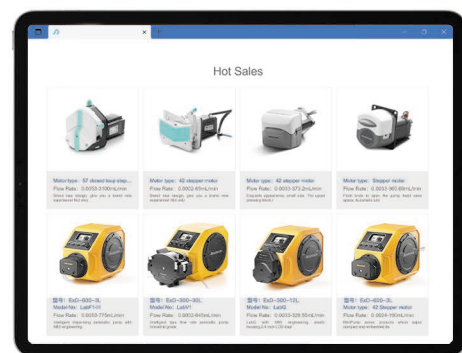




Official Website:
www.innofluid.com



OFFICIAL WEBSITE

innofluid Co.,Ltd.
Building 10, No. 860, Xinyang Road, Lingang New Area
Pilot Free Trade Zone, Shanghai, China.

Website: www.innofluid.com
Email: info@innofluid.com

INNOFLUID

ExD series



ExD Series

Redefine Explosion Proof Peristaltic Pump



Series ExD

- A new category of peristaltic pump based on explosion proof standards.
- The whole pump is explosion proof, reaching  II2G Ex db IIC T4 Gb and  II2D Ex tb IIC T130°C Db explosion proof levels at the same time.
- Intelligent control system to realize high precision transferring and dispensing.



VS



Assembled products with parts

ExD series explosion proof peristaltic pump

	Explosion proof motor type	ExD series
Explosion proof method	Explosion proof motor and Explosion proof control box	Overall explosion proof
Speed range(rpm)	180-600 / 60-600	0.1-600
Speed revolution(rpm)	——	0.1
Display	——	4.3-inch color LCD screen
Control	External frequency converter control	Manual, External signal, Communication
Intelligent dispensing mode	——	Automatic filling and dispensing
Flow rate	——	Display both speed and flow rate
Intelligent calibration	——	Input actual volume and calibrate automatically
Power consumption	370W	300W
Drive weight	≥40kg	30.1kg
IP rate	IP55	IP66

Integrated casting body

- The unique casting reinforced structure and integrated design have successfully passed the "No explosion transmission" test of the IIC level of the national testing center to ensure safety.
- The cast aluminum shell has a tensile strength of 280MPa after heat treatment, which greatly reduces the overall weight and volume of the pump while ensuring strength and safety.
- The hidden design of the flange explosion proof surface combined with the sunken design of the flange fastening screws changes the appearance of traditional explosion proof products.
- The cast aluminum shell has good heat dissipation performance and no additional heat dissipation device is required.

Three-proof button and knob system: explosion-proof, dustproof, waterproof

- Button dust cover: Double layer protection to ensure dustproof and waterproof effect.
- Concave button design: It conforms to ergonomics and fits more comfortably with fingers.

Intelligent operation system

- 4.3-inch color LCD screen, easy operation.
- Dynamic display working status.
- Flow rate, setting parameters and system configuration are displayed in the same screen.
- Intelligent calibration function.
- Multiple external control methods meet remote control requirements.

Passed EMC test

excellent anti-electromagnetic interference capability

- Comply with safety regulations:
IEC61000-6-2
IEC61000-6-4
IEC61000-3-2
IEC61000-3-3

The whole pump is IP66, designed for industrial environment

- More than 90% of the pump body sealing surface of the pump body is sealed by O-ring, which has self-sealing characteristics.
- Passed the IP66 protection level test, easily cope with hot and humid working environment.

The identification system has been fully upgraded

- The logo pattern on the pump head and operation panel adopts laser engraving technology to eliminate the hidden danger of static electricity of traditional plastic masks.

AC servo motor control system

- AC servo motor, high precision, high torque and smooth operation.
- Under full load:
ExD-300-30L (with DZ45 pump head): Motor temperature rise 25 °C
ExD-600-12L (with YZ35 pump head): Motor temperature rise 15 °C

IP66 IP66 Protection Level



Intelligent Operation System



External Control Interface





Precise dripping of chemical drug in explosion-proof production workshop

In the titration process of chemical drug production, customers have been using liquid level tanks to drip acetone or ethanol solutions. This method is less accurate. Because this process is used to transport ethanol and acetone, the equipment is required to be explosion-proof and corrosion-resistant. Using ExD-600-12L explosion proof peristaltic pump to achieve precise control and accuracy of $\pm 1\%$.



95% ethanol sub-package production

The customer has been using the explosion proof motor and piston pump to dispensing ethanol. When producing products of different specifications, complicated equipment adjustment work is required, which takes about 2-3 hours. The customer's equipment transformation replaces the sub-package pump with ExD-600-6L. For each replacement, it only needs to adjust the parameters on the control panel of the pump, and it only takes 5 minutes at most.



Catalytic validation equipment and simulation pilot production equipment validation device sampling for chemical enterprises

In the process of validating catalysts and simulating oil production, chemical enterprises need sampling pumps for accurate injection. A lot of electromagnetic interference signals will be generated in the field cause of multiple devices running in a centralized manner. And many similar products in the market cannot meet the demand. ExD-600-12L peristaltic pump achieves accurate sampling through good anti-interference ability on site.



exD series



Redefine Explosion Proof Peristaltic Pump



Explosion Proof Peristaltic Pump

Application: Inflammable and explosive sites, including chemistry, pharmaceutical industry, etc.

IP66

Technical Specifications

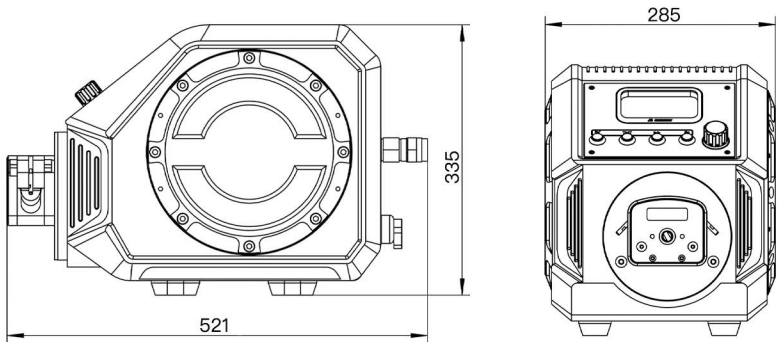
- Standard: EN IEC 60079-0:2018+A11:2024, EN 60079-1:2014+A11:2024, EN IEC 60079-31:2018.
- Housing material: Aluminum Alloy
- Speed range:
 - ExD-600 series: 0.1-600rpm
 - ExD-300 series: 0.1-300rpm
- Speed resolution: 0.1rpm
- Display: 4.3 inch -Industrial grade - True color LCD screen
- Control: Mechanical button, explosion proof knob, external control signal and communication.
- Working mode: Flow rate mode, Dispensing mode.
- Flow rate mode: Continuous transferring according to the set flow rate or motor speed.
- Dispensing mode: Set the dispensing volume, dispensing time, pause time and repeat numbers.
- Dispensing volume: 0.1mL-9999L
- Dispensing time: 0.1sec-9999hour
- Pause time: 0.5sec-9999hour
- Repeat number: 1-9999 times, 0 represent unlimited
- Calibration function: Input actual volume and calibrate automatically
- Back suction angle: 0-360°
- Communication: RS485
- Communication protocol: Modbus protocol(RTU mode)
- External control speed signal: 0-5V, 0-10V, 4-20mA optional
- External control signal input: Active switch signal (5-24V) control start/stop, direction and full speed; Passive switch signal control start/stop.
- External control signal output: Open collector output working status
- Drive dimension (LxWxH): 458x285x335mm
- Power supply: AC220V±10%, 50/60Hz
- Rated power: 300W
- Relative humidity: <90%
- Condition temperature: 0-40°C
- IP rate: IP66
- Drive weight: 30.1kg

ExD Series Explosion Proof Peristaltic Pump

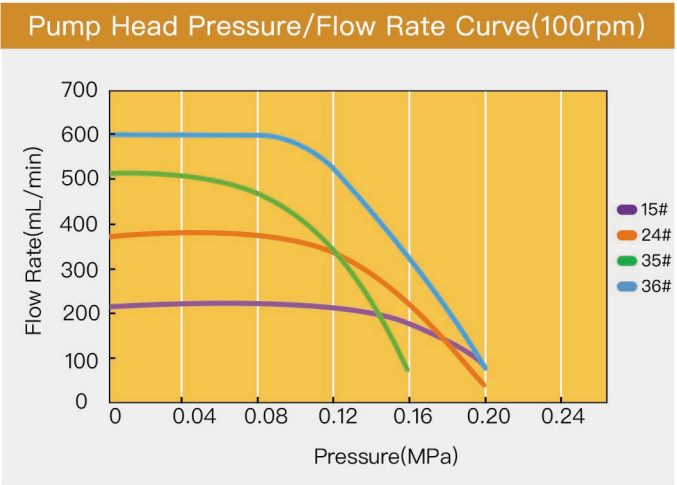
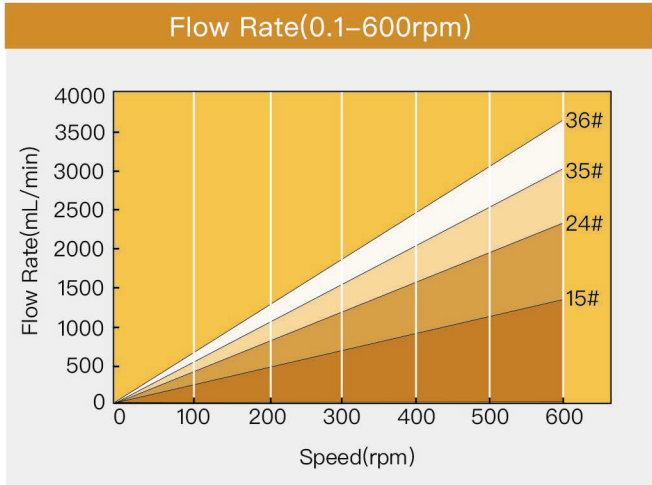
Pump Head



Dimension Drawing(Unit:mm)



DZ25-3L Flow Rate									
Drive	Pump Head	Housing Material	Tube Clamp Material	Tubing		mL/r	Speed (rpm)	Flow Rate (mL/min)	Weight (kg)
				Size	IDxWall Thickness				
ExD-600-3L	DZ25-3L	Aluminum alloy	Polyamide	15#	4.8x2.4(mm)	2.11	0.1-600	0.211-1264	1.16
				24#	6.4x2.4(mm)	3.85		0.385-2310	
				35#	7.9x2.4(mm)	5.08		0.508-3050	
				36#	9.6x2.4(mm)	6		0.6-3600	



DZ25-3L Filling Volume Reference Parameter							
Drive	Pump Head	Tubing	Filling Volume(mL)	Filling Time(s)	Accuracy(±%)	Output (pcs/min)	Motor Speed(rpm)
ExD-600-3L	DZ25-3L	15#	20	1.2	0.5	27	473.9
		24#	40	1.5	0.5	24	415.6
		35#	50	1.5	0.5	24	393.7
		36#	70	2	0.5	20	350.0

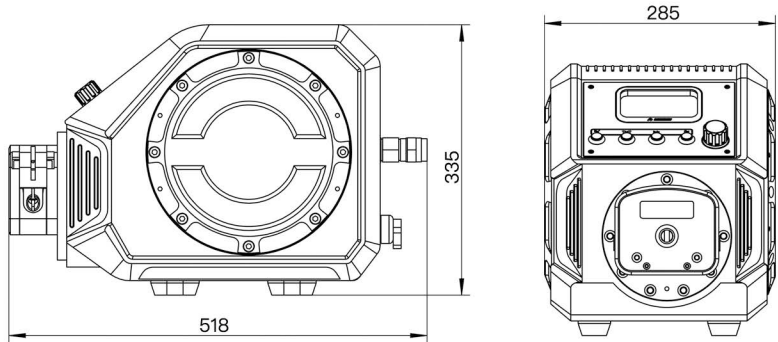
Experimental conditions:standard atmospheric pressure, room temperature at 20°C,the liquid is pure water, no pressure, no suction and lift.
Note: Actually, it is affected by many factors such as transmission medium, inlet and outlet pressure, hose material and error, working environment, etc. This data is for reference only.

ExD Series Explosion Proof Peristaltic Pump

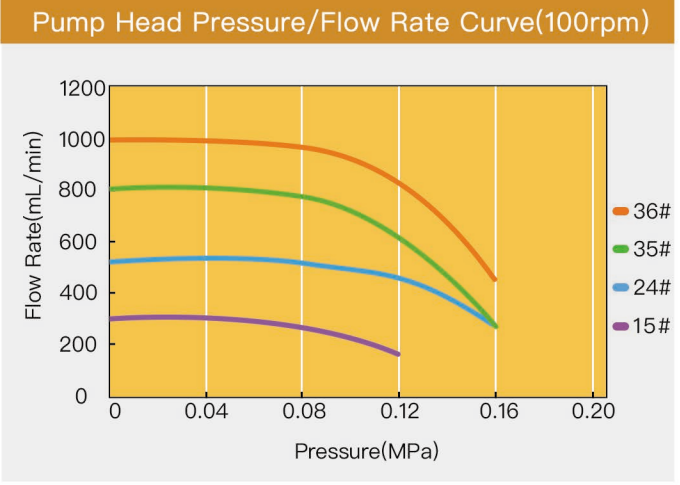
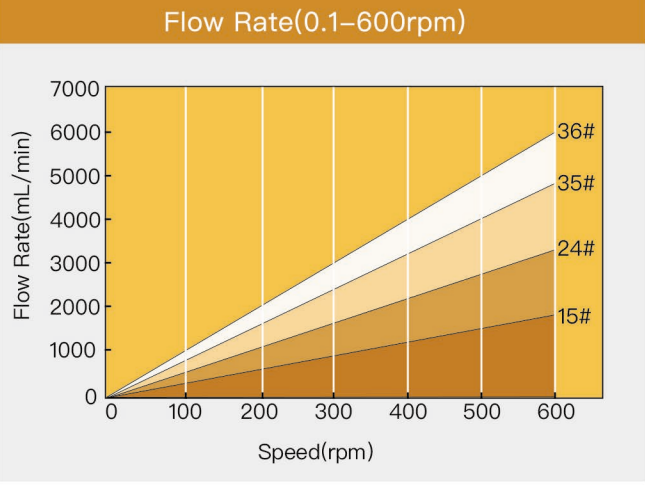
Pump Head



Dimension Drawing(Unit:mm)



DZ25-6L Flow Rate									
Drive	Pump Head	Housing Material	Tube Clamp Material	Tubing		mL/r	Speed (rpm)	Flow Rate (mL/min)	Weight (kg)
				Size	IDxWall Thickness				
ExD-600-6L	DZ25-6L	Aluminum alloy	Polyamide	15#	4.8x2.4(mm)	3	0.1-600	0.3-1800	1.87
				24#	6.4x2.4(mm)	5.5		0.55-3300	
				35#	7.9x2.4(mm)	8		0.8-4800	
				36#	9.6x2.4(mm)	10		1-6000	



DZ25-6L Filling Volume Reference Parameter							
Drive	Pump Head	Tubing	Filling Volume(mL)	Filling Time(s)	Accuracy(±%)	Output (pcs/min)	Motor Speed(rpm)
ExD-600-6L	DZ25-6L	15#	30	1.2	0.5	27	500.0
		24#	50	1.2	0.5	27	454.6
		35#	70	1.2	0.5	27	437.5
		36#	100	5	0.5	24	400.0

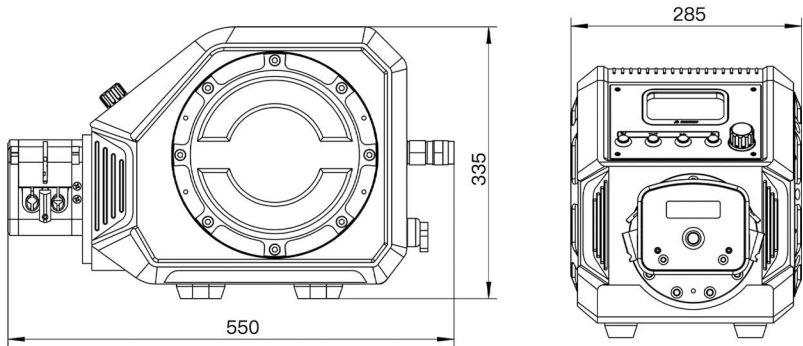
Experimental conditions:standard atmospheric pressure, room temperature at 20°C,the liquid is pure water, no pressure, no suction and lift.
Note: Actually, it is affected by many factors such as transmission medium, inlet and outlet pressure, hose material and error, working environment, etc. This data is for reference only.

ExD Series Explosion Proof Peristaltic Pump

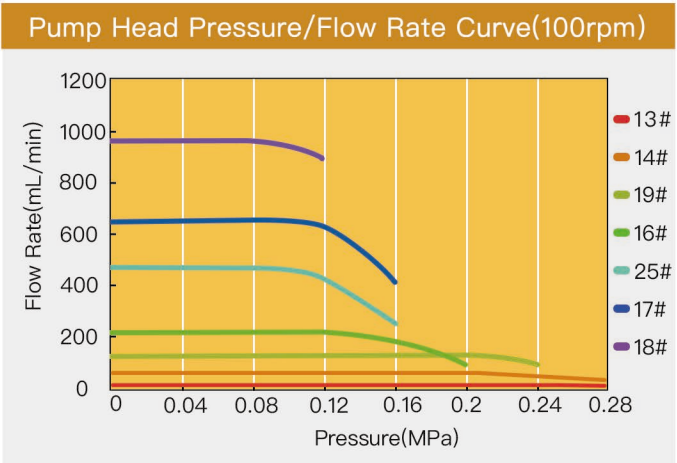
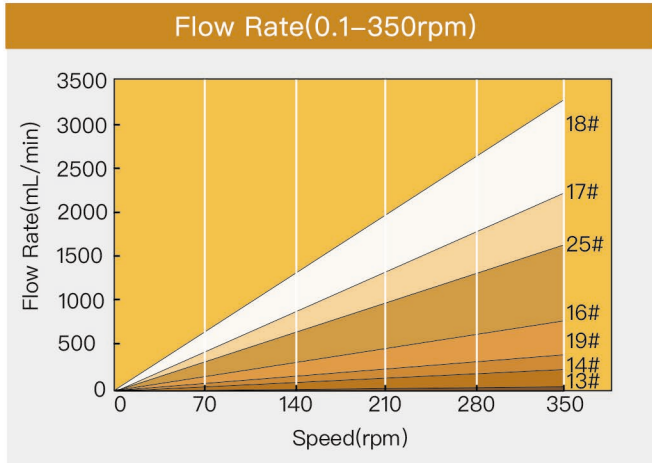
Pump Head



Dimension Drawing(Unit:mm)



DY15 Flow Rate									
Drive	Pump Head	Housing Material	Tube Clamp/Connector Material	Tubing		mL/r	Speed (rpm)	Flow Rate (mL/min)	Weight (kg)
				Size	IDxWall Thickness				
ExD-600-6L	DY15	Aluminum alloy	Polyamide	13#	0.8x1.6(mm)	0.14	0.1-350	0.01-48	3.2
				14#	1.6x1.6(mm)	0.64		0.06-223	
				19#	2.4x1.6(mm)	1.28		0.13-448	
				16#	3.2x1.6(mm)	2.07		0.2-723	
				25#	4.8x1.6(mm)	4.65		0.47-1626	
				17#	6.4x1.6(mm)	6.37		0.64-2230	
				18#	7.9x1.6(mm)	9.53		0.95-3337	



DY15 Filling Volume Reference Parameter							
Drive	Pump Head	Tubing	Filling Volume(mL)	Filling Time(s)	Accuracy(±%)	Output (pcs/min)	Motor Speed(rpm)
EXD-600-6L	DY15	13#	0.5	0.8	0.8	33	273.4
		13#	1	1.2	0.5	27	364.6
		14#	0.5	0.5	1	30	94.2
		14#	1	0.6	0.8	38	157.0
		14#	3	1	0.5	30	282.6
		19#	5	1	0.8	30	234.4
		16#	15	1.5	0.5	24	290.4
		25#	20	1	0.5	30	258.3
		17#	30	1	0.5	30	282.5
		18#	100	2.5	0.5	17	251.7

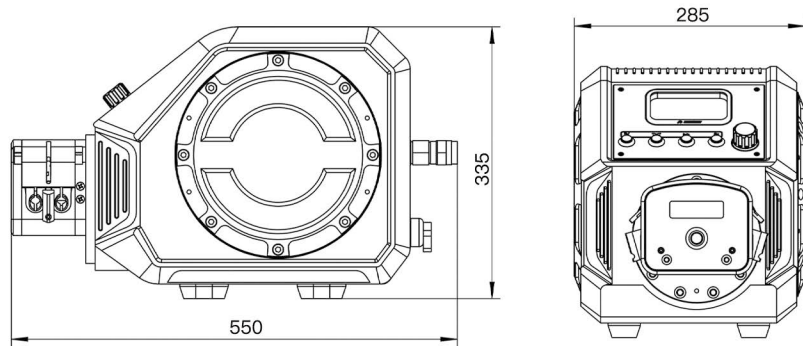
Experimental conditions:standard atmospheric pressure, room temperature at 20°C,the liquid is pure water, no pressure, no suction and lift.
Note: Actually, it is affected by many factors such as transmission medium, inlet and outlet pressure, hose material and error, working environment, etc. This data is for reference only.

ExD Series Explosion Proof Peristaltic Pump

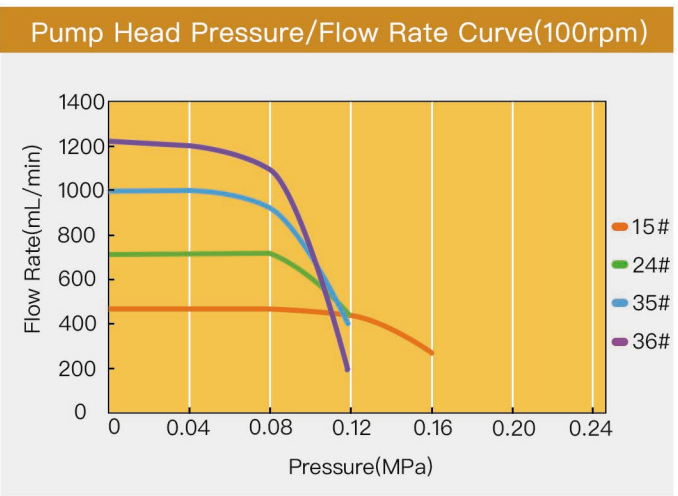
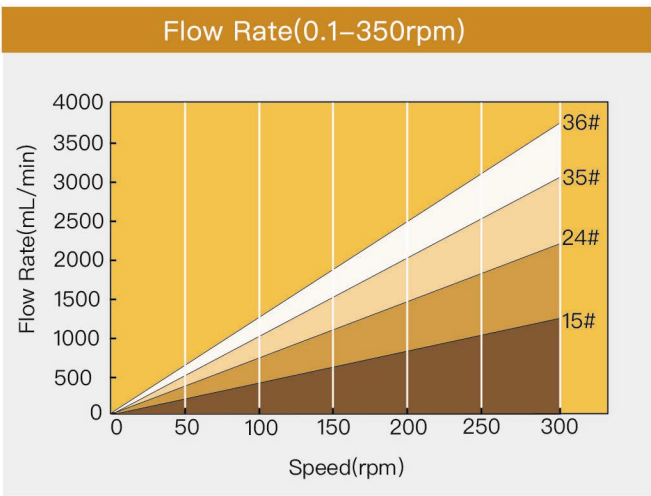
Pump Head



Dimension Drawing(Unit:mm)



DY25 Flow Rate									
Drive	Pump Head	Housing Material	Tube Clamp/Connector Material	Tubing		mL/r	Speed (rpm)	Flow Rate (mL/min)	Weight (kg)
				Size	IDxWall Thickness				
ExD-600-6L	DY25	Aluminum alloy	Polyamide	15#	4.8x2.4(mm)	4.23	0.1-350	0.42-1480	3.2
				24#	6.4x2.4(mm)	7.63		0.76-2670	
				35#	7.9x2.4(mm)	10.29		1.03-3600	
				36#	9.6x2.4(mm)	12.40		1.24-4340	



DY25 Filling Volume Reference Parameter							
Drive	Pump Head	Tubing	Filling Volume(mL)	Filling Time(s)	Accuracy(±%)	Output (pcs/min)	Motor Speed(rpm)
ExD-600-6L	DY25	15#	10	0.8	0.8	33	177.3
		24#	30	1	0.8	30	235.9
		35#	70	1.5	0.5	24	272.2
		36#	100	2	0.5	20	241.9

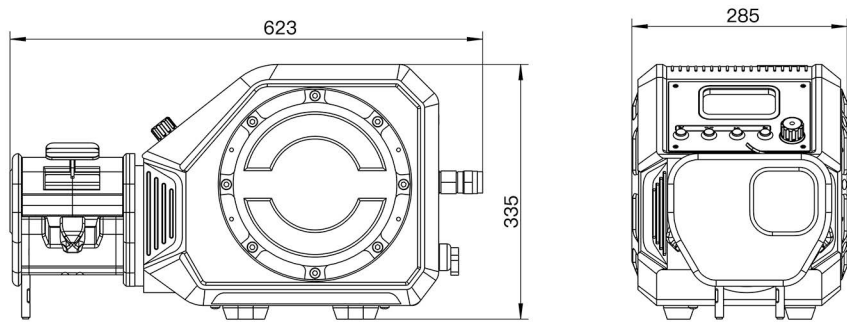
Experimental conditions:standard atmospheric pressure, room temperature at 20°C,the liquid is pure water, no pressure, no suction and lift.
Note: Actually, it is affected by many factors such as transmission medium, inlet and outlet pressure, hose material and error, working environment, etc. This data is for reference only.

ExD Series Explosion Proof Peristaltic Pump

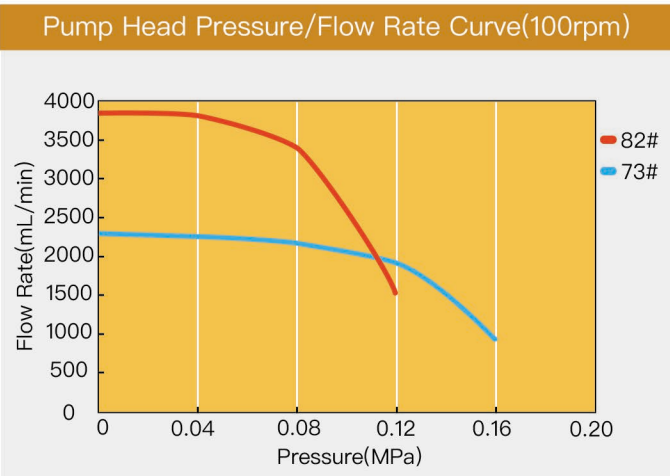
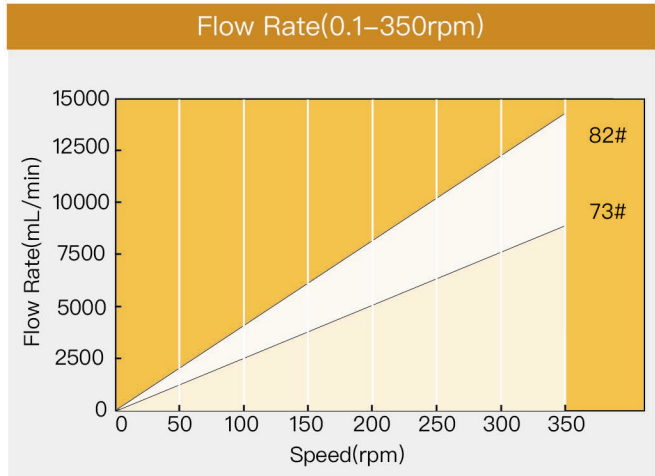
Pump Head



Dimension Drawing(Unit:mm)



DY Pump Head Flow Rate								
Drive	Pump Head	Housing Material	Tubing		(mL/r)	Speed (rpm)	Flow Rate (mL/min)	Weight (kg)
			Size	IDxWall Thickness(mm)				
ExD-600-12L	DY35	Aluminum alloy	73#	9.6x3.3	23.96	0.1-350	2.40-8756	9.45
			82#	12.7x3.3	39.3		3.93-14147	



DY Pump Head Filling Volume Reference Parameter							
Drive	Pump Head	Tubing	Filling Volume(mL)	Filling Time(s)	Accuracy (±%)	Output (pcs/min)	Motor Speed (rpm)
ExD-600-12L	DY35	73#	300	3	0.5	15	245.1
		82#	500	3	0.5	15	269.2

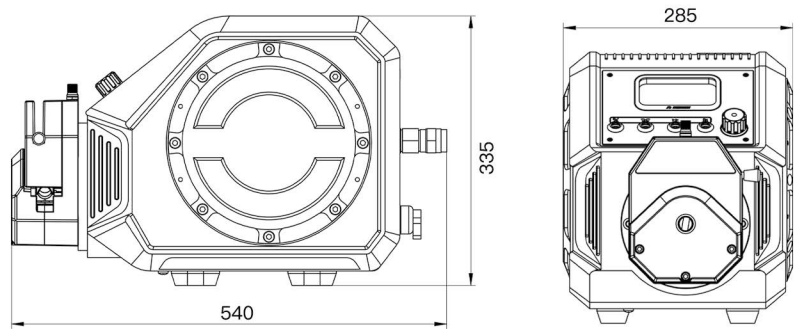
Experimental conditions:standard atmospheric pressure, room temperature at 20°C,the liquid is pure water, no pressure, no suction and lift.
Note: Actually, it is affected by many factors such as transmission medium, inlet and outlet pressure, hose material and error, working environment, etc. This data is for reference only.

ExD Series Explosion Proof Peristaltic Pump

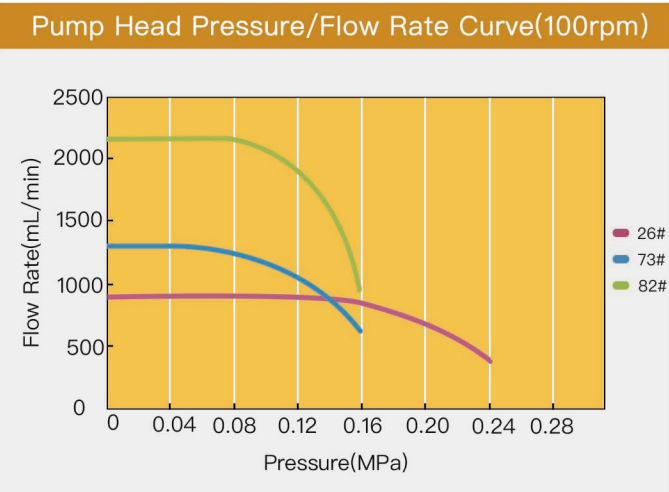
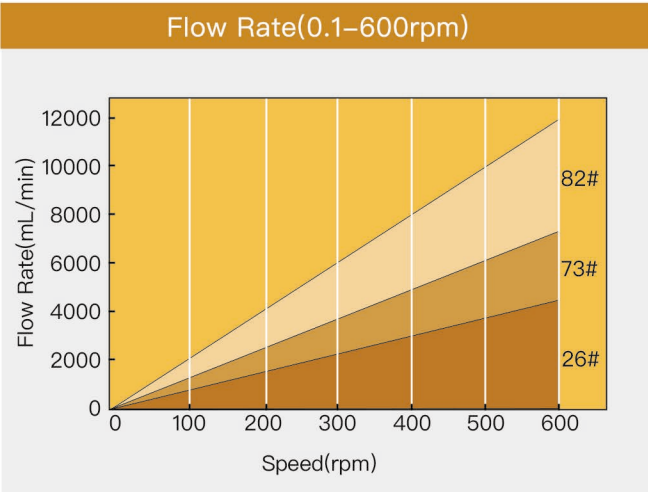
Pump Head



Dimension Drawing(Unit:mm)



YZ35-II Flow Rate								
Drive	Pump Head	Housing Material	Tubing		mL/r	Speed (rpm)	Flow Rate (mL/min)	Weight (kg)
			Size	IDxWall Thickness				
ExD-600-12L	YZ35-II	Cast aluminum	26#	6.4x3.3(mm)	6.9	0.1-600	0.69-4200	2.8
			73#	9.6x3.3(mm)	12.3		1.23-7400	
			82#	12.7x3.3(mm)	20		2-12000	

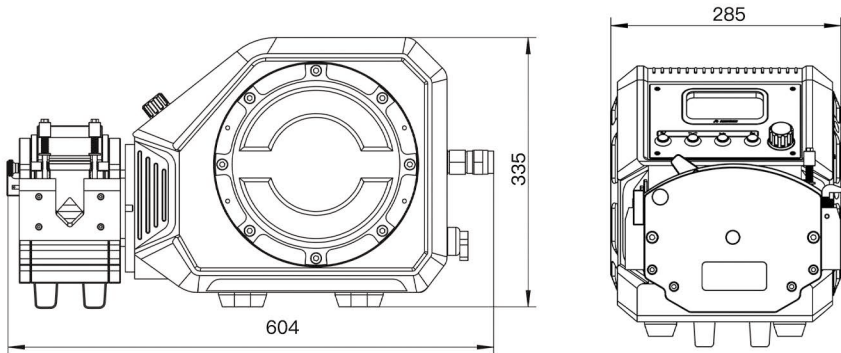


YZ35-II Filling Volume Reference Parameter							
Drive	Pump Head	Tubing	Filling Volume(mL)	Filling Time(s)	Accuracy(±%)	Output (pcs/min)	Motor Speed(rpm)
ExD-600-12L	YZ35-II	26#	50	1	0.5	30	428.6
		26#	100	2	0.5	20	428.6
		73#	100	1.2	0.5	27	406.5
		73#	150	2	0.5	20	365.9
		82#	200	1.5	0.5	24	400.0
	2*YZ35-II	73#	100	1.2	0.5	27	203.3
		73#	200	1.5	0.5	24	325.2
		82#	500	2	0.5	20	375.0

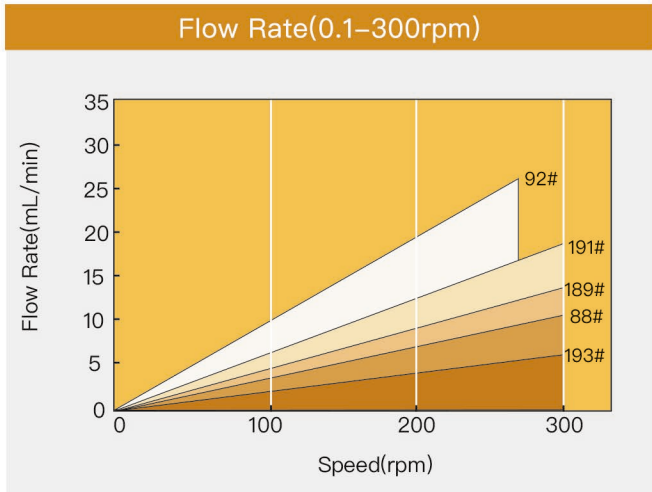
Experimental conditions:standard atmospheric pressure, room temperature at 20°C,the liquid is pure water, no pressure, no suction and lift.
Note: Actually, it is affected by many factors such as transmission medium, inlet and outlet pressure, hose material and error, working environment, etc. This data is for reference only.

Pump Head

Dimension Drawing(Unit:mm)



DZ45 Flow Rate									
Drive	Pump Head	Housing Material	Tube Clamp/Connector Material	Tubing		L/r	Speed (rpm)	Flow Rate (L/min)	Weight (kg)
				Size	IDxWall Thickness				
ExD-300-30L	DZ45	Aluminum alloy	Polyamide	193#	9.6x4.8(mm)	0.019	0.1-300	0.0019-5.66	10
				88#	12.7x4.8(mm)	0.035		0.0035-10.5	
				189#	15.9x4.8(mm)	0.047		0.0047-13.98	
				191#	19.4x4.8(mm)	0.063		0.0063-18.78	
				92#	25.4x4.8(mm)	0.104	0.1-270	0.0104-28.15	



QUALIFICATION CERTIFICATES



No: BA0500061-2023



中国认可
国际互认
检测
TESTING
CNAS L1177

211520110775

TEST REPORT

Sample: Explosion Proof Peristaltic Pump

Manufacturer: Baoding Shenchen Precision Pump Co., Ltd.

Client: Baoding Shenchen Precision Pump Co., Ltd.

Test kind: Entrust



Shandong Institute for Product Quality Inspection

QUALIFICATION CERTIFICATES

No : BA0500061-2023

Shandong Institute for Product Quality Inspection

Test Report

Page 1 of 22

Sample	Explosion Proof Peristaltic Pump	Test Kind	Entrust
Client	Baoding Shenchen Precision Pump Co., Ltd.	Model, Type	ExD series
Manufacturer	Baoding Shenchen Precision Pump Co., Ltd.	Grade	/
Address of Client	No.103, Building 2, ZhiDian Industrial Park, FuXing East Road 999, Baoding, China. 071000	Registered Trademark	/
Sampling Location	/	Client Representative	Li Mingjie
Sample Batch	/	Receipt Date	2023-02-15
Sample Quantity	1 set	Producing Date	/
Sample Description	Apparently Sound, No damage.	Batch No.	/
Environmental for Test	Temperature: 18.3℃~18.7℃, Humidity: 32%RH~38%RH, Atmospheric pressure: 101.40kPa~101.90kPa	Test Date	2023-02-15~2023-02-16
Test Standard	IEC61000-6-2:2016, IEC61000-6-4:2018, IEC61000-3-2:2020, IEC61000-3-3:2017		
Decision Standard	IEC61000-6-2:2016, IEC61000-6-4:2018, IEC61000-3-2:2020, IEC61000-3-3:2017		
Test Item	Electrostatic discharge Immunity test, Radiated, radio-frequency, electromagnetic field immunity test, Electrical fast transient/burst immunity test, Surge immunity test, Immunity test to conducted disturbances, induced by radio-frequency fields, Power-frequency magnetic field immunity test, Voltage dips and short interruptions immunity test, Conducted disturbance test, Radiated disturbance test, Harmonic current emission test, Voltage fluctuations and flicker test		
Test Conclusion	The sample is determined as qualified according to IEC61000-6-2:2016, IEC61000-6-4:2018, IEC61000-3-2:2010 and IEC61000-3-3:2017.		
Note	1. This report contains front cover and second cover (signal"/"indicates this item has no content) 2. Testing address: No.31000, Jingshidong Road, Jinan, Shandong Prov.		

Approved by: 潘勇

Reviewer: 刘桂秋

Tested by: 胡德隆

Date: 2023-03-10

Date: 2023-03-10

Date: 2023-03-10

QUALIFICATION CERTIFICATES

Registered / Eingetragen 05/12/2022

No 015005182-0001

The Executive Director / Der Exekutivdirektor

Christian Archambeau

EU IPO

EUROPEAN UNION INTELLECTUAL PROPERTY OFFICE

CERTIFICATE OF REGISTRATION

This Certificate of Registration is hereby issued for the Registered Community Design identified below. The corresponding entries have been recorded in the Register of Community Designs.

AMT DER EUROPÄISCHEN UNION FÜR GEISTIGES EIGENTUM EINTRAGSURKUNDE

Diese Eintragungsurkunde wird für das unten genannte eingetragene Gemeinschaftsgeschmacksmuster ausgestellt. Die entsprechenden Einträge sind in das Register für Gemeinschaftsgeschmacksmuster aufgenommen worden.

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中华人民共和国国家版权局

计算机软件著作权登记证书

证书号：软著登字第10842215号

软件名称：防爆型蠕动泵系统软件 [简称：防爆泵系列] V1.0

著作权人：申辰流体科技（上海）有限公司

开发完成日期：2022年09月01日

首次发表日期：未发表

权利取得方式：原始取得

权利范围：全部权利

登记号：2023SR0255044

根据《计算机软件保护条例》和《计算机软件著作权登记办法》的规定，经中国版权保护中心审核，对以上事项予以登记。

No. 12284663

2023年02月16日

证书号第6889685号

外观设计专利证书

外观设计名称：蠕动泵驱动器

设计人：孙巍;任爱华

专利号：ZL 2021 3 0328388.9

专利申请日：2021年05月31日

专利权人：保定申辰泵业有限公司

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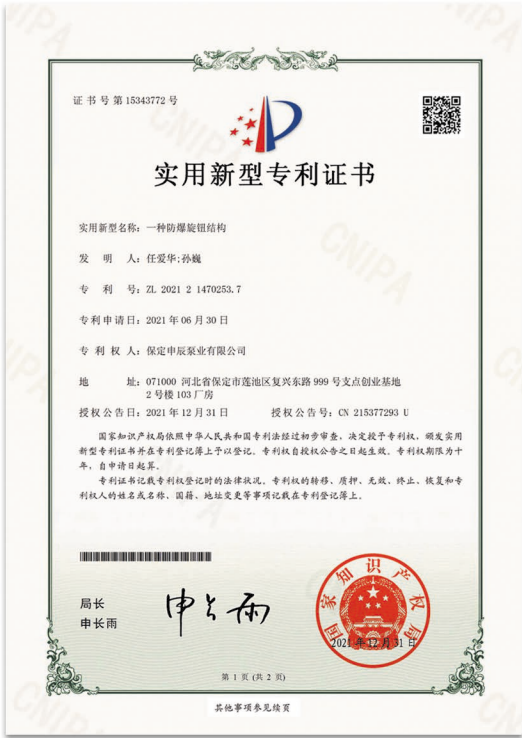
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PATENTS



The utility model relates to an explosion proof peristaltic pump.



The utility model relates to an explosion proof knob structure.



The utility model relates to an explosion proof locking structure.



The utility model relates to a dust-proof, water-proof and explosion-proof, three-proof button structure.

1. Explosion-proof concept analysis

• Classification of areas – Explosive gas atmospheres

Countries around the world have different zones for dangerous places, but there are roughly two factions: China and most European countries use the IEC classification method, Other countries, mainly represented by the United States and Canada, use the North American method. According to IEC 60079-10-1:2020 Explosive Atmospheres Part 10-1: Classification of areas – Explosive gas atmospheres: Hazardous areas are classified into the follow zones according to the frequency and duration of the explosive gas atmospheres: Zone 0: A place where an explosive gas atmospheres is present continuously or for a long time. Zone 1: A place where an explosive gas atmospheres may occur during normal operation. Zone 2: A place where an explosive gas atmospheres is not likely to occur in normal operation, but if it does occur, it will occur occasionally and only for a short time.

Electrical apparatus for explosive gas atmospheres				Maximum surface temperature grouping for Class II electrical equipment	
Ex	db	II C	T4	Temperature group	Maximum surface temperature of equipment (°C)
				T1	450
				T2	300
				T3	200
				T4	135
				T5	100
				T6	85

Classes and temperature groups of explosive gases or vapors									
温度组别		T1		T2		T3	T4	T5	T6
category	I	methane		—		—	—	—	—
	IIA	Acetic acid acetone acetonitrile Allyl fluoride ammonia aniline Styrene Benzene Methylstyrene Tritoluene penta-2-one (Methylpropyl ketone)	Cresol Bromoethane Isobutane Butyryl fluoride Chloromethane propane Chloroethane petroleum Nitrogen (impurity) benzene	Cyclopentane Methylcyclopentane Propionic acid ethane methanol Methyl formate ethyl acetate ethylene oxide Diisopropyl ether	Propanol cyclohexanone Ethylene Furan Butane methylamine chloroethanol Ethyl acrylate	Pentane Methylcyclohexane Petroleum (including gasoline) Naphtha Diesel kerosene hexane ethanethiol Pentyl alcohol chlorobutane tetrahydrothiophene	Acetaldehyde	—	Ethyl nitrite
	IIB	Propylene (methyl acetylene) Cyclopropane Acrylonitrile	Hydrogen cyanide Coke oven gas	Butadiene-1,3 ethylene oxide Methyl acrylate furan		Diformaldehyde methylfuryl alcohol Butenal Ethylthiol	Ethyl methyl ether diethyl ether Dibutyl ether tetrafluoroethylene	—	—
	IIC	Hydrogen		Acetylene		—	—	Carbon disulfide	—

Explosive gas group				
Electrical equipment category	Representative gas	Gas classification	Maximum Experimental Safe Gap(MESG)	Minimum ignition current (MIC)
I	Methane	—	—	—
IIA	Propane	A	MESG is greater than 0.9mm	MIC ratio is greater than 0.8
IIB	Vinyl	B	MESG is 0.5–0.9mm	MIC ratio is 0.45–0.8
IIC	Hydrogen/Acetylene	C	MESG is less than 0.5mm	MIC ratio is less than 0.45

● Electrical equipment for combustible dust environments

Protected by an enclosure to prevent dust from entering and limit the surface temperature, an explosion proof form of electrical equipment used in explosive dust atmospheres. The type of protection “t” is divided into three protection classes according to the degree of danger that Ex equipment can become a source of ignition in explosive dust atmospheres. Equipment protected by a dust ignition–tight enclosure “t” is classified as:
---“ta” (Equipment Protection Level “Da”); or
---“tb” (Equipment Protection Level “Db”); or
---“tc” (Equipment Protection Level “Dc”).

Protection rate,Relationship between device category and protection rate (IP)			
Protection rate	IIIC	IIIB	IIIA
“ta”	IP6X	IP6X	IP6X
“tb”	IP6X	IP6X	IP5X
“tc”	IP6X	IP5X	IP5X

2.Description of IP protection level (According to IEC60529)

For example, the protection level is IP54, IP is the marked letter, the number 5 is the first marked number, and 4 is the second marked number. The first marked number indicates the contact protection and foreign object protection level, and the second marked number indicates the waterproof protection level

The first characteristic number fixed conductor foreign matter enters.		Second special identification number to prevent harmful effects from ingress of water	
0	No protection	0	No protection
1	Fixed foreign object with a diameter greater than 50mm	1	Vertical drip
2	Fixed foreign object with a diameter greater than 12mm	2	15° drip
3	Fixed foreign object with a diameter greater than 2.5mm	3	Deluge
4	Fixed foreign object with a diameter greater than 1.0mm	4	Splash
5	Dustproof	5	Spray water
6	Dusty	6	Blast water
		7	Short time immersion
		8	Continuous immersion

○ Peristaltic Pump Tubing

Silicone Tubing

Platinum-cured silicone tubing: Soft, slightly transparent, smooth inner wall; low protein adhesion, low protein penetration, temperature range: -51~238°C.

Micro Flow Rate Tubing										
Tubing Size	0.13×0.86	0.5×0.86	0.86×0.86	1.52×0.86	2.06×0.86	2.79×0.86	1×1	2×1	3×1	2.4×0.8
Tubing cross sections(1:1)	●	●	●	●	○	○	●	○	○	○
Wall thickness (mm)	0.86						1.0			0.8
Inside diameter (mm)	0.13	0.5	0.86	1.52	2.06	2.79	1.0	2.0	3.0	2.4
Maximum pressure (Mpa)	Continuous						0.1			
	Intermittent						0.1			

Basic Flow Rate Tubing												
Tubing Size		13 [#]	14 [#]	19 [#]	16 [#]	25 [#]	17 [#]	18 [#]	15 [#]	24 [#]	35 [#]	36 [#]
Tubing cross sections (1:1)												
Wall thickness	mm	1.6							2.4			
	inch	1/16							3/32			
Inside diameter	mm	0.8	1.6	2.4	3.2	4.8	6.4	7.9	4.8	6.4	7.9	9.6
	inch	1/32	1/16	3/32	1/8	3/16	1/4	5/16	3/16	1/4	5/16	3/8
Maximum pressure (Mpa)	Continuous	0.17				0.14	0.1	0.07	0.17		0.14	
	Intermittent	0.27				0.24	0.14	0.1	0.27		0.24	

Industrial Tubing								
Tubing Size		26"	73"	82"	86"	90"	88"	92"
Tubing cross sections (1:1)								
Wall thickness	mm	3.3			6.4		4.8	
	inch	1/8			1/4		3/16	
Inside diameter	mm	6.4	9.6	12.7	9.5	19	12.7	25.4
	inch	1/4	3/8	1/2	3/8	3/4	1/2	1
Maximum pressure (Mpa)	Continuous	0.2			0.25			
	Intermittent	0.27			0.3			