

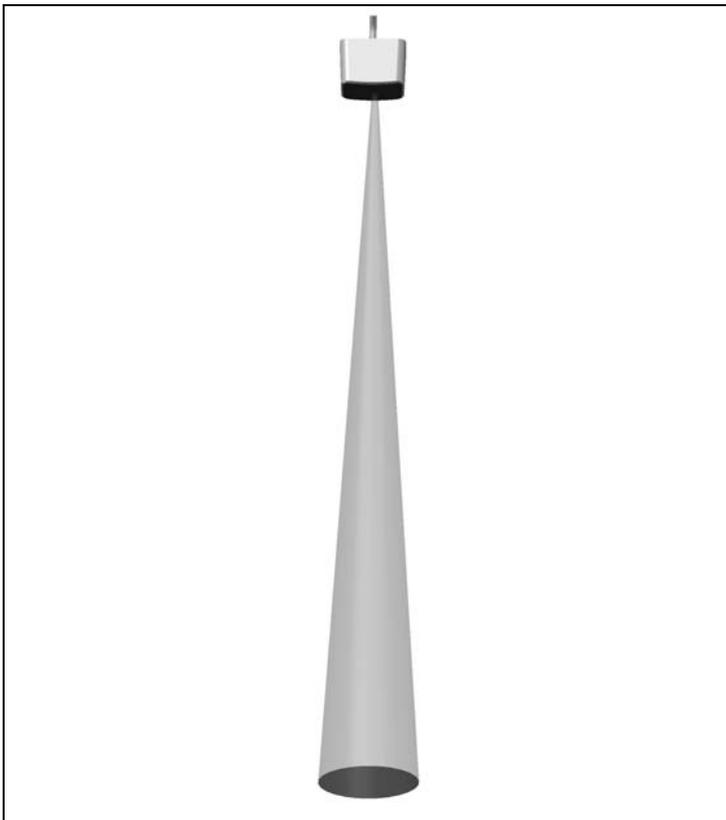
# CEDES

Installation and Operation Manual

## TLS 500

**... small, compact, versatile**

English



### **IMPORTANT NOTE**

**FOLLOW THE INSTRUCTIONS GIVEN IN THIS MANUAL CAREFULLY. FAILURE TO DO SO MAY CAUSE CUSTOMER COMPLAINTS AND SERIOUS CALLBACKS. KEEP INSTRUCTION MANUAL ON SITE.**

**⚠ IMPORTANT INFORMATION ⚠**

THE TLS 500 SHOULD ONLY BE INSTALLED BY AUTHORIZED AND FULLY TRAINED PERSONNEL! ALL INSTRUCTIONS IN THIS MANUAL AND IN THE RELATED DOCUMENTS HAVE TO BE FOLLOWED AND FULLY COMPLIED WITH. IN ADDITION, THE INSTALLER IS REQUIRED TO COMPLY WITH ALL LOCAL LAWS AND STANDARDS. SHOULD ANY OF THESE INSTRUCTIONS NOT BE CAREFULLY FOLLOWED, SERIOUS INJURY OR DEATH MAY OCCUR. THE INSTALLER OR SYSTEM INTEGRATER IS FULLY RESPONSIBLE FOR THE SAFE INTEGRATION OF THE SENSOR. IT IS THE SOLE RESPONSIBILITY OF THE PLANNER AND/OR INSTALLER AND/OR BUYER TO ENSURE THAT THIS PRODUCT IS USED ACCORDING TO ALL APPLICABLE CODES AND STANDARDS IN ORDER TO ENSURE SAFE OPERATION OF THE WHOLE APPLICATION.

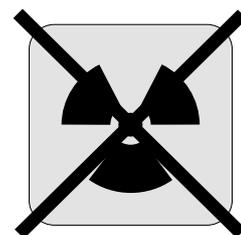
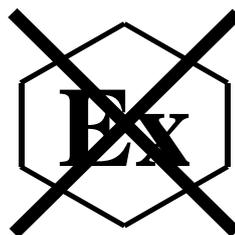
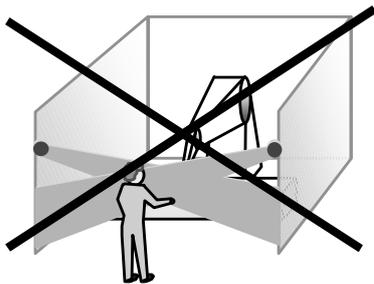
ANY ALTERATIONS TO THE DEVICE BY THE BUYER, INSTALLER OR USER MAY RESULT IN UNSAFE OPERATING CONDITIONS.

CEDES AG IS NOT RESPONSIBLE FOR ANY LIABILITY OR WARRANTY CLAIM WHICH RESULTS FROM SUCH MANIPULATION.

**THE TLS 500 MAY NOT BE USED FOR:**

- THE SAFEGUARDING OF DANGEROUS MACHINES
- EQUIPMENT IN EXPLOSIVE ATMOSPHERES
- EQUIPMENT IN RADIOACTIVE ENVIRONMENTS

USE ONLY SPECIFIC AND APPROVED SAFETY DEVICES FOR SUCH APPLICATIONS, OTHERWISE SERIOUS INJURY OR DEATH OR DAMAGE TO PROPERTY MAY OCCUR!



Original version - Installation and operation manual

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**Content**

**1. Introduction ..... 3**

1.1. Functionality ..... 3

1.2. Features ..... 3

1.3. Type definition ..... 3

**2. Installation ..... 3**

2.1. Dimensions ..... 3

2.2. Setup ..... 4

2.3. Configuration (VR- and P-types only) ..... 4

**3. Electrical connection & output signals .. 5**

3.1. Connection diagram ..... 5

3.2. Output signals ..... 5

3.3. Test Input ..... 5

**4. Start-Up and LED status ..... 5**

4.1. Start-Up ..... 5

4.2. LED status ..... 5

**5. Maintenance and Disposal ..... 6**

5.1. Maintenance ..... 6

5.2. Disposal ..... 6

**6. Technical data ..... 6**

**7. Ordering information ..... 7**

**8. Certificates ..... 8**

8.1. CE certificate ..... 8

**1. Introduction**

The TLS 500 measures the reflection from objects compared with background reflection. Any change in the values is detected as an object and the output switches.

**1.1. Functionality**

After switching on the TLS 500, it calibrates a background measurement and saves this as a reference value. When an object enters the detection area, the reflection value changes.

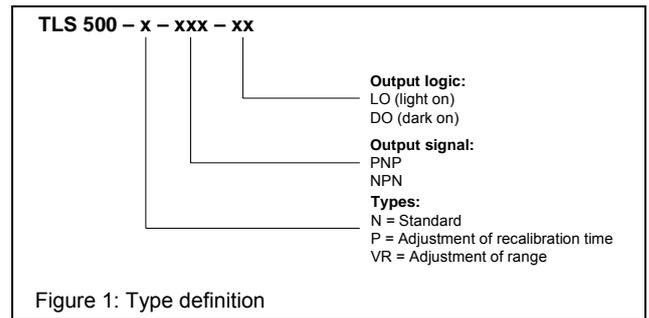
The bigger the difference in light reflection between the object and the background, the easier it is to detect said object. High sensitivity comes from a clear contrast between a detectable object and the background: For example curtain, cloth, rubber, asphalt, wood, concrete, earth, terracotta, cardboard in comparison to people.

Poor sensitivity comes from a reflecting background like marble, metal, glass, bright objects on bright background, dark objects on dark background and no background (the sensor does not see the floor).

**1.2. Features**

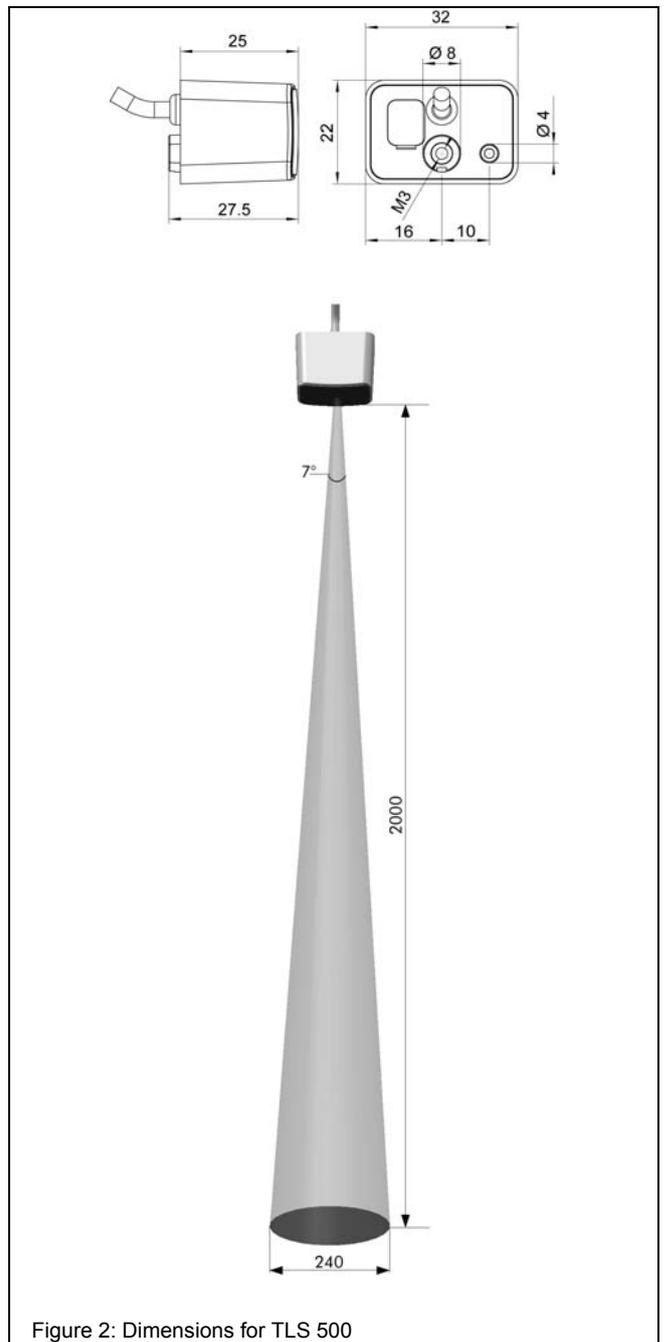
- Intelligent, infrared-based diffuse-reflective sensor
- Excellent detection capability
- PNP or NPN output, light on or dark on available
- For indoor and outdoor applications
- Small and sleek design
- Plug-and-play and easy mounting
- Operating range up to 6 m
- Insensitive to direct sunlight up to 100,000 Lux
- Test input (N-, P-type)

**1.3. Type definition**



**2. Installation**

**2.1. Dimensions**



**2.2. Setup**

It is recommended to carry out the system installation according to the following steps:

1. Switch off main power for the installation area and mark it clearly with out of service.
2. Complete the configuration of the TLS 500 by adjustment the potentiometer (**VR- and P-types only**)
3. Screw the TLS 500 to the chosen location.

**Important:**

Do not over-tighten the mounting screws.  
Do not drill additional holes into the TLS 500.

**2.3. Configuration (VR- and P-types only)**

There is a potentiometer at the back of the TLS 500.

1. Open the cover at the back of the TLS 500 carefully with a slotted screw driver.
2. Turn the potentiometer to either fully left or fully right.



3. Adjust the potentiometer with a screw driver according to the application.

**VR-Type**

On the VR-type, the operation range can be adjusted.

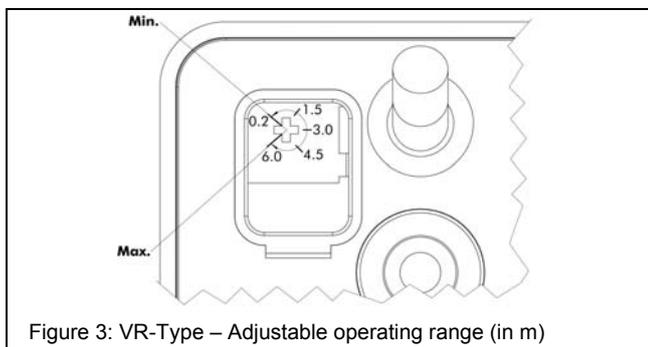


Figure 3: VR-Type – Adjustable operating range (in m)

Because of different reflection ability, a correction factor has to be taken into account for setting the sensing distance.

Reference material	Correction factor f
Kodak white	1.0
Kodak grey	0.6
Bright concrete	0.6 ... 0.8
Dry gravel	0.4 ... 0.5
Dark carpet	0.3 ... 0.5
Grey plastic floor (PVC etc.)	0.4 ... 0.8
Wood bright, cardboard brown	0.7 ... 0.8
Glass, metal plate 90°	1.2 ... 2.0
Black floor, asphalt	0.4 ... 0.5
Cotton white	0.5 ... 0.7
Card board dull black	0.1 ... 0.3

Condition: Beam axis perpendicular to surface

**Example:** TLS 500-VR on a wooden floor

**Mounting height** = 3 m and f = 0.7 ... 0.8

**Range setting:** 3 m / 0.75 = 4 m

**P-Type**

On the P-type, the recalibration time can be adjusted.

Recalibration time means the time until an immobile person or object is accepted by the sensor as background.

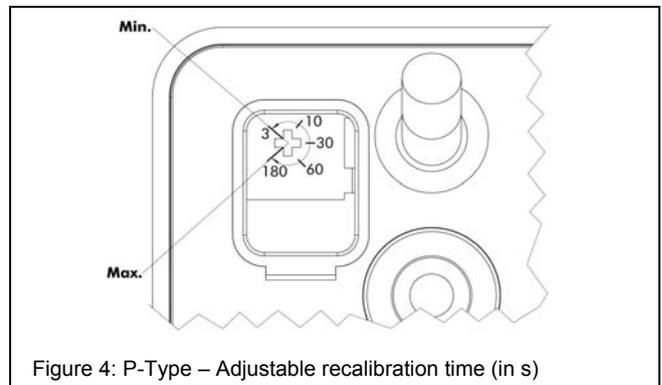


Figure 4: P-Type – Adjustable recalibration time (in s)

4. When the configuration is completed, close the cover again.

### 3. Electrical connection and output signals

#### 3.1. Connection diagram

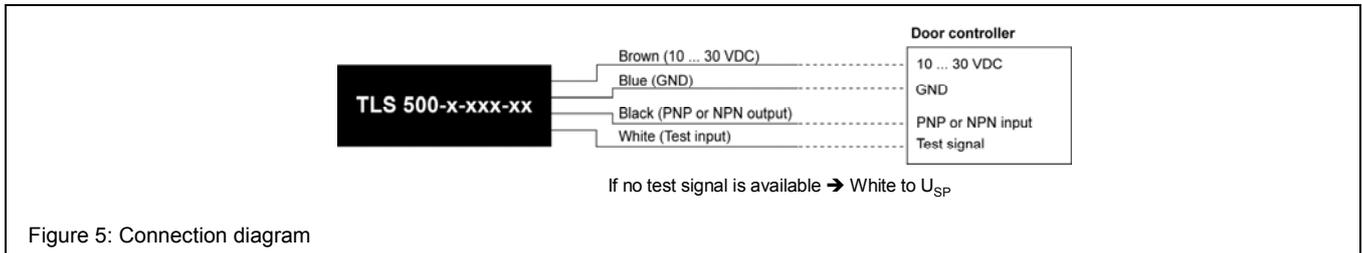


Figure 5: Connection diagram

#### 3.2. Output signals

The following diagram shows the output signal behavior based on an object detection or test input signal.

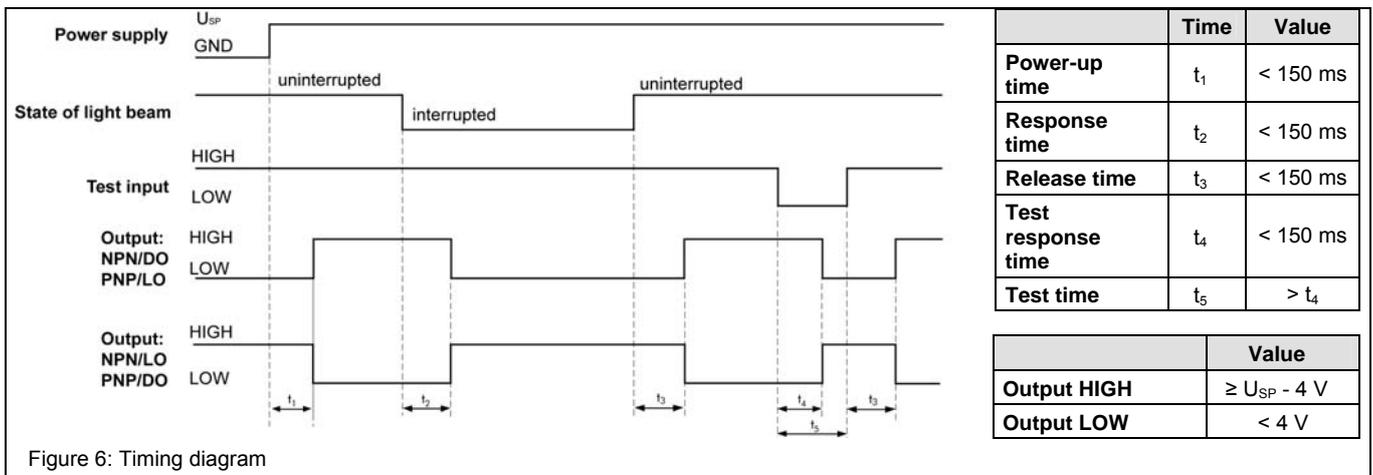


Figure 6: Timing diagram

#### 3.3. Test Input

A test cycle works as follows: The emitter is switched off and the output recognizes the change and switches the output.

**! Important:**

Please be aware that this works only with the N- and P-type when they “see” the floor. The test input cannot be used with the VR-type and has to be connected to the Usp.

### 4. Start-Up and LED status

#### 4.1. Start-Up

1. Switch on mains and/or power up the door control unit.
2. After start-up, an LED comes on.
3. It is recommended to perform a test procedure with the door control unit using the test input.

**! Important:**

Check the detection area of the sensor. If adjustments are needed, please switch off main power and/or the door controller again for your own safety.

#### 4.2. LED status

The TLS 500 has a red and a green LED to indicate its status which is dependent on the type.

TLS 500 type	Field free	Object detected
PNP-DO	Red LED on	Green LED on
PNP-LO	Green LED on	Red LED on
NPN-DO	Red LED on	Green LED on
NPN-LO	Green LED on	Red LED on

**Example for a TLS 500 N-NPN-LO:**

1. The TLS 500 shows via a green LED that there is no object disrupting the detection area.
2. When a person enters the detection area the TLS 500 switches the output and the LED to red.
3. The sensor cannot differentiate between an object and a person. Therefore any object entering the detection field is also detected.
4. When an object or person does not move for more than 10 s, the TLS 500 accepts this object as background and switches the output to free again.

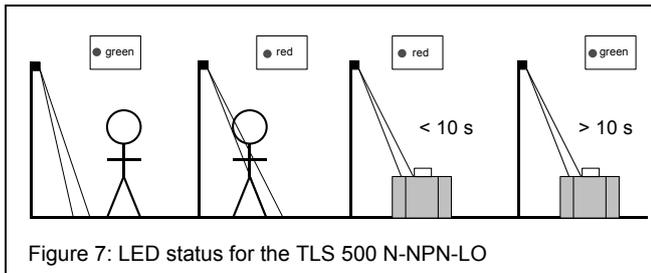


Figure 7: LED status for the TLS 500 N-NPN-LO

If there is no LED visible, please check the electrical connections.

If the green LED is blinking (only N- or P-Type):  
The sensor either sees no floor or the floor is specular.

## 5. Maintenance and Disposal

### 5.1. Maintenance

Although the TLS 500 does not need regular maintenance, a periodical functional check is strongly recommended as follows:

- Check the mounting position and detection area of the sensor.
- Clean the sensor with a soft towel and a little soap water from dust or dirt.

### 5.2. Disposal

The TLS 500 should only be replaced if a similar device is installed. Disposal should be done using the most up-to-date recycling technology according to local regulations and laws. There are no harmful materials used in the design and manufacture of the sensor. Traces of such dangerous materials may be found in the electronic components but not in quantities that are harmful.

## 6. Technical data

### Optical

<b>Operating range</b>	6 m
<b>Adjustable operating range</b>	0.2 ... 6 m (VR-Type)
<b>Active light spot @ 2 m</b>	Ø 0.24 m
<b>Aperture angle</b>	±3.5°
<b>Min. distance to background</b>	0.2 m
<b>Recalibration time</b>	10 s (N-Type)
<b>Recalibration adjust time</b>	3 ... 180 s (P-Type)
<b>Max. ambient light</b>	100,000 Lux

### Mechanical

<b>Dimensions (l x w x h)</b>	32 x 22 x 27.5 mm
<b>Housing material and color</b>	Polycarbonate UL 94-V0, black (other colors on request)
<b>Enclosure rating</b>	IP65
<b>Temperature range</b>	-40° ... +65°C (operation), -40° ... +85°C (storage)

### Electrical

<b>Supply voltage U<sub>SP</sub></b>	10 ... 30 VDC
<b>Current consumption @ 24 VDC</b>	12 mA
<b>Max. output current</b>	40 mA
<b>Output type</b>	PNP or NPN
<b>Output logic</b>	Light on (LO) or dark on (DO)
<b>Power-up time</b>	< 150 ms
<b>Response time</b>	< 150 ms
<b>Test response time</b>	< 150 ms

### Electrical connection

<b>Length</b>	2 m
<b>Wires</b>	4, 14 mm <sup>2</sup> (AWG26)
<b>Brown</b>	U <sub>SP</sub>
<b>Blue</b>	GND
<b>Black</b>	Output (PNP or NPN)
<b>White</b>	Test input (N-, P-Type)

## General

<b>EMC emission</b>	EN 61000-6-3
<b>EMC immunity</b>	EN 61000-6-2
<b>Standards for Automatic Doors</b>	Acc. to DIN 18650, EN 12978, EN 12453
<b>Vibration / Shock</b>	EN 60068-2-6, EN 60068-2-27
<b>Certificate</b>	CE
<b>RoHS</b>	Fulfilled 2002/95/EC

## 7. Ordering information

### System

Part No.	Device type	Description
110 601	TLS 500-VR-NPN-LO	TLS 500 with adjustable operating range 0.2 ... 6 m
110 600	TLS 500-VR-PNP-LO	TLS 500 with adjustable operating range 0.2 ... 6 m
110 602	TLS 500-VR-PNP-DO	TLS 500 with adjustable operating range 0.2 ... 6 m
110 828	TLS 500-P-PNP-LO	TLS 500 with adjustable recalibration time 3 ... 180 s
110 810	TLS 500-N-PNP-LO	TLS 500 with 10 s recalibration time

### Accessories

Part No.	Parts	Description
106 666	Power line converter	85 ... 265 VAC, for 24 V sensors with up to 250 mA current consumption
103 602	Relay module	Interface module for sensors with semiconductor output

**8. Certificates**

**8.1. CE certificate**

**Konformitätserklärung  
Declaration of Conformity  
Déclaration de Conformité  
Dichiarazione di Conformità  
Deklaracja zgodności**



Wir / We / Nous / Noi / My

erklären in alleiniger Verantwortung, dass  
declare in sole responsibility that  
déclarons sous notre propre responsabilité que  
dichiariamo sotto propria responsabilità che  
deklarujemy z pełną odpowiedzialnością, że

**CEDES AG  
Science Park  
CH-7302 Landquart  
Switzerland**

die Produktfamilie  
the product range  
la famille de produit  
la gamma di prodotti  
rodzina wyrobów

**TLS 500**

die Produktbeschreibung  
the product description  
la description du produit  
la descrizione del prodotto  
opis produktu

Reflexionslichttaster  
Diffuse-reflective sensor  
Capteur à réflexion diffuse  
Sensore reflex  
Odbiciowy czujnik

den Anforderungen der folgenden Richtlinien entspricht  
meets all the provisions of the following directives  
remplit toutes les exigences de la directives suivantes  
adempie a tutte le esigenze della direttive seguenti  
odpowiada wszystkim wymaganiom dyrektywy następczy

2004/108/EC  
2006/25/EG

Andere normative Dokumente  
Other standards  
D'autre normes  
Altre norme  
Inne dokumenty normatywne

EN 61000-6-2:2005  
EN 61000-6-3:2007

Prüfberichte / EG Baumusterprüfung  
Test reports / EC type examination  
Rapports de test  
Relazioni sull'esperimento  
Nr raportu technicznego

PB-11-LB-012 CEDES AG

Ort und Datum  
Place and date  
Lieu et date  
Luogo e data  
Miejsce i data

**CEDES AG, CH-7302 Landquart  
2011-01-31**

Name und Funktion  
Name and function  
Nome et fonction  
Nome e funzione  
Nazwisko i stanowisko

**R. Degiacomi**  
Leiter Qualitätsmanagement  
Head of Quality Management  
Directeur de Qualité  
Direttore di Qualità  
Dyrektor ds. Jakości



