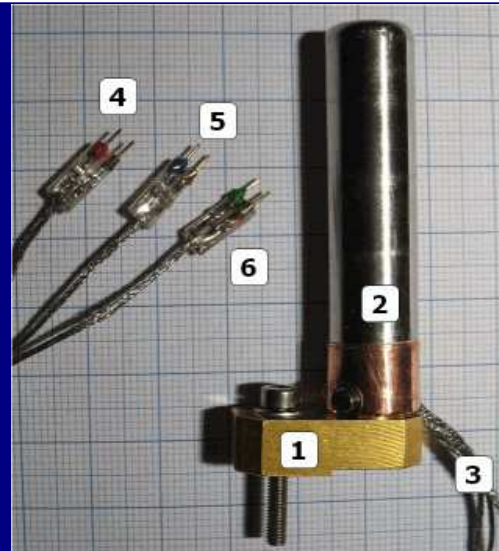


SRD1000 superconductive reference device

The SRD1000 sensor provides up to 13 stable **reference points for thermometry** between about 10 mK and 10 K. The points are established by the superconducting to normal transitions of samples of various materials. Lesser points may be included in a specific device to cover only the main temperature range of a set-up.

- Adapter [1] eases and secures the mounting of the sensor in a cryogenic set-up;
- A Cryoperm / niobium shield [2] reduces ambient magnetic fields near the reference samples to minimise shifts of the transition temperatures. An optional internal **compensation coil** allows analysis and compensation of residual fields;
- The shielded signal leads [3] of the primary, secondary and compensation coils are terminated by connectors that contain filters [4,5,6] to suppress the influence of rf-interference;
- Calibration of a sensor and electronics is performed by either HDL or **PTB**, Berlin.



Characteristics of the 13 reference points, with typical values for:

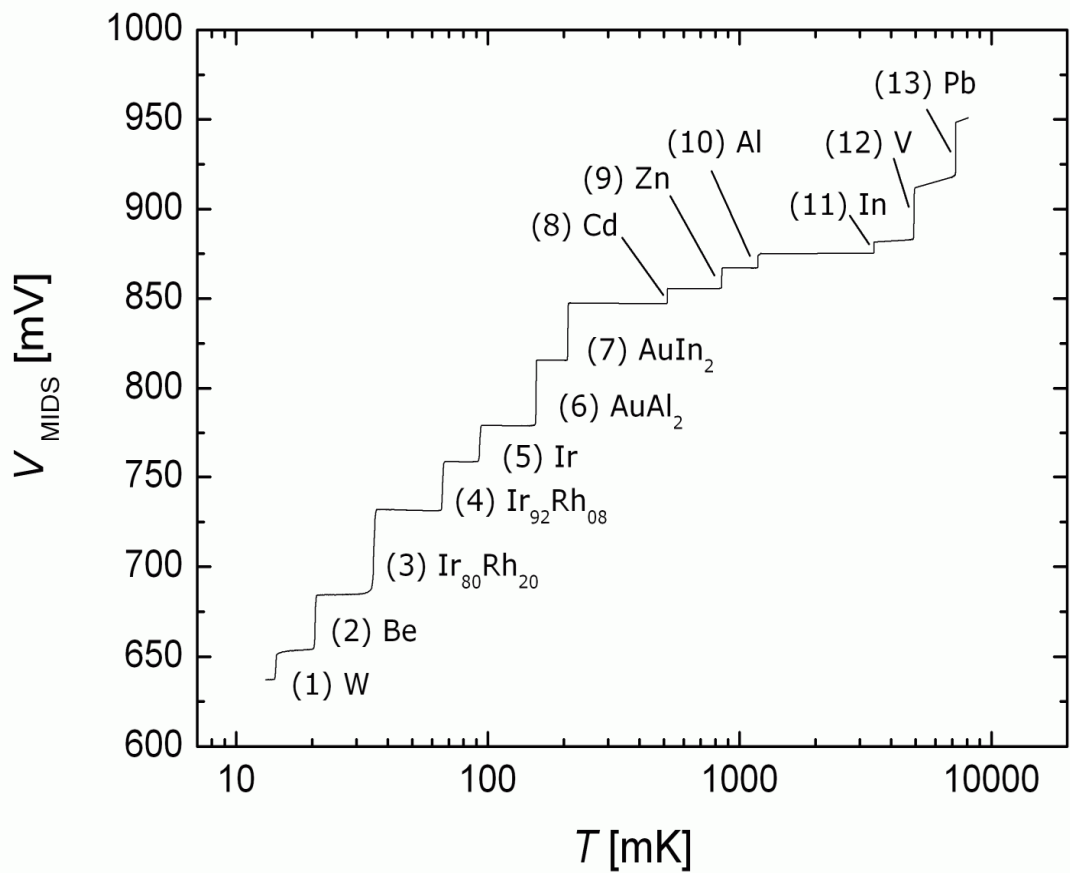
T_c = transition temperature of the reference material;

W_c = transition width (temperature interval in which the signal of the transition changes by 80%);

U_c = estimate of the uncertainty in determining T_c related to the transition characteristics.

#		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
material		W	Be	Ir ₈₀ Rh ₂₀	Ir ₉₂ Rh ₀₈	Ir	AuAl ₂	AuIn ₂	Cd	Zn	Al	In	V	Pb
T_c	[mK]	15	21	30	65	98	145	208	520	850	1180	3400	4900	7200
W_c	[mK]	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<1	<1	<2	<4	<4	<20	<6
U_c	[%]	<0.3	<0.3	<0.3	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Output voltage of the MIDS-20x electronics showing the transitions of a 13-point SRD1000 sensor.



Example of an $\text{Ir}_{92}\text{Rh}_{08}$ reference point with $T_C = 65.38$ mK and $W_C = 0.34$ mK (output voltage V of the MIDS-20x electronics versus sensor temperature- measurements by PTB, Berlin).

