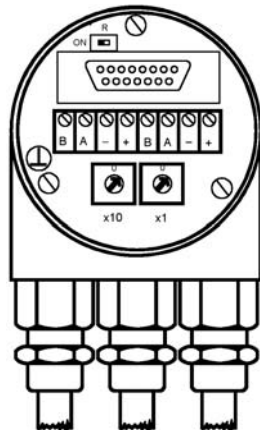
Shaft (mm)

	Synchro(S)	Clamping(C)	Hollow(B)
Shaft ϕ	6	10	15
Length	10	20	-
Insertion depth min/max.	-	-	15/30
Permissible shaft loading	40N F_a	40N F_a	110N F_r
Minimum service life in 10 ⁸ revolutions at $F_a = 40N$			
$F_r =$	60N	80N	110N
Synchro(S)	822	347	133
Clamping(C)	247	104	40

Environmental Data

Shock resistance: (EN 60068-2-27)	100 g (half-sine, 6 ms)
Permanent shock: (EN 60028-2-29)	10 g (half-sine, 16 ms)
Vibration resistance: (EN 60068-2-6)	10 g (10 Hz ... 2000 Hz)
Operating temperature:	- 40 ... + 85 °C
Storage temperature:	- 40 ... + 85 °C
Relative air humidity:	98 % non-condensing
Protection rating (EN 60529):	IP65, shaft sealed to: IP64

Interface



- Interface: Profibus-DP
 - Solid/hollow shaft: 6 or 10 mm / 15 mm
 - 8,192 steps per revolution (13 bits)
 - Max. 4,096 revolutions (12 bits)
 - Code: binary
 - Temperature-insensitive IR opto-receiver ASIC with integrated signal conditioning
- www.wachendorff.de/absoluteliftprofibus-engl

Electrical Data:

Resolution:	13 bits (25 bits Multiturn)
Baud rate:	max. 12 Mbaud
Data output:	Line-driver to RS 485, galvanically isolated via optocoupler Rotary switches in the field bus hood
Addressing:	Rotary switches in the field bus hood
Step frequency LSB:	800 kHz
Linearity:	$\pm 1/2$ LSB (12 bit), ± 2 LSB (16 bit)
Power supply:	10-30 V DC (absolute limit values) *
Current consumption:	max. 2,5 W
EMC:	Emitted: EN 61000-6-4
Immunity:	EN 61000-6-2
Service life, electrical:	> 10 ⁵ h
Connection:	Field bus hood

* Supply voltage to EN 50 178 (SELV)

Interface Profibus-DP

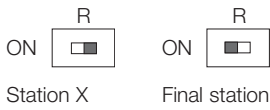
Driver:	to RS 485 standard up to 12 MBit/s
Transmission:	Transmission distances up to 1200 m
Immunity:	high degree of immunity thanks to symmetrical transmission extremely high immunity when using shielded twisted-pair cables
Cables:	direction of rotation (Complement)
Programmable parameters:	Resolution per revolution Total resolution Preset value Velocity output Time basis for velocity output Software limit switches

Installation

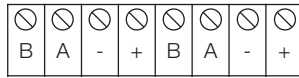
The encoder is connected using either two or three cables, depending on whether the supply voltage is integrated into the bus cable or connected separately. One of the cable glands can be replaced by a blanking connector if required. Each two-core shielded bus cable is fed into or out of the field bus hood via one of the cable glands respectively (these are suitable for cable diameters from 6.5 up to 9 mm).

Setting the Profibus station address is carried out using the two rotary switches in the bus field bus hood. Possible (permitted) addresses are from 1 to 99, whereby each address number may be used only once. The hood can be opened for installation by simply removing the two screws on the encoder.

Resistors are provided in the field bus hood, which can be switched in as required for termination purposes:



Connecting the signal and power supply cables



Terminal	Description
B (left)	Bus line B (Bus in)
A (left)	Bus line A (Bus in)
-	0 V
+	10 - 30 V
B (right)	Bus line B (Bus out)
A (right)	Bus line A (Bus out)
-	0 V
+	10 - 30 V

No.	Red LED	Green LED	Status display / Possible cause
1	OFF	OFF	No supply voltage
2	ON	ON	Encoder is ready for operation but has not received any configuration data after power ON. Possible causes: address set incorrectly. Incorrect bus connection.
3	ON	Flashing	Parameter or configuration error. The encoder is receiving configuration or parameter data with an incorrect length or inconsistent data. Possible cause: e.g. total resolution set too high.
4	Flashing	ON	Encoder is ready for operation but is not being addressed by the Master. (e.g. false address being used).
5	ON	OFF	Encoder has not received any data for a considerable time (approx. 40 seconds) - (e.g. data line interrupted)
6	OFF	ON	Normal operation in Data Exchange mode
7	OFF	Flashing	Start-up mode in Data Exchange mode

The power supply lines have to be connected only once (it does not matter to which of the relevant terminals).

If the terminating resistor is switched on, the outgoing bus lines are disconnected.

The GSD file is required in order to install the encoder; this can be downloaded from our website at www.wachendorff.de/gsd-engl

Diagnostic LEDs are integrated into the rear of the field bus hood. These can be used to show the operating state of the device.

Interface

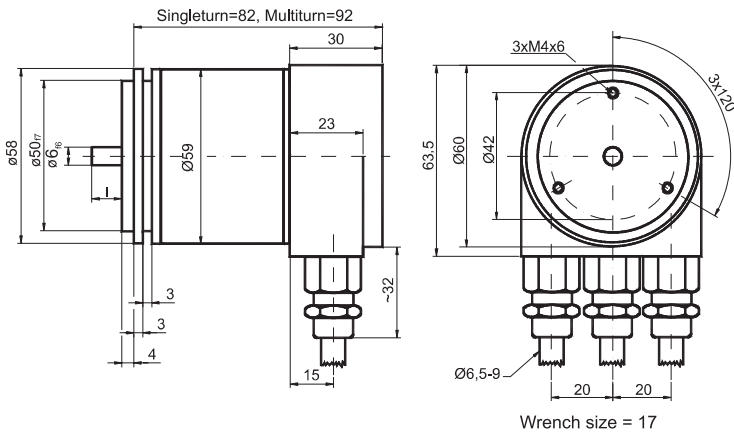
Programmable parameters

The Profibus-DP interface of the absolute encoder supports Class 1 and Class 2 functionality according to the encoder profile*. In addition the GSD files support further features, with which for example the software limit switches can be set. These are some of the encoder parameters that can be programmed:

* The Profibus profile for encoders can be obtained from the: Profibus Nutzerorganisation
 Haid-und-Neu-Str. 7,
 D-76131 Karlsruhe
 using part number 3.062.

Counting direction	The counting direction (Complement) can be assigned as an operating parameter. This parameter defines the counting direction, with which the output code increases or decreases.
Resolution per Revolution	The parameter "Resolution per Revolution" is used to programme the desired number of steps per revolution.
Total Resolution	The parameter "Total Resolution" gives the desired number of steps relating to the total distance traversed. This value should not exceed the total resolution of the absolute encoder - this is given on the type plate.
Preset Value	The Preset Value is the desired position value, which should be reached at a certain physical position of the axis. The position value is set to the desired process value by means of the parameter "Preset Value".
Velocity	The implemented software can additionally supply the current velocity. This value is transmitted in binary code, 16 bits, after the position value. It is possible to choose between four different units: steps per 10 ms, per 100 ms, per 1000 ms and revolutions per minute.
Software Limit Switches Function	Two software limit switches can be set. If the position value either exceeds or falls below these limits, a special bit is set.
Teach-In functionality (Online parameter assignment)	A special mode is available for the commissioning phase of a plant. Here parameters can be changed, whilst the encoder is transmitting data. For continuous operation another mode can be selected, in which the parameters can be protected against unintentional changes.

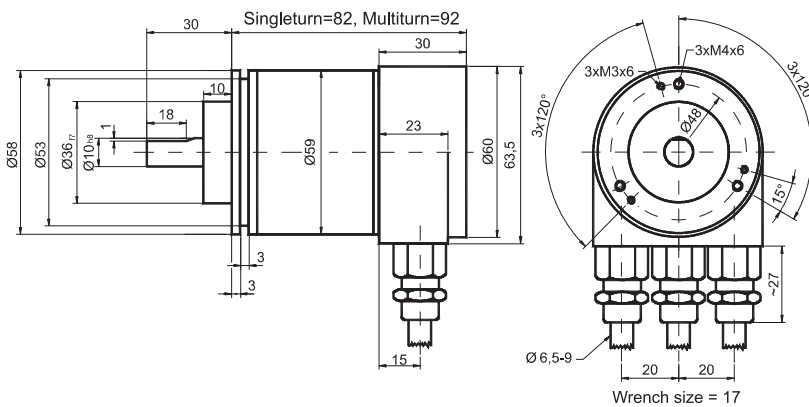
Synchro flange (S)



Synchro flange	d / mm	l / mm
Version S06	6 _{f6}	10

Dimensional drawing WDG absolute Profibus DP, synchro flange.
All dimensional specifications in mm.

Clamping flange (C 10)

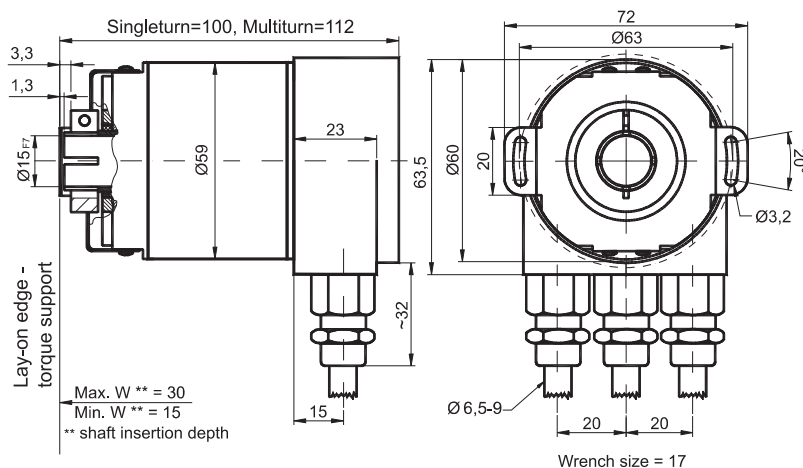


Dimensional drawing WDG absolute Profibus DP, clamping flange.
All dimensional specifications in mm.

Mounting instructions for hollow shaft (B)

The clamping ring must only be tightened on the hollow shaft, if the shaft of the drive element is inserted in the hollow shaft. The diameter of the hollow shaft can be adapted to suit 12 mm, 10 mm or 8 mm by means of a reducing adapter, (which is simply pushed into the hollow shaft). Thinner shafts are not recommended because of the mechanical loads.

End hollow shaft (B)



Permissible shaft movements of the drive element are listed in the following table:

	Axial	Radial
static	± 0,3 mm	± 0,5 mm
dynamic	± 0,1 mm	± 0,2 mm

Dimensional drawing WDG absolute Profibus DP, end hollow shaft with PAL: axial, PRL: radial.
All dimensional specifications in mm.

Accessories

Description		Order-No.
Clamping claw for S6 and C10	3 pcs. per encoder	SP300
Adapter sleeve for hollow shaft	15 mm -> 12 mm, ± 0,3 mm	RR12
Adapter sleeve for hollow shaft	15 mm -> 10 mm, ± 0,3 mm	RR10
Adapter sleeve for hollow shaft	15 mm -> 8 mm, ± 0,3 mm	RR08

Suitable accessories can be found on our website: www.wachendorff.de/absoluteliftprofibus-engl or request the data sheets on accessories for shaft encoders. Please contact us for further options.

Ordering information

Revolutions [Bit]	Flange	Code	Electrical interface	Option	Electrical connection	Order No.:
0	Clamping flange	Binary	Profibus DP	None	Field bus hood	WDG-DPB1B-0013-C100-0CC
12	Clamping flange	Binary	Profibus DP	None	Field bus hood	WDG-DPB1B-1213-C100-0CC
0	Synchro flange	Binary	Profibus DP	None	Field bus hood	WDG-DPB1B-0013-S060-0CC
12	Synchro flange	Binary	Profibus DP	None	Field bus hood	WDG-DPB1B-1213-S060-0CC
0	hollow shaft 15 mm	Binary	Profibus DP	None	Field bus hood	WDG-DPB1B-0013-B150-0CC
12	hollow shaft 15 mm	Binary	Profibus DP	None	Field bus hood	WDG-DPB1B-1213-B150-0CC