



- RF absorption & cooling by water
- Water is guided in a rugged high-quality quartz glass tube
- Excellent peak & average power capability
- High reliability & long life-time
- Free of maintenance & wear parts
- RoHS compliant
- Designed for S-band LINAC applications

Parameter	Value			
Footprint Drawing No.	FP-10072622			
Product Type	RF Load			
Configuration	Water Load			
Center Frequency f_0	2856 MHz or 2998 MHz			
Bandwidth BW	± 10 MHz			
Input Power	Options:	Xp = 1	Xp = 2	Xp = 3
Input Peak Power		20 MW	15 MW	10 MW
Input Average Power		15 kW	30 kW	60 kW
Return Loss	≥ 30 dB			
VSWR	< 1.065			
RF Waveguide	WR284			
RF Flanges / Connectors	CPR284G, grooved, 10 holes $\varnothing 6.5$ mm			
RF Coupling Probes	1x non-directional coupling probe at input			
	Coupling: $-60\text{dB} \pm 2\text{dB}$, Connector type: N-female			
Cooling System	demineralized water			
Water Tube Materials	Stainless steel, quartz glass			
Water Connectors	2x $\frac{1}{2}$ " hose barb fittings, stainless steel			
Water Inlet Temperature (nominal)	selectable between 20°C and 40°C			
Water Inlet Temperature Range	$\pm 5^\circ\text{C}$			
Water Flow Rate	≥ 900 l/h (15kW)	≥ 1800 l/h (30kW)	≥ 3600 l/h (60kW)	
Water Pressure Drop	< 2 bar @ minimum flow rate			
Water Inlet Pressure	≤ 10 bar			
Water Leak Test Pressure	15 bar for 10min			

Waveguide Dielectric Filling Gas	SF6		
Gas Pressure	nominal:	3 bar absolute	
	maximum :	4 bar absolute	
Gas Leak Rate (Helium)	< 5·10 ⁻⁴ mbar l/s		
	tested with Helium pressurization at 2.5 bar gauge		
Ambient Temperature	operating :	10°C to 40°C	
	storage :	0°C to 60°C	
Relative Humidity	< 80%, non-condensing		
Magnetic Stray Field	device must not be exposed to magnetic stray radiation of >5G		
Body Material	Aluminium		
Surface Finish	none		
Dimensions	see footprint drawing		
Weight	3 kg approximately		
Mounting Orientation	any		
Accessories included	1x metallic gasket p/n 1-0002998000-000		

Ordering Code

LW-WR284-02 - Xf - Xp - Xw

Variable	Description	Value Options		
Xf	Center Frequency [MHz]	2856 or 2998		
Xp	Input Power Option	1 : 20MW / 15kW	2 : 15MW / 30kW	3 : 10MW / 60kW
Xw	Water Inlet Temp. [°C]	20 .. 40		

Notes:

- 1 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.

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

- 3 Documentation: An owner’s manual is supplied 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.

Rev.	Remark	Date	Name
00	Initial	17.09.2015	C. Weil
	New logo, notes updated	19.02.2024	C. Weil