



- 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

6. Conformity	Description
■ CE, RoHS	2014/35/EC, 2014/30/EC, 2011/65/EC & 2015/863/EC (RoHS)

7. P/N of Available Items	Description
T6TCU02	TCU6 Temperature Compensation Unit 2.0, 19" chassis
T6RFSC02	TCU6 RF Sensor Card 2.0
T6CCSh0xy	TCU6 Coil Cable shielded, xy: length in meter
T6CSh0xy	TCU6 Sensor Cable shielded, xy: length in meter
T6RFCh0xy	TCU6 RF Cable to Sensor Card, xy: length in meter
T6CSCF02	TCU6 Customer Software for Config File Up-/Download
T6CFSN	TCU6 Configuration File for a Circulator S/N

7. P/N of Available Items	Description
T6CCA01	TCU6 Adapter Coil Cable 01 (old cable - to - new TCU6 2.0)
T6CCA02	TCU6 Adapter Coil Cable 02 (shield. cable - to - old TCU6 1.0)
T6CCSh-Set	Set of Connectors for TCU6 coil cable and temp. sensor cable
T6CP02	TCU6 Connector Box 2.0
TSWAT03	Temperature Sensor Water (NTC)
TSCWIN002	Temperature Sensor Cable – water inlet
TSCWOUT002	Temperature Sensor Cable – water outlet
TSAMB03	Temperature Sensor Ambient

Rev.	Remark	Date	Name
00	initial	14.03.2018	C. Weil
01	Update P/N cables (halogen free)	10.09.2019	C. Weil
02	Update P/Ns, RoHS 2015/863/EC	21.02.2022	C. Weil
03	Update P/Ns	30.10.2023	C. Weil
04	P/N T6CCSh-Set added	08.07.2024	C. Weil