

IWAKI  
DIRECT  
DRIVE PUMPS

**NRD**



# High performance canned pumps for a wide variety of uses

NRD series models are small canned motor centrifugal pumps powered by brushless DC motors. They are incredibly compact, lightweight, quiet and feature seal less construction designed to eliminate the potential for leakage. The models in the NRD series offer a wider range of options with their flow adjustment feature (DC 1 to 5V), support for high-temperature liquid 0°C to 80°C, and capacity to be installed in areas with high ambient temperature 0°C to 50°C.

## Seal-less design

The pumps are equipped with a small, lightweight canned motor encapsulated in resin. This construction requires less space than magnet pumps, while the seal-less design prevents liquid leakage. (US Patent 6, 604, 917)

## Long life

A Brushless DC motor is employed as the pump drive. This motor design eliminates pump/motor failures due to brush wear, ensuring a service life equal to AC motors.

## Flow adjustment feature and built-in drive technology

An external input signal (DC 1 to 5V) can be used to vary the flow rate. The NRD series models are also equipped with a built-in motor drive circuit. With this circuit, the power can be connected to variable external input to operate the pump.

## Multiple connection types

There are four different port connection options available, Hose, NPT Thread, R Thread or G Thread<sup>Note</sup>. Select the option that best fits your location and installation.   
Note: NRD-40/40X only

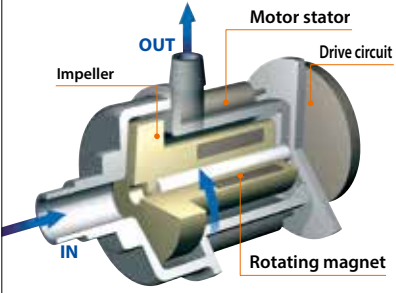
## Readily compliant with international standards

The NRD series power voltage is classified as safety voltage (50V or less), which allows the user to easily comply with international standards such as UL, CSA, CE and GS. The DC power supply does not have a region-specific voltage or frequency, allowing for unified usage.

## High temperature environments

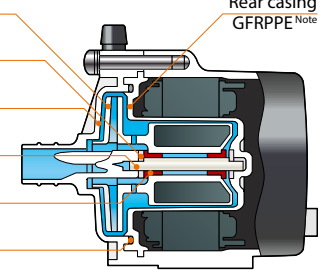
The pump can be installed in an environment with an ambient temperature of up to 50°C (08Z: 40°C). It can also pump fluids as warm as 80°C (08Z: 50°C).

### Operating principle



Canned motor centrifugal pumps directly drive the rotor magnet that is coupled to the impeller. The pump chamber is completely sealed from the exterior by a static o-ring. The impeller is driven by a rotating magnetic field that doesn't require a shaft seal. In addition, these products have a simpler and more compact structure than pumps which have external drive magnets.

### Wet end materials



- Impeller: GFRPP<sup>Note</sup>
- Thrust ring: Alumina ceramic
- Front casing: GFRPPE<sup>Note</sup>
- Spindle: Alumina ceramic
- Bearing: PTFE w/filler
- O ring: FKM or EPDM
- Rear casing: GFRPPE<sup>Note</sup>

Note: NRD-40/40X is GFRPPS.



## Typical applications

**Fuel cells** Cogeneration systems (cooling and circulation)

**Medical** Biochemical analysis, Cooling systems, Patient temperature management medical equipment, Cooling for laser treatment

**Physical/chemical analysis** Thermostats, Pure water equipment, Different types of analyzers

**Vending machines** Dispensers

**Photo** Automatic film developing machines, X-ray film developing machines

**Semiconductors** Semiconductor cooling systems

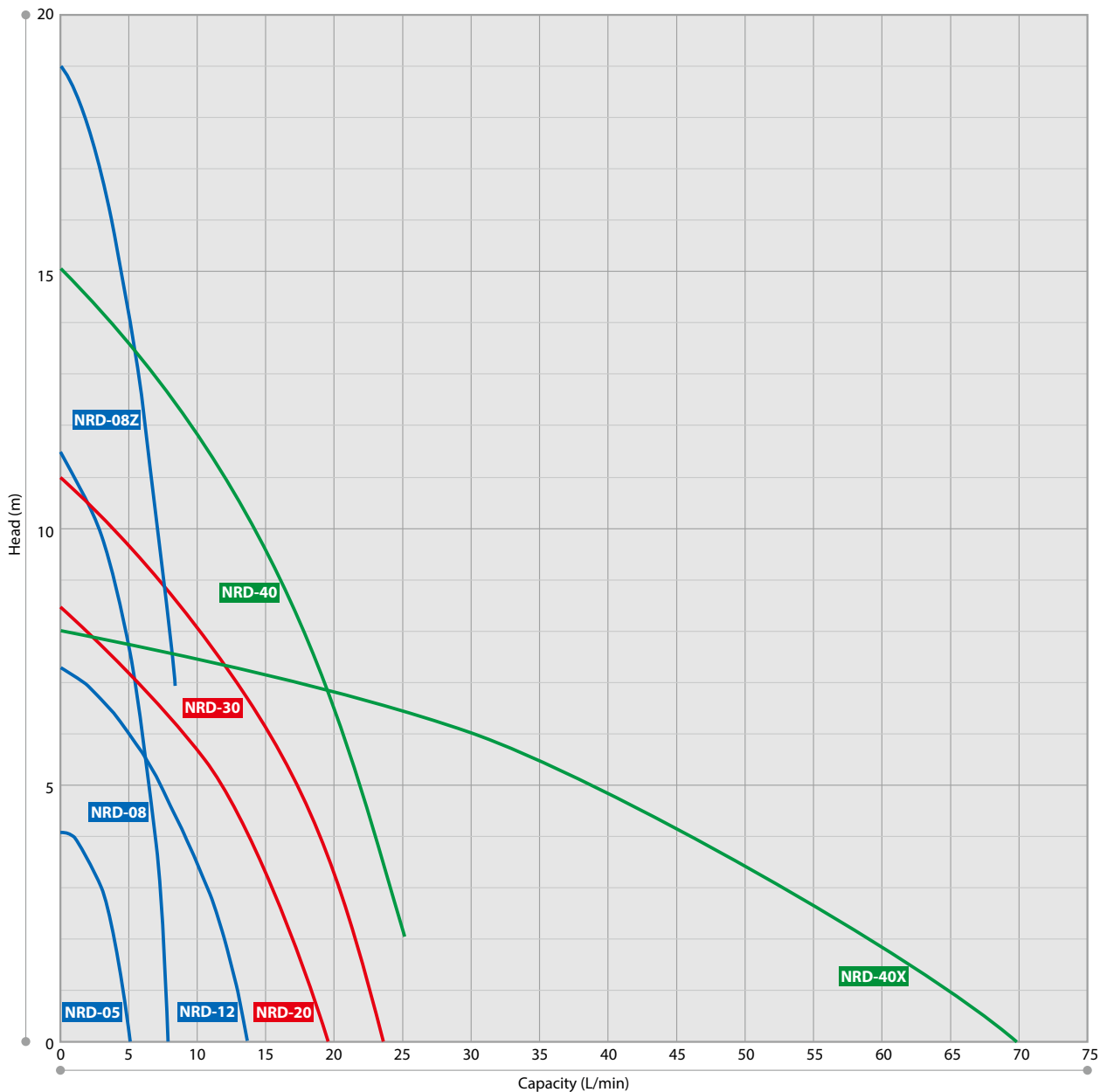
**Surface treatment** Small plating machines

**Solar power systems** Electric water heaters, Solar battery heat collectors

**Electric cars** Radiators, Heaters

## Performance curves

(Note) NRD-40: Do not exceed 25 L/min in operation, or cavitation may take place.



### Pump identification

**NRD - 05 T V 24 - R S**

- Pump size**  
05, 08, 08Z, 12, 20, 30, 40, 40X
- Material of Bearing**  
T: PTFE w/filler
- Material of O ring**  
V: FKM  
E: EPDM
- Power voltage**  
24: 24VDC  
48: 48VDC
- Pump connection port**  
No code: Hose  
R: R Thread  
N: NPT Thread  
G: G Thread
- Base type**  
No code: Left and right direction mounting type (Left-to-right direction when viewed from pump front)  
S: Custom type

### Specifications

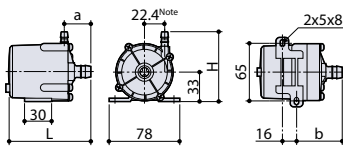
Model	Connection	Connection sizes (Outer diameterØ)		Max. Capacity <sup>Note1</sup> L/min	Max. Head <sup>Note1</sup> m	Noise <sup>Note2</sup> dB	Limit of specific gravity	Motor		Mass kg
		IN mm	OUT mm					Power voltage V	Output W	
NRD-05	Hose	14	8	5.1	4.1	up to 40	1.07	DC24	6	0.4
	R Thread	R3/8	R1/8							
	NPT Thread	NPT3/8	NPT1/8							
NRD-08	Hose	14	8	7.9	11.5	up to 45	1.07	DC24	22	0.4
	R Thread	R3/8	R1/8							
	NPT Thread	NPT3/8	NPT1/8							
NRD-08Z	Hose	14	8	8.0	19	up to 45	1.07	DC24	33	0.4
	R Thread	R3/8	R1/8							
	NPT Thread	NPT3/8	NPT1/8							
NRD-12	Hose	18	18	13.6	7.4	up to 45	1.07	DC24	17	0.4
	R Thread	R3/8	R3/8							
	NPT Thread	NPT3/8	NPT3/8							
NRD-20	Hose	21	17	19.5	8.5	up to 55	1.0	DC24	28	1.2
	R Thread	R1/2	R3/8							
	NPT Thread	NPT1/2	NPT3/8							
NRD-30	Hose	21	17	23.5	11	up to 55	1.0	DC24	45	1.2
	R Thread	R1/2	R3/8							
	NPT Thread	NPT1/2	NPT3/8							
NRD-40	Hose	27	21	25.0	15	up to 55	1.07	DC48	85	1.5
	R Thread	R1	R1/2							
	NPT Thread	NPT1	NPT1/2							
	G Thread	G1 · 1/2	G1 · 1/4							
NRD-40X	Hose	27	27	70.0	8	up to 55	1.07	DC48	72	1.5
	R Thread	R1	R3/4							
	NPT Thread	NPT1	NPT3/4							
	G Thread	G1 · 1/2	G1 · 1/2							

Note1: The numerical values listed in the table represent the average performance values for when NRD series models are shipped from the factory. The individual differences between models may result in an error discrepancy of ±10%.  
 Note2: Noise was measured at a location 1 meter away from pump front, using the A scale.  
 • Test performance using clear water at room temperature.  
 • The maximum discharge rate is the discharge rate for when the pump head is at 0 meters and the maximum pump head is based on the shut-off total head.  
 • The viscosity limit of the working fluid is up to 1.0 mPa·s (with specific gravity of NRD-05/08/08Z/12/40/40X: 1.07, NRD-20/30: 1.0).  
 • Specifications/Environmental conditions Ambient temperature: 0°C to 50°C (08Z: 0°C to 40°C), Working liquid temperature: 0°C to 80°C (08Z: 0°C to 50°C), Relative humidity: 35% to 85% RH (40/40X: 35% to 90%)  
 Please note that the above conditions vary depending on working liquid and heat cycle specifications.

### Dimensions (mm)

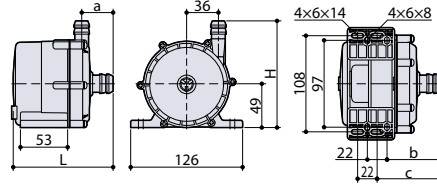
#### NRD-05/08/08Z/12

Right and left direction mounting type



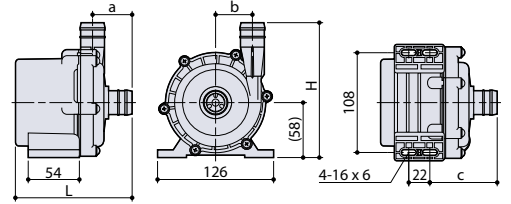
Connection	H	L	a	b
Hose	78 (84)	91 (92.5)	29.5 (31)	50.5 (52)
R Thread	75.5 (84)	90.5 (92.5)	29 (31)	50 (52)
NPT Thread	75.5 (84)	90.5 (92.5)	29 (31)	50 (52)

#### NRD-20/30



Connection	H	L	a	b	c
Hose	119	112	35	59.5	70.5
R Thread	115	107	30	54.5	65.5
NPT Thread	115	107	30	54.5	65.5

#### NRD-40/40X



Model	Connection	H	L	a	b	c
NRD-40	Hose	(139)	(127)	42	37	(75)
	R Thread	(133)	(127)	42	37	(75)
	NPT Thread	(133)	(127)	42	37	(75)
NRD-40X	G Thread	(138)	(121)	36.5	37	(67.5)
	Hose	(143)	(127)	42	40	(75)
	R Thread	(134)	(127)	42	40	(75)
NRD-40X	NPT Thread	(134)	(127)	42	40	(75)
	G Thread	(138)	(123)	36.5	40	(70)

( ) dimensions are NRD-12.  
 Note: NRD-12 is 21mm.

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Caution for safety use: Before use of pump, read instruction manual carefully to use the product correctly.

Actual pumps may differ from the photos. Specifications and dimensions are subject to change without prior notice. For further details please contact us.

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