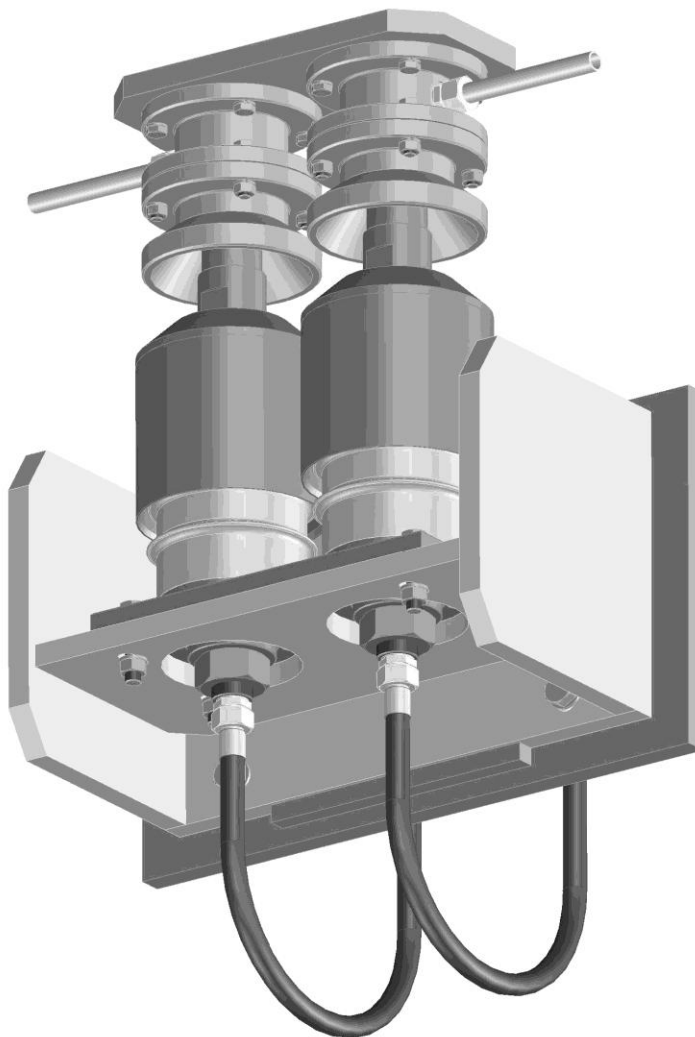


# **C** AUTOMATIC RAPID STIRRING GAS COUPLING SYSTEM



## FUNCTION

The purpose of the automatic gas coupling system is to connect the stirring gas supply automatically by placing the ladle on the ladle car or on the ladle stand.

The rapid gas coupling system consists of a lower section which is installed on the ladle car etc. and an upper section which is fixed on each ladle.

By placing the ladle on its station via crane, the upper and lower part are pressed together and the stirring gas supply is connected automatically.

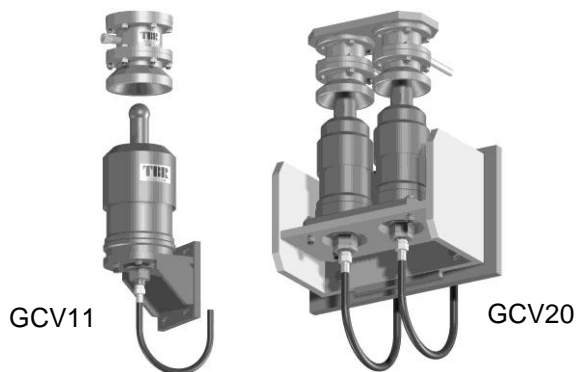
In a combined system: The gas control unit supplies the precise quantity of purging gas, irrespective of back pressure.



## AVAILABLE TYPES

Single Coupling	Type GCV 6	for one line (Mini – NEW)
Single Coupling	Type GCV 10	for one line (compact application)
Single Coupling	Type GCV 11	for one line
Dual Coupling	Type GCV 20	for two lines
Triple Coupling	Type GCV 30	for three lines

This high temperature solution enables the application in VD-and VOD-plants.







## TECHNICAL DESCRIPTION

TBR stirring gas connecting system is a quick-, safe-, reliable- and maintenance-friendly automatic connection device for the stirring gas supply to the steel ladle.

The system is actuated immediately and automatically by placing the ladle on ladle station or on the transfer car.

The application of the system safeguards the supply the stirring-gas to the ladle automatically without the need of any personnel for coupling hoses to the supply source.

This system can be used for:

-  ladle furnace, teeming ladle during taping from converter, EAF
-  ladle stirring station, VOD, etc.
-  ladle turret on continuous casting machine
-  deslagging-station, special applications, tailor made for any customer needs

The multiple-gas version is a mirror image of the well-proven and reliable mono-gas system. In the multiple-gas arrangement, the individual sections are joined together into two 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.

Completing the connection between the lower and upper section is done automatically when a ladle is placed onto the ladle treatment stand, ladle car, ladle furnace etc. The multiple gas version allows for 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 for flexibility in the X-, Y-and Z-axis plane. This principle enables the unit to compensate for possible misaligned of the upper and lower sections, in the event these two sections are not properly positioned relative to each other. The connection of the lower section to the gas supply lines consists of steel flexible metal hoses.

The volume of gas supply is controlled by the control valve pulpit, which allows the operator to use the inert gas to blow-off dust and dirt from the surfaces of the of the connecting elements prior to coupling the sections.

The upper sections are attached to the metallurgical ladles and consist mainly of the cones to connect with the pins of the lower section. The pins sit tight in the cones without any seal. The upper section has outlets for the gas supply to the porous plugs of the ladle.

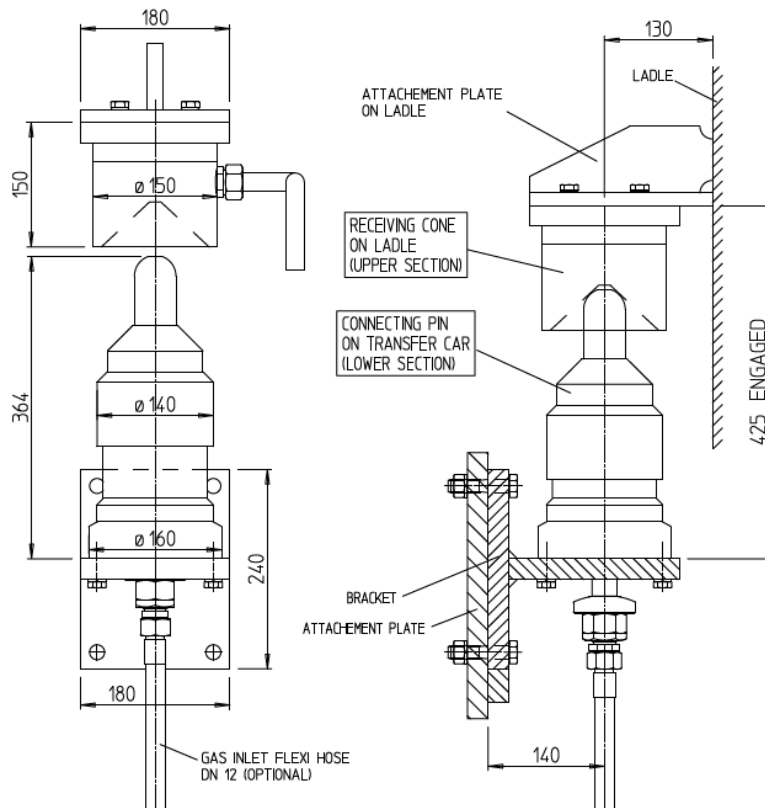
This high temperature solution enables the application in VD-und VOD-plants.

The components are finished assembled as compact building group and supplied function-tested.

## GCV 6

### TECHNICAL DATA

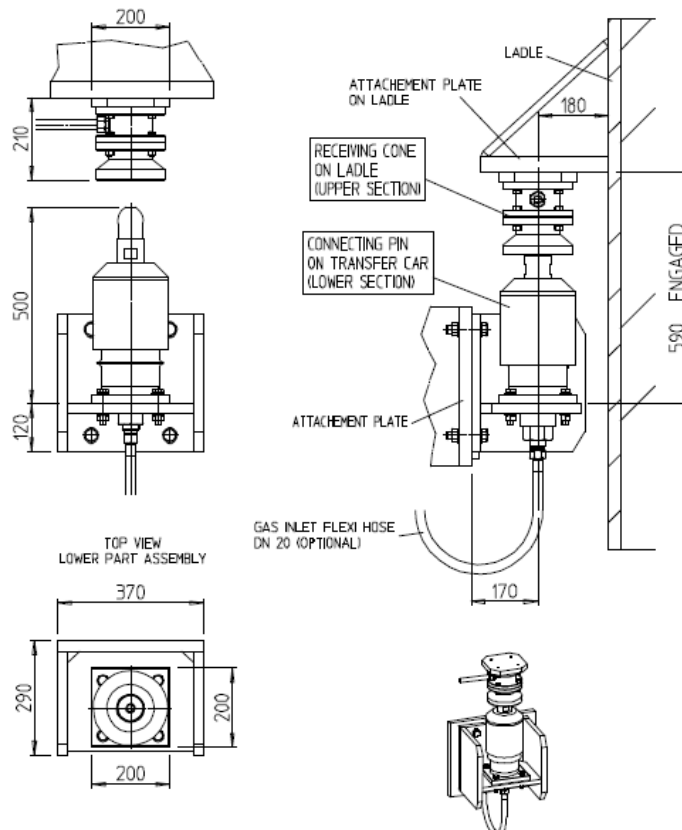
Number of ports	1 / ladle	
Medium	Argon, Nitrogen or compressed air	
Gas supply capacity per line	0 – 1000 l/min	
Maximum pressure	20 bar	
Sealing compound	metal / metal	
Max. temperature of operation	500 C (984 F)	
Horizontal flexibility	+/- 40 mm	X-,Y- axis
Vertical flexibility	+/- 25 mm	Z- axis
Pipe connections	DN15 (1/2") flexible metal hose DN15 (1/2") steel pipe	
Lower part of coupling	160 x 160 x 425 mm 18 kg	
Upper part of coupling	180 x 180 x 150 mm 22 kg	



## GCV 10

### TECHNICAL DATA

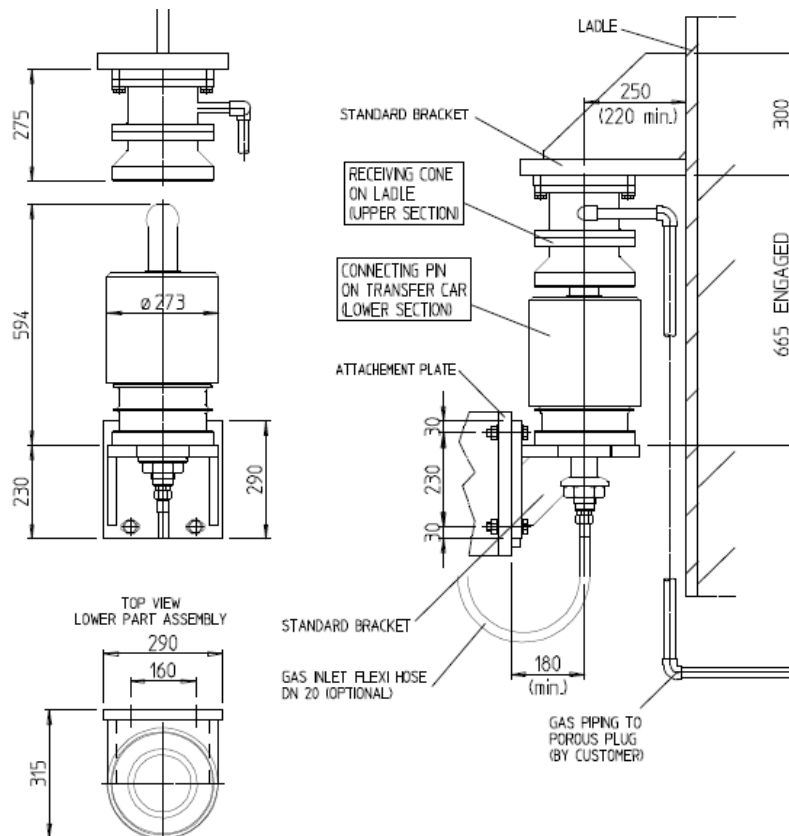
Number of ports	1 / ladle	
Medium	Argon, Nitrogen or compressed air	
Gas supply capacity per line	0 – 1500 l/min	
Maximum pressure	25 bar	
Sealing compound	metal / metal	
Max. temperature of operation	500 C (984 F)	
Horizontal flexibility	+/- 50mm	X-,Y- axis
Vertical flexibility	+/- 25 mm	Z- axis
Pipe connections	DN20 (3/4") flexible metal hose DN20 (3/4") steel pipe	
Lower part of coupling	570 x 200 x 200 mm 40 kg	
Upper part of coupling	200 x 200 x 210 mm 25 kg	



## GCV 11

### TECHNICAL DATA

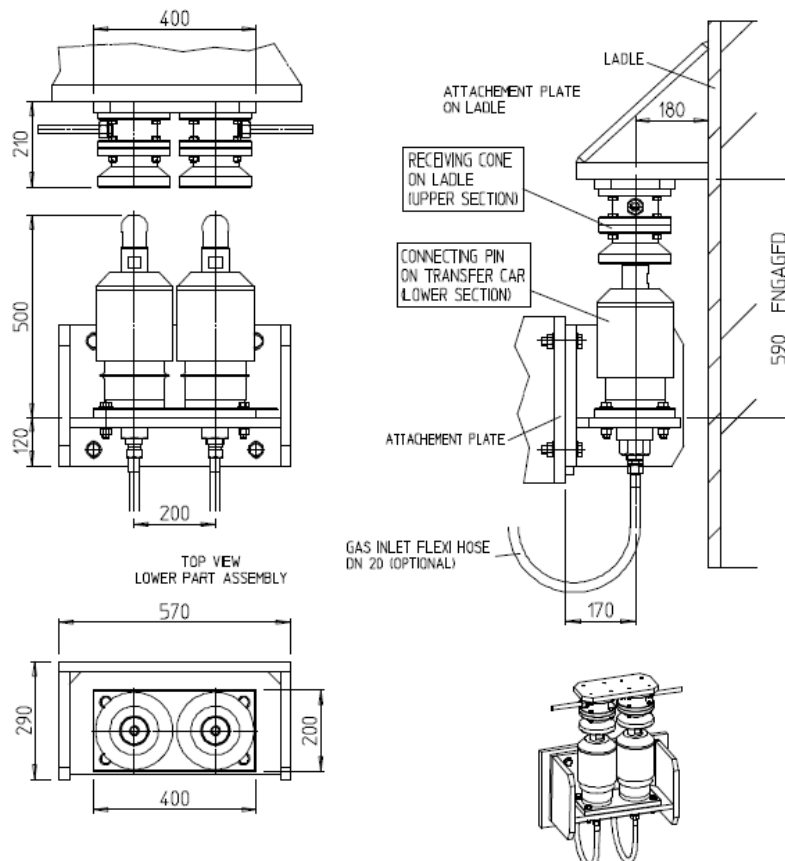
Number of ports	1 / ladle	
Medium	Argon, Nitrogen or compressed air	
Gas supply capacity per line	0 – 2500 l/min	
Maximum pressure	25 bar	
Sealing compound	metal / metal	
Max. temperature of operation	500 C (984 F)	
Horizontal flexibility	+/- 70mm	X-,Y- axis
Vertical flexibility	+/- 40mm	Z- axis
Pipe connections	DN20 (3/4") flexible metal hose DN20 (3/4") steel pipe	
Lower part of coupling	273 x 273 x 750 mm 74 kg	
Upper part of coupling	250 x 250 x 750 mm 55 kg	



## GCV 20

### TECHNICAL DATA

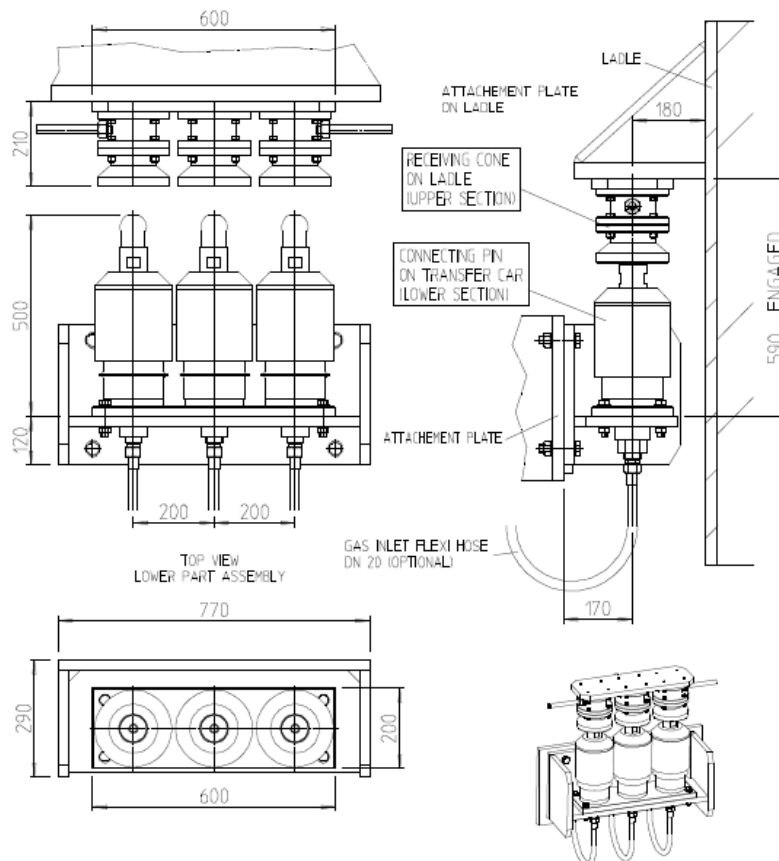
Number of ports	2 / ladle	
Medium	Argon, Nitrogen or compressed air	
Gas supply capacity per line	0 – 1500 l/min	
Maximum pressure	25 bar	
Sealing compound	metal / metal	
Max. temperature of operation	500 C (984 F)	
Horizontal flexibility	+/- 50mm	X-,Y- axis
Vertical flexibility	+/- 25 mm	Z- axis
Pipe connections	DN20 (3/4") flexible metal hose DN20 (3/4") steel pipe	
Lower part of coupling	570 x 400 x 200 mm 80 kg	
Upper part of coupling	400 x 200 x 210 mm 52 kg	



## GCV 30

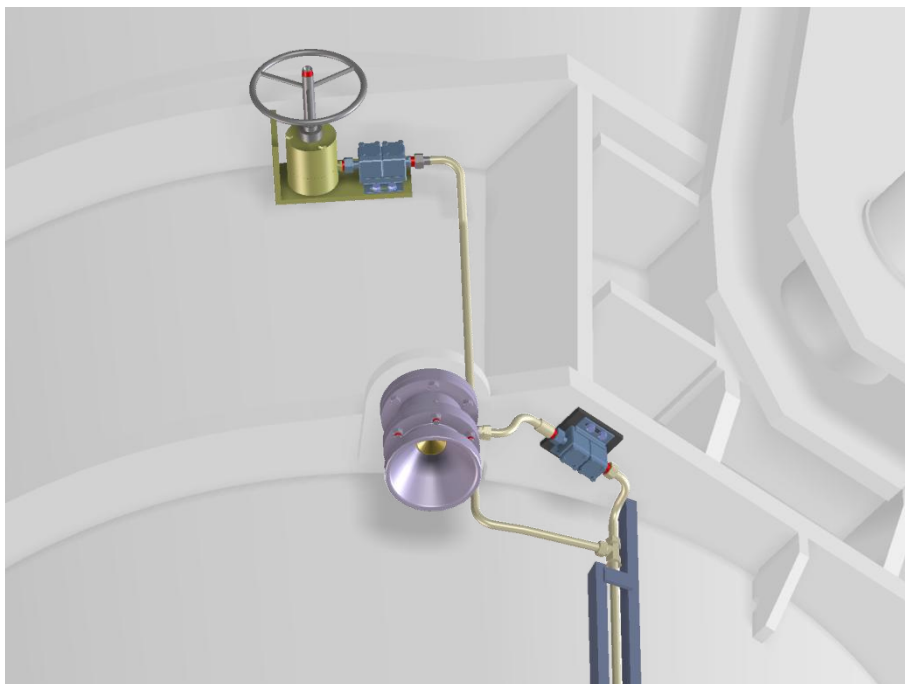
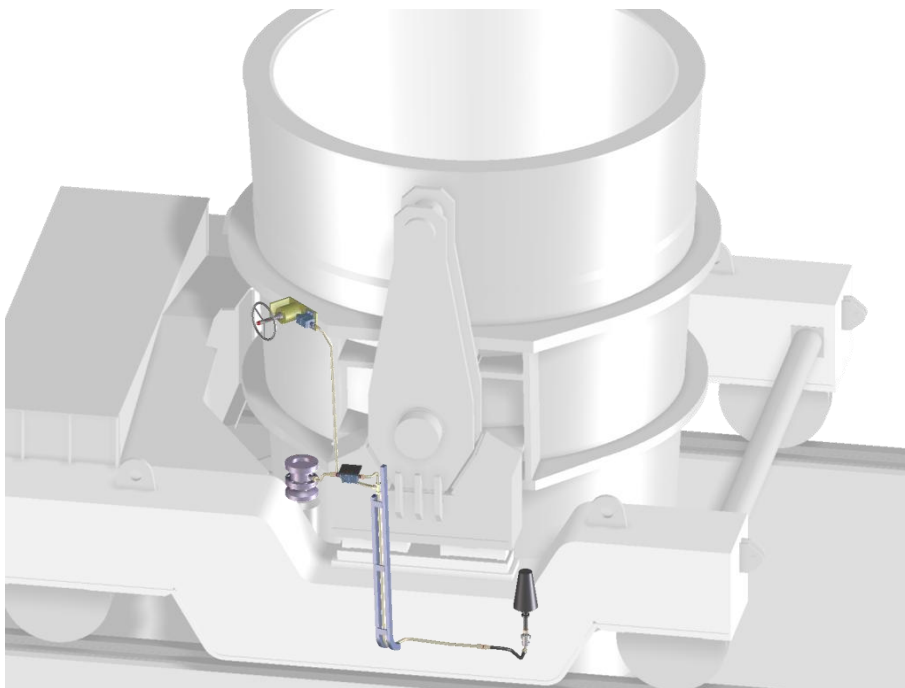
### TECHNICAL DATA

Number of ports	3 / ladle	
Medium	Argon, Nitrogen or compressed air	
Gas supply capacity per line	0 – 1500 l/min	
Maximum pressure	25 bar	
Sealing compound	metal / metal	
Max. temperature of operation	500 C (984 F)	
Horizontal flexibility	+/- 50mm	X-,Y- axis
Vertical flexibility	+/- 25 mm	Z- axis
Pipe connections	DN20 (3/4") flexible metal hose DN20 (3/4") steel pipe	
Lower part of coupling	570 x 600 x 200 mm 120 kg	
Upper part of coupling	600 x 200 x 210 mm 78 kg	

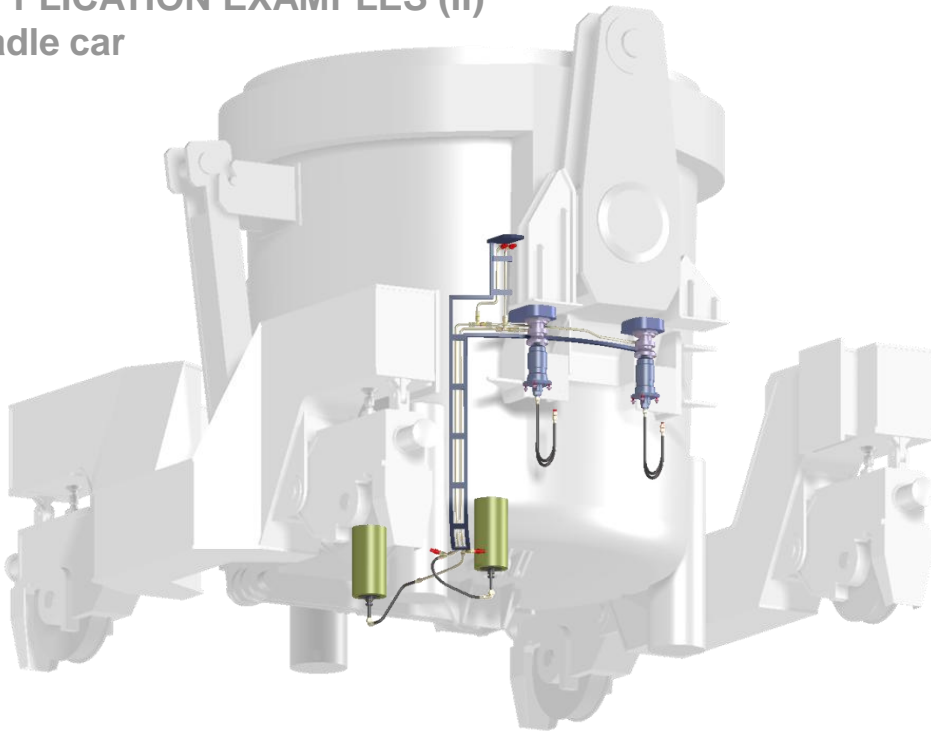




**APPLICATION EXAMPLES (I)**  
Combination of **MANUAL** with **AUTOMATIC** coupling



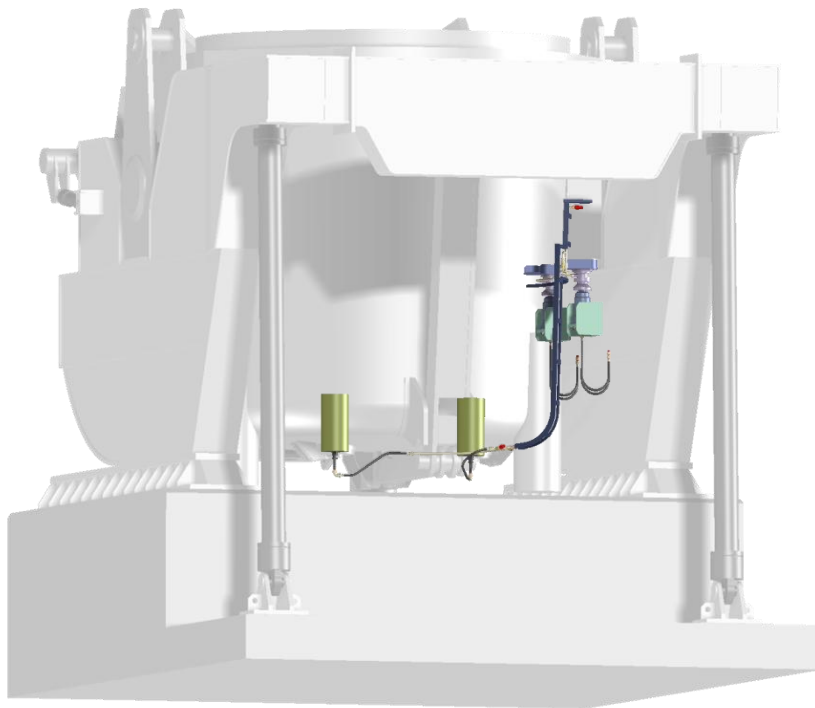
**APPLICATION EXAMPLES (II)**  
**Ladle car**



**APPLICATION EXAMPLES (III)**  
**Ladle stand**



**APPLICATION EXAMPLES (IV)**  
**Ladle tilting station**



**APPLICATION EXAMPLES (V)**  
**Vakuum tank**



**REFERENCE – LIST (I)**

<b>Client</b>	<b>steel plant</b>	<b>Country</b>	<b>Appl.</b>	<b>typ</b>	<b>year</b>
voestalpine STAHL Donawitz	voestalpine STAHL Donawitz	Austria	LS (TS)	GCV11	1991
voestalpine STAHL Donawitz	voestalpine STAHL Donawitz	Austria	BOF, LF, LS	GCV11	1994
Sidmar Gent	Sidmar Gent	Belgium	BOF, LS	GCV11	1995
Fuchs Systemtechnik	Asco Steel Ahwaz	Iran	BOF, LS	GCV11	1997
VAST	Birmingham Steel Memphis	USA	EAF, LF, VD	GCV11	1997
Inteco / Technometal	Benxi Iron & Steel	China	VD	GCV11	1997
VAST	Gallatin Steel Ghent	USA	LS	GCV11	1997
Inteco	Minera Loma Caracas	Venezuela	LF (TS), LS	GCV1C	1998
Smorgon Steel	Smorgon Steel	Australia	EAF, LF	GCV11	1998
Böhler Edelstahl	Böhler Edelstahl	Austria	EAF, LF (TS), VD, VOD	GCV11	1999
Fuchs Systemtechnik	Avesta Fagersta	Sweden	LF	GCV11	2000
Fuchs Systemtechnik	Hoganas	Sweden	LF	GCV11	2000
Inteco	HFF	Iran	EAF, LF, LS, VD, OT	GCV11	2001
Breitenfeld Edelstahl	Breitenfeld Edelstahl	Austria	EAF, LF (TS), VD, VOD	GCV11	2001
Lucchini	Sarezzo	Italy	LF	GCV11	2001
Lucchini	Sarezzo	Italy	EAF	GCV11	2002
Fuchs Systemtechnik	Xingtai Steel	China	EAF, LF, VOD	GCV11	2002
Fuchs Systemtechnik	Delta Steel	Nigeria	LF	GCV11	2002

**REFERENCE – LIST (II)**

<b>Client</b>	<b>steel plant</b>	<b>Country</b>	<b>Appl.</b>	<b>typ</b>	<b>year</b>
Gerdau Cosiqua	Gerdau Cosiqua	Brazil	EAF, LF	GCV11	2003
Böhler Edelstahl	Böhler Edelstahl	Austria	AOD	GCV11	2003
VAI Fuchs Systemtechnik	Ispat Karmet	Kazakhstan	LF	GCV20	2004
VAI Fuchs Systemtechnik	Rewda Steel	Russia	LF, EAF	GCV11	2004
VAI Linz	Outokumpu Stainless Tornio	Finland	LF	GCV11	2004
VAI Fuchs Systemtechnik	Ispat Sidex	Romania	LF	GCV20	2004
Smorgon Steel	Smorgon Steel	Australia	LF	GCV11	2004
VAI Fuchs Systemtechnik	Alchevsk	Ukraine	LF	GCV20	2005
VAI Linz	ZPPS	China	LF (TS)	GCV20	2005
VAI Fuchs Systemtechnik	Maanshan	China	LF	GCV20	2006
VAI Fuchs Systemtechnik	Alchevsk	Ukraine	LF (TS)	GCV20	2006
JSC Mittal Steel	JSC Mittal Steel	Kazakhstan	LF	GCV20	2006
VAI Fuchs Systemtechnik	DMK	Ukraine	LF	GCV20	2006
Zamet	UMICORE	Belgium	LFS	GCV6	2007
VAI Linz	NLMK	Russia	LF	GCV20	2007
Mukand Steel Ltd.	Mukand Steel Ltd.	India	LF	GCV11	2007
Badische Stahl Engineering	Mittal Steel Hunedoara	Romania	LF	GCV11	2007
VAI Linz	ZPPS	China	LF	GCV20	2007
Inteco	vonRoll Moostahl	Swiss	LF	GCV11	2007
VAI Siemens	Alchevsk	Ukraine	LF	GCV20	2007
VAI Siemens	DMKD	Ukraine	LF	GCV20	2007

**REFERENCE – LIST (III)**

Client	steel plant	Country	Appl.	typ	year
VAI Siemens	AMK-MELT	Ukraine	EAF, TS	GCV20	2008
VAI Siemens	Ahmsa	Mexiko	EAF, LF	GCV20	2008
VAI Siemens	Maanshan	China	LF	GCV20	2008
VAI Siemens	Georgsmarienhütte	Germany	LF	GCV20	2008
VAI Siemens	Outokumpu Stainless Tornio	Finland	LF	GCV11	2008
Inteco		Korea		GCV20	2008
Inteco	Barro Alto	Brazil		GCV11	2008
Inteco	Breitenfeld Edelstahl	Austria		GCV11	2008
Inteco	Minera Loma	Venezuela	LF	GCV10	2008
SCS		China	VOD	GCV20	2008
IASCO	Iran Alloy Steel Co	Iran		GCV11	2008
DANIELI		Korea	EAF, LF, LTC, VOD, LS	GCV20	2009
Böhler Edelstahl	Böhler Edelstahl	Austria		GCV11	2009
RHI Mexiko	Sidertul	Mexiko	LTC, Ladle Turret	GCV20	2009
VAI Siemens	Bhilai	Indien	LTC	GCV20	2010

BOF = LD Converter  
 EAF = Electro Arc Furnace  
 LF = Ladle Furnace  
 LS = Ladle Treatment Station  
 LTC = Ladle Transfer Car  
 VD = Vacuum Degasser  
 VOD = Vacuum Oxygen Decarburisation  
 OT = Others  
 (TS) = Tilting Stool

