

Messrs. _____

1000+ units supplied in the markets!!

Total solution of conventional hydraulic problems

The brief guide to DDV Hydraulic Servo Pump For half-reduced energy consumption and noise.

(Direct Drive VolumeControl Pump)

27 varieties available in the total series



Small type

GA-03/1.5

Non-leak reversible piston pump:

AC servo motor : 1.5kw



large capacity

HL-70/30

Non-leak reversible piston pump: 70cc/rev.

AC servo motor :30kw

Opton Co.,Ltd.

Ver.2.1

◆ **Reliable problem solution is offered with 15-years long experience with large-sized hydraulic-powered bending machines**

Opton “DDV” products serve the total and perfect functions by the N/C supported hydraulic facility of new generation built-in to shoot the intrinsic problems to conventional hydraulic systems that includes poor accuracy, high-noise, high heat generation and large coolant facility.

◆ **Two major applications proposed**

- ① By replacing the conventional hydraulic facility of the machine currently at service by Opton DDV Hydraulic Servo Pump System, the production with save-energy and -space yet with enhanced-accuracy comes realistic to make differentiation against competitors.
- ② Opton DDV Pack serves the total and perfect solution of the production problems intrinsic to the hydraulic systems currently installed to the machines.

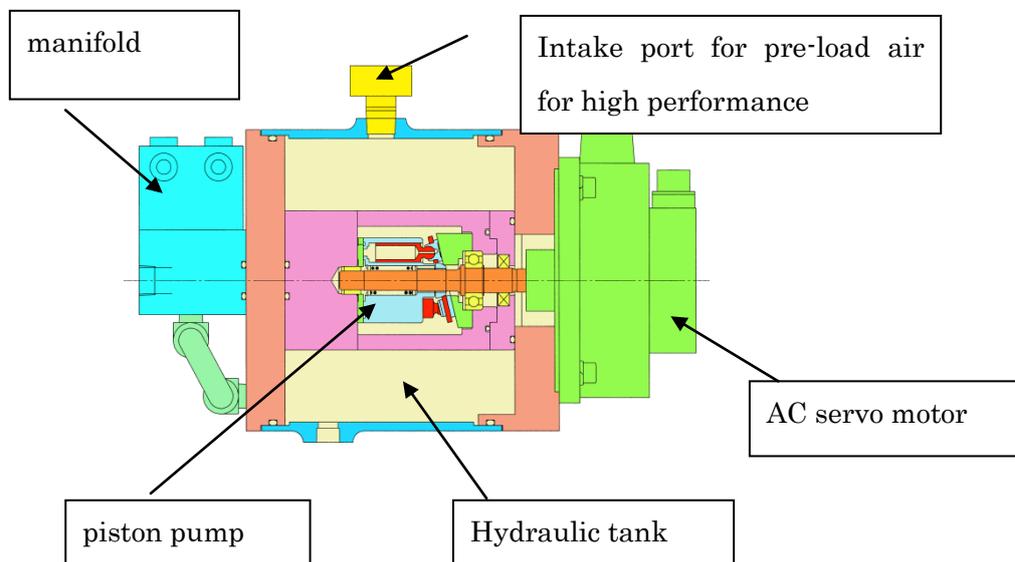
1. Opton’s original designed 「DDV Hydraulic Servo pump」

- ① **High-accuracy performance has been realized with total elimination of electro-magnetic valves from the hydraulic system.**

The product is built in hybrid structure that is composed of non-leakage and fixed-displacement piston of reversible type, AC-servo motor.

Velocity, direction and thrust forth of the cylinder motion are controlled by the turning speed, direction and the torque of the AC servo motor.

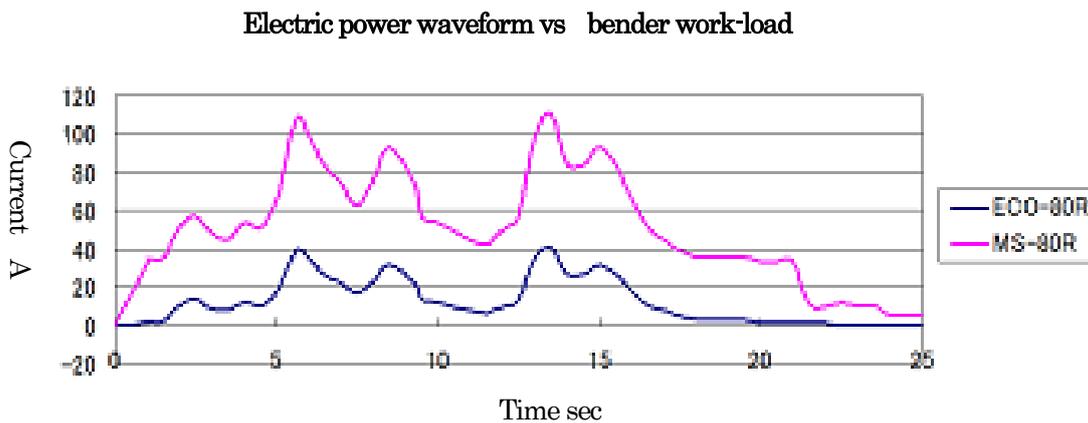
Thanks to the piston pump at the end of AC motor that works as the reducer of hydraulic pressure, hydraulic performance can be directly mirrored by the one of AC servo motor. This indicates that no electro-magnetic valve is needed for the pressure control and that manufacturing accuracy needs not depend on the hydraulic temperature.



②Power consumption in half, noise to 1/10 by Opton DDV vs. conventional hydraulic systems

The conventional hydraulic servo valve system causes high heat generation when hydraulic media runs through narrow path of throttle valve. 50+% of the input electricity is only consumed as heating, thus leading the effective work of electricity down to less than 50% Another disadvantage is that large-sized hydraulic tank, complicated distribution channels and pump vibration resonant to cause big noise.

Because of no throttle valve installed and the cylinder pump activating only in time needed, Opton DDV system works at the input electricity efficiency of 95+% or with less than 5% loss for heating energy, thus leading to the noise generation around 1/10 of those of conventional systems.. With the DDV installed, the Opton bender has marked the energy consumption less than 1/3 of the conventional case.



Power consumption of Opton Bender ECO-80 the ECO-approved
by the Japan Forming Machinery Association

= 1 / 3

Old Opton model of MSO-80-R

③Hydraulic consumption is as few as 500ml for the smallest capacity of the series. No coolant media/device needed.

Large-sized hydraulic tank and coolant facility are the “must” to control the temperature and quality degradation of the media for conventional hydraulic systems.

Opton’s non-leak type DDV pump causes only minimized level of heat generation and subsequent lower degradation of hydraulic media, no large-sized hydraulic tank. Because 1/10 or less of the hydraulic media only needed which is enough for cooling by air.

④ Easiest precision enhancement with N/C embedded can be met for upgrading hydraulic-operated machinery by their remodeling and/or original built-in to new models. Typical cases as below:

1) Remodeling of the machine currently at service with servo-valve operation into the one with up-graded save-energy and higher-accuracy version.

The case required to install a linear scale to the N/C axial cylinder after removal of complicated distribution channels, the valves and a large tank.

One DDV pump needs be installed to the machine with cylinder control for serial operation only, while corresponding numbers of DDV pumps be installed to the machine that includes cylinders for parallel operation. By new mounting of DDV controller, an old machine can be reborn as an excellent N/C machine.

2) DV as original equipment to the machines designed for space-, energy-saving and higher accuracy performance

Conventional driving system with AC servo motor and ball-screw can be replaced by DDV pump with hydraulic cylinder built-in.

By this replacement, instantaneous operation torque can be increased in triple for several seconds, and suites to work for press-machining where large instantaneous power is needed.

Thanks to shock-absorbing by the hydraulic cylinder, remarkable reduction of machine breakdown is expected.

⑤ Client original products can enjoy remarkable production cost-saving by embedding DDV system with high performance at low cost.

Unlike conventional hydraulic system with many single-work valves and complicated distribution channels for cylinder control, the DDV Pump actuates the reversible hydraulic pump with AC servo motor to control all of the required cylinder motions. By eliminating a large-sized tank, electro-magnetic valve and complicated hydraulic channels, the DDV product works as a big contributor for cost saving.

2. DDV Pack/DDV pump and controller all in one package

① Easy remodeling of conventional machine for upgrading to that of hydraulic performance with N/C built-in

An economic pack series is available for convenient application including DDV Hydraulic Servo Pump with N/C.

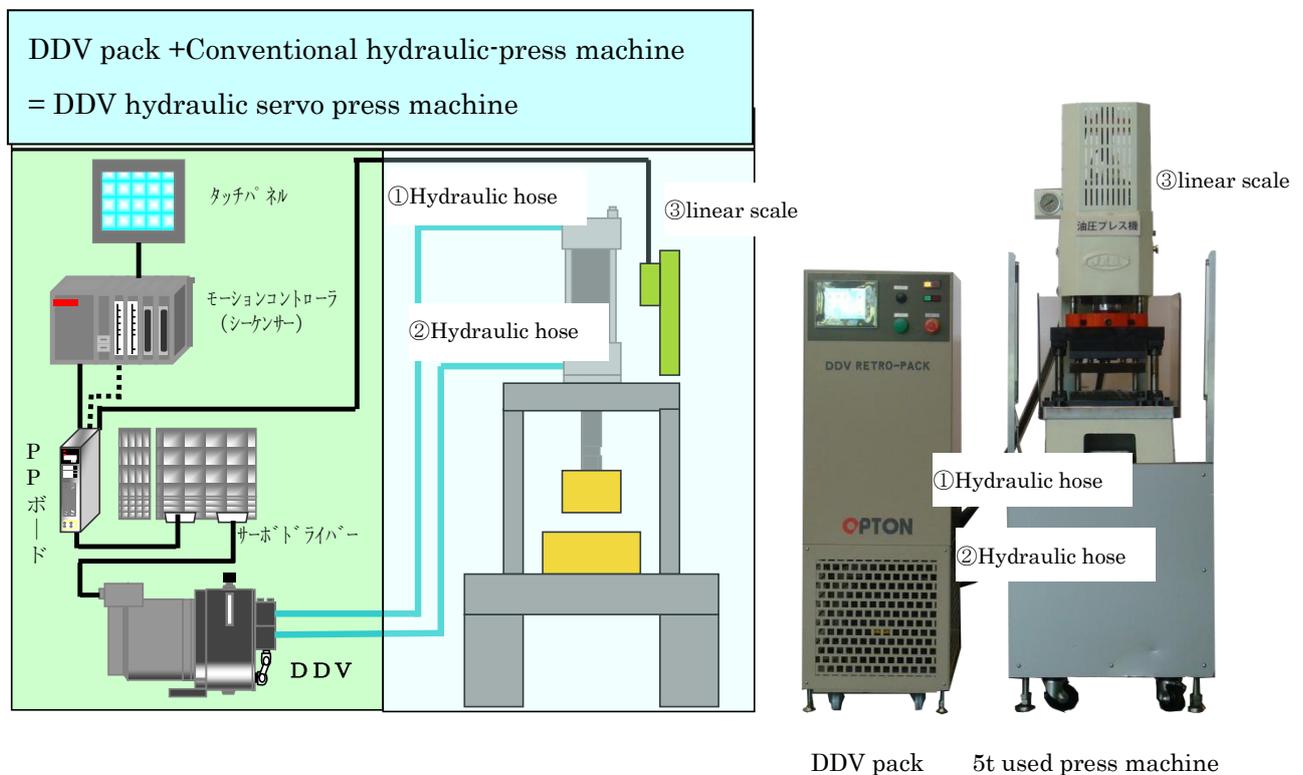
With this pack being built in the machinery, the machines currently at service or newly-designed can be easily upgraded to the version of N/C hydraulics by client's self engineering force.

By taking the typical three steps as below, the machine at service can be easily graded-up to that of N/C built-in;

Step 1: Install linear scale.

Step 2: Remove old hydraulic hoses

Step 3: Install. New hoses.



Opton is pleased and ready anytime to offer a custom-designed DDV Pack to meet the market demand.

3. Application examples of DDV-embedded products

- **For application in Opton machinery**

- CNC Pipe Benders
- CNC Hammering-impact Hydrformer
- CNC Multibender
- CNC pipe multibender
- CNC Stretch Bender
- Pierce-burring machine
- Endforming machines

- **For application in client-designed machinery**

- ①【Metal forming industries】

- 1) For press-related machinery

- Press machine
- Press-brake
- Wheel-rib caulking machine
- Roll press former
- Powder molding machine
- Laminate caulking machine
- Press die cushion
- Scudding press

- 2) [Metalwork-related industries]

- Spinning machine
- Bulging machine
- Tube expander
- Flow-forming machine
- Plate-spring end former
- Rolling machine
- End-former
- Press-cutting machine
- Rolling machine

- ② [Plastic molding industries]

- Plastic Injection molding machine
- Vertical die-clamper for plastic injection molding machine

- ③[Part-insertion]

- Press-fitting machine
- Tire-infalter

- ④ [Others]

- Plate-spring line transfer
- Casting-gate controller
- Paper rolling machine
- Automatic film winder

And many others for 1000-plus installation

In starting feasibility study

For starting a study on Robot Bender series, followings are offered:
Please pick up any one below that most suites your initial interest.

1. Opton staff visit to an inquirer is offered to make detailed presentation including demonstration, the specification documents and application examples by DVD.
2. Opton factory visit by an inquirer is most welcome where DDV demonstration is held including a NC press machine with DDV pack embedded.
3. Opton is pleased to offer an optimized application plan based on the inquirer's information available including hydraulic cylinder specification with lubrication chart and activating time etc. N/C related advice can also be provided if the case is found feasible.
4. An application booklet is offered to all enquiries.

Opton stays always ready to meet anyone above