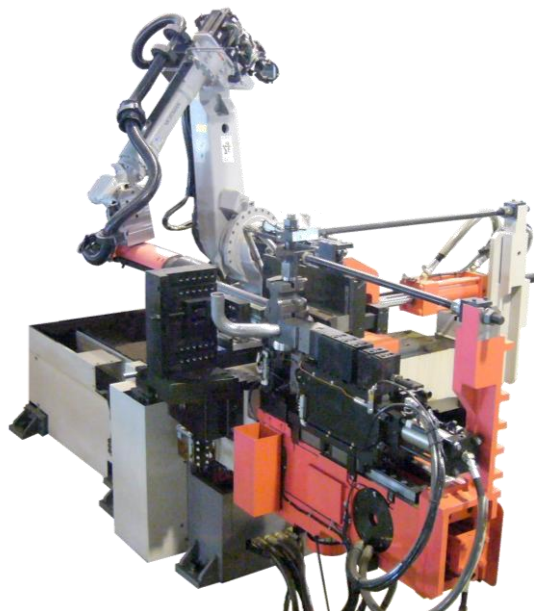


Messrs. \_\_\_\_\_

Next-generation machines for large-sized work piece in dia and length.

Just suitable machines for saving set-up work, installation space, labor, energy and noise

## The brief guide to G-WIN Robotic Bender ( 3 ranks of E,C O)



Opton Co.Ltd.

Ver. 1

## Heavy-duty Robotic Benders G-WIN Series

Large-sized robot benders are available as followings;

① G-WIN Series

total 11 types available all with the large-capacity bending robot stationed on the ground, and with 6-axis motion implemented for DBB, POB, loading, unloading and mold changing.

② 1D-bending with cutting-off of a work piece is optionally equipped in all types in G-WIN series.

**【 1 】 3 varieties each of all 11 types of machine for an optimal investment choice for bending business**

① Bending data entry is executed same as in other Opton benders.

② Loading/unloading is controlled through the teaching pendant controller that is of standard to robot benders.

Same molds can be mounted as those for ECO series.

③ Same bending head is mounted as the one for ECO series that allows mandrel unit and wiper to be installed.

④ For tool setting, mounting of the roll-supporting rod is manually handled by an operator while mounting of the rolls, pressure dies and clamp dies is handled by the robot. The removed dies are transferred by the robot into a die-storage box. The time needed for this set-up would be less than 1/3 of that of conventional benders.

⑤ For a work piece with pre-loaded part or any obstacles between bending points, the robot raises to forward the work piece with simultaneous POB motion into right positioning on the bend-roll.

⑥ Three varieties for each type available as following depending on driving specification;

Class-E: All electric powered and numerically controlled.

Great advantages in low-energy needed and –noise as well as in accuracy, but, because of motor-driven mechanism being fully employed, its total design may give way in simplicity to those of other classes.

Class-C:Electrically-powered DOB while clamp-/pressure- die and chucking powered by conventional hydraulic system.

Thanks to the cylinders employed in place of motor as in the class E, design of the total machine is more simplified.

Class O:Electrically-powered DOB while clamp-/pressure- dies and chucking powered by conventional hydraulic system. Booster by N/C servo valve. Machine performance grades down to reasonable level in terms of energy consumption, noise and accuracy.

The initial cost goes downwards from the class-E as highest, C to O as the lowest.

- ⑦ The robot can transfer a work piece to a separate 1-D bender as an intermediate process.
- ⑧ The installation floor space gets smaller than those of the ECO-series if the facility is systematized.
- ⑨ The initial cost if systematized will get smaller than the case with ECO model.
- ⑩ Higher productivity bending can be achieved by proper choice of chucking device either from chucking-at-work-end, chucking-at-work-center, chucking on a pre-mounted part or any other depending on the specification of pre-mounted part on a work piece.
- ⑪ Taking the advantage of final bending motion at time of unloading, total review production system becomes very feasible including cutting of working material, pre-mounting of parts, end-forming and quality inspection etc. Many successful cases have been established where these review for systematized facility has brought the production of varied specifications at small lot can be best met towards the productivity being enhanced to twice to as high as fivefold.
- ⑫ With the power of the surface profiler of 「Cloudforma」 and the integrated data management software 「Bendmaster」, ultimate FA system comes very realistic for pipe deformation business

## **【 2 】 Wide selection of the plans available for work sizes, investment cost and manufacturing cost.**

With the robot main frame being fixed on the installation floor, its with bending head performs DBB, POB , loading/unloading and tooling set-up as well. Please refer the Robot Bender Series Table A.

### **①Type-35**

- 6-axis Robot carrying capacity 100kg.
- The robot holds a chuck. The chuck can be of variable-capacity for multi work sizes.
- Thanks to the easiest tool selection access by the motion of the robot itself, the robot bending head with standard 5-stack tooling capacity can be modified to max. 7 stack capacity if needed without devising adjustment parts thus leading no additional cost involved.
- The power sources is available from three choices, all-electric for DOB, pressure/clamp die and booster (or class E with no coolant), DDV hydraulic (class C with air cooling), or conventional hydraulic (O rank with water cooling).
- The performances go degraded in order of the class E, C then to O in terms of energy consumption, accuracy and noise.
- The initial cost goes cheaper in order of the class E, C and to O.

### **②Type-45**

- 6-axis Robot carrying capacity 100kg.
- The robot holds a chuck. The chuck can be of variable-capacity for multi work sizes.
- The standard bending head for max 5-stack tooling.
- The power sources is available from three choices, all-electric for DOB, pressure/clamp die and booster (or class E with no coolant), DDV hydraulic (class C with air cooling), or conventional hydraulic (Class O with water cooling).
- The performances go degraded in order of the class E, C then to O in terms of energy consumption, accuracy and noise.
- The initial cost goes cheaper in order of the class E, C and to O.

### ③Type-50

- 6-axis Robot carrying capacity 100kg.

The robot holds a chuck. The chuck can be of variable-capacity for multi work sizes.

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- The standard bending head for max 5-stack tooling.
- The power sources is available from three choices, all-electric for DOB, pressure/clamp die and booster (or class E with no coolant), DDV hydraulic (class C with air cooling), or conventional hydraulic (Class O with water cooling).
- The performances go degraded in order of the class E, C then to O in terms of energy consumption, accuracy and noise.
- The initial cost goes cheaper in order of the class E, C and to O.

### ④Type-60

- 6-axis Robot carrying capacity 100kg.

The robot holds a chuck. The chuck can be of variable-capacity for multi work sizes.

- The standard bending head for max 5-stack tooling.
- The power sources is available from three choices, all-electric for DOB, pressure/clamp die and booster (or class E with no coolant), DDV hydraulic (class C with air cooling), or conventional hydraulic (Class O with water cooling).
- The performances go degraded in order of the class E, C then to O in terms of energy consumption, accuracy and noise.
- The initial cost goes cheaper in order of the class E, C and to O.

### ⑤Type-70

- 6-axis Robot carrying capacity 100kg.

The robot holds a chuck. The chuck can be of variable-capacity for multi work sizes.

- The standard bending head for max 5-stack tooling.
- The power sources is available from three choices, all-electric for DOB, pressure/clamp die and booster (or class E with no coolant), DDV hydraulic (class C with air cooling), or conventional hydraulic (Class O with water cooling).

- The performances go degraded in order of the class E, C then to O in terms of energy consumption, accuracy and noise.
- The initial cost goes cheaper in order of the class E, C and to O.

### ⑥Type-80

- 6-axis Robot carrying capacity 100kg.
- The robot holds a chuck. The chuck can be of variable-capacity for multi work sizes.
- The standard bending head for max 5-stack tooling.
- The power sources is available from three choices, all-electric for DOB, pressure/clamp die and booster (or class E with no coolant), DDV hydraulic (class C with air cooling), or conventional hydraulic (Class O with water cooling).
- The performances go degraded in order of the class E, C then to O in terms of energy consumption, accuracy and noise.
- The initial cost goes cheaper in order of the class E, C and to O.

### ⑦Type-85

- 6-axis Robot carrying capacity 100kg.
- The robot holds a chuck. The chuck can be of variable-capacity for multi work sizes.
- The standard bending head for max 5-stack tooling.
- The power sources is available from three choices, all-electric for DOB, pressure/clamp die and booster (or class E with no coolant), DDV hydraulic (class C with air cooling), or conventional hydraulic (Class O with water cooling).
- The performances go degraded in order of the class E, C then to O in terms of energy consumption, accuracy and noise.
- The initial cost goes cheaper in order of the class E, C and to O.

### ⑧Type-90

- 6-axis Robot carrying capacity 100kg.
- The robot holds a chuck. The chuck can be of variable-capacity for multi work sizes.
- The standard bending head for max 5-stack tooling.

- The power sources is available from three choices, all-electric for DOB, pressure/clamp die and booster (or class E with no coolant), DDV hydraulic (class C with air cooling), or conventional hydraulic (Class O with water cooling).
- The performances go degraded in order of the class E, C then to O in terms of energy consumption, accuracy and noise.
- The initial cost goes cheaper in order of the class E, C and to O.

### ⑨ Type-100

- 6-axis Robot carrying capacity 100kg.
- The robot holds a chuck. The chuck can be of variable-capacity for multi work sizes.
- The standard bending head for max 5-stack tooling.
- The power sources is available from three choices, all-electric for DOB, pressure/clamp die and booster (or class E with no coolant), DDV hydraulic (class C with air cooling), or conventional hydraulic (Class O with water cooling).
- The performances go degraded in order of the class E, C then to O in terms of energy consumption, accuracy and noise.
- The initial cost goes cheaper in order of the class E, C and to O.

### ⑩ Type-130

- 6-axis Robot carrying capacity 100kg.
- The robot holds a chuck. The chuck can be of variable-capacity for multi work sizes.
- The standard bending head for max 5-stack tooling.
- The power sources is available from three choices, all-electric for DOB, pressure/clamp die and booster (or class E with no coolant), DDV hydraulic (class C with air cooling), or conventional hydraulic (Class O with water cooling).
- The performances go degraded in order of the class E, C then to O in terms of energy consumption, accuracy and noise.
- The initial cost goes cheaper in order of the class E, C and to O.

### ⑪ Type-150

- 6-axis Robot carrying capacity 100kg.
- The robot holds a chuck. The chuck can be of variable-capacity for multi work sizes.

- The standard bending head for max 5-stack tooling.
- The power sources is available from three choices, all-electric for DOB, pressure/clamp die and booster (or class E with no coolant), DDV hydraulic (class C with air cooling), or conventional hydraulic (Class O with water cooling).
- The performances go degraded in order of the class E, C then to O in terms of energy consumption, accuracy and noise.
- The initial cost goes cheaper in order of the class E, C and to O.

### 【 3 】 Application versatility of G-WIN Robot Benders

- ① Suitable to heavy-duty bending works of varied sizes at small production lot yet with labor-saving typically for hydraulic distribution pipe of construction machines, boiler pipe and car-mufflers.
- ② Opton is most pleased to introduce attractive application cases to help finding out the best suited G-WIN Robot Bender to meet the production requirements.
- ③ Followings are partial examples for G-WIN Robot Bender application;
  - Automated production system with T-Win Robot Bender, Pipe Cutter and End-Forming machine,
  - Automated production system with T-Win Robot Bender, stocker and AB Bender (one point bender)
  - Automated production system with T-Win Robot Bender, stocker and cut-off device.

### 【 4 】 Option 「user-maintenance 」 backed up by Oprton

- ① After-market service is fully maintained by Opton and the robot supplier. メン
- ② With the combined power of optional MAT ( maintenance analyzer software or traceable computing system) and 「Trouble Shooting」 in the Opton HP, user's self maintenance comes realistic towards preventative maintenance that will lead to remarkable elimination of machine down-time and maintenance cost.



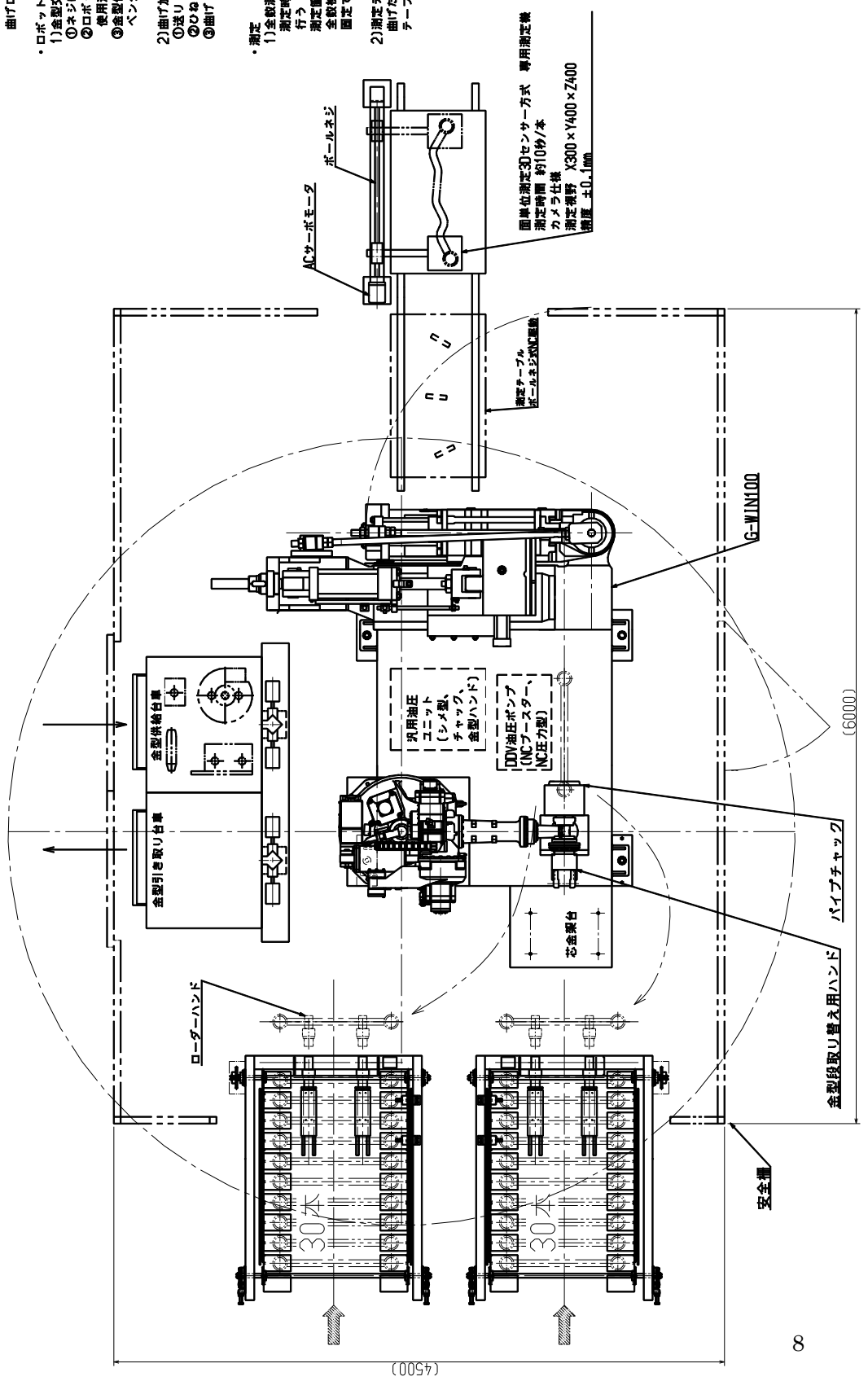
# 金型半自動交換 全数検査 G-WIN型 SK式パイプ曲げ加工システム

- ・ローダー (2台)
  - 1) 重量パイプの両端に、金具が付いたパイプを30本スタック出来る水平型ローダー。最前部に1本取り出しハンドを持っている。
  - 2) 送り・ひねり・ローディング・アンローディング・金型交換機能をもったロボットがローダー1本取り出しハンド上のパイプを取り、曲げロールにセットする。

- ・ロボットベンダー
  - 1) 金型交換 (ロボットの標準タイミング指示)
    - ① ネジは人手が締め・外しする。
    - ② ロボットが、金型を取り外し、使用済みを金型引き取り台車に置く。
    - ③ 金型供給台車にある次の製品用の金型を、ベンダー曲げヘッドの所定位置にはめ込む。

- 2) 曲げ加工 (パイプ中心線XYZインアップ方式)
  - ① 送り ロボットの運搬機機構で行う
  - ② ひねり ロボットの円周機機構で行う
  - ③ 曲げ 地上に固定した曲げヘッド内のACサーボモーターで行う

- ・測定
  - 1) 全数測定を行う
    - 測定時間は、1測定箇所につき4秒タクト以下で行う
    - 測定箇所が多く、1台のカメラの移動方式で全数検査にタクトが不足する場合は、カメラ固定で台数を増やす方式で行う
  - 2) 測定テーブルが、ベンダーヘッド近くまで来る。曲げたパイプをロボットが受け取り置く。テーブルが所定の位置に戻ると測定が始まる



## In starting feasibility study

For starting a study on G-WIN Robot Bender series, followings are offered:

Please pick up any one below that most suites your initial interest.

- 1 . We are pleased to offer presentation with more detailed series table of G-WIN Root Benders.
2. Opton factory visit by an inquirer is most welcome where G-WIN Robot Benders are exhibited for demonstration.
3. Opton staff is pleased to make a visit to an inquirer for the best proposal upon Opton's receipt of inquirer's product information covering the title, OD, thickness, material, Q'ty of production, repetitiveness of production etc.

Opton stays always ready to meet anyone above