PRODUCT GUIDE
High-Performance Air-Powered Double Diaphragm Pumps
About Yamada...
The Yamada Corporation has been a leading producer of industrial equipment since 1905, and of fluid handling products for over 60 years. As a leader in pneumatic pumping technology, Yamada is known in many industries worldwide for its innovative products, superior quality, and unmatched reliability. Other companies may claim to be innovators, but an impressive history of delivering new products and solving customer problems confirms Yamada’s position as the industry leader.

Yamada’s reputation for manufacturing top quality products, allied with continuing efforts in research and development have created a strong foundation for market leadership. As an ISO 9001 certified corporation, stringent quality procedures are followed throughout the manufacturing process, including liquid testing of every pump prior to shipping.

The Yamada Corporation is headquartered in Tokyo with manufacturing facilities located throughout Japan. Satellite facilities are located in Arlington Heights, Illinois, USA, servicing the Western Hemisphere, The Netherlands, providing support throughout Europe, Africa, and the Middle East, and Shanghai, covering the emerging markets of China. These offices are support centers for over 300 authorized fully stocking Yamada distributors worldwide.

Yamada professional staff provides:

- Customer Service
- Product Training
- Research & Development
- Parts and Service for all Yamada® Pumps
- Application Engineering
- Industry Knowledge

With over 300 distributors, Yamada is effectively positioned to service your market needs. Contact Yamada for the location of your closest local stocking distributor.

For additional information, AutoCAD® drawings, product literature, and promotions, please visit yamadacorp.co.jp/global or contact our Sales Staff at Phone No.+81-(0)3-3777-0241.
Diaphragm Dynamics
Extensive research has led to the development of an optimal stroke length that maximizes diaphragm life and performance while minimizing downtime and maintenance costs.

Rugged, Bolted Construction
All Yamada pumps feature bolted construction, which eliminates leaks and simplifies post-maintenance reassembly. Bolted construction is superior to clamp band retainers, which frequently require frustrating, unnecessary leakage rebuilds from misalignment during reassembly.

Outside-Accessible Air Valve
Inspection or maintenance of every Yamada air valve may be performed without removing the pump from service.

Unified Air Valve Concept
Common-size air valve assemblies reduce parts confusion.

Pilot Valve
Unique to the Yamada design is an individual modular pilot valve that actuates the air valve. It is depressed slightly by the inner center disk creating a pressure drop at one end of the air valve, allowing shifting to occur. It is maintenance free with no cumbersome snap rings or lubricated dynamic o-rings to replace or repair.
Air Valve Technology

Yamada air valve technology is the heart of the air-powered double diaphragm pump and determines reliability. Yamada holds three patents on its field proven valve and enjoys a superior reputation throughout the industry.

Unified Air Valve Concept
To simplify, Yamada offers two common size air valve assemblies within five sizes of pumps (3/4" & 1" pumps and 1-1/2", 2" & 3" pumps) further reducing reassembly confusion and parts inventory. Other air-powered double diaphragm pump manufacturers offer multiple air valve designs and revisions in an effort to address pump reliability problems. Multiple designs and revisions typically create maintenance rebuild issues, parts confusion, and obsolete inventory. **Whether your pumps are functioning continuously or intermittently—at high or low pressure—using dirty or clean air—Yamada offers one field proven design.**

Truly Non-Lubricated Air Valve
The patented Yamada air valve on all NDP series pumps never requires lubrication or pre-packing. The advanced design eliminates the need for external lubrication, which can lead to pumpage contamination and maintenance headaches. **Yamada is proud to be the originator of non-lubricated air valve technology for air-powered double diaphragm pumps.**

Some air-powered double diaphragm pump manufacturers claim to offer a non-lubricated air valve. Dependent upon the competitor’s design, the air valve will probably require lubrication for continuous operation, or lubricator installation if moisture is present within the air system. These valves are pre-packed with grease and are not truly non-lubricated.

Component Replaceable
All Yamada air valves can be restored with individual components, without requiring complete valve and housing replacement.

Many competitor air valves incorporate a complicated design which requires complete replacement of the valve assembly and housing, further increasing the cost of ownership.

Non-Stalling
A patented non-centering, spring-assisted shifter is incorporated into every NDP Series pump, ensuring a positive shift every time. The 304 stainless steel C-springs provide exceptional durability and longevity and are tested to last over 300 million cycles!

The spring assist also aids in long dead head applications for reliable startup.

For additional information on Yamada products and services, visit yamadacorp.co.jp/global
Non-Metallic Components

Yamada engineers utilize state-of-the-art solid modeling and finite element analysis techniques, including rib and shell methods of injection molding to design non-metallic parts structure. This patented technique greatly increases the component strength and reduces material usage.

NDP-40, 50, & 80 Series Stainless Steel Pump Base for Non-Metallic Pumps

The tubular 304 Stainless Steel base was designed to simplify rebuilding procedures and to absorb weight distribution. Maintenance operations are streamlined by mounting the base directly to the air motor so that the pump can sit upright on a workbench for most of the service. The radially bent tubular steel base is exceptional strength vs. welded angle designs.

About Diaphragm Pumps

1. Handles a wide variety of fluids with high solids content: No close fitting or rotating parts so liquid with high solids content and/or size can be easily pumped.

2. Self Priming: The Yamada pump design (incorporating internal check valves) allows for high suction lift even at dry start-up and with heavier fluids.

3. Ability to run dry: No close fittings or sliding parts are at risk—the pump can run dry without damage.

4. Variable flow rate and discharge pressure: Yamada pumps will run at any setting within their operating range simply by adjusting the air inlet pressure and system conditions. One pump can fit a broad spectrum of applications.

5. Portable/Simple Installation: Yamada pumps transport easily to the application site. Simply connect your air supply line and liquid lines; the pump is ready to perform. There are no complex controls to install and operate.

6. Dead Head: Because the discharge pressure can never exceed air inlet pressure, the discharge line can be closed with no damage or wear. The pump will simply slow down and stop.

7. Shear sensitive: The gentle nature and minimal parts contact with the liquid makes Yamada pumps an excellent choice for shear sensitive fluids.

8. Explosion Proof: Yamada pumps are operated by compressed air, therefore, they are intrinsically safe.

9. Submersible: If external components are compatible—Yamada pumps can be submerged in the liquid by simply running the exhaust line above the liquid level.

10. Pumping efficiency remains constant: There are no rotors, gears, or pistons, which wear over time and lead to the gradual decline in performance/flow rate.

For additional information on Yamada products and services, visit yamadacorp.co.jp/global
NDP-5 Series

Maximum Fluid Discharge of 10L/min
Port Size 1/4

Specifications

Port Dimensions
Intake & discharge: Rc1/4
Air inlet (incl. ball valve): Rc1/4
Air exhaust (internal silencer): Rc3/8

Maximum Liquid Temperature
Fitted with Teflon® (PTFE) diaphragm

<table>
<thead>
<tr>
<th>Pump Material</th>
<th>Temperature</th>
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<tbody>
<tr>
<td>Polypropylene (PPG)</td>
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<td>Kynar® (PVDF)</td>
<td>60°C</td>
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<tr>
<td>Groundable Acetal(POM)</td>
<td>60°C</td>
</tr>
<tr>
<td>Aluminum (AC4C-T6)</td>
<td>100°C</td>
</tr>
<tr>
<td>Stainless Steel (SCS14)</td>
<td>100°C</td>
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Air Supply Pressure (All Models)
0.2–0.7MPa

Discharge Volume Per Cycle
20mL

Maximum Cycles Per Minute: 400

Maximum Dry Suction Lift: 1.5M

Pump Air Motor
Ryton® air motor standard

Model Number Nomenclature
Polypropylene (PPG) NDP-5FPT
Kynar® (PVDF) NDP-5FVT
Groundable Acetal(POM) NDP-5FDT
Aluminum (AC4C-T6) NDP-5FAT
Stainless Steel (SCS14) NDP-5FST

Performance Curve

AutoCAD® drawings are available at yamadacorp.co.jp/global

Table of Contents

5
DP-10 Series / DP-15 Series

Maximum Fluid Discharge of 20L/min
Port Size 3/8

Maximum Fluid Discharge of 50L/min
Port Size 1/2

DP-10
Polypropylene
Dimensions: 186mm W x 241mm H
Net Wt.: 3.0 kg
Shipping Wt.: 3.3 kg

DP-10 Aluminum
Dimensions: 186mm W x 241mm H
Net Wt.: 3.5 kg
Shipping Wt.: 6.0 kg

DP-10 Stainless Steel
Dimensions: 186mm W x 241mm H
Net Wt.: 5.2 kg
Shipping Wt.: 6.0 kg

DP-15
Groundable Acetal
Dimensions: 246mm W x 297mm H
Net Wt.: 4.0 kg
Shipping Wt.: 5.4 kg

DP-15 Polypropylene
Dimensions: 246mm W x 297mm H
Net Wt.: 4.0 kg
Shipping Wt.: 5.4 kg

AutoCAD® drawings are available at yamadacorp.co.jp/global
DP-10/15 Series Specifications

DP-10 Port Dimensions
Intake & discharge connection:
Polypropylene (PPG) Rc3/8
Aluminum (ADC12) Rc3/8
Stainless Steel (SCS14) Rc3/8

DP-15 Port Dimensions
Intake & discharge connection:
Polypropylene (PPG) Rc3/8
Groundable Acetal (POM) Rc3/8

Air Inlet / Exhaust
Air inlet (incl. ball valve): Rc1/4
Air exhaust (incl. silencer): Rc3/8

Maximum Liquid Temperature*
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<td>Santoprene® (TPO)</td>
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</tr>
<tr>
<td>Teflon® (PTFE)</td>
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*The maximum liquid temperature for metal and Kynar®-fitted pumps is determined by the elastomer (diaphragm material). Polypropylene and Groundable Acetal pumps have a maximum liquid temperature of 60°C regardless of diaphragm material.

Air Supply Pressure (All Models)
0.2–0.7MPa

Discharge Volume Per Cycle
DP-10: 50mL
DP-15: 55mL

Maximum Cycles Per Minute
All diaphragms: 300

Maximum Size Solid
1/32” (1 mm)

Maximum Dry Suction Lift
All diaphragms: 3m

Aluminum Air Motor – Standard
Optional: Epoxy-coated, Teflon*-coated, or Electroless Nickel Plate
Optional Split Manifold – contact Yamada

Model Number Nomenclature
Series:
DP-10 pump or DP-15 pump

Valve Type:
B = Ball
F = Flat*

Diaphragm Material:
C = Neoprene (CR)
N = Buna N (NBR)
S = Santoprene® (TPO)
T = Teflon® (PTFE)
H = Hytrel® (TPEE)

Body Material:
P = Polypropylene
D = Groundable Acetal
A = Aluminum
S = Stainless Steel

* Flat valves available for DP-15 pumps only.
NDP-15 Series

Maximum Fluid Discharge of 50L/min
Port Size 1/2

Split Manifold Pump
Model NDP-15FPT-Z

Polypropylene
Dimensions:
220mm W x 297mm H
Net Wt.: 3.5 kg
Shipping Wt.: 4.0 kg

Polypropylene with Center Port Option
Dimensions:
220mm W x 297mm H
Net Wt.: 3.5 kg
Shipping Wt.: 4.0 kg

Kynar® (PVDF)
Dimensions: 220mm W x 297mm H
Net Wt.: 4.3 kg
Shipping Wt.: 5.0 kg

Groundable Acetal
Dimensions: 220mm W x 297mm H
Net Wt.: 3.5 kg
Shipping Wt.: 4.5 kg

Aluminum
Dimensions: 220mm W x 271mm H
Net Wt.: 4.1 kg
Shipping Wt.: 5.0 kg

Stainless Steel
Dimensions: 211mm W x 247mm H
Net Wt.: 6.3 kg
Shipping Wt.: 7.0 kg

AutoCAD® drawings are available at yamadacorp.co.jp/global
NDP-15 Series Specifications

Port Dimensions

*Intake & discharge connection*
- Polypropylene (PPG) ■ Rc1/2
- Kynar® (PVDF) ● Rc1/2
- Groundable Acetal (POM)▲ Rc1/2
- Aluminum (ADC12) ▲ Rc1/2
- Stainless Steel (SCS14) ▲ Rc1/2
- Air inlet (includes ball valve): Rc1/4
- Air exhaust (internal silencer): Rc3/8

- Polypropylene pumps may be fitted with ball or flat check valves. Ball-type check valves are recommended for flooded suction applications. Flat-type check valves are recommended for suction lift applications.
- Kynar® and Groundable Acetal pumps are fitted with flat check valves only.
- Aluminum and Stainless Steel pumps are fitted with ball check valves only.

**Maximum Liquid Temperature**

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*The maximum liquid temperature for metal and Kynar®-fitted pumps is determined by the elastomer (diaphragm material). Polypropylene and Groundable Acetal pumps have a maximum liquid temperature of 60°C regardless of diaphragm material.

Air Supply Pressure (All Models)
- 0.2–0.7MPa

Discharge Volume Per Cycle
- 70mL

Maximum Cycles Per Minute
- All diaphragms: 400

Maximum Size Solid: 1/32" (1 mm)

Maximum Dry Suction Lift
- Flat-type check valve: 2.4M
- Ball-type check valve: 1.5M

Pump Air Motor: Ryton® air motor standard

Rubber Diaphragm Performance Curve

PTFE Diaphragm Performance Curve

Model Number Nomenclature

<table>
<thead>
<tr>
<th>Series:</th>
<th>NDP-15</th>
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<td>Pump</td>
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<td>Valve Type:</td>
<td>B = Ball</td>
<td>F = Flat*</td>
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<td></td>
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<tr>
<td>Body Material:</td>
<td>P = Polypropylene</td>
<td>V = Kynar® (PVDF)</td>
<td>D = Groundable Acetal</td>
<td>A = Aluminum</td>
</tr>
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</table>

* Flat valves are available for plastic pumps only.
NDP-20 Series

Maximum Fluid Discharge of 100L/min
Port Size 3/4

Aluminum
Dimensions: 249mm W x 317mm H
Net Wt.: 9.0 kg
Shipping Wt.: 11.0 kg

Stainless Steel
Dimensions: 245mm W x 315mm H
Net Wt.: 14.0 kg
Shipping Wt.: 15.0 kg

Polypropylene – Rc
Dimensions: 316mm W x 368mm H
Net Wt.: 8.0 kg
Shipping Wt.: 9.0 kg

Polypropylene – JIS Flange
Dimensions: 316mm W x 374mm H
Net Wt.: 8.0 kg
Shipping Wt.: 9.0 kg

AutoCAD® drawings are available at yamadacorp.co.jp/global
NDP-20 Series Specifications

**Port Dimensions**

- **Intake & discharge connection:**
  - Polypropylene (PPG): Rc3/4
  - Aluminum (ADC12): Rc3/4
  - Stainless Steel (316): Rc3/4
  - Air inlet (incl. ball valve): Rc1/4
  - Air exhaust (incl. silencer): Rc3/4

**ANSI Flange also available — consult Yamada.**

**Maximum Liquid Temperature**

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*The maximum liquid temperature for metal and Kynar®-fitted pumps is determined by the elastomer (diaphragm material). Polypropylene pumps have a maximum liquid temperature of 60°C regardless of diaphragm material.*

**Air Supply Pressure (All Models)**

0.2–0.7 MPa

**Discharge Volume Per Cycle**

- Rubber diaphragm: 350mL
- PTFE diaphragm: 240mL

**Maximum Cycles Per Minute**

- Rubber diaphragm: 195
- PTFE diaphragm: 195

**Maximum Size Solid**

1/16” (2.0 mm)

**Maximum Dry Suction Lift**

Rubber-fitted pump capability: 5.5m

**Air Motors**

- Aluminum air motors are standard on metal pumps;
- Glass-filled polypropylene air motors are standard on plastic pumps.

**Optional air motors:** Epoxy-coated, Teflon*-coated, Electroless Nickel Plate, aluminum and glass-filled polypropylene.

**Optional Split Manifold** – contact Yamada

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**Rubber Diaphragm Performance Curve**

To calculate performance for Santoprene® and Hytrel®-fitted pumps, use Rubber Diaphragm Curve.

**PTFE Diaphragm Performance Curve**

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**Model Number Nomenclature**

- **Series:** NDP-20 Pump w/Ball Valve
- **Plunge:** or Rc
- **Diaphragm Material:** P = Polypropylene
- **Air Motor:** A = Aluminum
- **Body Material:** E = Nordel™ (EPDM)
- **Plastic Pump:** S = Stainless Steel
- **Air Motor:** T = Teflon® (PTFE)
- **Diaphragm Material:** V = Viton® (FKM)
- **Plastic Pump:** H = Hytrel® (TPEE)
 NDP-25 Series

Maximum Fluid Discharge of 160L/min
Port Size 1

Polypropylene – JIS Flange
Dimensions: 366mm W x 442mm H
Net Wt.: 11.0 kg
Shipping Wt.: 14.0 kg

Polypropylene – Rc
Dimensions: 367mm W x 429mm H
Net Wt.: 11.0 kg
Shipping Wt.: 14.0 kg

Kynar® (PVDF) – JIS Flange
Dimensions: 364mm W x 440 mm H
Net Wt.: 13.5 kg
Shipping Wt.: 15.0 kg

Kynar® (PVDF) – Rc
Dimensions: 365mm W x 429mm H
Net Wt.: 13.5 kg
Shipping Wt.: 15.5 kg

Aluminum
Dimensions: 287mm W x 375mm H
Net Wt.: 13.0 kg
Shipping Wt.: 15.0 kg

Stainless Steel
Dimensions: 281mm W x 375mm H
Net Wt.: 20.0 kg
Shipping Wt.: 20.9 kg

Cast Iron
Dimensions: 286mm W x 375mm H
Net Wt.: 20.0 kg
Shipping Wt.: 22.0 kg

AutoCAD® drawings are available at yamadacorp.co.jp/global
NDP-25 Series Specifications

Port Dimensions

*Intake & discharge connection:

- Polypropylene (PPG) Rc1
- Kynar® (PVDF) Rc1
- Aluminum (ADC12) Rc1
- Stainless Steel (SCS14) Rc1
- Cast Iron Rc1

Air inlet (incl. ball valve): Rc3/8
Air exhaust (incl. silencer): Rc3/4

ANSI Flange also available — consult Yamada.

Maximum Liquid Temperature*

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Air Supply Pressure (All Models)

0.2 – 0.7 MPa

Discharge Volume Per Cycle

- Rubber diaphragm: 600mL
- PTFE diaphragm: 500mL

Maximum Cycles Per Minute

- Rubber diaphragm: 210
- PTFE diaphragm: 210

Maximum Size Solid

3/16" (4.8 mm)

Maximum Dry Suction Lift

Rubber-fitted pump capability: 5.5M

Air Motors: Aluminum air motors are standard on metal pumps; glass-filled polypropylene air motors are standard on plastic and Kynar® pumps. Optional

Optional Split Manifold — contact Yamada

Model Number Nomenclature

NDP-P25B x x

- Series: NDP-20 Pump w/Ball Valve
- Plastic Pump
- Air Motor: P = Polypropylene
- Body Material: C = Neoprene (CR) A = Aluminum S = Stainless Steel F = Cast Iron V = Kynar®
- Diaphragm Material: H = Hytrel® (TPEE)
NDP-40 Series

Maximum Fluid Discharge of 400L/min
Port Size 1-1/2

Polypropylene
Dimensions:
405mm W x 752mm H
Net Wt.: 27.0 kg
Shipping Wt.: 36.0 kg

Aluminum
Dimensions:
412mm W x 710mm H
Net Wt.: 29.0 kg
Shipping Wt.: 38.0 kg

Stainless Steel
Dimensions:
411mm W x 705mm H
Net Wt.: 40.0 kg
Shipping Wt.: 49.0 kg

Cast Iron - Rc
Dimensions:
411mm W x 704mm H
Net Wt.: 47.0 kg
Shipping Wt.: 56.0 kg

Kynar® (PVDF)
Dimensions: 398mm W x 749mm H
Net Wt.: 32.0 kg
Shipping Wt.: 36.0 kg

AutoCAD® drawings are available at yamadacorp.co.jp/global

JIS/DIN Flange on Stainless Steel pumps.
NDP-40 Series Specifications

Port Dimensions
Intake & discharge connection:
- Polypropylene (PPG) Flange JIS 10K40A/DN40PN10
- Kynar® (PVDF) Flange JIS 10K40A/DN40PN10
- Aluminum (ADC12) Flange JIS 10K40A/DN40PN10
- Stainless Steel (SUS14) Flange JIS 10K40A/DN40PN10
- Cast Iron Rc1-1/2
- Air inlet (incl. ball valve): Rc1/2
- Air exhaust (incl. silencer): Rc1

Maximum Liquid Temperature*
Diaphragm Material Temperature
- Neoprene (CR) 70°C
- Buna N (NBR) 70°C
- EPDM 80°C
- Hytrel® (TPEE) 100°C
- Santoprene® (TPO) 100°C
- Viton® fluoroelastomer (FKM) 100°C
- Teflon® (PTFE) 100°C

*The maximum liquid temperature for metal and Kynar®-fitted pumps is determined by the elastomer (diaphragm material). Polypropylene pumps have a maximum liquid temperature of 60°C regardless of diaphragm material.

Air Supply Pressure (All Models)
0.2–0.7MPa

Discharge Volume Per Cycle
- Rubber diaphragm: 2800 mL
- PTFE diaphragm: 1400 mL

Maximum Cycles Per Minute
- Rubber diaphragm: 148
- PTFE diaphragm: 270

Maximum Size Solid
9/32" (7 mm)

Maximum Dry Suction Lift
Rubber-fitted pump capability: 5.5M

Aluminum Air Motor – Standard
Optional: Epoxy-coated, Teflon®-coated, or Electroless Nickel Plate

Model Number Nomenclature
- Series: NDP-40
- Valve Type: B = Ball
- Body Material:
  - P = Polypropylene
  - A = Aluminum
  - S = Stainless Steel (SS)
  - F = Cast Iron
  - V = Kynar®
- Diaphragm Material:
  - C = Neoprene (CR)
  - N = Buna N (NBR)
  - E = Nordel™ (EPDM)
  - S = Santoprene® (TPO)
  - T = Teflon® (PTFE)
  - V = Viton® (FKM)
  - H = Hytrel® (TPEE)
- SUS Port Option
  - Rc or FLG

To calculate performance for Santoprene® and Hytrel®-fitted pumps, use Rubber Diaphragm Curve.
NDP-50 Series

Maximum Fluid Discharge of 600L/min
Port Size 2

Cast Iron
Dimensions: 450mm W x 776mm H
Net Wt.: 65.0 kg
Shipping Wt.: 77.0 kg

Stainless Steel
Dimensions: 450mm W x 782mm H
Net Wt.: 60.0 kg
Shipping Wt.: 72.0 kg

Kynar® (PVDF)
Dimensions: 462mm W x 819mm H
Net Wt.: 41.0 kg
Shipping Wt.: 53.0 kg

Polypropylene
Dimensions: 472mm W x 821mm H
Net Wt.: 35.0 kg
Shipping Wt.: 46.0 kg

Aluminum
Dimensions: 452mm W x 780mm H
Net Wt.: 37.0 kg
Shipping Wt.: 49.0 kg

JIS/ANSI/DIN Flange on Stainless Steel models.

Maximum Fluid Discharge of 600L/min
Port Size 2
NDP-50 Series Specifications

Port Dimensions

Intake & discharge connection:
- Polypropylene (PPG) Flange JIS10K50A/ANSI150 2B/ DN50PN10
- Kynar® (PVDF) Flange JIS10K50A/ANSI150 2B/ DN50PN10
- Aluminum (ADC12) Flange JIS10K50A/ANSI150 2B/ DN50PN10
- Stainless Steel (SCS14) Flange JIS10K50A/ANSI150 2B/ DN50PN10
- Cast Iron Rc2
- Air inlet (incl. ball valve): Rc3/4
- Air exhaust (incl. silencer): Rc1

Maximum Liquid Temperature*

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<tr>
<td>Hytrel® (TPEE)</td>
<td>100°C</td>
</tr>
<tr>
<td>Santoprene® (TPO)</td>
<td>100°C</td>
</tr>
<tr>
<td>Viton® fluoroelastomer (FKM)</td>
<td>100°C</td>
</tr>
<tr>
<td>Teflon® (PTFE)</td>
<td>100°C</td>
</tr>
</tbody>
</table>

*The maximum liquid temperature for metal and Kynar®-fitted pumps is determined by the elastomer (diaphragm material). Polypropylene pumps have a maximum liquid temperature of 60°C regardless of diaphragm material.

Air Supply Pressure (All Models)

0.2–0.7MPa

Discharge Volume Per Cycle

- Rubber diaphragm: 4300mL
- PTFE diaphragm: 2100mL

Maximum Cycles Per Minute

- Rubber diaphragm: 146
- PTFE diaphragm: 220

Maximum Size Solid

5/16” (8 mm)

Maximum Dry Suction Lift

Rubber-fitted pump capability: 5.8M

Aluminum Air Motor – Standard

Optional: Epoxy-coated, Teflon®-coated, or Electroless Nickel Plate

AutoCAD® drawings are available at yamadacorp.co.jp/global

Rubber Diaphragm Performance Curve

PTFE Diaphragm Performance Curve

Model Number Nomenclature

- Series: NDP-50 Pump
- SUS Port Option
- Valve Type: B = Ball
- Body Material:
  - P = Polypropylene
  - A = Aluminum
  - S = Stainless Steel (SS)
  - F = Cast Iron
  - V = Kynar®

Diaphragm Material:
- C = Neoprene (CR)
- N = Buna N (NBR)
- E = Nordel™ (EPDM)
- S = Santoprene® (TPO)
- T = Teflon® (PTFE)
- V = Viton® (FKM)
- H = Hytrel® (TPEE)
NDP-80 Series

Maximum Fluid Discharge of 800L/min
Port Size 3

**Stainless Steel**
- Dimensions: 521mm W x 984mm H
- Net Wt.: 102.0 kg
- Shipping Wt.: 117.0 kg

**Cast Iron–Rc**
- Dimensions: 521mm W x 984mm H
- Net Wt.: 112.0 kg
- Shipping Wt.: 127.0 kg

**Aluminum**
- Dimensions: 522mm W x 998mm H
- Net Wt.: 65.0 kg
- Shipping Wt.: 74.0 kg

**Polypropylene**
- Dimensions: 580mm W x 1044mm H
- Net Wt.: 64.0 kg
- Shipping Wt.: 79.0 kg
## NDP-80 Series Specifications

### Port Dimensions

*Intake & discharge connection:*

<table>
<thead>
<tr>
<th>Material</th>
<th>Connection</th>
<th>Flange JIS10K80A/ANSI150 3B/DN80PN10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polypropylene (PPG)</td>
<td>Flange JIS10K80A/ANSI150 3B/DN80PN10</td>
<td></td>
</tr>
<tr>
<td>Aluminum (ADC12)</td>
<td>Flange JIS10K80A/ANSI150 3B/DN80PN10</td>
<td></td>
</tr>
<tr>
<td>Stainless Steel (SCS14)</td>
<td>Flange JIS10K80A/ANSI150 3B/DN80PN10</td>
<td></td>
</tr>
</tbody>
</table>

*Cast Iron*: Rc3

*Air inlet (incl. ball valve):* Rc3/4

*Air exhaust (incl. silencer):* Rc1

### Maximum Liquid Temperature*

<table>
<thead>
<tr>
<th>Diaphragm Material</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neoprene (CR)</td>
<td>70°C</td>
</tr>
<tr>
<td>Buna N (NBR)</td>
<td>70°C</td>
</tr>
<tr>
<td>EPDM</td>
<td>80°C</td>
</tr>
<tr>
<td>Hytrel* (TPEE)</td>
<td>100°C</td>
</tr>
<tr>
<td>Santoprene* (TPO)</td>
<td>100°C</td>
</tr>
<tr>
<td>Viton* fluoroelastomer (FKM)</td>
<td>100°C</td>
</tr>
<tr>
<td>Teflon* (PTFE)</td>
<td>100°C</td>
</tr>
</tbody>
</table>

*The maximum liquid temperature for metal pumps is determined by the elastomer (diaphragm material). Polypropylene pumps have a maximum liquid temperature of 60°C regardless of diaphragm material.*

### Air Supply Pressure (All Models)

0.2–0.7 MPa

### Discharge Volume Per Cycle

- Rubber diaphragm: 8500mL
- PTFE diaphragm: 3800mL

### Maximum Cycles Per Minute

- Rubber diaphragm: 95
- PTFE diaphragm: 160

### Maximum Size Solid

13/32" (10 mm)

### Maximum Dry Suction Lift

Rubber-fitted pump capability: 5.8M

### Aluminum Air Motor – Standard

Optional: Epoxy-coated, Teflon*-coated, or Electroless Nickel Plate

Notes: Hytrel*-fitted pumps include Buna N check balls & wetted o-rings. Santoprene*-fitted pumps include EPDM check balls & wetted o-rings.

AutoCAD® drawings are available at [yamadacorp.co.jp/global](http://yamadacorp.co.jp/global)

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### Model Number Nomenclature

- **Series:** NDP-80
- **B**
- **x**
- **x**
- **x**
- **SUS Port Option**
- **Rc or FLG**

### Valve Type:

- **B** = Ball

### Body Material:

- **P** = Polypropylene
- **A** = Aluminum
- **S** = Stainless Steel (SS)
- **F** = Cast Iron

### Diaphragm Material:

- **C** = Neoprene (CR)
- **N** = Buna N (NBR)
- **E** = Nordel™ (EPDM)
- **S** = Santoprene* (TPO)
- **T** = Teflon* (PTFE)
- **V** = Viton* (FKM)
- **H** = Hytrel* (TPEE)

---

### Rubber Diaphragm Performance Curve

![Rubber Diaphragm Performance Curve](image1)

To calculate performance for Santoprene* and Hytrel*-fitted pumps, use Rubber Diaphragm Curve.

### PTFE Diaphragm Performance Curve

![PTFE Diaphragm Performance Curve](image2)

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*NDP-80 Series Specifications*
Flap Valve Diaphragm Pump

Flapper Pump for Solids Handling

The New Yamada Flap Valve Pump was designed and engineered to address the problems normally associated with flap valve pumps. I.e. Normally due to severe working conditions, there is often a need to remove a pump from service for repairs, cleaning or parts changeovers.

Based on Yamada field proven NDP series foundation, this pump has all of the features and benefits associated with every Yamada pump.

Ingenious Flap Valve design allows for passage of large solids up to 50 mm

Easy access to valve chambers allows easy maintenance when you need it most without the need to remove the pump from service.

Vented diaphragm chambers serve to alleviate problems associated with trapped air/gas.

Mechanical Switch Series

Available in 1-1/2", 2" and 3" port sizes, these pumps are built on the liquid platform of a standard NDP Series pump, but with a **mechanically-actuated air motor**.

Air power is conserved by actuating the air valve using a mechanical linkage instead of relying on air pressure. Air power is reduced versus a standard air-actuated valve, providing higher pump efficiency.
Extensively field proven, Yamada F-Series clean room manufactured pumps are specifically designed for the safe and efficient transfer of ultra high-purity process chemistries. They provide maximum corrosion resistance, ultra high-purity levels and low particle generation.

Pumps include 100% machined virgin PTFE diaphragms, liquid chambers and manifolds.

F-Series pumps are available in six sizes

<table>
<thead>
<tr>
<th>Fluid connections</th>
<th>JIS Flange, or Rc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Flow rate</td>
<td>95L/min</td>
</tr>
<tr>
<td>Air control</td>
<td>internal shuttle valve or external timer-based control</td>
</tr>
<tr>
<td>Air pressure range</td>
<td>0.2–0.7MPa</td>
</tr>
<tr>
<td>Temperatures up to</td>
<td>100°C</td>
</tr>
</tbody>
</table>

For additional information, please request the Yamada High-Purity PTFE Pumps catalog or visit yamadacorp.co.jp/global

NDP-20 to 80E Series
(Electronic Sensor Switching System)

This range of pumps is designed to operate using an External Electronic Pump Driver coupled to a Proximity Sensor built into the pump. They provide the operator with unrivaled operational performance, reliability and cost effectiveness. This system removes any chance of pump stoppages caused from blockages or failures of a standard Internal Air Switching System. Moreover due to the proximity sensors inside the pump, it operates in a de-stroke situation. This will greatly increase the life of the pumps diaphragms, as well as other working parts. These pumps also create high operational stability especially at slow pumping speeds.

- Operating system. Using a proximity sensor installed into the pump and reciprocated with an external solenoid valve. Operation is controlled through an Instrument Sequencer, or Signal Transmit Controller.
- Accessories include a Stroke Counter and a Diaphragm Rupture Sensor.
- Take care as these pumps are not standard stock items and must be specially ordered.

*As these pumps operate using an electrical control system, they are not suited to flammable applications.
Drum Pumps

Yamada AODD Pumps have distinct design advantages, making them versatile and cost effective drum pumps.

Models are available in Polypropylene, PVDF (Kynar®), Aluminum, and Stainless Steel, which includes a 2" bung adapter and suction tube.

Drum pumps are available in 3/8", 1/2", and 3/4" port sizes (3/8" metal only & 1/2" plastic only) with flow rates up to 100L/min.

Note: Some Yamada plastic drum pumps incorporate side liquid ports and utilize a 90° elbow on the top of the drum. Refer to DP-10 & NDP-20 technical information for additional performance data. Use applicable NDP nomenclature adding a "D" at the end of the model number. Other sizes and materials are available, consult Yamada.

Port Dimensions

<table>
<thead>
<tr>
<th>Intake &amp; discharge connection:</th>
<th>Aluminum (ADC12)</th>
<th>Stainless Steel (316)</th>
<th>Polypropylene (PPG)</th>
<th>Kynar® (PVDF)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rc3/8 or Rc3/4</td>
<td>Rc3/8 or Rc3/4</td>
<td>Rc1/2 or Rc3/4</td>
<td>Rc1/2</td>
</tr>
<tr>
<td></td>
<td>Includes Aluminum Male Rc</td>
<td>Includes Stainless Steel Male Rc</td>
<td>Includes PVC suction pipe, elbow, &amp; Bung adapter (PPG also avail.)</td>
<td>Includes PVDF suction pipe, elbow, and Bung adapter</td>
</tr>
<tr>
<td></td>
<td>Bung adapter and suction pipe</td>
<td>Bung adapter and suction pipe</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Drum inlet connection: 2" Bung

FDA-Compliant Drum Pumps are available. Please consult the factory for details.

Powder Pumps

Yamada powder pumps are designed to move bulk powders more effectively throughout your process vs. other unsafe and labor intensive means. These heavy duty pumps will consistently transfer fine-grained, low-bulk density dry powders in a dust-free operation.

Port sizes: 1-1/2", 2", or 3"

Construction: Aluminum, Cast Iron, or Stainless Steel

Availability: Three series of pumps are offered, dependent upon requirements.

Also refer to the Powder Pump flyer and Pumpable Powders data sheet.
FDA Compliant Pumps

Yamada FDA compliant pumps are specifically designed for Food, Pharmaceutical & Cosmetic industries where 3A or USDA standards are not required.

Pumps include 316 Stainless Steel wetted components with passivated satin finish, epoxy-coated air motor, sanitary clamp fittings, and FDA compliant elastomers: Hytrel®, EPDM and PTFE.

Available in eight sizes from 3/4" to 4" ports with flow rate up to 800L/min.

ATEX Compliant Pumps

Select Yamada® DP and Yamada® NDP Series pumps are compliant with ATEX guidelines for safe pump operation in potentially dangerous or explosive areas. Please consult Yamada.

CSA-Certified Pumps

Yamada offers a series of three CSA-certified pumps, each built on the consistently-designed foundation of the field-proven DP- and NDP-Series pumps. Pumps are constructed with aluminum wetted components and durable Buna N elastomers certified by CSA International.

Available in 3/8", 3/4", & 1" port sizes with flow rates up to 160L/min. Note: CSA Certification Class 3305-10 & 3305-90 limits natural gas temperature range to 0°C to 50°C.

NDP-32 Series Pumps

With all the features of the Yamada® NDP series, the NDP-32 adds port compatibility to simplify pump replacement.

Yamada remedies re-piping issues with the Yamada® NDP-32 series pump. Designed to facilitate pump replacement for existing non-Yamada pump installations, the NDP-32 utilizes a 1-1/2" inlet port with a 1-1/4" outlet port to ensure compatibility with competitor designs.

As with all NDP series pumps, the NDP-32 incorporates the same patented Non-Lubricated Air Motor technology and has all the features of the NDP line including bolted design, outside accessible air motor, ease of maintenance, interchangeability of parts, and Yamada reliability.
Filter/Regulators

These units remove moisture and contamination from the supplied air to protect the pump mechanism. Depending on the use conditions, use the air filter/regulator unit or air filter/regulator/lubricator unit.

[Recommended oil]
Turbine oil Class 1 VG32

We recommend that when you use the NDP series pump, you select a two-airport type and operate it without refueling for your environment except when you operate it continuously for 24 hours.

**Broad Operating Parameters** – Handles operating pressures from 0.05MPa-0.85MPa and temperatures from -5°C to 60°C.

**Precise Pressure Adjustment** – Locking adjustment knob provides precise and secure pressure control and allows for infinitely variable flow rates.

**Quick Release Bayonet Polypropylene Bowl** – Provides access to filter element with quick 1/4-turn of the bowl.

**High Visibility Bowl Guard** – Unique liquid level indicator allows monitoring up to 9M away and 20 angles.

**Embedded Pressure Gauge**

Optional – Auto drain available for all filter/regulators.

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Anti Stall Device

**VUK-225/VUK-458**

This is an optional kit which can be fitted to any Yamada NDP-20 to 80 Series Pump. It is designed to prevent the inbuilt Air Switching Valve Mechanism from stall (Dead Point). Normally if an air valve were to centre, the pump would stop, but by using this device the valve will be re-started automatically giving this pump system extremely reliable operation performance.

**Application:**

SVT225: NDP-20/25 Series
SVT458: NDP-40/50/80 Series

**Air supply pressure:** 0.2-0.7MPa

**Valve type:** Normal open, cross valve
High-Low Level Controller

This unit is used to control the high and low levels of liquid being pumped into or out of a container. This device is driven by compressed air and is therefore suitable for use in highly explosive environments. The system is also designed to work in many harsh environments, e.g. areas with high temperatures, high humidity or even areas where there are high electromagnetic fields. It can handle any liquid with a viscosity of less than 1000 cps.

- The High-Low level controller is suitable for use in waste liquid treatment applications.
- The High-Low level controller is suited to the transfer of highly inflammable liquids.
- This controller uses no electrical devices and is run completely by compressed air.
- The High-Low level controller is suitable for the treatment of the slurry liquid.
- Because of the size of the detective piping, fluids with solids up to 50 A are easily transferred.
- The High-Low level controller is suitable for the transfer of a wide variety of chemical liquids.
- PTFE tube is usable for the material of the detective pipe.
- The High-Low level controller is simple to operate.
- To preset liquid levels just adjust the depth of the detective pipes.
- The High-Low level controller is maintenance free.
- The controller has few moving parts and is constructed to be highly durable.
- The High-Low level controller is simple to install.
- This controller is contained inside 1 compact box unit.

Dry-Run Detector

ESV-06

The Yamada® ESV-06 detects increases in air volume due to loss of prime or dry-running, and automatically shuts down the pump to prevent excess cycling and increased diaphragm wear.

- Extends life of diaphragm
- Eliminates air consumption in dry run applications
- Prevents air valve from premature failure
- Intrinsically safe operation
- Supports remote warning systems
Pulsation Dampeners

AD Series Pulsation Dampeners

Metering / Injection / Dosing
Equalizes discharge pressure spikes, increasing accuracy.

Filter Press/Inline Filters
Increases filter efficiency and life by providing a smooth flow.

Spraying: Smooth, consistent spray pattern.

Filling
Eliminates inconsistent filling and splashing.

Transfer
Eliminates harmful water hammer, preventing pipe and valve damage.

Yamada® AD Pulsation Dampeners incorporate a flow-through design which keeps solids in suspension, maintaining dampener effectiveness.

A completely automatic air motor self-relieves if reduction of discharge head condition occurs.

Port Sizes: 3/8", 1", 1-1/2", and 2"

Dampener Model… Fits Pump Models
AD-10 (3/8" port) NDP-5, DP10/15, & NDP-15
AD-25 (1" port) NDP-20 & NDP-25
AD-40 (1-1/2" port) NDP-40
AD-50 (2" port) NDP-50 & NDP-80

Material
Aluminum (ADC12) All models
Stainless Steel (SCS14) All models
Cast Iron AD-25, AD-40, & AD-50
Polypropylene (PPG) All models
Kynar® (PVDF) AD-25 & AD-50

Diaphragm
Choice of seven elastomers.

Air Side Coating Options
Epoxy, Teflon®, or E-Nickel plate air-side.

For additional information see the Yamada AD Dampeners flyer. Refer to inside back cover for installation diagram.
Rubber Compounds

Neoprene (CR)
Excellent for non-corrosive abrasive applications.
Identification: Dull Black with No Dot
Temperature Range: 0 to 70°C

Buna-N (NBR)
Excellent for petroleum based fluids.
Identification: Black with a Red or Pink Dot
Temperature Range: 0 to 70°C

Nordel™ (EPDM)
Excellent for low temperatures, caustics and some acids.
FDA Compliant Material (must be specified).
Identification: Black with Green Dot
Temperature Range: 0 to 80°C

Viton® (FKM)
Excellent for aggressive fluids and high temperature applications.
Identification: Black with Silver or Blue Dot
Temperature Range: 0 to 100°C

Thermoplastic Compounds

Hytrel® (TPEE)
Excellent general-purpose diaphragm for non-corrosive abrasive applications and high-flex life.
FDA compliant material.
Identification: Tan/Cream material with No Dot
Temperature Range: 0 to 80°C

Santoprene® (TPO)
Excellent for acids or caustics with a very high flex life.
Identification: Black Thermoplastic
Temperature Range: 0 to 100°C

Teflon® (PTFE)
Excellent choice for pumping highly aggressive fluids, including solvents.
Identification: White diaphragm with No Dot
Temperature Range: 0 to 100°C

Please note that excessive inlet pressure or excessive suction lift can shorten diaphragm life. Please consult Yamada for further information.

Accessories

Companion Flange:
Various flanges equipped with a short pipe are available for use in a line. Flanges made of SUS304 or resin (PP) according to the various standards such as JIS, DIN, ANSI and JPI.

Pump Bracket:
A common base pump (mounting rack) is to be manufactured on orders. (Standard specifications: SUS304)
### Basic Model Variations

- Eight different sizes of pumps
- Six different types of pump bodies "wetted parts"
- Seven different types of diaphragm

This gives a total of 150 or more basic models in the Yamada Air Operated Double Diaphragm Pump range.

In addition, Yamada also manufactures the high purity DP-F series of diaphragm pumps which are used specifically for industries like semiconductor manufacturing.

This graph gives a general indication of the applications available by using different pump models.

### Model Indicator

- When choosing a Yamada AODD Pump, use the below model indicator to select pump size (Diameter of fluid ports) main body material (Wetted Parts) and the type of Diaphragm.

- If using a pump with fluid temperatures of 70°C or higher, the switching mechanism and other parts may have to be changed. Contact your closest distributor or Yamada Corporation for distributor.

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**Diaphragm Material**
- C: Neoprene (CR)
- N: Buna N (NBR)
- E: Nordel® (EPDM)
- V: Viton® (FKM)
- T: Teflon® (PTFE)
- H: Hytrel® (TPEE)
- S: Santoprene® (TPO)

**Body Material**
- A: Aluminum alloy (ADC-12/AC4-T6)
- S: Stainless steel (SCS14/SUS316)
- F: Cast iron (FC250/S45C)
- P: Polypropylene (PPG)
- V: Polyvinylidene fluoride (PVDF)
- D: Polyacetal (POM)

**Material**
- Glaze: Bilge waste water
- Lubricant: Kerosene, Cutting oil
- Ethylene alcohol: Xylene, Jet fuel
- Latex: Paint, Ink
- Sulfuric acid: (98%) Nitric acid (less than 23%): MEK
- Acetone: E:
- Ammonia water: Stack lime
- Ethyl chloride: Sodium peroxide
- Methylene chloride: Lactic acid
- Trichloroethylene
- L:
- P: L:
- G: L:
- Ethyl chloride: Sodium silicate
- Methyl alcohol: Whiskey
- Sulfuric acid: (less than 20%)
- Ethyl alcohol: Plating solution
- Parachloroethylene
- Sodium hypochlorite
- M:
- Ammonium nitrate
- Barium sulfate
- Calcium chloride
- Ethyl alcohol: Ammonium chloride
- Butyl acetate

**Valve type**
- B: Ball valve
- F: Flat valve (NDP-5, NDP-15)

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*Note* 1: Glass-reinforced polypropylene

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* N indication is not provided for the 10 series and F series.
Installation Diagram

Ideal Air-Powered Double Diaphragm Pump Installation

Understanding Performance Curves

To determine compressed air requirements and proper size for a Yamada air-powered double diaphragm pump, two elements of information are required:

1. **Required Flow Rate (LPM)**
2. **Total Dynamic Head (TDH)**

As an example, consider an NDP-40 Series Pump performance curve with rubber diaphragms, pumping at 300L/min \((\text{LPM})\) at 2500L/min \((\text{ANR})\) at 5M TDH \((\text{ANR})\).

Point "◆" on the performance curve is where the desired Flow Rate \((\text{LPM})\) and Total Dynamic Head points intersect. This point determines compressed air requirements for the particular pump.

At performance point "◆", the pump will require approximately 0.5 MPa air inlet pressure. To arrive at this figure, follow the solid curve \(\text{---}\) to the left to read the air pressure rating in MPa.

By looking at the nearest dashed line \(\longrightarrow\), it is determined the pump will require approximately 2500 L/min(ANR) of air volume.
CAUTION WHEN SELECTING A PUMP

Yamada offers a large range of Air Operated Double Diaphragm Pumps to cater for many different kinds of materials and conditions. When selecting the most appropriate pump for a particular selection and installation please consult your local Yamada Pump Distributor or Yamada Corporation.

CAUTION

The products presented in this catalogue may be classified as an export-controlled item under Foreign Exchange and Foreign Trade Act of Japan, hence an export license must be required to export the products. In addition, whenever the products are to be re-exported from any country to the third country, an export license must be required under the laws and regulations of the re-exporting country.

YOUR LOCAL DISTRIBUTOR:

Yamada Corporation
International Department
No.1-3, 1-Chome, Minami-Magome,
Ohta-ku, Tokyo 143-8504, Japan
+81-(0)3-3777-0241 Phone
+81-(0)3-3777-0584 Fax
E-mail: intl@yamadacorp.co.jp
Web: www.yamadacorp.co.jp/global