

design	Ø58 x 78mm	
incremental	number of pulses	10 to 5000

- ✓ encoder with shaft Ø 6mm
- ✓ resolution up to 5000 pulses/rotations
- ✓ high rotational speed up to 10000 min⁻¹
- ✓ optical sensing principle
- ✓ compensation of ageing and temperature drift
- ✓ compensation in case of a soiled encoder disc
- ✓ high signal-to-noise ratio thanks to complementary output signals



angular, linear and speed measurement



description

Incremental encoders are used to detect angle of rotation and rotary speeds. To measure length or position, connect the encoder to a driveshaft using a flexible coupling or directly by way of a friction wheel or pinion.

When measuring length using incremental encoders, the square wave signals, emitted by the encoder on its signal lines, are counted. The resolution can be influenced by selecting the number of encoder pulses per rotation.

Incremental encoders operate using photoelectric scanning. Infrared light that is emitted by a temperature controlled LED passes through a mask and a code disc and produces a light proportional DC signal on the optical diodes. When the shaft turns, periodic signals, similar to sine waves, result on the optical diodes. The number of signal periods per rotation corresponds to the number of markings on the encoder disc. To increase immunity to interference each channel is scanned differentially.

A light-intensity controller compensates both for the temperature and/or ageing drift and for any soiling of the glass encoder disc.

Incremental encoders lose their current measured value when the control is turned off or after a power failure. In order to allow an angle position for any given position to be referenced

again, a zero pulse is used that is transmitted once per rotation thus providing an absolute marker.

Incremental encoders emit two output signals in 90° phase quadrature thus allowing the direction of rotation to be determined.

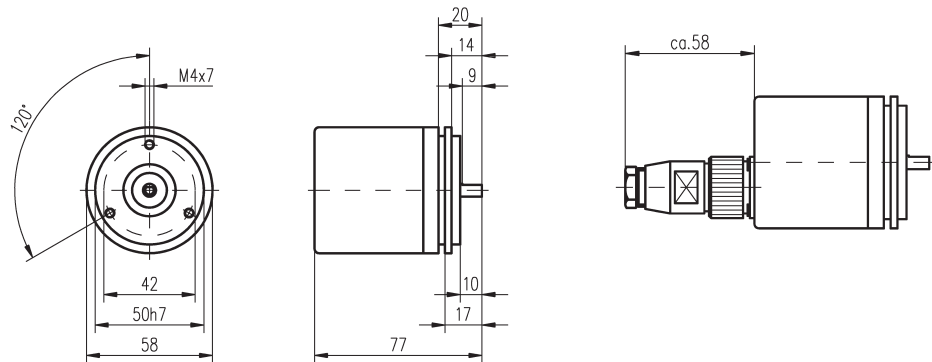
Linking the two square wave signals together with a pulse edge evaluation allows the number of pulses per rotation to be quadrupled. To ensure a clear marker is obtained from the zero pulse even with pulse quadrupling, its pulse width is one quarter of the period width of one signal.

As the signals from the incremental encoders are counted during the evaluation, noise pulses on the signal lines are bound to cause false counts. For this reason special emphasis must be placed on a particularly large signal-to-noise ratio. In practice the signal-to-noise ratio is doubled by outputting the complementary (i.e. the inverted) pulses on two different tracks in addition to the pulse signals in phase quadrature.

application examples

- ▶ angular measurement at bending machines
- ▶ linear measurement at conveyor systems
- ▶ speed measurement at wind-up units

article no.	VD580536	VD580538	VD580539	VD580540	VD580541
pulses (per rotation)	10	30	50	60	100
article no.	VD580506	VD580513	VD580514	VD580515	VD580522
pulses (per rotation)	200	360	400	500	1000
article no.	VD580523	VD580526	VD580528	VD580529	VD580530
pulses (per rotation)	1024	1500	2000	2048	2500
article no.	VD580531	VD580535			
pulses (per rotation)	3600	5000			



TECHNCAL DATA

rotation speed	max. 10.000min ⁻¹
pulses (per rotation)	s. above
output signal	push-pull: A, A inverse, B, B inverse, N, N inverse reference signal: zero pulse width 90°
output frequency	max. 150kHz
voltage supply	4.75 ... 30V DC
current consumption (w/o load)	40mA
output current (max. load)	40mA (6-channel)
starting torque	IP54: ≤ 0.015Ncm / IP65: ≤ 0.03Ncm (option)
load capacity of shaft	axial 10N / radial 20N
moment of inertia (rotor)	14.5gcm ²
vibration resistance	10g, 16 ... 2000Hz
shock resistance	200g, 2ms
short-circuit protection	+
material (housing)	aluminum
dimensions	∅ 58mm / shaft: ∅ 6 x 10mm
temperature (operating)	-25 ... +85°C
humidity	95% non-condensing
weight	approx. 0.25kg
degree of protection (EN 60529)	without shaft seal: IP54 / with shaft seal: IP65 (option)
connectgion	M23 flange connector, 12-in. axial
connection accessories	e.g. AV000023