

# WASTE HEAT RECOVERY SYSTEMS

**TRANSPARENT**  
ENERGY SYSTEMS PRIVATE LIMITED  
LOYAL TO RESOURCE CONSERVATION  
ISO 9001 COMPANY



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# INTRODUCTION

**Transparent** has developed wide variety of superefficient Heat Recovery Systems for harnessing all types of waste heat, originating from various fuels and from different industrial sources.

The Waste Heat Recovery Boilers are provided with Economizers which improve their thermal output and efficiency.

Transparent superefficient Waste Heat Recovery Systems find ideal applications in Cogeneration Systems working on Reciprocating Engines and Gas Turbines.

## Various sources of waste heat.

- Ø Exhaust heat recovery from Reciprocating Engine driven Gen-sets used for Captive Power Cogeneration and Independent Power Production.
  - Heavy fuel fired
  - Gas fired
  - Diesel fired
- Ø Exhaust heat recovery from Gas Turbine exhaust.
- Ø Jacket heat recovery from Engine
- Ø Hot Waste Gases from
  - Scrap melting steel furnaces
  - Cement kilns
  - Industrial furnaces
  - Incinerators
  - Process Waste Gases

## Converting into useful form

Energy is consumed in various forms like steam, hot water, Chilling, refrigeration etc. at different places. Please refer next page for separate matrix to check different useful forms of energy to which this waste heat can be converted. **Transparent** has expertise in converting this waste energy into the most beneficial form of energy for any customer.

## Various models of heat recovery systems

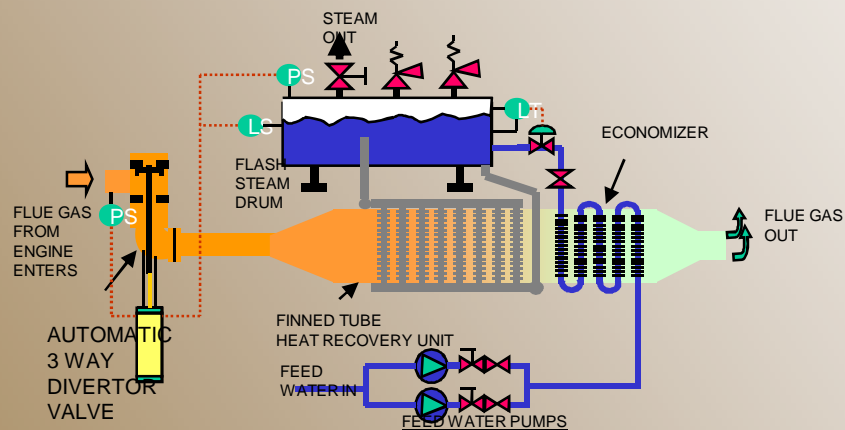
**Transparent** has developed following wide range of 'application specific designs and constructions' of Waste Heat Recovery systems / HRSGs for above applications.

### Various designs of Waste Heat Recovery Systems are :

q	Recostar – FI	: Finned Water tube IBR.
q	Recostar – S	: Smoke tube IBR.
q	Recostar – WC	: Bare Water tube, IBR.
q	Recostar – WCOF	: Water tube, co-flow (concurrent flue-gas flows) IBR.
q	Recostar – WCRF	: Water tube cross tube IBR.
q	Recostar – CC	: Cylindrical coil type once through.
q	Recostar – PC	: Pancake coil type once through.
q	Recostar – SCMP	: Smoke tube, composite unfired plus fired type.
q	Recostar – JW	: Engine jacket water heat recovery system

## Product Details

- ✓ **Type** : **Finned, Water Tube, IBR**
- ✓ **Installation** : **Horizontal & Vertical, Indoor as well as Outdoor**
- ✓ **Tube Orientation** : **Horizontal & Vertical**
- ✓ **Waste Gas Flow Direction** : **Horizontal/ Vertical (Upwards & Downwards)**
- ✓ **Quality of Waste Gases** : **Normally clean dust free gases**
- ✓ **Acceptable dust in waste gases** : **Moderate dust level acceptable for Boilers having vertical fin orientation with mechanized soot removal and collecting facility.**
- ✓ **Type of output** : **Steam- D&S/ Superheated, Hot Water, Hot Thermic Fluid**
- ✓ **Media of Waste Heat** : **Hot gases, Hot bulk powders, hot liquids, hot vapours.**
- ✓ **Waste Heat Source suitability** : **Fuel cell exhaust, micro gas turbine exhaust, DG set exhaust process waste gases, Incinerator exhaust, furnace exhaust.**
- ✓ **Typical applications** : **Process heating, hot water generation, Thermic Fluid heating, Power generation, Cogeneration applications.**
- ✓ **Number of heat recovery stages possible** : **3 to 4 stages of heat recovery possible e.g. super-heater evaporator, economizer, water preheater**



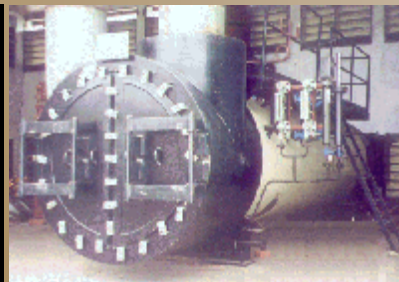
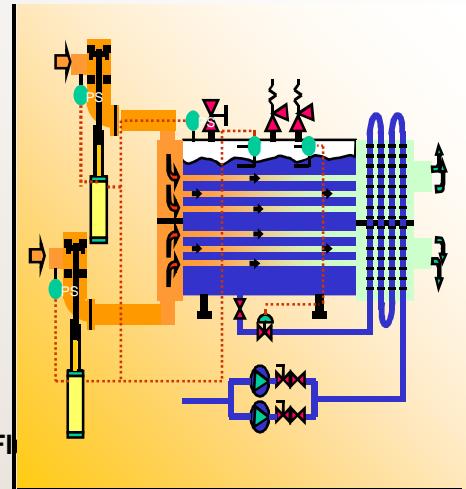
**Recostar FI : Flow diagram**

### Case study

- q **Waste heat source** : **Engine generator exhaust**
- q **Capacity of Engines** : **800KW X 1 No.**
- q **Fuel fired in Engines** : **HSD**
- q **Total flue gas quantity** : **4000 Kg./Hr.**
- q **Flue gas inlet temp.** : **518°C**
- q **System configuration** : **Main WHRB + Economizer**
- q **Flue gas outlet temp.** : **151°C**
- q **Output type** : **Steam at 10 Bar(g)**
- q **Output at 100% load** : **700 Kg./Hr (F & A 100°C)**

## Product Details

- ✓ Type : Smoke Tube IBR
- ✓ Installation : Horizontal & Vertical, Indoor as well as Outdoor.
- ✓ Tube Orientation : Horizontal / Vertical.
- ✓ Waste gas flow direction : Horizontal / Vertical (upwards & downwards)
- ✓ Quality of Waste Gases : Low dust level acceptable.
- ✓ Type of heat recovery output : 1) D & S / superheated  
2) Hot Water  
3) Vapour phase Thermic Fl
- ✓ Media of Waste Heat : Hot gases, hot liquids, hot vapors
- ✓ Waste heat source suitability : Fuel cell exhaust, Micro / miniturbine exhaust small gas turbine exhaust, DG set exhaust, process waste gases, Incinerator exhaust, furnace exhaust.
- ✓ Typical applications : Exhaust of steel furnaces, cement kilns, metal smelters, Incinerators, Industrial furnaces, DG set exhaust, process waste gases, Incinerator exhaust, furnace exhaust, Gas turbine exhaust.
- ✓ Output capacity possibilities : Typically 15 TPH
- ✓ Number of heat recovery stages possible : 3 to 4 stages of heat recovery possible e.g. super-heater, evaporator, economizer, water preheater.



Recostar-S for 2 X 1 MW gas engines



Recostar-S for 3 X 1 MW F.O. engines

### Case study

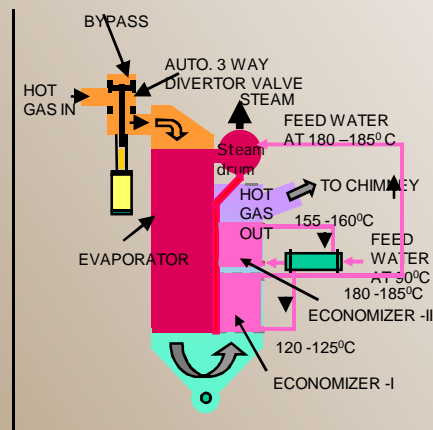
- q Waste heat source : Engine generator exhaust
- q Capacity of Engines : 1 MW X 1 No.
- q Fuel fired in Engines : Furnace oil (Heavy oil)
- q Total flue gas quantity : 24000 Kg./Hr.
- q Flue gas inlet temp. : 305°C
- q System configuration : Main WHRB + 2 stage Eco.
- q Flue gas outlet temp. : 181°C
- q Output type : Steam at 10 Bar(g)
- q Output at 100% load : 1500 Kg./Hr (F & A 100°C)

## Product Details

- ✓ Type : Water tube, coflow (Cocurrent gas flow) IBR
- ✓ Installation : Horizontal / Vertical, Indoor as well as Outdoor
- ✓ Tube Orientation : Vertical.
- ✓ Waste gas flow direction : Vertical
- ✓ Quality of Waste Gases : Specially suitable for dust laden gases. Provided with special mechanized soot removal and collection system.
- ✓ Acceptable dust in waste gases : High dust level readily accepted
- ✓ Type of heat recovery output :
  - 1) Steam– D & S/Superheated
  - 2) Hot Water
  - 3) Hot Thermic Fluid
- ✓ Media of Waste Heat : Hot gases, Hot vapours
- ✓ Waste heat source suitability : Exhaust of steel furnaces, cement kilns, metal smelters, incinerators, industrial furnaces, DG set exhaust process waste gases, Incinerator exhaust, Furnace exhaust, gas turbine exhaust.
- ✓ Typical applications : Process heating, hot water generation, thermic fluid heating, power generation, cogeneration.
- ✓ Output capacity possibilities : No Limits.
- ✓ Number of heat recovery stages possible : 3 to 4 stages of heat recovery possible e.g. super-heater evaporator, economizer, water preheater
- ✓ Protection against sulphur corrosion on cold end side : Provided by various means to ensure that metal temperature is maintained above the actual incipient limit.



Recostar – WCOF for 3.8 MW engine



Recostar WCOF : Typical arrangement

### Recostar WCOF : Flow diagram ( Vertical )

#### Case study

- q Waste heat source : Engine generator exhaust
- q Capacity of Engines : 3.8 MW X 1 No.
- q Fuel fired in Engines : Furnace oil ( Heavy oil )
- q Total flue gas quantity : 32180 Kg./Hr.
- q Flue gas inlet temp. : 327°C
- q System configuration : Main WHRB + Economizer
- q Flue gas outlet temp. : 185°C
- q Output type : Steam at 10 Bar(g)
- q Output at 100% load : 1950 Kg./Hr ( F & A 100°C)

## Product Details

- ✓ Type : Water tube cross flow IBR
- ✓ Installation : Vertical, Indoor and Outdoor.
- ✓ Tube Orientation : Vertical.
- ✓ Waste gas flow direction : Horizontal
- ✓ Quality of Waste Gases : Moderately clean gas desired. Provided with mechanized Soot removal and collection System.
- ✓ Acceptable dust in waste gases : Moderate dust level accepted
  
- ✓ Type of heat recovery output :
  - 1) Steam– D & S / Super-heater
  - 2) Hot Water
  - 3) Vapour phase thermic fluid
- ✓ Media of Waste Heat : Hot gases
- ✓ Waste heat source suitability : Exhaust of steel furnaces, cement kilns, metal smelters, incinerators, industrial furnaces, DG set exhaust process waste gases, Incinerator exhaust, Furnace exhaust, gas turbine exhaust. (Gases with temperature less than 550°C)
  
- ✓ Typical applications : Process heating, hot water generation, thermic fluid heating, power generation, cogeneration.
  
- ✓ Number of heat recovery stages possible : 3 to 4 stages of heat recovery possible e.g. super-heater, evaporator, economizer, water preheater.



**Recostar WCRF : Flow diagram ( Vertical )**

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### Case study

- q Waste heat source : Engine generator exhaust
- q Capacity of Engines : 6.7 MW
- q Fuel fired in Engines : Natural Gas
- q Total flue gas quantity : 41000 Kg./Hr.
- q Flue gas inlet temp. : 418°C
- q System configuration : Water Tube Cross Flow
- q Flue gas outlet temp. : 159°C
- q Output type : Steam at 10 Bar(g)
- q Output at 100% load : 5060 Kg./Hr (F & A 100°C)

## Product Details

- |   |   |  |  |
|---|---|--|--|
| ✓ Type                                    | : | Smoke tube, composite (I.e. unfired plus fired zone)   |  |
| ✓ Installation                            | : | Horizontal, Vertical, Indoor.  |  |
| ✓ Tube Orientation                        | : | Horizontal / Vertical.   |  |
| ✓ Waste gas flow direction                | : | Horizontal / Vertical (upwards & downwards)  |  |
| ✓ Quality of Waste Gases                  | : | Low dust level desired.  |  |
| ✓ Type of heat recovery output            | : | 1) Steam–D & S / Super-heat.<br>2) Hot water<br>3) Vapour phase Thermic Fluid Heating.   |  |
| ✓ Media of Waste Heat                     | : | Hot gases, Hot vapors, Hot liquids   |  |
| ✓ Waste heat source suitability           | : | Fuel cell exhaust, micro / min gas turbine exhaust, Small gas turbine exhaust, DG set exhaust, process waste gases, Incinerator exhaust, furnace exhaust, gas turbine exhaust. |  |
| ✓ Typical applications                    | : | Where heat recovery from waste heat needs to be supplemented with fuel firing and installation of two separate boilers unfired and fired has space limitation.                 |  |
| ✓ Supplemetory firing possibilities       | : | Firing in internal furnace provided in boilers.  |  |
| ✓ Number of heat recovery stages possible | : | 3 to 4 stages of heat recovery possible e.g. Super-heater evaporator, economizer, water preheater.   |  |

### Recostar SCMP : Flow diagram ( Vertical )

#### Case study

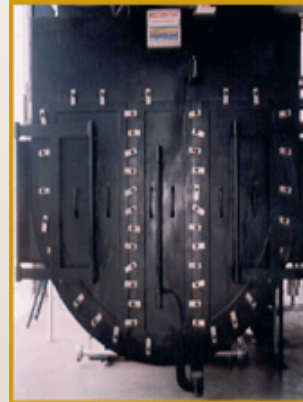
- |   |                           |   |                            |
|---|---------------------------|---|----------------------------|
| q | Waste heat source         | : | Engine generator exhaust   |
| q | Capacity of Engines       | : | 1.1 MW X 1 No.             |
| q | Fuel fired in Engines     | : | Natural gas                |
| q | Total flue gas quantity   | : | 4780 Kg./Hr.               |
| q | Flue gas inlet temp.      | : | 598°C                      |
| q | System configuration      | : | Main WHRB+Fired zone+ Eco. |
| q | N.G. firing in fired zone | : | 60 SM <sup>3</sup> /Hr.    |
| q | Flue gas outlet temp.     | : | 205°C                      |
| q | Output type               | : | Steam at 10 Bar(g)         |
| q | Output at 100% load       | : | 2000 Kg./Hr (F & A 100°C)  |

# PRODUCT FEATURES



## CONTROL PANEL

The Control Panel is wired with solid conductor single strand wires for easy traceability. Indications for all temperatures, safety trips provided on panel. Facilities for auto-manual switching of individual devices provided.



## EASE OF FLUE GAS SIDE INSPECTION

Front and rear doors are hinged type to provide simple & quick opening for full access to fireside tube surface. This job can be done by a single person



## MAXIMUM HEAT RECOVERY

Heat recovery in multiple stages ( 3 to 4 ) with help of single/double stage economizers plus water preheater ensures maximum possible heat recovery from the waste gases. Customer gets nearly 7 to 19 % of additional output compared to other makes.



## CUSTOM ENGINEERED / CUSTOM BUILT

Every TRANSPARENT Boiler is specifically engineered and built to every customer's needs and specifications. Special sizes, sources of heat and auxiliary equipment are no problem with TRANSPARENT.



## DIVERTOR VALVE

Specially Designed Three way automatic pneumatically operated, Diverter valve allows facility of bypassing the WHRB without stopping the source equipment. Linear movement of valve assures and positive pneumatic pressure eliminates possibility of any leakage.



## INSULATION

Insulation thickness is selected scientifically to minimize heat loss even at a high flue gas temp. (Typical thickness used is 300 mm for 500°C)

# APPLICATION SUITABILITY PRODUCT MATRIX

## Matrix for of converting waste heat in useful form

Useful Form Of Output	Source of Waste Heat													
	H O E E	L O E E	G E E	E J H	G T E	I E G	C P K G	S P F	H G P	G F G	F G F H	A C	H P C	
Low Pressure Steam	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	
Medium Pressure Steam	✓	✓	✓		✓	✓	✓	✓	✓	✓				
High Pressure Steam		✓	✓		✓	✓	✓	✓						
Hot Thermic Fluid	✓	✓	✓		✓	✓	✓	✓	✓	✓				
Hot Water (Pressurized)	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	
Hot Water (Non Pressurized)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Hot Air for Process (Dryer etc)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Chilled Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Chilled Brine	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Ice Making	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	
Cold Storage	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Waste Water Recycling	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Power	✓	✓	✓		✓	✓	✓	✓	✓	✓				
Combustion Air Preheating						✓		✓			✓			
Inlet Air Cooling	✓		✓		✓									

### Source of Waste Heat

- ✓ HOEE : Heavy Oil Engine Exhaust
- ✓ LOEE : Light Oil Engine Exhaust
- ✓ GEE : Gas Engine Exhaust
- ✓ EJH : Engine Jacket Heat
- ✓ GTE : Gas Turbine Exhaust
- ✓ IEG : Incinerator Exit Gases
- ✓ CPKG : Cement Plant Kiln Gases
- ✓ SPF : Steel Plant Furnaces
- ✓ HGP : Hot Gases From Process
- ✓ GFG : Glass Furnace Gases
- ✓ FGFH : Flue Gases From Fired Heaters
- ✓ AC : Air Compressors
- ✓ HPC : High Pressure Condensate

# WHRB INSTALLATION



WHRB Installed on Natural Gas Fired Engine,



Power Generation from waste heat in  
Cement Industries - Simple Rankine  
Cycle



WHRB Installed on Natural Gas Fired Engine



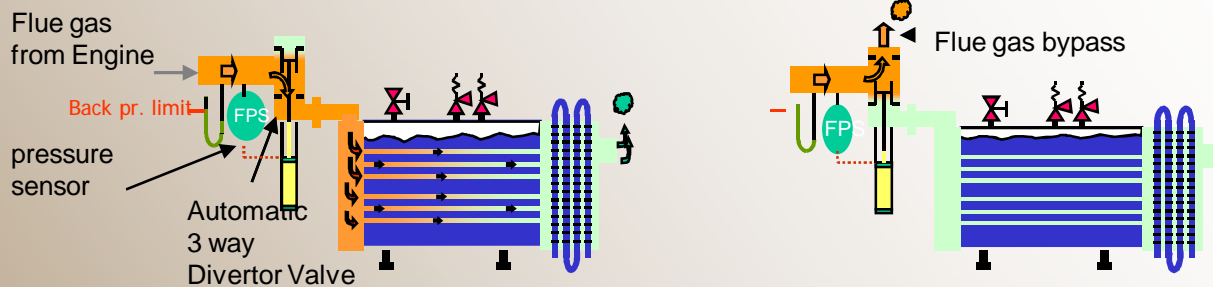
Power Generation from waste heat in  
Cement Industries - Organic Rankine  
Cycle



WHRB Installed on Heavy Fuel Oil fired engine

# COMPARISON

## Safety of Source Equipment



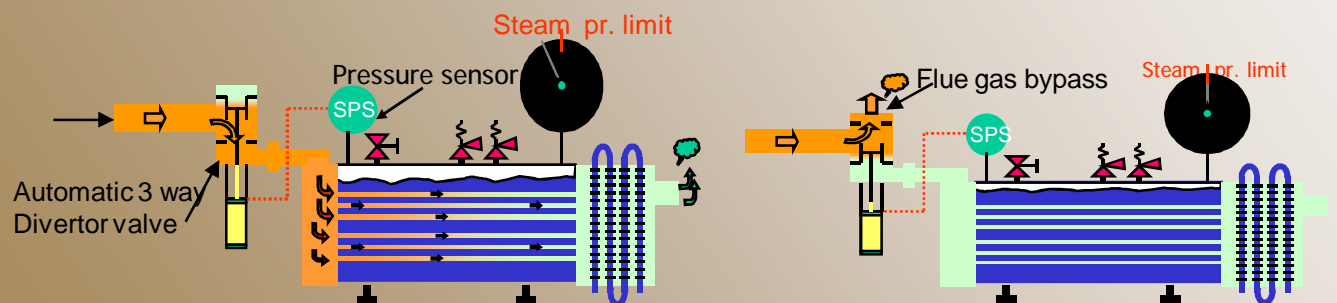
### Back pressure control on flue gas side

**Transparent** provides automatic flue gas monitoring & control system. If the back pressure exceeds the predetermined value, the Diverter Valve automatically diverts the flue gases to stack. This saves the source (Engine or turbine) from getting subjected to excessive back pressure.

No such system exists in other make whrb (standard model). This is quite unsafe for the engine or turbine on which the WHRB is installed.

Note : In case of gas fired engines or turbines, even though there is very little possibility of carbon accumulation but other possibilities do exist for excessive back pressure on flue gas side. It can happen either due to leakage of boiler tube or lube oil vapour condensation in abnormal conditions. Hence even in case of gas engines/turbines, above safety feature is of paramount importance.

## Safety of Waste Heat Recovery Boiler



### High steam pressure control

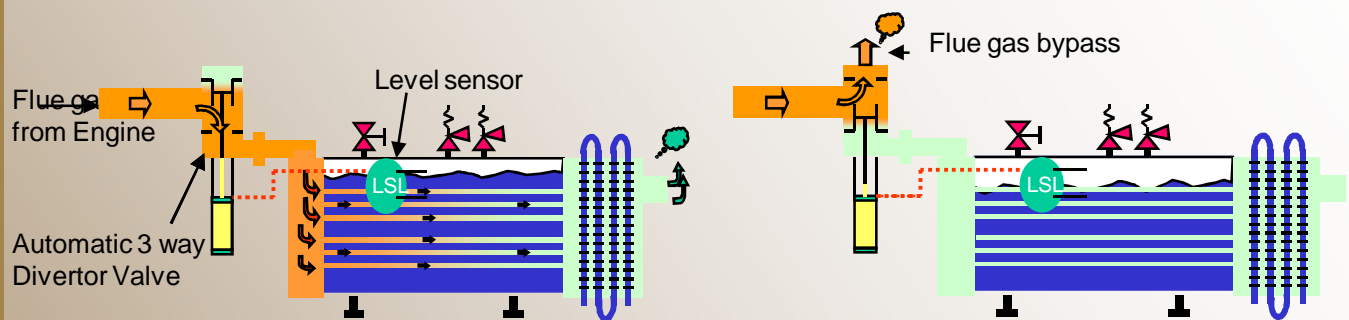
**Transparent** provides automatic steam pressure monitoring & control system. If the steam pressure exceeds the predetermined value, the flue gases are automatically diverted to stack. This eliminates frequent operation of safety relief valve.

No such system exists in other make whrb (standard model). This is quite unsafe for the WHRB. In such case one has to solely depend on safety valve.

Note : Frequent operation of safety valve is an undesirable situation since it is meant for ultimate safety of boiler & supposed to operate once in a while.

# COMPARISON

## Safety of Waste Heat Recovery Boiler



### Low water level safety trip

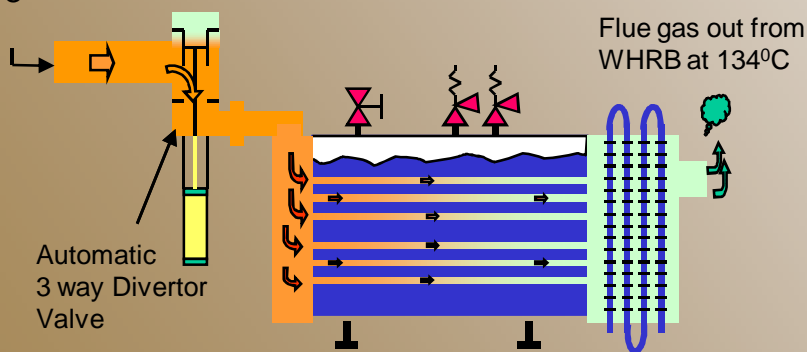
**Transparent** provides automatic boiler water level monitoring & control system. In case the level falls below safe level, the flue gases automatically bypass the WHRB & go to stack. This eliminates boiler tubes overheating.

No such system exists in other make WHRB (standard model). This is quite unsafe for the WHRB. Overheating of tubes can result into cracking & leakage.

Note : Generally the feed pump & drum level controller system maintains desired level. Anyhow in case of abnormal situation the level can drop in spite of above system due to various reasons such as unavailability of water in F.W. tank, malfunctioning of drum level controller etc.

## Efficiency and Outputs

Flue gas from Engine  
 at 586°C



### Heat From the Gases

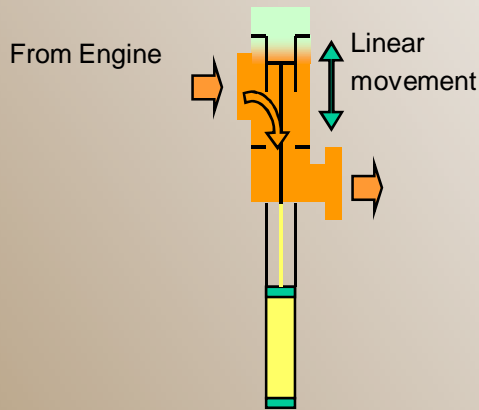
**Transparent** WHRB recovers maximum possible heat from the gases. It gives atleast 7 to 10% extra output compared to other make. This needs a much bigger economizer & high manufacturing cost for Transparent but gives benefit to user in terms of more savings.

In other makes, even though economizer is provided, heat is recovered upto a temperature level where the manufacturing cost is less. This results in cost savings for WHRB supplier but recurring loss to the user.

# COMPARISON

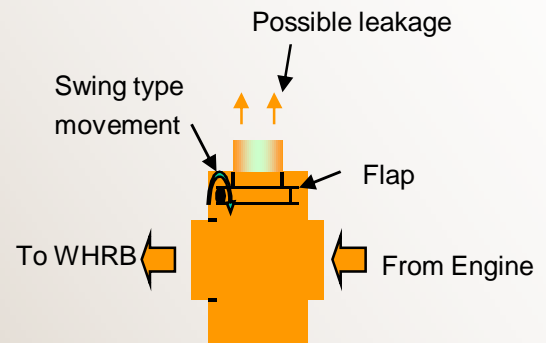
## Divertor Valve

### Transparent Make



- **Automatic** pneumatically operated.
- Linear movement of valve (poppet). **No possibility of jamming.**
- Positive pneumatic pressure acts as good sealing force continuously when the valve reaches the respective positions. The poppet is pressed against the valve seat by pneumatic pressure **eliminating possibility of any leakage.**
- Force is applied at center of poppet ensuring equal distribution throughout the sealing edges.
- **Made of Stainless steel which can work upto 850°C continuously.**

### Other Make



- **Manually** operated.
- Swing type movement of valve (flap). **Possibility of jamming.**
- No positive force is applied after the flap reaches its respective positions. The mechanical play in the gearbox results in small opening due to self weight of flap & flue gas back pressure. This **can result in leakage in the long run.**
- Force is applied at one end of flap. This results in unequal force distribution. The distant edge gets less force.
- Made of carbon steel alloy which is not suitable for **more than 500°C.**

Transparent Group Companies, are technology leaders working in the field of Co-generation Systems( CHP), Ammonia Absorption Refrigeration Plants (AARP), Waste Heat Recovery Systems, Energy Conservation Contracts, Biomass Gasification, Water Recycling Plants. Superefficient Boilers, Energy and Water consultancy, Pollution control, Drying Plants , Noise abatement Systems etc. having Indian Patents for many of its products.

## Transparent Energy Systems Private Limited

Our company was incorporated on 16<sup>th</sup> April, 1986 with the name of Vapor Energy Machines Private Limited. The first commercial production was started in January, 1988. The name of the company was changed from Vapor Energy Machines Private Limited to Transparent Energy Systems Private Limited on 18<sup>th</sup> December, 1995.

### 1. Co-generation Systems - [www.tesplcogen.com](http://www.tesplcogen.com)

Cogeneration Systems involving combined generation of

- Power - Heat - Refrigeration / Chilling - Water Recycling / Desalination by multistage evaporation.

Fuels and energy sources for Cogeneration.

- Natural Gas - Heavy Fuel Oil (HFO) - Coal - Process Waste Heat - Biogas - HSD / Kerosene / LDO - Biomass

Types of Cogeneration Systems

- Steam Engine / Turbine Based Co-generation - Reciprocating Engine Generator Based Co-generation - Gas Turbine Based Co-generation

### 2. Ammonia Absorption Refrigeration Plants- [www.tesplaarp.com](http://www.tesplaarp.com) (Technology collaboration with Mattes Engineering GmbH, Germany)

- Refrigerant Evaporators - Refrigerant Circulation Systems - Air Handling Units - Accessories

- Flash Vessels - Ammonia Vaporizers - Turnkey Refrigeration Contracts.

### 3. Heat Recovery Systems – [www.heatrecovery-system.com](http://www.heatrecovery-system.com)

Waste Heat Recovery Boilers - Finned Tube - Water Tube - Smoke Tube

Waste Heat Recovery Thermic Fluid Heaters

Heat Recovery & Efficiency improvement Retrofits

- Combustion Air Preheater - Economisers ( Smoke tube / water tube / finned tube type) - Condensate Recovery Systems

- Blow Down Heat Recovery Systems - Flash Steam Recovery Systems

### 4. Boilers & Heaters – [www.tespl.com](http://www.tespl.com) (Technology Collaboration with Lamont Kessel GmbH, Germany)

- 96% Superefficient Oil / Gas Fuelled Boilers - 93% Superefficient Thermic Fluid Heaters / Hot Air Generators

- 89% Superefficient Agrofuelled / Coal Fired Boilers. - Superefficient High Pressure steam Boilers, (Oil / Gas / Coal / Biomass Fired) for Cogeneration application

### 5. Energy Conservation Projects – [www.tespl.com](http://www.tespl.com)

Conservation of Electrical heating to Steam / Thermic Fluid / Hot Water Heating

### 6. Water Treatment Plants & Other Accessories – [www.tespl.com](http://www.tespl.com)

### 7. Bio mass Gasification - [www.tespl.com](http://www.tespl.com)

(Technology collaboration with Bioenergie Beratung Bornim GmbH, Germany)

- Wet and Dry Fermentation of solid, semi solid and liquid biomass, Bio Diesel and Ethanol production



**Transparent Technologies Private Limited** - [www.ttplpune.com](http://www.ttplpune.com)

1. **Dryers- spray Flash/Fluid Bed/ Flash**      2. **Coolers** - Spray Coolers (Closed / Open Circuit) / Fluidized Bed Coolers / Bulk Flow Coolers

3. **Granulators** -Spray Granulators / Fluidized Bed Granulators / Rotary Granulators      4. **Waste to Energy Incinerators**

### 5. Evaporators and Concentrators



**EcoKleen Pollution Control Pvt. Ltd.** - [www.ecokleen.com](http://www.ecokleen.com)

1. **Pollution Control-** Scrubbers/ Bag Filters / Cyclones / Multicyclones

2. **Flue Gas Desulpharisation** – Wet- Wet/Dry Wet/ Dry Dry Systems

3. **Fume and Dust Extraction Plants**

4. **Air stripping plants & Airborn Solvent Vapor Recovery Plants**

5. **Thermal Oxidation System of Airborne Solvent Vapors**

6. **Bulk Material Handling**



**Decimin Control Systems Pvt. Ltd.** - [www.decimin.com](http://www.decimin.com)

**Noise abatement products and systems ( in collaboration with IAC BOET STOPSON, France)**

- Acoustic Canopies for D G sets, Machineries

- Noise silencers for engines, blowers, compressors, valve exhaust, acoustic louvers and baffles.

- Gas turbine inlet / outlet systems.

- ISO containerized DD sets / compressors engine house acoustic.



**Ecosustain Energy Systems Pvt. Ltd.** - [www.ecosustainenergy.com](http://www.ecosustainenergy.com)

(Co Operation Agreement with ShandongQingeng Thermal Power Equipment Co. Ltd.)

1. **Steam Turbine Generators** - Stage Extraction / Condensing / Back Pressure Multi-Stage / Single – Stage Superheated / Saturated Steam inlet

2. **Steam Turbine Drives for Pumps / Blowers / Compressors.**      3. **Steam Condensers** - Water cooled shell and tube, Air cooled finned tube



**Ecosustain Technologies Pvt. Ltd.** - [www.ecosustain.co.in](http://www.ecosustain.co.in)

**Water Recovery and reuse from effluents - Turnkey solutions through CECIC** - Conceptualization, Engineering, Coordination, Inspection, Commissioning

**Vital Technologies used** - Ultra filtration, Reverse osmosis (RO) . - Super efficient multistage evaporators and crystalisers

- Ultra-violet based wet oxidation systems - High pressure thermal wet air oxidation systems

- Absorption and ion exchange - Drying and incineration - Waste heat utilization