

- 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.	3-125943-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	$\pm 25$ MHz
Forward Power (cw) - Options	6 kW                      10 kW
Reverse Power	100% of forward power, at any phase
Insertion Loss (Port 1-2)	$\leq 0.2$ dB at $f_0$ (< 0.15 dB typical) $\leq 0.2$ dB in BW
Return Loss (Port 1,2)	$\geq 23$ dB @ $f_0$ $\geq 20$ dB in BW
Isolation (Port 2-1)	$\geq 23$ dB @ $f_0$ $\geq 20$ dB in $\pm 15$ MHz $\geq 16$ dB in full BW
FWD RF Power Coupling Probe at Port 1	-60 dB $\pm 2$ dB, non-directional, SMA, female, 50 $\Omega$
REV RF Power Coupling Probe at Load	-60 dB $\pm 2$ dB, non-directional, N-type, female, 50 $\Omega$
RF Waveguide	WR340
RF Flange (Input and Output)	CPR340F, flat, 10 M6
Cooling System	Water or water-glycol mixture
Materials	stainless steel and copper
Coolant Connectors (Inlet & Outlet)	2x G 3/8", female thread
Coolant Inlet Temperature (nominal)	20°C
Coolant Inlet Temperature Range	$\pm 5$ °C

<b>Coolant Flow Rate</b>	≥ 360 l/h	≥ 600 l/h
	@ 6 kW	@ 10 kW
<b>Coolant Pressure Drop</b>	< 2 bar	
<b>Coolant Input Pressure</b>	≤ 6 bar	
<b>Coolant Leak Test Pressure</b>	15 bar for 10min	
<b>Waveguide Dielectric Gas</b>	clean, dry air	
<b>Ambient Temperature</b>		
<b>Operational Temperature</b>	10°C to 45°C, no condensation	
<b>Storage Temperature</b>	0°C to 60°C	
<b>Relative Humidity</b>	< 80%, no condensation	
<b>RF Stray Field</b>	< 5 mW/cm <sup>2</sup> in a distance of 5 cm from the surface	
<b>Magnetic Stray Field</b>	< 5 G in 1m distance	
<b>Body Material</b>	Aluminium	
<b>Dimensions L x B x H</b>	see Fig.1 for interface dimensions	
<b>Weight (net)</b>	6.7 kg ± 10%	
<b>Mounting Orientation</b>	any	

### Ordering Code

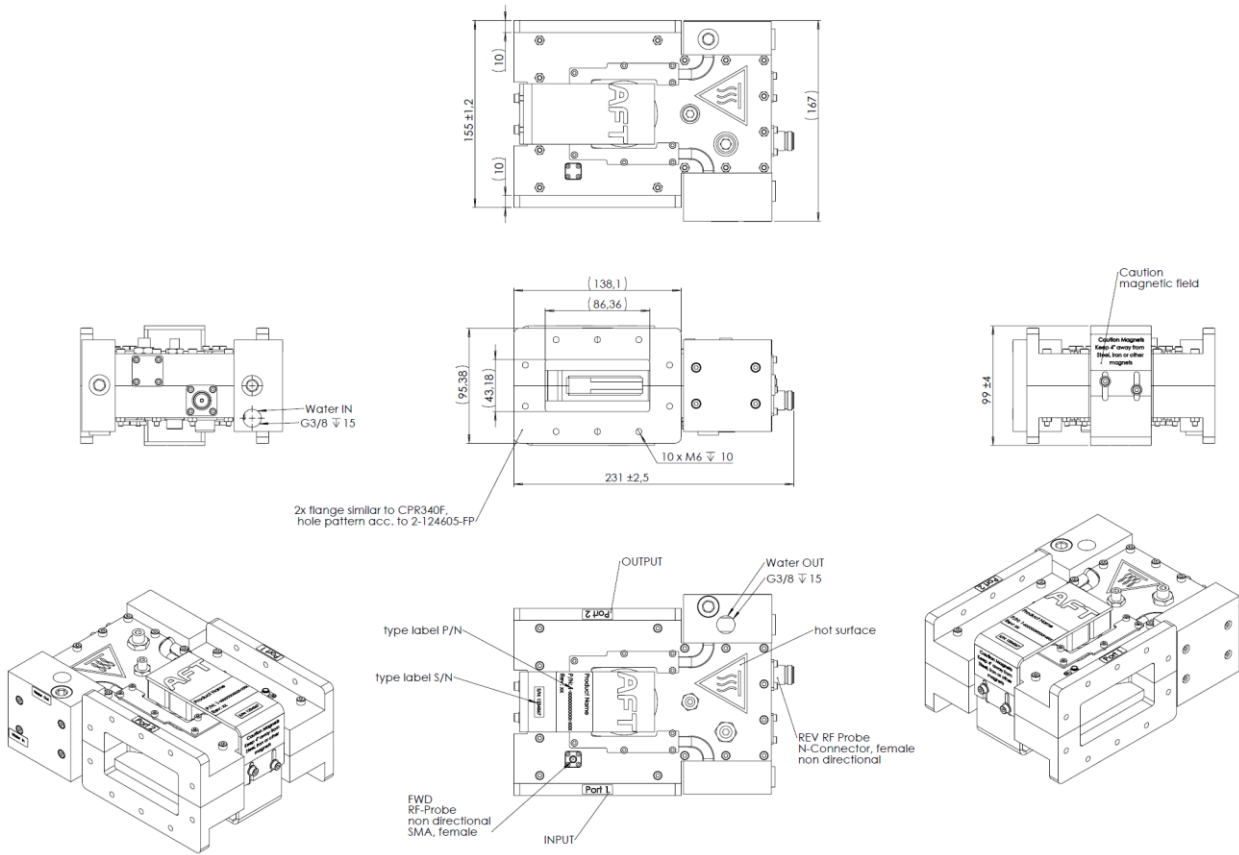
I3-WR340-03-2450 - Xp

Variable	Description	Value Options	
Xp	Forward Power cw [kW]	6	10

### Notes:

- Circulator Characteristic Power Capability:** The circulator is designed to 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.
- 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.

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- 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  $22^{\circ}\text{C} \pm 4^{\circ}\text{C}$ , 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 will also include 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