



1. Task

Robots are frequently used – in particular in the automotive industry – with exchangeable tools. Since the tool change procedure may not delay or even interrupt the production process, the interface between robot arm and tool has to be constructed in such a way that this change can be accomplished easily and quickly. So-called multi-couplings for supply voltages, control signals, pneumatics and hydraulics help to facilitate this process.

The mechanical connection between robot arm and tool is usually done by gripping a bolt, which is attached to the tool. The grip mechanism is activated and the pin is seized by triggering a pneumatic cylinder. The reversing of the pneumatic cylinder again causes the tool to be put back in place.

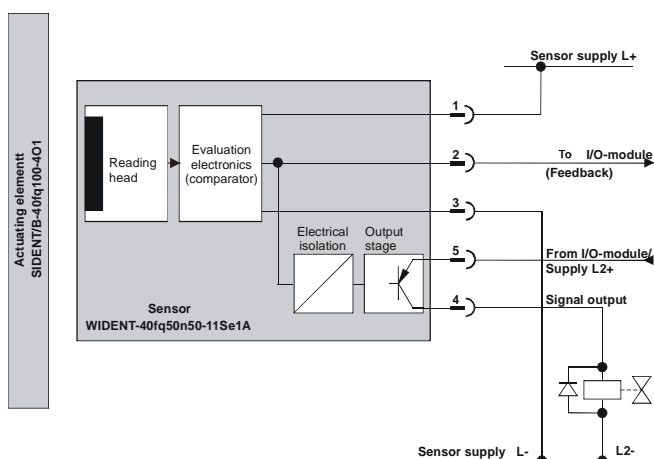
The compressed air supply, which is necessary for the grip mechanism, has to be available only during the coupling and uncoupling procedure. For safety reasons it has to be switched-off during the use of the tool, so that an inadvertent throwing-off is prevented. For this, a pneumatic valve is connected before the grip mechanism, which is activated only during the coupling and uncoupling procedure. This means that the pneumatic valve is activated only within a limited range.

The detection system described above fulfils this task. In addition, it is able to minimise the risk of this safety mechanism possibly being switched off or bridged for negligence or time reasons. The actual sensor is attached at that part of the coupling, which is fixed at the robot arm. The sensor is only activated if it is brought together with the corresponding actuating element, which is mounted at the “silence part” of the tool.

The detection system WIDENT is based on the transponder technology which works with the identification principle. This means that always only one certain actuating element, which has received a defined code, is able to activate the sensor. The operating range of the actuating element is approx. 40 mm x 60 mm, with a recommended distance of approx. 30 mm between sensor and actuating element.

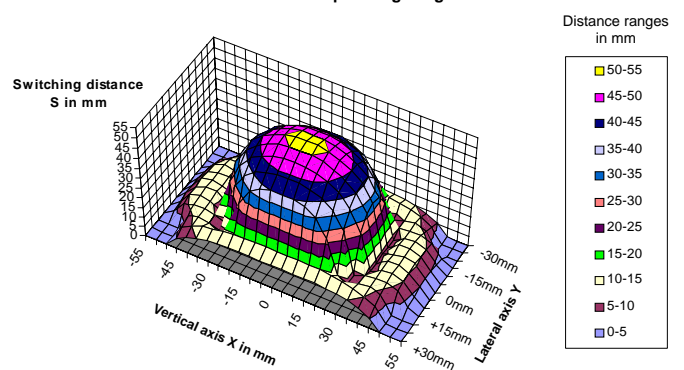
The sensor has got two outputs: The first output transmits the status feedback via an external field bus module, the second output, which is electrically isolated from the first one, triggers the pneumatic valve, which activates the compressed air supply of the grip mechanism.

2. Block circuit diagram and connection

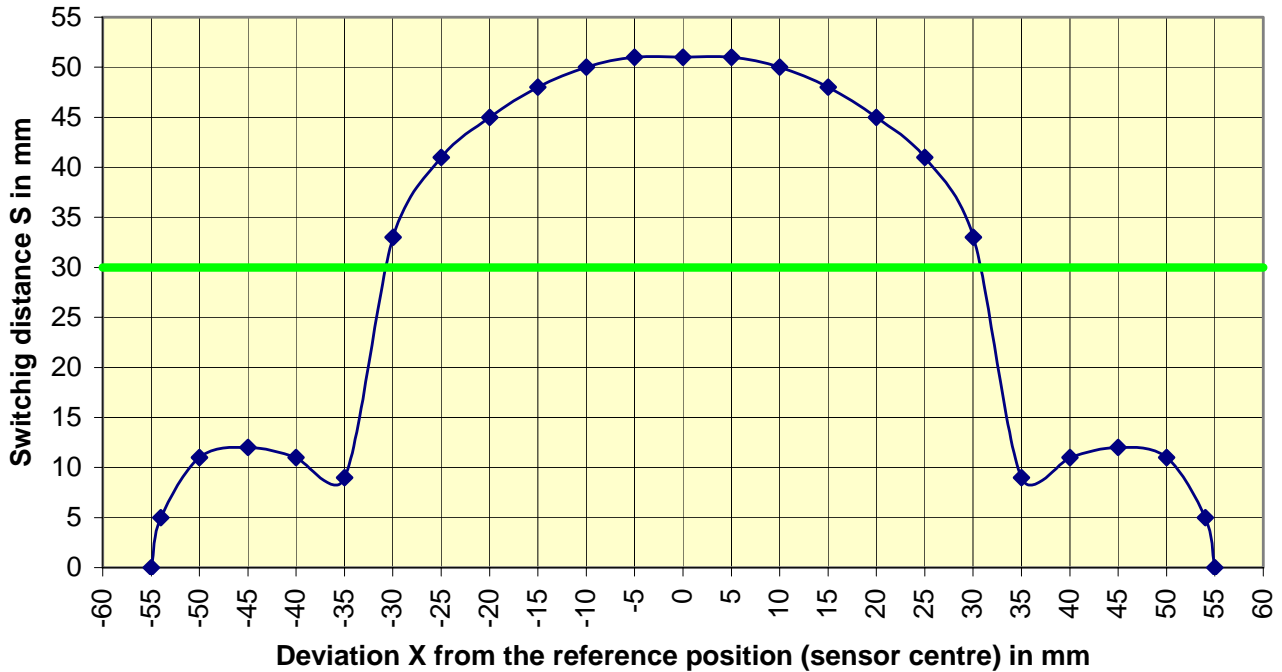


3. Operating range of the actuating element

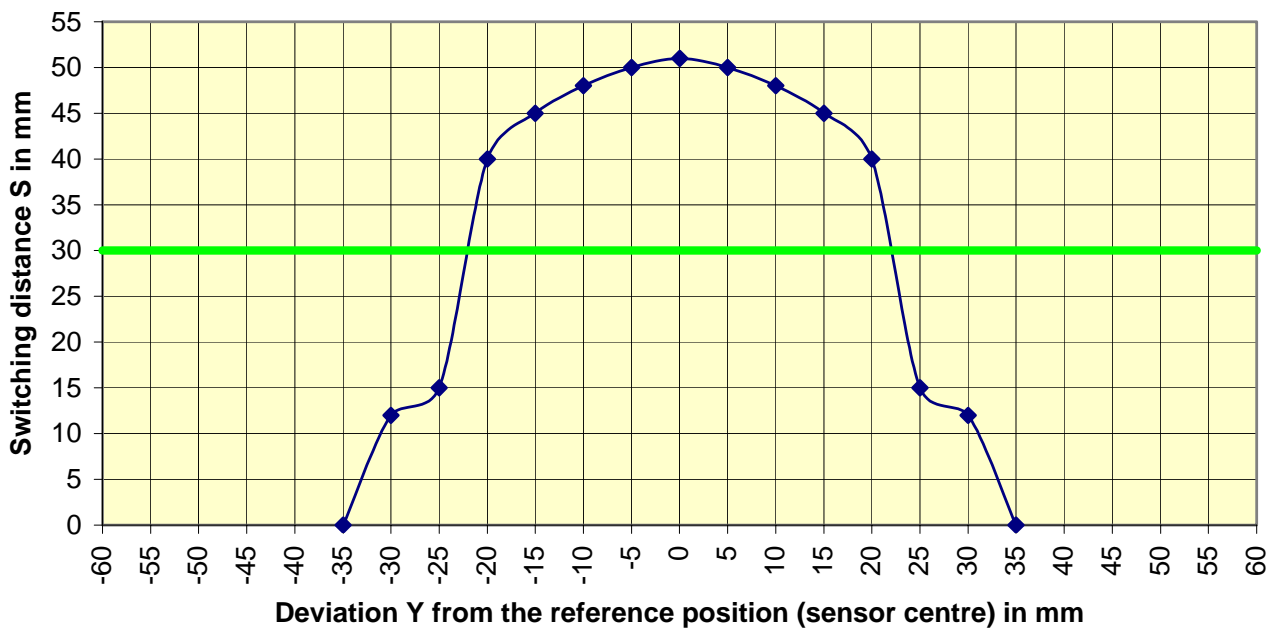
Three-dimensional schematic of the operating range



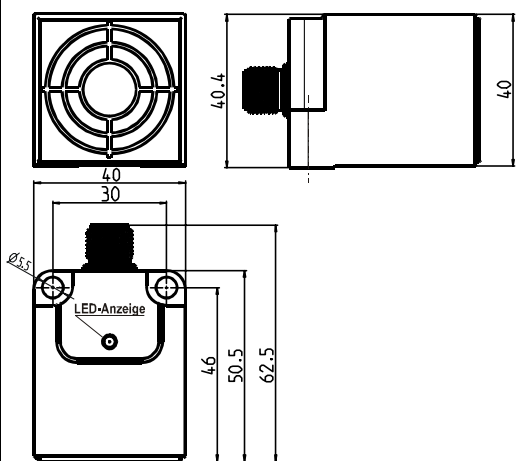
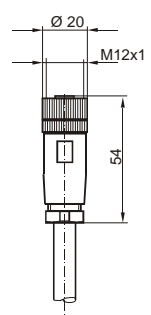
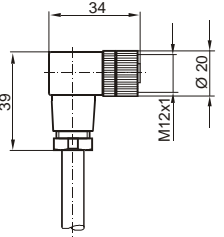
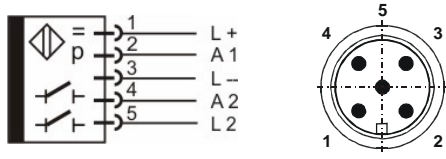
Switching distance in the longitudinal axis



Switching distance in the lateral axis (vertical to the longitudinal axis)



4. Technical data

Designation	Sensor	Connecting lead	Connecting lead
Type	WIDENT-40fq50n50-11Se1A	VLG5E/6/X-1	VLG5E/6/X-2
Ident. no.	13.28-06	20.18-58	20.18-59
Switching distance, hysteresis	approx. 50 mm (with 13.14-68), 10%	-	-
Assured switching-off distance	70 mm	-	-
Shape, housing material	rectangular 40 x 40 x 50 mm, PA radiation cross-linked	straight, plastic	angled, plastic
Installation	non-flush	-	-
Connection	plug, 5-pole, M12	socket, 5-pole, M12	socket, 5-pole, M12
Max. permissible lead length	300 m, with/without shield	-	-
Ambient temperature range	-30 ... +70 °C	-30 ... +70 °C	-30 ... +70 °C
Protection rating, weight	IP 67, 150 g	IP 67	IP 67
Protective insulation <input type="checkbox"/>	protection class II conform IEC 947	protection class II	protection class II
Dimensions			
Connection diagram, colour of wires		1: brown 2: white 3: yellow 4: green 5: grey unshielded lead	1: brown 2: white 3: yellow 4: green 5: grey unshielded lead
Identification	via 6-digit numeric code	-	-
Supply voltage range L+	15 ... 24 ... 30 VDC	-	-
Operating mode output A1	NO (3-pole)	-	-
Current consumption from L+	< 45 mA	-	-
Output voltage A1	typ. UL+ -1.75 V (100 mA)	-	-
Input voltage L2+	12 ... 24 ... 30 VDC	-	-
Operating mode output A2	NO (2-pole)	-	-
Output voltage A2	typ. UL2 -2.5 V (100 mA)	-	-
Output current A1, A2	< 400 mA per output	-	-
Actuating time	typ. 10 ms	-	-
Voltage drop-out time (pulse stretching)	typ. 200 ms	-	-
Switch-on delay	after voltage supply approx. 1 s	-	-
Max. operating frequency	1 Hz	-	-
Display	1 x identification (green)	-	-
Rev. polarity, interference prot.	installed	-	-

Designation	Actuating element
Type	SIDENT/B-40fq100-4O1
Ident. no.	13.14-68
Shape, housing material	rectangular 40 x 25 x 100 mm, PA radiation cross-linked
Installation	metal parts beside or behind the actuating element are permissible, but may affect the operating range
Ambient temperature range	-30 ... +70 °C
Protection rating, weight	IP 67, 125 g
Protective insulation ☐	protection class II conform IEC 947
Dimensions	
Identification	via 6-digit numeric code
Configuration	transponder

5. Order designations

WIDENT-40fq50n50-11Se1A

Switch for the use with
tool changer coupling systems for robots

Ref. no. 13.28-06

SIDENT/B-40fq100-4O1

Actuating element for the use with
tool changer coupling systems for robots

Ref. no. 13.14-68

VLG5E/6/X-1

Connecting lead,
5-pole socket with straight outlet
Please indicate lead length X when placing the order
(standard length X=5 m)

Ref. no. 20.18-58

VLG5E/6/X-2

Connecting lead,
5-pole socket with angled outlet
Please indicate lead length X when placing the order
(standard length X=5 m)

Ref. no. 20.18-59

We are certified according to DIN EN ISO 9001
Subject to changes!