Direct Water Cooled Wirewound Resistor

FEATURES

- Direct cooling without heatsink
- Excellent power / volume ratio
- Multi resistive element option
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

APPLICATIONS

- Filter resistor
- Snubber resistor
- Discharge resistor

DESIGN SUPPORT TOOLS

click logo to get started

3D Models Available

STANDARD ELECTRICAL SPECIFICATIONS			
GLOBAL MODEL	POWER RATING P_n (1) W	RESISTANCE RANGE Ω	TOLERANCE ± %
DCRF 38 x 178	1500	0.56 to 4.7	5, 10 (2)
DCRF 38 x 224	3000	1 to 9.1	5
DCRF 38 x 270	4500	1.5 to 15	5
DCRF 38 x 316	6000	2 to 20	5
DCRF 38 x 362	7500	2.4 to 24	5
DCRF 38 x 410	9000	3 to 27	5

Notes

(1) Water inlet temperature 65 °C with 40 % mono ethylene glycol, flow rate 8.33 l/min

(2) 5 for value ≥ 1 Ω, 10 for value < 1 Ω

TECHNICAL SPECIFICATIONS		
PARAMETER	UNIT	RESISTOR CHARACTERISTICS
Temperature coefficient	ppm/°C	100 ppm/°C (typical)
Maximum working voltage	V	Up to 3600 V
Operating temperature range	°C	-55 to +120
Water conductivity	µs/cm	< 2

GENERAL CHARACTERISTICS	
Core	Ceramic, stainless steel
Winding	NiCr alloy (direct in water)
Hydraulic plugs	Stainless steel
Coating	None: ceramic nude
Ohmic values	E24 (for other values consult us)
Inductance	Refer to Inductance curves (see Fig. 3)
Cooling	Deionized water (1); coolant mixtures up to 60 % mono ethylene glycol
Operating pressure	1 bar to 6 bars
Test pressure	15 bars
Flow	8.33 l/min to 16 l/min (see Fig. 2)
CTI index	> 600
Creeping distance	On request

For technical questions, contact: mcbfixedresistors@vishay.com

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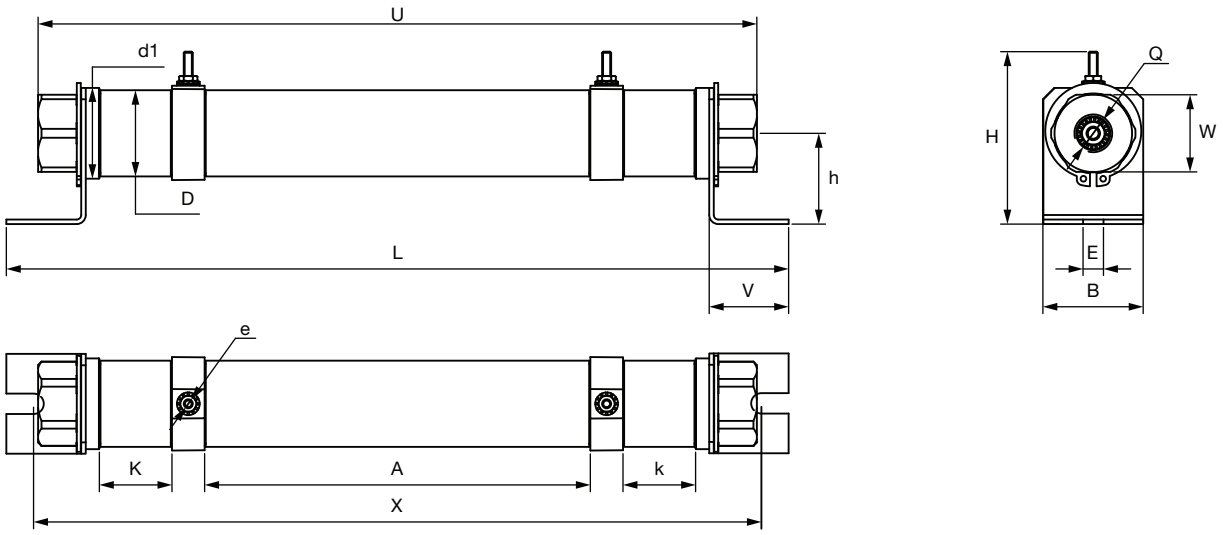
GENERAL CHARACTERISTICS	
Clearance distance	On request
Dielectric strength V_{RMS} (50 Hz / 1 min)	8000 V (2)
Partial discharge	For free partial discharge version please consult us
Electrical connections	M4 rod (tightening 2 Nm max.)
Mounting	Minimum 5° angle from horizontal (see “Mounting Recommendation”)
Overload	2 × P_n 60 s ($\theta_{65\ °C}$ at 8.33 l/min)
Endurance	1200 h; P_n 30 s / 30 s; variation < 5 % (MCB laboratory condition)
Pressure drop	Refer to “Pressure Drop” curves (see Fig. 4)

Notes

(1) Water conductivity must be permanently controlled to remain under 2 µs/cm.
The cooling mixture must remain homogeneous without any liquid or solid foreign element.
Use appropriate filter with regenerating mixed bed resin device

(2) Resistor filled with deionized water (conductivity < 2 µS/cm)

DIMENSIONS in millimeters



TYPE	38 x 178	38 x 224	38 x 270	38 x 316	38 x 362	38 x 410
Water pipe fitting internal diameter	Ø 6.6 mini	Ø 6.6 mini	Ø 6.6 mini	Ø 6.6 mini	Ø 6.6 mini	Ø 6.6 mini
A	32	78	124	170	216	264
B +0.5 / -0	44	44	44	44	44	44
D max.	43	43	43	43	43	43
e	Ø M4	Ø M4	Ø M4	Ø M4	Ø M4	Ø M4
E	9	9	9	9	9	9
H max.	80	80	80	80	80	80
k	32	32	32	32	32	32
K	32	32	32	32	32	32
L max.	213	259	305	351	397	445
Ø	38	38	38	38	38	38
Q	G 3/8"	G 3/8"	G 3/8"	G 3/8"	G 3/8"	G 3/8"
U ± 6	178.8	224.8	270.8	316.8	362.8	410.8
V	35	35	35	35	35	35
W	34	34	34	34	34	34
X ± 6	182.8	228.8	274.8	320.8	366.8	414.8
Weight kg	0.77	0.89	1.01	1.13	1.26	1.38

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POWER DISSIPATION

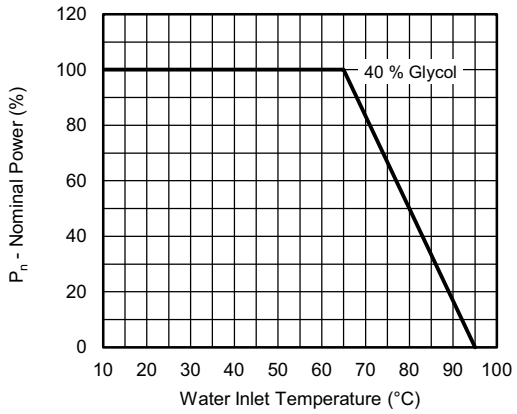


Fig. 1 - Power vs. Water Inlet Temperature
P_n = f (Water Inlet Temperature), Flow Rate = 8.33 l/min

FLOW RATE

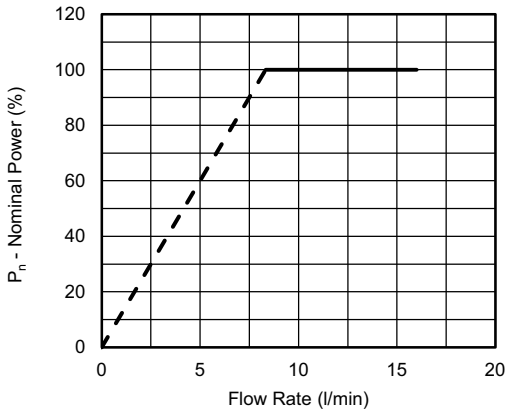


Fig. 2 - Power vs. Flow Rate
P_n = f (Flow Rate), Water Inlet Temperature = 65 °C

INDUCTANCE

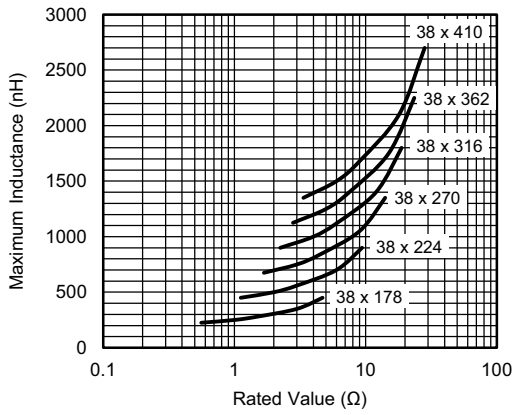


Fig. 3 - Inductance vs. Ohmic Value
Maximum Inductance (may Vary for Particular Rated Values)

PRESSURE DROP

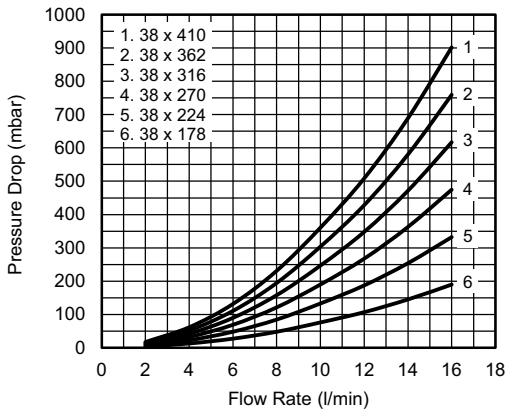
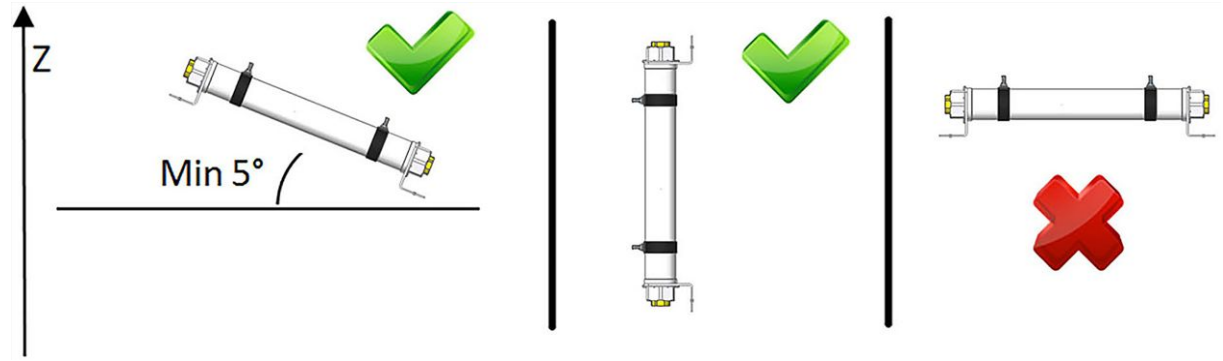


Fig. 4 - Pressure Drop vs. Flow Rate
40 % of Mono Ethylene Glycol at 20 °C

MOUNTING RECOMMENDATION



OK **OK** **NOK**

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ORDERING INFORMATION

DCRF	38 x 178	U56	± 10 %	XXX	BO12
MODEL	STYLE	RESISTANCE VALUE	TOLERANCE	CUSTOM DESIGN	PACKAGING
			± 5 % ± 10 %	Optional On request: special value, multiple resistor, etc.	

GLOBAL PART NUMBER INFORMATION

D	C	R	F	3	8	1	7	8	0	R	5	6	K	B	8	7	9
1				2					3				4	5	6		

1	2	3	4	5	6
PRODUCT TYPE	TYPE	RESISTANCE VALUE	TOLERANCE	PACKAGING	INDUSTRIALIZATION NUMBER
DCRF	**38178** **38224** **38270** **38316** **38362** **38410**	**The first three digits are significant figures and the last specifies the number of zeros to follow, R designates decimal point.** **4R7 = 4.7 Ω** **0R56 = 0.56 Ω**	**J = 5 %** **K = 10 %**	**B = box** **Box quantity depends of model and size**	**3 specific digits (if applicable)**

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