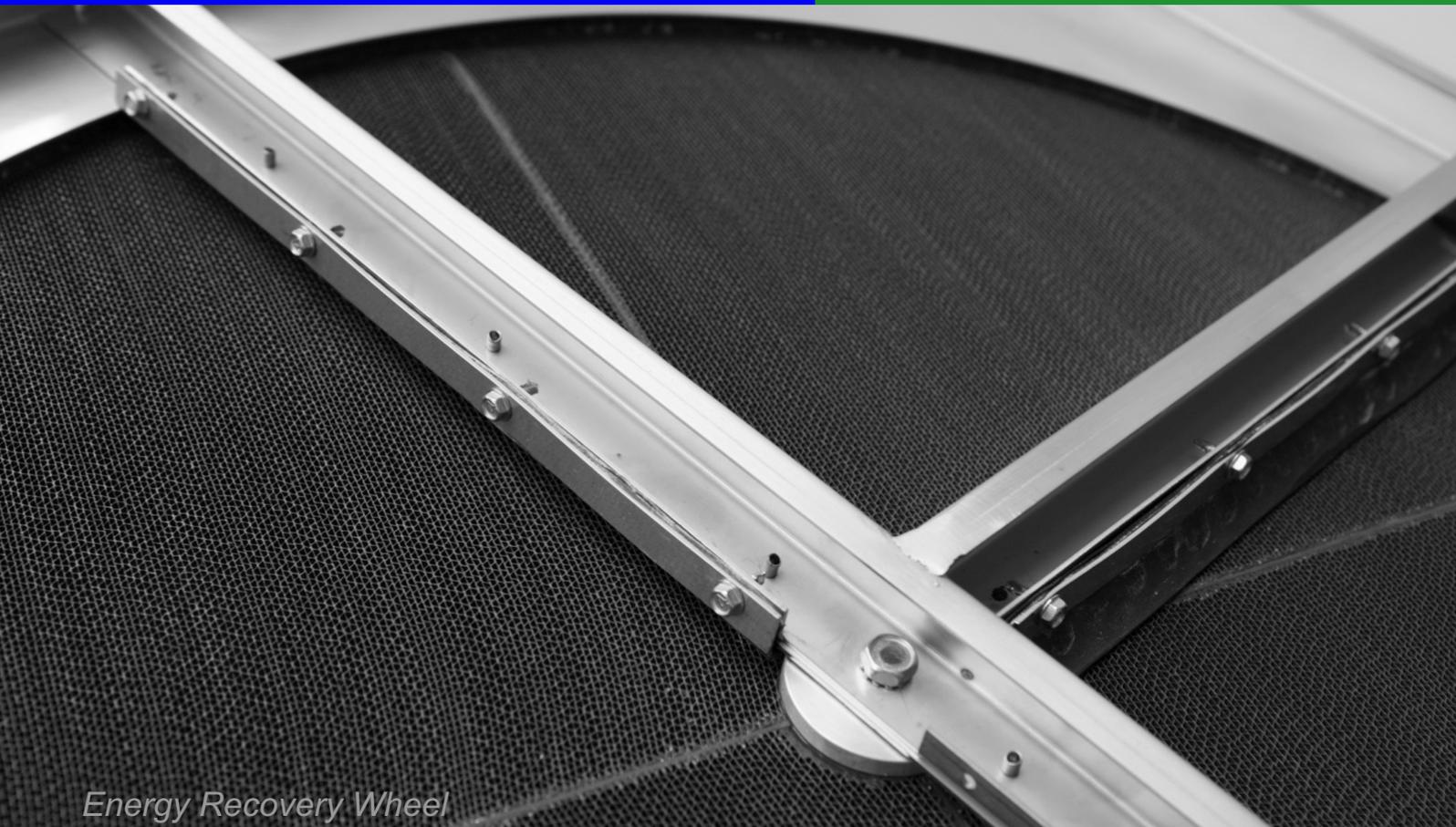


 **CASILICA**
ENERGY RECOVERY UNITS

Your **Environmental** Control Partners..



Energy Recovery Wheel

a Group Company Of.... **HUMIDIN**




Ensure Good Indoor Air Quality(IAQ) inside the building, Reduce aircon & recurring energy costs

Fresh Air a concern a need for Indoor Air Quality

Indoor Air Quality is a big concern & challenge today. Poor indoor air quality results to adverse effect on the health of the occupants inside the building, as most of the time spent inside the building means we all need to breathe quality of inside air only. Other than occupational health problems poor IAQ also results to fatigue and loss of productivity.

Now a days almost all the buildings are designed for air tight to minimize leakages and fresh air entering the buildings, this reduces the aircon requirements and in turn less running cost. Just to save capital cost designers knowingly or unknowingly plays with the occupant's health and which also leads to loss of productivity. Indoor air quality keeps on getting polluted due to mold, spores, bacteria, viruses, dust etc. presents in the indoors and is not exhausted out ,their concentration levels keeps on increasing due to not bringing enough fresh air inside. This refers to poor Indoor Air Quality (**Poor IAQ**) which results to **SBS – Sick Building Syndrome**.

The various sources of contamination inside the buildings are:

Occupants themselves: Body odors, perfumes, Deo's, CO2 etc

Various chemicals: used for cleaning purpose

Other Sources: Building materials, Paints Furnitures, etc also contribute to contamination

ASHRAE 62 gives guidelines to HVAC engineer for maintaining Indoor Air Quality by bringing fresh air to the buildings as per the activity levels of the occupants. This opens up another challenge to the HVAC designer as the fresh air condition is always at higher design levels then what is being maintained inside the building. This means fresh air needs to be treated before pumped inside the building. Treating fresh air requires much higher tonnage, which in turn increases the running cost as the outside conditions are much higher then the inside. The recurring energy expenses is much greater concern then adding additional tonnage. Thus maintaining Indoor air quality is always challenging for the HVAC designer.



Almost all projects today are designed/included with much greater amount of fresh air quantities to meet ASHRAE standards and Indoor Air Quality (IAQ). Hence the Cost Effective Ventilation with energy conservation is the key for all the HVAC designers.

CASILICA energy recovery is the answer to all IAQ related problems; **CASILICA** energy recovery units can cater to all fresh air needs without adding much load on the aircon by recovering energy through Energy Recovery and thus reduces the recurring energy costs drastically. **CASILICA** energy recovery can recover energy over 80%. Recovery is both sensible & latent energy, hence it also caters to all humidity control requirements in any conditioned space/buildings

Energy Recovery units are available as

- Stand alone wheel / Cassettes (Enthalpy wheel, Sensible wheel)
- Energy Recovery Ventilators (ERV)
- Treated fresh air units (TFA)

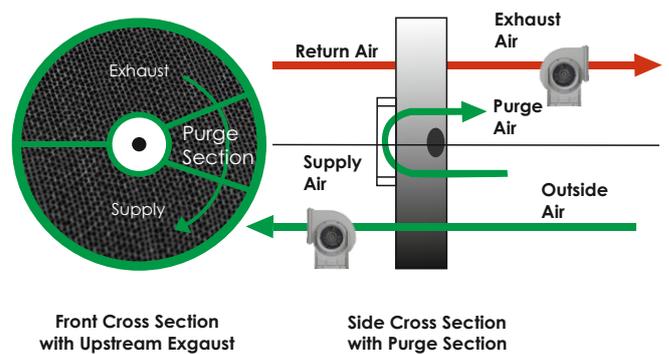
Heat Recovery Wheel

The heart of any energy recovery devices is Energy Recovery wheel which recovers the total energy i.e Enthalpy (both Sensible & Latent energy) from the exhaust of any conditioned space



How it Works?

The energy recovery wheel rotates between two air streams i.e. Exhaust from the Conditioned space and fresh air stream. The wheel rotates slowly between these two air streams and recovers the energy from the conditioned exhaust air by absorbing both sensible and latent energy and which is used to condition the fresh air when the wheel rotates and comes in contact with the fresh air stream. Thus the conditioned space can have more fresh air with lower humidity levels and at much lower energy costs. This not only ensures meeting the international ASHRAE standards but also enhanced Indoor Air Quality (IAQ) inside the conditioned space.



Benefits of Energy Recovery Units

- Preconditions the fresh air
- Higher intake of Fresh Air inside
- Delivers fresh air near to inside conditions throughout the year
- High energy recovery
- Can meet ASHRAE ventilation recommended standards
- Maintain humidity conditions without any additional energy costs
- Can maintain better IAQ inside
- Reduction in Aircon capacity
- Easily integration with existing system
- Easy installation

Technical features of Energy Recovery Wheel

- Aluminium substrate used as base material
- High structural strength
- Molecular sieve desiccant coated
- Desiccant provides high latent recovery
- Total energy (enthalpy) recovery
- Nearly equal Sensible & Latent recoveries
- Very high performance
- Low Pressure drops
- Can be easily retrofitted

Special features to avoid Cross Contamination

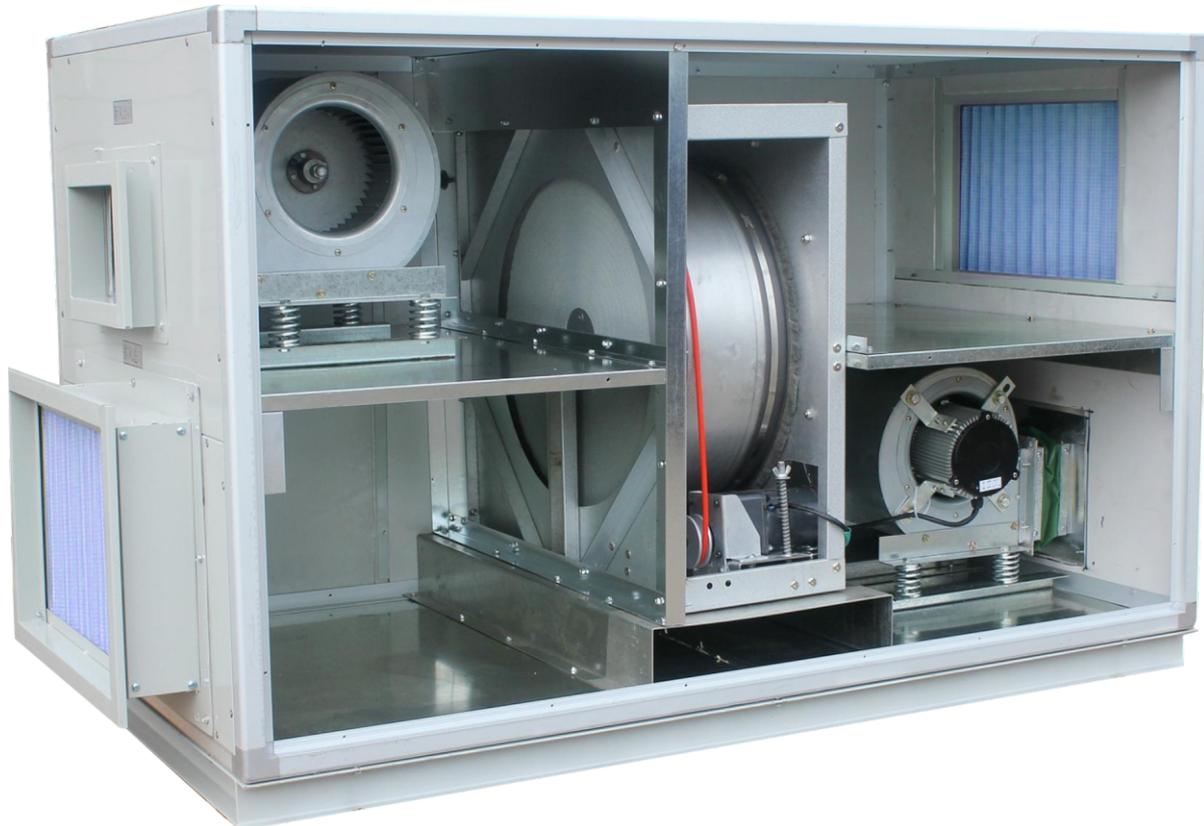
- Desiccant selectivity
- In built purge sector
- No carryover of bacteria, pollutants & dust
- No mixing of two airstreams
- Non contact Labyrinth seals
- Excellent sealing
- No wear & tear of the seals

Energy Recovery Ventilator (ERV)

CASILICA ERV's has inbuilt high efficiency energy recovery wheel. The energy is recovered from conditioned space exhaust and conditions the fresh air without any extra aircon capacity & any additional running cost.

ERV's are most suitable to cater to low fresh air requirements. All conditioned spaces with Windows A/C's, Split, Packages A/C's installed, ERV's can supplement the fresh air needs. It can be installed as stand alone to the conditioned space. In some cases with Low fresh air requirements ERV's can be installed along with AHU's also.

ERV's unlike Treated fresh air units does not have Cooling coil sections, Heating Sections, Humidifier sections and cannot be customized. ERV's comes in standard sizes and capacities.



Energy Recovery Ventilators (ERV's) are the excellent ventilation system of choice for any home or building, nursing homes, restaurants, pubs, shopping malls, schools, colleges, etc.

Treated Fresh Air Units (TFA)

CASILICA TFA's are meant to cater to large fresh airflows and recovery needs, Treated Fresh Air Units are supplied with various inbuilt options for all HVAC needs, some of the sections/modules/features are standard modules & others are available as an optional. Heart of the TFA is energy recovery wheel only which recovers Total Enthalpy i.e both Sensible & latent energy. The units can have inbuilt Pre filter section, Fine filter section, Cooling coil section, Heating section, UV section, Humidifier Section.

Standard Modules of TFA:

- 2 tier arrangement
- Supply Air Pre filter section
- Supply Air Fine filter section
- Exhaust air Pre filter section
- Exhaust air Fine filter section (optional)
- Energy recovery section
- Supply air Fan section
- Exhaust air Fan section
- Common skid for all the sections

Optional Modules:

- Cooling coil section
- Heating section (various heating options available e.g. electric/steam etc)
- Humidifier section
- UV section

CASILICA TFA's are designed for:

- High intake of fresh air
- To meet ASHRAE standards
- Very high performance
- No mixing of two air streams
- High Reliability
- Easy to maintain fan assembly
- Very low pressure drops
- Imported energy recovery wheel
- High efficiency energy recovery wheel
- Equal energy recovery
- High quality filtration arrangement
- Low leakage casing standards
- Corrosion Resistant double casing
- Modular design
- Wide range of models available



Benefits of CASILICA energy recovery: ★ Enhanced Indoor Air quality ★ Enhanced Energy Savings ★ Total energy recovery i.e. both sensible & latent energy ★ Equal Energy savings over 80% ★ Almost no Cross Contamination ★ Special Labyrinth seals to avoid cross leakage between supply and exhaust air ★ Adjustable purge sector to ensure no cross contamination ★ Very less payback period

Ideal for various applications

Healthcare : Hospitals, Nursing homes, Clinical laboratories, Operation theatres, ICU's, Recovery rooms, Burn wards etc



Hospitality : Hotels, Restaurants, Bar, Pubs, Discotheques



Commercials : Malls, Office Buildings, Super markets, Departmental stores, Conference rooms, Banquet halls ,Air-conditioned plants, Pharmaceuticals



Educational areas : Schools, Colleges, Auditoriums



Recreational areas : Theater, Bowling alleys, Indoor stadiums



Cross Flow Heat Exchanger(CCX)

CASALICA cross-flow heat exchanger exchanges thermal energy from Exhaust airstream of conditioned space to fresh air stream. In flat type heat exchanger two airstreams cross by each other one of these airstreams is exhaust from conditioned air and other airstreams is fresh outside air being supplied to ventilated space.

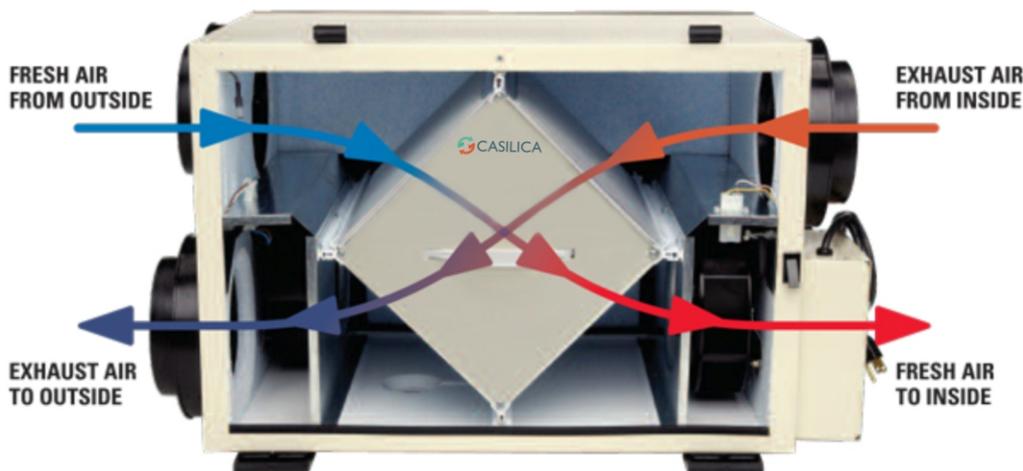
A cross-flow heat exchanger is made of thin metal panels, normally aluminium. The thermal energy is exchanged via the panels. A traditional cross-flow heat exchanger has a square cross-section. It has a thermal efficiency of 40–65%. A counter-flow or dual cross-flow heat exchanger can be used if greater thermal efficiencies are required – typically up to 75–85 %. The two airstreams (exhaust & fresh air) flow through the channels formed between the flat plates. Each airstream flows into alternating channels—i.e., supply air in one channel, return air in the next, supply in the one after that, etc.

Sensible energy from the warm air flowing through one side of the exchanger is transferred to the cold air flowing through the other.

The two air streams does not mix with each other. Hence, Cross flow heat exchanger does not have risk of short-circuiting of the airstreams.

A cross-flow is typically less expensive than other types of heat exchangers. It is normally used where hygienic standards requires that both airstreams are kept completely separate from one another. It is often used in heat recovery installations in large canteens, hospitals and in the food industry

Therefore, the mixing of dirt, odors, moisture, bacteria do not exist. Heat is transmitted from exhaust air to fresh air purely by conduction as a result of temperature difference between the two air streams. The warm extract air is cooled down, the cool fresh air is heated



Features of CASALICA plate type heat exchanger: ★ No wear & tear because there is no moving parts ★ Side and corner sealing avoids transfer of odors, contamination or humidity ★ High efficiencies due to special plate design ★ Different plate distances (spacing) are available ★ Horizontal or vertical installation is possible ★ Low investment cost ★ No electrical connections ★ Light-weight, compact design, easy to install

“CASILICA” Energy Recovery Wheel Performance Data

Velocity (FPM)	300	400	500	600	700	800	900	1000	
Efficiency (%)	80	78	75	73	71	69	66	64	
Model	Wheel Dia(mm)	Air Quantity (cfm)							
CRW-60	600	360	450	610	700	850	970	1100	1220
CRW-80	800	700	920	1150	1400	1610	1845	2075	2300
CRW-100	1000	1110	1480	1860	2200	2600	2980	3350	3720
CRW-120	1200	1595	2140	2680	3200	3740	4280	4820	5350
CRW-140	1400	2160	2900	3620	4300	5080	5800	6530	7260
CRW-160	1600	2850	3810	4760	5700	6670	7620	8580	9530
CRW-180	1800	3657	4890	6110	7400	8550	9780	11000	12220
CRW-200	2000	4565	6090	7020	9200	10670	12190	13720	15245
CRW-220	2200	5600	7480	9350	11200	13080	14950	16820	18700
CRW-240	2400	5700	8950	11190	13500	15670	17900	20140	22390
CRW-260	2600	7900	10560	13200	15900	18480	21125	23760	26400
CRW-280	2800	9200	12300	15370	18500	21520	24600	27670	30750
CRW-300	3000	10535	14170	17710	21300	24800	28340	31780	35720
CRW-320	3200	12100	16170	20210	24300	28300	32340	36380	40430
CRW-340	3400	13700	18300	22880	27500	32030	36810	41190	45760
CRW-360	3600	15400	20570	25710	30900	36000	41140	46260	51420
CRW-380	3800	17200	22950	28700	34500	40190	45930	51670	57410
CRW-400	4000	19100	25490	31550	38300	44600	50980	57360	63730
Velocity (m/s)	1.5	2	2.5	3	3.5	4	4.5	6	
Pressure Drop (mm w c)	0.33	0.4	0.48	0.56	0.65	0.74	0.84	0.95	

Note

- The technical data is for reference purpose only, exact data to be provided along with the drawings.
- Specifications and technical data are subject to change without any notice
- Noise level data is at 3mtr distance from the unit with ducting in place.

Energy Recovery Ventilator - Technical Data

Model	Fresh Air Quantity	Exhaust Air Quantity	Total Power Consumption	Fan Motor		Rotor Drive Motor	Noise Level
				Supply	Exhaust		
	CFM	CFM	Watts	Watts		Watts	DbA
CRV-10	100	100	69	32	32	5	<50
CRV-15	150	150	179	87	87	5	<50
CRV-20	200	200	265	120	120	25	<50
CRV-25	250	250	309	142	142	25	<50
CRV-35	350	350	325	150	150	25	<50
CRV-45	450	450	325	150	150	25	<50
CRV-65	650	650	365	170	170	25	<50
CRV-75	750	750	425	200	200	25	<50
CRV-85	850	850	425	200	200	25	<50
CRV-100	1000	1000	475	225	225	25	<50
CRV-150	1500	1500	1440	700	700	40	<50
CRV-200	2000	2000	2440	1200	1200	40	<50

Treated Fresh Air Unit - Models

Model	Air Quantity Range			Models	Air Quantity Range		
CFU-0612	CFM	600	1200	CFU-4510	CFM	4500	10200
	CMH	1000	2000		CMH	7500	17000
CFU-0918	CFM	900	1800	CFU-6012	CFM	6000	12000
	CMH	1500	3000		CMH	10000	20000
CFU-1530	CFM	1500	3000	CFU-8515	CFM	8700	15000
	CMH	2500	5000		CMH	14500	25000
CFU-2042	CFM	2010	4200	CFU-9018	CFM	9000	18000
	CMH	3350	7000		CMH	15000	30000
CFU-2448	CFM	2400	4800	CFU-12020	CFM	12000	21000
	CMH	4000	8000		CMH	20000	35000
CFU-3060	CFM	3000	6000	CFU-13524	CFM	13500	24000
	CMH	5000	10000		CMH	22500	40000
CFU-3672	CFM	3600	7200	CFU-15028	CFM	15000	28500
	CMH	6000	12000		CMH	25000	47500

Note

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Cross Flow Heat Exchanger(CCX) - Technical Data

Model	Air Quantity Range (CFM)		Pressure Drop (Pa)		Efficiency (%)		Power (Watts)		Noise Level (dbA)		Weight Kgs
	Max	Min	Max	Min	Sensible	Enthalphy	Max	Min	Max	Min	
CCX-12	120	90	75	65	75	60	80	58	30	27	26
CCX-18	180	150	85	75	75	58	107	78	32	29	32
CCX-24	240	210	90	80	75	56	142	121	34	30	38
CCX-30	300	270	110	95	71	52	173	130	35	32	47
CCX-36	360	300	100	90	71	51	190	162	35	33	48
CCX-48	480	420	120	100	74	52	320	302	37	35	73
CCX-60	600	540	100	80	76	56	410	360	38	36	92
CCX-78	780	660	150	120	74	56	655	630	45	41	95
CCX-96	960	840	150	130	76	58	815	750	50	44	110
CCX-120	1200	1080	200	170	77	60	980	945	53	47	133
CCX-156	1560	1560	200		72	54	1210		55		165
CCX-180	1800	1800	220		75	58	1750		58		210
CCX-192	1920	1920	220		76	58	1780		58		212
CCX-240	2400	2400	200		74	60	2250		62		290
CCX-300	3000	3000	250		75	58	3950		64		372
CCX-360	3600	3600	250		75	59	4790		64		493

Note

- All models from CCX-12 to CCX-120 - 220 V/1/50, Models from CCX-156 to CCX-360 415 V/3/50



The intention of this brochure is to introduce you to and acquaint you with the capabilities of the HUMIDIN group as an organization in the offered product areas. It will not answer all your immediate questions, and indeed, it will no doubt raise others. We welcome your interest in our products and shall be very pleased to provide further information.

GUARANTEE

HUMIDIN guarantees its products to be free of defects in material and workmanship for a period of one year from the date of delivery from the factory, provided motors are properly installed with overload protector. Humidin agrees to repair or replace defective parts or part to be returned to the factory, all transportation charges prepaid. Humidin does not guarantee against abrasion, corrosion or erosion. Humidin shall not be held responsible for any charges in connection with the removal or replacement of alleged defective equipment nor for incidental consequential damages.

In accordance with our policy of continual improvement in design, we reserve the right to depart from the details given in this brochure.

CASILICA D-AIR Pvt. Ltd.

37/5B, RAJPUR ROAD, CIVIL LINES, DELHI - 110054 INDIA

E-mail : info@casilica.com & sales@casilica.com

PH. 9654452921, 9650375541 Landline No. - 011-23993868

OFFICE IN - DELHI, TRONICA CITY (UP), MUMBAI, BANGLORE, KOLKATA