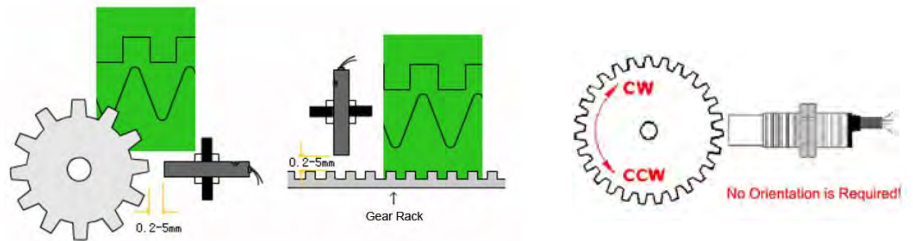


Features

- Hall-effect Principle
- Single channel square-wave signal
- Speed detection of metal toothed wheels
- 0... 15000Hz Wide switching frequencies
- ± 1 pulse detection accuracy
- -40°C ... +125°C operating temperature
- >0.5 Gear module
- Built-in electric protection

Working Diagram

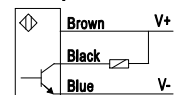


Diameter	M8	M12	M16	M16	3/4"-16
Dimension(mm)					
NPN	SA0840N1A	SA1245N1A	SA1665N1A	SA1665N1B	SAU165N1A
PNP	SA0840P1A	SA1245P1A	SA1665P1A	SA1665P1B	SAU165P1A
NPN with Internal Pull-Up Resistor	SA0840R1A	SA1245R1A	SA1665R1A	SA1665R1B	SAU165R1A
Two Wire	SA0840T1A	SA1245T1A	SA1665T1A	SA1665T1B	SAU165T1A

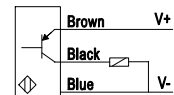
Working Principle	Hall-effect
Output Signal	Single channel, Digital square wave, High-voltage+Low-voltage
Output Mode	NPN, PNP, NPN with Pull-Up Resistor, 2-Wire
Working Voltage Range	5-24VDC operating voltage, 30VDC max. input voltage, 24VDC max. reverse voltage
Power-off Status Memory Function	No
Direction Detection	No
Switching Function	NO, NC
Residual Ripple	<5%
Tolerance	± 1 pulse
Hysteresis	<10%
Sensing Distance	0.2 ... 5mm (Different Modulus has an influence on the sensing range)
Operating Distance	2mm
Mounting Orientation	No orientation is required
Target Sensing Object	Ferrous Metal
Frequency	0... 15KHz
Minimum Gear Module	>0.5
Supply Current	<12mA
Output Current	<30mA
Insulation Resistance	50Mohm
Output Indicator	Yellow LED
Electrical Protection	Reverse polarity protection, Overload protection, Short-circuit protection
Ambient Humidity	<95% RH
Temperature Limit	-40°C ~ +125°C
Protection Degree	IP66/IP67/IP68
EMC	IEC 6094752 Part 7.4.1 and Part 7.4.2
Shock	30g@11ms
Vibration	50g
Housing Material	Stainless Steel Housing and Sensing Face
Sensing Face Pressure	10Bar
Connection	3m PVC Cable / M16 Connector
Weight	Approx. 25... 165g

Wiring Diagram

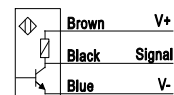
NPN Open-Collector



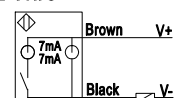
PNP



NPN with Internal Pull-Up Resistor



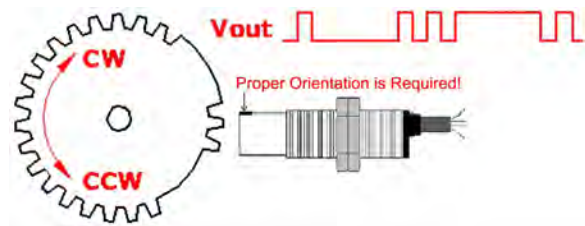
2-Wire



Features

- Hall-effect Principle
- Single channel square-wave signal
- Target Tracker
- Speed detection of metal toothed wheels
- 0... 20000Hz Wide switching frequencies
- 0 pulse detection accuracy
- -40°C ... +125°C operating temperature
- >0.5 Gear module
- Built-in electric protection

Working Diagram

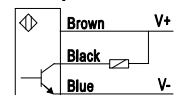


Diameter		M12	M16	M16	3/4"-16
Dimension(mm)					
NPN		SB1245N2A	SB1665N2A	SB1665N2B	SBU165N2A
PNP		SB1245P2A	SB1665P2A	SB1665P2B	SBU165P2A
NPN with Internal Pull-Up Resistor		SB1245R2A	SB1665R2A	SB1665R2B	SBU165R2A
Two Wire		SB1245T2A	SB1665T2A	SB1665T2B	SBU165T2A

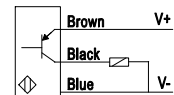
Working Principle	Hall-effect
Output Signal	Single channel, Digital square wave, High-voltage+Low-voltage
Output Mode	NPN, PNP, NPN with Internal Pull-Up Resistor, 2-Wire
Working Voltage Range	12-24VDC operating voltage, 30VDC max. input voltage, 24VDC max. reverse voltage
Power-off Status Memory Function	Yes
Direction Detection	Yes
Switching Function	NO, NC
Residual Ripple	<5%
Tolerance	0 pulse
Hysteresis	<10%
Sensing Distance	0.2 ... 5mm (Different Modulus has an influence on the sensing range)
Operating Distance	2mm
Mounting Orientation	Proper mounting orientation is required
Target Sensing Object	Ferrous Metal
Frequency	0...20KHz
Minimum Gear Module	>0.5
Supply Current	<12mA
Output Current	<30mA
Insulation Resistance	50Mohm
Output Indicator	Yellow LED
Electrical Protection	Reverse polarity protection, Overload protection, Short-circuit protection
Ambient Humidity	<95% RH
Temperature Limit	-40°C ~ +125°C
Protection Degree	IP66/IP67/IP68
EMC	IEC 6094752 Part 7.4.1 and Part 7.4.2
Shock	30g@11ms
Vibration	50g
Housing Material	Stainless Steel Housing and Sensing Face
Sensing Face Pressure	10Bar
Connection	3m PVC Cable / M16 Connector
Weight	Approx. 25...165g

Wiring Diagram

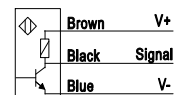
NPN Open-Collector



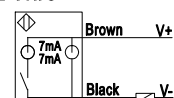
PNP



NPN with Internal Pull-Up Resistor



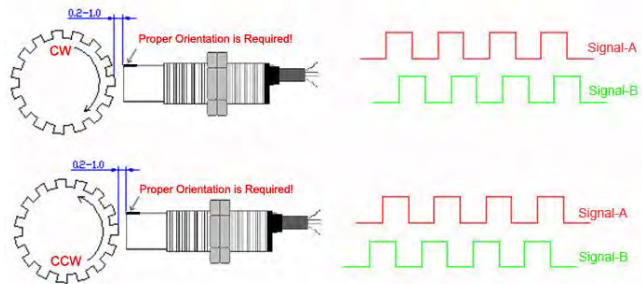
2-Wire



Features

- Hall-effect Principle
- 2-channel square-wave signal
- Speed and Direction detection of metal toothed wheels
- 0...15000Hz Wide switching frequencies
- ± 1 pulse detection accuracy
- -40°C ... +125°C operating temperature
- >0.5 Gear module
- Built-in electric protection

Working Diagram

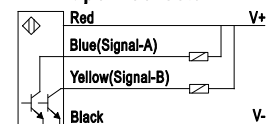


Diameter		M12	M16	M16	3/4"-16
Dimension(mm)					
NPN		SC1245N2A	SC1665N2A	SC1665N2B	SCU165N2A
PNP		SC1245P2A	SC1665P2A	SC1665P2B	SCU165P2A
NPN with Internal Pull-Up Resistor		SC1245R2A	SC1665R2A	SC1665R2B	SCU165R2A

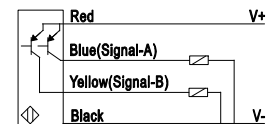
Working Principle	Hall-effect
Output Signal	2-channel, Digital square wave, High-voltage+Low-voltage
Output Mode	NPN, PNP, NPN with Pull-Up Resistor
Working Voltage Range	12-24VDC operating voltage, 30VDC max. input voltage, 24VDC max. reverse voltage
Power-off Status Memory Function	No
Direction Detection	Yes
Switching Function	NO, NC
Residual Ripple	<5%
Tolerance	± 1 pulse
Hysteresis	<10%
Sensing Distance	0.2 ... 2mm (Different Modulus has an influence on the sensing range)
Operating Distance	1mm
Mounting Orientation	Proper mounting orientation is required
Target Sensing Object	Ferrous Metal
Frequency	0...20KHz
Minimum Gear Module	>0.5
Supply Current	<12mA
Output Current	<30mA
Insulation Resistance	50Mohm
Output Indicator	Yellow LED
Electrical Protection	Reverse polarity protection, Overload protection, Short-circuit protection
Ambient Humidity	<95% RH
Temperature Limit	-40°C ~ +125°C
Protection Degree	IP66/IP67/IP68
EMC	IEC 6094752 Part 7.4.1 and Part 7.4.2
Shock	30g@11ms
Vibration	50g
Housing Material	Stainless Steel Housing and Sensing Face
Sensing Face Pressure	10Bar
Connection	3m PVC Cable / M16 Connector
Weight	Approx. 25...165g

Wiring Diagram

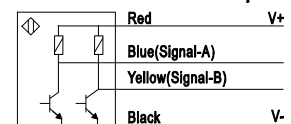
NPN Open-Collector



PNP



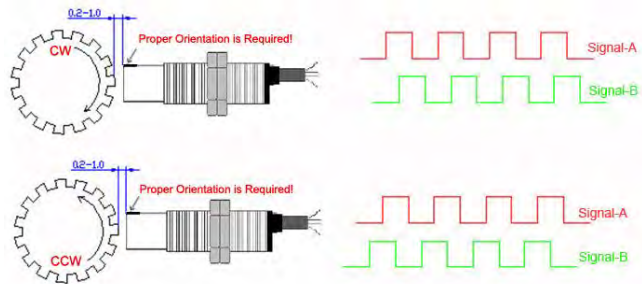
NPN with Internal Pull-Up Resistor



Features

- Hall-effect Principle
- 2-channel square-wave signal
- Target Tracker
- Speed and Direction detection of metal toothed wheels
- 0...20000Hz Wide switching frequencies
- 0 pulse detection accuracy
- -40°C ... +125°C operating temperature
- >0.5 Gear module
- Built-in electric protection

Working Diagram

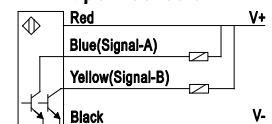


Diameter		M12	M16	M16	3/4"-16
Dimension(mm)					
NPN		SD1245N2A	SD1665N2A	SD1665N2B	SDU165N2A
PNP		SD1245P2A	SD1665P2A	SD1665P2B	SDU165P2A
NPN with Internal Pull-Up Resistor		SD1245R2A	SD1665R2A	SD1665R2B	SDU165R2A

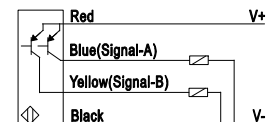
Working Principle	Hall-effect
Output Signal	2-channel, Digital square wave, High-voltage+Low-voltage
Output Mode	NPN, PNP, NPN with Pull-Up Resistor
Working Voltage Range	12-24VDC operating voltage, 30VDC max. input voltage, 24VDC max. reverse voltage
Power-off Status Memory Function	Yes
Direction Detection	Yes
Switching Function	NO, NC
Residual Ripple	<5%
Tolerance	0 pulse
Hysteresis	<10%
Sensing Distance	0.2 ... 2mm (Different Modulus has an influence on the sensing range)
Operating Distance	1mm
Mounting Orientation	Proper mounting orientation is required
Target Sensing Object	Ferrous Metal
Frequency	0...15KHz
Minimum Gear Module	>0.5
Supply Current	<12mA
Output Current	<30mA
Insulation Resistance	50Mohm
Output Indicator	Yellow LED
Electrical Protection	Reverse polarity protection, Overload protection, Short-circuit protection
Ambient Humidity	<95% RH
Temperature Limit	-40°C ~ +125°C
Protection Degree	IP66/IP67/IP68
EMC	IEC 6094752 Part 7.4.1 and Part 7.4.2
Shock	30g@11ms
Vibration	50g
Housing Material	Stainless Steel Housing and Sensing Face
Sensing Face Pressure	10Bar
Connection	3m PVC Cable / M16 Connector
Weight	Approx. 25...165g

Wiring Diagram

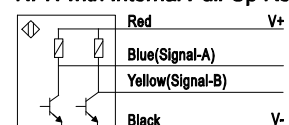
NPN Open-Collector



PNP



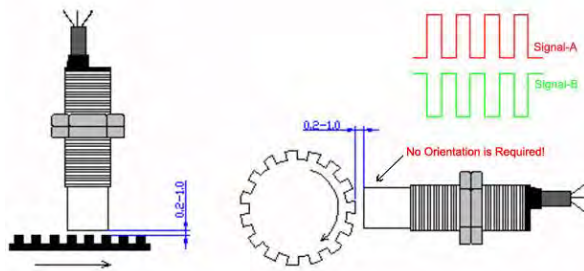
NPN with Internal Pull-Up Resistor



Features

- Hall-effect Principle
- 2-channel square-wave signal, 180° phase shift
- Speed and Direction detection of metal toothed wheels
- 0...15000Hz Wide switching frequencies
- ±1 pulse detection accuracy
- -40°C ... +125°C operating temperature
- >0.5 Gear module
- Built-in electric protection

Working Diagram

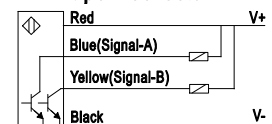


Diameter		M12	M16	M16	3/4"-16
Dimension(mm)					
NPN		SE1245N2A	SE1665N2A	SE1665N2B	SEU165N2A
PNP		SE1245P2A	SE1665P2A	SE1665P2B	SEU165P2A
NPN with Internal Pull-Up Resistor		SE1245R2A	SE1665R2A	SE1665R2B	SEU165R2A

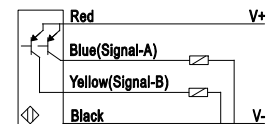
Working Principle	Hall-effect
Output Signal	2-channel, Digital square wave, High-voltage+Low-voltage, the phase difference is 180°
Output Mode	NPN, PNP, NPN with Pull-Up Resistor
Working Voltage Range	12-24VDC operating voltage, 30VDC max. input voltage, 24VDC max. reverse voltage
Power-off Status Memory Function	No
Direction Detection	No
Switching Function	NO+NC
Residual Ripple	<5%
Tolerance	± 1pulse
Hysteresis	<10%
Sensing Distance	0.2 ... 2mm (Different Modulus has an influence on the sensing range)
Operating Distance	1mm
Mounting Orientation	No orientation is required
Target Sensing Object	Ferrous Metal
Frequency	0...15KHz
Minimum Gear Module	>0.5
Supply Current	<12mA
Output Current	<30mA
Insulation Resistance	50Mohm
Output Indicator	Yellow LED
Electrical Protection	Reverse polarity protection, Overload protection, Short-circuit protection
Ambient Humidity	<95% RH
Temperature Limit	-40°C ~ +125°C
Protection Degree	IP66/IP67/IP68
EMC	IEC 6094752 Part 7.4.1 and Part 7.4.2
Shock	30g@11ms
Vibration	50g
Housing Material	Stainless Steel Housing and Sensing Face
Sensing Face Pressure	10Bar
Connection	3m PVC Cable / M16 Connector
Weight	Approx. 25...165g

Wiring Diagram

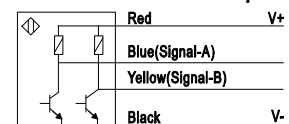
NPN Open-Collector



PNP



NPN with Internal Pull-Up Resistor

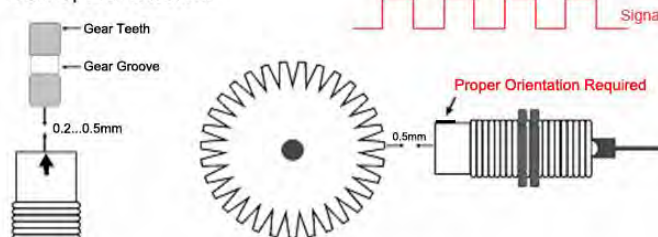


Features

- Magnetic Principle
- Single channel square-wave signal
- Small Gear Module and High Gear Speed
- Speed detection of metal toothed wheels
- 0...15000Hz Wide switching frequencies
- ± 1 pulse detection accuracy
- -40°C ... +70°C operating temperature
- >0.5 Gear module
- Built-in electric protection

Working Diagram

Gear Speed Detection:

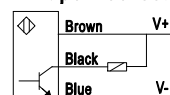


Diameter	M16
Dimension(mm)	
NPN	SS1665N2A
PNP	SS1665P2A
NPN with Internal Pull-Up Resistor	SS1665R2A

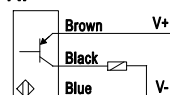
Working Principle	Magnetic
Output Signal	Single channel, Digital square wave, High-voltage+Low-voltage
Output Mode	NPN, PNP, NPN with Internal Pull-Up Resistor
Working Voltage Range	12-24VDC operating voltage, 30VDC max. input voltage, 24VDC max. reverse voltage
Power-off Status Memory Function	No
Direction Detection	No
Switching Function	NO, NC
Residual Ripple	<5%
Tolerance	± 1 pulse
Hysteresis	<10%
Sensing Distance	0.2 ... 1mm (Different Modulus has an influence on the sensing range)
Operating Distance	0.6mm
Mounting Orientation	Proper mounting orientation is required
Target Sensing Object	Ferrous Metal
Frequency	0...15KHz
Minimum Gear Module	>0.5
Supply Current	<12mA
Output Current	<30mA
Insulation Resistance	50Mohm
Output Indicator	Yellow LED
Electrical Protection	Reverse polarity protection, Overload protection, Short-circuit protection
Ambient Humidity	<95% RH
Temperature Limit	-40°C ~ +70°C
Protection Degree	IP66/IP67/IP68
EMC	IEC 6094752 Part 7.4.1 and Part 7.4.2
Shock	30g@11ms
Vibration	50g
Housing Material	Stainless Steel Housing and Sensing Face
Sensing Face Pressure	10Bar
Connection	3m PVC Cable
Weight	Approx. 165g

Wiring Diagram

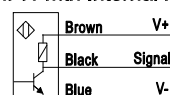
NPN Open-Collector



PNP



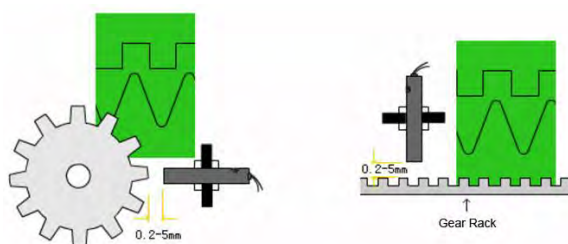
NPN with Internal Pull-Up Resistor



Features

- Hall-effect Principle
- Single-channel square-wave signal
- 350Bar Max. sensing face pressure
- Speed detection of metal toothed wheels
- 0.5... 15000Hz Wide switching frequencies
- ± 1 pulse detection accuracy
- $-40^{\circ}\text{C} \dots +100^{\circ}\text{C}$ operating temperature
- >0.5 Gear module
- Built-in electric protection

Working Diagram



Diameter	M12
Dimension(mm)	
NPN	SH1278N2C
PNP	SH1278P2C

Working Principle	Hall-effect
Output Signal	2-channels, Digital square wave, High-voltage+Low-voltage
Output Mode	NPN, PNP, NPN with Pull-Up Resistor
Working Voltage Range	12-24VDC operating voltage, 30VDC max. input voltage, 24VDC max. reverse voltage
Power-off Status Memory Function	No
Direction Detection	No
Switching Function	NC
Residual Ripple	$<5\%$
Tolerance	± 1 pulse
Hysteresis	$<10\%$
Sensing Distance	0.3 ... 1mm (Different Modulus has an influence on the sensing range)
Operating Distance	0.6mm
Insulation Strength	500VDC
Target Sensing Object	Ferrous Metal
Frequency	0... 15KHz
Minimum Gear Module	>0.5
Supply Current	$<12\text{mA}$
Output Current	$<30\text{mA}$
Insulation Resistance	50Mohm
Mounting Orientation	No mounting orientation is required
Electrical Protection	Reverse polarity protection, Overload protection, Short-circuit protection
Ambient Humidity	$<95\%$ RH
Temperature Limit	$-40^{\circ}\text{C} \sim +100^{\circ}\text{C}$
Protection Degree	IP67/IP68/IP69
EMC	IEC 6094752 Part 7.4.1 and Part 7.4.2
Shock	30g@11ms
Vibration	50g
Housing Material	Stainless Steel Housing and Sensing Face
Sensing Face Pressure	350Bar
Connection	4 Pin M12 Connector
Weight	Approx. 25g

Wiring Diagram

Cable Connection

Brown: VCC
Blue: GND
Black: OUT

M12 Connector Connection

1: VCC
2: N/D
3: GND
4: OUT



Features

- Magnetolectric Principle
- Speed detection of metal toothed wheels
- 10... 10000Hz Wide switching frequencies
- -30°C ... +130°C operating temperature
- Built-in electric protection

Working Diagram



Diameter	M10	M12	M12	M16	M22
Dimension(mm)					
PN	SM1090T3A	SM1250T3A	SM1265T3B	SM1665T3B	SM2261T3A

Working Principle	Magnetolectric
Output Signal	Single channel, app. Sine-wave to involute gears, app. Square-wave to orifice plate
Output Mode	2-Wire
Working Voltage Range	No need for external power supply
Power-off Status Memory Function	No
Direction Detection	No
Switching Function	NO, NC
Residual Ripple	<5%
Tolerance	± 1pulse
Hysteresis	<10%
Sensing Distance	0.2 ... 1mm(Different Modulus has an influence on the sensing range)
Operating Distance	0.5mm
Mounting Orientation	No orientation is required
Target Sensing Object	Ferrous Metal
Frequency	10...10000Hz
Minimum Gear Module	>0.5
Supply Current	/
Output Current	/
Insulation Resistance	/
Output Indicator	Yellow LED
Electrical Protection	/
Ambient Humidity	<95% RH
Temperature Limit	-30°C~+130°C
Protection Degree	IP66/IP67/IP68
EMC	IEC 6094752 Part 7.4.1 and Part 7.4.2
Shock	30g@11ms
Vibration	50g
Housing Material	Stainless Steel Housing and Sensing Face
Sensing Face Pressure	10Bar
Connection	3m PVC Cable / M16 Connector
Weight	Approx. 25...165g

Wiring Diagram

2-Wire

