yamada

Air-Operated Double-Diaphragm

High Purity PTFE Pumps

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ULTRA High-Purity Series

Ultra-High Purity Series was designed specifically for the Semiconductor process chemistries where purity is of the utmost concern.
It has no internal metal components, so even a diaphragm failure will not produce a single PPB of ionic contamination. To ensure maximum corrosion resistance, purity levels and low particle generation, all wetted parts are machined from 100% virgin PTFE

YAMADA's High Purity Series was designed to be installed any high purity or corrosive environment. Yamada offers various models each with its own specific characteristics offering different levels of purity and corrosion resistance. Each model is designed to give different levels of operation performance and back up redundancy.

High-Purity Series

Contents

Truly Non - Lubricated

The patented air valve on all Yamada F-Series pumps never requires lubrication or pre-packing. Plus, it is easily accessible without disassembling the pump.

Wetted Parts

To ensure maximum corrosion resistance, purity levels and low particle generation, Yamada pumps feature diaphragms, liquid chambers and manifolds that are machined from 100% virgin PTFE. Polypropylene and High Density Polyethylene are used in the air motor section (non-wetted) to ensure resistance in a corrosive environment.

Extended Performance

All Yamada F-Series diaphragms are manufactured from 100% virgin PTFE. As a result, these diaphragms will last up to twice as long as those found in many competitive pumps. In addition, incorporating minimal shaft travel reduces pump pulsation.

Clean Room Manufactured

Yamada F-Series pumps are manufactured, DI water tested, nitrogen purged, and double bagged under clean room conditions according to stringent quality control standards and procedures.

Most Complete Line Available

Yamada offers wide sizes range of PTFE pumps for your applications with adjustable flow rates up to a maximum of 120 Liter per minute. Yamada is proud to offer the largest line of field-proven, high purity air-operated double diaphragm pumps.

End - User Maintenance

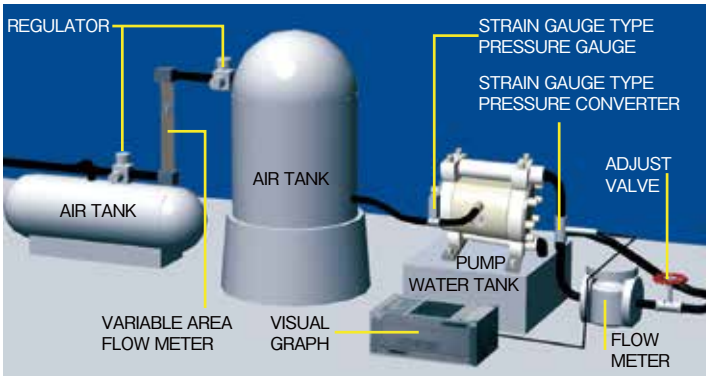
Yamada F-Series pumps are easily end-user maintainable and are backed with readily available service and parts worldwide.

Explosion - Proof Operation

Air operation eliminates a potential source of ignition, so there is no need to take additional preventative measures when pumping volatile or flammable liquids or when using the pump in potentially hazardous environments.

Performance Testing and Pump Selection

Testing Instruments and Procedures



Condition

Supplied air pressure: 0.2MPa, 0.3MPa, 0.4MPa, 0.5MPa

Liquid: DI water (1mPa/s, S.G.1.0)

Temperature: Ambient

Suction condition: Flat suction (0m head)

Measuring method: Flow meter

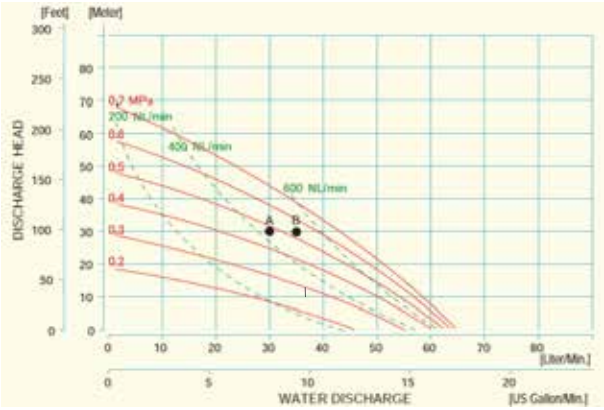
Precautions when selecting a pump

* For safety and to prolong the life of the diaphragm and other consumable parts Yamada recommends selecting a pump with an output of at least 50% or higher than actually required.

* Performance curve data on this brochure is measured using the above system and conditions pumping fresh water (1mPa/s, S.G.1.0) with flat suction. A pumps performance will vary under different conditions. Some factors include fluid viscosity, specific gravity, slurry concentration, suction lift, suction head and friction loss due to pipes and fittings.

How to read a performance curve

DP-20F

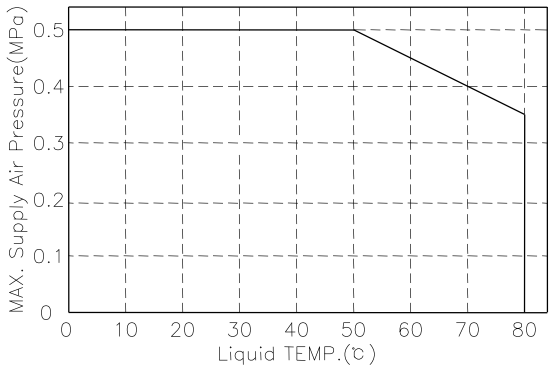


Condition

A Supply air: 0.5MPa Liquid: DI water (1mPa/s, S.G.1.0) Flow Rate: 30L/min Discharge Head: 30m	**B** Supply air: 0.5MPa Liquid: DI water (1mPa/s, S.G.1.0) Flow Rate: 35L/min Discharge Head: 30m

1. Determine which curve corresponds to the desired air pressure.
2. Determine the desired discharge volume and the required total discharge head.
3. According to the graph, DP-20F would be suitable for condition A. However, for the condition B, DP-20F is not enough. Thus in the condition B, larger pump than DP-20F would be suitable.

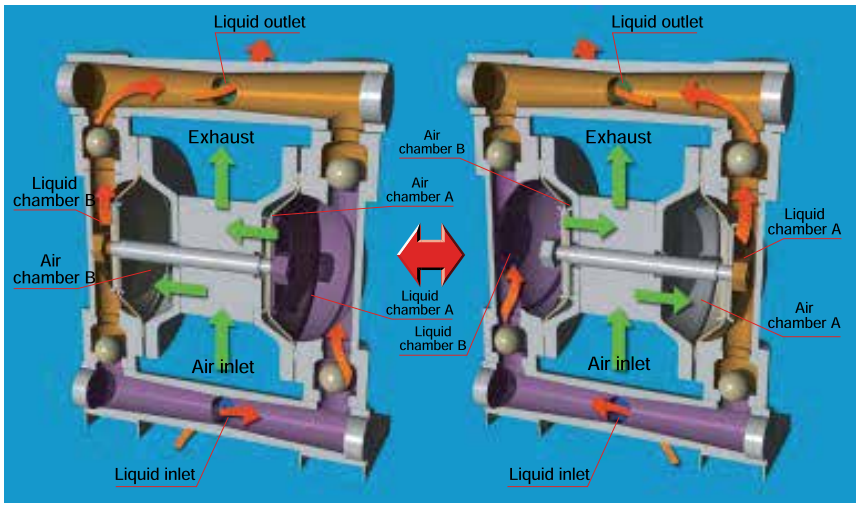
Liquid temperature – Pressure Correlation Chart



Operation Principle

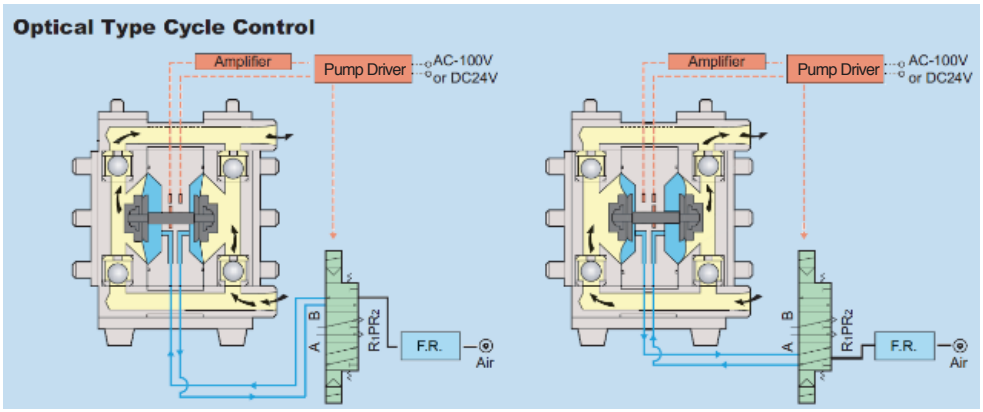
C-spool Switch

Compressed Air enters Air Chamber A (shown above), moving the center rod to the right, forcing liquid out of Liquid Chamber A. At the same time due to a pressure decrease in Liquid Chamber B, liquid is drawn in. When the center rod is fully to the right the pneumatic logic system switches the supply of air from Air Chamber A to Air Chamber B. the center rod moves to the left, forcing the liquid out from liquid chamber B



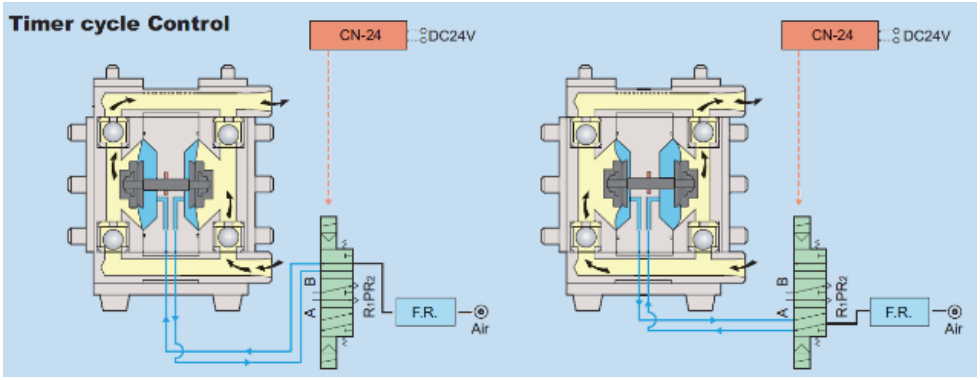
Optical Type Cycle Control

This sensor allows the pump to be used in high purity, corrosive or explosive applications and can guarantee start stop operation performance It allows the pump to be externally controlled and will greatly increasing all aspects of the pumps performance. It will ensure accurate flow rates even during very slow pump cycling.



Timer Cycle Control

This unit is used to control the pumps cycle speed and can also detect diaphragm ruptures or failures of the cycle sensor etc. This control system will greatly improve all aspects of the pumps operating performance and control.



High-Purity
Pneumatic C-spool Controlled

DP-F Series

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DP-5F

DP-10F

DP-20F

DP-25F

DP-38F

Specifications

Model			DP-5F	DP-10F		DP-20F		DP-25F	DP-38F
Model No.			853656	853620	853622	853621	853623	853601	853606
Port Size	Liquid	Intake	Rc 1/4"	Rc 3/8"	JIS Flange 10K10A	Rc 3/4	JIS Flange 10K20A	JIS Flange 10K25A	
		Discharge							
	Air	Supply	Rc 1/4"					Rc 3/8	Rc 1/2
		Exhaust	Rc 3/8" (DP-5F is with built-in silencer)					Rc 3/4	
Material		Casing	PTFE, PFA						
		Diaphragm	PTFE						
		Air Body	PPS	PP				HDPE	
Air Supply Pressure *1			0.2 - 0.5 MPa					0.2 - 0.7 MPa	
Maximum Discharge Pressure			0.5 MPa					0.7 MPa	
Discharge Volume Per Cycle *2			13mL	65mL		150mL		300mL	700mL
Maximum Flow Rate			11L/min	27L/min		54L/min		64L/min	95L/min
Maximum Air Consumption (ANR)			170L/min	250L/min		350L/min		900L/min	1500L/min
Maximum Size Solid			-	1mm		2mm		3mm	
Maximum Viscosity			0.5Pa·s	1Pa·s		2Pa·s		2.5Pa·s	
Temp Range		Ambient	0 - 70℃						
		Liquid	0 - 80℃						
Noise Level *3			71 dB	82dB		85dB		88dB	90dB
Net Weight			3.4 kg	6.7 kg	7.2 kg	14.6 kg	15.5 kg	32 kg	52 kg

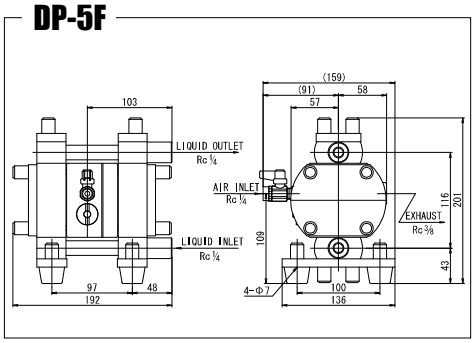
*1 Quality of the supply air shall satisfy quality grade 2.3.2 (maximum particle size: 1μm, maximum dew point pressure: -20℃, maximum oil concentration: 0.1mg/m³) of ISO 28392-1 : 2000 "Compressed air for the general use"

*2 Discharge volume per cycle is highly dependent on application

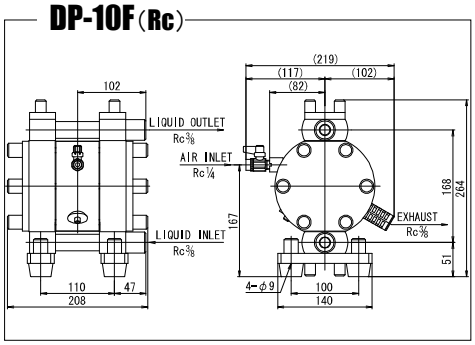
*3 The measuring method is based on ISO 1996 and ISO 3744

Dimensions

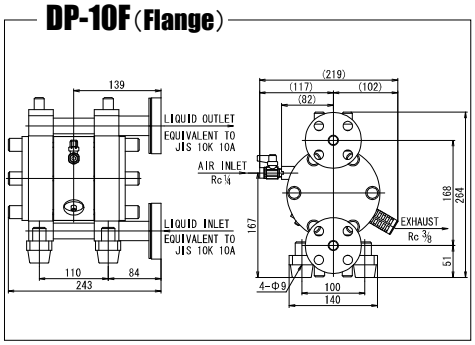
DP-5F



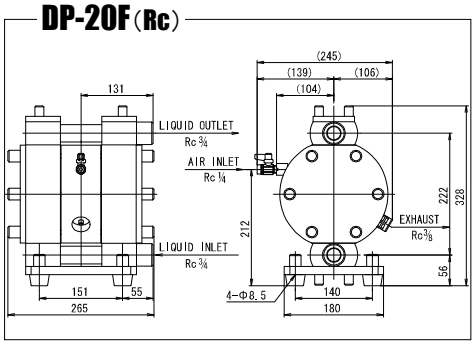
DP-10F (Rc)



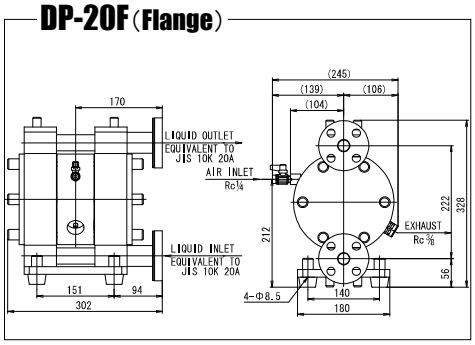
DP-10F (Flange)



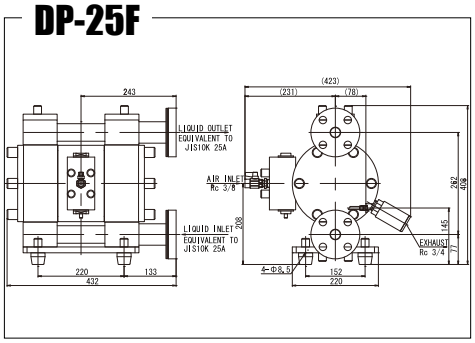
DP-20F (Rc)



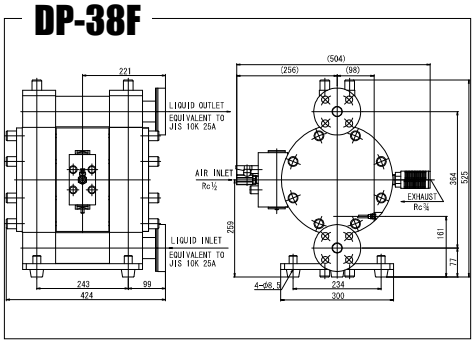
DP-20F (Flange)



DP-25F

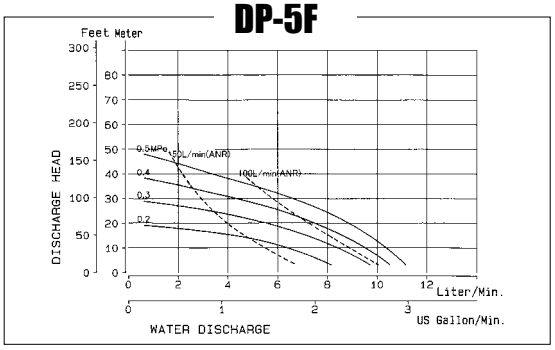


DP-38F

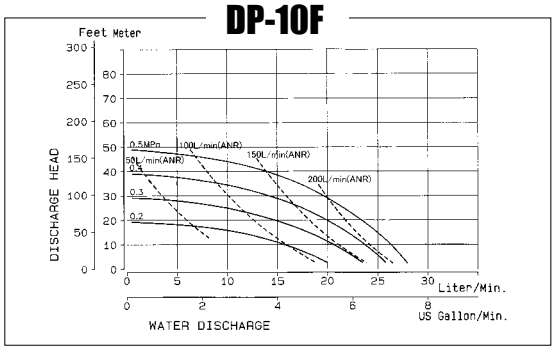


Performance Curve

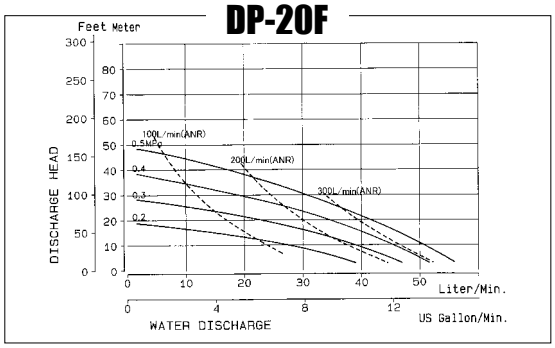
DP-5F



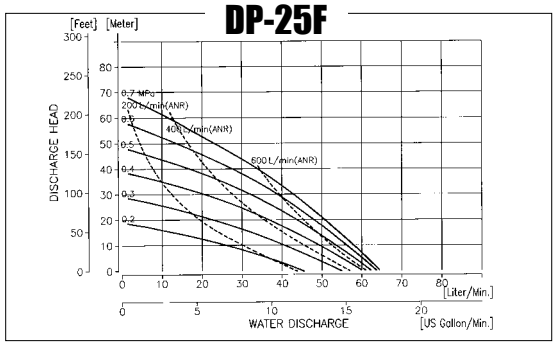
DP-10F



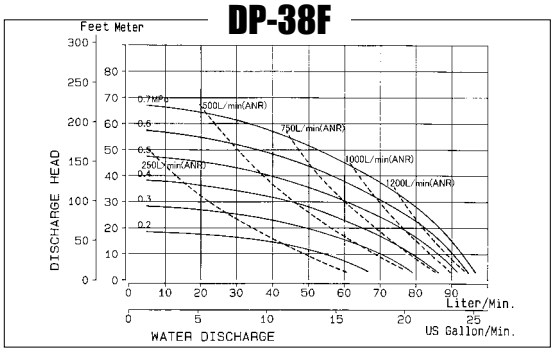
DP-20F



DP-25F



DP-38F



The performance curve was measured using the method and conditions shown on page 11. Also when the pumps performance was measured, a suction pipe wasn't connected to the inlet port. If a 1.5-meter long pipe, with a diameter the same as the inlet port were to be used, the flow rate may be reduced up to 50%.

ULTRA High-Purity Series
Pneumatic C-spool Controlled

DP-F/P Series

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Specifications

Model			DP-20F/P	DP-25F/P	DP-38F/P
Model No.			854804	854805	1500EL
Port Size	Liquid	Intake	JIS Flange 10K20A	JIS Flange 10K25A	JIS Flange 10K25A
		Discharge			
	Air	Supply	Rc 1/4"	Rc 3/8"	Rc 1/2"
		Exhaust	Rc 3/8"	Rc 3/4"	
Material		Casing	PTFE		
		Diaphragm	PTFE (Center disk inserted)		
		Air Body	HDPE		
Air Supply Pressure *1			0.2 - 0.5 MPa		
Maximum Discharge Pressure			0.5 MPa		
Discharge Volume Per Cycle *2			160mL	300mL	700mL
Maximum Flow Rate			30L/min	60L/min	70L/min
Maximum Air Consumption (ANR)			400L/min	600L/min	1000L/min
Maximum Size Solid			2mm	3mm	
Maximum Viscosity			2Pa•s	2.5 Pa•s	
Temp Range		Ambient	0 - 70℃		
		Liquid	0 - 80℃		
Noise Level *3			85dB	88 dB	90 dB
Net Weight			14.8kg	32 kg	52 kg

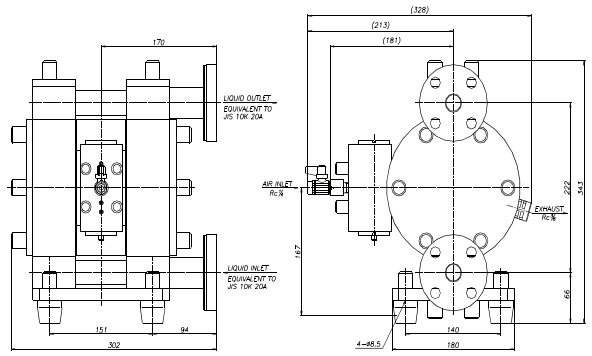
*1 Quality of the supply air shall satisfy quality grade 2.3.2 (maximum particle size: 1μm, maximum dew point pressure: -20°C, maximum oil concentration: 0.1mg/m³) of ISO 28392-1 : 2000 "Compressed air for the general use"

*2 Discharge volume per cycle is highly dependent on application

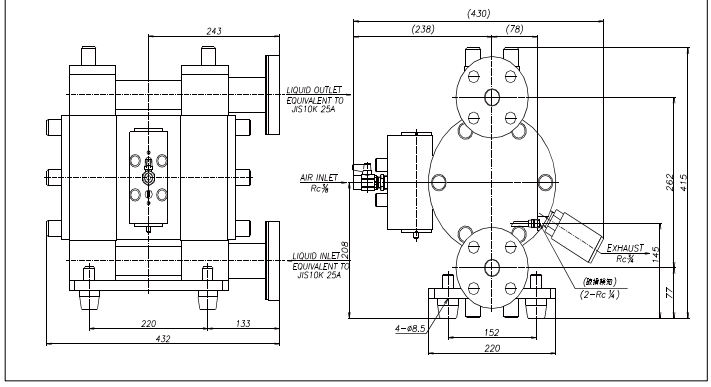
*3 The measuring method is based on ISO 1996 and ISO 3744

Dimensions

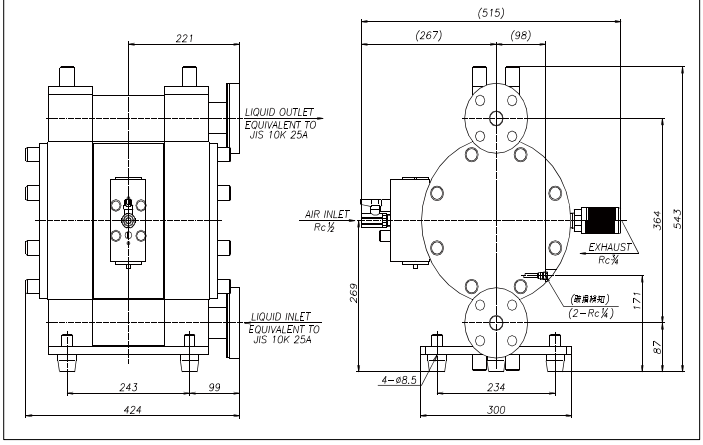
DP-20F/P



DP-25F/P

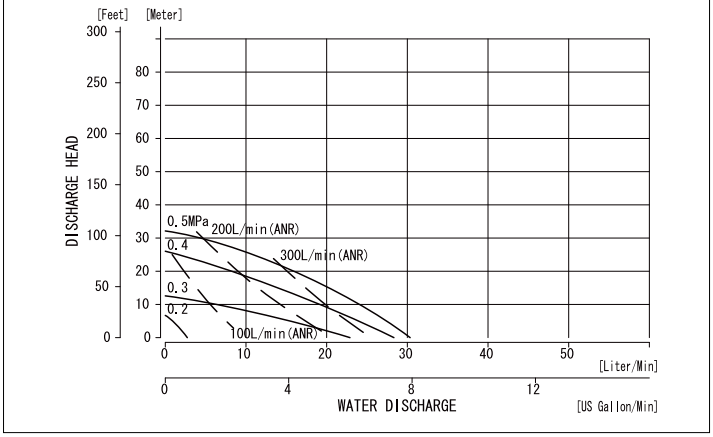


DP- 38F/P

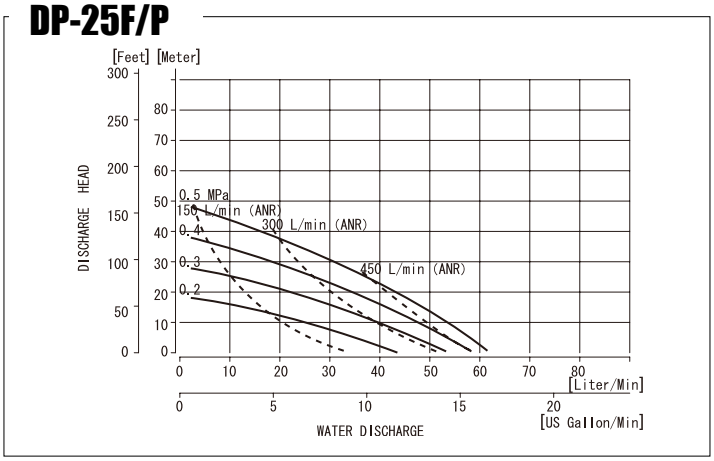


Performance Curve

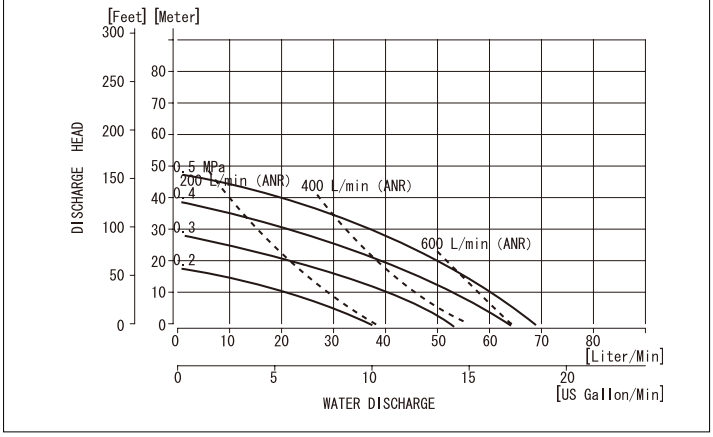
DP-20F/P



DP-25F/P



DP-38 F/P



The performance curve was measured using the method and conditions shown on page 11. Also when the pumps performance was measured, a suction pipe wasn't connected to the inlet port. If a 1.5-meter long pipe, with a diameter the same as the inlet port were to be used, the flow rate may be reduced up to 50%.

ULTRA High-Purity Series
Timer – Solenoid Controlled

DP-F/N Series

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Specifications

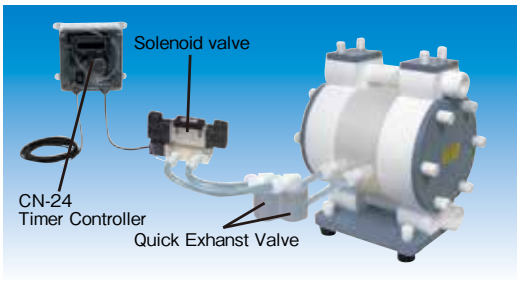
Model			DP-10F/N		DP-20F/N		DP-25F/N
Model No.			853499	853500	853437	853438	854240
Port Size	Liquid	Intake	Rc 3/8"	JIS Flange 10K10A	Rc 3/4"	JIS Flange 10K20A	JIS Flange 10K25A
		Discharge					
	Air	Supply	Rc 1/4"				Rc 3/8
		Exhaust	Rc 3/8"				Rc 3/4
Material		Casing	PTFE, PFA				
		Diaphragm	PTFE				
		Air Body	PPS	PP			HDPE
Air Supply Pressure *1			0.2 - 0.5 MPa				0.2 - 0.7 MPa
Maximum Discharge Pressure			0.5 MPa				0.7 MPa
Switching Speed			0.2 – 0.5 sec./ cycle		0.5 – 1.0 sec. / cycle		
Discharge Volume Per Cycle *2			60mL		180mL		300mL
Maximum Flow Rate			22L/min		35L/min		64L/min
Maximum Air Consumption (ANR)			350L/min		400L/min		900L/min
Maximum Size Solid			1mm		2mm		3mm
Maximum Viscosity			1 Pa・s		2 Pa・s		2.5 Pa・s
Temp Range		Ambient	0 - 70℃				
		Liquid	0 - 80℃				
Noise Level *3			82 dB		85dB		88dB
Net Weight			6.4 kg		14.2 kg		32 kg

*1 Quality of the supply air shall satisfy quality grade 2.3.2 (maximum particle size: 1μm, maximum dew point pressure: -20°C, maximum oil concentration: 0.1mg/m³) of ISO 28392-1 : 2000 "Compressed air for the general use"

*2 Discharge volume per cycle is highly dependent on application

*3 The measuring method is based on ISO 1996 and ISO 3744

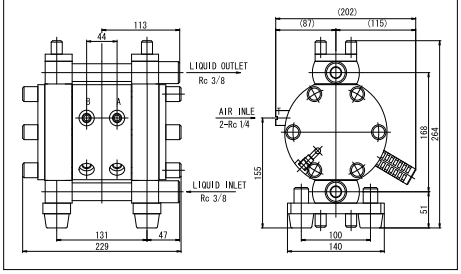
System Configuration



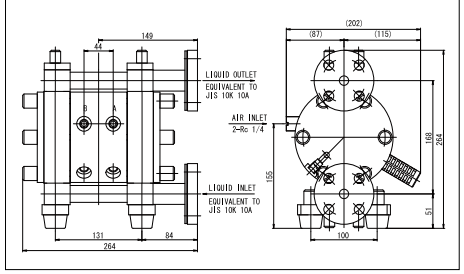
Pump unit 1
Filter Regulator 1
Solenoid Valve 1
Quick Exhaust Valve 2
CN-24 Timer Controller 1

Dimensions

DP-10F/N (Rc)

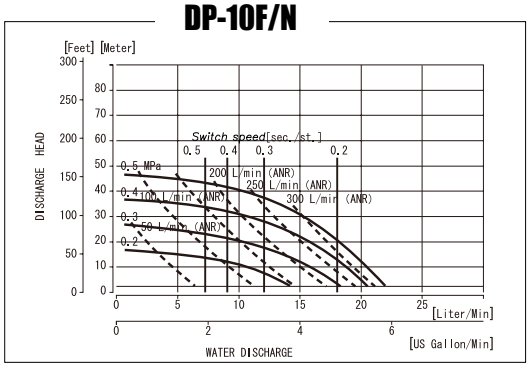


DP-10F/N (Flange)

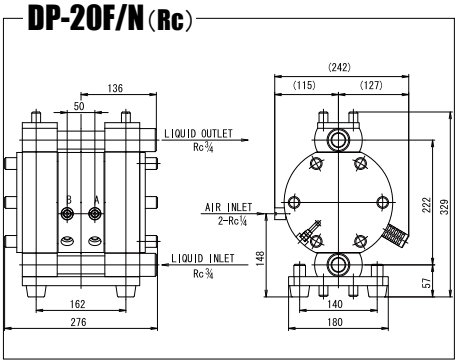


Performance Curve

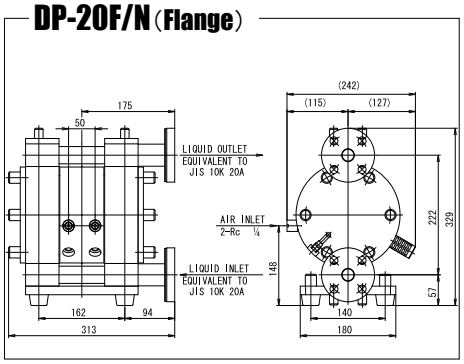
DP-10F/N



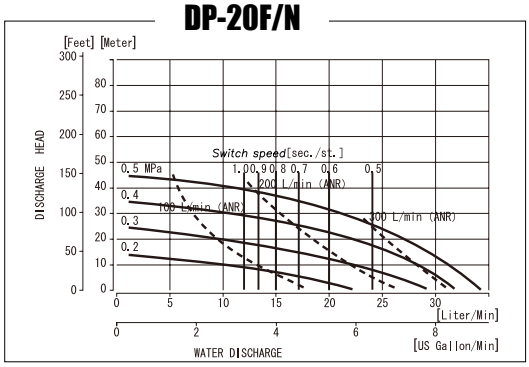
DP-20F/N (Rc)



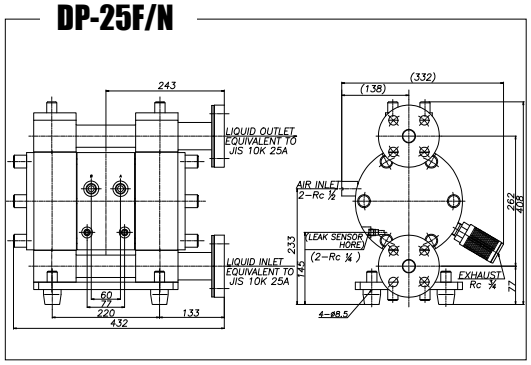
DP-20F/N (Flange)



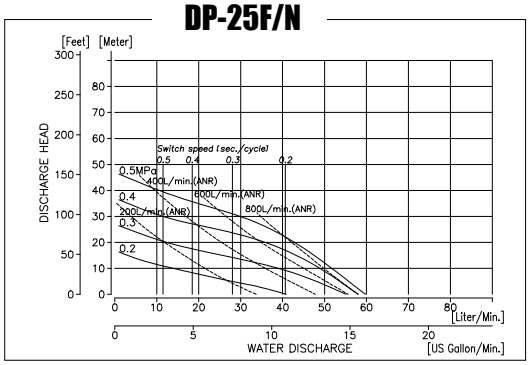
DP-20F/N



DP-25F/N



DP-25F/N



The performance curve was measured using the method and conditions shown on page 11. Also when the pumps performance was measured, a suction pipe wasn't connected to the inlet port. If a 1.5-meter long pipe, with a diameter the same as the inlet port were to be used, the flow rate may be reduced up to 50%.

ULTRA High-Purity
Fiber-optic stroke sensor - Solenoid Controlled

DP-C FE/SD Series

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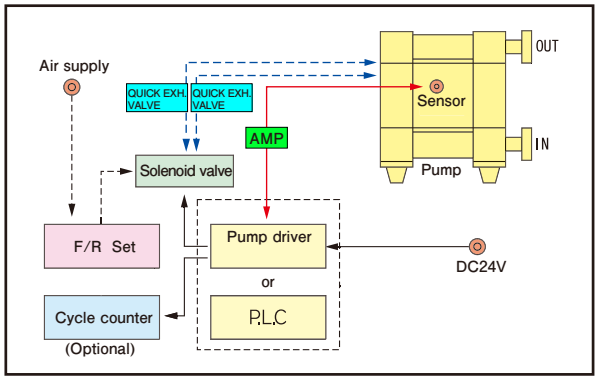
DP-C20FE/SD

DP-C25FE/SD

Specifications

Model			DP-C20FE/SD	DP-C25FE/SD
Port Size	Liquid	Intake	PFA Tube Fitting O.D. 19mm	PFA Tube Fitting O.D. 25mm
		Discharge		
	Air	Supply	Rc 1/4" x 2	Rc 1/2" x 2
		Exhaust		
Material		Casing	PTFE, PFA	
		Diaphragm	PTFE	
		Air Body	PPS	PP
Air Supply Pressure *1			0.2 - 0.5 MPa	
Maximum Discharge Pressure			0.5 MPa	
Discharge Volume Per Cycle *2			180mL	300mL
Maximum Flow Rate			40L/min	70L/min
Maximum Air Consumption (ANR)			450L/min	1000L/min
Maximum Size Solid			-	1mm
Maximum Viscosity			0.5 Pa・s	1 Pa・s
Temp Range		Ambient	0 - 70℃	
		Liquid	0 - 80℃	
Noise Level *3			85 dB	85 dB
Net Weight			12.2 kg	20.3 kg

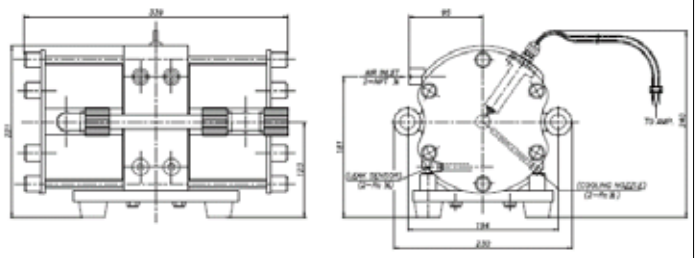
System Configuration



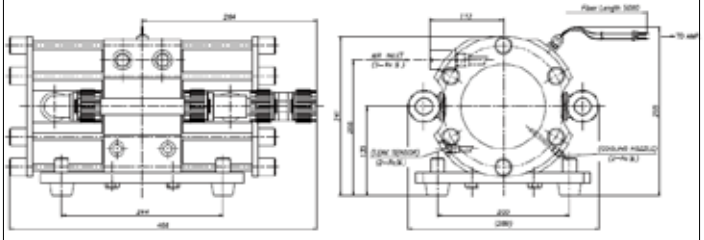
Pump unit.....1
Filter Regulator 1
Solenoid Valve 1
Quick Exhaust Valve 2
Amplifier..... 1
Pump Driver or PLC..... 1

Dimensions

DP-C20FE/SD

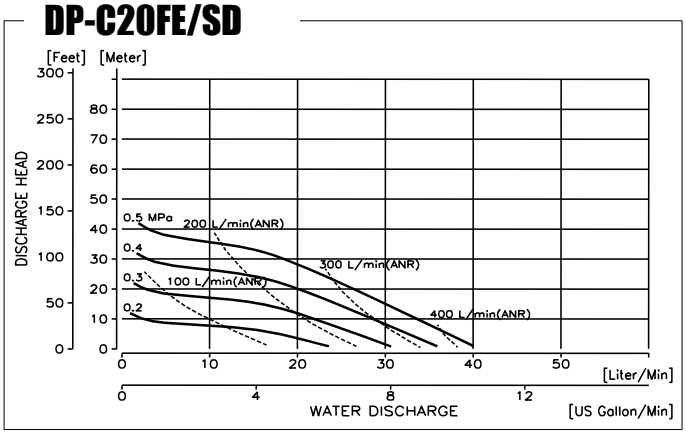


DP-C25FE/SD

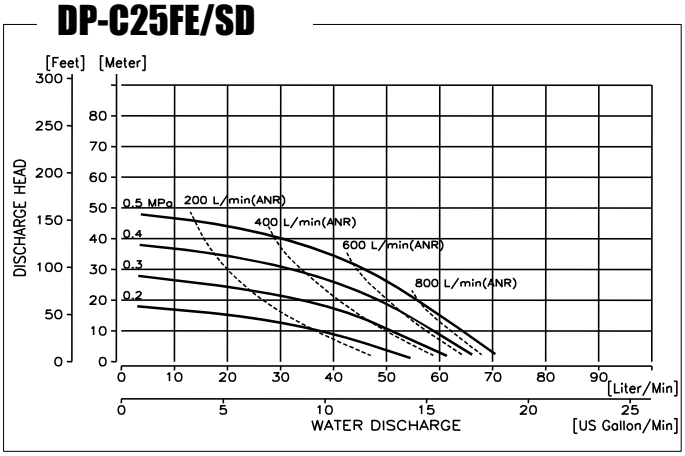


Performance Curve

DP-C20FE/SD



DP-C25FE/SD



The performance curve was measured using the method and conditions shown on page 11. Also when the pumps performance was measured, a suction pipe wasn't connected to the inlet port. If a 1.5-meter long pipe, with a diameter the same as the inlet port were to be used, the flow rate may be reduced up to 50%.

Pulsation Dampener

AD-TT Series

This active type pneumatic dampener with wetted parts made from 100% PTFE will reduce the pulsation of the liquid caused when using an F Series Diaphragm Pump. By reducing pulsation all ancillary equipment such as filters, spray units, piping etc will be protected from damage as well as enabling a steady fluid flow rate in the process system.

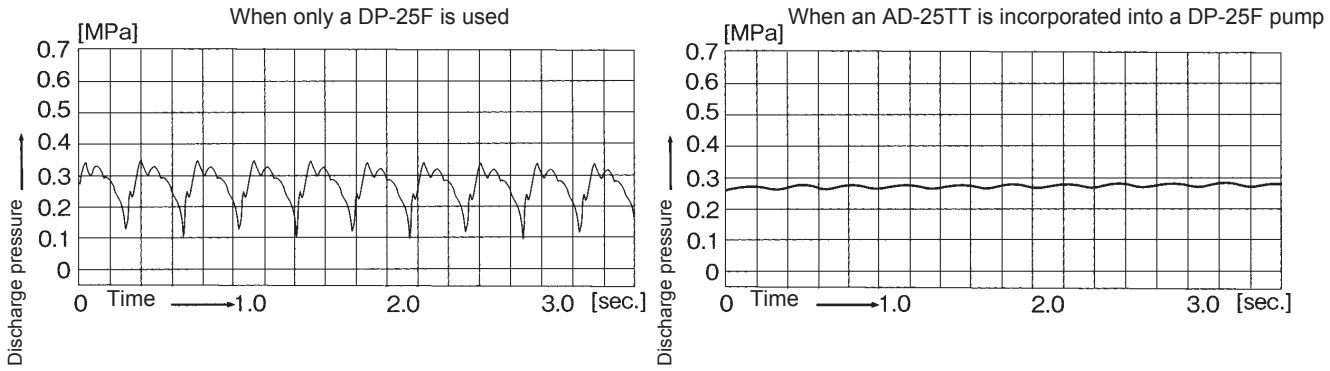
AD-38TT AD-25TT AD-10TT

Specifications

Model	AD-10TT	AD-25TT	AD-38TT
Model No.	851918	851919	853441
Port dimensions			
Liquid inlet & outlet	Rc 3/8″	Rc 3/4″	Rc 1″
Air inlet	Rc 1/4″	Rc 1/4″	Rc 1/4″
Exhaust (with muffler)	Rc 1/8″	Rc 1/8″	Rc 1/8″
Air supply pressure range	0.2～0.5 MPa	0.2～0.7 MPa	0.2～0.7 MPa
Max discharge pressure	0.5 MPa	0.7 MPa	0.7 MPa
Max air consumption*	20 L/min(ANR)	20 L/min(ANR)	20 L/min(ANR)
Max slurry diameter	1 mm	3 mm	3 mm
Ambient temperature range	0～70 ℃	0～70 ℃	0～70 ℃
Liquid temp erature range**	0～80 ℃	0～80 ℃	0～80 ℃
Weight	4.5 kg	12.5 kg	30.0kg

*These figures may vary depending on many factors including, the liquid used, the ambient and fluid temperature, the supplied air pressure, and the inlet and outlet conditions.

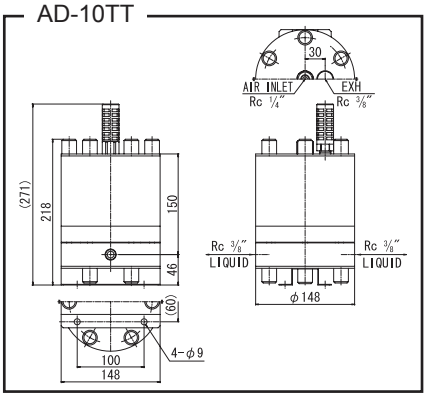
Comparison with a DP-25F pump



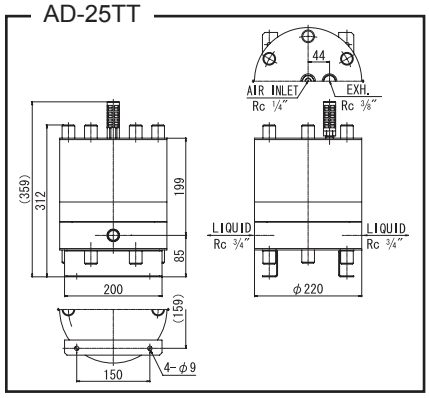
Due to Japanese and other international trade laws, products contained within this catalogue may require licensing prior to export or re-export. We request that when dealing with yamada products that you take the utmost care in ensuring that all required export procedures are carried out correctly.

Dimensions

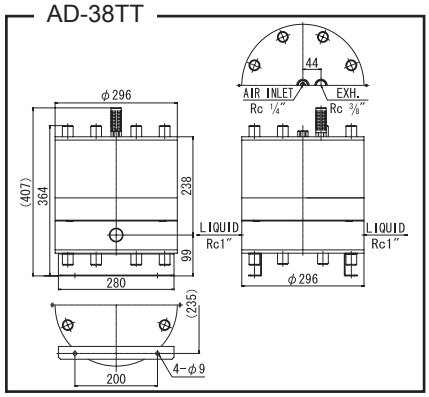
AD-10TT

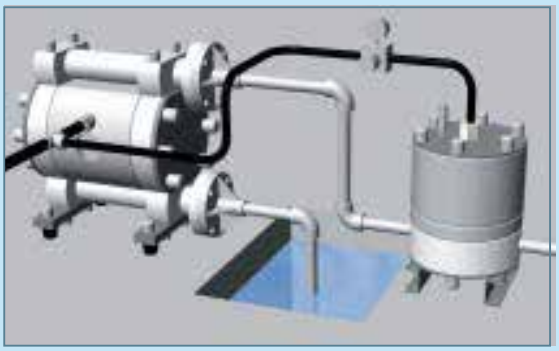


AD-25TT



AD-38TT





Dampener Installation Diagram

Cautions for Dampener Installation

1. *The dampener should be installed no more than 1 meter from the pumps discharge port.*
   The pumps effects will be reduced if installed further than this.
2. *With the installation of an air regulator on the air inlet port the dampener will work more effectively.*
3. *The dampener's consumption of air depends on the pulse conditions.*
4. *The dampener requires the same pre-maintenance as the F series diaphragm pump series.*
5. *The dampener doesn't work without backpressure. At least 0.1 MPa of backpressure is required.*

Accessories

MFC-24 Pump Controller

Model		MFC-24
Power Supply		DC24V
Power Consumption		6.5mA
Input	Sensor	NPN Open Collector Input
	Remote signal	No-voltage contact or open collector input
Output	Solenoid	Transistor output (DC24V)
	Counter	Transistor output (DC24V)
	Alarm	Transistor output (DC24V)
Dimensions		W125.6mm×H25mm×L205.6mm
Material		ABS
Environment Resistance	Ambient Temperature	0 to 50°C (Not to be frozen)
	Ambient Humidity	35 to 85% (Not to be condensation)
	Vibration Resistance	10 to 55 Hz (amplitude 1.5 mm, X, Y, Z)
Net Weight		300g

Quick Exhaust Valve

Model No.	804019	804130
Model	QV-2	QV-4
Port Size	1/4"	1/2"
Body Material	PVC	PVC
Fits Pump	DP-C20FE/SD DP-10F/N, DP-20F/N	DP-C25FE/SD, DP-C38FE/SD DP-25F/N, DP-38F/N

High Purity PTFE Pumps

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:

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