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**DATA SHEET FOR STANDARD SENSOR TYPE**  
**CP149-150-151-152-153-154-174 (FROM 2011)**

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Sensor Description

Sensor Type	Pressure Sensitive Single Sensor
Typical applications	Infinite variable resistive user interface devices
Number of active areas / cells	1
Dimensions and available connectors	See layout drawings on annexe

Manufacturing Tolerances

Length and width tolerances	according DIN 7151 IT 14
Thickness	Nominal value (see drawings) +/- 12 %
Total manufacturing tolerance	+/- 0.8 mm

Base Materials

Topside substrate	PET film
Laminating adhesive	Acrylic
Backside substrate	PET film
Backing adhesive (upon request)	Acrylic

Operating Parameters

Standby resistance (no load)	$R_{NL} > 1 \text{ M}\Omega$
Typical activation resistance range for a pressure range of	$1 \text{ M}\Omega > R_L > 2 \text{ k}\Omega$ $0.5\text{-}100 \text{ N/cm}^2$ (i.e. per $\text{cm}^2$ of activated area)
Typical Conductor lead resistance	$\leq 25 \Omega$
Typical lifetime when used according to application advice (see page 2)	$> 1.000.000$ cycles @ $1 \text{ kg/cm}^2$ and 1Hz
Typical sensor response time on single activation	2-3 ms (mechanical)
Current density	$< 1 \text{ mA/cm}^2$ (of activated area)
Parasitic capacitance	$< 1 \text{ nF}$
Power dissipation	$< 1 \text{ mW/cm}^2$ (of activated area)

Operating Conditions

Nominal operating voltage	1..5 V Use pulsed voltage (duty cycle $< 2 \%$ ) for extended lifetime and heavy duty conditions
Operating temperature range	-40 to +85 °C (-40 to 185 °F)
Operating humidity range	$\leq 95 \%$ R.H.

**This general specification sheet has been created on 15.03.11 and supersedes all previous versions.**

#### Standard Test Criteria at Time of Delivery

Standby resistance	$R_{NL} > 1 \text{ M}\Omega$ @ RT and 5 V DC
Measuring device	IEE load applicator (see table 1 for load values)
Force probe surface material	Rubber pad
Thickness of pad	2 mm +/- 0.2 mm
Rubber hardness	65 Shore A (+/- 10 Shore A)
Endtest criteria:	

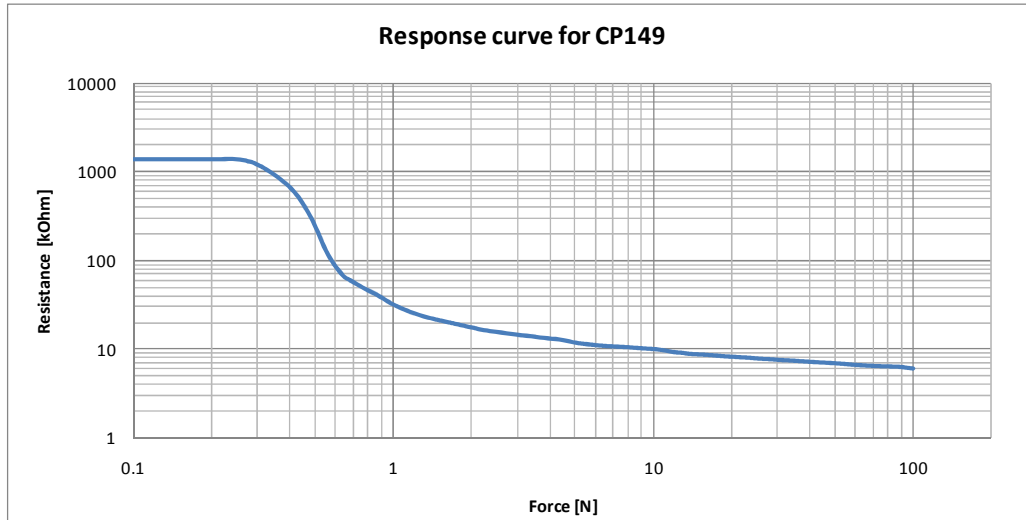
Sensor Type	Detection area dimension	Force probe diameter	Test weight load	Typical resistance at test load
<b>Standard 149</b>	circular, $\varnothing$ 6mm	4 mm	500 g	$30 \text{ k}\Omega > R_L > 3 \text{ k}\Omega$
<b>Standard 150</b>	$8.1 \times 7.5 \text{ mm}$	6 mm	1100 g	$15 \text{ k}\Omega > R_L > 5 \text{ k}\Omega$
<b>Standard 151</b>	circular, $\varnothing$ 12 mm	6 mm	1100 g	$15 \text{ k}\Omega > R_L > 5 \text{ k}\Omega$
<b>Standard 152</b>	circular, $\varnothing$ 16 mm	6 mm	1100 g	$15 \text{ k}\Omega > R_L > 5 \text{ k}\Omega$
<b>Standard 153</b>	$22.3 \times 21.6 \text{ mm}$	6 mm	1100 g	$15 \text{ k}\Omega > R_L > 5 \text{ k}\Omega$
<b>Standard 154</b>	$40.6 \times 40.3 \text{ mm}$	6 mm	1100 g	$15 \text{ k}\Omega > R_L > 5 \text{ k}\Omega$
<b>Standard 174</b>	circular, $\varnothing$ 25 mm	6 mm	1100 g	$15 \text{ k}\Omega > R_L > 5 \text{ k}\Omega$

#### Application Advice

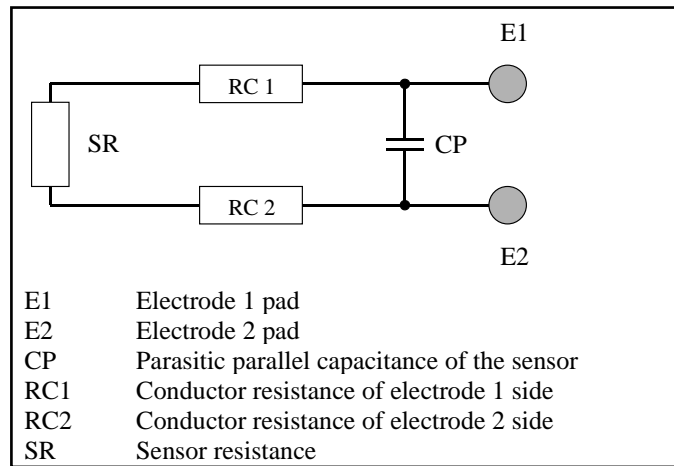
- The sensor should be mounted onto an even, smooth, and hard support surface like, e.g., a plastic, glass or metal plate.
- The actuator should always be placed perpendicular to the sensor surface in the centre of the active area. Avoid offset mounting. Ensure that the actuator is smaller than the active area of the sensor. If this is not feasible, use a soft activator for force transmission and distribution like, e.g., a soft rubber with hardness  $\leq 25$  Shore A.
- Do not expose the sensor to permanent load to avoid possible signal drift.
- Never bend the sensor in the active area to avoid mechanical pre-load and false signals.
- Do not bend the connection tail to a radius  $< 8 \text{ mm}$  to avoid broken conductor lines.
- All sensors feature an air vent. Take care not to block it and to avoid liquids from penetrating through it.

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Example of response curve



[Response curve depending on actuator shape material and design  
Measurements performed with a 4mm probe diameter covered with a 2mm thick rubber of 65 Shore A]



Simplified sensor equivalent circuit

Use an ohmmeter with PC interface option for dynamic data recording. An ordinary ohmmeter will be sufficient, if you do not intend to record data.

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### General Statement

The use of our proprietary pressure sensing technology is very flexible, thus allowing tailor-made design solutions on a relatively short time scale. Almost any shape or size can be designed. If this sensor type does not fulfil your demands, please feel free to contact your closest retailer concerning the availability of other sensor types for your application.

### Liability Issues

IEE sensors are designed for multiple activations and will easily exceed the stated typical lifetime when used according to IEE instructions.

All values listed in datasheets are typical values. IEE cannot be held responsible for any deviation from these values unless a mutually agreed specification concerning a specific sensor design and performance has been signed.

The suitability of a chosen sensor for a specific application is not the concern of IEE, unless a complete sensor specification has been compiled by the customer and accepted by IEE. That specification must describe in detail every aspect of the desired application as well as the use of the sensor in said application.

Subsequent testing to prove the suitability of the sensor for a specific application does not supersede IEE specification sheets.

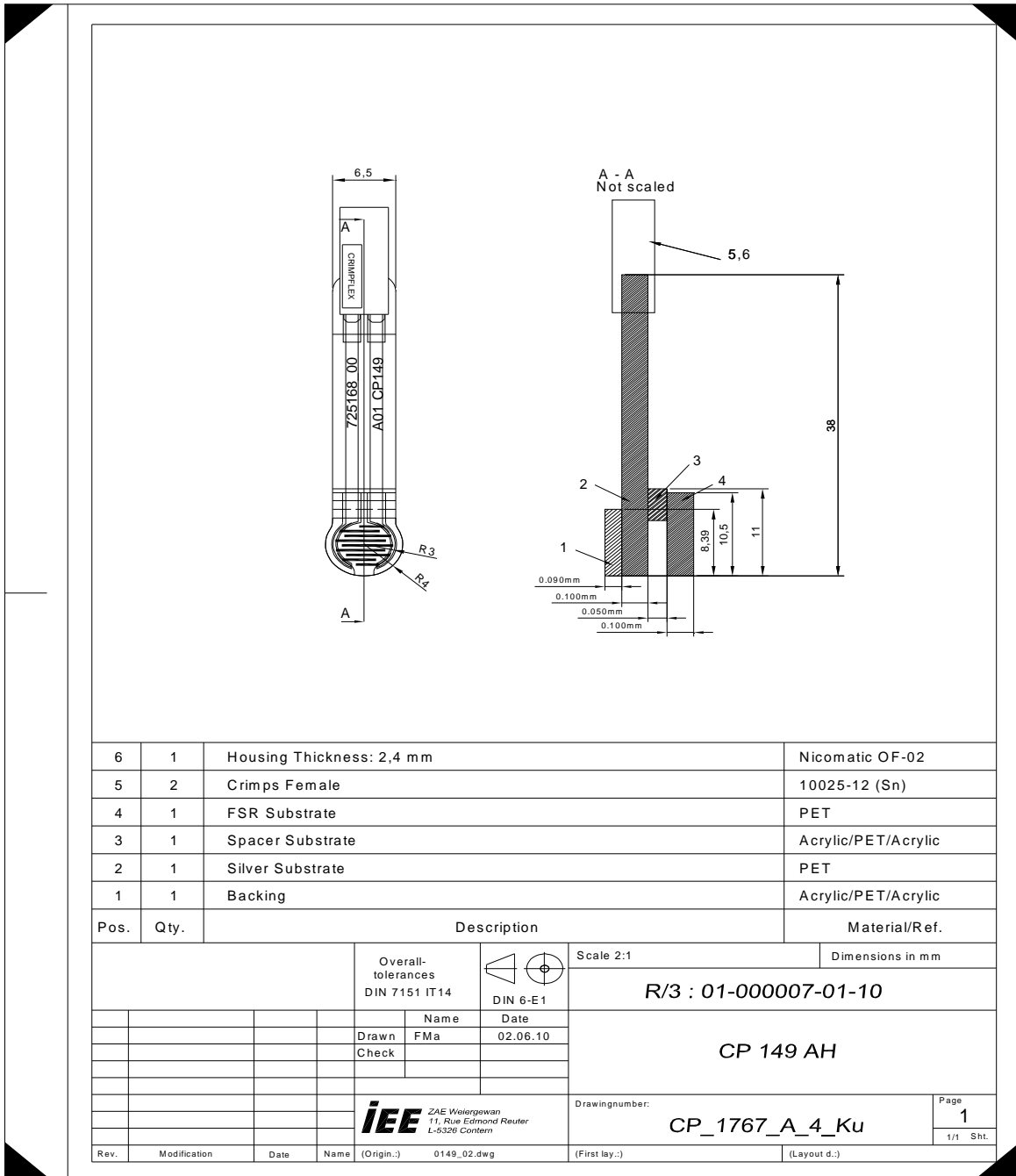
IEE refuses any responsibility for sensors used in applications of which IEE has no notice. The same is valid for applications of which IEE has been informed, if no written agreement stating specific features exists.

The customer is responsible for the validation of the IEE sensor in the end product.

**Depending on the presence of backing adhesive or not and the connection method, CP sensors are available in different configurations**

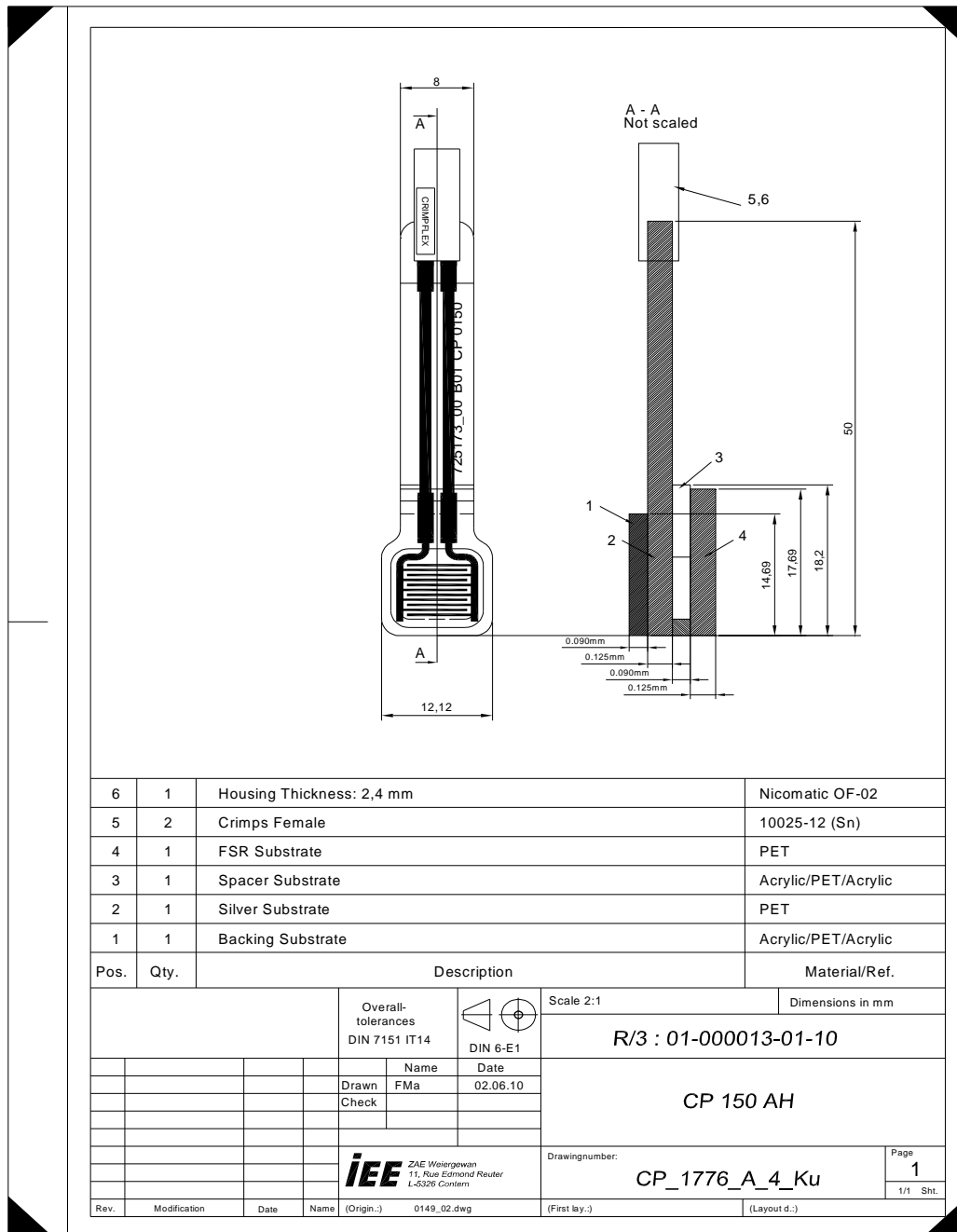
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Sensor Reference	Backing adhesive	Crimp type	Housing	Sensor drawing
CP 149 NN	No	No crimps	No	CP_1770_A_4_Ku
CP 149 NS	No	Male	No	CP_1768_A_4_Ku
CP 149 NH	No	Female	Yes	CP_1769_A_4_Ku
CP 149 AN	Yes	No crimps	No	CP_1765_A_4_Ku
CP 149 AS	Yes	Male	No	CP_1766_A_4_Ku
CP 149 AH	Yes	Female	Yes	CP_1767_A_4_Ku



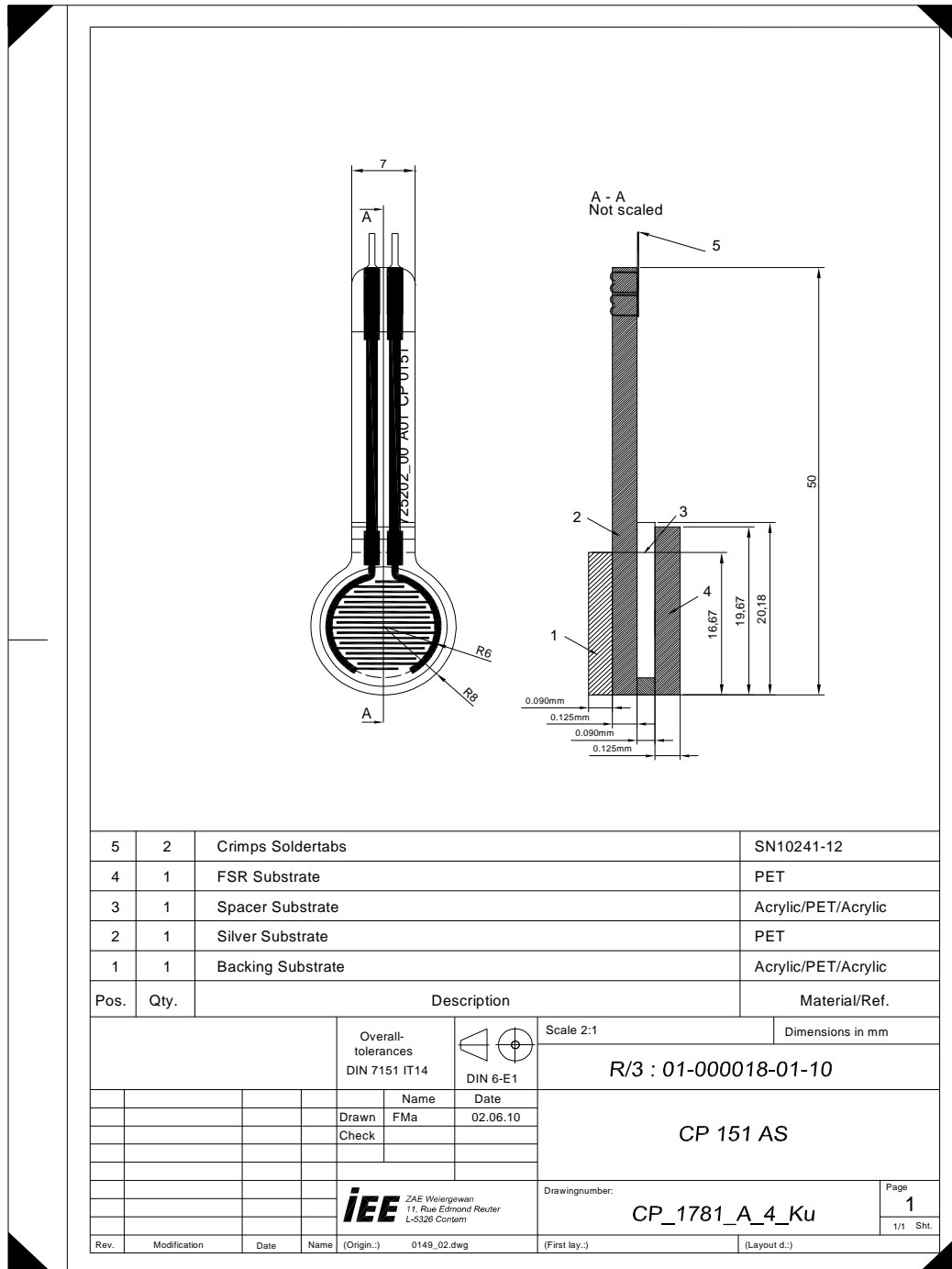
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Sensor Reference	Backing adhesive	Crimp type	Housing	Sensor drawing
CP 150 NN	No	No crimps	No	CP_1771_A_4_Ku
CP 150 NS	No	Male	No	CP_1772_A_4_Ku
CP 150 NH	No	Female	Yes	CP_1773_A_4_Ku
CP 150 AN	Yes	No crimps	No	CP_1774_A_4_Ku
CP 150 AS	Yes	Male	No	CP_1775_A_4_Ku
CP 150 AH	Yes	Female	Yes	CP_1776_A_4_Ku



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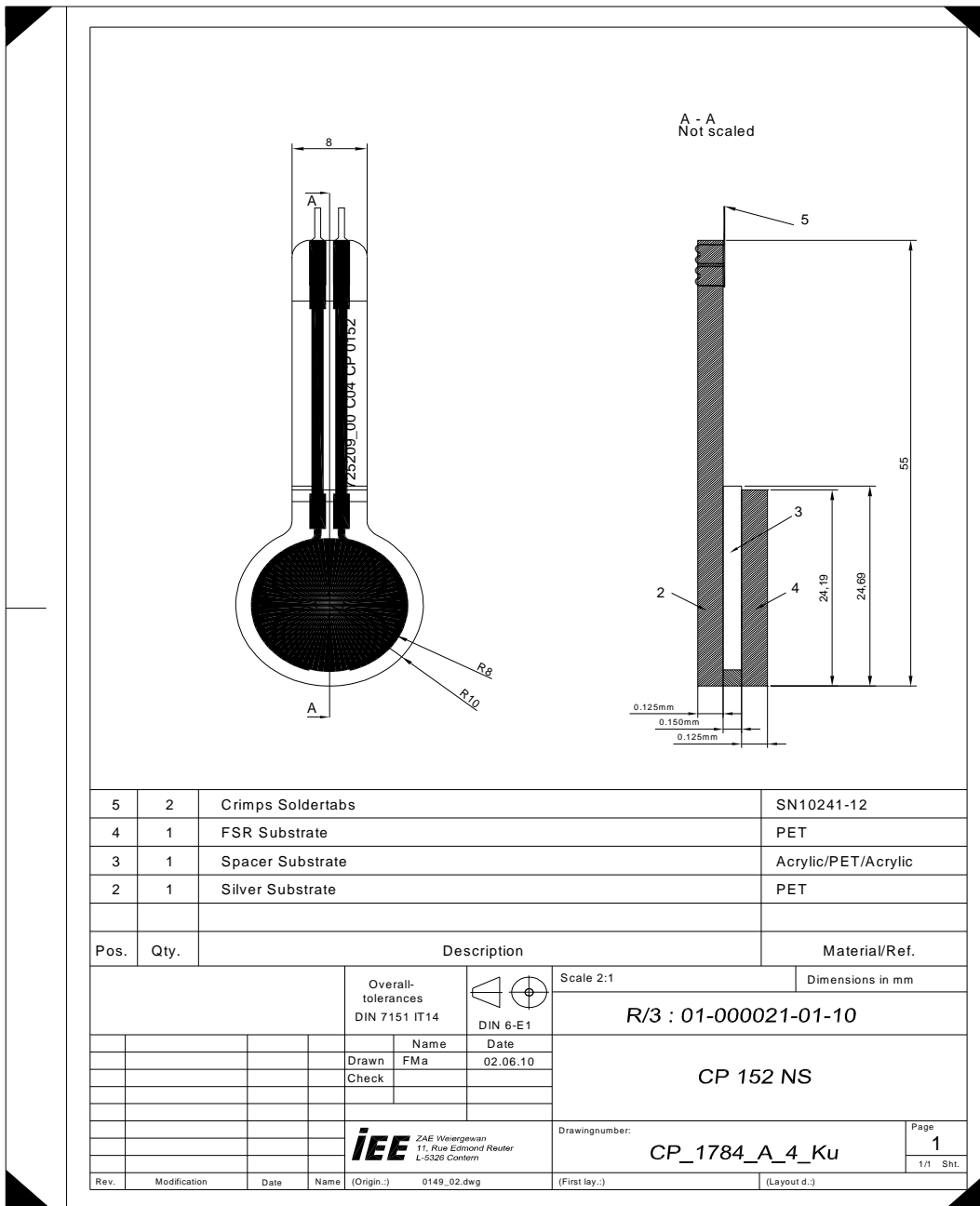
Sensor Reference	Backing adhesive	Crimp type	Housing	Sensor drawing
CP 151 NN	No	No crimps	No	CP_1777_A_4_Ku
CP 151 NS	No	Male	No	CP_1778_A_4_Ku
CP 151 NH	No	Female	Yes	CP_1779_A_4_Ku
CP 151 AN	Yes	No crimps	No	CP_1780_A_4_Ku
CP 151 AS	Yes	Male	No	CP_1781_A_4_Ku
CP 151 AH	Yes	Female	Yes	CP_1782_A_4_Ku





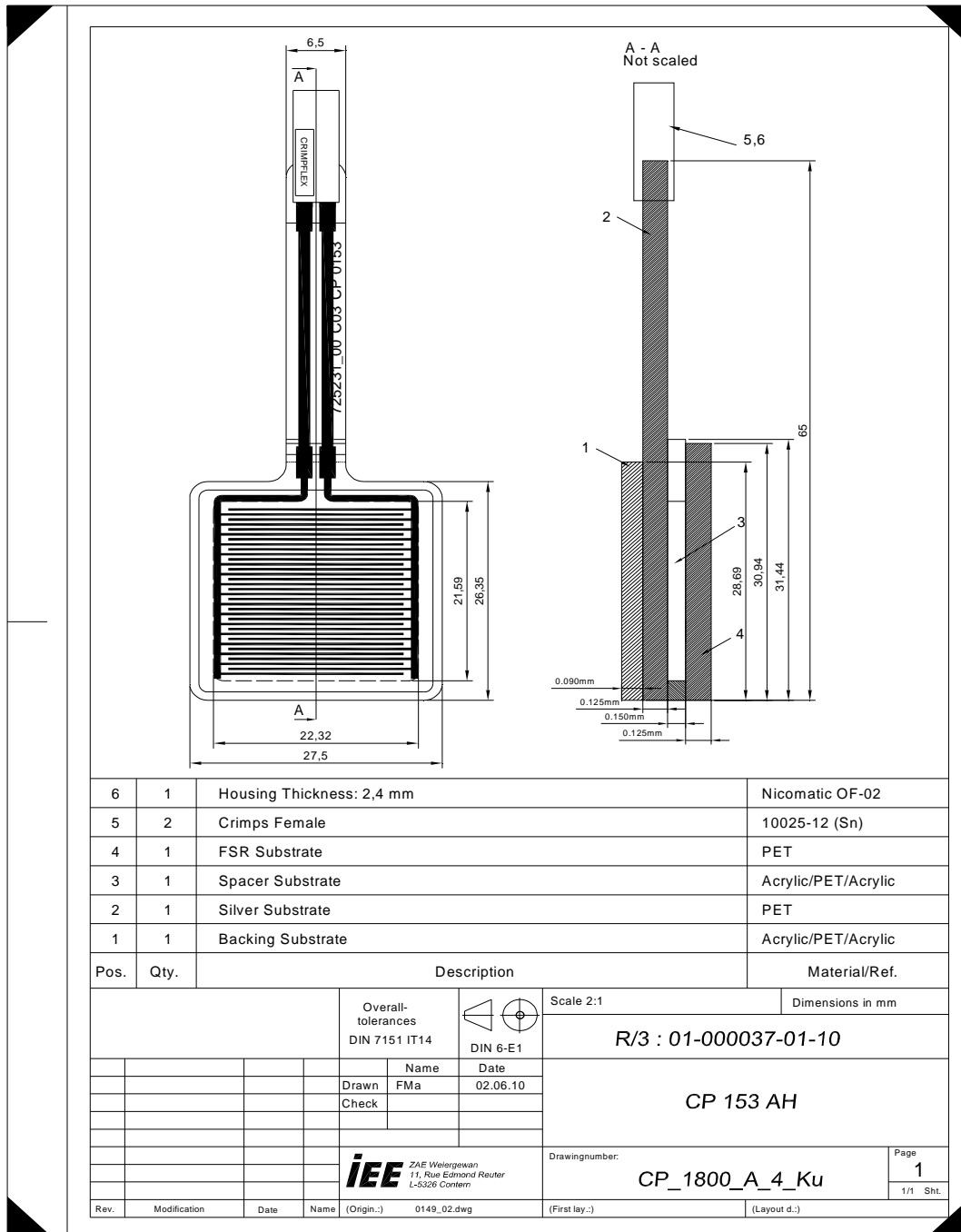
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Sensor Reference	Backing adhesive	Crimp type	Housing	Sensor drawing
CP 152 NN	No	No crimps	No	CP_1783_A_4_Ku
CP 152 NS	No	Male	No	CP_1784_A_4_Ku
CP 152 NH	No	Female	Yes	CP_1785_A_4_Ku
CP 152 AN	Yes	No crimps	No	CP_1786_A_4_Ku
CP 152 AS	Yes	Male	No	CP_1787_A_4_Ku
CP 152 AH	Yes	Female	Yes	CP_1788_A_4_Ku
CP 152 NF	Yes	Female	No	CP_1813_A_4_Ku
CP 152 AF	Yes	Female	No	CP_1814_A_4_Ku



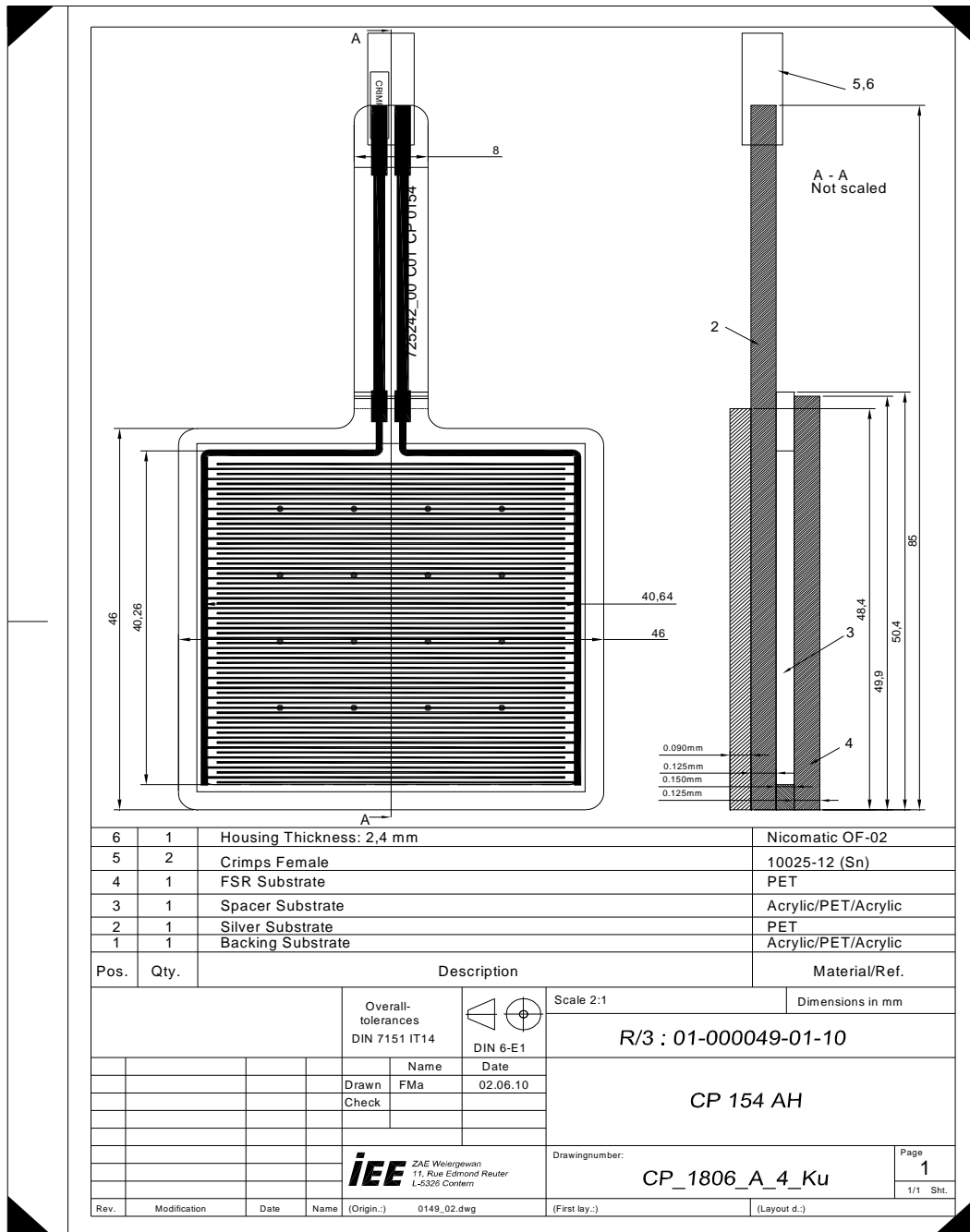
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Sensor Reference	Backing adhesive	Crimp type	Housing	Sensor drawing
CP 153 NN	No	No crimps	No	CP_1795_A_4_Ku
CP 153 NS	No	Male	No	CP_1796_A_4_Ku
CP 153 NH	No	Female	Yes	CP_1797_A_4_Ku
CP 153 AN	Yes	No crimps	No	CP_1798_A_4_Ku
CP 153 AS	Yes	Male	No	CP_1799_A_4_Ku
CP 153 AH	Yes	Female	Yes	CP_1800_A_4_Ku



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Sensor Reference	Backing adhesive	Crimp type	Housing	Sensor drawing
CP 154 NN	No	No crimps	No	CP_1801_A_4_Ku
CP 154 NS	No	Male	No	CP_1802_A_4_Ku
CP 154 NH	No	Female	Yes	CP_1803_A_4_Ku
CP 154 AN	Yes	No crimps	No	CP_1804_A_4_Ku
CP 154 AS	Yes	Male	No	CP_1805_A_4_Ku
CP 154 AH	Yes	Female	Yes	CP_1806_A_4_Ku



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Sensor Reference	Backing adhesive	Crimp type	Housing	Sensor drawing
CP 174 NN	No	No crimps	No	CP_1807_A_4_Ku
CP 174 NS	No	Male	No	CP_1808_A_4_Ku
CP 174 NH	No	Female	Yes	CP_1809_A_4_Ku
CP 174 AN	Yes	No crimps	No	CP_1810_A_4_Ku
CP 174 AS	Yes	Male	No	CP_1811_A_4_Ku
CP 174 AH	Yes	Female	Yes	CP_1812_A_4_Ku

