- Calorimetric sensing of ferrite circulator power loss
- Control by water and ambient temperature measurements
- RF feedback control (optional) for improved response time
- SPS status and error signal interlocks
- USB, RS232 COM Interface

1. Product Introduction

The **TCU6 2.0** is our face-lifted digital temperature compensation unit used to stabilize our high-power circulators in a wide range of power levels and operating conditions. By sensing water inlet, outlet and ambient temperature the TCU compensates for variations of the water inlet temperature and a high-power induced ferrite temperature drift by retuning the coil current of the circulator bias magnetic system. Once the TCU is tuned for optimal high-power performance, the circulator operates at a single set of correction settings without manual operator interaction. The TCU6 comes in a standard 19” chassis.
Optionally, it can be extended with the **RF sensor card** module, to be installed in the chassis. In this case, the temperature compensation is assisted by an RF feedback control to improve the response time of the compensation. It´s algorithm minimizes the RF power being reflected from the circulator, measured by a directional coupler at the circulator input. The RF feedback control may add benefits in following rapid variations of water inlet temperature or following events of a fast instantaneous change in forward and reflected power. Moreover, it is often applied in connection with large size coaxial circulators.

2. Product Features

- **Sensing and monitoring of water inlet, water outlet and ambient temperature**
- **Coil current output**
- **ΔT potentiometer for manual high-power tuning**
- **SPS status and error signal interlocks**
- **RS232 and USB communication interface for TCU parameter read out**
- **19” chassis**
- **Shielded connectors and cabling**

3. Optional Product Feature

- **TCU6 RF Sensor Card for RF feedback control**
- **TCU6 Customer Software for up-/download of TCU configuration files and firmware updates**
- **Flexible configuration of spare TCU6s by uploading circulator-specific TCU config. files**

4. Interfaces	Description
■ **Temperature Sensor Connector**	Binder Series 680, 5-pin, female
■ **Coil Current Connector**	Phoenix Contact ST-3ES1N8ACK04S - 1618764, 3-pin + PE, female
■ **RF Signal Input (RF Sensor Card)**	N-type female, 50 Ω
■ **SPS Status/Error Signaling**	D-SUB 15 female, see user manual for details
■ **RS232 Communication**	D-SUB 9 female
■ **USB Communication**	USB Type B, USB 2.0
■ **Mains Power**	IEC-600320-C14 (male)
■ **Mains Cable**	IEC-600320-C13 (female) to CE7/7 plug, 3x 1mm^2, 3m length

5. Main Characteristics		Description
Coil Current Rating (Output)		± 6 A, ± 200 V max.
RF Signal Input Rating		10 µW to 10 mW, 30 MHz to 6 GHz
SPS Status/Error Signaling		Relay contacts, 10 W max, 0.5 A max., 100 V max.
Mains Power Supply		220-240 VAC/ 50Hz, 100-120 VAC/ 60Hz, universal, 4A fused
		fuse 4A, time delay
Mains Power Consumption		1 kW max.
Temperature Range	**Operating**	0°C to +40°C
	Storage	-40°C to +85°C
Mechanical Data	**Dimensions**	19” chassis, 485 x 350 x 132.5 mm^3
	Weight	5 kg approximately
Safety Class		IP40

7. Conformity	Description
■ **CE, RoHS**	2014/35/EC, 2014/30/EC, 2011/65/EC (RoHS)

6. P/N of Available Items	Description
T6TCU02	TCU6 Temperature Compensation Unit 2.0, 19” chassis
T6RFSC01	TCU6 RF Sensor Card
T6CCS0xy	TCU6 Coil Cable shielded, xy: length in meter
T6CSS0xy	TCU6 Sensor Cable shielded, xy: length in meter
T6RFC0xy	TCU6 RF Cable to Sensor Card, xy: length in meter
T6CFSN	TCU6 Customer Software for Config File Up-/Download
T6CSCF	TCU6 Configuration File for a Circulator S/N

Rev.	Remark	Date	Name
00	Initial	14.03.2018	C. Weil