NRD
series

Direct Drive Sealless Pumps

IWAKI AMERICA

Small Canned Motor Centrifugal Pumps Powered by Brushless DC Motors

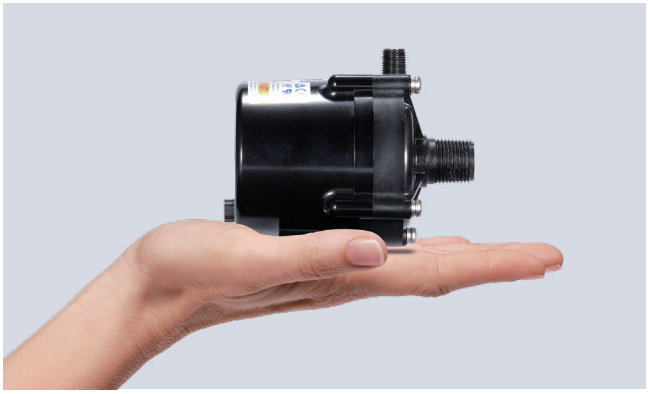
Compact, lightweight, quiet and feature seal less construction designed to eliminate the potential for leakage. The models in the NRD series offer a wider range of options with their flow adjustment feature (1 to 5VDC), support for high-temperature liquid 32-176°F (0°C to 80°C), and capacity to be installed in areas with high ambient temperature 32-122°F (0°C to 50°C).

In addition, tachometer feedback (rotation speed pulse output [Note1]) and variable input signal are available at the same time.

Note1: NRD-08Z-P4//70/70X/100/100X/100H only. Open collector method Outputs at 1 pulse/rotation.

Compact and Seal-Less Design

The canned motor design offers the most compact package available. This construction requires less space, while the seal-less design prevents liquid leakage and the need for seal replacement.



Long Life

A Brushless DC motor drives the pump for efficient, reliable operation. 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 (1 to 5VDC or 400 Hz ± 10% of PWM, Duty 0 - 100%[Note2]) 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.

Note2: NRD-08Z-P4//70/70X/100/100X/100H only. Connect the PWM control signal with an open collector (drain).

Multiple Connection Types

There are four different port connection options available, Tube (Hose barb type), NPT Thread, R Thread or G Thread [Note3]. Select the option that best fits your location and installation.

Note3: NRD-40/40X/70/70X/100/100X/100H only.

Tube (Hose barb type)

R Thread

NPT Thread

G Thread

Readily Compliant with Global Safety Standards

The NRD series power voltage is classified as safety voltage (50V or less), which allows the user to easily comply with global safety standards such as UL, CSA and CE. 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 122°F/50°C (08Z: 104°F/40°C). It can also pump fluids as warm as 176°F/80°C (08Z: 122°F/50°C, 100H: 158°F/70°C).

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NRD Series Overview

The NRD series has a large selection of models offering a wide flow range of 1.3 - 37 GPM (5.1 - 140 LPM).

Models	Max. Capacity (L/min)	Max. Head (m)	Limit of specic gravity
	20 40 60 80 100 120 140	5 10 15 20 25	
NRD-05	5.1	4.1	1.07
NRD-08	7.9	11.5	1.07
NRD-08Z(-P)	8	19	1.07
NRD-12	13.6	7.4	1.07
NRD-20	19.5	8.5	1.0
NRD-30	23.5	11	1.0
NRD-40	25	15	1.07
NRD-40X Large capacity type	70	6	1.07
NRD-70	55	19.1	1.07
NRD-70X Large capacity type	112	9.3	1.07
NRD-100	64	22.2	1.07
NRD-100X Large capacity type	140	12.2	1.07
NRD-100H High head type	70	26	1.07

NRD-05/08/08Z(-P)

NRD-20/30

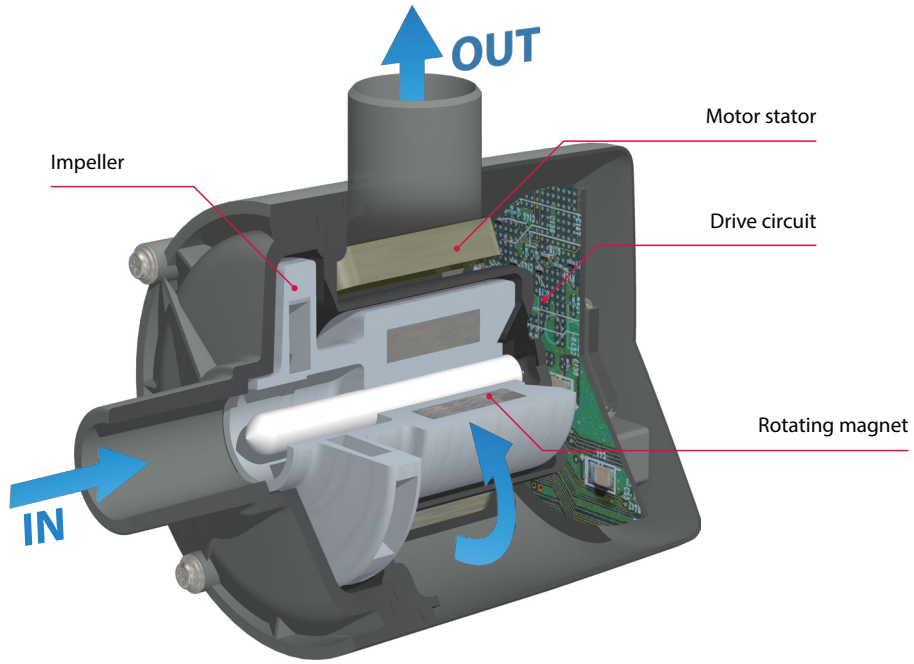
NRD-40/40X

NRD-70/70X/100/100X/100H

Operating Principle

The NRD Series combine simplicity with a compact build, setting them apart from pumps with external drive magnets.

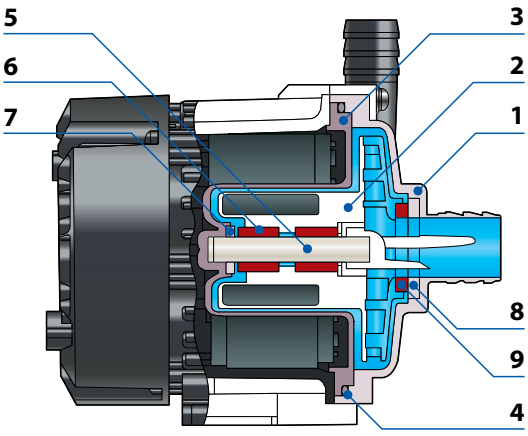
Canned motor centrifugal pumps directly drive the rotor magnet that is coupled to the impeller. The pump chamber is completely sealed from the exterior by a static o-ring. The impeller is driven by a rotating magnetic field that doesn't require a shaft seal.



Wet End Materials

Model		NRD-05 to 30	NRD-40	NRD-70 to 100
1	Front casing	GFRPPE	GFRPPS	GFRPPS
2	Impeller	GFRPP		
3	Rear casing	GFRPPE		
4	O ring	FKM or EPDM		
5	Spindle	Alumina ceramic		
6	Bearing	Filled PTFE		
7	Thrust ring	Alumina ceramic		
8	Liner ring	-	-	Alumina ceramic
9	Mouth ring	-	-	Filled PTFE

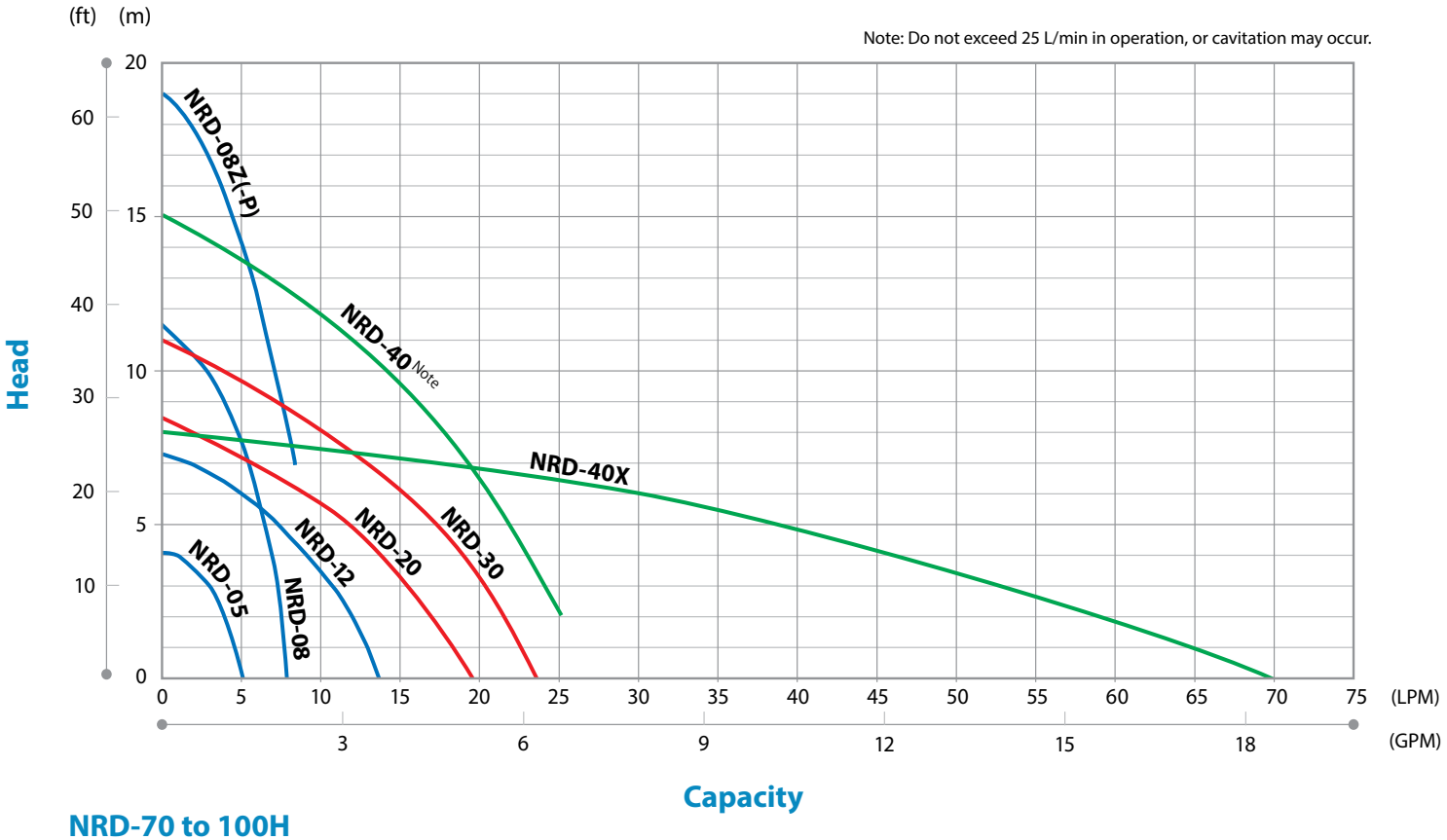
Illustration shows model NRD-70/100. The structure varies slightly depending on the model.
Note: NRD-05 to 40X models do not have liner rings or mouth rings.



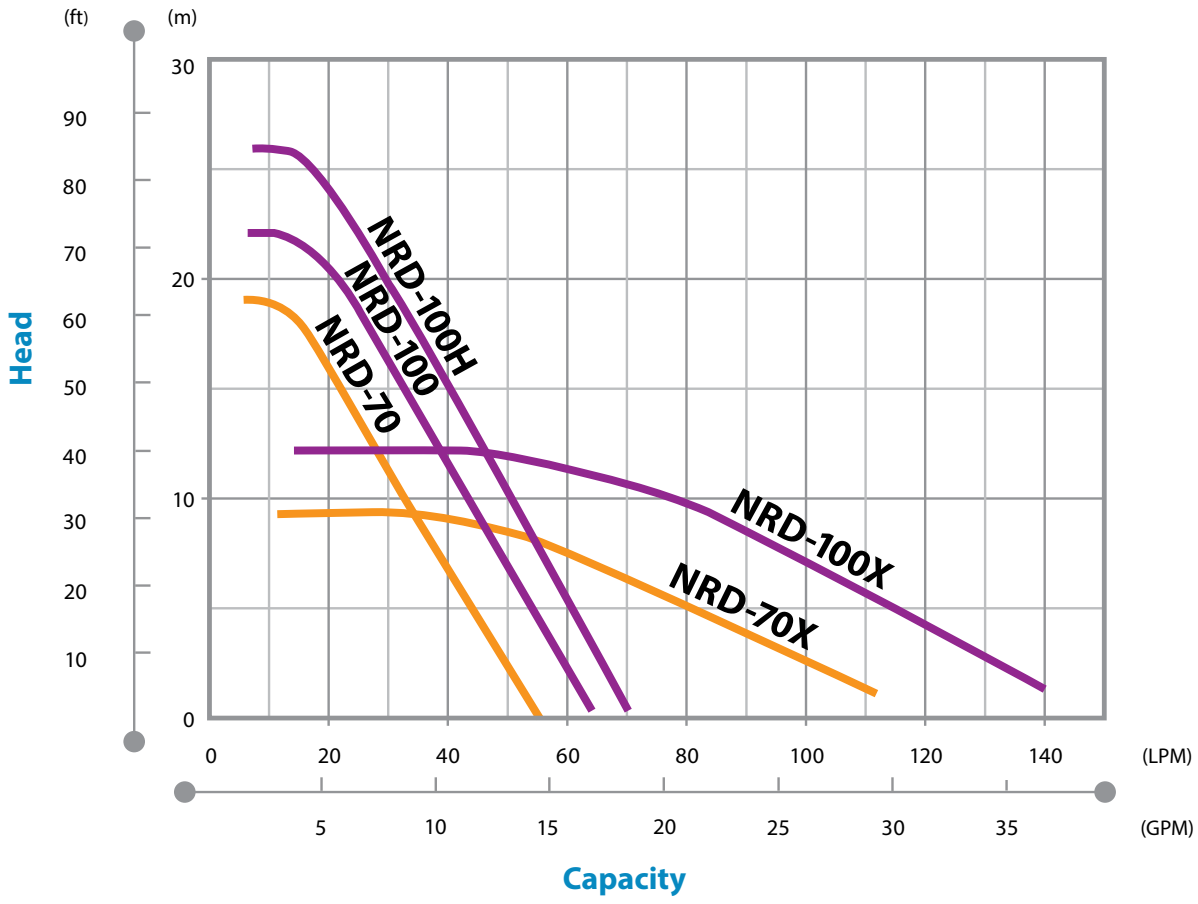
Performance Curves

NRD series

NRD-05 to 40X



NRD-70 to 100H



Specifications

Model	Connection	Connection sizes (Outer diameter Ø) IN in (mm)	OUT in (mm)	Max. Capacity[Note1] GPM (LPM)	Max. Head[Note1] ft (m)	Noise[Note2] dB	Limit of specific gravity	Motor Power voltage V	Motor Output W	Mass lb (kg)
NRD-05	Tube	0.55 (14)	0.31 (8)	1.35 (5.1)	13.45 (4.1)	Up to 40	1.07	DC24	6	0.88 (0.4)
	R Thread	R3/8	R1/8							
	NPT Thread	NPT3/8	NPT1/8							
NRD-08	Tube	0.55 (14)	0.31 (8)	2.09 (7.9)	37.73 (11.5)	Up to 45	1.07		22	0.88 (0.4)
	R Thread	R3/8	R1/8							
	NPT Thread	NPT3/8	NPT1/8							
NRD-08Z(-P)	Tube	0.55 (14)	0.31 (8)	2.11 (8)	62.34 (19)	Up to 45	1.07		33	0.88 (0.4)
	R Thread	R3/8	R1/8							
	NPT Thread	NPT3/8	NPT1/8							
NRD-12	Tube	0.71 (18)	0.31 (8)	3.59 (13.6)	24.28 (7.4)	Up to 45	1.07		17	0.88 (0.4)
	R Thread	R3/8	R3/8							
	NPT Thread	NPT3/8	NPT3/8							
NRD-20	Tube	0.83 (21)	0.67 (17)	5.15 (19.5)	27.89 (8.5)	Up to 55	1.0		28	2.65 (1.2)
	R Thread	R1/2	R3/8							
	NPT Thread	NPT1/2	NPT3/8							
NRD-30	Tube	0.83 (21)	0.67 (17)	6.21 (23.5)	36.09 (11)	Up to 55	1.0		45	2.65 (1.2)
	R Thread	R1/2	R3/8							
	NPT Thread	NPT1/2	NPT3/8							
NRD-40	Tube	1.06 (27)	0.83 (21)	6.60 (25)	49.21 (15)	Up to 55	1.07	DC48	85	3.31 (1.5)
	R Thread	R1	R1/2							
	NPT Thread	NPT1	NPT1/2							
	G Thread	G1 · 1/2	G1 · 1/4							
NRD-40X (Large capacity type)	Tube	1.06 (27)	1.06 (27)	18.49 (70)	26.25 (8)	Up to 55			72	3.31 (1.5)
	R Thread	R1	R3/4							
	NPT Thread	NPT1	NPT3/4							
	G Thread	G1 · 1/2	G1 · 1/2							
NRD-70	Tube	1 (25)	0.75 (19)	14.53 (55)	62.66 (19.1)	Up to 55			135	5.95 (2.7)
	R Thread	R1	R3/4							
	NPT Thread	NPT1	NPT3/4							
	G Thread	G1 · 1/2	G1 · 1/4							
NRD-70X (Large capacity type)	Tube	1-1/4 (32)		29.59 (112)	30.51 (9.3)				120	
	R Thread	R1 · 1/4								
	NPT Thread	NPT1 · 1/4								
	G Thread	G1 · 1/2								
NRD-100	Tube	1 (25)	0.75 (19)	16.91 (64)	72.83 (22.2)				165	
	R Thread	R1	R3/4							
	NPT Thread	NPT1	NPT3/4							
	G Thread	G1 · 1/2	G1 · 1/4							
NRD-100X (Large capacity type)	Tube	1.25 (32)		36.98 (140)	40.03 (12.2)	Up to 60			170	
	R Thread	R1 · 1/4								
	NPT Thread	NPT1 · 1/4								
	G Thread	G1 · 1/2								
NRD-100H (High head type)	Tube	1 (25)	0.75 (19)	18.49 (70)	85.30 (26)				195	
	R Thread	R1	R3/4							
	NPT Thread	NPT1	NPT3/4							
	G Thread	G1 · 1/2	G1 · 1/4							

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, 70, 70X, 100, 100H, 100X: 1.07, NRD-20/30: 1.0).
- Specifications/Environmental conditions

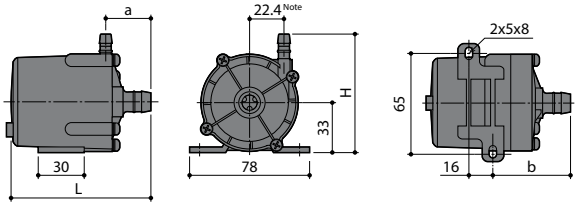
NRD-05/08/12/40/40X:	Ambient temperature: 32 to 122°F (0 to 50°C), Working liquid temperature: 32 to 176 °F (0 to 80°C), Relative humidity: 35 to 85%RH
NRD-08Z:	Ambient temperature: 32 to 104°F (0 to 40°C), Working liquid temperature: 32 to 122 °F (0 to 50°C), Relative humidity: 35 to 85%RH
NRD-40/40X:	Ambient temperature: 32 to 122°F (0 to 50°C), Working liquid temperature: 32 to 176 °F (0 to 80°C), Relative humidity: 35 to 90%RH
NRD-70/70X/100/100X:	Ambient temperature: 32 to 122°F (0 to 50°C), Working liquid temperature: 32 to 176 °F (0 to 80°C), Relative humidity: 35 to 90%RH
NRD-100H:	Ambient temperature: 32 to 122°F (0 to 50°C), Working liquid temperature: 32 to 158 °F (0 to 70°C), Relative humidity: 35 to 90%RH

Please note that the above conditions vary depending on working liquid and heat cycle specifications.

Dimensions

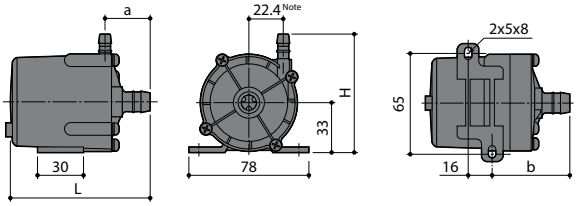
NRD series

NRD-05/08/08Z(-P)



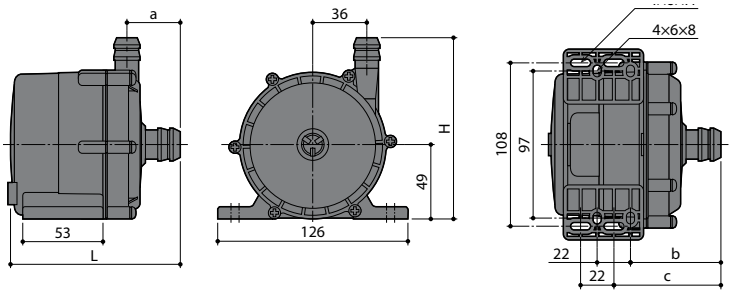
Connection	H in (mm)	L in (mm)	a in (mm)	b in (mm)
Tube	3.07 (78)	3.58 (91)	1.16 (29.5)	1.99 (50.5)
R Thread	2.97 (75.5)	3.56 (90.5)	1.14 (29)	1.97 (50)
NPT Thread	2.97 (75.5)	3.56 (90.5)	1.14 (29)	1.97 (50)

NRD-12



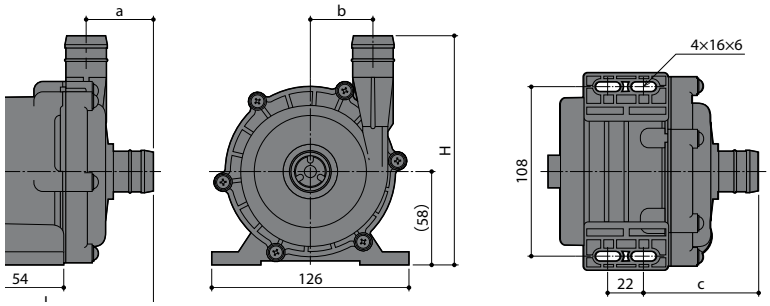
Connection	H in (mm)	L in (mm)	a in (mm)	b in (mm)
Tube	3.31 (84)	3.64 (92.5)	1.22 (31)	2.05 (52)
R Thread	3.31 (84)	3.64 (92.5)	1.22 (31)	2.05 (52)
NPT Thread	3.31 (84)	3.64 (92.5)	1.22 (31)	2.05 (52)

NRD-20/30



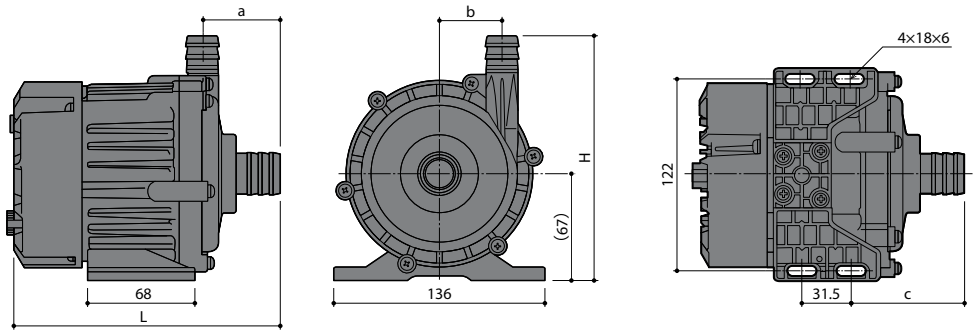
Connection	H in (mm)	L in (mm)	a in (mm)	b in (mm)	c in (mm)
Tube	4.69 (119)	4.41 (112)	1.38 (35)	2.34 (59.5)	2.78 (70.5)
R Thread	4.53 (115)	4.21 (107)	1.18 (30)	2.15 (54.5)	2.58 (65.5)
NPT Thread	4.53 (115)	4.21 (107)	1.18 (30)	2.15 (54.5)	2.58 (65.5)

NRD-40/40X



Model	Connection	H in (mm)	L in (mm)	a in (mm)	b in (mm)	c in (mm)
NRD-40	Tube	5.47 (139)	5.12 (130)	1.73 (44)	1.46 (37)	2.95 (75)
	R Thread	5.43 (133)	5.12 (130)	1.73 (44)	1.46 (37)	2.95 (75)
	NPT Thread	5.43 (133)	5.12 (130)	1.73 (44)	1.46 (37)	2.95 (75)
	G Thread	5.43 (138)	4.84 (123)	1.44 (36.5)	1.46 (37)	2.66 (67.5)
NRD-40X	Tube	5.63 (143)	5.12 (130)	1.65 (42)	1.57 (40)	2.96 (75)
	R Thread	5.28 (134)	5.12 (130)	1.65 (42)	1.57 (40)	2.96 (75)
	NPT Thread	5.28 (134)	5.12 (130)	1.65 (42)	1.57 (40)	2.96 (75)
	G Thread	5.43 (138)	4.92 (125)	1.44 (36.5)	1.57 (40)	2.76 (70)

NRD-70/70X/100/100X/100H



Model	Connection	H in (mm)	L in (mm)	a in (mm)	b in (mm)	c in (mm)
NRD-70/100	Tube	6.10 (155)	6.69 (170)	1.92 (48.9)	1.61 (41)	2.91 (74)
	R Thread					
	NPT Thread					
	G Thread					
NRD-70X/100X	Tube	6.38 (162)	6.85 (174)	2.07 (52.6)	1.65 (42)	3.07 (78)
	R Thread					
	NPT Thread					
	G Thread					
NRD-100H	Tube	6.10 (155)	6.69 (170)	1.92 (48.9)	1.61 (41)	2.91 (74)
	R Thread					
	NPT Thread					
	G Thread					

Pump Identification

NRD	-	05	T	V	24	P4	-	R	S
1		2	3	4	5	6		7	8

1 Pump series
NRD Series

2 Pump size
05, 08, 08Z, 12, 20, 30
40, 40X, 70, 70X, 100, 100X, 100H

3 Material of Bearing
T: Filled PTFE

4 Material of O ring
V: FKM
E: EPDM

5 Power voltage
24: 24VDC
48: 48VDC

6 Control method
No code: Variable external input (1 to 5VDC)
P4: PWM input (NRD-08Z-P4 only)
P: PWM input (NRD-70 to 100H only)

7 Pump connection port
No code: Tube
R: R Thread
N: NPT Thread
G: G Thread (NRD-40 to 100H only)

8 Base type (NRD-05/08/08Z only)
No code: Left and right direction mounting type
(Left-to-right direction when viewed from pump front)
S: Custom type