

Dream of Human-Oriented Technology

Auto gas coupler system

(A: Auto, CVS : Control Valve System)



WOOJIN INC.

Auto gas control system

The gas control system consists primarily of a valve station with PLC, flow meter and main control console in the control room.

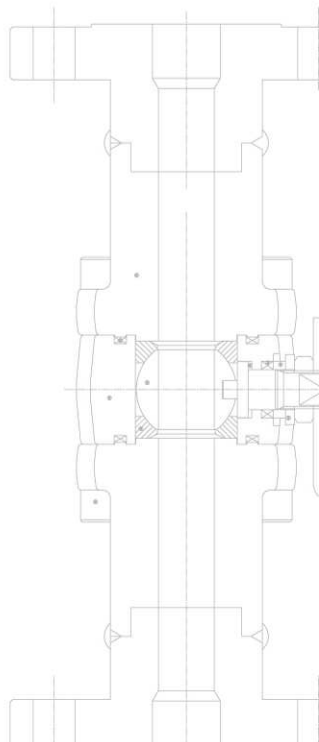
An additional control box for local operation control can also be optionally provided.

Good reasons for the Woojin auto gas coupling system

- Safety for operation personnel—no activities in dangerous areas
- Sitting in the ladle seated part of ladle car to ensure equipment which is protected from slag scattering
- Quick and safe connection by simply placing the ladle onto stirring station
- High flexibility—compensates for possible misaligned ladle position
- Low maintenance—simple and sturdy design with good access
- Compact and solid construction—especially important in case of limited space
- Reliable operation —no need of utilities

It sits in the ladle seated part of ladle car to ensure equipment is protected from slag scattering

Technical Description



▶ Gas connecting points

- 1 Type A—CVS 1
- 2 Type A—CVS 2
- 3 Type A—CVS 3

▶ Stirring gas

Argon or Nitrogen
alternative : compressed air for cooling

▶ Gas supply capacity

0 – 1500 NL/min (0 – 53 st.cu.ft./min)

▶ Maximum pressure 21 bar

▶ Sealing compound metal/metal

▶ Max. temperature of operation

300C(600F) standard
500C(984F) high-temp 'H' (optional)

Lower Section

| | | |
|----------------------|--|---------------------|
| Quantity | 1 unit per ladle station | |
| Attached to | ladle station ladle car, ladle furnace, degassing tank, Ladle turret | |
| Attached with | 1 pc. Console to be bolted to steel frame | |
| Dimensions (LxWxH) | 190x300~400mm Type A—CVS 1 | |
| | 190X300~400mm Type V—CVS 2 | |
| | 190x300~400mm Type V—CVS 3 | |
| Horizontal clearance | +/- 40mm | X-, Y- axis |
| Pipe connection | DN20 (3/4") | flexible metal hose |

Upper Section

| | | |
|-----------------|------------------|---------------------------|
| Quantity | 1 unit per ladle | |
| Attached to | ladle shell | side wall or bottom plate |
| Attached with | 1 pc. bracket | to be welded to ladle |
| Pipe connection | DN20 (3/4") | steel pipe |

Auto gas coupling system

The challenge

The stirring gas supply to ladles must withstand a high load of dust, weight, misalignment and sometimes even high temperature. Nevertheless, the coupling system has to operate at high availability, and a modern gas coupling system must additionally provide the best possible safety for the operating personnel.

Our solution

The WOOJIN's Auto gas coupler system is a quick, safe, reliable and maintenance friendly connection device for the stirring gas supply to the steel ladle. The system actuates immediately and automatically when the ladle is placed onto the ladle station or onto the transfer car. It safeguards the ladle automatically without the need for personnel to connect hoses to the supply source.



Auto gas coupler system

(A: Auto, CVS : Control Valve System)



Function

Auto gas coupler system connects the stirring gas supply automatically by placing the ladle on the ladle car on the ladle stand.

Gas coupling system consists of a male part which is installed on the ladle car and a female part which is fixed on each ladle.

Therefore, it ensures equipment reliability in the high-temperature, dust, and SLAG scattering areas.

The male and female part are pressed together and the stirring gas supply is connected automatically by placing the ladle on its station via a crane.

Valve system

The Gas control unit supplies the precise quantity of purging gas to the inside Ladle, irrespective of back pressure.

Auto gas coupler system



Technical Data

- ▶ Stirring gas : Argon or Nitrogen, others on request
- ▶ Working pressure : 5 ~ 21 bar
- ▶ Flow rate per line : 1500 NL/min
- ▶ Tolerances : horizontal (x,y) ±40 mm
- ▶ Pipe connections : 3/4"

Available Types

- ▶ Single Coupling Type A-CVS 1 1 inert gas line
- ▶ Double Coupling Type A-CVS 2 2 inert gas lines
- ▶ Triple Coupling Type A-CVS 3 3 inert gas lines

Technical Description

- ▶ SINGLE VERSION Type A-CVS 1
- ▶ DUAL VERSION Type A-CVS 2
- ▶ TRIPLE VERSION Type A-CVS 3

Auto gas coupler system is quick, safe reliable and maintenance friendly connection device for the stirring gas supply to the steel ladle.

The system actuated immediately and automatically when the ladle is placed onto the ladle station or onto the transfer car.

Applications

- Ladle furnace, Pouring ladle during tapping from converter, EAF
- Ladle stirring station, VOD, etc.
- Ladle turret of continuous casting machine
- Deslagging station, Special applications, tailor made for any customer needs



Gas valve station is the well-proven and reliable gas system



In the Gas valve arrangement, individual sections are joined together into two or three functional units to efficiently utilize space. The independent supply, as well as the safe separation of the two or three gases is an additional benefit that this system offers.

The connection between the lower and upper section is completed automatically when a ladle is placed onto the ladle treatment stand, ladle car, ladle furnace etc.

Gas valve station allows independent gas supply to the two porous bottom plugs or the usage of two different gases simultaneously.

The compact lower section is equipped with spring-loaded pins, which allow flexibility in the X- and Y- axis planes This principle enables the unit to compensate for a possible misaligned ladle position. The connection of the lower section to the gas supply lines consists of flange O-Ring The upper sections are attached to the metallurgical ladles and consist mainly of the pipe lines on the Saddle of side of the Ladle to connect with the Flange O-Ring of the lower section.

The Flange O-Ring sits tight in the Saddle of side of the Ladle without any seal. The upper section has outlets for the gas supply to the porous plugs of the ladle Auto gas coupler system consists of each pipe line, which allows independent gas supply at different pressure.

Introducing the automatic gas coupling system High flexibility and low maintenance

Auto gas supply

Auto gas coupler system is the well-proven and reliable single-gas system (A-CVS 1).

In Auto gas coupler system arrangement, individual sections are joined together onto two or three functional units to efficiently utilize space.

The connection between the lower and upper section is completed automatically when a ladle is placed onto the ladle treatment stand, ladle car, ladle furnace etc.

Auto gas coupler system allows independent gas supply to the two or three porous bottom plugs or the usage of two different gases simultaneously.

Highlights

The compact lower section is equipped spring-loaded Flange O-Ring, which allows flexibility in the X- and Y- axis planes.

This principle enables the unit to compensate for a possible misaligned ladle position.

The connection of the lower section to the gas supply lines is made by a flexible metal hose

General data

- ▶ **Stirring gas** : Argon or nitrogen
- ▶ **Working pressure** : 1 ~ 21 bar
- ▶ **Flow rate per line** :
 - A-CVS 1 – up to 2500 NL/min
 - A-CVS 1/2/3 – up to 1500 NL/min
- ▶ **Tolerances** : horizontal(x,y)
 - A-CVS 1 – 80mm
 - A-CVS 1/2/3 ? 80mm
- ▶ **Single coupling type** :
 - A-CVS 1 – 1 inert gas line
 - A-CVS 2 – 2 inert gas line (compact version)
- ▶ **Double coupling type** : A-CVS 2 – 2 inert gas lines
- ▶ **Triple coupling type** : A-CVS 3 – 3 inert gas lines
- ▶ **Applications** :
 - Ladle furnace
 - Pouring ladle during tapping from converter or EAF
 - Ladle stirring station, VOD, RH, etc.
 - Ladle turret of continuous casting machine
 - Deslagging station