

SPEED SENSORS

- BRS** = for toothed wheels, single output, aligned mounting
- BRUS** = for toothed wheels, single output, non aligned mounting
- BRDS** = for toothed wheels, double output A+B, aligned mounting
- DSD** = with integrated control in d.c.
- ASD** = with integrated control in a.c.

Diameter

- X** = sensor with stainless steel housing

BRS	18	X/	4	6	0	9	KJ	-5
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- 3** = with connector M12 x 1
- 6** = standard type cable output
- *** = male connector cabled on sensor (see pag. H-1)

- 0** = 1 output
- 2** = 2 outputs A+B

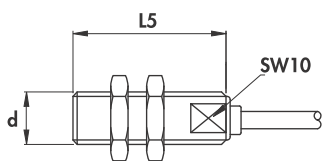
- 8** = NPN with pull-up resistor
- 9** = PNP with pull-down resistor

- J** = degree of protection IP68
- K** = protection against short circuit and overload
- T** = high temperatures version
- S** = LED output status

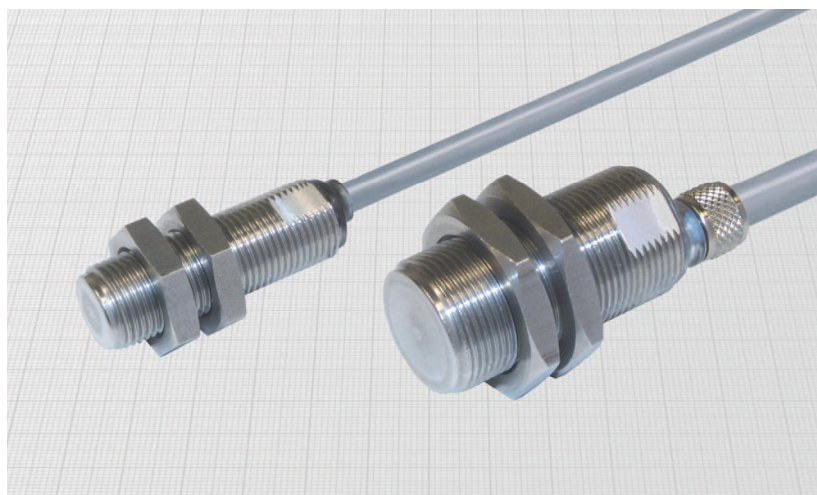
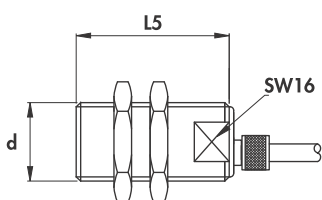
Cable length (if required different than standard 2m)

- Aligned mounting •
- For teeth ≥ 2 mm •
- Cable output •

Housing B-12



Housing B-13



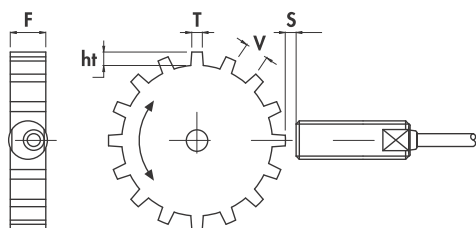
Diameter		M12 x 1	M18 x 1
Nut	Size	SW17	SW24
	Thickness mm	4	4
Max tightening torque Nm		20	50

Materials:

- Cable: 2 m thermoplastic, 300 V; O.R.
- Housing: stainless steel
- Back cap: plastic

Mounting and teeth dimension:

The sensor axis must be perpendicular to the rotation axis of the gear.
Flat faces must be parallel to the rotation plane of the gear.



Valley depth	ht	> 2 mm
Valley width	V	> 2 mm
Tooth width	T	> 2 mm
Gear thickness	F	> 3 mm
Operating distance	S	0 ± 1,5 mm

General Features:

This sensor allows the detection with extremely high precision of the rotation of a ferrous toothed wheel and reference marks. The frequency of the digital output signal is proportional to the rotation speed starting from zero. The output is open collector. The extremely strong construction allows the use in the most difficult conditions even with high pressures on the housing.

The sensor must be aligned to the rotation axis of the wheel.

Technical data:

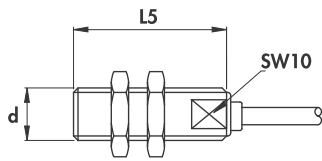
- Supply voltage (U_B): 8 ÷ 30 Vdc
- No-load supply current (I_0): ≤ 20 mA
- Voltage drop (U_d): $\leq 0,6$ V
- Temperature range: -40 ÷ +120°C
- Degree of protection: IP68
- Max pressure on front side: 150 bar
- Protected against short-circuit and overload
- Protected against any wrong connection
- Electromagnetic compatibility (EMC) according to EN60947-5-2
- Shock and vibration resistance according to EN60068-2-27 EN60068-2-6
- Cable conductor cross section: 0,35 mm² on 12 mm
0,50 mm² on 18 mm

Housing	L1	L2	L3	L4	L5	Cable diameter	Body diameter (d)	Max switching frequency (f)	Rated operational current (I _e)	ORDERING REFERENCES			
										PNP		NPN	
B-12	-	-	-	-	35	4	M12 x 1	20	80	BRS12X/4609KJ	BRS12X/4608KJ		
B-13	-	-	-	-	35	5	M18 x 1	20	80	BRS18X/4609KJ	BRS18X/4608KJ		

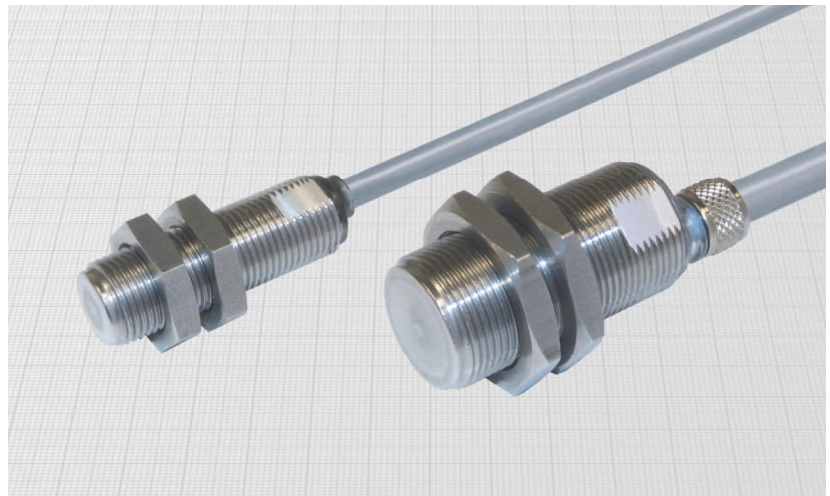
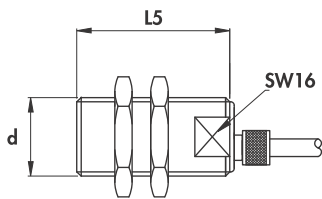
SPEED SENSORS FOR TOOTHED WHEELS

- Non aligned mounting
- For teeth ≥ 5 mm
- Cable output

Housing B-12



Housing B-13



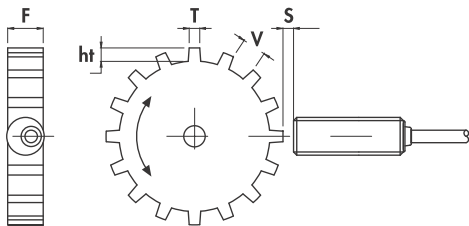
Diameter	M12 x 1	M18 x 1
Nut	Size	SW17
	Thickness mm	4
Max tightening torque Nm	20	50

Materials:

- Cable: 2 m thermoplastic, 300 V; O.R.
- Housing: stainless steel
- Back cap: plastic

Mounting and teeth dimension

The sensor axis must be perpendicular to the rotation axis of the gear. Flat faces can be at any position respect the rotation plane of the gear.



Valley depth	ht	≥ 5 mm
Valley width	V	≥ 13 mm
Tooth width	T	≥ 5 mm
Gear thickness	F	≥ 5 mm
Operating distance	S	$0 \div 1,5$ mm

General Features:

This sensor allows the detection with extremely high precision of the rotation of a ferrous toothed wheel and reference marks. Since it can detect the approaching of the target, it can also be used as proximity switch. The frequency of the digital output signal is proportional to the rotation speed starting from zero. The output is open collector. The extremely strong construction allows the use in the most difficult conditions even with high pressures on the housing. The sensor does not require any alignment to the rotation axis of the wheel.

Technical data:

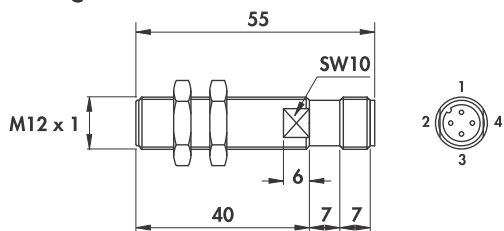
- Supply voltage (U_B): $8 \div 30$ Vdc
- No-load supply current (I_0): ≤ 16 mA
- Voltage drop (U_d): $\leq 0,6$ V
- Temperature range: $-40^\circ \div +120^\circ$ C
- Degree of protection: IP68
- Max pressure on front side: 150 bar
- Protected against short-circuit and overload
- Protected against any wrong connection
- Electromagnetic compatibility (EMC) according to EN60947-5-2
- Shock and vibration resistance according to EN60068-2-27 EN60068-2-6
- Cable conductor cross section: $0,35$ mm² on 12 mm, $0,50$ mm² on 18 mm

Housing	L1	L2	L3	L4	L5	Cable diameter	Body diameter (a)	Max switching frequency (f)	Rated operational current (I _o)	ORDERING REFERENCES	
										ORDERING REFERENCES	
										PNP	NPN
B-12	-	-	-	-	35	4	M12 x 1	25	80	BRUS12X/4609KJ	BRUS12X/4608KJ
B-13	-	-	-	-	35	5	M18 x 1	25	80	BRUS18X/4609KJ	BRUS18X/4608KJ

Double output A + B •

Connector output •

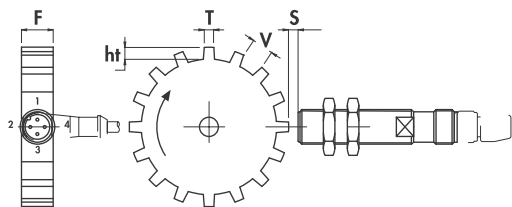
Housing B-21



Diameter	M12 x 1	
Nut	Size	SW17
	Thickness mm	4
Max tightening torque Nm	20	

Mounting and teeth dimension

The sensor axis must be perpendicular to the rotation axis of the gear.
Flat faces must be parallel to the rotation plane of the gear.



Valley depth	ht	≥ 2 mm
Valley width	V	≥ 2 mm
Tooth width	T	≥ 2 mm
Gear thickness	F	≥ 6 mm
Operating distance	S	0 ÷ 1 mm

Materials:

- Housing: stainless steel



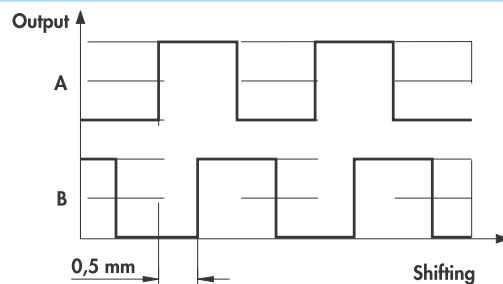
General Features:

This sensor gives two separate signals phase shifted which enables the detection of not only the rotation speed but also the direction of a ferrous toothed wheel or reference marks. The frequencies of the digital output signals are proportional to the rotation speed starting from zero. The outputs are NPN open collector. The extremely strong construction allows the use in the most difficult conditions even with high pressures on the housing. The sensor must be aligned to the rotation axis of the wheel.

Technical data:

- Supply voltage: 5 ÷ 25 Vdc
- No load supply current: ≤ 21 mA
- Voltage drop (I_o=10mA): ≤ 0,4 V
- Temperature range: - 40 ÷ +120°C
- Degree of protection: IP68
- Max pressure on front side: 150 bar
- Protected against short-circuit and overload
- Protected against any wrong connection
- Electromagnetic compatibility (EMC) according to EN60947-5-2
- Shock and vibration resistance according to EN60068-2-27 EN60068-2-6

Output Signals

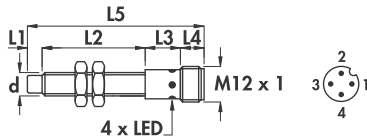


Housing	L1	L2	L3	L4	L5	Cable diameter	Body diameter (d)	Max switching frequency (f)	Rated operational current (I _o)	ORDERING REFERENCES	
	mm	mm	mm	mm	mm					mm	KHz
B-21	-	-	-	-	35	4	M12 x 1	6	20		
										BRDS12X/4328KJ	

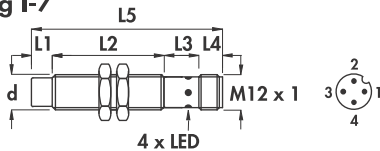
SPEED SENSORS

- Speed sensors with integrated control function
- 3-wire - d.c.
- Connector output M12 x 1

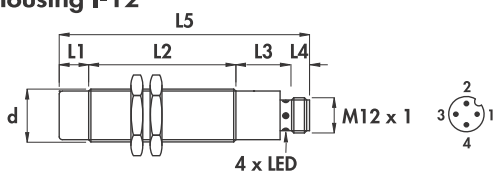
Housing I-11



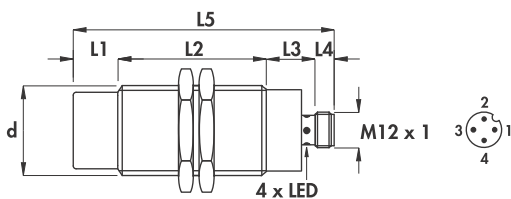
Housing I-7



Housing I-12



Housing I-2



General Features:

These sensors enable the control with extremely high precision the rotation of a toothed wheel or reference marks, switching off the load or giving an alarm in case the speed falls below the minimum threshold. Thanks to the extremely wide measuring range they can be even used to control repetitive operations, signalling in case of unwanted stops. Further delays or other special functions may be implemented upon specific request.

The output is protected against wrong connection, overvoltages on line, and short circuit of the load. The connection is with a 4-wire M12x1 connector which must be ordered separately.

Technical data:

- Working voltage: 10 ÷ 30 Vdc
- Max ripple: 10%
- No-load supply current: < 15 mA
- Rated operational current (I_o): 200 mA
- Voltage drop: < 1,5 V
- Switching hysteresis (H): < 10% S_n
- Repeat accuracy (R): < 2% S_n
- Maximum detectable interval (between two pulses): 2 min
- Detectable start-up time (T₁): 0 ÷ 1 min (default 2 sec.)
- Temperature range: -20 ÷ +70°C
- Max thermal drift of sensing distance S_n: ±10%
- Degree of protection: IP67
- Status indicator: yellow LED = out ON; frequency over the threshold
- Protected against short-circuit and overload
- Electromagnetic compatibility (EMC) according to EN60947-5-2
- Shock and vibration resistance according to EN60068-2-27 e EN60068-2-6

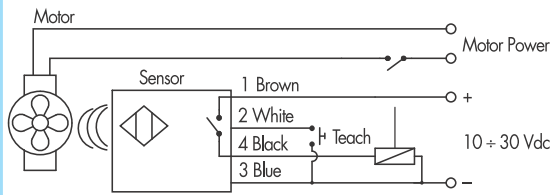
Diameter	M8 x 1	M12 x 1	M18 x 1	M30 x 1,5
Nut	Size	SW13	SW17	SW24
	Thickness mm	4	4	4
Max tightening torque Nm	10	15	35	80

Materials:

- Housing 8 mm: stainless steel
- Housing 12 - 18 - 30 mm: nickel plated brass
- Sensing face: plastic

Housing	Flush mounting Non flush mounting	L1	L2	L3	L4	L5	Female connector (see page H-1)	Body diameter (d)	Max detectable frequency	Nominal sensing distance (S _n) ± 10%	Rated operational current (I _o)	ORDERING REFERENCES	
												PNP (positive switching)	
I-11	•	-	40	12	8	60	6-8B-10	M8 x 1	1	1,5	200	DSD8/4309KS	
I-11	•	5	35	12	8	60	6-8B-10	M8 x 1	1	2,5	200	DSD8/5309KS	
I-7	•	-	43	15	8	66	6-8B-10	M12 x 1	1	2	200	DSD12/4309KS	
I-7	•	7	36	15	8	66	6-8B-10	M12 x 1	1	4	200	DSD12/5309KS	
I-12	•	-	50	19	8	77	6-8B-10	M18 x 1	1	5	200	DSD18/4309KS	
I-12	•	10	50	19	8	87	6-8B-10	M18 x 1	1	8	200	DSD18/5309KS	
I-2	•	-	65	17	8	90	6-8B-10	M30 x 1,5	0,8	10	200	DSD30/4309KS	
I-2	•	15	50	17	8	90	6-8B-10	M30 x 1,5	0,4	15	200	DSD30/5309KS	

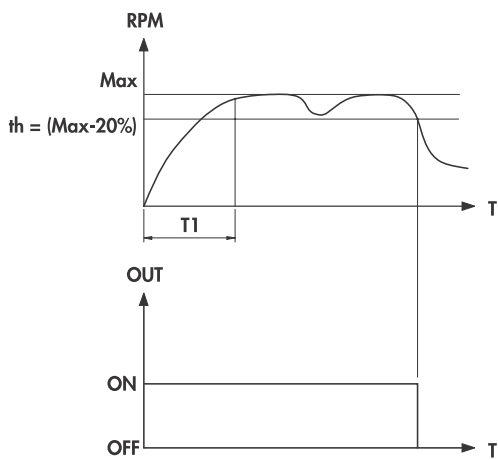
Example of application



Use of the sensor:

On power on, the yellow LED lights and the output switches to the ON state, driving the relay, which will drive the motor. After a start up delay time (T1) the sensor measures the speed of the motor and compares it to the threshold value. If the speed is under the threshold value, the output goes OFF, turning off the LED. The minimum threshold can be either factory preset or can be programmed from the sensor application with no need to perform any measurement.

Procedure 1



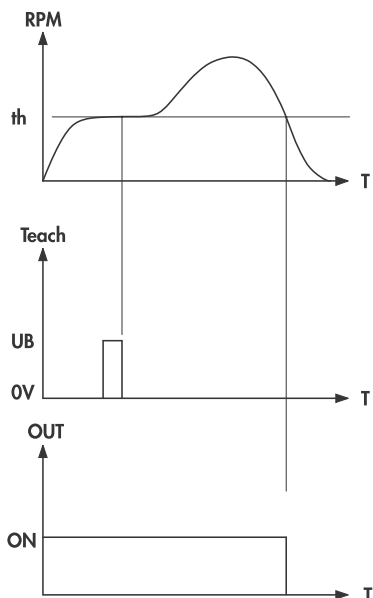
Threshold self-teaching procedure:

There are two different ways to perform the self-teaching of the threshold:

1- Acquisition of start up time and calculation of the threshold from the maximum speed:

- a) connect the Teach input (white) to the positive of power supply (brown) before turning on the power
- b) Turn on the power supply to the machine and to the sensor and wait the speed gets the nominal value. The yellow LED will flash 4 times to indicate the acquisition complete
- c) Turn off the power supply
- d) At this stage the sensor has acquired the start up time (T1) and calculated the threshold as the maximum value of the speed reduced of -20%
- e) Disconnect the Teach in from the positive of power supply before running the machine again.

Procedure 2



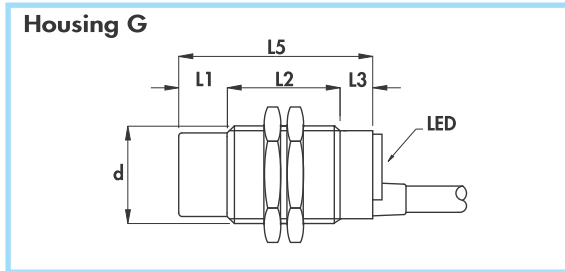
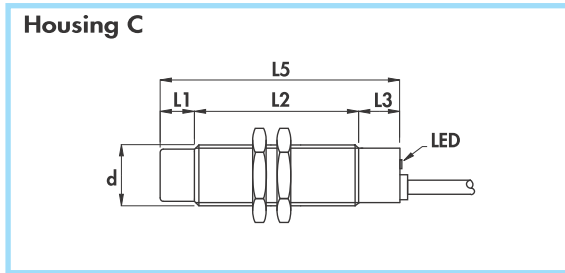
2 - Acquisition of a known threshold (start up time is not modified):

- a) Turn the power supply on to the machine and sensor and accelerate to the speed you want to get as threshold (th)
- b) Connect temporarily the Teach input (white) to the positive of power supply. This operation can be easily done with a push-button on the operator panel of the machine.
- c) At this stage the current speed becomes the minimum threshold (th), under of which the sensor goes in OFF state.

Both of the procedures can be repeated unlimited times.

SPEED SENSORS

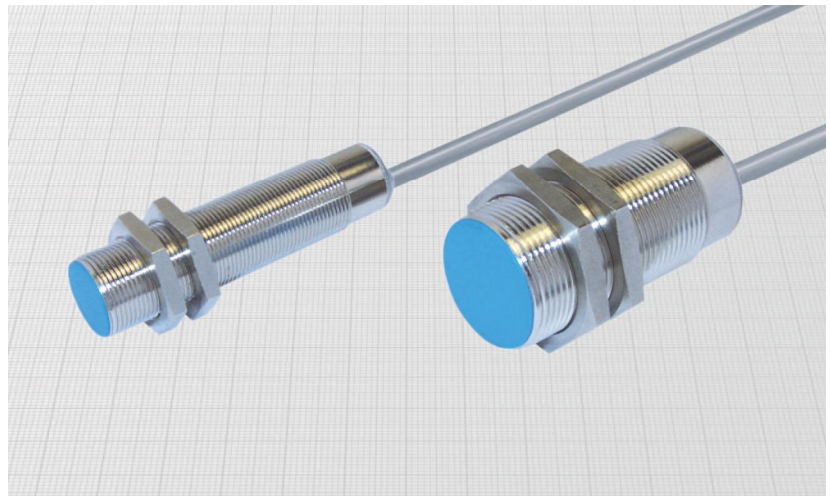
- Speed sensors with integrated control function
- 2-wire - a.c.
- Cable output



Diameter	M18 x 1	M30 x 1,5
Nut	Size	SW24
	Thickness mm	4
Max tightening torque Nm	35	80

Materials:

- Cable: 2m PVC - CEI 2022 II- 90°C 300V.O.R.
- Housing: nickel plated brass
- Sensing face: plastic



General Features:

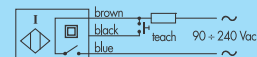
These sensors enable the control with extremely high precision the rotation of a toothed wheel or reference marks, switching off the load in case of the speed falls below the minimum threshold. Thanks to the extremely wide measuring range they can be even used to control repetitive operations, signalling in case of unwanted stops. They are able to drive directly a.c. relays from 90 to 240 Vac with no need external power supply or amplifiers.

Further delays or other special functions may be implemented upon specific request. The output is protected against wrong connection, overvoltages on line, and short circuit of the load.

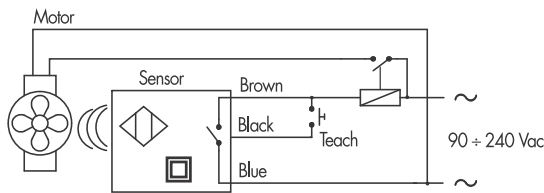
Technical data:

- Working voltage: 90 ÷ 240 Vac
- Electrical system frequency: 40 ÷ 60 Hz
- Off-state current at 220 V: < 2,2 mA
- Minimum operational current: 8 mA
- Voltage drop: < 8V
- Switching hysteresis (H): < 10% S_n
- Repeat accuracy (R): < 2% S_n
- Maximum detectable interval (between two pulses): 2 min
- Detectable start-up time (T₁): 0 ÷ 1 min (default 2 sec.)
- Temperature range: -20 ÷ +70°C
- Max thermal drift of sensing distance S_n: ±10%
- Degree of protection: IP67
- Cable conductor cross section: 0,50mm²
- Status indicator: yellow LED = out ON; frequency over the threshold
red LED = out OFF; frequency under the threshold
blinking red LED = out OFF; short circuit on the output
- Protected against short-circuit and overload
- Class 2 equipment according to EN61140
- Shock and vibration according to EN60068-2-27 EN60068-2-6
- Electromagnetic compatibility (EMC) according to EN60947-5-2

Housing	Flush mounting Non flush mounting	L1	L2	L3	L4	L5	Cable diameter	Body diameter (d)	Max detectable frequency	Rated operational current (I _e)	Nominal sensing distance (S _n) ± 10%	ORDERING REFERENCES
		mm	mm	mm	mm	mm						
C	•	-	58	12	-	70	5	M18 x 1	800	200	5	ASD18/4609KS ASD18/5609KS
C	•	10	48	12	-	70	5	M18 x 1	400	200	8	
G	•	-	50	10	-	60	6	M30 x 1,5	400	200	10	ASD30/4609KS ASD30/5609KS
G	•	15	35	10	-	60	6	M30 x 1,5	200	200	15	



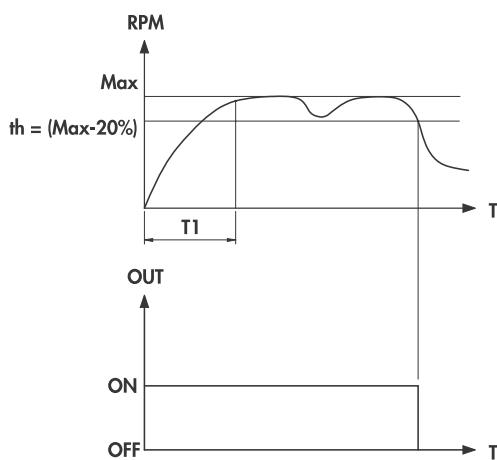
Example of application



Use of the sensor:

On power on, the yellow LED lights and the output switches to the ON state, driving the relay, which will drive the motor. After a start up delay time (T1) the sensor measures the speed of the motor and compares it to the threshold value. If the speed is under the threshold value, the output goes OFF, giving an alarm indication with the red LED. The minimum threshold can be either factory preset or can be programmed from the sensor application with no need to perform any measurement.

Procedure 1



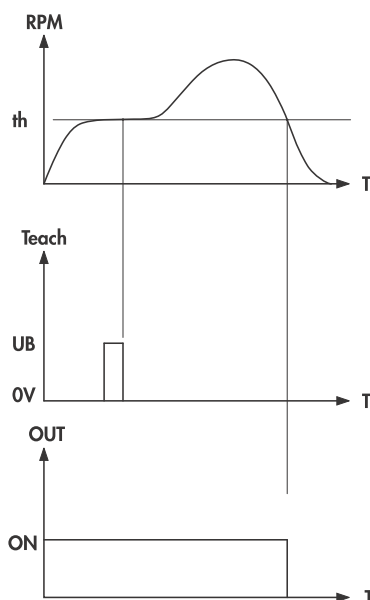
Threshold self-teaching procedure:

There are two different ways to perform the self-teaching of the threshold:

1 - Acquisition of start up time and calculation of the threshold from the maximum speed:

- a) connect the Teach input (black) to the brown before turning on the power
- b) Turn on the power supply to the machine and to the sensor and wait the speed gets the nominal value
- c) Turn off the power supply
- d) At this stage the sensor has acquired the start up time (T1) and calculated the threshold as the maximum value of the speed reduced of -20%
- e) Disconnect the Teach in from the brown wire before running the machine again.

Procedure 2



2 - Acquisition of a known threshold (start up time is not modified):

- a) Turn the power supply on to the machine and sensor and accelerate to the speed you want to get as threshold (th).
- b) Connect temporarily the Teach input (black) to the brown wire. This operation can be easily done with a push-button on the operator panel of the machine.
- c) At this stage the current speed becomes the minimum threshold (th), under of which the sensor goes in OFF state.

Both of the procedures can be repeated unlimited times.