



**High Efficiency  
Low Height Air Handler With Side Discharge Condensing Unit  
USIN-USON Rotary Series**



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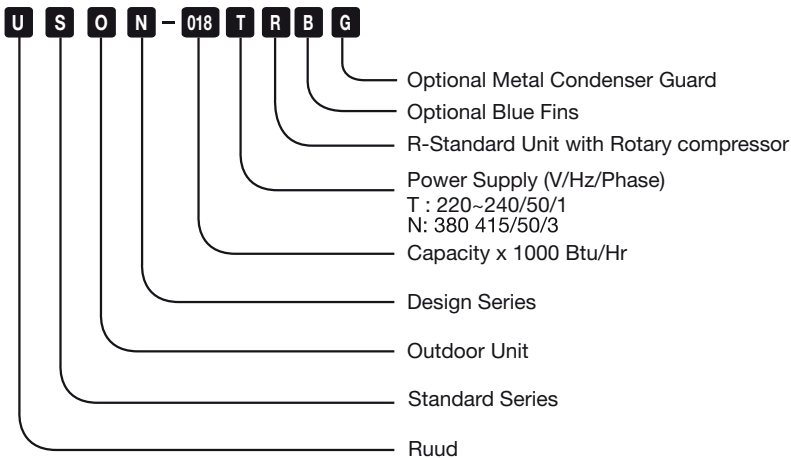
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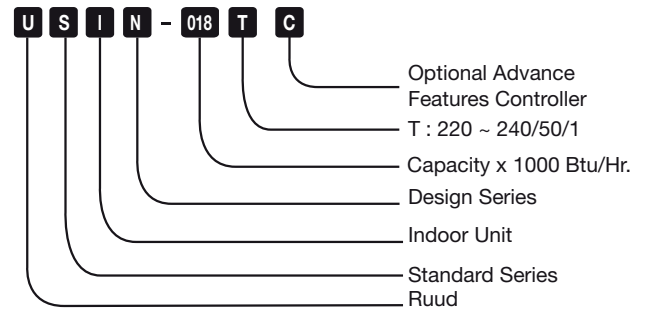
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## NOMENCLATURE

### Outdoor Unit:



### Indoor Unit:



## ENGINEERING FEATURES

### Indoor Units

#### Cabinet:

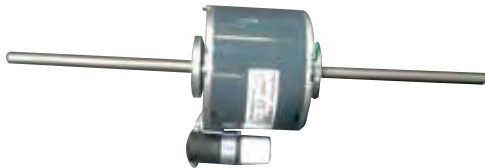
Polyester based Powder coated, made from Hot dip galvanized steel sheet metal for high corrosion resistance of 1008 hrs salt spray test as per ASTM-B117 std.



#### Motor:

Multi speed, internally protected Ultra high efficiency with Class-B insulation mounted on resilient neoprene rubber mountings to reduce noise level.

Ultra high efficiency & low RPM motors:  
6 Pole Motors.



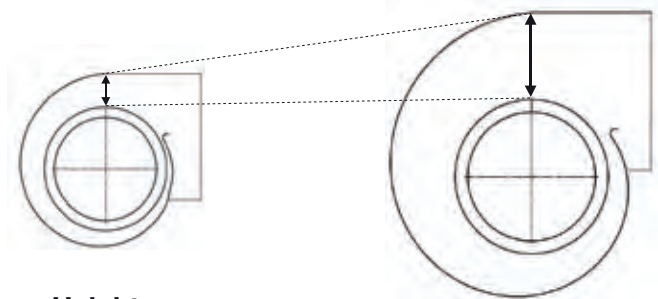
#### Motor Mounting Arrangement:

Specially designed mounting arrangement for motors to have center alignment of motor & fan blower assembly with housing which provide absolute sturdiness against vibrations.



#### Silent Operation:

The motor & fans are designed to achieve performance by running at lower RPM to reduce tip speeds for extremely silent operation. Motors used in the units are 6 pole. The fans are designed to operate at lower blower outlet & coil face velocity for quiet & highly efficient operation of units.

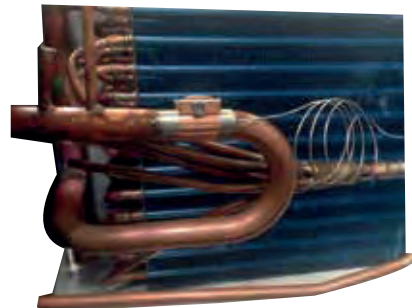


#### Low Height:

Height 12 to 16 inches. Allows for horizontal installation in most standard or replacement work.

#### Brass Distributor:

Distributor is used in all the indoor units to distribute refrigerant uniformly in the evaporator circuits for best performance in the evaporator coil.



## ENGINEERING FEATURES

### Blower:

Direct driven, Centrifugal, forward curved, double inlet double width type, made from galvanized steel sheet.

### Blower Housing:

Double inlet orifice, Profile to give advantage in low noise, high efficiency and uniform air flow, made from galvanized steel sheet.



Old Conventional Design



New Design

### Insulation:

Irradiated grade EPE, fire retardant, odour free material for thermal, hygiene and acoustic application.



### Evaporator Coil :

Coils are constructed with inner grooved copper tubes (IGT) & aluminium fins. Fins mechanically bonded to the tubes for maximum heat transfer capabilities. Coated highly corrosion resistant aluminium fins are provided as standard features in all the units.

### Antifreeze Protection For Coil :

Antifreeze temperature sensor is provided on coil against freezing during abnormal operating conditions.

### Refrigerant Connections :

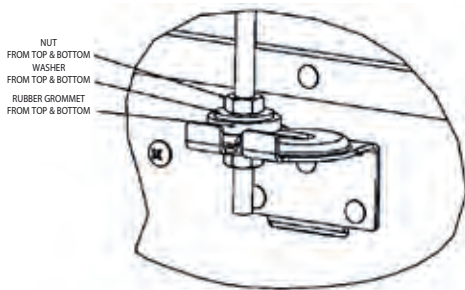
For field piping connections, sweat solder type joints are provided outside the unit. Rubber plugs with positive pressure inside the coil are provided on the connection for ease of installation.

### Drain Pan:

Insulated & powder coated galvanized steel drain pan is designed with adequate slope to have proper condensate drain. The sandwich insulation kept between upper and lower sheet metal panels provides drip free performance.

### Drain Pan Cleaning:

The construction of cabinet is designed to remove the drain pan for servicing & cleaning purpose through bottom access under installed condition without disturbing the installation of the unit.



### Unit Suspension:

Rolled up rigid brackets for proper and easy mounting / installation of units. Rubberized cushions are provided at hanging brackets for suspending the unit from the ceiling / concrete slab to eliminate vibration.

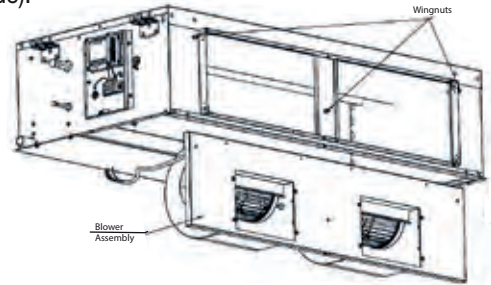
### Filters:

5mm thick woven synthetic, permanent washable filters are standard on all units. provision for fixing 1/2" thk field supplied filters is standard feature on all the units.



### Service Access:

Removable panels at the bottom of the unit are provided for service access to blower, blower housing, motors & expansion device. Entire fan and motor section assembly can be separated from the cabinet by opening special bolts for servicing and maintenance purpose in all the units. This feature provide the complete access of components without opening the ducting & refrigerant connections. Filter access provision is made without removing any part of unit (Lift and Remove from backside).



### Microprocessor Based Controller:

Microprocessor based electronic controller with built in programming for complete control of system, time delays for refrigeration systems protection & interlocking arrangement with safeties are provided as standard feature on all the indoor units.

### Controller Features:

- Standard with all units
- Microprocessor based unit
- High pressure and low pressure protection
- Antifreeze protection
- Built in time delay for compressor

### Advance Controller Features (Optional):

- Weekly Scheduling
- Remote ON/OFF
- BMS Compatibility
- Wireless remote controller
- Drain Pump supply



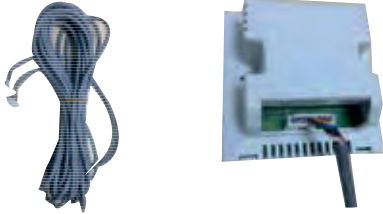
## ENGINEERING FEATURES

### Blower:

Direct driven, Centrifugal, forward curved, double inlet double width type, made from galvanized steel sheet.

### Blower Housing:

Double inlet orifice, Profile to give advantage in low noise, high efficiency and uniform air flow, made from galvanized steel sheet.



### Provision For Direct Duct Connection:

Flanges are provided on the front of units, suitable to connect flexible duct.

### Riveted Panels:

Non serviceable panels in the cabinet are joined with the help of rigid steel rivets. The riveted panel provide very good stability, fit and finish.

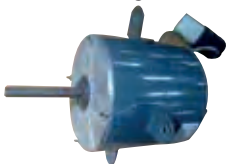
## Outdoor Units

### Compressor:

Compressor used in the units are hermetically sealed Rotary type and incorporates internal high temperature motor overload protection, and durable insulation on the motor winding. The compressors used are tropical compressors optimized for performance & reliability for high temperature environmental conditions. It is internally spring mounted and externally mounted on rubber grommets to reduce vibration and noise.

### Condenser Fan Motor:

Internally protected, totally enclosed and permanently lubricated type motors are tested for high ambient operation.



### Fan:

Metallic Condenser fan blades ensure safety & high durability. Suitable for operation in high ambient temperature and heavy wind pressure.



### Fan Guard:

Metallic wire guard confirms to IEC safety standard & high durability.

### Cabinet:

Polyester Powder coated, made from hot dip galvanized steel sheet metal for high corrosion resistance of 1008 hrs salt spray as per ASTM-B117 std. Pressed parts like Base, Foot, Top, Front, Fan Motor Bracket and Side grille are adds sturdiness to the cabinet.

### Refrigerant Connections:

All connections are sweat and soldered type on exterior of the unit, located close to the ground for neat appearing installation.

### Service Valves:

Standard on all models. These valves are provided outside the unit with service port for connecting gauges for ease of installation, additional refrigerant charging and monitoring of system.



### Serviceability:

The compressor the electrical box is located in separate compartment of the cabinet providing for easy access through service panel.



### Filter Drier:

Filter drier is supplied loose as standard accessory with the units for installation in liquid line in field. The filter drier prevents the unwanted moisture in the system and help in enhancing the life of the system.



### Precharged:

Every unit is factory charged and run tested before shipment.

### Pressure Cut-Outs:

High Pressure and Low Pressure safety controls are a standard feature on all the models.



### Condenser Coil:

Coils are constructed with inner grooved copper tube (IGT) & aluminum fins mechanically bonded to the tubes for maximum heat transfer capabilities.



# PHYSICAL AND ELECTRICAL DATA

PHYSICAL & ELECTRICAL DATA		TABLE FOR TECHNICAL DATA									
AIR HANDLING UNIT MODEL		USIN012-T	USIN018-T	USIN021-T	USIN024-T	USIN030-T	USIN036-T	USIN042-T			
CONDENSING UNIT MODEL	AMBIENT TEMP 35 °C	USIN012-TR	USIN018-TR	USIN021-TR	USIN024-TR	USIN030-TR	USIN036-TR	USIN042-NR			
	26.7 DB / 19.4 WB °C	11.3	17.4	21.7	25.9	30.3	36.5	42.2			
EVAP ENTERING AIR TEMP.	SMBH	8.9	13.2	17.3	18.7	23.3	26.3	31.7			
	EER	12.35	12.17	12.06	11.81	11.82	11.82	11.82			
AMBIENT TEMP 35 °C	27 DB / 19 WB °C	11.2	17.2	21.0	25.2	29.4	36.0	40.9			
	24.4 DB / 17.2 WB °C	9.4	14.0	18.3	19.7	24.3	27.8	33.8			
EVAP ENTERING AIR TEMP.	SMBH	12.043	12.070	11.765	11.507	11.529	11.520	11.521			
	EER	10.2	16.5	20.4	23.6	27.2	33.8	39.2			
AMBIENT TEMP 46 °C	29 DB / 19 WB °C	8.6	13.4	17.4	19.3	23.3	26.3	32.4			
	24.4 DB / 17.2 WB °C	9.9	15.0	18.5	21.8	25.8	31.0	36.8			
EVAP ENTERING AIR TEMP.	SMBH	9.5	14.6	18.4	20.8	25.4	29.6	36.7			
	EER	8.839	8.671	8.685	8.321	8.323	8.333	8.364			
AIR FLOW PERFORMANCE (DRY COIL)	24.4 DB / 17.2 WB °C (Medium Speed)	10.0	14.6	17.7	20.9	25.4	31.2	34.6			
	24.4 DB / 17.2 WB °C (High Speed)	8.3	12.4	14.6	17.6	20.6	26.3	29.1			
NOISE LEVEL	LOW	10.3	15.1	17.8	21.2	25.5	31.6	35.4			
	MED	8.3	12.5	14.6	17.6	20.4	26.4	29.1			
EXTERNAL STATIC PRESSURE (ESP)	HIGH	360	485	745	795	1145	1200	1260			
	LOW	435	570	770	840	1200	1250	1390			
NUMBER OF COMPRESSORS	MED	500	650	790	890	1250	1290	1560			
	HIGH	38.6	38.4	40.8	46.3	44.8	45.4	48.1			
NUMBER OF REFRIGERANT CIRCUIT FOR AHU	LOW	39.3	39.1	41.3	46.5	45.4	45.9	49.1			
	HIGH	39.7	40.5	41.7	47.5	45.9	46.7	50.7			
EXPANSION DEVICE/REFRIGERANT - R410A	IN (Pa)	0.1(25)	0.1(25)	0.1(25)	0.1(25)	0.15(37)	0.15(37)	0.15(37)			
	NOS.	1	1	1	1	1	1	1			
POWER SUPPLY	NOS.	1	1	1	1	1	1	1			
	VOLT / HZ / PH	220-240/50/1	220-240/50/1	220-240/50/1	220-240/50/1	220-240/50/1	220-240/50/1	220-240/50/1			
CONDENSING UNIT	CONDENSING UNIT	220-240/50/1	220-240/50/1	220-240/50/1	220-240/50/1	220-240/50/1	220-240/50/1	220-240/50/1			
	CONDENSING UNIT	0.065	0.085	0.100	0.145	0.165	0.180	0.260			
CIRCUIT BREAKER SIZE	CONDENSING UNIT	0.865	1.340	1.685	2.045	2.385	2.945	3.290			
	CONDENSING UNIT	15	15	15	15	15	15	15			
FULL LOAD CURRENT	CONDENSING UNIT	25	25	25	25	32	32	25			
	CONDENSING UNIT	0.3	0.4	0.4	0.6	0.8	1.0	1.2			
COIL FACE AREA	CONDENSING UNIT	3.6	5.5	7.0	9.2	10.9	13.1	5.4			
	CONDENSING UNIT	2.7	2.7	3.6	3.6	4.5	4.5	5.1			
NO OF FANS	CONDENSING UNIT	3.9	6.0	6.0	6.7	6.7	9.2	9.2			
	CONDENSING UNIT	2	2	2	2	2	2	2			
UNIT DIMENSION (W*H*D)	CONDENSING UNIT	1	1	1	1	1	1	1			
	CONDENSING UNIT	977*310*600	977*310*600	1252*310*600	1252*310*600	1252*400*700	1252*400*700	1402*400*700			
NET WEIGHT	CONDENSING UNIT	850*550*310	850*690*310	850*690*310	850*800*310	850*800*310	1020*930*416	1020*930*416			
	INDOOR UNIT	37	38	44	44	58	58	64			
OUTDOOR UNIT	INDOOR UNIT	36	50	50	55	58	85	86			
	OUTDOOR UNIT										

1- Air flow and sound data is mentioned at compressor off condition.

2- Unit performance is rated as per ESMA standard for evaluation.

\* Refer long piping guidelines and accessory requirements.