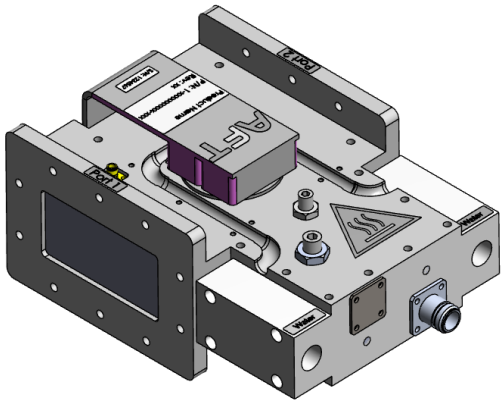

- Compact 3-port T-junction ferrite isolator including water load
- High performance ferrites from in-house production
- Excellent power capability covering operation into 100% reflective load, any phase
- Low insertion loss and high isolation
- Robust and reliable design
- RoHS compliant

Parameter	Value		
Footprint Drawing No.	3-125979-FP		
Product Type	Isolator		
Configuration	3-port		
RF Transmission Line	Waveguide		
Set-up	Ferrite circulator with integrated water load		
Orientation of Rotation	Clockwise		
Center Frequency f_0	2450 MHz		
Bandwidth BW	± 25 MHz		
Forward Power (cw) - Options	1 kW	2 kW	3 kW
Reverse Power	100% of forward power, at any phase		
Insertion Loss (Port 1-2)	≤ 0.2 dB at f_0 (< 0.15 dB typical)		
	≤ 0.2 dB in BW		
Return Loss (Port 1,2)	≥ 23 dB @ f_0		
	≥ 20 dB in BW		
Isolation (Port 2-1)	≥ 23 dB @ f_0		
	≥ 20 dB in ± 15 MHz		
	≥ 16 dB in BW		
FWD Power Coupling Probe at Port 1	-60 dB ± 2 dB, non-directional, SMA, female, 50Ω		
REV Power Coupling Probe at Load	-60 dB ± 2 dB, non-directional, N-Type, female, 50Ω		
RF Waveguide	WR340		
RF Flange (input and Output)	CPR340F, flat, 10xM6		
Cooling System	Water		
Material	stainless steel and copper		
Coolant Connectors (Inlet & Outlet)	2x G3/8” female thread		
Coolant Inlet Temperature (nominal)	20°C		
Coolant Inlet Temperature Range	± 5°C		

	Coolant Flow Rate	≥ 120 l/h	≥ 120 l/h	≥ 180 l/h
		@ 1 kW	@ 2 kW	@ 3 kW
	Coolant Pressure Drop	< 2 bar		
	Coolant Input Pressure	≤ 6 bar		
	Coolant Leak Test Pressure	15 bar for 10min		
Waveguide Dielectric Gas		clean, dry air		
Ambient Temperature				
	Operational Temperature	10°C to 45°C, no condensation		
	Storage Temperature	0°C to 60°C		
Relative Humidity		< 80%, no condensation		
RF Stray Field		< 5 mW/cm^2 in a distance of 5 cm from the surface		
Magnetic Stray Field		< 5 G in 1m distance		
Body Material		Aluminium		
Dimensions L x B x H		see Fig. 1 for interface dimensions		
Weight (net)		4.9 kg ± 10%		
Mounting Orientation		any		

Ordering Code

I3-WR340-02-2450 - **Xp**

Variable	Description	Value Options		
Xp	Forward Power cw [kW]	1	2	3

Notes:

1 Circulator Characteristic Power Capability: The circulator is designed offer lowest loss and highest peak power capability by using AFT premium microwave ferrites. The device is designed to handle full forward power into a 100% reflective short-circuit at port 2, covering all phase angles, without breakdown. The peak power capability of the device can also be expressed by a "characteristic" power of Pc = 4x forward peak power operated into a matched load at output port 2.

2 Water Cooling: There is a water cooling circuit with a designated water inlet and outlet connector. Water quality, temperature, flow, and input pressure need to be controlled carefully according to the specified values. Air bubbles in the cooling channel have to be avoided.
The requirement for demineralized water is based on the exclusion of deposition and agglomeration of mineral salts, calcium carbonate or rust in the cooling channels. There are no specific requirements for the water resistivity.
The cooling channels must not be contaminated by sealants such as PTFE tape or hemp fibers. These can decrease cooling significantly or even block cooling channels.

For reason of protection, the device requires sensorics with RF interlocks for specified water temperature, water flow, and water inlet pressure. The corresponding equipment is to be provided by the customer.
Note: Water has to be carefully drained from the cooling circuit before transport and storage, in order to avoid possible damage by freezing of water.

3 Low-Power Factory Tests: The following tests will be performed at the AFT factory before shipment:
   (1) Electrical tests: small-signal network analyzer measurements of insertion loss, isolation, and return loss vs. frequency at the nominal water inlet temperature and at an ambient room temperature of 22°C ± 4°C, for all ports and signal paths.
   (2) Water leak test at specified test pressure.
   (3) Visual inspection.

4 Documentation: An owner´s manual is available for providing information on the installation, operation and maintenance of the device. The documentation also includes specification, footprint drawing, an inspection report, and the RF test results as viewgraphs of S-parameters vs. frequency.
The documentation is limited to digital format (no hardcopy) and is available on request.

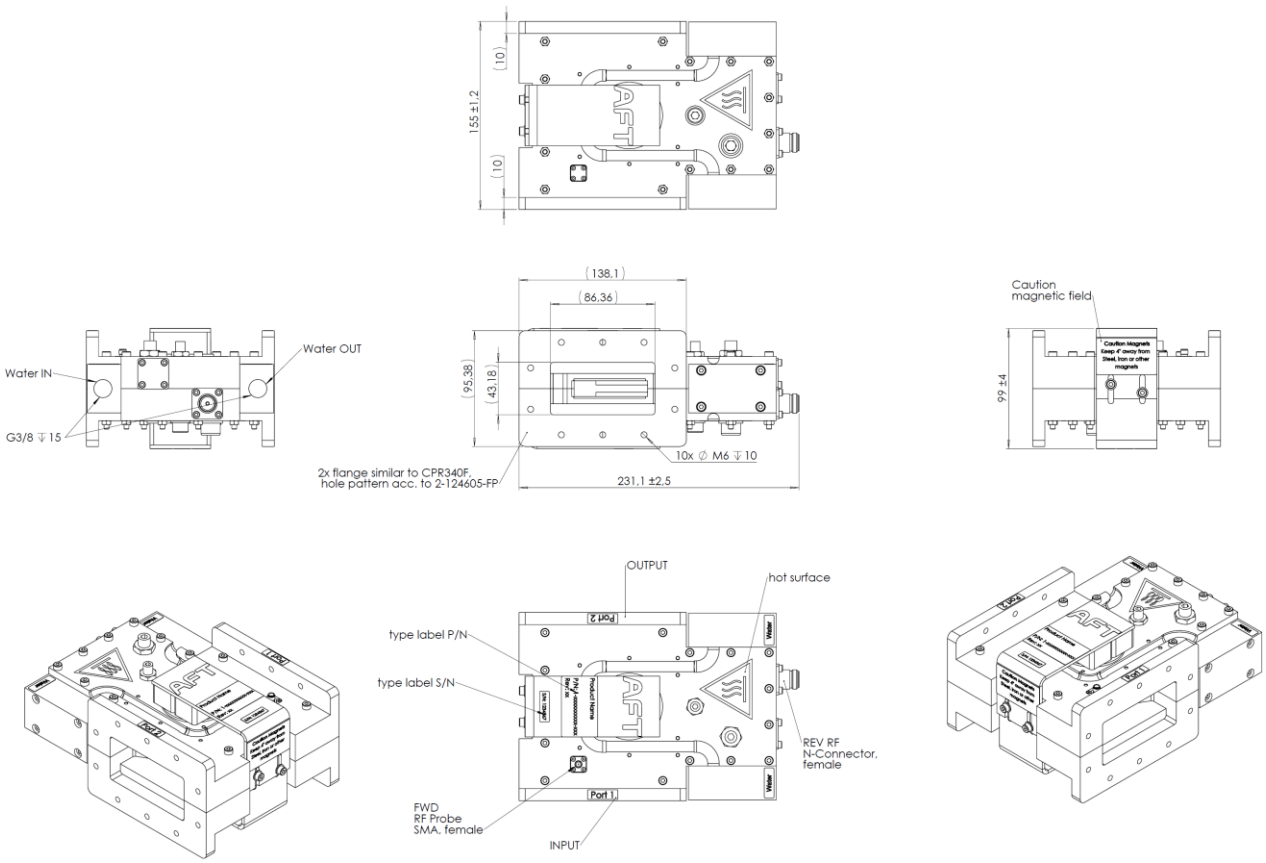

Fig. 1: Interface dimensions, all dimensions in mm.

Rev	Remark	Date	Name
00	initial	16.02.2024	C. Weil