

# EXHAUST GAS DRIVEN VAPOUR ABSORPTION CHILLER



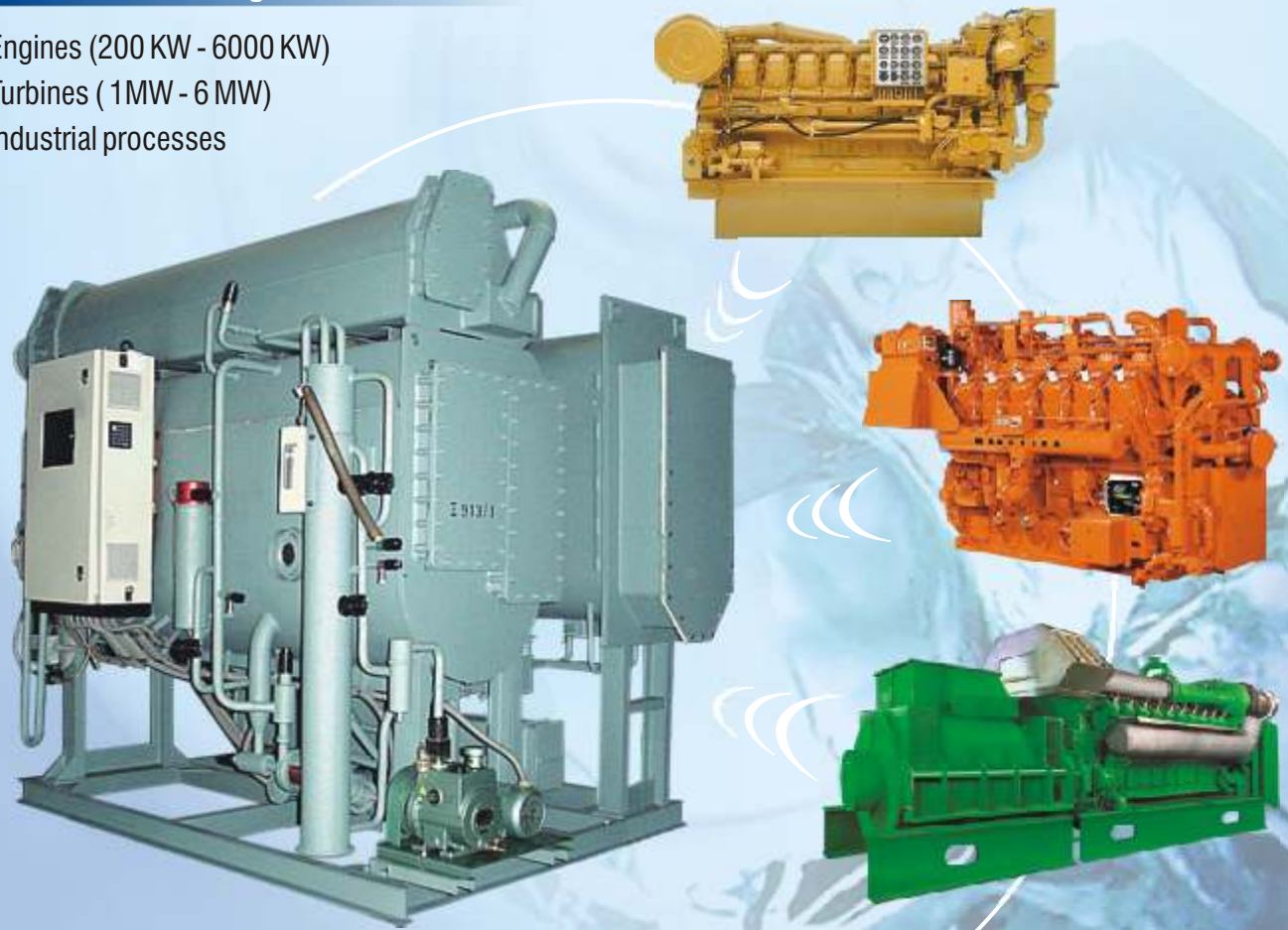
Thermax is a multi divisional, transnational engineering organization whose core businesses are in the area of Energy conservation and Environment protection

Thermax with its technological leadership has been providing various lucrative solutions to wide spectrum of industries worldwide. Thermax pioneered the concept of Vapour Absorption Cooling in India. It's products are exported to more than 40 countries across the globe.

In pursuit of technology excellence and in its endeavor to continually provide optimal solutions to customers, THERMAX comes forward with yet another innovation

## Exhaust Gas Driven VAC can operate on exhaust gases from

- Engines (200 KW - 6000 KW)
- Turbines ( 1MW - 6 MW)
- Industrial processes



## Applications

### Comfort Air-conditioning:

- Shopping Malls
- Office Buildings
- Theatres
- Multiplexes
- Hotels

### Process Cooling:

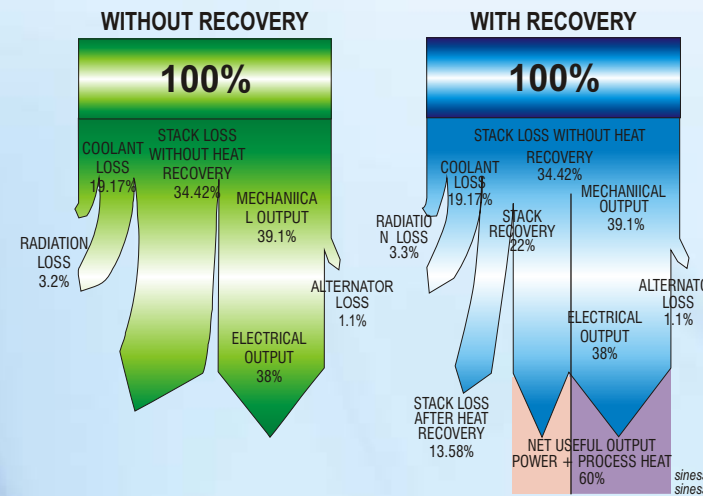
- Glass Manufacturing
- Synthetic Fibers
- Pharmaceuticals / Bulk Drugs
- Ceramic Tiles

## Operating Principle

The exhaust gases are directly taken into Vapour Absorption Chiller. They act as heat source required for its operation thus saving electrical energy. The jacket water from the engine also acts as heat source which is taken to the Hot Water Generator of VAC.

From the diagram below it is very clear that without recovery only 39% of the energy input is really converted into useful work...

## Sankey Diagram



## Capacity of Gas Engine

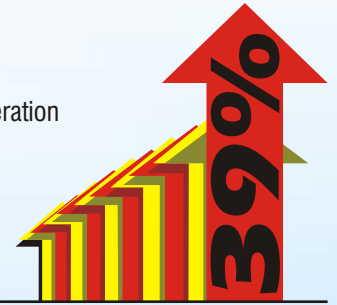
## Capacity of Chilling \*\*

500 KW	200 TR
1000 KW	360 TR
1600 KW	566 TR
2500 KW	739 TR

Notes: \*Thermax also offers Steam fired Vapour absorption machines operating on heat recovery units  
\*\*Based on Engine exhaust and jacket heat rejection, indicative only

## Benefits

- Increase in overall engine efficiency by approx.. 39%
- Uses low grade heat energy
- Negligible operating costs
- Savings in fuel consumption
- Trouble free/ Continuous operation
- Higher reliability
- Reduction in greenhouse gas emissions



## Options Available

- Exhaust gas fired Vapour Absorption Chiller along with hot water recovery
- Exhaust gas fired Vapour Absorption Chiller along with Auxiliary firing
- Exhaust gas fired Vapour Absorption Chiller along with hot water recovery and auxiliary firing

### REGISTERED OFFICE / WORKS

**THERMAX Limited**  
Absorption Cooling Division  
D-13, R.D. Aga Road, MIDC Industrial Area,  
Chinchwad, Pune - 411 019. INDIA  
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[www.thermaxindia.com/acd](http://www.thermaxindia.com/acd)

### YOUR NEAREST CONTACT



Agent / Distributor

# TECHNICAL SPECIFICATION

## Exhaust Driven Vapour Absorption Chiller

Model Number		Units	ED 20A C	ED 20B C	ED 20C C	ED 20D C	ED 30A CX	ED 30B CX	ED 30C CX	ED 40A CX	ED 40B CX	ED 40C CX	ED 50A CX	
Cooling Capacity		TR	110	129	159	190	240	269	320	361	409	447	504	
		kW	387	454	560	669	845	947	1126	1271	1440	1573	1774	
Chilled Water Circuit	Flow Rate	m <sup>3</sup> /hr	60.5	70.9	87.4	104.5	132.0	148.0	175.9	198.5	224.9	245.8	277.1	
	No. of passes (Evaporator)	#	5				3							
	Friction Loss	mWC	4.4	5.4	4.0	4.7	3.8	3.7	5.7	5.7	5.9	6.4	5.5	
	Connection Diameter	mmNB	100				150				200			
Cooling Water Circuit	Flow Rate	m <sup>3</sup> /hr	110	129	159	190	240	269	320	361	409	447	504	
	Outlet Temp	°C	34.9				34.6							
	No. of passes (Absorber)	#	3				2							
	No. of passes (Condensor)	#					1				2			
	Friction Loss	mWC	4.0	3.9	4.8	4.9	4.9	5.1	7.7	6.9	7.2	7.9	7.9	
Connection Diameter	mmNB	150				200				250				
Exhaust Gas Circuit	Exhaust Flow Rate	kg/hr	3855	4500	5555	6600	7600	8550	10150	11500	13000	14200	16000	
	Connection Diameter (In/Out)	mmNB	350		400		450	500	550	600		650	700	
Overall Dimension	Length	mm	3000		3800		4000		4700		4900		5100	
	Width	mm	2400				2600				3000			
	Height	mm	3120				3240				3480		3840	
Operating Weight	x 1000 kg	6.0	6.4	7.7	8.3	10.5	11.2	13.2	15.9	16.5	17.3	20.0		
Max. Shipping Weight	x 1000 kg	4.6	5.0	5.9	6.5	8.1	8.6	10.2	12.3	12.8	13.3	15.4		
Clearance for Tube Removal	mm	2400		3755		3815		4100						
Electric Supply	Absorbent Pump Motor Rating	kW(A)	2.2 (6.0)				3.0 (8.0)				3.7 (11.0)		5.5 (14.0)	
	Refrigerant Pump Motor Rating	kW(A)					0.3 (1.4)							
	Total Electric Input	kVA	7.8				9.2				11.4		13.5	
	Power Supply		415V(±10%), 50Hz(±5%), 3 Phase+N											

Model Number		Units	ED 50B CX	ED 60A CX	ED 60B CX	ED 60C CX	ED 60D CX	ED 70A CX	ED 70B CX	ED 80A CX	ED 80B CX	ED 80C CX	ED 80D CX		
Cooling Capacity		TR	557	657	724	827	918	1026	1141	1251	1372	1570	1685		
		kW	1961	2313	2548	2911	3231	3612	4016	4404	4829	5526	5931		
Chilled Water Circuit	Flow Rate	m <sup>3</sup> /hr	306.2	361.2	398.0	454.7	504.7	564.1	627.3	687.8	754.3	863.2	926.4		
	No. of passes (Evaporator)	#	3				2								
	Friction Loss	mWC	5.6	6.1	6.5	3.7	3.9	3.5	3.8	3.6	3.9	6.2	6.5		
	Connection Diameter	mmNB	200	250				300							
Cooling Water Circuit	Flow Rate	m <sup>3</sup> /hr	557	657	724	827	918	1026	1141	1251	1372	1570	1685		
	Outlet Temp	°C	34.6												
	No. of passes (Absorber)	#	2				1				2		1		
	No. of passes (Condensor)	#					1								
	Friction Loss	mWC	8.3	8.1	8.3	11.3	6.4	8.5	6.5	11.4	12.2	7.6	8.1		
Connection Diameter	mmNB	250	300				350				400				
Exhaust Gas Circuit	Exhaust Flow Rate	kg/hr	17700	20900	23000	26200	29100	32600	36200	39700	43600	49800	53500		
	Connection Diameter (In/Out)	mmNB	700	800		900		1000		1100		1200			
Overall Dimension	Length	mm	5100	6700		7900		3780		4260					
	Width	mm	3180	3480				3780				4260			
	Height	mm	3840	4020				4560				4920			
Operating Weight	x 1000 kg	20.9	33.4	34.8	40.3	42.4	45.0	51.3	62.0	64.6	73.2	76.4			
Max. Shipping Weight	x 1000 kg	16.0	25.4	26.5	31.2	32.4	36.6	38.6	46.9	49.1	55.3	58.0			
Clearance for Tube Removal	mm	4100	5320		6560				7910						
Electric Supply	Absorbent Pump Motor Rating	kW(A)	5.5 (14.0)				6.6 (17.0)				7.5 (20.0)				
	Refrigerant Pump Motor Rating	kW(A)	0.3 (1.4)				1.5 (5.0)								
	Total Electric Input	kVA	13.5				18.3				20.4				
	Power Supply		415V(±10%), 50Hz(±5%), 3 Phase+N												

- Chilled water inlet/outlet temperature = 12.2/6.7 °C
- Cooling water inlet temperature = 29.4°C
- Minimum cooling water inlet temperature is 10°C
- Maximum allowable pressure in chilled / cooling water system = 8 kg/cm<sup>2</sup>(g)
- Ambient condition shall be between 5 to 45°C
- Exhaust gas inlet temperature = 460°C
- Exhaust gas outlet temperature = 180°C
- Maximum allowable pressure drop in exhaust gas furnace = 200 mm WC
- Rated current for Purge pump motor = 1.9 A and Control panel = 1.5 A

Note : All the parameters listed above are for indicative purpose only.  
The parameters are subjected to change as per the exhaust gas flow / temperature.

# TECHNICAL SPECIFICATION

## Exhaust and Hot Water Driven Vapour Absorption Chiller

Model Number		Units	EJ 20A C	EJ 20B C	EJ 20C C	EJ 20D C	EJ 30A CX	EJ 30B CX	EJ 30C CX	EJ 40A CX	EJ 40B CX	EJ 40C CX	EJ 50A CX	
Cooling Capacity		TR	110	129	159	190	240	269	320	361	409	447	504	
		kW	387	454	560	669	845	947	1126	1271	1440	1573	1774	
Chilled Water Circuit	Flow Rate	m <sup>3</sup> /hr	60.5	70.9	87.4	104.5	132.0	148.0	175.9	198.5	224.9	245.8	277.1	
	No. of passes (Evaporator)	#	5				3							
	Friction Loss	mWC	4.4	5.4	4.0	4.7	3.8	3.7	5.7	5.7	5.9	6.4	5.5	
	Connection Diameter	mmNB	100				150				200			
Cooling Water Circuit	Flow Rate	m <sup>3</sup> /hr	110	129	159	190	240	269	320	361	409	447	504	
	Outlet Temp	°C	32.7				32.5							
	No. of passes (Absorber)	#	3				2							
	No. of passes (Condensor)	#					1				2			
	Friction Loss	mWC	4.0	3.9	4.8	4.9	4.9	5.1	7.7	6.9	7.2	7.9	7.9	
Connection Diameter	mmNB	150				200				250				
Exhaust Gas Circuit	Exhaust Flow Rate	kg/hr	2313	2700	3333	3960	4560	5130	6090	6900	7800	8520	9600	
	Connection Diameter (In/Out)	mmNB	300		350		400		450		500		550	
Hot Water Circuit	Hot Water Flow Rate	m <sup>3</sup> /hr	21	24	29.6	35.4	42.2	47.3	56.5	63.4	72	78.5	88.6	
	Connection Diameter	mmNB	75				100				150			
Overall Dimension	Length	mm	3000		3800		4000		4700		4900		5100	
	Width	mm	2800				2910				3100			
	Height	mm	2850				3000				3480		3840	
Operating Weight	x 1000 kg	6.1	6.7	8.2	12	14	16	18	19	19.5	20	22		
Max. Shipping Weight	x 1000 kg	5	5.3	7	9	12	14	16	17	17.5	18	19		
Clearance for Tube Removal	mm	2400		3755		3815		4100						
Electric Supply	Absorbent Pump 1 Motor Rating	kW(A)	2.2 (6.0)				3.0 (8.0)				3.7 (11.0)		5.5 (14.0)	
	Absorbent Pump 2 Motor Rating	kW(A)	2.2 (6.0)				3.0 (8.0)				3.7 (11.0)		5.5 (14.0)	
	Refrigerant Pump Motor Rating	kW(A)					0.3 (1.4)							
	Total Electric Input	kVA	7.8				9.2				11.4		13.5	
Power Supply		415V(±10%), 50Hz(±5%), 3 Phase+N												

Model Number		Units	EJ 50B CX	EJ 60A CX	EJ 60B CX	EJ 60C CX	EJ 60D CX	EJ 70A CX	EJ 70B CX	EJ 80A CX	EJ 80B CX	EJ 80C CX	EJ 80D CX		
Cooling Capacity		TR	557	657	724	827	918	1026	1141	1251	1372	1570	1685		
		kW	1961	2313	2548	2911	3231	3612	4016	4404	4829	5526	5931		
Chilled Water Circuit	Flow Rate	m <sup>3</sup> /hr	306.2	361.2	398.0	454.7	504.7	564.1	627.3	687.8	754.3	863.2	926.4		
	No. of passes (Evaporator)	#	3				2								
	Friction Loss	mWC	5.6	6.1	6.5	3.7	3.9	3.5	3.8	3.6	3.9	6.2	6.5		
	Connection Diameter	mmNB	200	250				300							
Cooling Water Circuit	Flow Rate	m <sup>3</sup> /hr	557	657	724	827	918	1026	1141	1251	1372	1570	1685		
	Outlet Temp	°C	32.5												
	No. of passes (Absorber)	#	2				1				2		1		
	No. of passes (Condensor)	#					1								
	Friction Loss	mWC	8.3	8.1	8.3	11.3	6.4	8.5	6.5	11.4	12.2	7.6	8.1		
Connection Diameter	mmNB	250	300				350				400				
Exhaust Gas Circuit	Exhaust Flow Rate	kg/hr	10620	12540	13800	15720	17460	19560	21720	23820	26160	29880	32100		
	Connection Diameter (In/Out)	mmNB	600	650		700		750		800		850		900	
Hot Water Circuit	Hot Water Flow Rate	m <sup>3</sup> /hr	97.8	115.4	127.1	145	161.3	180.4	200.4	219.8	241	275.5	296		
	Connection Diameter	mmNB	150				200				250				
Overall Dimension	Length	mm	5100	6700		8165		8300		8500		9350			
	Width	mm	3710	3597				4410				4970			
	Height	mm	3840	3978				4560				4920			
Operating Weight	x 1000 kg	23	35	37	42	44	48	49	63	66	74	78			
Max. Shipping Weight	x 1000 kg	20	30	33	38	41	45	47	57	58	59.5	69			
Clearance for Tube Removal	mm	4100	5320		6560				7910						
Electric Supply	Absorbent Pump 1 Motor Rating	kW(A)	5.5 (14.0)				6.6 (17.0)				7.5 (20.0)		9.0 (27.0)		
	Absorbent Pump 2 Motor Rating	kW(A)	5.5 (14.0)				6.6 (17.0)				7.5 (20.0)		9.0 (27.0)		
	Refrigerant Pump Motor Rating	kW(A)	0.3 (1.4)				1.5 (5.0)								
	Total Electric Input	kVA	13.5				18.3				20.4		25.4		
Power Supply		415V(±10%), 50Hz(±5%), 3 Phase+N													

- Chilled water inlet/outlet temperature = 12.2/6.7°C
- Cooling water inlet temperature = 29.4°C
- Minimum cooling water inlet temperature is 10°C
- Maximum allowable pressure in chilled / cooling water system = 8 kg/cm<sup>2</sup>(g)
- Ambient condition shall be between 5 to 45°C
- Exhaust gas inlet temperature = 460°C
- Exhaust gas outlet temperature = 180°C
- Maximum allowable pressure drop in exhaust gas furnace = 200 mm WC
- Hot water inlet/outlet temperature = 90/80°C
- Rated current for Purge pump motor = 1.9 A and Control panel = 1.5 A

Note : All the parameters listed above are for indicative purpose only.  
The parameters are subjected to change as per the exhaust gas and hot water flow / temperature.