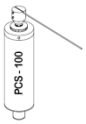
NORDMANN

TOOL MONITORING
AND PROCESS CONTROL

Positive Contact Sensor PCS-100

SPECIFICATIONS:

Sensor PCS-100



Housing Matl.:	stainless steel
Diameter:	D = 28 mm / L = 120mm
Needle:	spring steel1.4310 D = 1,2 mm / L = 140 mm
Weight:	370 g

Plug PCS-1016

Material:	Polycarb , alu (oil-resistant)
	Plug (PCS-1016)
Cable:	5 m
	4 x 1,5 mm^2 with Shield

Control Unit SCU-100

Input:	24VDC, 250mA
Relay Outputs:	2A, 250VAC (*general use)*

Ambient Temp:	55°C
Wiring Terminals:	18-14AWG
	stranded copper wire only,
	7 lb/in Torque. One wire per terminal.
Housing Matl.:	Polycarb UL94V1
Terminal Matl.:	Polycarb UL94V2
Mounting:	35mm DIN Rail

SCU-100
Terminal Description

Terminals 1 & 2: The SCU operates with 24VDC, note that terminal 1 is + and terminal 2 is - . This unit requires a minimum supply of 250 mA. When powering the SCU with an existing 24VDC power supply, confirm that the supply is capable of additional output capacity to power the SCU.

Terminals 3 & 4: Not used.

Terminals 5, 6, 7 & 8: Sensor cable connection, as indicated. The preferred method is to connect the cable directly from the sensor to the SCU. If the SCU and sensor need to be connected via external junction box, avoid wiring near electromagnetic
or high current devices.
DO NOT connect the braided shield in the supplied sensor cable to the machine ground !

Terminals 9 & 10: are dry contacts (internal relay) capable of switching 2A @ 250 VAC. The contact operation can be configured eliminating peripheral devices for interfacing the SCU.

Terminals 11 & 12: are dry contacts (internal relay) capable of switching 2A @ 250 VAC. The contact operation can be configured eliminating peripheral devices for interfacing the SCU

Terminal 13: Is used to reset the SCU after a fault condition has been detected. The required input is + 24VDC for a minimum of 100mS. (OPTIONAL)

Terminals 14, 15 & 16 are used to activate the checking sequence when required in your application. T-16 is the common for either a 115VAC start signal (T-14) or a 24VDC start signal (T-15). The SCU recognizes a change of state in the circuit to activate the checking sequence. A minimum duration of 100mS is required regardless of the of the signal utilized, (HI – LO – HI) or (LO – HI – LO).

OK LED
The OK LED will illuminate at power on. When a start signal is initiated the LED will momentarily turn off. If a good condition has been detected the LED will again illuminate.

FAULT LED
When a fault or broken tool condition is detected the FAULT LED will illuminate until the unit is reset
CW / CCW Switch. This switch selects the rotation of the sensor. This setting must correspond with the knurled adjustment on the sensor.

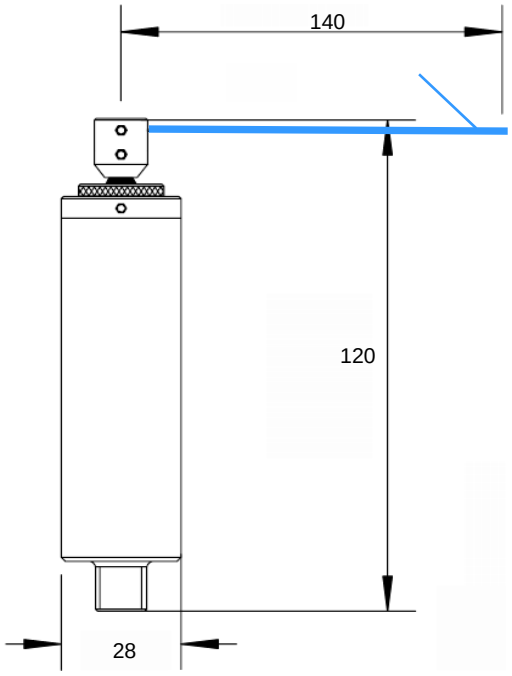
LO / HI Switch
Selects the rate at which the sensor swings. “LO” rate is a slower swing rate generally used for micro tool detection. NOTE: The Vseal in the swing arm assembly may interfere with the sensors motion when the swing rate is set on “LO”. If your application does not allow “HI” rate operation, remove the V-seal from the assembly.

Time Switches
These switches control the amount of time the sensor rotates during the scanning sequence. Since it takes a greater amount of time to swing the sensing needle 180º than 90º, a greater amount of time needs to be set. If the sensor will not reach its end or fault position with the tool removed simply set more time. These switches are accumulative. All 3 switches in the on position represent the longest
amount of time. The sensor will not swing if a time selection has not been made.

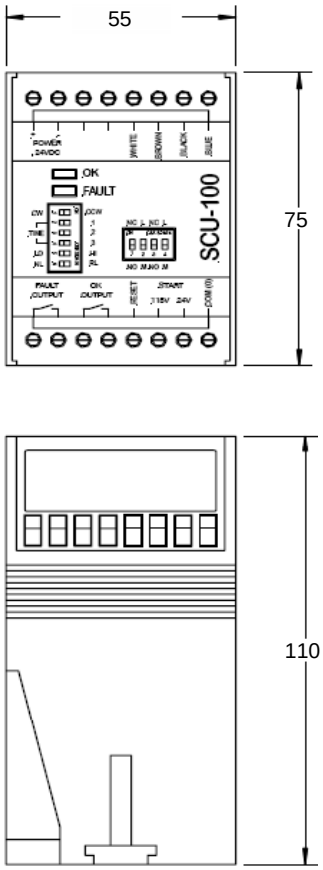
NL/RL Switch
Selects the units operational mode and logic.
NL= Normal logic RL= Reverse logic (free space monitoring)

Oder Number:	
PCS-100	10 .1
SCU-100	10 .3
PCS-1016	10 .5

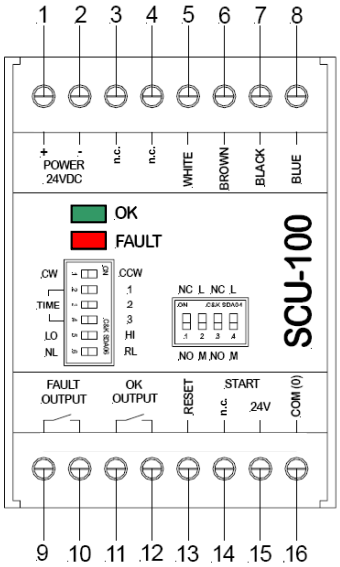
PCS-100
(Order Number 10.1)

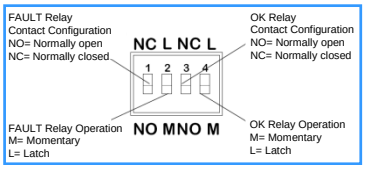


SCU-100
(Oder-Number 10.3)

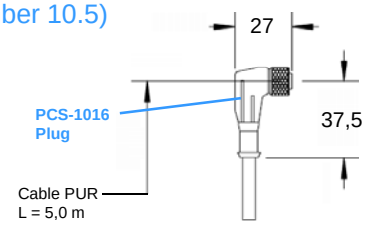


SCU-100
(Oder-Number 10.3)

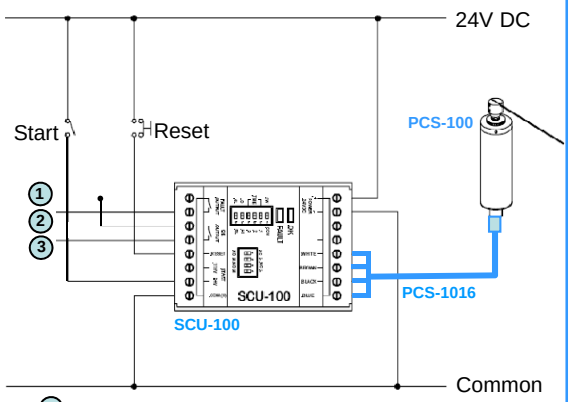




PCS-1016
(Order Number 10.5)



Wiring diagram



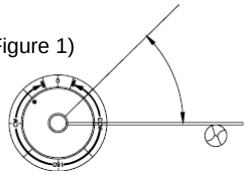
Nordmann GmbH & Co. KG • Kalscheurener Str. 8 • D-50354 Hürth
☏ +49(0) 2233/9688-0 • 🖷 +49(0) 2233/9688-22
Web: www.nordmann.eu • E-Mail: info@nordmann.eu

Nordmann International GmbH • Huobstrasse 10 • CH-8808 Pfäffikon
☏ +41(0) 55/4101500 • 🖷 +41(0) 55/4106462
Web: www.nordmann.eu • E-Mail: international@nordmann.eu

PCS-100 Installation

The Positive Contact System consists of two main components; a Positive Contact Sensor (PCS) and a Sensor Control Unit (SCU).The control unit is mounted in the machine electrical cabinet, while the sensor is mounted in close proximity to the tool which is to be monitored. The sensor monitors the tool presence by light physical contact of the tool tip with the sensing needle assembly. If the tool is present at the specific station, the needle will contact the tool tip and return to its starting position. The machine cycle will then be allowed to continue. If the tool is broken, the needle will swing past the broken tool to its complete swing angle stop. This condition will immediately be interpreted as a fault condition, and the control unit sends the appropriate stop output to the machine control.

(Figure 1)



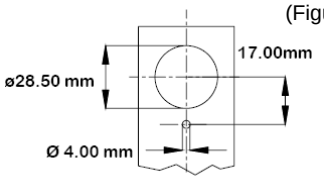
Determine The Mounting Position

Determine where you wish to mount the PCS sensor. This will depend on the space available and the tooling configuration of your machine. The variables are listed below.

a) Preference for clockwise (CW) or counter clockwise (CCW) swing direction.

b) Swing angle (see fig. 1) The most common swing angle selection is 45º to 90º. ~180º of swing is available in either swing direction.

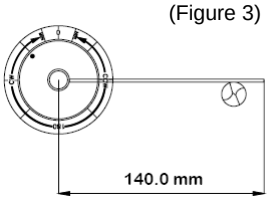
(Figure 2)



c) You will need to fabricate a mounting bracket that will hold the sensor in place. If you will mount the sensor using the clamping collar provided, drill holes in the bracket per figure 2.

d) The standard sensing needle length is shown in figure 3. You may use either a longer (up to 8") or shorten the standard sensing needle to your application.

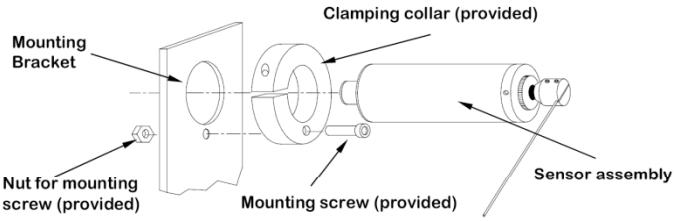
(Figure 3)



Note: If a straight sensing needle does not suit your needs, the sensing needle may be bent into any desired configuration.

Mount the Clamping Collar to the bracket

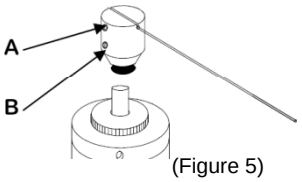
The clamping collar holds the PCS sensor body and allows for attachment to the mounting bracket fabricated by the customer according to the application. Below is a typical mounting example.



(Figure 4)

Loosen and remove the sensing needle assembly

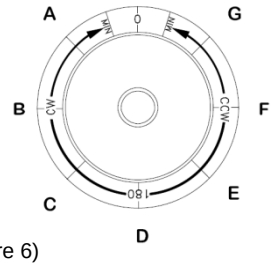
Loosen the 1.5mm set screw "B" on the sensing needle assembly and slide the assembly off the sensor. (Figure 5)



(Figure 5)

Set swing direction and angle

The PCS sensor features a 180º adjustable swing angle in either a CW or CCW direction. The sensor can be preset at the factory to your specifications. If you did not specify a swi angle in your order, the sensor is set to a 90º CW swing. CW or CCW is established by looking at the sensing needle straight on (looking at the adjusting ring). The ring is divided into 45º increments. (See fig. 6))

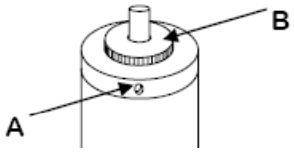


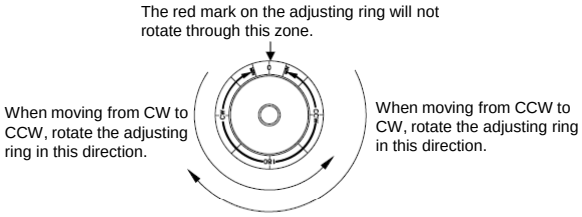
A = CW 45°
B = CW 90°
C = CW 135°
D = CW/CCW180°
E = CCW 135°
F = CCW 90°
G = CCW 45°

(Figure 6)

PCS-100 Installation

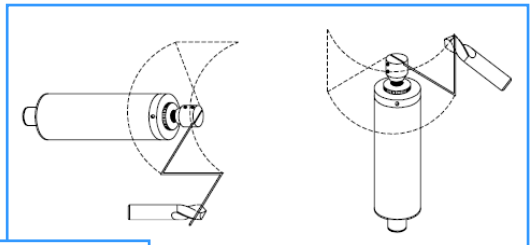
To change the swing angle or swing direction loosen the set screw “A” until the knurled adjusting ring “B” can be manually rotated. Note that the knurled ring has a red mark. Turn the knurled ring to the desired swing angle in either CW or CCW field. If you are changing from CW to CCW or from CCW to CW, always move away from the zero zone and PAST the 180º mark, (~5°). Once you have passed the 180º mark, the sensor will operate in the CW or CCW field it is in. The knurled ring will not move through the zero zone. Once the desired swing angle and direction are set, tighten set screw “A”.





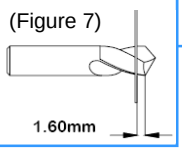
Mount the sensor in the bracket.
Slip the PCS sensor into and through the bracket assembly. Connect the power cable to the sensor and then rotate the sensor in the bracket so the connector points in the desired direction. Be sure the cable is properly positioned to avoid any interference with the machine operation. Note: If the cable needs to be repositioned while attached to the sensor, rotate the entire sensor to avoid damage to the connector.

Reinstall the sensing needle assembly but do not fasten it. Move the sensor body forward or back so the needle will contact the tool according to the sketch in figure 7. Once the sensing needle assembly is properly located, tighten the clamping collar fastener to secure the sensor to the bracket. Remove the sensing needle assembly.



Alternative Mounting Examples

(Figure 7)

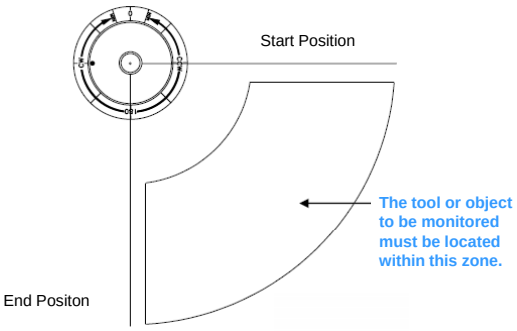


Install the Sensor Control Unit. (SCU)
Install the SCU-100 in the electrical cabinet according to the installation instructions. If you have specified a supply voltage of 115V an additional power supply has been included. The power supply is not required for 24VDC operation.

Set CW or CCW selector switch on the SCU
If you have selected a CW or CCW swing direction on the sensing head, flip the selector switch on the SCU to the corresponding setting.

Supply power to the SCU
Once power has been supplied to the SCU, the sensor will rotate to its starting position.

Re-install the sensing needle assembly
Re-install and fasten the sensing needle assembly so that the sensing needle will contact the tool anywhere between the starting position of the needle and the end position of the needle.



Check your installation:
Cycle the PCS sensor. If the sensing needle assembly is installed properly, the needle will contact the tool tip and return to its starting position. The green “OK” LED on the SCU will illuminate . Now, remove the tool and initiate another start input. The needle should travel through its full swing angle to the end stop. This simulates a broken tool condition. The red “FAULT” LED on the SCU should be illuminated.