川崎重工业株式会社

精密机械公司

东京总公司
〒105-8315 东京都港区海岸1丁目14-5
电话:03-3435-6862 传真:03-3435-2023

神户总公司
〒650-8680 神户市中央区东川崎町1丁目1-3 (神户水晶塔)
电话:078-360-8605 传真:078-360-8609

西神户工厂
〒651-2239 神户市西区炉谷町松本234番地
电话:078-991-1133 传真:078-991-3186

福冈营业所
〒812-0011 福冈市博多区博多站前1丁目4-1 (博多站前第一生命大厦9楼)
电话:092-432-9561 传真:092-432-9566

东京服务中心
〒272-0015 千叶县市川市鬼高4丁目9-2
电话:047-379-8181 传真:047-379-8186

今治服务中心
〒794-0028 爱媛县今治市北宝来町1丁目5-3 (Gibraltar生命、川崎商事内)
电话: 0898-22-2531 传真:0898-22-2183

福冈服务中心
〒811-0112 福冈县粕屋郡新宫町下府2丁目10-17
电话:092-963-0452 传真:092-963-2755

http://www.khi.co.jp/kpm/

Kawasaki Heavy Industries, Ltd.

Precision Machinery Company
http://www.khi.co.jp/kpm/

Tokyo Head Office
1-14-5 Kaigan, Minato-ku, Tokyo 105-8315, Japan
Phone +81-3-3435-6862 Fax. +81-3-3435-2023

Kobe Head Office
Kobe Crystal Tower, 1-3 Higashikawasaki-cho 1-chome, Chuo-ku, Kobe 650-8680, Japan
Phone +81-78-360-8607 Fax. +81-78-360-8609

Nishi-kobe Works
234, Matsumoto, Hasetani-cho, Nishi-ku, Kobe 651-2239, Japan
Phone +81-78-991-1160 Fax. +81-78-991-3186

OVERSEAS SUBSIDIARIES

Kawasaki Precision Machinery (UK) Ltd.
Ernesettle Lane, Ernesettle, Plymouth, Devon, PL5 2SA United Kingdom
Phone +44-1752-364394 Fax. +44-1752-364816
http://www.kpm-eu.com

Kawasaki Precision Machinery (U.S.A.), Inc.
3838 Broadmoor Avenue S.E. Grand Rapids, Michigan 49512, U.S.A.
Phone +1-616-975-3100 Fax. +1-616-975-3103
http://www.kpm-usa.com

Kawasaki Precision Machinery (Suzhou) Ltd.
668 JianLin Rd, New District, Suzhou, 215151 China
Phone +86-512-6616-0365 Fax. +86-512-6616-0366

Kawasaki Precision Machinery Trading (Shanghai) Co., Ltd.
17th Floor (Room 1701), The Headquarters Building, No168, XiZang Road (M), Huangpu District, Shanghai, 200001, China
Phone +86-021-3366-3800 Fax. +86-021-3366-3808

Kawasaki Chunhui Precision Machinery (Zhejiang) Ltd.
No.200 Yasha Road Shangyu Economic Development Zone, Shansyu, Zhejiang, 312300, China
Phone +86-575-8215-6999 Fax. +86-575-8215-8699

Flutek, Ltd.
98 GIL 6, Gongdan-Ro, Seongsan-Ku, Changwon-Si, Kyungnam,641-370, Korea
Phone +82-55-210-5900 Fax. +82-55-286-5557

Wipro Kawasaki Precision Machinery Private Limited
No. 15, Sy. No. 35 & 37, Kumbalgodu Industrial Area, Kumbalgodu Village, Kengeri Hobli, Bangalore, – 560074 ,India

Cat. No. KPM1512 Jun. '15Ⓢ
Printed in Japan

Kawasaki
Powering your potential

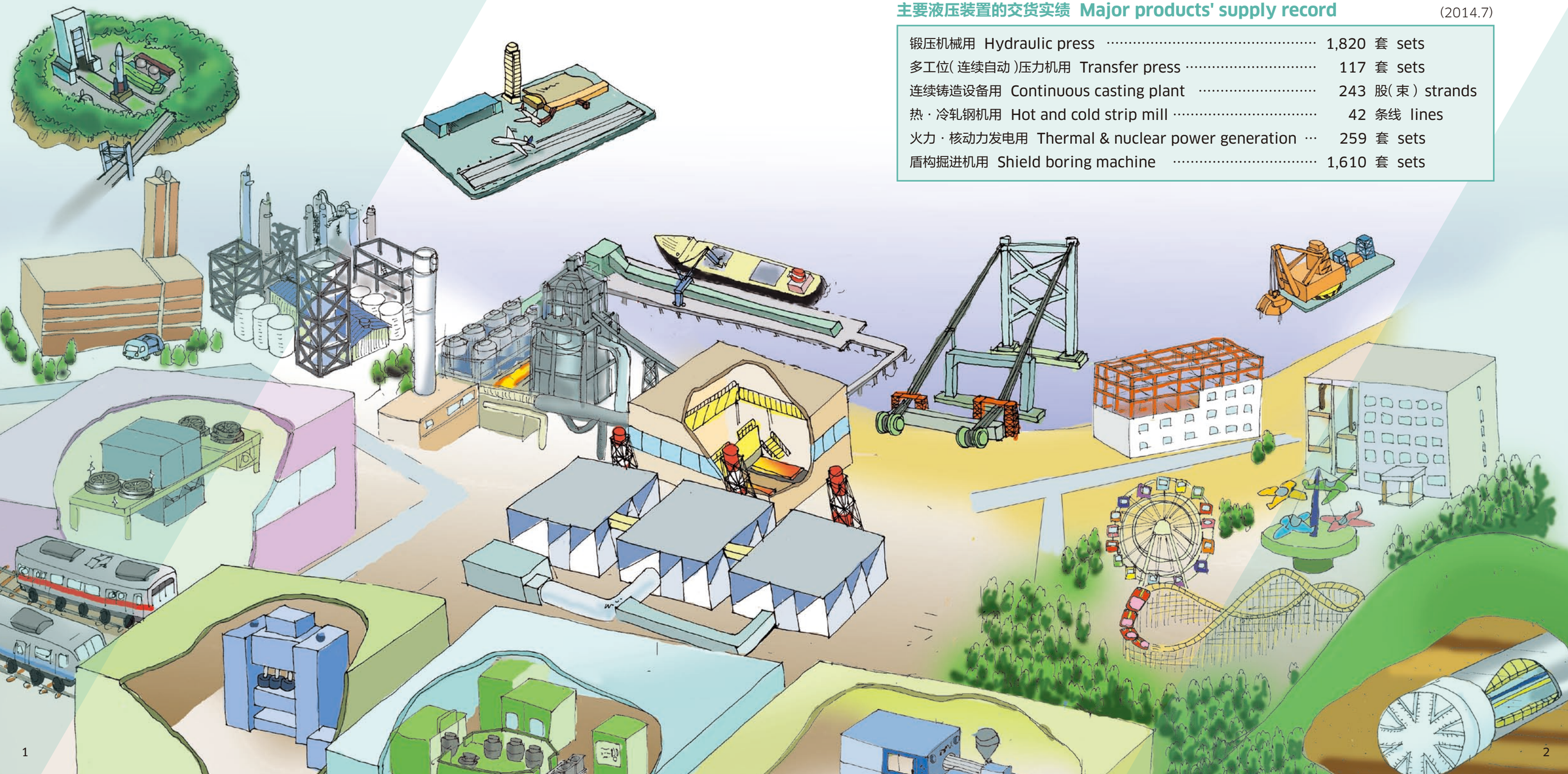
精密机械公司

产业机械用
液压装置

Hydraulic Systems for Industrial Use

面对追求动力和自动化的各种产业机械，
川崎以精确的精度和高度的控制技术作出回应。

Kawasaki responds to your power and automation requirements for Industrial Machines with precision, utilizing advanced control technology.



川崎重工作为一个向陆・海・空提供丰富多彩产品群的综合性工程企业，拥有充实的智囊团。在此得天独厚的环境下、我们的“液压”技术历经90多年的历史。

在此期间、为追求“力”的各式各样机械，和追求“自动化”的各种各样装置提供了可靠性・耐久性超群的丰富多彩的液压元件，并达到了高度的控制技术。

今后将不断技术革新、努力实现产品的多样化和提高可靠性。

Kawasaki is a total systems engineering company which applies hydraulic products to provide complete engineered solution on land, sea and air.
With 90 years experience in hydraulic technology we have produced world beating hydraulic components offering advanced control, durability and reliability to provide the power and automation required in today's Industrial Machines.
For the future Kawasaki is looking to build on its success, always looking to provide increased innovation, diversification and continual improvements in service, reliability and efficiency.

主要液压装置的交货实绩 Major products' supply record

(2014.7)

锻压机械用 Hydraulic press	1,820	套 sets
多工位(连续自动)压力机用 Transfer press	117	套 sets
连续铸造设备用 Continuous casting plant	243	股(束) strands
热・冷轧钢机用 Hot and cold strip mill	42	条线 lines
火力・核动力发电用 Thermal & nuclear power generation	259	套 sets
盾构掘进机用 Shield boring machine	1,610	套 sets

液压技术的智囊团
Hydraulic Technology Think Tank

将川崎重工集团广泛的事业部门・研究开发部门所拥有的技术、专有技术及高度的液压技术相融合，提供最先进的液压系统。

By gathering the experience of Kawasaki group including extensive research and development facilities, a wealth of knowledge has accumulated enabling the development of outstanding hydraulic technology, Kawasaki is a leading total systems engineering company.

广阔的事业领域 Total Technology

川崎重工集团作为一个向陆・海・空提供丰富多彩产品的“技术型企业”，拥有丰富的经营资源。

As a technology company that provides diverse products for use on land, at sea and in the air,we seek to apply our abundance of management resources to continue our development as an excellent company and promote the Kawasaki brand globally.

充实的研究开发体制 Research & Development

先进・尖端化的技术、基础・要素技术的研究开发由川崎重工的研究开发部门为中心负责进行，在应用・开发阶段，与各集团企业成为一体，齐心协力推动其发展等等，建立起充分灵活运用集团的综合力量的研究开发体制。

The head office R&D division of kawasaki Heavy Industries, LTD. is in charge of research involving advanced technology as well as basic technologies, which Kawasaki group cooperate to apply and promote.
Kawasaki is bolstering its R&D system to make full use of the Company's technologies.

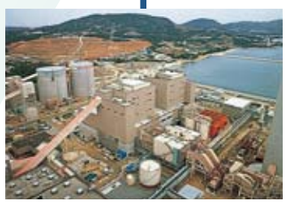
- 机械设备的专有技术 Know-how of machinery and plants
- 液压元件的专有技术 Know-how of hydraulic machinery
- 材料、表面处理相关的专有技术 Know-how of material and surface treatment
- 综合控制系统的专有技术 Know-how of total control technology
- 机械力学的技术措施 Know-how of mechanical engineering
- 流体力学的技术措施 Know-how of hydro-dynamics
- 工作油相关的专有技术 Know-how of hydraulic fluid
- 计算机的适应能力 Technical ability of computer

川崎重工业株式会社 精密机械公司
Kawasaki Heavy Industries, Ltd. Precision Machinery Company

一般产业用液压装置
Hydraulic equipment for industrial machinery

工程机械用液压装置
Hydraulic equipment for construction machinery

炼铁用液压装置
Hydraulic equipment for steel making plant



电力用液压装置
Hydraulic equipment for electric power plant

船舶用液压装置
Hydraulic marine machinery

产业机械用液压装置的历程
History of Hydraulic Equipment for Industrial Use

1964年以从事盾构掘进机用液压装置为开端，开发出了适合压力机械、制铁机械、成形机械、挖掘机械等使用的各种产业机械用液压装置。并且，伴随着这些产业机械的高度化，液压控制技术、工作油及其污染管理技术等同样也得到了研究开发。

Our first product was a hydraulic system unit for a "Shield Boring Machine" developed in 1964. Subsequently we have been developing many kinds of hydraulic units in accordance with varying market needs, producing products for Press machines Steel manufacture, Moulding Machines, Excavators and so on.
Kawasaki continue to promote the research and development of hydraulic technology to increase control and efficiency and to adapt to a variety of working fluids, and improvements in contamination tolerance.

■液压控制技术 Technology for Hydraulic Control

1969	确立连续铸造设备、泥枪、盾构掘进机、液压机等控制技术 Control technology for continuous casting plant, mud guns, shield boring machines, and hydraulic presses
1975	确立钢液水平控制技术 Control technology for level control system in casting molds
1976	完成逻辑系统 确立液压机数字控制技术 Logic control system Digital control technology for presses
1978	确立管式测试器压力控制技术 确立轧辊压力・位置控制技术 Pressure control technology for pipe testers Pressure and displacement control technology for Rolling mills
1980	确立UO压力机压力控制技术 Pressure control technology for UO presses
1981	确立转炉、连续铸造设备ITV控制技术 完成大鸣门桥缆绳架设控制装置 Control technology using ITV for CCP and Converters Control equipment for cable wiring machine for the Ohnaruto Bridge
1984	确立多工位(连续自动)压力机用NC模具缓冲机构控制技术 Control technology of transfer presses
1987	确立超高压196.2/392.4MPa (2,000/4,000kgf/cm²) 系统 Super high pressure 196.2/392.4 MPa (2,000/4,000 kgf/cm²) systems
1989	确立试验机用精密压力控制技术 Precise pressure control system 49±0.1 MPa (500±1 kgf/cm²)
1992	确立扇形片自动装配控制技术 Automatic segment erection system
1995	完成通用型伺服控制器KIDS-10 Kawasaki intelligent digital system
1999	完成伺服逻辑系统 Servo logic control system
2000	电−液混合系统「川崎环保型伺服」 Electro-Hydraulic hybrid system “KAWASAKI ECO SERVO”
2002	确立连铸设备用的锭摸振动液压控制技术 Control technology for Mold oscillation
2008	完成液压泵专用节能变频系统「KISS」 Kawasaki Inverter System “KISS”

■工作油、配管技术 Technology for Hydraulic Fluids and Piping

1971	水−乙二醇13.7 MPa (140kgf/cm²) 评价试验 确立黑染排管技术 Water-glycol evaluation test at 13.7 MPa (140 kgf/cm²) Piping technology of black-oxide coating
1972	确立有关磷酸酯的技术 Technology for phosphate-ester
1974	多元醇聚脂肪酸酯20.6 MPa (210kgf/cm²) 评价试验 Polyol-ester evaluation test at 20.6 MPa (210 kgf/cm²)
1976	水−乙二醇20.6 MPa (210kgf/cm²) 评价试验 Water-glycol evaluation test at 20.6 MPa (210 kgf/cm²)
1979	水−乙二醇24.5 MPa (250kgf/cm²) 评价试验 Water-glycol evaluation test at 24.5 MPa (250kgf/cm²)
1982	多元醇聚脂肪酸酯39.2 MPa (400kgf/cm²) 评价试验 Polyol-ester evaluation test at 39.2 MPa (400 kgf/cm²)
1983	水−乙二醇30.9 MPa (315kgf/cm²) 评价试验 Water-glycol evaluation test at 30.9 MPa (315 kgf/cm²)
1992	导入3-D排管CAD系统 3-D CAD piping designing system
1993	W/O乳化液20.6 MPa (210kgf/cm²) 评价试验 W/O emulsion evaluation test at 20.6 MPa (210 kgf/cm²)

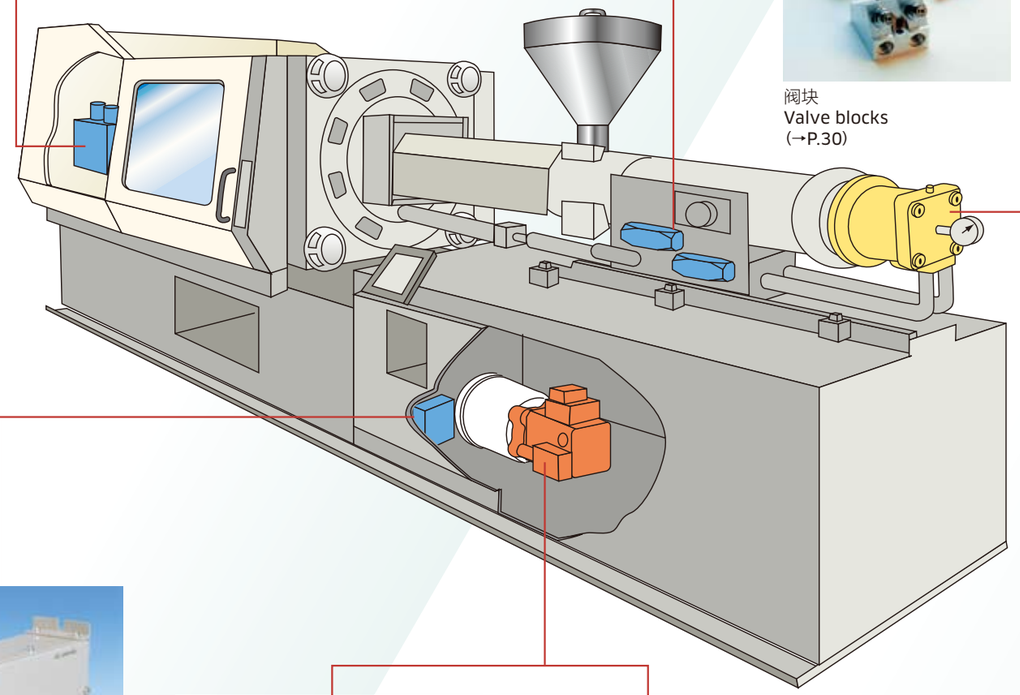
塑料加工机械
Plastics Molding Machine

代表塑料加工机械的是注塑成型机，该机械的关键在于如何控制注塑和合模油缸的速度和压力为要点。使用最新的数字控制技术的泵系统「ILIS」、电-液混合系统「川崎环境友好型伺服」，可使注塑成型机的性能有飞跃性的提高。

并且、在挤压成形机上，本公司的精密齿轮泵（参照P.15）对挤压成形机质量的提高作出了贡献。

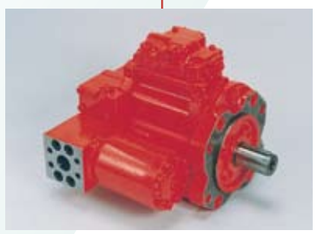
The injection molding machine is one of the main representative plastics molding machines. The Key issue with this machine is how to control the speed and pressure of the injection cylinder. The KAWASAKI ECO SERVO (Electro-Hydraulic Hybrid System), that controls the flow and pressure with electrical control signals only, has greatly improved the performance of injection moulding machines.
Our series of precision gear pumps (cf. P15) are also widely used for extrusion molding.

通用控制阀
Control valves
(→P.29)

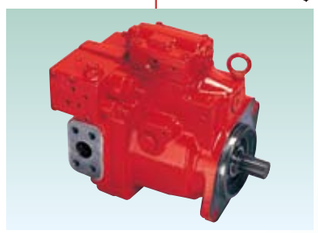


阀块
Valve blocks
(→P.30)

伺服控制器
Servo controller
ILIS (→P.34)



斜盘式轴向柱塞泵
Swash plate type axial piston pump
K3VG series (→P.23)



斜盘式轴向柱塞泵
Swash plate type axial piston pump
K3VL series (→P.24)

【可塑化·计量用马达 Motors】

斜盘式轴向柱塞马达
Swash plate type axial piston motor
M3XA series (→P.27)

低速、大扭矩径向柱塞马达
Low-speed, high-torque
radial piston motor
HMKB/HMKC(SB) series
(→P.28)

系统技术 System Technology

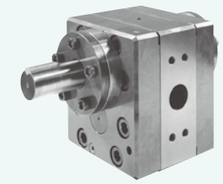
电-液混合系统
Electro-Hydraulic hybrid system
川崎环保型伺服
KAWASAKI ECO SERVO (→P.41)

电-液伺服调节器
Electro-Hydraulic servo regulator
ILIS (→P.34、P.44)

逻辑系统
Logic system (→P.37)

大流量伺服逻辑系统
Large flow servo logic system

精密齿轮泵
Precision gear pump (→P.15)



适用事例 Applications

挤压成形机
Extrusion molding machine

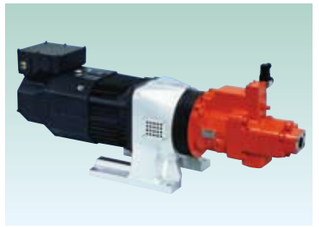
吹塑成型机
Blow molding machine

锻压机械
Press Machine

这是要求大输出且高速化锻造机械用的高压、大流量液压系统。为提高产品的质量，要求高精度的加压油缸的速度・位置・压力控制的深拉深压力机和压型机用的液压系统。

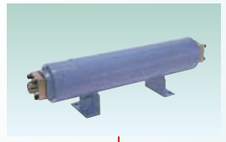
由本公司于1965年在我国首次对液压机导入电−液伺服系统以来，历经控制技术、降低冲击技术、低噪音技术等的研究开发，提供了高压・大流量且静音的高可靠性液压系统・元件，在该领域内作出了卓有成效的实绩。

Our hydraulic system is also used for forging and deep drawing pressure which require high pressure, high capacity and high speed operation. We also provide extremely accurate speed and position control systems for cylinders used in Fibre reinforced plastic presses, a necessity for producing high quality product.
We are continually developing and researching power and motion technology to include shock and noise reduction and the provision of reliable hydraulic systems and components for applications which require high pressure and capacity.

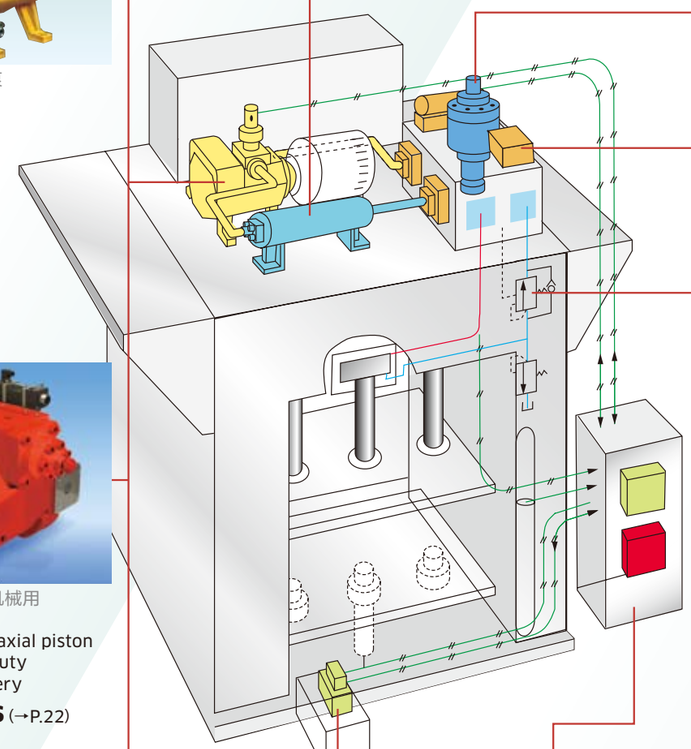


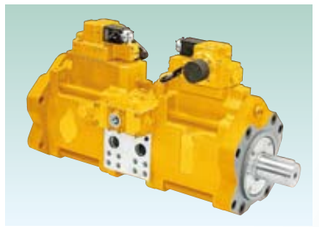
节能・静音・高精度控制泵
电−液混合系统
Electro-Hydraulic hybrid system
川崎环保型伺服
KAWASAKI ECO SERVO
(→P.41)

高压・高精度控制泵
电−液伺服调节器
Electro-hydraulic servo regulator
LZ-ROTAS
(→P.43)



低噪音・低振动机器
脉冲阻尼器
Pulse Dampers
(→P.40)





高压・低脉动・高精度控制泵
带电−液控制调节器
斜盘式柱塞泵
Swash-plate type axial piston pump with electro-hydraulic control regulator
K3VG/K7VG ILIS (→P.44)

高压・大排量・重载机械用
斜盘式轴向柱塞泵
Swash plate type axial piston pump for heavy duty industrial machinery
K7VG series (→P.22)

低噪音泵组
Low noise pump unit
K3PU series (→P.39)

低噪音・低脉动泵
螺杆泵
Screw pumps (→P.25)

高精度控制装置
NC缓冲器用液压装置
Numerical control cushion

高精度控制装置
液压机用
伺服控制器
Servo controller for hydraulic press (→P.43)

大流量高精度控制
伺服逻辑阀
Servo-logic valves
SLV series (→P.31)

降低冲击用液压阀
逻辑阀
Logic valves (→P.38)

控制自重下降
KDZ平衡阀
Counterbalance valves
KDZ series (→P.32)

通用阀
Control valves (→P.29)

高性能插装式阀
SUN插装式阀
SUN cartridge valves (→P.30)

系统技术
System Technology

伺服逻辑阀站
Servo-logic valve unit

适用事例 Applications

自由高速热锻机
Forging press

挤压机
Extrusion press

1,000t压力机
1,000t press

SMC压型机
SMC formingpress

弯边机（弯板机）
Press brake

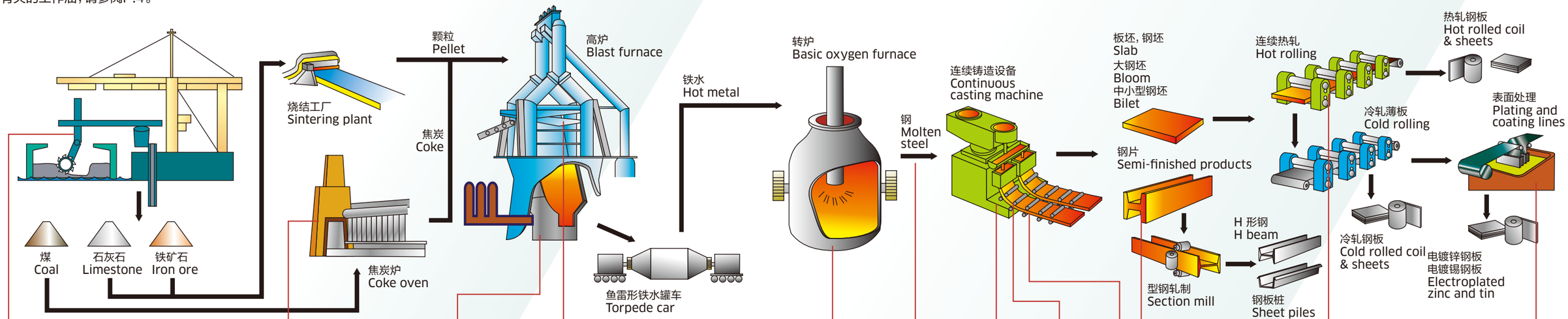
炼铁机械
Steel Making Plants

在支撑了产业的基础同时带来了高度的繁荣、向全世界展示了日本的钢铁工业。靠的是创造出强劲动力「液压」和对其精确操作「控制」的相结合。

为稳定作业、炼铁机械用的液压元件・装置可靠性要高，为此须使用诸如高压・大流量控制、电液伺服控制等的系统技术，并为低成本制造出更好品质的产品贡献了高精度化、省力化、节能化。

※有关的工作油，请参阅P.4。

Japanese steel making technology has been exported world-wide and Kawasaki has applied the technology to achieve both the huge power output and the sensitive control required in these applications.
Kawasaki has also made significant contributions to energy and cost savings as well as offering improvements in system design and control to enable the stable and productive operation of these steel plant.
Refer to page 4 for hydraulic fluids.



卸料机 Unloader | 堆积机 Stacker | 回收装置 Reclaimer

焦炭台车 Coke guide car

泥枪 Mud gun

出钢口机 Taphole opener

炉顶装入装置 Top-charging equipment
- 装甲，铠装 Armor
- 气体取样器 Gas sampler
- 放出阀 Bleeder valve

脱气设备 Degassing equipment

浇注包升降 Ladle lifting

扁坯剪切机 Slab shear

轧制设备/液压压下 Steel mill equipment Reduction stand
- 卷绕机 Coiler
- 卷材输送机 Coil conveyer
- 表皮光轧机 Skin-pass rolling mill
- 线材绑轧机 Wire-rod binder

连续电镀设备 Continuous galvanizing equipment
- 连续酸洗设备 Continuous pickling equipment
- 连续退火设备 Continuous annealing equipment

外罩升降 Skirt lifting device
- 紧急返回 Emergency return
- 气阀 Gas valve

铸模振动 Mold oscilation
- 漏斗车 Tundish car
- 钢液水平控制 Mold level control

连续铸造设备 Continuous caster
- 夹紧棍压力控制装置 Pinchroll pressure control equipment
- 轻压下控制装置 Soft-reduction control equipment

本公司液压的适用对象设备
Hydraulic System Applications

顾客需求的对应
Solution to Customers' Needs

- 产品的高度化 Advanced products
- 高精度控制 Accurate control
- 节省人力 Labor saving
- 自动化 Automation
- 紧凑化 Miniaturization
- 高压化 Higher pressure
- 安定作业 Stable operation
- 提高可靠性 Higher reliability
- 节省能源 Energy saving
- 电-液混合系统（川崎环境友好型伺服） Hybrid system

电子液压控制 Electro-hydraulic control
- 软件伺服控制 Software servo control
- 数字控制 Digital control
- 模拟检验 Computer simulation

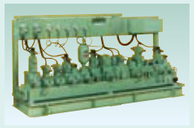
无管道阀试验台 Pipeless valve stands
- 长寿型泵 (LZV・K7VG) Long-life pumps (LZV・K7VG)
- 低脉动泵 (B4・B6・K3VG) Reduced pressure pulsation pumps
- 高压规格阀 High-pressure valves

电子液压控制系统实例
Electro-hydraulic control system applications

电-液混合系统
Electro-Hydraulic hybrid system
川崎环境友好型伺服
KAWASAKI ECO SERVO
(→P.41)

SUN插装式阀
SUN cartridge valves
(→P.30)

通用阀
Control valves
(→P.29)



阀站
Valve stand
(→P.35)

螺杆泵
Screw pump
(→P.25)

斜盘式轴向柱塞泵
Swash plate type axial piston pump
K3VG series
(→P.23)

K7VG series
(→P.22)

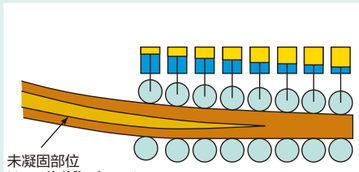
斜轴式轴向柱塞泵
Bent axis type axial piston pump
LZV series
(→P.21)

连续铸造设备轻压下系统
Soft reduction system for continuous casting plant

因铸片的中心部位容易产生中心偏析，所以压下该未凝固部位的“轻压下”技术得到开发。在这方面，就要求具有在苛刻条件下将多数的油缸控制在0.1mm指令的精度这样一种液压技术。

During continuous casting processes segregation is liable to occur inside the center of the slab. In "soft reduction" technology, accurately position-controlled cylinders press down this unsolidfied part to within 0.1 mm.

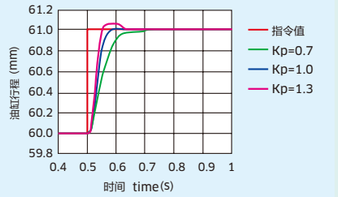
●以高精度控制的连续铸造轻压下的油缸
Hydraulic cylinders in "Soft Reduction" continuous caster



利用内置位置检测器的油缸与伺服阀，进行位置的反馈控制。
A cylinder with an integrated position-sensor and a servo valve compose a position-feedback control loop with high accuracy.

轧制设备压下控制
Roll force control of rolling mill

液压控制系统模拟
Hydraulic system simulation



发电设备
System for Power plant

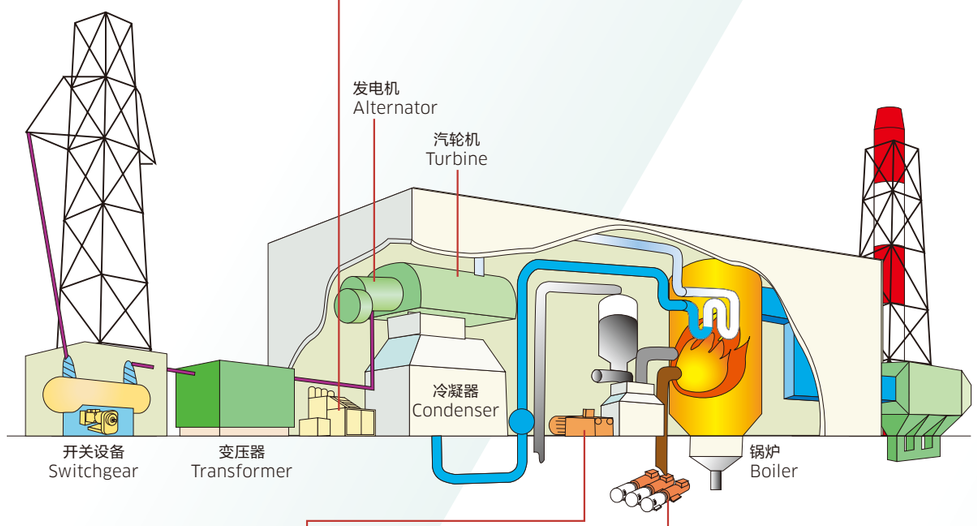
火力・核动力发电用设备，本公司提供了伺服用液压源装置EHC (Electro-Hydraulic Controller) 约200基、水力发电用液压装置也创造了许多实绩。并且，锅炉用的重油移送・喷燃的螺杆泵、用于煤粉碎 (辊碎机)、用于高压电压断路机等，本公司的液压元件・装置活跃在广泛领域。

Kawasaki have provided in approximately 200 hydraulic power units of EHC (Electro-Hydraulic Control) for Thermal or Nuclear power plants and many units for Hydro-electric power plants.
In addition we also apply hydraulic systems such as screw pumps for the transfer and service of heavy oil delivered to boilers and burners. As well as Hydraulic systems for roller mills for pulverizing coal, actuators for high voltage circuit breakers and so on.

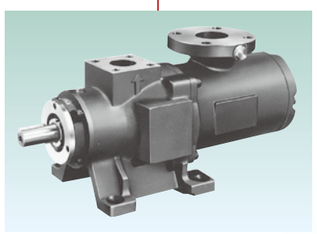
EHC (调速器用高压控制液发生装置)
Hydraulic power unit for
Electro-Hydraulic Controller
(→P.36)

斜轴式轴向柱塞泵
Bent axis type axial piston pump
LZ series (→P.21)

燃气轮机用燃料控制阀
Fuel control valve



辊碎机用液压装置
Oil hydraulic unit for roller mill



重油喷燃用螺杆泵
Fuel oil burning pump
4X series (→P.25)

环境装置
Environmental Protection System

收集垃圾的收集车、挑选机、金属冲床、粗大垃圾粉碎机、旋转筛等，各种各样的机器被用于各个工序，本公司的高压用液压元件，因是紧凑型的机械却输出大功率，所以多用于冲压作业、破碎作业的马达和油缸的驱动源。

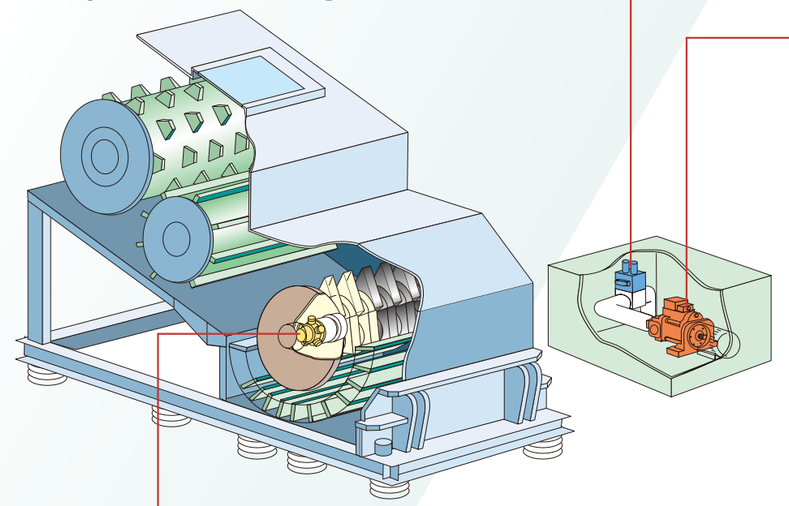
Various machines are used for refuse collection, separation, shredding and screening and scrap pressing. Kawasaki hydraulic components offer a high pressure capability ideally suited to these applications providing reliable, high power output while maintaining compact and strong designs.

SUN插装式阀
SUN cartridge valves
(→P.30)

通用阀
Control valves
(→P.29)

逻辑阀
Logic valves
(→P.38)

粗大垃圾用旋转式破碎机
Rotary crusher for Large waste



斜轴式轴向柱塞泵
Bent axis type axial piston pump
LZ series (→P.21)

斜盘式轴向柱塞泵
Swash plate type axial piston pump
K3VL series (→P.24)

斜盘式轴向柱塞泵
Swash plate type axial piston pump
K3VG series (→P.23)

低速、大扭矩径向柱塞马达
Low-speed, high-torque
radial piston motor
HMKB series (→P.28)

适用事例 Applications

多用切削机
Multi cutter

2轴式破碎机
Biaxial shredder

隧道挖掘机
Tunnel Boring Machine

本公司的液压系统被使用于追求强大的“动力”和可靠的“控制”的各种土木机械。在此介绍的是隧道挖掘机（包括盾构挖掘机）——对于挖掘机的切削刃和安装器的旋转，带有具备大起动扭矩与低滑率特性的减速机的马达MX-RG和HMKB（SX）等发挥着强大的动力。并且，保持正圆度、扇形片的自动装配、依靠螺旋式输送机将土砂搬出等等，对应高压的液压阀块在系统中担负着隧道挖掘机系统的主要功能。

Our hydraulic systems are used in various civil engineering machines that require power and accurate control. We would like to introduce the Kawasaki Tunnel Boring Machine (Shield Machine is included). The cutter drive and erector within these machines is provided by MX-RG, axial piston motor with reduction gear, or the HMKB (SX) radial piston motor, both offer high starting torque and low shaft creep characteristics.
Furthermore the hydraulic system activates the main function of the tunnel excavation system. Our hydraulic control technology has enabled the automation of tunnel segment erection.

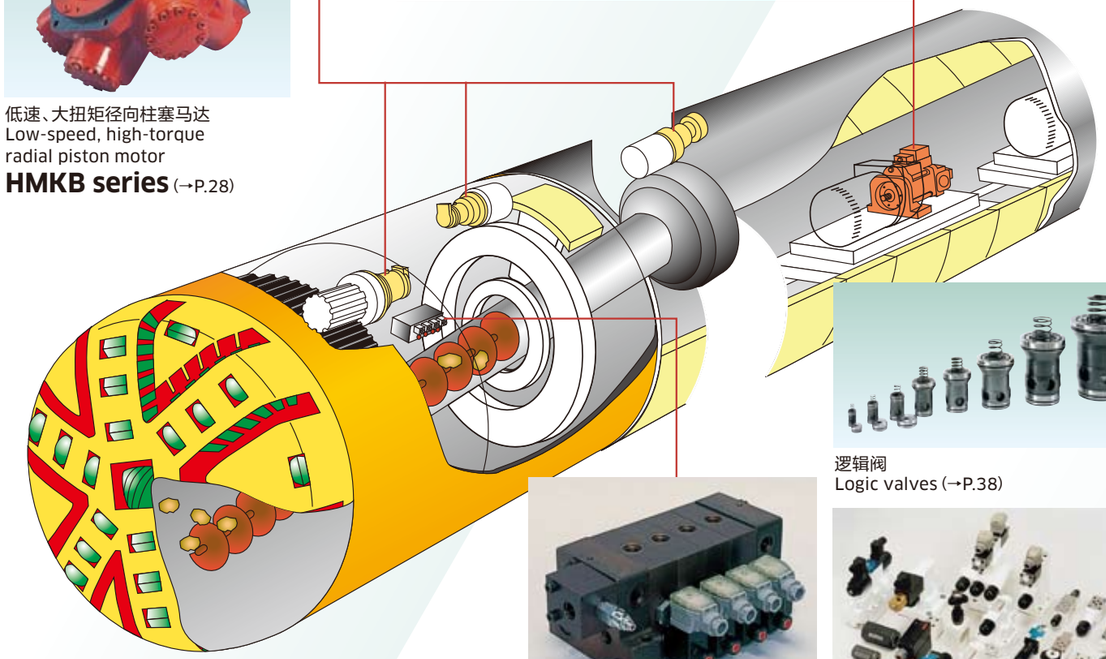
斜盘式轴向柱塞马达
Swash plate type axial piston motor
M3X/M3B-RG series (→P.27)

低速、大扭矩径向柱塞马达
Low-speed, high-torque radial piston motor
HMKB series (→P.28)

斜盘式轴向柱塞泵
Swash plate type axial piston pump
K7VG series (→P.22)

斜盘式轴向柱塞泵
Swash plate type axial piston pump
K3VG series (→P.23)

斜轴式轴向柱塞泵
Bent axis type axial piston pump
LVP017 (→P.22)



逻辑阀
Logic valves (→P.38)

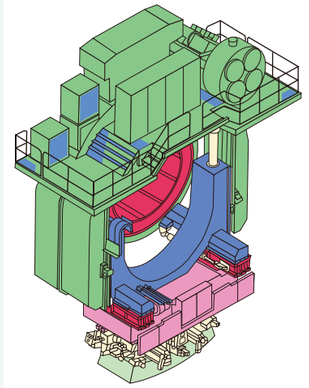
SUN插装式起重器梭阀
SUN cartridge jack select valve
CVB series (→P.30)

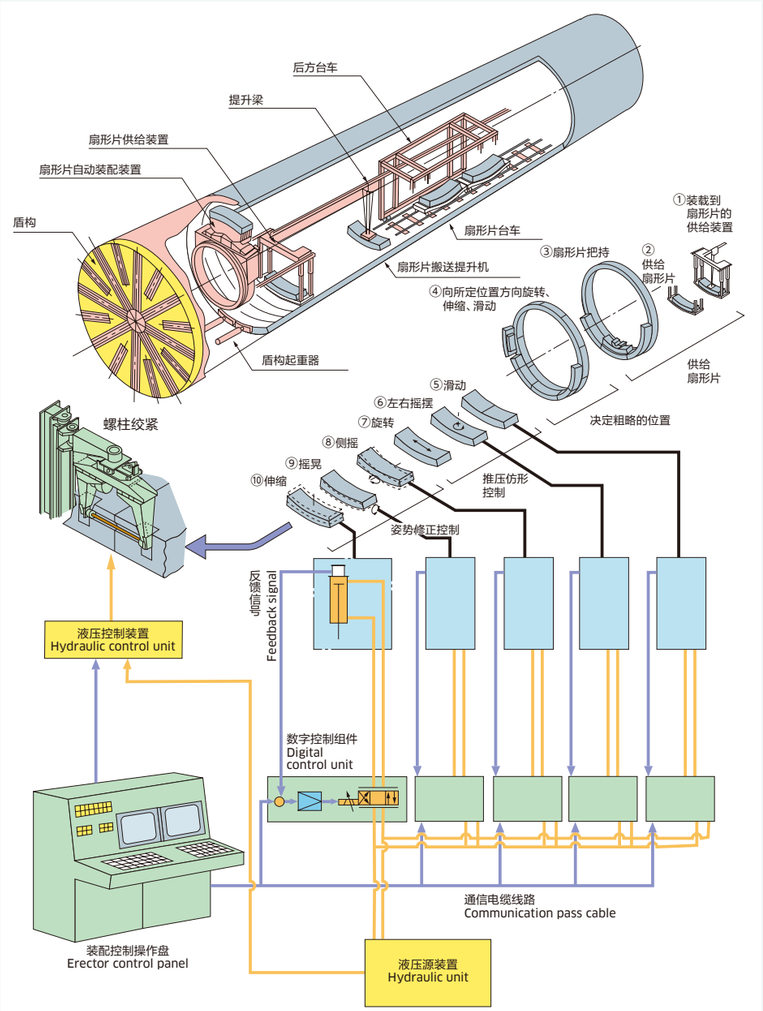
通用阀
Control valves (→P.29)

扇形片自动装配系统
Automatic Segment Erection System for Shield Machine

在盾构施工法的自动化・合理化的发展过程中，液压控制技术克服了可以说是唯一遗留下来的扇形片装配自动化这个难题。

Our hydraulic control technology has enabled automatization of segment erection work that used to be well behind other kinds of automatization and robotization of the shield tunneling method.





系统技术 System Technology

●钟形罩式泵组
Pump unit

●电-液混合系统
Electro-Hydraulic hybrid system (→P.41)

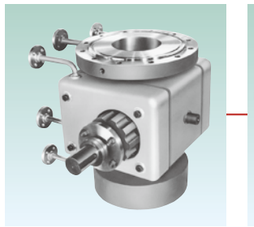
●电-液控制技术
Electro-Hydraulic servo control system

精密齿轮泵
Precision Gear Pump

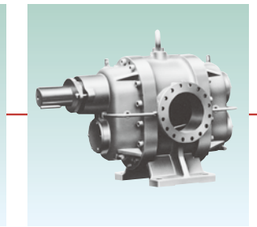
本公司自1946年开始生产并向世界各地出口精密齿轮泵。其性能别人难以仿效，获得了极高的评价。本公司的精密齿轮泵是以原来的输出脉动小，定量性好的外啮合式齿轮泵为基型，将其制作精度提高到极限，进一步追求好高次元的性能而创造出来的。最初，是作为化学纤维制造方面的纺线喷嘴的计量压力输送而开发的，而现在根据其出色的性能和特点，多用于精密计量。（产品详情请参阅P.26）

Kawasaki has been manufacturing precision gear pumps since 1946, and their performances are unrivaled and highly acclaimed worldwide. The Kawasaki Precision Gear Pumps are produced with the highest degree of manufacturing accuracy to enhance performances of the external-contact type gear pumps, which in principle have small pulsations and good volumetric characteristics. These pumps were originally developed for pumping and metering of polymer to the spinnerette in the production of chemical fibers, and have prevailed in many other applications that require a constant accurate flow. (Refer to page 26)

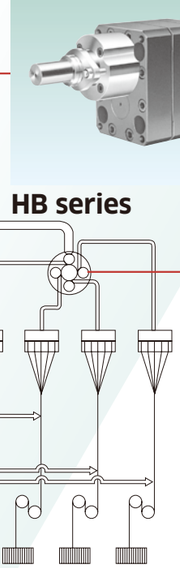
1 化学纤维制造用 For Chemical Fibers



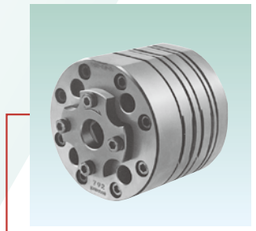
HT series



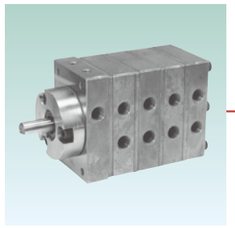
B series



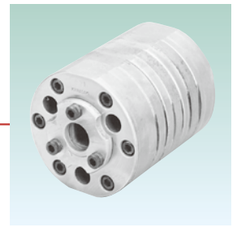
HB series



KH9S series

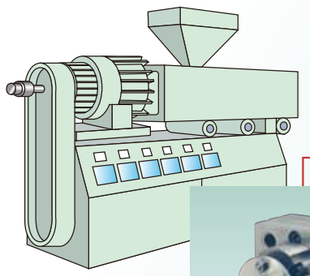


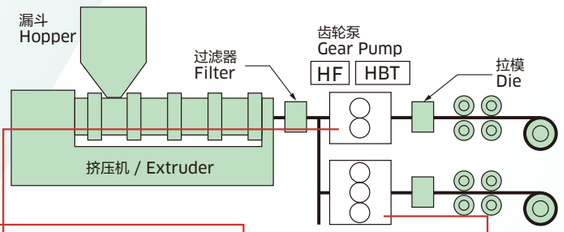
KWT series

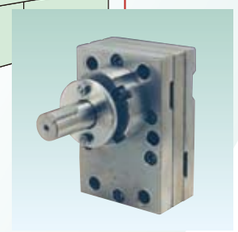


SADS series

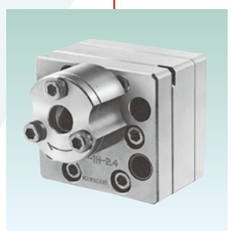
2 挤压成形用 For Extrusion Moldings



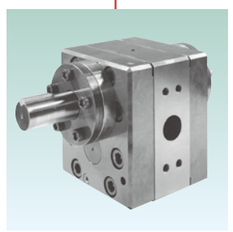




BAS series
BAS-H series



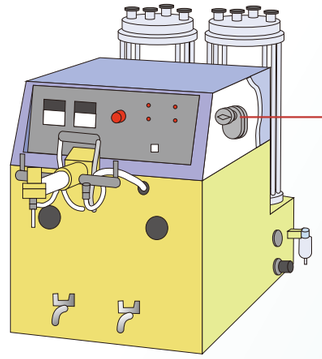
KHP-1H series

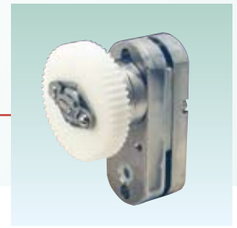


HF series

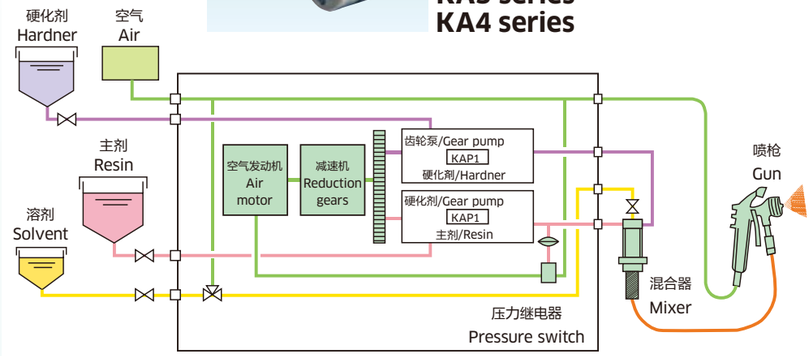
HBT series

3 多种液体混合用 For Multiple Liquids Mixing System





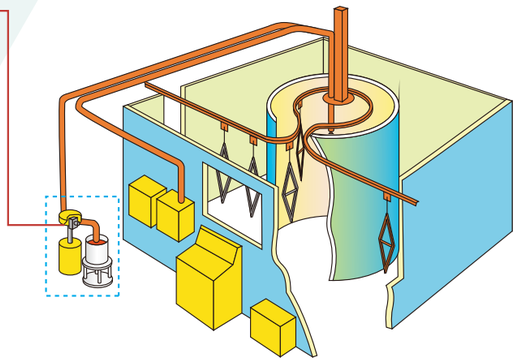
KAP-1/KA1 series
KA3 series
KA4 series



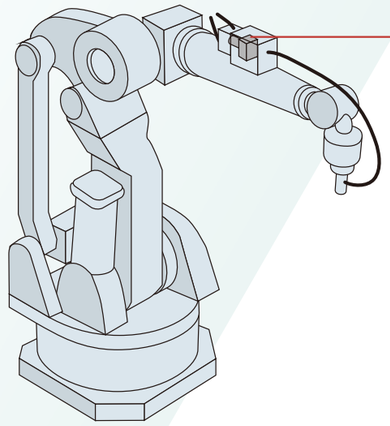
4 工业涂料用 For Painting System

KH-1 series

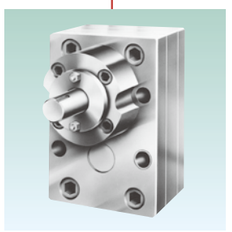
KISS series



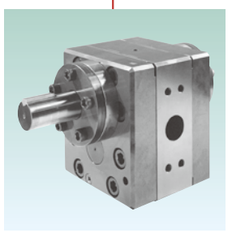
5 封印用 For Sealing System



BAS series
BAS-H series



KH-5 series



HF series

机械电子装置
Mechatronics

从事液压事业的90多年——在此悠久的历程中，我公司不仅开发研制液压技术，而且掌握了随之相关的精密加工技术、电气·电子控制技术、以及自由自在地操纵各种各样机械的技术，并以这些技术为基础开发出了不少的产品。

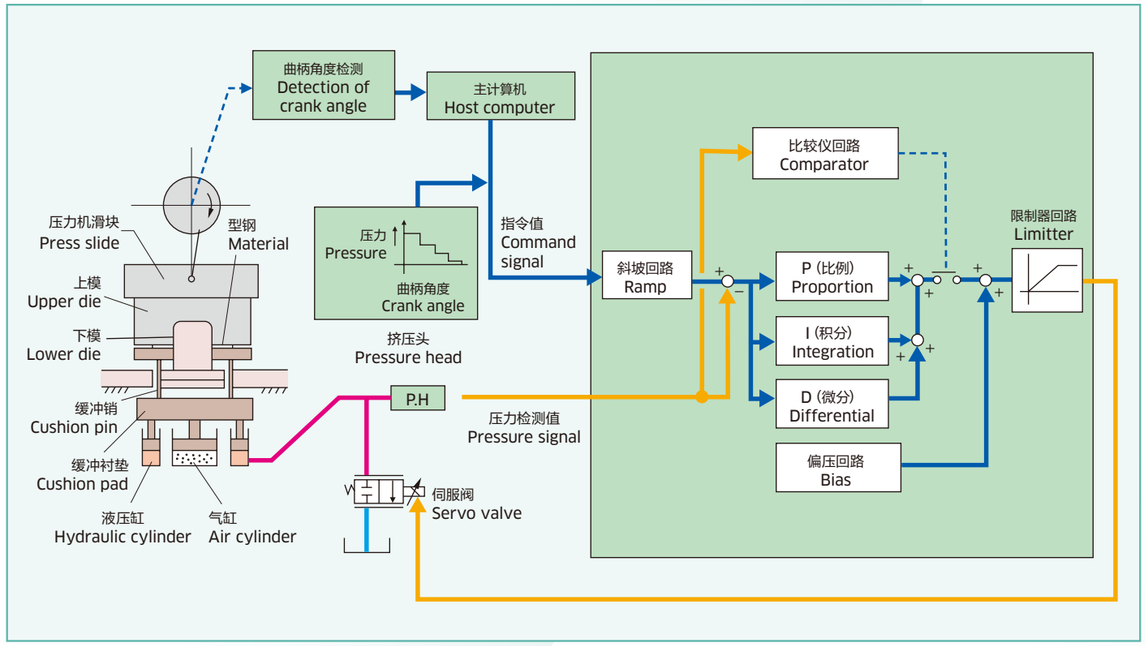
In 90 years of manufacturing hydraulic systems we have also gained experience of other precise manufacturing technologies such as electrical and electron control and other technologies which freely move machines.
We have developed many products based on these technologies.

NC缓冲器
NC Die Cushion Hydraulic Equipment for Mechanical Press

应用高速液压伺服技术，对机械式压力机的缓冲能力自由自在地进行控制。

The high-speed hydraulic servo technology applied to press machinery freely controls the cushion capability.

●系统构成图 **System configuration**

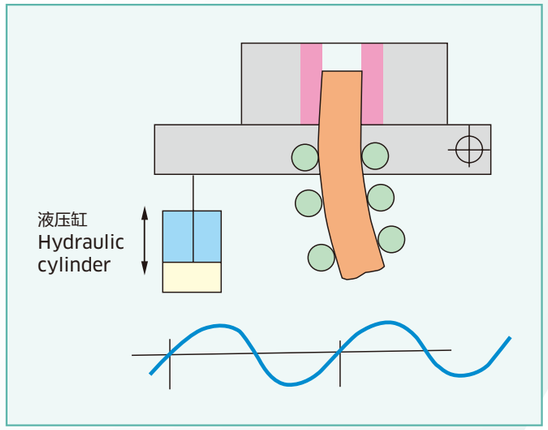


液压式模型振动装置
Hydraulic Mold Oscillation Equipment

给模型以上下的振动，防止钢液与模型面的粘砂。伴随着连续铸造的高速化、高循环化，能够得到任意波形的液压式被更多地采用，从而为表面品质的提高做出了贡献。

This equipment gives vertical oscillation to the mold and prevents the melted steel from being printed on the mold surface. In response to increasing higher-speed operation, the hydraulically operated type available arbitrary oscillation wave is being adopted in most of mold oscillation equipment, and contributes to quality improvement of the steel surface.

●最佳的振动模式 **Optimum oscillation**

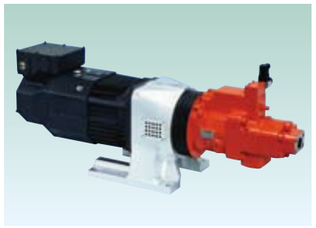


利用液压装置能得到符合铸造条件的振幅·频率·波形。
An optimum oscillation wave pattern is realized by hydraulic servo cylinders.

试验装置
Experimental System

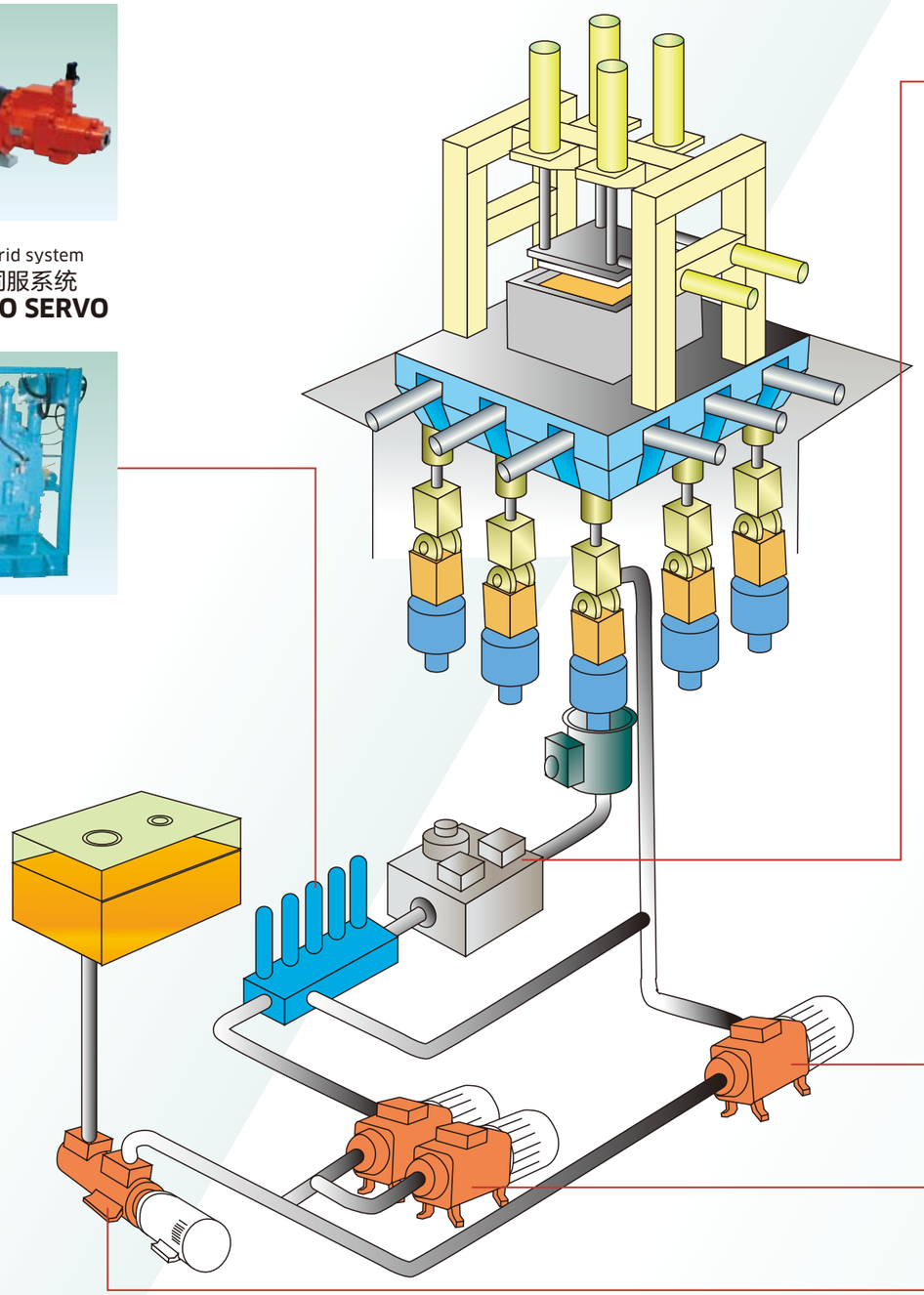
如插图中所介绍的、以三维大型振动台为首，本公司的泵组和丰富多彩的控制阀群被使用于负载试验机和弹簧试验机等要求高精度控制的各种试验装置上。

Kawasaki Pumps and various control valves are used in experimental systems that require accurate control. Load testing machines, spring testing machines and large three dimensional vibration units, as shown below, are all examples of this type of application.



电-液混合系统
Electro-Hydraulic hybrid system
川崎环境友好型伺服系统
KAWASAKI ECO SERVO
(→P.41)

过滤装置
Filter unit



●主控制阀组 **Main valve unit**

伺服逻辑阀
Servo-logic valves (→P.31)

逻辑阀
Logic valves (→P.38)

●主 (副) 泵站 **Main (Vice) Pump Unit** (→P.35)

斜轴式
轴向柱塞泵
Bent axis type
axial piston pump
LZV series (→P.21)

斜盘式
轴向柱塞泵
Swash plate type
axial piston pump
K3VG series (→P.23)

斜盘式
轴向柱塞泵
Swash plate type
axial piston pump
K7VG series (→P.22)

●增压泵组
Boost Pump Unit

螺杆泵
Screw pumps (→P.25)

斜轴式轴向柱塞泵
Bent axis type axial piston pump

LX series *
LXV series *
LZ series *
LZV series *

LX series

LZ series

LZV series

＊通用产品 standard

1. 作为锻压机械等所有的产业用液压源，以丰富的控制、高效率、长寿命而自豪的L系列泵，其种类非常丰富。客户可根据用途来选择最合适的泵。
2. LXV・LZV系列是对LX・LZ系列的轴承部位进行强化后的长寿型泵。在高压连续负荷状态或在使用了抗燃性工作油等的情况下等等，即使在苛刻的使用条件下也能显示它的长寿性。

1. As a hydraulic pump for industrial machinery, the "L-series" hydraulic pump has various control, and high efficiency and long life. There various pumps help you to select the best pump for your needs.
2. LXV･LZV series hydraulic pumps are long life, strengthened bearing type LX･LZ series pumps. They can operate for long periods of time under severe conditions: high pressure continuous drive, use of fire resistant fluid, etc.

型号 model		LX-030 LZ-030	LX-060 LZ-060	LX-090 LZ-090	LX-120 LXV-120 LZ-120 LZV-120	LX-180 LXV-180 LZ-180 LZV-180	LX-260 LXV-260 LZ-260 LZV-260	LX-500 LXV-500 LZ-500 LZV-500
排量 displacement	〔cm³〕	32.4	63.4	84.3	124	174	260	507
压力 pressure 〔MPa〕 (kgf/cm²)	额定值 rated	34.3 (350)						
	最高 peak	39.2 (400)						
额定转速 rated speed	〔min⁻¹〕	1,800						1,200

电一液伺服调节器「ROTAS-L」

这是以输入微小电信号，为进行对L系列斜轴式轴向柱塞泵的倾斜控制（输出流量控制）的电一液伺服调节器。

详情请参阅P.43

Electro-hydraulic servo regulator "ROTAS-L"

ROTAS-L is an electro-hydraulic servo regulator that controls the tilting angle (flow rate control) of the "L-series" hydraulic pumps using a low electrical signal for input.

Refer to page 43.

●性能 Performance

响应性 responsiveness	阶跃响应 step response	0.3 s (0°→ 27°)
	频率响应 frequency response	3Hz (±12.5°、-3dB)
滞后 hysteresis		1%
线性 linearity		<2%

斜盘式轴向柱塞泵
Swash plate type axial piston pumps

K7VG series *

K7VG256

K7VG500

＊通用产品 standard

这是最适合于炼铁机械・锻压机械等高压・大流量的产业机械用泵。由于采用大负载容量的轴承而实现了长寿化。

The K7VG pump is a high-pressure swash plate type axial piston pump suitable for steel making plant and press machinery. The adoption of high-load bearings has achieved long life.

型号 model		K7VG180	K7VG265	K7VG500
排量 displacement	〔cm³〕	180	270	500
压力 pressure 〔MPa〕 (kgf/cm²)	额定 rated	35 (357)		45 (459)
	最高 peak	40 (408)		50 (510)
转速 speed 〔min⁻¹〕	自吸最高 max.for self priming	1,800	1,600	1,350
	最高 max.	2,200	1,900	1,800

斜轴式轴向柱塞泵
Bent axis type axial piston pumps

LVP017 *

1. 最适合于高压起重器等的手动型变量泵。
2. 采用独创的倾斜中心偏置机构，通过将小倾角时的无用缸腔的容积抑制在最小，从而实现了从最小倾角到最大倾角的高效率。

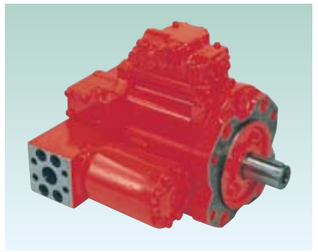
1. LVP017 is a manual variable displacement pump suitable for high-pressure jacks.
2. The original offset tilting center mechanism minimizes the dead volume and realizes high efficiency between minimum and maximum flow.

型号 model		LVP017
排量 displacement	〔cm³〕	4～17.4
压力 pressure 〔MPa〕 (kgf/cm²)	额定 rated	34.3 (350)
	最高 peak	49.0 (500)
额定转速 rated speed	〔min⁻¹〕	1,800

斜盘式轴向柱塞泵
Swash plate type axial piston pump

K3VG series *

＊通用产品 standard



1. 适合于一般产业机械的开环回路用泵，规格为63～560cm³。
2. 以高精度电-液伺服调节器「ILIS (Intelligent Liner Servo)」为主，拥有丰富的控制方式。
3. 是一种公认具有高功率・高可靠性，追求易使用的低噪声式的高压柱塞泵。

1. The K3VG pump is designed for industrial machinery with open circuits and has 63-560cm³ pump sizes.
2. Including a highly precise electrohidraulic servo regulator "ILIS", good varieties of control methods are available.
3. Silent and high-pressure pump with high efficiency and reliability.

型号 model		K3VG63	K3VG112	K3VG180	K3VG280	K3VG180 DT	K3VG280 DT
排量 displacement	〔cm³〕	63	112	180	280	360	560
压力 pressure 〔MPa〕(kgf/cm²)	额定 rated	34.3 (350)					
	最高 peak	39.2 (400)					
速度(每分钟) speed 〔min⁻¹〕	额定 rated	1,800			1,200	1,800	1,200
	自吸最大 max.for self priming	2,600	2,200	1,850	1,600	1,850	1,600
	最大 max.	3,250	2,700	2,300	2,000	2,300	2,000

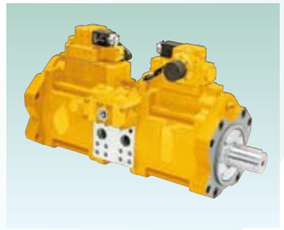
电一液伺服调节器「ILIS」
Electro-hydraulic servo regulator "ILIS"

通过微机控制，实现了优良的性能。加以、可获得即便输出压力变化但流量几乎不变的恒流量特性，因此最适合开环回路的速度控制。

详情请参阅P.44。

The performance equivalent to ROTAS has been realized by microcomputer control. In addition, it is optimized to speed control in open circuit applications. Constant flow characteristics are maintained regardless of system pressure.

Refer to page 44.



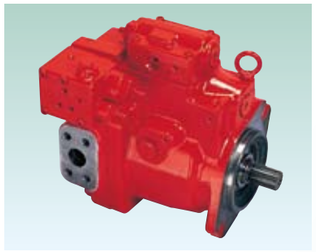
●性能 Performance

响应性 responsiveness	阶跃响应 step response	≦0.3s (0←→100%)
	频率响应 frequency response	≧3Hz (-3dB)
滞后 hysteresis		≦1%/FS
线性 linearity		≦±0.5%/FS

斜盘式轴向柱塞泵
Swash plate type axial piston pump

K3VL series *

＊通用产品 standard



1. 以工程机械用泵且具有丰富实绩的K3V系列为基型而开发的对应负载敏感、及恒压的液压回路用泵。
2. 通过我们长期研究而诞生的本公司独创的新机构，可大幅度地降低噪声源的压力脉动。
3. 除以负载敏感和恒压为基本外，还可以进行卸载及压力调整。用配选也可进行功率控制。

1. The K3VL series swash-plate type axial piston pump is a heavy duty variable displacement hydraulic pump newly developed for mobile and industrial applications.
2. The unique patented mechanism obtained through our long research has drastically reduced pressure pulsation.
3. Unload and variable pressure controls are made possible remotely in addition to load-sensing and pressure constant. In addition, the horsepower control is available.

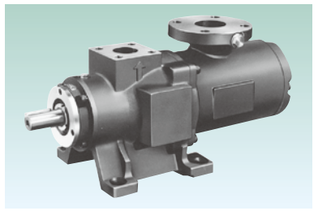
型号 model		K3VL28	K3VL45	K3VL60	K3VL80	K3VL112	K3VL140	K3VL200
排量 displacement	〔cm³〕	28	45	60	80	112	140	200
压力 pressure 〔MPa〕(kgf/cm²)	额定 rated	32 (326)		25 (255)	32 (326)			
	最高 peak	35 (357)		28 (286)	35 (357)			
转速 speed 〔min⁻¹〕	自吸最高 max.for self priming	3,000	2,700	2,400	2,400	2,200	2,200	1,900
	最高 max.	3,600	3,250	3,000	3,000	2,700	2,500	2,200

螺杆泵 *
Screw pumps *

*通用产品 standard

3D series

6D series



4X series

B4 series

1. 工作油沿轴向方向平稳流动，因没有剧烈的压力变化，所以噪声极小。
2. 输出的工作油的量与轴的旋转位置无关，因此几乎没有压力脉动。
3. 从动螺杆通过输出的工作油自转，因螺杆件之间的啮合力很小，所以磨损小，寿命长。

1. The hydraulic fluid flows to the axial direction smoothly and extremely quietly because of no sharp pressure change.
2. As the quantity of discharged hydraulic fluid is constant irrespective of the revolution position of an axis, there hardly occurs a pressure pulsation.
3. As the idler rotor auto-rotates by the delivered hydraulic fluid and the biting power between the rotors is small, little wear and a long life is achieved.

型 号 model	流量范围 capacity range L / min	最大压力 max. pressure MPa (kgf/cm²)	用 途 application					
			矿物油 mineral oil	水-乙二醇 water glycol solution	磷酸酯 phosphate ester	W/O乳剂 O/W乳剂 W/O emulsion O/W emulsion	切削液 cutting oil	燃料油 fuel oil
3D	10～150	2.9 (30)	●	○	□	○	○	●
6D	10～35	6.9 (70)	●	○	□	○	○	●
4X	30～500	6.9 (70)	●	○	□	○	○	●
B4	30～700	20.6 (210)	●	○	□			

● 印表示最适合于此用途使用的泵系列。
○ 印表示对该用途来说可以使用的泵系列。
□ 印表示更换密封材质后可使用。

● Indicates that pump series is best suited for the indicated fluid.
○ Indicates that the pump series is also applicable to the indicated fluid.
□ Indicates that the pump series is applicable to the indicated fluid by changing the material of the seals.

精密齿轮泵
Precision gear pumps

1. 通过高容积效率，即便油压力和粘度变化时，仍能获得稳定的输出量流量。该输出精度是因为有加工精度高的保证，并且各零部件可互换。
2. 通过严选的材料及进行适当的热处理，使其具有使用寿命长。
3. 由丰富的机种构成，可适合使用的用途广泛。

1. High volumetric efficiency enables a stable output flow despite fluctuations in pressure and/or viscosity. The high accuracy is ensured by extremely accurate finishing. Each part is designed to be interchangeable.
2. Long durability is ensured with careful selection of pump materials and adequate heat treatment for them.
3. Abundance of type enables variety of applications.

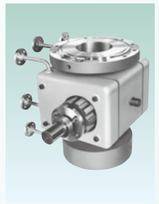
BAS/BAS-H series

KH5 series

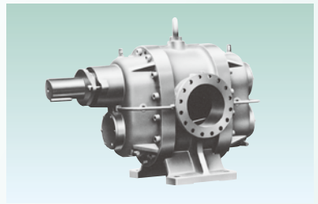
KES series

PFS series

HBT series



HT series



B series

型 号 model	流量范围 capacity range L / min	最大排出压力 max. outlet pressure MPa (kgf/cm²)	用 途 application					
			计 量 metering	挤压成形 extrusion molding	高品位成形 high quality molding	聚合作用 polycondensation	真空抽出 vacuum discharge	化学纤维 chemical fiber
KAP-1 KA1	0.015～0.6	6.9 (70)	◎					◎
KA3	0.03～1.1	6.9 (70)	◎					◎
KA4	0.15～4.5	6.9 (70)	◎					◎
BAS	0.06～3	29.4 (300) 24.5 (250) 19.6 (200)	◎	○				◎
BAS-H	0.06～2	49 (500)		◎				◎
KH5	0.2～6	19.6 (200)	◎	○				◎
KES	0.8～20	14.7 (150)	○	○				◎
PFS	0.25～15	7.8 (80)	◎					◎
KHP-1H	0.001～0.24	49 (500)	○	◎				◎
HF	0.1～40	39.2 (400)		◎				
HB	2～60	39.2 (400)				◎		
HBT	0.1～90	29.4 (300)			◎			
HBTD	0.1～72	29.4 (300)			◎			
HBTDS	0.1～40	2.9 (30)	◎					
HT	0.02～160	29.4 (300)		○		◎	◎	
B	3～800	4.9 (50)				○		◎

○ 表示可以使用，◎表示适合于该用途的泵系列。
○ Acceptable for the use. ◎ Adequate choice for the application.

斜盘式轴向柱塞马达
Swash plate type axial piston motor

M3X series *

*通用产品 standard

该马达是经过长期积累的斜盘式泵・马达且有实绩和技术而开发的产品、自吸能力、起动效率极高的斜盘式轴向柱塞马达。

The M3X/M3B series is a swash plate type axial piston motor with a good self-priming capability and high starting efficiency.

型号 model		M3X200	M3X280	M3X530	M3X800
排量 displacement	〔cm³〕	195	280	533	800
压力 pressure 〔MPa〕(kgf/cm²)	额定 rated	29.4 (300)			
	最高 peak	34.3 (350)			
最高转速(每分钟) max. speed	〔min⁻¹〕	1,900	1,700	1,400	1,200

斜盘式轴向柱塞马达
Swash plate type axial piston motor

M3B series *

型号 model			M3B200	M3B280	M3B530	M3B800
排量 displacement	〔cm³〕	最大 max.	195	280	533	800
		最小 min.	106	93	178	267
压力 pressure	〔MPa〕(kgf/cm²)	额定 rated	32.0 (326)	30.0 (306)	29.4 (300)	
		最大 peak	35.0 (357)	35.0 (357)	34.3 (350)	
最高转速 max. speed	〔min⁻¹〕	最大 max.	1,900	1,700	1,400	1,200
		最小 min.	2,930	2,200	1,700	1,500

带减速机斜盘式轴向柱塞马达
Swash plate type axial piston motor with reduction gear

M3X-RG series *
M3B-RG series *

型号 model		M3X200-RG03S5.7	M3X280-RG06S6.4 M3B280-RG06S6.4	M3X530-RG10S5.7 M3B530-RG10S5.7	M3X800-RG16S6.4 M3B800-RG16S6.4
排量 displacement	〔cm³〕	840	1,610	3,010	5,120
额定压力 rated pressure	〔MPa〕(kgf/cm²)	21.9 (223)	20.6 (210)		19.6 (200)
最高转速(每分钟) max. speed	〔min⁻¹〕	270	190	150	130

斜盘式轴向柱塞马达
Swash plate type axial piston motor

M3XA series *

型号 model		M3XA380	M3XA600	M3XA820	M3XA1000
排量 displacement	〔cm³〕	385	600	824	1,065
额定压力 rated pressure	〔MPa〕(kgf/cm²)	17.2 (175)			
最高转速(每分钟) max. speed	〔min⁻¹〕	690	590	540	490
容许轴向力 allowable thrust		小轴向力型 light thrust type		大轴向力型 heavy thrust type	

低速大扭矩径向柱塞马达
Low speed, high torque radial piston motor

HMKB (C) series *

*通用产品 standard

1. 作为注塑成型机的螺旋驱动用、深受用户好评的低速大扭矩径向柱塞马达。
2. 备有为了切换双速的控制阀阀安装座等的配选。
3. 可对应负载的大小而自动无级变速(恒功率控制)的CHP阀的安装。

1.Proven in screw driving of injection molding machines.
2.Multiple options available such as valvemounting type for speed changing.
3.CHP valve is available which can automatically change the speed steplessly in response to the load. (Constant horse-power control)

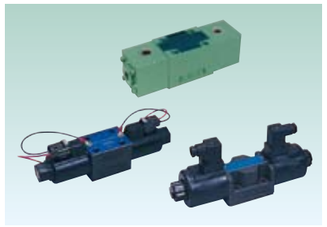
●定量型 Fixed displacement type

型号 model		HMKB 046/35	HMKB 046	HMKB 075/60	HMKB 075	HMKB 100	HMKB 200/125	HMKB 200	HM(HD)B 270	HM(HD)B 325	HMHDB 400
排量 displacement	〔cm³〕	580	745	1,000	1,281	1,510	2,049	3,087	4,310	5,310	6,800
压力 pressure 〔MPa〕(kgf/cm²)	额定 rated	20.6 (210)							24.5 (250)		
	最高 max.	24.5 (250)							29.4 (300)		

●变量型 Dual-displacement type

型号 model		SB 500M	SB 505	HMKC 046	HMKC 075	HMKC 080	HMKC 200	HMC 270	HMC 325
排量 displacement 〔cm³〕	100%	492	492	745	1,241	1,475	3,087	4,588	5,326
	50%	246	246	410	574	737	1,470	2,294	2,622
压力 pressure 〔MPa〕(kgf/cm²)	额定 rated	17.2 (175)	20.6 (210)					24.5 (250)	20.6 (210)
	最高 max.	20.6 (210)	24.5 (250)					27.5 (282)	24.5 (250)

方向控制阀 *
Directional control valve *



压力控制阀 *
Pressure control valve *

流量控制阀 *
Flow control valve *

*通用产品 standard

产品 product	型号 model	最高压力 max. pressure MPa (kgf/cm²)	最大流量 max. flow L/min
方向控制阀 Directional control valve			
电磁换向阀 sol. operated directional valve	DE	30.9 (315)	6, 10
电液换向阀 sol. controlled pilot operated directional valve	DEH	34.3 (350)	16, 22, 32
液动换向阀 pilot operated directional valve	DH	30.9/34.3 (315/350)	6, 10, 16, 22, 32
手动换向阀 manually operated directional valve	DM	30.9/34.3 (315/350)	6, 10, 16, 22, 32
手动换向阀 manually operated directional valve	K4LA	24.5 (250)	6
单向阀 check valve	C/C1M	30.9 (315)	6, 8, 10, 15, 20, 25, 30, 52, 62, 82, 102, 125, 150
液控单向阀 pilot operated check valve	CH (Y)	30.9 (315)	6, 8, 10, 15, 20, 25, 30, 52, 62, 82, 102, 125, 150
压力控制阀 Pressure control valve			
溢流阀—直动式 relief valve–direct type	RD	30.9/39.2/61.8 (315/400/630)	6, 8, 10, 15, 20, 25, 30
溢流阀—先导式 relief valve–balanced piston type	RB/ RBE	30.9 (315)	10, 20, 30, 35, 52, 82
减压阀—直动式 reducing valve–direct type	PRD	30.9 (315)	6, 10
减压阀—先导式 reducing valve–balanced piston type	PRB	30.9 (315)	10, 20, 30
顺序阀—直动式 sequence valve–direct type	SD	20.6 (210)	6, 10
顺序阀—先导式 sequence valve–balanced piston type	SB	30.9 (315)	10, 20, 30
卸载阀 unloading relief valve	PU/ PUE	30.9 (315)	10, 20, 30, 35
3级溢流阀 pressure relief valve (3 pressure ratings)	3RBE	30.9 (315)	10, 20, 30
制动阀 brake valve	B	30.9 (315)	10, 15, 20, 25, 30
平衡阀 counterbalance valve	CBD	30.9 (315)	6, 10, 15, 20, 25, 30
平衡阀—带卸载功能 counterbalance valve-with unloading function	KDZ	24.5 (250)	15, 25, 40
流量控制阀 Flow control valve			
节流阀 throttle valve	T/T1M	30.9 (315)	6, 8, 10, 15, 20, 25, 30, 52, 62, 82, 102
单向节流阀 throttle and check valve	TC	30.9 (315)	6, 8, 10, 15, 20, 25, 30, 52, 62, 82, 102
精密节流阀 fine throttle valve	F	20.6 (210)	5, 10
压力—温度补偿调速阀 pressure-temperature compensated flow control valve	FJC	20.6/30.9 (210/315)	5, 10, 16, 30
3向调速阀 3-directional flow control valve	FK	30.9 (315)	10, 16

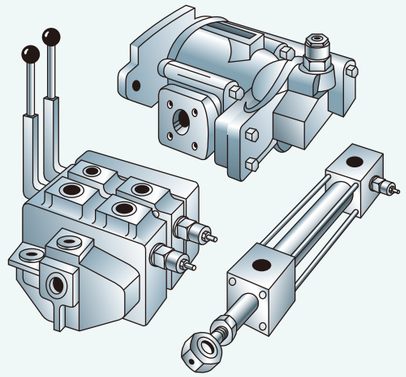
SUN插装式阀 *
SUN cartridge valve *

*通用产品 standard

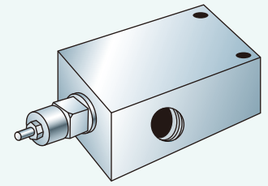
阀块 Valve block

Available for
Japanese customers only.

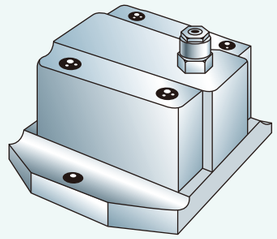
可安装SUN插装式阀
Versatile application potential



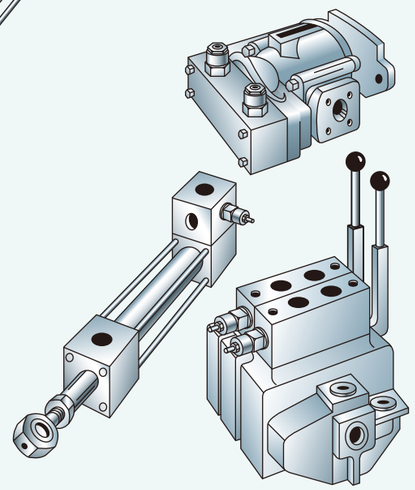
内置插装式
Direct integration



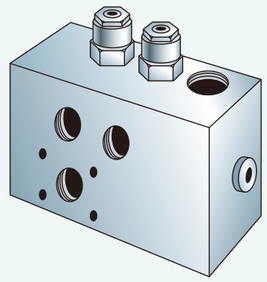
标准螺纹连接阀块
Line mounted standard block



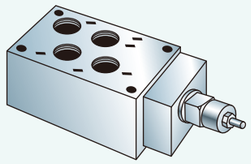
旧型阀的替代品
Industrial subplate mounted valve



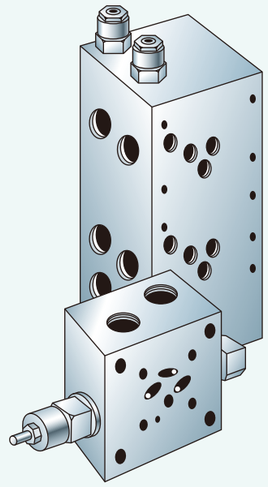
直接安装用阀块
Directed mounted package



多用途阀块
Custom valvepac



夹层阀
Sandwich valve



带插装式阀油路连接块
Subplates and manifold

伺服逻辑阀
Servo-logic valves

SLV series *

*通用产品 standard

1. 作为伺服阀的置换最适合应用于高压・高速、大流量的用途。
2. 紧凑型的插装方式。
3. 与伺服阀比较，泄漏少，耐污染性出色。

1. Suitable to high-pressure, high-speed and large-flow applications as substitute for conventional servo valves.
2. Compact slip-in cartridge.
3. Lower leakage than servo valves, and insensitive to contamination.

规格 size	SLV40	SLV50	SLV63	SLV80	SLV100
最高使用压力 max. pressure 〔MPa〕(kgf/cm²)	41.2 (420)				
最大流量 max. flow 〔L/min〕	2,200	3,500	5,500	9,000	14,000
阶跃响应 step response	20ms以下 20ms below			30ms以下 30ms below	
内泄漏 leakage	1cm³/min以下 1cm³/min and below				
滞后 hysteresis	0.5%以下 0.5% and below				
线性 linearity	±1%以下 ±1% and below				
再现（重复）性 repeatability	0.2%以下 0.2% and below				

小型升降阀
Hydraulic lift valves

HLV series *

1. 利用电信号，可任意控制升降速度。
2. 对故障状态进行分析，并在此基础上做出的安全设计。
3. 采用可靠的直接式插头，接线容易。

1. The running speed can be freely controlled by electrical signals.
2. A fail-safe design based on the failure mode effect analysis has been adopted.
3. Easily attachable plug is used for wiring.

型号 model	HLV20	HLV40
使用压力范围 operating pressure 〔MPa〕(kgf/cm²)	1.5 ～ 13.7 (15 ～ 140)	
最大流量 max. flow 〔L/min〕	20	40

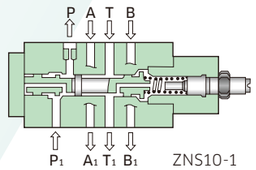
无冲击阀
Pressure shock damping valves

ZNS series *

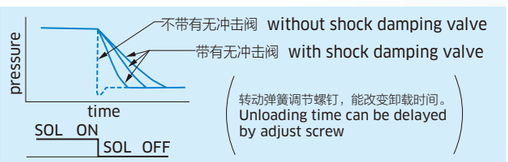
作为卸载用电磁阀的夹层使用，通过调节螺钉调整卸载时间的方法，降低卸载的冲击。

ZNS, installed between the solenoid unloading valve and the sub-plate, can delay the unloading time by means of an adjust screw and reduce shock as a result.

型号 model	ZNS5	ZNS6	ZNS10
最高使用压力 max. pressure 〔MPa〕(kgf/cm²)	30.9 (315)		
最大流量 max. flow 〔L/min〕	4	8	12



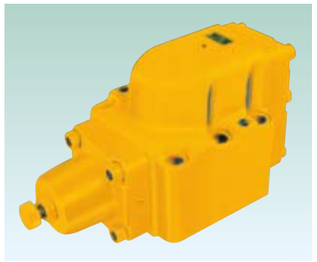
ZNS10-1



平衡阀
Counterbalance valves

KDZ series *

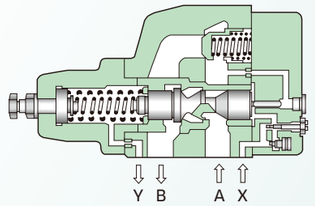
*通用产品 standard



使用于防止液压机的加压压头的自重落下以及压头速度的缓急控制等。

Prevents pressure-ram weight drop and controls ram speed.

型号 model	KDZ15	KDZ25	KDZ40
最高使用压力 max. pressure 〔MPa〕(kgf/cm²)	24.5 (250)		
最大流量 max. flow 〔L/min〕	120	240	500



电磁比例控制阀 *
Solenoid operated proportional control valves *


RDPV


RBP


PRDPIM

1. 利用控制系统来的电气信号，进行高度的方向・压力・流量控制。
2. 对带有局部反馈机构的电磁比例控制阀等的系列阵容进行充实，起到了构筑响应性好的系统及简单又廉价的支援作用。

1. Proportional control valves, which precisely control direction, pressure, and flow by means of electric signals from the control system, are more widespread in the press machinery field.
2. They also contribute to forming a sophisticated and simple electro-hydraulic system.

产品 product	型号 model	最高压力 max. pressure MPa (kgf/cm²)	最大流量 max. flow L /min
电液比例方向控制阀 Solenoid operated directional proportional valves			1 2 5 10 20 50 100 200 500 1,000 2,000
直动式电液比例方向阀（带有LVDT） direct acting type (with LVDT)	**DDP (DDPL)**	30.9 (315)	6
2级增幅式电液比例方向阀（带有LVDT） pilot control type (with LVDT)	**DHP (DHPL)**		16 22
电液比例压力控制阀 Solenoid operated proportional pressure relief valves			1 2 5 10 20 50 100 200 500 1,000 2,000
直动式电液比例溢流阀 direct acting type	**RDPV**	30.9 (315)	5
先导式电液比例溢流阀 balanced piston type	**RBP**		10 20 30 35
电液比例减压阀 Solenoid operated proportional pressure reducing valves			1 2 5 10 20 50 100 200 500 1,000 2,000
直动式电液比例减压阀 direct acting type	**PRDP1M6**	30.9/2 (315/20)	6
	PRDP	13.7/4.9 (140/50)	6
先导式电液比例减压阀 balanced piston type	**PRBP**	30.9 (315)	10 20 30

带有LVDT：带阀局部反馈机构
with LVDT : With minor feed back

PRDP・PRDP1M 压力表示：最高使用压力／ 2次控制压力
PRDP・PRDP1M pressure : Max. pressure / Secondary control pressure

电液比例控制阀用控制器
Controller for proportional valves

KC series *
KWC series *

*通用产品 standard

这是为了驱动电液比例控制阀而专用的控制器。有单电磁线圈用(KC系列)和双电磁线圈用(KWC系列)两种。

KC/KWC series are controllers for only proportional valves. We have two types, KC series (single solenoid type) and KWC series (double solenoid type).

型号 type	KC-B10-11	KWC-B10-10
电源电压 supply voltage	DC24V	
最大输出电流 max. output current	1.0A (额定值 nominal)	
指令电压 input voltage	DC 0～+5V	DC 0～±5V
使用温度范围 permissible ambient temperature	0～50℃、90%RH以下、无露水 90%RH and below, no dew	

伺服逻辑阀用控制器 *
Controller for Servo Logic valve *

这是为驱动伺服逻辑阀的专用控制器。

This controller is for only the servo logic valve SLV series.

型号 type	SLC-B20-11-J841	SLC-B20-11-J843
电源电压 supply voltage	DC24V	
指令电压 input voltage	DC 0～±10V	
伺服输出 servo output Voltage	±2A (max)	
使用温度范围 permissible ambient temperature	0～50℃、90%RH以下、无露水 90%RH and below, no dew	

ILIS用控制器 *
Controller for ILIS *

*汎用品 standard

通过采用微处理器的高速数字控制方式，能以紧凑的结构高精度地控制泵的输出流量。为K3VG、K7VG泵ILIS控制专用的控制器。

Adopting high speed digital control system by micro-processor enables compact setting and high-precision regulation of outlet flow of pumps.
This controller is for only ILIS control of the K3VG, K7VG pumps.

型号 type	KIC-D24-10
电源电压 supply voltage	DC24V
最大输出电流 max. output current	1.4A×2
使用温度范围 permissible ambient temperature	0～50℃

川崎环境友好型伺服系统用控制器 *
Controller for KAWASAKI ECO SERVO *

这是电-液混合系统式的川崎环境友好型伺服系统专用的控制器。
详细请参阅P.42。

This controller is for only KAWASAKI ECO SERVO.
Refer to page 42.

液压装置 Hydraulic Unit

泵站 Pump Unit

1. 将液压泵、电动机和具有卸载功能的溢流阀安装在高刚性的底座上。
2. 使用LZ系列轴向柱塞泵，实现高压、长寿命。
3. 由丰富的调节器群、可以根据需要选定恒功率、恒压、电控制等

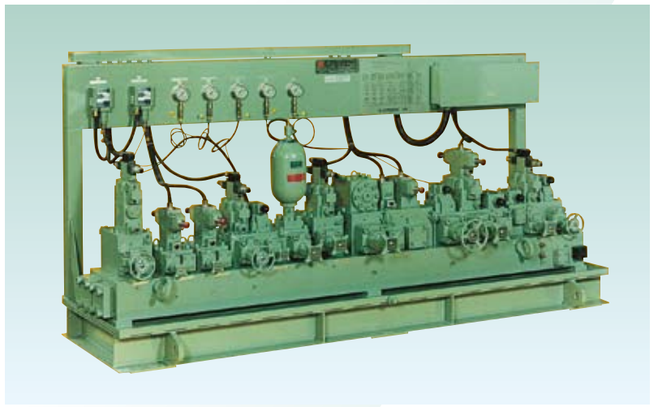
1. A hydraulic pump, an electric motor and unloading relief valves are mounted on a base of high rigidity.
2. High pressure and long life can be attained by using a LZ series axial piston pump.
3. Among various regulators, the horsepower constant type, pressure constant type, and electric control type, are available depending upon customers' requirements.

油箱装置 Tank Unit

1. 根据配置情况，最佳设计吸油・回油管道的位置和油箱内工作油的流动。
2. 根据工作油的种类、使用环境、污染管理水平，从不锈钢板、耐大气腐蚀钢板、一般钢板中选择材质。

1. According to the arrangement, the location of the suction port and return port, and flow in a tank are designed suitably.
2. According to the hydraulic fluid type, working environment, and contamination control level, the material is selected from among stainless steel, improved atmospheric corrosion resistant steel, and general structural steel.

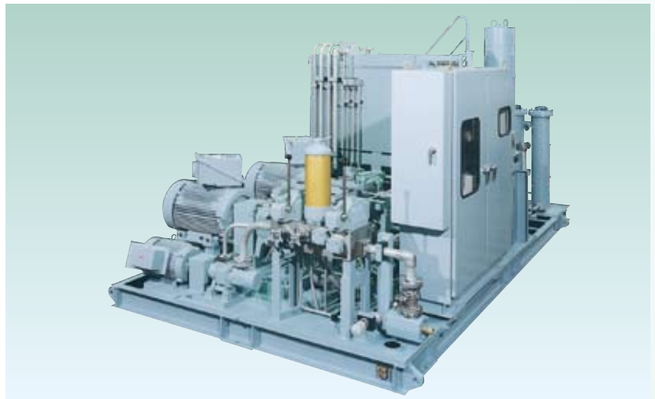
阀站 Valve Stand



1. 实现无管道的简单设计。
2. 使用整体型基块，减少了造成漏油原因的焊接、密封部分。
3. 全部阀实现密封垫圈化，易于维修。

1. Simple and pipeless.
2. Single piece manifold reduces welding, packing and sealing that cause oil leakage.
3. Adoption of all gasket valves assures easy maintenance.

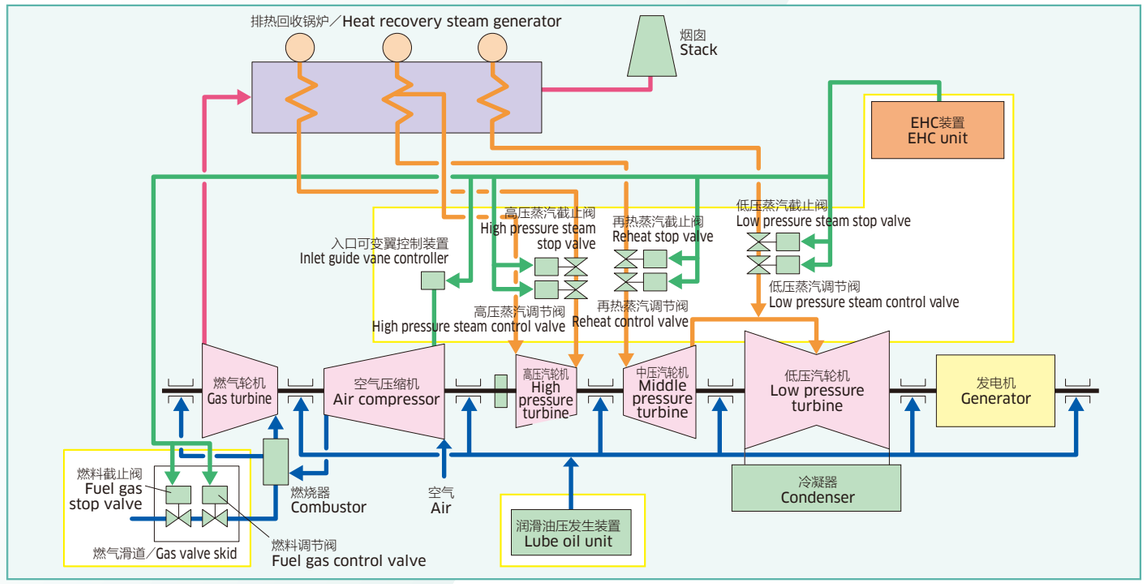
EHC装置 EHC Unit



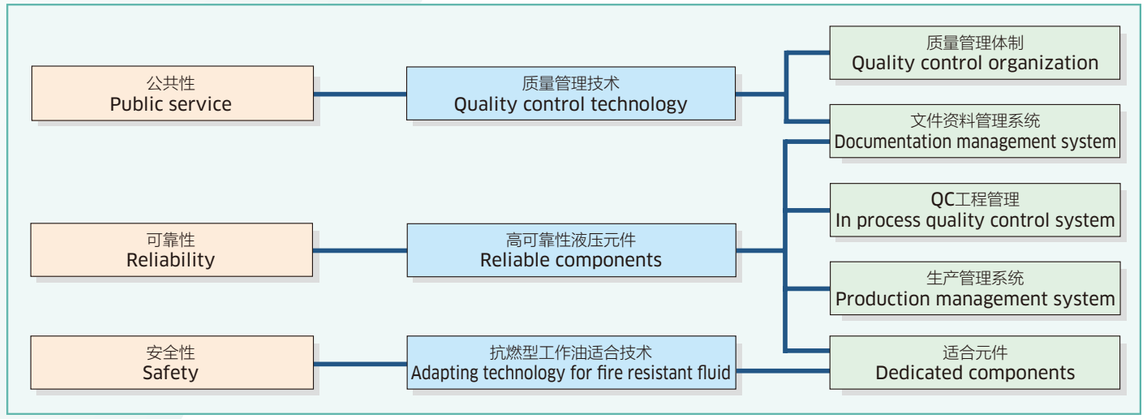
EHC(Electro Hydraulic Controller)装置是火力・核动力发电设备和燃气轮机发电设备上，向汽轮机输送的蒸汽和燃气进行控制的控制阀所用的液压装置。
本公司自1980年接到1号机订货以来，已创造了交货250基以上的实绩。

EHC (Electro Hydraulic Controller) unit is specialized hydraulic system to be used at nuclear, thermal or gas-turbine power plant to provide stable hydraulic power driving many kinds of valves to regulate the flow of steam or gas to be sent to turbine.
Since 1980 we have been supplying over 250 units.

●系统构成图 System configuration



●特长 Features



逻辑系统
Logic System

配合所使用机器的特性，构成液压回路，利用该液压回路构成使逻辑元件具备复合功能，将多个逻辑元件安装到单一的集成块上构成阀系统。

特　长

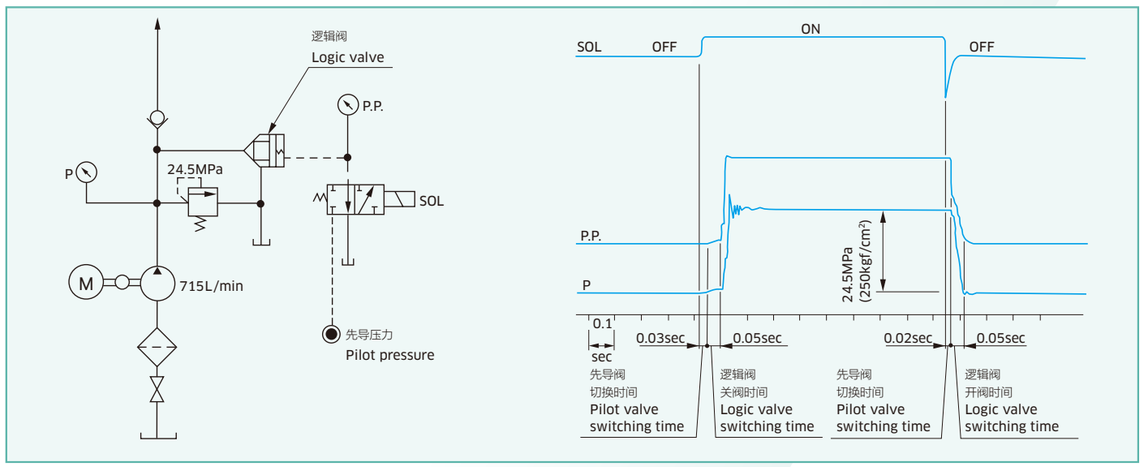
1. 可无冲击地进行高压、大流量的回路切换 (图1)。
2. 最适合用于高速·高频率切换 (图1)。
3. 液压系统紧凑化，容易进行保养 (图2)。

The logic system is formed by the logic elements on the manifold, which have compound functions according to the hydraulic circuit formations of the host machine.

Features

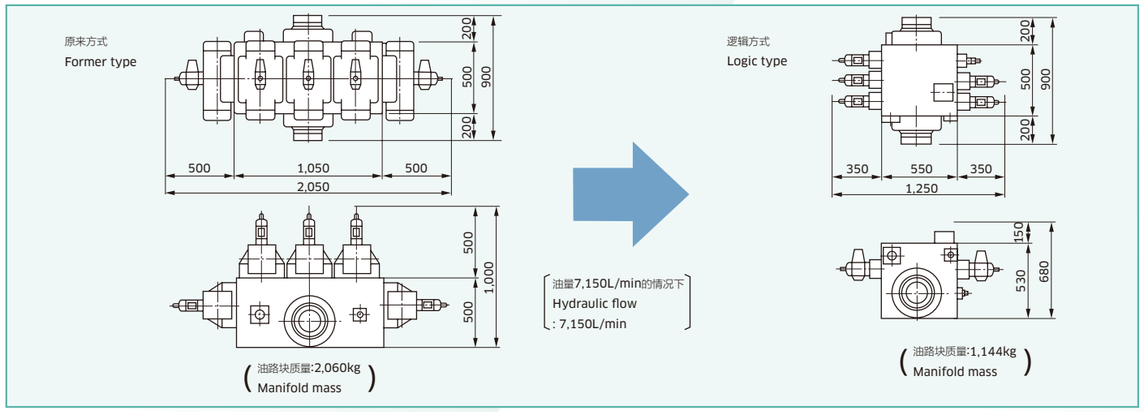
1. Shockless switching of the high pressure/large capacity hydraulic circuit. (Fig.1)
2. High speed and high frequency switching ability. (Fig.1)
3. Simple the hydraulic system and easy maintenance. (Fig.2)

●图1 Fig.1



▲是主泵的输出压力在24.5MPa (250 kgf/cm²) 时加载·卸载的压力波形。
The oscillograph shows pressures when the pump pressure set of 24.5 MPa (250 kgf/cm²) is loaded and unloaded.

●图2 Fig.2



逻辑系统的应用

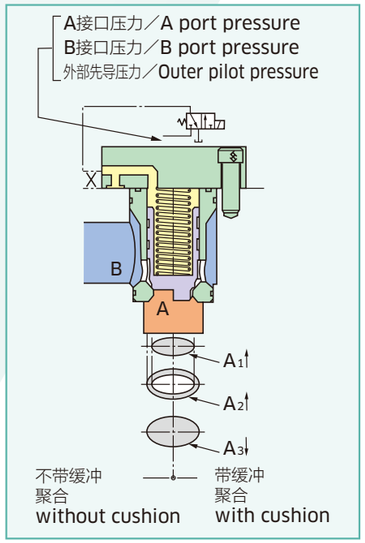
逻辑系统能利用逻辑元件所具有的功能以及控制功能的方法构成多种多样的回路，是设计自由度极高的系统。
为了灵活运用其特点，构成最合适的系统，必须充分掌握机械的动作，并对协调电控顺序进行考虑然后设计。一旦设计错误，就不能充分发挥其功能和性能。为此，在本公司的逻辑系统上进行了适合客户需求的最佳的设计·制作，以此满足客户的要求。

Logic System Application

This logic system has freedom for design and can form various circuits by using each logic element's function and their controlling method.
We not only produce, but also design logic systems to meet your requirements.

逻辑元件
Logic Element

能将各种插装组件和丰富的盖组合，进行各类控制。
Various control by combining logic elements and logic valve covers.



压力控制用逻辑元件
Logic Element for Pressure Control

以压力控制作为主要的功能目的，有溢流元件和减压元件2种。利用与方向控制元件的组合，更能构筑出色的功能·性能的逻辑系统。

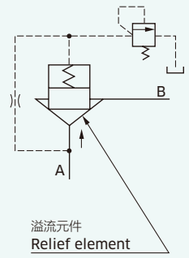
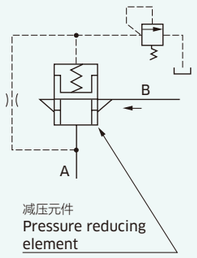
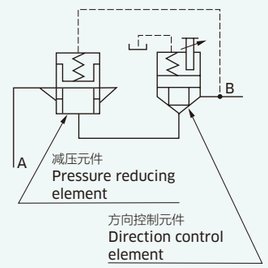
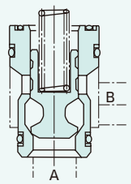
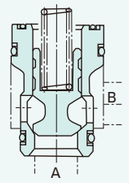
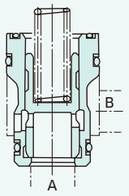
特　长

1. 作为溢流元件、具有优良的压力-流量特性。
2. 减压元件能构成用标准阀难以达到的大流量的减压阀。
3. 与节流阀组合能构成带有压力补偿的流量控制阀。

The pressure controlling logic elements have a relief valve element and a pressure reducing element. Through combination with the directional controlling elements, they can form a more advanced logic system.

Features

1. Pressure override as a relief valve element.
2. Pressure reduction of the large capacity flow, which standard valves are unable to control stably.
3. Forms a pressure compensating flow control element through combination with flow control valve.

溢流功能 Pressure relief function	减压阀功能 Pressure reducing function	带有压力·温度补偿的流量控制阀功能 Pressure-temperature compensate flow control function	溢流元件 Relief element		减压元件 Pressure reducing element
			带有缓冲器 with cushion 	无缓冲器 without cushion 	

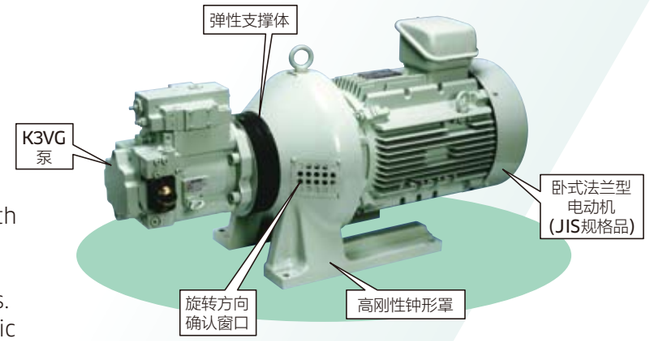
低噪声系统
Low-Noise Systems

低噪声泵站 Low-Noise Pump Units

川崎K3PU系列
KAWASAKI K3PU Series

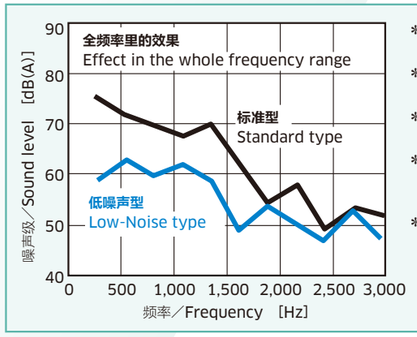
用钟形罩将作为高压・大流量型具有丰富实绩的本公司液压泵和电动机组合在一起的泵站。由于液压泵采用的是弹性支撑从而抑制了液压泵的振动传递，使系统获得了降低噪声的效果。

The high pressure and large capacity pump with ample experience is combined with an electric motor by introducing a unique bellhousing. This development realizes compact pump units. Furthermore the flexible mount of the hydraulic pump alleviates the vibration and system noise.



●实际液压装置的降低噪声效果一例 Example of Noise Reduction in an Actual Hydraulic System

	标准型 Standard Type	低噪声型 Low-Noise Type	降低的效果 Noise Reduction
噪声值dB(A) Noise Level	83	75	8



*泵：K3VG180DT Pump
*输出压力：13.7MPa Delivery Pressure
*流量率：40% Flow Percentage
*使用电动机：75kW、1,800 min^{-1} Electric Motor
*距离4m噪声，工厂内的一般声场 Measurement 4m apart inside a factory

特　长

1. 采用高压・大流量轴向柱塞泵(Kawasaki K3VG系列)
2. 电动机采用卧式法兰型(JIS的规格品)
3. 液压泵与电动机因用嵌入式安装，所以无需进行繁琐的联轴器的对中心作业。
4. 在液压泵输出接口也可附属带电磁阀的溢流阀阀块。

Features

1. A high-pressure and large-capacity type axial piston pump is used. (Kawasaki K3VG series)
2. A flange mounted type (JIS) electric motor is used.
3. A hydraulic pump and an electric motor are directly assembled to the bellhousing, so it saves you the centering work.
4. It is possible to attach a relief valve block to the hydraulic pump delivery port.

●机种 Description

○：表示可供应的机种。The supply model is shown.

型　号 type	适用泵 pump type	电动机功率　E／M capacity														
		18.5kW		22kW		30kW		37kW		45kW		55kW		75kW		90kW
		4P	6P	4P	6P	4P	6P	4P	6P	4P	6P	4P	6P	4P	6P	4P
K3PU63	K3VG63	○	○	○	○	○	○	○	○							
K3PU112	K3VG112			○	○	○	○	○	○	○	○	○	○	○	○	○
K3PU180	K3VG180							○	○	○	○	○	○	○	○	○
K3PU280	K3VG280												○	○	○	○

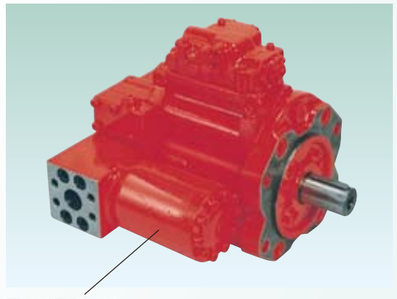
*K3PU280的4P在60Hz地区使用时，吸油侧必须要增压压力。
Boost pressure is necessary for suction port that 4P of K3PU280 is used in 60Hz.

任选元件 Option

压力脉动吸收器
REDUCED PRESSURE PULSATION TYPE

作为任选件备有降低系统噪声效果的压力脉动吸收器。

An optional pressure pulsation absorber is available for lowering the system noise.

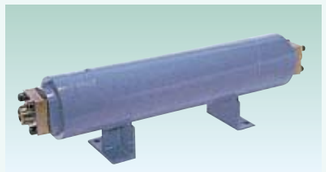


压力脉动吸收器
REDUCED PRESSURE PULSATION TYPE

脉动阻尼器(LZ用)
Pulse Dampers

通过在泵的输出管道安装脉动阻尼器，吸收输出脉动，来降低装置的噪声。

The Pulse Damper installed in the pump's delivery line effectively absorbs the pulsating flow and the noise.



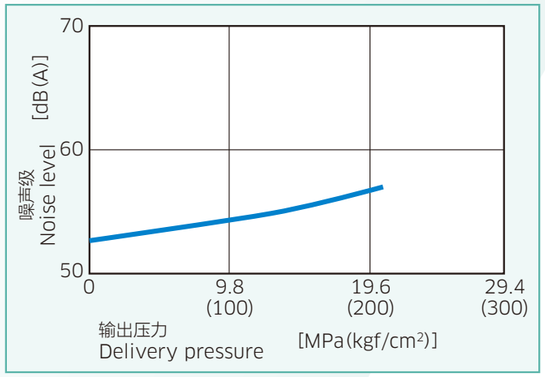
螺杆泵 Screw Pumps

B4 series

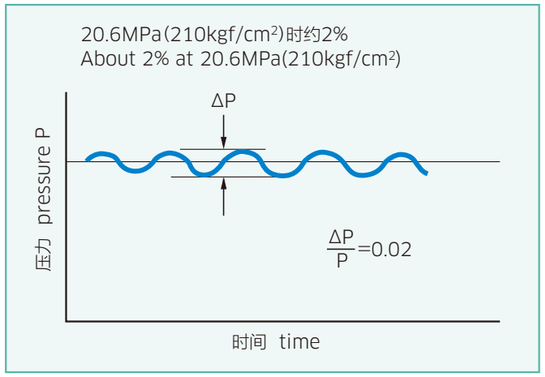
实现低噪声、低脉动的定量型泵。

Low pulsating flow delivery and low noise available for use in fixed displacement pumps.

●低噪声 Low noise



●低脉动 Low-pulsating flow



●规格 Specifications

型　号 model		B38-4L	B45-4L	B52-4L	B60-4L	B70-4L
排量 displacement	[cm³]	34.9	58.0	88.9	137.3	217.1
最高压力 max. pressure	[MPa] (kgf/cm²)	20.6 (210)				
最高转速 max. speed	[min^{-1}]	3,600				

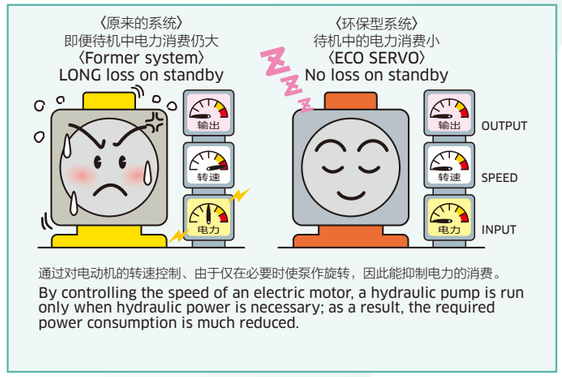
*上述的数据，根据动作条件有所不同。
The above data vary according to working condition.

电–液混合系统 Electro-Hydraulic Hybrid System

川崎环保型伺服系统
KAWASAKI ECO SERVO

通过对作为高压・大流量型具有丰富实绩的本公司液压泵的驱动电动机转速的控制，能进行高精度输出量的控制。通过此、不仅可对执行机构进行高精度控制，并还可实现节能・低噪声化。

The rotation control of the pumps which are of high pressure and large capacity type based upon our long and ample experience can control flow rate with high accuracy. This will make not only high-accuracy control but also energy-saving control and low noise of actuator possible.



通过对电动机的转速控制、由于仅在必要时使泵作旋转，因此能抑制电力的消费。
By controlling the speed of an electric motor, a hydraulic pump is run only when hydraulic power is necessary; as a result, the required power consumption is much reduced.

特　长

1. **使用高压・大流量・高效获得广泛好评的川崎柱塞泵K3VL系列。**
   峰值压力：35MPa、
   最高转速：2000min-1、
   最大输出流量：360L/min (泵排量200cm³)
2. **对应开环・闭环两种回路**
   加以标准的开环回路规格泵、以及双高压・闭环回路规格泵 (带吸油阀) 的系列阵容。可适用各种液压回路。
3. **采用变量泵**
   通过将泵排量切换成大小二级，可降低驱动扭矩，可使马达排量下降。
4. **对应伺服驱动・变频调速驱动两种方式**
   根据使用的系统，可选择控制特性优良的伺服驱动、或性能价格比优良的变频调速驱动。

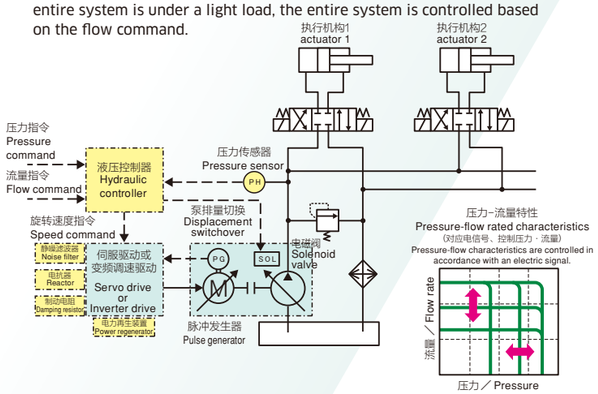
Features

1. **KAWASAKI ECO SERVO employs the KAWASAKI piston pump K3VL series product that boasts good reputation for their high pressure rating, high capacity and high efficiency.**
   Peak pressure: 35 MPa, Max. speed: 2000 min-1 Max. discharge: 360 L/min (pump displacement: 200 cm³)
2. **Applicable to both open and closed circuits**
   Employing not only the standard pump intended for open circuits but also special pumps (with suction valve) intended for reversible high-pressure and closed circuits. KAWASAKI ECO SERVO can be applied to a diversity of hydraulic circuits.
3. **Variable displacement pump is employed.**
   Through use of a variable displacement pump that is capable of two displacement settings, the necessary drive torque can be lower and the necessary motor capacity can be smaller.
4. Applicable to both servo drive and inverter drive
   To best cope with an intended system, KAWASAKI ECO SERVO can be driven by either a servo motor that boasts good control performance or an inverter motor that excels in cost-performance.

●系统回路构成 System configuration

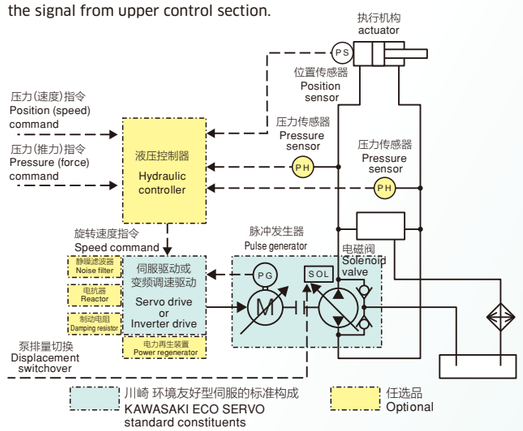
开环回路构成 Open circuit

<液压控制器:压力・流量控制>
在小负载等压力指令值以下、压力不上升时，用流量指令值来限制动作。
<Hydraulic controller: pressure-flow control>
When the pressure does not increase to the commanded level when the entire system is under a light load, the entire system is controlled based on the flow command.



闭环回路构成 Closed circuit

<液压控制器:位置・流量控制>
根据上位的切换信号、进行位置控制、压力控制。
<Hydraulic controller: position-pressure control>
Control mode is switched over to position control or pressure control by the signal from upper control section.



●规格 Specifications

型号・泵排量 Type・Pump displacement		cm³	KESP22		KESP45		KESP80		KESP112		KESP140		KESP200		KESP500
变频调速驱动 Inverter drive	电动机功率 Electric motor capacity	kW	7.5	11	22	30	30	37	37	45	45	55	75	90	
	额定转矩※3 Rated torque	N・m	47.7	70	140	191	191	235	235	286	286	350	477	572	
	最大转矩※4 Max. torque	N・m	71.6	105	211	287	287	353	353	429	429	525	715	858	
伺服驱动 Servo drive	电动机功率 Electric motor capacity	kW	5	7	7	11	11	15	22	30	37	45	45	50	
	额定转矩※3 Rated torque	N・m	23.9	33.4	33.4	70	70	95.5	140	191	236	286	286	318	
	最大转矩※4 Max. torque	N・m	71.6	100	100	210	210	286	350	477	589	716	716	796	※5
泵压力 pressure	最高使用 Max. operating	MPa	32												
	峰值 Peak	MPa	35												
最大转速 Max. speed		min^{-1}	2,000										1,800		
工作油种类 Hydraulic fluid type			抗磨性液压工作油 Antiwear hydraulic fluid ※2												
电源电压・频率 Supply voltage/frequency			200～230V、380～480V 50/60Hz												

※1：如有上述以外的泵、电动机功率组合请协商。
※2：如有使用其他工作油的情况必须垂询本公司。
※3：电动机的额定转速为1,500min^{-1}。(仅伺服驱动的5kW、7kW为2,000min^{-1})
※4：每一周期的转矩实效值请选用额定转矩以下。
※5：泵排量500cm³为个别对应。研究决定时请与本公司磋商。

※1: When considering other pump displacement and motor capacity, contact Kawasaki Precision Machinery.
※2: When wanting to use a hydraulic fluid not specified above, contact Kawasaki Precision Machinery for technical assistance.
※3: Rated speed of the electric motor is 1500 min^{-1}. (2000 min^{-1} only when the servo drive is rated at 5 kW or 7 kW)
※4: The max. torque values are short-time rating values. Be sure to select the appropriate servo or inverter drive such that the effective torque value for each cycle is below the corresponding rated torque.
※5: With regard to the specification of KESP500, please contact us.

控制器 Controller

位置・压力控制用
For position-pressure control

压力・流量控制用
For pressure-flow control

项目 Items	规格 Specification	
使用电源 Power supply	DC5V、DC24V(信号输出入用) 5 VDC/24 VDC (for signal input/output)	
指令・传感器输入 Command-sensor input	位置・压力控制用 For position-pressure control	位置信号(模拟、数字) 压力信号(模拟) Position signal (analog/digital) Pressure signal (analog)
	压力・流量控制用 For pressure-flow control	压力信号(模拟) 转速信号(模拟) Pressure signal (analog) Rotation signal (analog)

电−液控制系统 Electro-Hydraulic Control Systems

电−液伺服调节器「ROTAS-L」
Electro-Hydraulic Servo Regulator ‘‘ROTAS-L’’

「ROTAS」在1967年应用于斜轴式轴向柱塞泵的倾角控制，是利用本公司独创技术完成的，使用该部件的电−液伺服泵适用于FRP压型机，其高精度的位置・速度控制引起了很大的话题。78年开始，本公司开发的「L系列」泵，主要活跃在锻压机械领域。

High power pump control system which controls the outlet flow of high pressure, and large capacity ‘‘Lseries’’ pumps by means of electric signals.

液压压力机伺服控制器
Hydraulic press servo controller

特　长

1. 具有优良的线性、滞后小和精度高。
2. 能利用各种电输入信号进行远距离操作，实现了反馈控制的构筑。
3. 内部装有位置反馈功能，无须配置外部反馈机构。

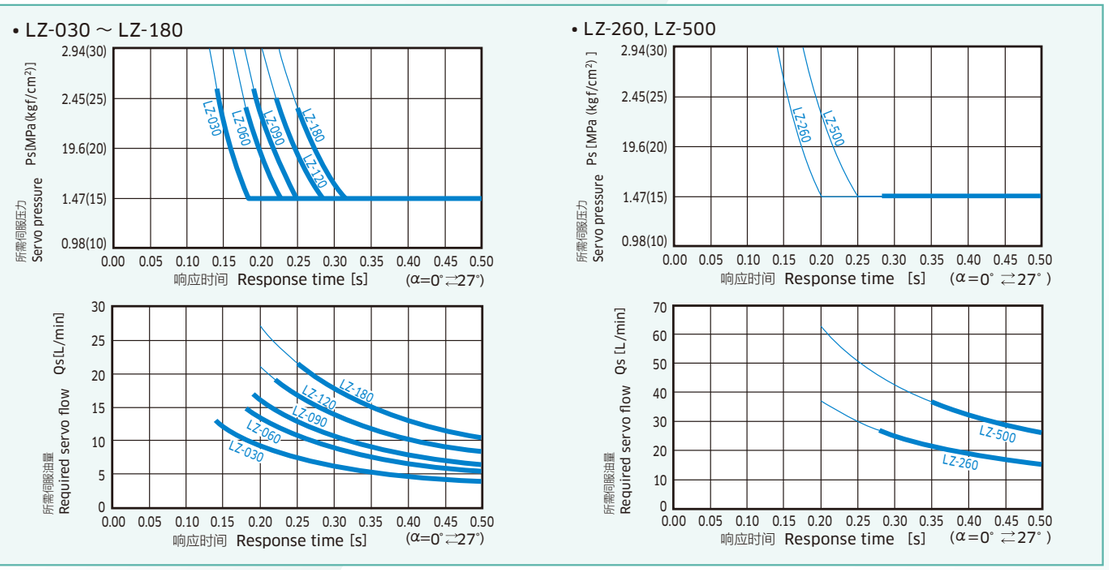
Features

1. Good linearity and low level hysteresis.
2. By receiving various electrical signals, it enables remote control systems and feed-back control systems.
3. A feed back mechanism is include inside, making the system simple (outside feed back is not necessary, unlike in servo valves).

●规格 Specifications

响应性 responsibility	阶跃响应 step response	0.3s(0°→27°)
	频率响应 frequency response	3Hz(±12.5°、−3dB)
滞后 hysteresis		1% (0.5°以下 less than 0.5°)
线性 linearity		<2%

●响应时间与所需伺服压力・所需伺服油量的关系
Relationship between response time and required servo pressure/servo flow



〈备注〉 1. 对所设计的响应时间，伺服压力・流量都请确保在如图线所示的必要值以上。
2. 即便动作时的伺服压力变化，也请不要低于1.47MPa (15kgf/cm²)。

<Note> 1. The servo pressure and flow should be the valve shown in the graph and above for the required response time.
2. The servo pressure should be 1.47MPa(15kgf/cm²) and above even if the pressure is changed.

电−液伺服调节器「ILIS」
Electro-Hydraulic Servo Regulator ‘‘ILIS’’

「ILIS」是作为斜盘式轴向柱塞泵「K3VG・K7VG」用的电−液伺服调节器。它继承了「ROTAS」的高可靠性传统的同时，加进了最新的控制技术（通过微机控制的本公司独创的PID控制方式），使高精度、高响应的控制特性进一步得到了提高。

The electric control pump K3VG/K7VG with electrohydraulic servo regulator ‘‘ILIS’’ delivers flow accurately according to the pilot voltage signal. ILIS has succeeded the advantage of the ROTAS wellreputed excellent reliability, and has further improved accurate and highly responsive controllability by the latest control technology.

特　长

1. 通过采用微机控制的本公司独创的PID控制方式，达成了高控制精度。
2. 通过在倾角传感器的反馈控制上再加上机械式泵局部反馈的双重反馈环的构成，实现了稳定的控制特性和高响应性。
3. 因使用吸力强的比例阀，所以对污染具有高可靠性。
4. 通过压力传感器的信号进行电控制。以多段折线（最大可6段），从小功率到大功率都实现了高的近似精度。
5. 利用压力传感器信号补偿泵的泄漏特性。获得了负载压力即便变化，但输出流量几乎不变的恒流量特性。

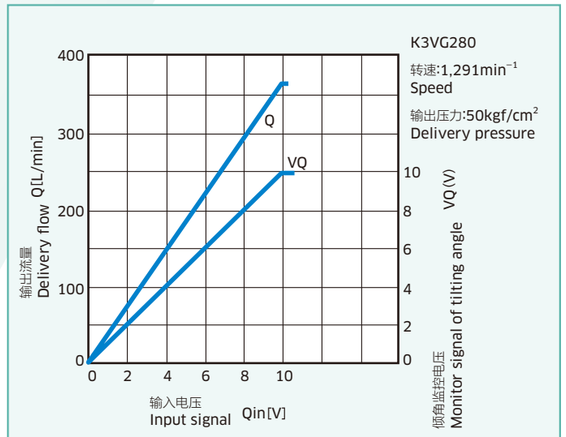
Features

1. Our original PID control system with a built-in micro-processor has achieved accurate controllability.
2. The double feedback system of the sensed tilting angle and mechanical minor-feedback has realized stable and highly responsive controllability.
3. ILIS utilizes a powerful proportional valve, and consequently retains high reliability against contamination.
4. The horsepower is electrically limited by the sensed pressure. The adoption of linear approximation with many steps (max. 6 steps) enable to control horsepower accurately from low to high power level.
5. The sensed pressure signal compensates the volumetric efficiency of pump. In spite of the delivery pressure, you will get the delivery flow in proportion to input signal.

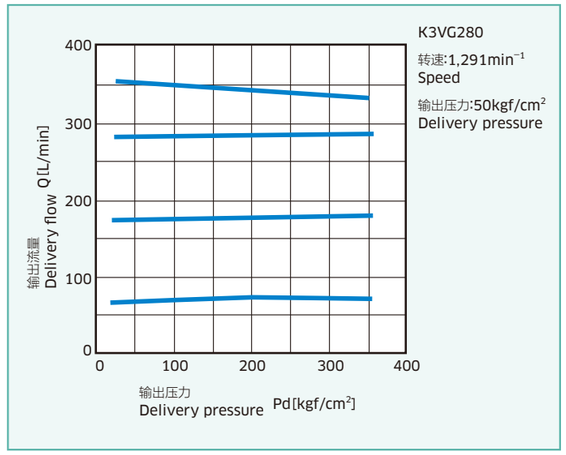
●规格 Specifications

响应性 responsibility	阶跃响应 step response	≦0.3s(0←→100%)
	频率响应 frequency response	≧3Hz(−3dB)
滞后 hysteresis		≦1%/FS
线性 linearity		≦±0.5%/FS

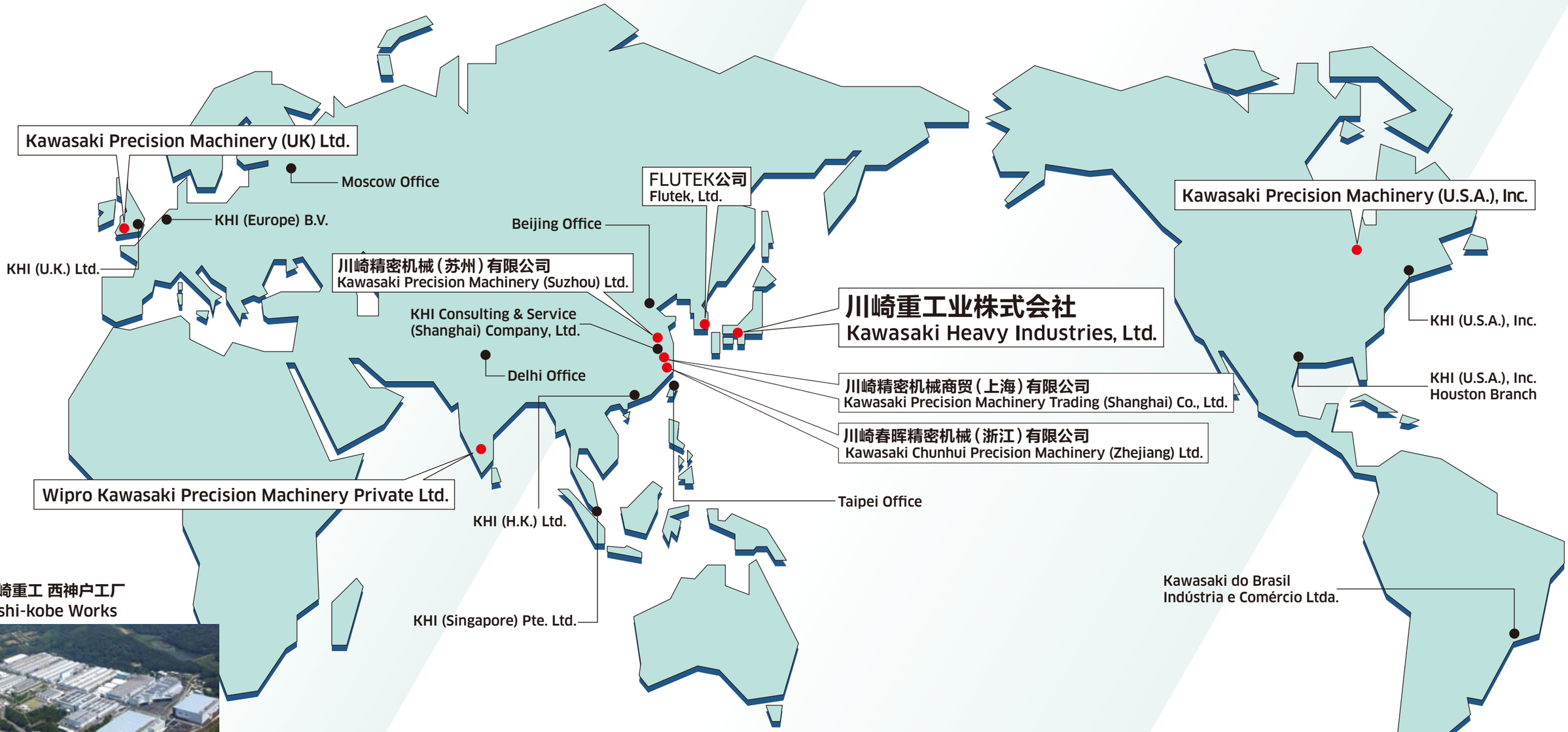
●电压—流量特性 Voltage-flow characteristics



●压力—流量特性 Pressure-flow characteristics



Global Network



川崎重工 西神户工厂
Nishi-kobe Works

Kawasaki Precision Machinery (UK) Ltd.

address : Plymouth, Devon, United Kingdom
established : December, 1993

Kawasaki Precision Machinery (U.S.A.), Inc.

address : Grand Rapids, MI, USA
established : January, 1994

川崎精密机械（苏州）有限公司
Kawasaki Precision Machinery (Suzhou) Ltd.

地址 ：中国江苏省苏州市
设立 ： 2005年12月

address : New District, Suzhou, China
established : December, 2005

川崎春晖精密机械（浙江）有限公司
Kawasaki Chunhui Precision Machinery (Zhejiang) Ltd.

地址 ：中国浙江省上虞市
设立 ： 2009年8月

address : Shangyu, Zhejiang, China
established : August, 2009

Flutek, Ltd.

address : Changwon, Kyungnam, Korea
established : May, 2000

Wipro Kawasaki Precision Machinery Private Ltd.

address : Bangalore, India
established : December, 2011