

# CHEMICAL INJECTION PACKAGE



Depamu (Hangzhou) Pumps Technology Co., Ltd.

Add.: No. 658, 20th Street, Qiantang New District,  
Hangzhou, China

P.C.: 310018

Tel.: +86-571-86400588 86403988

Fax: +86-571-86408588

Http://www.depamu.com

Email: depamu@depamu.com

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 400-809-6100  
[www.depamu.com](http://www.depamu.com)

**PACESETTER OF FLUID  
EQUIPMENT IN THE WORLD**

**Depamu**





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# Company Profile

Depamu (Hangzhou) Pumps Technology Co., Ltd., located in Qiantang New District, China, is a high-tech enterprise specialized in R & D, production and sales of main products including metering pumps, high-pressure reciprocating pumps (plunger/diaphragm type), pneumatic diaphragm pumps, cryogenic pumps, progressing cavity pumps, rotor pumps, chemical dosing packages, water-steam sampling equipment, supercritical fluid equipment and water-treatment equipment.

Through introduction of advanced technologies from Germany, the company has been devoted to research and development of fluid transfer equipment since its establishment, and multiple patented technologies held take a leading place globally. The company has passed API certification; at the same time, it serves as a drafter of pump industry standards.

Presently, company products have been widely applied to oil & gas field exploitation, petroleum and gas refining and transportation as well as industries of nuclear power, military, chemical, electric power, pulp & paper, pharmaceutical, food, new energy, water treatment, etc. Based on establishment of long-term strategic partnerships with large-scale enterprises like CNPC, SINOPEC, CNOOC, CNNC, etc., products have been exported to over 50 countries and regions including the USA, the UK, France, Swiss, Russia, India, Brazil, Iran, Sudan, Turkmenistan, Syria, etc.

The company aims to be the most competitive fluid equipment manufacturer and service supplier in the world, and build Depamu into a century-old global brand.

# Enterprise Qualification



API Certificate 2018-2021



ISO 9001



OHSAS



ISO14001



Invention Patent for Multiple-Plunger High Pressure Reciprocating Pump



Utility Model Patent for Metering Pump with Sleeve Adjustment Mechanism



Certificate of China Torch Program for New-type Extra-Large Flow High Pressure Metering Pump



Hangzhou City High-tech Enterprise



Enterprise High-tech R&D Center in Hangzhou City





# Delicacy Management

Depamu has kept a leading role in the industry in respect of its metering pumps following the corporate spirits of innovation and progress based on outstanding personnel, excellent equipment, advanced technologies, first-class standards, strict management as well as perfect service. The company aims at creation of a most influential major high-tech enterprise in the field.

Assembly Shop ▶



▶ Excellent Team



◀ Office



▶ Precision Machining Workshop

▶ Careful Testing



Warehouse ▶



▶ Testing Workshop





# Application Fields

Depamu provides professional service for multiple fields.



## PetroChina:

PetroChina Daqing Petrochemical Company  
PetroChina Daqing Refining Chemical Company  
PetroChina Lanzhou Petrochemical Company  
PetroChina Dushanzi Petrochemical Company  
PetroChina Urumqi Petrochemical Company  
PetroChina Karamay Petrochemical Company  
PetroChina Fushun Petrochemical Company  
PetroChina Liaohe Petrochemical Company  
PetroChina Qingyang Petrochemical Company  
PetroChina Liaoyang Petrochemical Company  
PetroChina Sichuan Petrochemical Company Limited  
PetroChina North China Petrochemical Company  
Golmud Refinery of Qinghai Oilfield  
PetroChina Harbin Petrochemical Company  
PetroChina Jinxi Petrochemical Company  
PetroChina Dalian Petrochemical Company  
...



## PetroChina Oil & Gas Fields:

Daqing Oilfield Material Company  
PetroChina Changqing Oilfield Company  
PetroChina Jilin Oilfield Company  
PetroChina Tarim Oilfield Company  
PetroChina Qinghai Oilfield Company  
PetroChina Yumen Oilfield Company  
PetroChina Zhejiang Oilfield Company  
...



## Sinopec:

Sinopec Zhenhai Refining & Chemical Company  
Sinopec Shanghai Petrochemical Company Limited  
Sinopec Shanghai Gaoqiao Company  
Sinopec Qilu Company  
Sinopec Tianjin Company  
Sinopec Yangzi Petrochemical Company Limited  
Sinopec Jiujiang Company  
Sinopec North China Company  
Sinopec Wuhan Company  
Sinopec Changling Company  
Sinopec Baling Company  
Sinopec Jinmen Company  
Sinopec Zhanjiang Dongxing Petrochemical Company Limited  
Sinopec Hainan Refining & Chemical Company Limited  
Sinopec Tahe Refining & Chemical Company Limited  
Sinopec Beihai Company  
Sinopec Anqing Company  
Sinopec Wuhan Company  
...



## Sinopec Oil & Gas Fields:

Sinopec Shengli Oilfield Company  
Sinopec Southwest Petroleum & Natural Gas Company  
Sinopec North China Petroleum Bureau  
Sinopec Northeast Petroleum Bureau  
Sinopec Zhongyuan Oilfield Company  
Sinopec Henan Oilfield Company  
...



## CNOOC:

CNOOC Huizhou Oil Refining Project  
CNOOC Zhoushan Petrochemical Ltd.  
CNOOC (Taizhou) Petrochemical Ltd.  
Shandong Binzhou BEFAR Group  
CNOOC Zhanjiang Fuel Oil Co., Ltd.  
CNOOC New Energy (Hainan) Biological Energy Chemical Co., Ltd.  
CNOOC Huahe Coal Chemical Co., Ltd.  
CNOOC Tianye Petrochemical Ltd.  
CNOOC Energy Technology & Services Limited, Oil Production Technical Service Branch  
...



## Chemical and Coal Chemical Industry:

China National Chemical Corporation  
Shenhua Mengxi Huarui Chemical Co., Ltd.  
Shenhua Ningxia Coal Industry Group Co., Ltd.  
Zhongtian Hechuang Energy Co., Ltd.  
Wanhua Polyurethane Co., Ltd.  
Yunnan Yuntianhua Co., Ltd.  
Guizhou Chitianhua Group Co., Ltd.  
China National Bluestar (Group) Co., Ltd.  
Shanxi Sanwei Group Co., Ltd.  
Shandong Hualu Hengsheng Chemical Co., Ltd.  
China Pingmei Shenma Group  
Shanxi Weilai Energy Chemical Co., Ltd.  
...



## Fluorine Chemical Industry

Arkema (Changshu) Fluorine Chemicals Co., Ltd.  
Do-fluoride Chemicals Co., Ltd.  
Zhejiang Yonghe Group  
Jiangsu Meilan Chemical Group  
Zhejiang Quhua Chemical Group  
Shandong Dongyue Chemical Group  
Changshu San'aifu Fluorine Chemical Co., Ltd.  
...



## Iron and Steel Industry

Wuhan Iron & Steel Co., Ltd.  
Jilin Tongang Group  
Jinan Iron & Steel Group  
Laiwu Iron & Steel Group  
Shougang Group  
Shagang Group  
Kungang Group  
...



## Electricity and Environmental Protection Industry

Huadian Water Engineering Co., Ltd.  
Dongfeng Motor Corporation, Thermal Power Plant  
Linyi City Yangguang Heating Power Co., Ltd.  
Shandong Hengli Heat Supply Co., Ltd.  
Shandong Luneng Electric Power Co., Ltd.  
Shandong Lubei Thermal Power Plant  
Dalian Thermal Power Company  
Shaoguan Pingshi Power Generation Plant  
Ningbo Zhenhai Thermal Power Plant  
Changsha Waste Water Treatment Plant  
Xi'an Waste Water Treatment Plant  
Jiaxing Waste Water Treatment Plant  
Jiangsu Yihuan Group Co., Ltd.  
...



## Design Institutes and University Science Research Institutions:

China Huanqiu Contracting & Engineering Co., Ltd.  
Sinopec Engineering Incorporation (SEI)  
Sinopec Luoyang Petrochemical Engineering Corporation Ltd.  
China Chengda Engineering Co., Ltd.  
Hualu Engineering & Technology Co., Ltd.  
Sinopec Ningbo Petrochemical Engineering Co., Ltd.  
Wuhuan Engineering Co., Ltd.  
China Petroleum First Construction Corporation  
China Petroleum Engineering & Construction Corporation, Huadong Design Branch  
Zhejiang University  
Xi'an Jiaotong University  
Southeast University  
China Jiliang University  
Zhejiang Sci-Tech University  
...



## Food and Pharmacy Industry:

Hangzhou Wahaha Group Co., Ltd.  
China Resources Snowflake Brewery Co., Ltd.  
Guangzhou Zhujiang Brewery Group Co., Ltd.  
Northeast Pharm Group Co., Ltd.  
Zhejiang New Harmony Union Pharmaceutical Co., Ltd.  
Fujian South Pharmaceutical Co., Ltd.  
...



## New Energy Industry

Quzhou Huayou Cobalt New Material Co., Ltd.  
Shanshan Energy (Ningxia) Co., Ltd.  
Fujian Ningde Xinshidai New Energy Co., Ltd.  
Jinmen GEM New Material Co., Ltd.  
Shangluo BYD Industry Co., Ltd.  
Qinghai Juzhiyuan New Material Co., Ltd.  
Do-fluoride Chemicals Co., Ltd.  
...



## Export:

CNPC (Turkmenistan) Amu Darya River Natural Gas Company  
(SSKOC) Syria Kaukab Oil Company  
400,000 Tons Pulp Project of Belarus Sweatt Los Gore Pulp, Paper and Cardboard Factory  
Plant Project, Open Joint Stock Company  
ATAL Environmental Engineering  
Venezuela Bisilliat Combined Cycle Power Plant Project  
100\*108m3/a Commodity Gas Product Construction Project, South Yolotan, Turkmenistan  
Afghanistan Kashkari Oilfield Exploitation  
Iraq Misan Water and Oil Waste Water Treatment Project  
Sudan 37th Area  
Indian Oilfield  
Lordegan Urea Fertilizer Project, Iran  
Mis Fertilizer Project, Iran  
...



Clients:

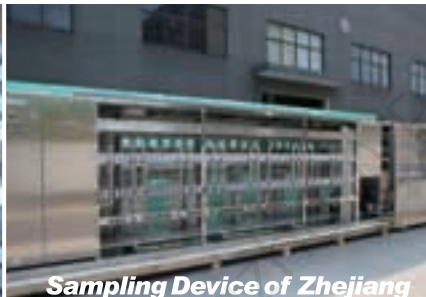




Classic Cases:



Oilfield in India



Sampling Device of Zhejiang Petro-chemical Co., Ltd.



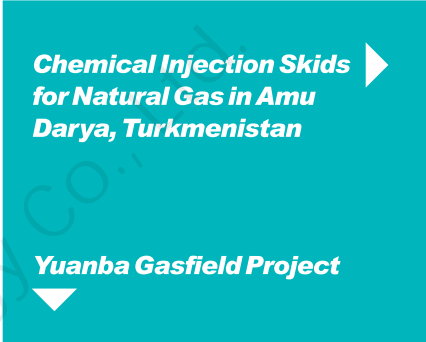
Chicheng County No. 2 Gas Production Plant of PetroChina Changqing Oilfield Company



Sinopec Great Wall Energy and Chemical Co., Ltd.

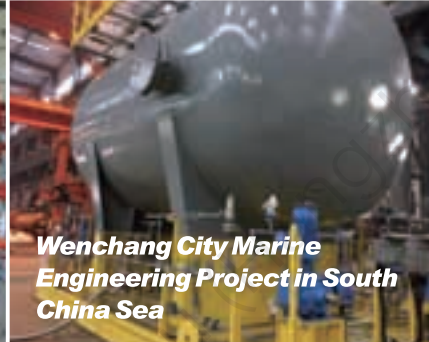


Hangzhou Xiaoshan Economic Technology Development Zone Thermoelectricity Co., Ltd.



Chemical Injection Skids for Natural Gas in Amu Darya, Turkmenistan

Yuanba Gasfield Project



Wenchang City Marine Engineering Project in South China Sea



Yuanba Gasfield Project



Zhejiang Petro-chemical Co., Ltd.



Demulsifier Injection Package of Zhejiang Petro-chemical Co., Ltd. Delayed Coking Project

Sinopec Zhongyuan Oilfield Mobile Methanol (CH<sub>3</sub>OH) Injection Skids



The First Phase of Copper-Cobalt Mine in Kamoya of the Democratic Republic of the Congo Contracted by NORINCO International with Comika Mining SAS



Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>), Sodium Hypochlorite (NaClO) and Stabilizer Injection System



Sinopec Anqing Petrochemical Company



Circulating Water Injection Package

Foam Inhibitor Injection Package



Product Introduction

DPJY-series injection packages are complete sets of equipment manufactured by Depamu through research and development strictly following process specifications combining with the practical situation in China based on introduction of advanced production processes and technologies from America, Germany, Japan, etc. The series are targeted at clients in various industries with production automation requirement such as petroleum, chemical, natural gas, oil refining, water supply, thermoelectricity, nuclear, pharmacy, food, etc., and released in order to meet market needs and provide convenience for wide clients. Depamu injection packages in complete sets with advanced processes, highly automated, easy to be operated and maintained, can satisfy demands of different operation conditions.

Features

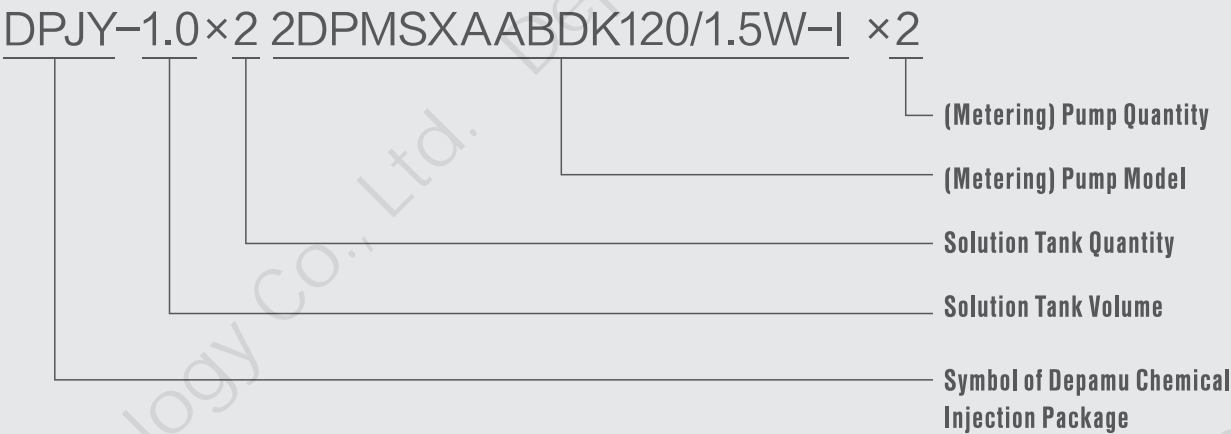
- 1.Adoption of systematic design avoids systematic differences existing in traditional products under single-equipment or single-part design;
- 2.Brand-new design concepts based on absorption of the essence in domestic and foreign dosing technologies make our techniques more reasonable;
- 3.Modular design of product structure in an integrated combination allows for convenient extension in aspects of capacity and function;
- 4.A best solution can be provided flexibly according to different medium and user demand;
- 5.A user can randomly select equipment and parts of famous domestic and foreign brands in various materials at all levels;
- 6.Multiple control modes like manual mode, automatic mode, etc. can be selected to meet all kinds of control requirements.

Application Scope

Boiler water injection package, circulating water injection package, raw water pretreatment injection package, wastewater treatment injection package, sewage treatment injection package, chemical additive injection package for oilfield and gas field, etc.



Code of Injection Package



Basic Parameters

Category	Equipment Name	Solution Tank Volume M³	Metering Pump Specification		Combination Form of Unit Set	Weight (kg)	Dimension(mm) (Length×Width×Height)
			Capacity (L/H)	Discharge Pressure (MPa)			
Boiler Water Injection Package	Ammonia Injection	0.5—2.5	20—70	0.5—2.5	1 Tank+2 Pumps	1600—4200	1800×1900×2500 3000×1900×2500 3000×1900×2500
	Hydrazine Injection		20—70	0.5—2.5	2 Tanks+3 Pumps		
	Acetoxime Injection		20—70	5—32	2 Tanks+4 Pumps		
	Phosphate Injection		20—70	5—32	2 Tanks+4 Pumps		
Circulating Water Injection Package	Scale Inhibitor (Corrosion Inhibitor) Injection	1—4	50—1000	0.3—2.0	1 Tank+2 Pumps	1800—4800	1800×1900×2500 3000×1900×2500 3000×1900×2500
	Injection		100—1500	0.3—2.0	2 Tanks+3 Pumps		
	Germicide Injection		100—1500	0.3—2.0	2 Tanks+4 Pumps		
Wastewater Injection Package	Flocculant Injection	0.5—2.5	100—850	0.3—2.5	1 Tank+2 Pumps	1800—5500	1800×1900×2500 3000×1900×2500 3000×1900×2500
	Dispersant Injection		100—850	0.3—2.5	2 Tanks+3 Pumps		
	Acid Injection		50—1000	0.3—2.5	2 Tanks+3 Pumps		
	Alkali Injection		50—1000	0.3—2.5	2 Tanks+4 Pumps		
Injection Package for Petroleum, Natural Gas Exploitation, Gathering and Transportation, and Oily Sewage Treatment	Demulsifier Injection	0.5—20	10—200	0.5—4.0	1 Tank+2 Pumps	1500—7600	2000×1900×2600 3200×2000×2600 3200×2300×2600 3200×2600×2600 4500×3000×2600
	Corrosion Inhibitor Injection		10—200	0.5—2.5	2 Tanks+2 Pumps		
	Deoxidant Injection		10—200	0.5—2.5	2 Tanks+3 Pumps		
	Reverse Demulsifier Injection		10—200	0.5—2.5	2 Tanks+3 Pumps		
	Germicide Injection		10—200	0.5—2.5	2 Tanks+4 Pumps		
	Methanol (CH <sub>3</sub> OH) Injection		50—400	0.5—2.5	2 Tanks+4 Pumps		
	(Ethenediol) (CH <sub>2</sub> OH) <sub>2</sub> Injection		10—500	5—32	3 Tanks+5 Pumps		
	Injection		10—500	5—32	3 Tanks+5 Pumps		

► **Required Information for Injection Package Model Selection**

User Name			
Equipment Name		Quantity	Set
Operating Parameters			
Liquid Name		Liquid Temperature	℃
Preparation Concentration	%	Solution Density	kg/m³
Number of Injection Points	Point	Injection Flow Rate per Point	L/h
Back Pressure at Injection Point	Mpa		
User Mode	<input type="checkbox"/> Intermittent <input type="checkbox"/> Continuous		
Installation Position			
Structure Parameters			
Solution Tank Volume	M³	Quantity	PC
Material	<input type="checkbox"/> SS <input type="checkbox"/> CS <input type="checkbox"/> CS with Rubber Lining <input type="checkbox"/> Non-metal <input type="checkbox"/> Others		
Mixer	<input type="checkbox"/> Yes <input type="checkbox"/> No	Material	Quantity PC
Metering Pump Type	<input type="checkbox"/> Mechanical Diaphragm Pump <input type="checkbox"/> Hydraulic Diaphragm Pump <input type="checkbox"/> Plunger Pump		Quantity PC
Metering Pump Flow Rate	L/h	Metering Pump Pressure	Mpa
Control Mode	<input type="checkbox"/> Manual <input type="checkbox"/> Automatic		
Pipeline Material	<input type="checkbox"/> SS <input type="checkbox"/> CS <input type="checkbox"/> UPVC <input type="checkbox"/> Others		
Other Requirements			



**Chemical Injection Package**

► **Description**

DPJY-series injection packages, applicable to boiler feed water treatment, boiler water treatment, circulating water treatment, raw water pretreatment, sewage treatment and petroleum chemical industry, can be used for quantitative transportation of chemicals and to meet process requirements arising from different operating conditions.

A complete-set device, composed of solution tank, metering pump, level gauge, safety valve, pulsation damper, all kinds of valves, pipes, electrical control cabinet, etc. installed on one iron base, is an integral combination achieving functions of chemical dissolving, preparation, metering and injection, and featuring a compact structure, a small size, easy transportation and installation. It can also be designed into various shapes based on dosing room space requirements of users.

Metering pumps included in the device can be randomly used as working or standby pumps; in case of two or more solution tanks, the tanks can be separately used alternately through valve switching or be used simultaneously.

- According to different anti-corrosion requirements, a solution tank can be made of 316 or 304 stainless steel, carbon steel, carbon steel with rubber (plastic) lining, FRP, PE, PVC, etc.
- According to different anti-corrosion requirements, wetted parts can be made of 316 or 304 stainless steel, carbon steel, UPVC, etc.





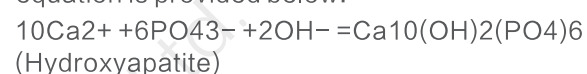
## Boiler Water Injection Package

Classified into: Phosphate injection package, ammonia injection package, hydrazine injection package, acetoxime injection package, etc.

### ► Phosphate Injection Package

#### • Description

Existence of calcium and magnesium hardness in boiler feed water will lead to chemical reaction in a high-temperature environment or concentration and crystallization, thus generating scale firmly attached to the heated surface of the boiler. Scale formed, a poor conductor of heat, will block heat conduction and may result in boiler tube explosion when scaling situation becomes serious. Moreover, it will trigger and intensify chemical corrosion of metal covered by scale, causing great harm. Despite strict softening and desalting treatment of boiler condensation water and feed water, a little calcium and magnesium ions enter in boiler water; if no treatment is done for such hardness, scaling arises, posing a threat to safe boiler operation. At present, the most appropriate treatment method is phosphate injection in boiler water and the chemical reaction equation is provided below:



Hydroxyapatite, loose and soft water slag, can easily be eliminated through boiler blowdown, won't adhere to the inside face of the boiler or become scale afterwards.

#### • Process Summary

Phosphate injection packages, composed of solution tank, metering pump, electrical control cabinet, level gauge, safety valve, pulsation damper, all kinds of valves, pipes, etc., can be controlled locally and manually or automatically. Automatic control is realized based on frequency converter's reception of signals for flow rate, PH value, phosphate radical value, etc.



#### • Function Characteristics

Introduction to Automatic Control System  
Function: Under the state of automatic control, through signal processing of flow rate, PH value and phosphate radical value via PLC, host computer or DCS, the system can automatically adjust the rotation speed and the stroke of a metering pump, and it allows a metering pump flow adjustment range at 0~100%. The frequency control input signal of the frequency converter is a standard 4~2mA signal, same with the feedback signal. Under demand, all signals for metering pump and mixer state and fault can be transmitted to DCS or host computer, which can remotely start or stop the injection pump as required.

- According to different technical requirements, an electrical control cabinet can be controlled locally and manually, semi-automatically or automatically.

- A solution tank can be made of 316 or 304 stainless steel according to different anti-corrosion requirements.





► **Ammonia Injection Package**

● **Description**

Feed water ammonia injection packages, applicable to thermal system in thermal power plants, through tracing of change in thermal system water vapor quality, automatically inject ammonia solution into boiler system to regulate the PH value of boiler water, thus ensuring good quality of system water vapor and safe unit operation.

● **Process Summary**

Ammonia injection packages, composed of solution tank, metering pump, level gauge, safety valve, pulsation damper, all kinds of valves, pipes, electrical control cabinet, etc., can be controlled locally and manually or automatically. Automatic control is realized based on frequency converter's reception of signals of for flow rate, PH value, electrical conductivity, etc.

● **Function Characteristics**

Introduction to Automatic Control System  
Function: Under the mode of automatic control, through signal processing of flow rate, PH value and electrical conductivity via PLC, host computer or DCS, the system can automatically adjust the rotation speed and the stroke of a metering pump, and it allows a metering pump flow adjustment range at 0~100%. The speed control input signal of the frequency converter is a standard 4~2mA signal, same with the feedback signal. Under demand, all signals for metering pump and mixer state and fault can be transmitted to DCS or host computer, which can remotely start or stop the injection pump as required.

○ According to different technical requirements, an electrical control cabinet can be controlled locally and manually, semi-automatically or automatically.

○ A solution tank can be made of 316 or 304 stainless steel according to different anti-corrosion requirements.





## Hydrazine Injection Package

### Description

Feed water hydrazine injection packages, applicable to thermal system in thermal power plants, through tracing of change in thermal system water vapor quality, automatically inject hydrazine into water vapor system to ensure good quality of system water vapor and safe unit operation.

Dissolved oxygen in boiler water vapor system is a main factor causing thermal equipment corrosion and threatening safe boiler operation. Hydrazine injection into feed water is a chemical approach of furtherly intensified deoxidization after deaerator application. Dosing volume for hydrazine injection packages should be strictly controlled; if the volume is too small, deoxidization effect can't be ensured, thus enabling to prevent boiler corrosion or guarantee safe and economic operation of power plant; if the volume is too great, it results in unnecessary waste and environmental pollution. Under application of an automatic hydrazine injection package, hydrazine dosing volume can be automatically adjusted based on the actual boiler operation situation, maintaining hydrazine concentration in water within a best range.

### Process Summary

Hydrazine injection packages, composed of solution tank, mixer, metering pump, electrical control cabinet, level gauge, safety valve, pulsation damper, all kinds of valves, pipes, etc., can be controlled locally and manually or automatically. Automatic control is realized based on frequency converter's reception of signals for flow rate, oxygen content, turbidimeter, etc.

### Function Characteristics

Introduction to Automatic Control System Function: Under the state of automatic control, through signal processing of flow rate and turbidimeter via PLC, host computer or DCS, the system can automatically adjust the rotation speed and the stroke of a metering pump, and it allows a metering pump flow adjustment range at 0~100%. The speed control input signal of the frequency converter is a standard 4~2mA signal, same with the feedback signal. Under demand, all signals for metering pump and mixer state and fault can be transmitted to DCS or host computer, which can remotely start or stop the injection pump as required.

- According to different technical requirements, an electrical control cabinet can be controlled locally and manually, semi-automatically or automatically.
- A solution tank can be made of 316 or 304 stainless steel according to different anti-corrosion requirements.

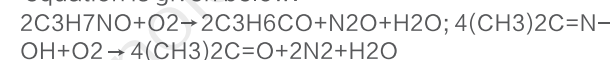


## Acetoxime Injection Package

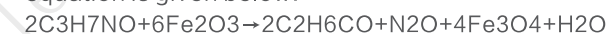
### Description

Acetoxime, mainly used as a chemical deoxidant for industrial boiler feed water, features low consumption, high deoxidization efficiency, non-toxicity and non-pollution compared with traditional chemical deoxidant for boiler, is the best chemical reagent for subcritical boiler shutdown protection and passivation, and also an ideal product replacing traditional chemical deoxidants like hydrazine, etc. in medium-high-pressure boiler feed water.

Acetoxime, with strong reducibility, can easily react with oxygen in water, thus lowering dissolved oxygen content in feed water and the reaction equation is given below:



At the same time, passivating reaction happens between acetoxime and metal, and the reaction equation is given below:



Acetoxime can lower iron content in feed water, preventing boiler metal tube damage due to overheating and corrosion caused by formation of iron oxide precipitate; at the same time, acetoxime can clean corrosion products of copper deposited in positions of pipeline, economizer, etc.; and that explains the reason why copper content in boiler water increases obviously at the beginning of acetoxime application.

Decomposition products of acetoxime (DMKO) are mainly ammonia and water accompanied by a little methanoic acid, acetic acid and nitrogen oxide; under deoxidization effect ensuring, when DMKO residual volume in feed water is controlled within 5~40 μg/L, methanoic acid (CH<sub>2</sub>O<sub>2</sub>), acetic acid

(CH<sub>3</sub>COOH), Cl<sup>-</sup> and SO<sub>4</sub> have not been found in all tested samples of water vapor, and NO<sub>2</sub> and NO<sub>3</sub> have not been found through testing of partial samples; therefore, acetoxime application for deoxidization has no bad influence on water vapor system.

### Process Summary

Acetoxime injection packages, composed of solution tank, metering pump, electrical control cabinet, level gauge, safety valve, pulsation damper, all kinds of valves, pipes, etc., can be controlled locally and manually or automatically. Automatic control is realized based on frequency converter's reception of signals for flow rate, oxygen content, turbidimeter, etc.

### Function Characteristics

Introduction to Automatic Control System Function: Under the state of automatic control, through signal processing of flow rate and turbidimeter via PLC, host computer or DCS, the system can automatically adjust the rotation speed and the stroke of a metering pump, and it allows a metering pump flow adjustment range at 0~100%. The speed control input signal of the frequency converter is a standard 4~2mA signal, same with the feedback signal. Under demand, all signals for metering pump and mixer state and fault can be transmitted to DCS or host computer, which can remotely start or stop the injection pump as required.

- According to different technical requirements, an electrical control cabinet can be controlled locally and manually, semi-automatically or automatically.
- A solution tank can be made of 316 or 304 stainless steel according to different anti-corrosion requirements.





# Circulating Water Injection Package

## Description

Circulating water injection packages, a kind of chemical injection equipment for water treatment based on a new concept, are widely applied to treatment systems of boiler water, raw water and waste water in industries such as thermal power generation, petroleum, chemical, etc. A package achieves functions of chemical dissolving, preparation, metering and injection with components including metering pump, mixer, solution tank, control system, pipes and valves, etc. installed on one base. According to purposes, circulating water injection packages can be divided into: PAC injection package, PAM injection package, scale inhibitor (corrosion inhibitor) injection package, germicide injection package, concentrated sulfuric acid injection package and sodium hypochlorite injection package.

## Process Summary

A circulating water injection package is composed of solution tank, mixer, metering pump, level gauge, safety valve, pressure gauge, pulsation damper, convactor, all kinds of valves, support base, stairway with handrail, circuit control part, a whole pipe system as well as accessories.

A circulating water injection package can be controlled locally and manually or automatically. Automatic control is realized based on frequency converter's reception of signals for flow rate, PH value, electrical conductivity, turbidity, etc.

## Function Characteristics

Introduction to Automatic Control System  
Function: Under the state of automatic control, through signal processing of flow rate, PH value, electrical conductivity and turbidity via PLC/host computer or DCS, the system can automatically adjust the rotation speed and the stroke of a metering pump, and it allows a metering pump flow adjustment range at 0~100%. The speed control input signal of the frequency converter is a standard 4~2mA signal, same with the feedback signal. Under demand, all signals for metering pump and mixer state and fault can be transmitted to DCS or host computer, which can remotely start or stop the injection pump as required.

- According to different technical requirements, an electrical control cabinet can be controlled locally and manually, semi-automatically or automatically.
- A solution tank can be made of carbon steel, 316 or 304 stainless steel, FRP, PE, etc. according to different anti-corrosion requirements.





# Sewage Treatment Injection Package

Types: Acid–base regulation package, disinfection package, Additive injection package, etc.

## Description

Sewage treatment injection packages, mainly designated for treatment of domestic sewage as well as similar organic industrial sewage, adopt the contact oxidation method as the principal treatment means, which is based on biochemical treatment technologies relatively mature currently. Water quality parameters are designed and calculated according to the water quality of general domestic sewage. A package is composed of chemical dissolving and preparation system, metering and injection system, safety system and control system. According to functions, sewage treatment injection packages can be divided into acid–base injection package, flocculant injection package and germicide injection packages.

Chemicals, added to a solution tank, dissolve in pure water automatically fed in proportion and then, the metering and injection system carries out injection of the solution prepared previously. Injection control can be either manual or automatic with control signal output from DCS system.



CHEMICAL INJECTION PACKAGE





# Injection Package for Petroleum and Petrochemical Industry

Types: Intelligence chemical injection package, pressurization Injection package, quantitative injection package, etc.

## Description

Injection packages for petroleum and petrochemical industry can concentratively or remotely receive real-time parameters of process media through online instrument testing, automatically regulate the ratio between chemical injection volume and process medium flow (the PPM value) according to those parameters, and receive feedback data of actual effect after chemical injection at the same time, thus achieving intelligence online closed-loop control of an optimum chemical injection volume with an

accuracy lower than  $\pm 1\%$ . Equipped with a high-precision flow recorder or weightless flow control system, the chemical injection accuracy of the packages can reach  $\pm 0.5 \sim 0.2\%$ , meeting production demands of high-precision chemical injection.

Injection packages for petroleum and petrochemical industry are basically divided into demulsifier injection package, corrosion inhibitor injection package, scale inhibitor injection package, desulfurizer injection package, antioxidant injection package, anti-static agent injection package, anti-wear agent injection package, polymerization inhibitor injection package, catalyst injection package, etc.





# Chemical Additive Injection Package for Oilfield and Gas Field

## Description

Chemical additive injection packages for oilfield and gas field are sorted into demulsifier injection package, corrosion inhibitor injection package, deoxidant injection package, germicide injection package, methanol ( $\text{CH}_3\text{OH}$ ) (ethanediol) ( $\text{CH}_2\text{OH}$ )<sub>2</sub> injection package, water and polymer injection package, etc.

An injection package is composed of solution tank, mixer, metering pump, level gauge, safety valve, pressure gauge, pulsation damper, convector, all kinds of valves, support base, stairway with handrail, circuit control part, a whole pipe system as well as accessories.

An injection package can be controlled locally and manually or automatically. Automatic control means output flow regulation of the injection pump

according to the injection volume indicated by the flowmeter at the injection port to meet system requirement. Under demand, all signals for injection pump and mixer state and fault can be transmitted to DCS or host computer, which can remotely start or stop the injection pump as required.

According to different technical requirements, an electrical control cabinet can be controlled locally and manually, semi-automatically or automatically.

According to different anti-corrosion requirements, a solution tank can be made of 316 or 304 stainless steel, carbon steel, carbon steel with rubber (plastic) lining, FRP, PE, etc.





# Chemical Injection Package for Offshore Platform

## Description

Features of injection packages: Modular design, compact structure, small size, convenient maintenance, good resistance of salt-spray corrosion, high-degree automation, capacity of unattended continuous running, self-diagnosis and alarm output. Under demand, all signals for metering pump and mixer state and fault can be transmitted to DCS or host computer, which can remotely start or stop the injection pump as required.



# Sealing Liquid Injection Package

## Description

Packages, specially designed for instrument flushing system and highly automated, can maximize instrument service life. System pressure regulation is under automatic control. Because instruments are precision apparatuses, pressure balancing system included in the packages should render a high precision and a stable discharge flow.





# Automatic Dissolving and Injection Package

## Dry Powder Injection Package

Automatic dissolving and injection packages are applicable to flocculation treatment for municipal or industrial wastewater, flocculation treatment during sludge dewatering process, drinking water purification as well as wastewater treatment in chemical, paper and metallurgy industry.

Automatic dry powder injection packages can automatically and continuously prepare liquid media in different concentrations with all kinds of dry powder and granular chemicals, which are then accurately injected into process system by a metering pump. The whole process is under automatic control.

Adoption of a scientific and reasonable servo mechanism and a unique powder transport system avoids powder heating, caking or sticking, thus securing a high injection precision.

An automatic dissolving and injection package, composed of PLC automatic control system, dry powder storage system, dry power accurate injection device, moisture-proof heater and stainless-steel mixer, can randomly prepare solutions in different concentrations due to application of high-quality imported core parts and an accurate adjustable feeding way. Besides, it includes functions of self-diagnosis and alarm output, and shows excellent performance of corrosion resistance.





# Water Steam Sampling Device

## Description

Water steam concentrated sampling devices, applicable to steam quality supervision in power plants, ensure water and steam quality up to standards, and prevent device corrosion and scaling; so, they play an extremely important role in safe and economic operation of generator sets. According to different sampling modes, the devices are sorted into manual sampling devices and automatic online sampling devices; automatic sampling signals can be output to host computer or automatic injection system.

Water steam concentrated sampling devices can be sorted into manual sampling devices and automatic online sampling devices; an automatic online sampling device is composed of high-temperature high-pressure frame, low-temperature instrument board and microcomputer processing system. High-temperature frame includes precoolers, sample water cooler, relief valve, etc. and low-temperature instrument board includes thermostat, manual sampling device, chemical analysis instrument, etc.

Features: Integrated automation design; stainless steel modular structure with simplicity and taste; high precision and stability; easy operation and maintenance.



CHEMICAL INJECTION PACKAGE

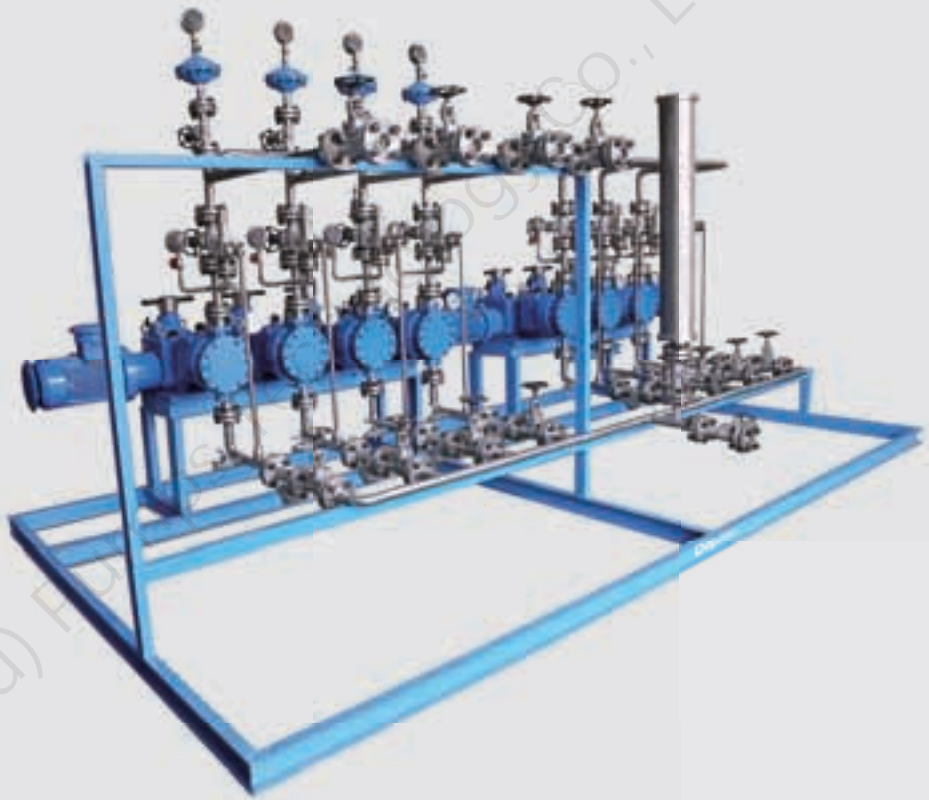




# Metering Pump Skid

## Description

Modular design of skid can meet customer process requirements to the utmost extent or under demand of customer process, metering pump as well as its accessories and pipes can be combined reasonably and installed standardly to render a more beautiful outlook, a more appropriate structure as well as more rapid and convenient using.





Metering Pump



Electromagnetic Diaphragm Metering Pump



Mechanical Diaphragm Metering Pump



Pneumatic Diaphragm Pump



Mechanical Diaphragm Metering Pump



Mechanical Diaphragm Metering Pump



Plunger Metering Pump



Hydraulic Diaphragm Metering Pump



Hydraulic Double-diaphragm Metering Pump



Hydraulic Diaphragm Metering Pump



Double-head Hydraulic Diaphragm Metering Pump



Three-head Hydraulic Diaphragm Metering Pump



Heat Insulation Metering Pump



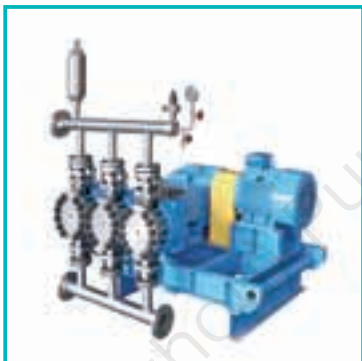
Intelligence Electric Metering Pump



Three-plunger Reciprocating Pump



High-pressure Reciprocating Pump



High-pressure Process Diaphragm Pump



High-pressure Process Diaphragm Pump



Star-type Reciprocating Pump



## Accessories for Chemical Injection Packages

### Mixer

A mixer is composed of motor, reducer, frame, coupler, mixing shaft and mixing impeller. The complete machine features a small size, a light weight, energy conservation, environmental protection, flexible installation, easy operation, a high efficiency, low noise and stable running. All types of mixers can be designed based on customer demands (such as requirement in aspects of motor power, mixer rotation speed, frame type, mixing shaft size, etc.).

### Electromagnetic Flowmeter

An electromagnetic flowmeter, an induction instrument measuring the volume and the flow of conducting media inside pipeline according to Faraday's law of electromagnetic induction, adopts microcontroller and embedded technology achieving digital excitation as well as CAN field bus technology. An electromagnetic flowmeter, in addition to the function of local display, can output 4~20mA current signals for record, regulation and control. Measurement accuracy of an electromagnetic flowmeter isn't influenced by any change in liquid density, viscosity, temperature, pressure or electrical conductivity, and signals for transducer induced voltage have linear relationship with the average flow rate. With high measurement precision and a wide measurement range (usually, 20:1~50:1), electromagnetic flowmeters can be applied to accurate measurement of corrosive liquids.

### Magnetic Level Indicator

Function of Level Gauge: A type of device measuring or displaying liquid level height. Generally, level gauges are sorted into local type and remote type. Common local-type level gauges include magnetic level indicator (output of 4~20mA standard signal+Hart protocol or switch quantity signal), glass plate level gauge and glass tube level gauge; and common remote-type level gauges include ultrasonic level gauge, radar level gauge, etc.

### Pulsation Damper

- Function: A pulsation damper can instantly absorb pulses to achieve a stable flow rate and pressure, and can smooth 90~95% pulses.
- Pulsation Damper Types: Bladder type, diaphragm type, gas-liquid contact type and bellows type.
- Bladder Type Casing Material: Stainless steel and carbon steel; bladder material: nitrile butadiene rubber (NBR), isobutylene isoprene rubber (IIR), fluororubber, ethylene propylene diene monomer (EPDM), neoprene, etc.
- Diaphragm Type Casing Material: Stainless steel, carbon steel, PVC and PEFE lining; diaphragm material: PTFE+rubber (double-layer).
- Gas-liquid Contact Type material: Stainless steel and carbon steel.
- Bellows Type Material: Stainless steel.

### Flow Calibration Pot and Methanol Injection Flow Calibration Pot

- A calibration pot is used for accurate calibration of metering pump working flow.
- Specifications: 100ml, 500ml, 1000ml, 1500ml, 2000ml, 4000ml.
- Material of Graduated Tube: PVC and organic glass.

### Back Pressure Valve

Function: A type of device raising pipeline pressure. When the pressure at the injection point is lower than the inlet pressure of the metering pump, a back pressure valve must be installed at the metering pump outlet to reduce overflow transport caused by siphonage and gravity flow, thus securing no influence on metering pump accuracy.

Material: PVC, PVDF, 304 or 316 stainless steel, etc.

### Safety Valve

Function: A type of safety protection device against pressure overload, normally closed, and automatically open when the rising pressure of the media in the equipment or the pipes exceeds the specified value, avoiding the pressure of the media in the equipment or the pipes beyond the specified pressure value through media discharge from the system.

- Material: PVC, PVDF, 304 or 316 stainless steel.

### Filter

Function: Installed on the inlet pipe of a metering pump, a filter is used for filtration of impurities and large particles, thus ensuring normal operation of the metering pump. Common filters are Y-type and basket-type filters.

- Material of a Y-type Filter: Stainless steel, carbon steel, PVC, PP, etc.
- Material of a Basket-type Filter: Stainless steel, PVC, PP, etc.

### Stop Valve

The opening and closing member of a stop valve is a plug-type valve flap with a horizontal or conical sealing surface in rectilinear motion along the fluid center line. And a stop valve features a simple structure, a short working stroke, opening and closing in a short time, good tightness, low friction on the sealing surface and a relatively long service life.

### Ball Valve

A ball valve has a sphere with a circular channel as its opening and closing member, which rotates with the valve stem to realize valve opening and closing. A ball valve mainly features an impact structure, easy operation and repairing. It is applicable to not only general working media like water, solvent, acid, natural gas, etc. but also media with harsh operation conditions like oxygen (O<sub>2</sub>), hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), methane (CH<sub>4</sub>), ethylene (C<sub>2</sub>H<sub>4</sub>), etc.

### Check Valve

A check valve, a type of automatic valve, realizes automatic opening and closing of the valve flap with the force of media flow, avoiding reverse flow of the media. According to structure, check valves can be divided into lift check valves, swing check valves, butterfly check valves, piping check valves, slow-close check valves and diaphragm check valves. They should be applied to pipelines requiring prevention against reverse flow of media.



► **Global Service System**

● **Integrated Service**

- Pipeline and Damper Design with Computer Aid
- Vibration Analysis
- Medium Assessment
- Site Commissioning
- System Testing
- Service and Repairing Contract
- Global Service
- Diagnosis of Change in Operation Conditions
- Extension and Modification of Running Pump and System

● **Consulting and Engineering with Special Requirements**

Depamu products are widely applied all over the world, which brings lots of experience where the company can learn and benefit. As a supplier of schemes and systems for liquid transportation, metering and mixed application, we can provide personalized solutions from the smallest independent unit to the biggest multi-link pump installation; at the same time, we can provide process engineering consulting for complex processes as well as schemes meeting the needs of special processes.

- Fluid Evaluation
- Independent Design Concept
- Cost Calculation for Installation Project
- Commissioning and Service
- Seminars and Site Training

● **Sales Network**

The professional engineering service teams of the company can provide customers with whole-process quality and efficient service. Depamu can quickly meet demands of multi-level customers in multiple fields through initiative construction of an efficient and unified global sales service network, advocating of a global localization sales mode and implementation of brand management. Due to supply of value-added service, the company is highly praised by its customers.

● **Customer Orientation**

The company has built a global service network offering pre-sales and after-sales service based on the business concept taking it as a duty to meet customer demands.

● **Extensible System Solution**

- Pump Instrumentation
- VFD Flow Adjustment
- System-oriented Operation Interface
- Electronic Control of Offline System Checkout

