

The WHD style resistors are mainly used in marine applications as brake resistors for winches, steering an propulsion (dynamic positioning). Depending on the needed power rating the WHD resistors have a tank with a diameter ranging from 100mm to 300mm. The length is also dependent on the requested power rating and can be up to 3000mm. In same power ratings you may choose between a short resistor with a large diameter or vice versa. WHD resistors are cooled with fresh water or a mixture of water-glycol. Depending on the water flow a suitable size water connector is selected. In principle, any water connection style the customer desires can be used.

Inside the water tank a number of steel tube resistor elements are fitted. This way a simple star or delta configuration is possible but also a load bank with different power steps.

The connections are done in a stainless steel connection box. The number and size of the cable glands can be according customer specifications.

The WHD resistors are made completely from stainless steel, for salty environments we recommend to use AISI316 steel.

WHD are high power, liquid cooled resistors, mainly used in marine applications. Wherever there is regenerative energy, brake resistors are used to dissipate the surplus energy.

WHD steel tube resistors are used in applications for winches, steering systems and propulsion systems. Because of their high continuous load capability they are also used in dynamic position systems.

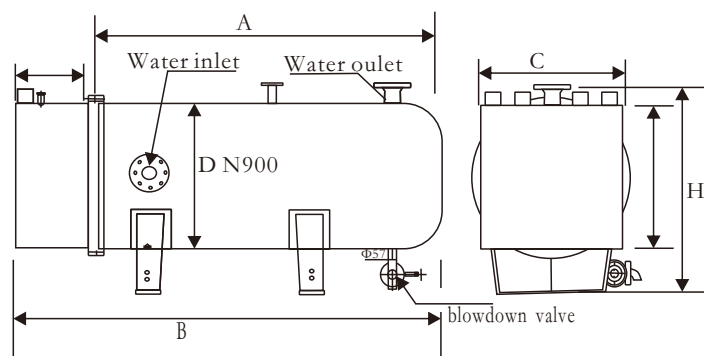
## ● Construction

Inside a stainless steel tank steel tube resistor elements are fitted. The elements are sealed with special epoxy resin to ensure high and stable resistor insulation values. The tank is fitted with water connection flanges than can be made in any style, according to the customers specifications. A special circulation system forces the water flow to be as effective as possible for optimum cooling.

## ● Main characteristic are:

- I. Construction made completely in AISI 304 or AISI316
- II. Protection degree IP67
- III. Continuous power range from 25kW to 1.3MW
- IV. Operated pressure 12 bar
- V. Working voltage up to 1800 VDC.

## ● Dimensions



Type	A [mm]	B [mm]	C [mm]	H [mm]
WHD100	1.000-1.700	A+150	220	270
WHD150	1.100-2.400	A+200	300	450
WHD200	1.200-3.000	A+250	600	700
WHD250	1.600-3.000	A+250	800	900
WHD300	1.850-2.700	A+350	980	1400

## ● Applications And Ratings

Type	Ohm value [ $\Omega$ ] $\pm 5\%$	Power Pn [kW]	Limit element voltage	Weight [kg]
WHD100	2 - 60	25-80	2500	36-70
WHD150	2- 40	80-180	2500	110-140
WHD200	1-30	150-450	2500	170-220
WHD250	1-15	280-600	2500	250-350
WHD300	1-15	600-1300	2500	350-450

## ● Performance Characteristics

Insulation resistance	all types	$\geq 1.000 \text{ M}\Omega @ 5.000 \text{ VDC}$
	WHD 300	$\geq 200 \text{ M}\Omega @ 5.000 \text{ VDC}$
Dielectric strength		$3.500 \text{ VAC @ } 50\text{Hz } 1 \text{ min}$
Protection degree		Ip67
Working pressure	all types	6 bar
	WHD 300	8 bar
Cooling		Water/Water-glycol