Installation
Operation
Maintenance

MCD/MWD
512-518-524-530-536-048-060
Ductable ceiling-suspended unit

SS-SVX07A-E4

General information

Foreword

These Installation Operation and Maintenance instructions are given as a guide to good practice in the installation, start-up, operation and periodic maintenance by the user of MCD/MWD. They do not contain the full service procedures necessary for the continued successful operation of this equipment. The services of a qualified service technician should be employed, through the medium of a maintenance contract with a reputable service company.

Warranty

Warranty is based on the general terms and conditions of the constructor. The warranty is void if the equipment is modified or repaired without the written approval of the constructor, if the operating limits are exceeded, or if the control system or the electrical wiring is modified. Damage due to misuse, lack of maintenance, or failure to comply with the manufacturer's instructions, is not covered by the warranty obligation. If the user does not conform to the rules of chapter "Maintenance", it may entail cancellation of warranty and liabilities by the constructor.

About this manual

The information contained in this manual applies to units designated MCD/MWD. Cautions appear at appropriate places in this instruction manual. Your personal safety and the proper operation of this machine require that you follow them carefully. The constructor assumes no liability for installations or servicing performed by unqualified personnel. Read this manual carefully and the manual on the installation of the outdoor unit before starting to install the system.

About the unit

MCD/MWD units are assembled, pressure tested, dehydrated, charged and run tested before shipment. MCD units are designed to operate in cooling mode only, whereas MWD can operate in cooling or heating modes. This unit with its mounted accessories is in conformity with the provisions of the low voltage directive 73/23/EEC and electromagnetic compatibility directive 89/336/EEC as amended, and in conformity with nation implementing legislation.

Reception

On arrival, inspect the unit before signing the delivery note. Specify any damage on the delivery note, and send a registered letter of protest to the last carrier of the goods within 72 hours of delivery. Notify the local sales office at the same time. The unit should be totally inspected within 7 days of delivery. If any concealed damage is discovered, send a registered letter of protest to the carrier within 7 days of delivery and notify the local sales office. Units are shipped with the refrigerant operating or holding charge and should be examined with an electronic leak detector to determine the hermetic integrity of the unit. The refrigerant charge is not included in the standard Warranty Cover.

Refrigerant

The refrigerant provided by the constructor meets all the requirements of our units. When using recycled or reprocessed refrigerant, it is advisable to ensure its quality is equivalent to that of a new refrigerant. For this, it is necessary to have a precise analysis made by a specialized laboratory. If this condition is not respected, the constructor warranty could be cancelled. Do not release refrigerant into the atmosphere.

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Before starting

Creation of refrigerant lines

To create the refrigerant lines you will need refrigeration quality annealed copper tubing. These tubes are available on the local market together with the insulation and mounting equipment. These units must be connected using screw connections/flare type for unit sizes 512 to 536 and brazed connections for unit sizes 048-060.

Electrical connections

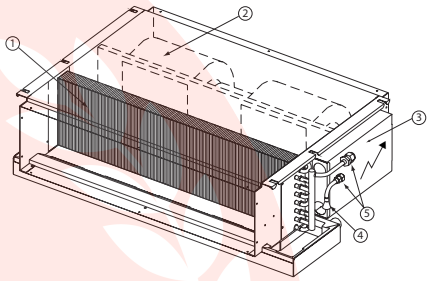
Use insulated copper wire. The section of the core varies depending on the length required. Refer to table 1 for the recommended sections. The wiring and electrical connections must comply with national electricity regulations. Check that the electrical characteristics on the nameplate correspond to those of the national grid. The electrical installation shall include a disconnect switch in compliance with local electrical regulations.

WARNING!
Never open the indoor or outdoor unit without first disconnecting the power supply. There is a risk of electrocution.

Table 1 - Recommended sections of electric wires (power link)

Unit size	Section	Maximum fuse size
512	2.5 mm^2	16 aM
518 - 524	2.5 mm^2	32 aM
530 - 536 RB/SB	4.0 mm^2	40 aM
530 - 536 RB/SB	2.5 mm^2	32 aM
048 - 060	2.5 mm^2	32 aM

Figure 1 - Unit description



1 = Direct expansion coil
2 = Fan assembly
3 = Control panel
4 = Cooling mode expansion device (sizes 530-060)
5 = Refrigerant connections (screw connections/flare type for unit sizes 512 to 536 and brazed connections for unit sizes 048-060)

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Table 2 - Cooling only R407C (1/2)

Performances		**TTK 512 RB**	**TTK 518 RB**	**TTK 524 RB**	**TTK 530 SB**	**TTK 530 SC**
Indoor unit		**MCD 512 CB**	**MCD 518 CB**	**MCD 524 CB**	**MCD 530 CB**	**MCD 530 CB**
Cooling Capacity (1)	(kW)	3.16	4.56	6.76	8.60	8.60
Power Input	(kW)	1.27	1.88	2.87	3.41	3.41
Main Power supply	(V/Ph/Hz)	230/1/50	230/1/50	230/1/50	230/1/50	400/3/50
Sound Power Level in high speed	(dB(A))	36	43	40	44	44
Units Amps						
Current	(A)	6.4	9.6	12.8	19.8	7.7
Starting Amps	(A)	28.7	44.0	72.0	97.0	45.5
Recommended Fuse size (AM) type gG		16	20	20	25	20
Recommended Power Wire	nb wires x mm^2	3 x 1.5	3 x 2.5	3 x 2.5	3 x 4	4 x 2.5
Recommended Control Interconnection Wire	nb wires x mm^2	2 x 1.5	2 x 1.5	2 x 1.5	2 x 1.5	2 x 1.5
Max wire length (2)	(m)	50	50	50	50	50
Compressor						
Number		1	1	1	1	1
Type		Rotary	Rotary	Rotary	Scroll	Scroll
Model		RE 207 VHSMT	PE 31 VNEMT	NE 41 VNHMT	ZR 40 K3E PFJ	ZR 40 K3E TFD
Number of speeds		1	1	1	1	1
Number of motors		1	1	1	1	1
Maximum Continuous Current	(A)	6.0	9.0	12.2	18.7	6.6
Locked Rotor Amps	(A)	28	43	71	100	46
Motor RPM	(rpm)	2850	2900	2900	2900	2900
Crankcase Heater	(W)	-	-	-	-	-
Outdoor Coil						
Fin Type		Wavy 3B	Wavy 3B	Wavy 3B	Wavy 3B	Wavy 3B
Tube size	(mm)	9.52	9.52	9.52	9.52	9.52
Tube Type		Inner Groove	Inner Groove	Inner Groove	Inner Groove	Inner Groove
Height	(mm)	508	559	559	762	762
Length	(mm)	420	755	755	855	855
Face Area	(m^2)	0.213	0.420	0.420	0.650	0.650
Number of rows		2	2	2	2	2
Number of circuits		1	2	2	4	4
Fins per feet	(fpf)	180	180	180	180	180
Outdoor Fan						
Type		Axial	Axial	Axial	Axial	Axial
Number		1	1	1	1	1
Diameter	mm (inches)	406(16)	457(18)	457(18)	508(20)	508(20))
Number of speeds		1	1	1	1	1
Airflow (3) (4)	(m^3/h)	1050	2020	2020	3400	3400
Number of motors		1	1	1	1	1
Motor (4)	(kW)	0.08	0.14	0.14	0.229	0.229
Rated Amps (4)	(A)	0.35	0.60	0.60	1.05	1.05
Locked rotor Amps (4)	(A)	0.70	1.00	1.00	2.04	2.04
Motor RPM	(rpm)	930	930	930	900	900
Capacitor per fan	(µF)	2.5	2	2	5	5
Power supply	(V/Ph/Hz)	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50
Indoor Fan						
Airflow (3) (4)	(m^3/h)	550	820	1100	1370	1370
Expansion device						
Cooling mode		Orifice	Orifice	Orifice	Orifice	Orifice
Dimensions crated						
Length	(mm)	672	860	860	1045	1045
Width	(mm)	357	340	340	380	380
Height	(mm)	577	580	580	790	790
Dimensions uncrated						
Length with feet	(mm)	667	821	821	1100	1100
Length without feet	(mm)	667	821	821	1003	1003
Width with feet	(mm)	332	400	400	365	365
Width without feet	(mm)	277	327	327	365	365
Height	(mm)	517	567	567	790	790
Weight						
Weight uncrated	(kg)	36	54	58	87	87
Weight crated	(kg)	37	56	60	89	89
Refrigerant Connections						
Type		Flare	Flare	Flare	Flare	Flare
Suction line	(inches)	1/2	5/8	5/8	3/4	3/4
Liquid line	(inches)	1/4	3/8	3/8	3/8	3/8
R407C Refrigerant Charge	**(kg)**	**1.1**	**1.6**	**2.2**	**2.5**	**2.5**

Notes:
(1) at 27°C db /19°C wb indoor and 35°C outdoor
(2) Wire channel @ 35°C ambient max.
(3) at nominal airflow with standard drive
(4) for fan system

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Table 2 - Cooling only R407C (2/2)

Performances *Indoor unit*		TTK 536 SB MCD 536 CB	TTK 536 SC MCD 536 CB	TTK 048 SC MCD 048 CB	TTK 060 SC MCD 060 CB
Cooling Capacity (1)	(kW)	9.42	9.42	13.14	14.90
Power Input	(kW)	4.35	4.35	5.25	6.37
Main Power supply	(V/Ph/Hz)	230/1/50	400/3/50	400/3/50	400/3/50
Sound Power Level in high speed	(dB(A))	44	44	53	63
Units Amps					
Current	(A)	24.6	11.1	11.3	12.7
Starting Amps	(A)	116.0	52.0	64.0	72.5
Recommended Fuse size (AM) type gG		40	20	20	20
Recommended Power Wire	nb wires x mm^2	3 x 6	4 x 2.5	4 x 2.5	4 x 2.5
Recommended Control Interconnection Wire	nb wires x mm^2	2 x 1.5	2 x 1.5	2 x 1.5	2 x 1.5
Max wire length (2)	(m)	50	50	50	50
Compressor					
Number		1	1	1	1
Type		Scroll	Scroll	Scroll	Scroll
Model		ZR 48 K3E PFJ	ZR 48 K3E TFD	ZR 61 KCE TFD	ZR 72 KCE TFD
Number of speeds	1	1	1	1	
Number of motors		1	1	1	1
Maximum Continuous Current	(A)	23.5	10.0	10.0	11.4
Locked Rotor Amps	(A)	114	50	65.5	74
Motor RPM	(rpm)	2900	2900	2900	2900
Crankcase Heater	(W)	-	-	-	-
Outdoor Coil					
Fin Type		Wavy 3B	Wavy 3B	Wavy 3B	Wavy 3B
Tube size	(mm)	9.52	9.52	9.52	9.52
Tube Type		Inner Groove	Inner Groove	Inner Groove	Inner Groove
Height	(mm)	762	762	1219	1219
Length	(mm)	855	855	855	855
Face Area	(m^2)	0.650	0.650	1.048	1.048
Number of rows		2	2	2	2
Number of circuits		4	4	6	6
Fins per feet	(fpf)	180	180	240	240
Outdoor Fan					
Type		Axial	Axial	Axial	Axial
Number		1	1	2	2
Diameter	mm (inches)	508(20)	508(20)	457(18)	457(18)
Number of speeds		1	1	1	1
Airflow (3) (4)	(m^3/h)	3400	3400	4600	4600
Number of motors		1	1	2	2
Motor (4)	(kW)	0.229	0.229	0.29	0.29
Rated Amps (4)	(A)	1.05	1.05	1.20	1.20
Locked rotor Amps (4)	(A)	2.04	2.04	2.00	2.00
Motor RPM	(rpm)	900	900	930	930
Capacitor per fan	(µF)	5	5	4	4
Power supply	(V/Ph/Hz)	230/1/50	230/1/50	230/1/50	230/1/50
Indoor Fan					
Airflow (3) (4)	(m^3/h)	1650	1650	2190	2300
Expansion device					
Cooling mode		Orifice	Orifice	Orifice	Orifice
Dimensions crated					
Length	(mm)	1045	1045	1045	1045
Width	(mm)	380	380	390	390
Height	(mm)	790	790	1389	1389
Dimensions uncrated					
Length with feet	(mm)	1100	1100	1030	1030
Length without feet	(mm)	1003	1003	1030	1030
Width with feet	(mm)	365	365	420	420
Width without feet	(mm)	365	365	366	366
Height	(mm)	790	790	1246	1246
Weight					
Weight uncrated	(kg)	89	89	105	108
Weight crated	(kg)	91	91	108	111
Refrigerant Connections					
Type		Flare	Flare	Braze	Braze
Suction line	(inches)	3/4	3/4	1 1/8	1 1/8
Liquid line	(inches)	3/8	3/8	3/8	3/8
R407C Refrigerant Charge	**(kg)**	**2.5**	**2.5**	**3.8**	**4.2**

Notes:
(1) at 27°C db /19°C wb indoor and 35°C outdoor
(2) Wire channel @ 35°C ambient max.
(3) at nominal airflow with standard drive
(4) for fan system

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Table 3 - Cooling only R22 (1/2)

Performances ***Indoor unit***		**TTK 512 RB** **MCD 512 DB**	**TTK 518 RB** **MCD 518 DB**	**TTK 524 KB** **MCD 524 DB**	**TTK 530 KB** **MCD 530 DB**
Cooling Capacity (1)	(kW)	3.30	5.00	6.40	8.30
Power Input	(kW)	1.51	1.62	2.70	3.30
Main Power supply	(V/Ph/Hz)	230/1/50	230/1/50	230/1/50	230/1/50
Sound Power Level in high speed	(dB(A))	36	43	40	44
Units Amps					
Current	(A)	6.0	8.0	11.3	19.1
Starting Amps	(A)	28.7	44.0	72.0	97.0
Recommended Fuse size (AM) type gG		16	20	20	25
Recommended Power Wire	nb wires x mm^2	3 x 1.5	3 x 2.5	3 x 2.5	3 x 4
Recommended Control Interconnection Wire	nb wires x mm^2	2 x 1.5	2 x 1.5	2 x 1.5	2 x 1.5
Max wire length (2)	(m)	50	50	50	50
Compressor					
Number		1	1	1	1
Type		Rotary	Rotary	Rotary	Reciprocating
Model		RH207 VHAT	PH31 VNET	CK32K3-PFZ	CR37KQ-PFT
Number of speeds		1	1	1	1
Number of motors		1	1	1	1
Maximum Continuous Current	(A)	5.5	7.0	11.0	18.5
Locked Rotor Amps	(A)	31	43	75	85.5
Motor RPM	(rpm)	2850	2900	2900	2900
Crankcase Heater	(W)	-	-	-	-
Outdoor Coil					
Fin Type		Wavy 3B	Wavy 3B	Wavy 3B	Wavy 3B
Tube size	(mm)	9.52	10.52	11.52	12.52
Tube Type		Inner Groove	Inner Groove	Inner Groove	Inner Groove
Height	(mm)	508	559	559	762
Length	(mm)	420	755	755	855
Face Area	(m^2)	0.213	0.420	0.420	0.650
Number of rows		2	2	2	2
Number of circuits		2	4	4	4
Fins per feet	(fpf)	180	180	180	180
Outdoor Fan					
Type		Axial	Axial	Axial	Axial
Number		1	1	1	1
Diameter	mm (inches)	406(16)	457(18)	457(18)	508(20)
Number of speeds		1	1	1	1
Airflow (3) (4)	(m^3/h)	1050	2020	2020	3400
Number of motors		1	1	1	1
Motor (4)	(kW)	0.08	0.14	0.14	0.23
Rated Amps (4)	(A)	0.35	0.60	0.60	1.05
Locked rotor Amps (4)	(A)	0.70	1.00	1.00	2.04
Motor RPM	(rpm)	930	930	930	900
Capacitor per fan	(µF)	2.5	2	2	5
Power supply	(V/Ph/Hz)	230/1/50	230/1/50	230/1/50	230/1/50
Indoor Fan					
Airflow (3) (4)	(m^3/h)	550	820	1100	1370
Expansion device					
Cooling mode		Orifice	Orifice	Orifice	Orifice
Dimensions crated					
Length	(mm)	672	860	860	1045
Width	(mm)	357	340	340	380
Height	(mm)	577	580	580	790
Dimensions uncrated					
Length with feet	(mm)	667	821	821	1100
Length without feet	(mm)	667	821	821	1003
Width with feet	(mm)	332	400	400	365
Width without feet	(mm)	277	327	327	365
Height	(mm)	517	567	567	790
Weight					
Weight uncrated	(kg)	36	54	58	87
Weight crated	(kg)	37	56	60	89
Refrigerant Connections					
Type		Flare	Flare	Flare	Flare
Suction line	(inches)	1/2	5/8	5/8	3/4
Liquid line	(inches)	1/4	3/8	3/8	3/8
R22 Refrigerant Charge	(kg)	1.2	1.9	2.5	3.6

Notes:
(1) at 27°C db /19°C wb indoor and 35°C outdoor
(2) Wire channel @ 35°C ambient max.
(3) at nominal airflow with standard drive
(4) for fan system

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Table 3 - Cooling only R22 (2/2)

Performances *Indoor unit*		TTK 536 KB MCD 536 DB	TTK 048 KC MCD 048 DB	TTK 060 KC MCD 060 DB
Cooling Capacity (1)	(kW)	9.90	13.50	15.80
Power Input	(kW)	4.20	5.10	5.90
Main Power supply	(V/Ph/Hz)	230/1/50	400/3/50	400/3/50
Sound Power Level in high speed	(dB(A))	44	53	63
Units Amps				
Current	(A)	21.9	9.0	10.6
Starting Amps	(A)	116.0	64.0	72.5
Recommended Fuse size (AM) type gG		40	20	20
Recommended Power Wire	nb wires x mm^2	3 x 6	4 x 2.5	4 x 2.5
Recommended Control Interconnection Wire	nb wires x mm^2	2 x 1.5	2 x 1.5	2 x 1.5
Max wire length (2)	(m)	50	50	50
Compressor				
Number		1	1	1
Type		Reciprocating	Reciprocating	Reciprocating
Model		CR47KQ-PFZ	CRPQ-0450-TFD	CRNQ-0500-TFD
Number of speeds		1	1	1
Number of motors		1	1	1
Maximum Continuous Current	(A)	21.0	8.0	10.0
Locked Rotor Amps	(A)	105	55	65
Motor RPM	(rpm)	2900	2900	2900
Crankcase Heater	(W)	-	27	27
Outdoor Coil				
Fin Type		Wavy 3B	Wavy 3B	Wavy 3B
Tube size	(mm)	13.52	14.52	15.52
Tube Type		Inner Groove	Inner Groove	Inner Groove
Height	(mm)	762	1219	1219
Length	(mm)	855	855	855
Face Area	(m^2)	0.650	1.048	1.048
Number of rows		2	2	2
Number of circuits		4	6	6
Fins per feet	(fpf)	180	240	240
Outdoor Fan				
Type		Axial	Axial	Axial
Number		1	2	2
Diameter	mm (inches)	508(20)	457(18)	457(18)
Number of speeds		1	1	1
Airflow (3) (4)	(m^3/h)	3400	4600	4600
Number of motors		1	2	2
Motor (4)	(kW)	0.23	0.29	0.29
Rated Amps (4)	(A)	1.05	1.20	1.20
Locked rotor Amps (4)	(A)	2.04	2.00	2.00
Motor RPM	(rpm)	900	930	930
Capacitor per fan	(µF)	5	4	4
Power supply	(V/Ph/Hz)	230/1/50	230/1/50	230/1/50
Indoor Fan				
Airflow (3) (4)	(m^3/h)	1650	2190	2300
Expansion device				
Cooling mode		Orifice	TXV	TXV
Dimensions crated				
Length	(mm)	1045	1045	1045
Width	(mm)	380	390	390
Height	(mm)	790	1389	1389
Dimensions uncrated				
Length with feet	(mm)	1100	1030	1030
Length without feet	(mm)	1003	1030	1030
Width with feet	(mm)	365	420	420
Width without feet	(mm)	365	366	366
Height	(mm)	790	1246	1246
Weight				
Weight uncrated	(kg)	89	105	108
Weight crated	(kg)	91	108	111
Refrigerant Connections				
Type		Flare	Flare	Flare
Suction line	(inches)	3/4	1 1/8	1 1/8
Liquid line	(inches)	3/8	3/8	3/8
R22 Refrigerant Charge	(kg)	3.8	3.5	4.5

Notes:
(1) at 27°C db /19°C wb indoor and 35°C outdoor
(2) Wire channel @ 35°C ambient max.
(3) at nominal airflow with standard drive
(4) for fan system

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Table 4 - Heat pump R407C (1/2)

Performances		**TWK 512 RB**	**TWK 518 RB**	**TWK 524 RB**	**TWK 530 SB**	**TWK 530 SC**
Indoor unit		**MWD 512 CB**	**MWD 518 CB**	**MWD 524 CB**	**MWD 530 CB**	**MWD 530 CB**
Cooling Capacity (1)	(kW)	2.97	4.28	6.08	7.95	7.95
Cooling mode power input	(kW)	1.46	1.54	2.60	3.26	3.26
Heating Capacity (2)	(kW)	3.40	4.61	6.78	8.82	8.82
Heating mode power input	(kW)	1.16	1.30	2.13	2.83	2.83
Main Power supply	(V/Ph/Hz)	230/1/50	230/1/50	230/1/50	230/1/50	400/3/50
Sound Power Level in high speed	(dB(A))	36	43	40	44	44
Units Amps						
Current	(A)	6.4	9.6	12.8	19.8	7.7
Starting Amps	(A)	28.7	44.0	72.0	97.0	45.5
Recommended Fuse size(AM) type gG		16	20	20	25	20
Recommended Power Wire	nb wires x mm^2	3 x 1.5	3 x 2.5	3 x 2.5	3 x 4	4 x 2.5
Recommended Control Interconnection Wire	nb wires x mm^2	2 x 1.5	2 x 1.5	2 x 1.5	2 x 1.5	2 x 1.5
Max wire length (3)	(m)	50	50	50	50	50
Compressor						
Number		1	1	1	1	1
Type		Rotary	Rotary	Rotary	Scroll	Scroll
Model		RE 207 VHSMT	PE 31 VNEMT	NE 41 VNHMT	ZR 40 K3E PFJ	ZR 40 K3E TFD
Number of speeds		1	1	1	1	1
Number of motors		1	1	1	1	1
Maximum Continuous Current	(A)	6.0	9.0	12.2	18.7	6.6
Locked Rotor Amps	(A)	28.0	43.0	71.0	100.0	46.0
Motor RPM	(rpm)	2850	2900	2900	2900	2900
Crankcase Heater	(W)	-	-	-	-	-
Outdoor Coil						
Fin Type		Wavy 3B	Wavy 3B	Wavy 3B	Wavy 3B	Wavy 3B
Tube size	(mm)	9.52	9.52	9.52	9.52	9.52
Tube Type		Inner Groove	Inner Groove	Inner Groove	Inner Groove	Inner Groove
Height	(mm)	508	559	610	762	762
Length	(mm)	420	755	855	855	855
Face Area	(m^2)	0.213	0.420	0.521	0.650	0.650
Number of rows		2	2	2	2	2
Number of circuits		2	4	2	3	3
Fins per feet	(fpf)	180	180	240	180	180
Outdoor Fan						
Type		Axial	Axial	Axial	Axial	Axial
Number		1	1	1	1	1
Diameter	mm (inches)	406(16)	457(18)	457(18)	508(20)	508(20)
Number of speeds		1	1	1	1	1
Airflow (4) (5)	(m^3/h)	1050	2020	2020	3400	3400
Number of motors		1	1	1	1	1
Motor (5)	(kW)	0.08	0.14	0.14	0.229	0.229
Rated Amps (5)	(A)	0.35	0.60	0.60	1.05	1.05
Locked rotor Amps (5)	(A)	0.70	1.00	1.00	2.04	2.04
Motor RPM	(rpm)	930	930	930	900	900
Capacitor per fan	(µF)	2.5	2	2	5	5
Power supply	(V/Ph/Hz)	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50
Indoor Fan						
Airflow (3) (4)	(m^3/h)	550	820	1100	1370	1370
Expansion device						
Cooling mode		Orifice	Orifice	Orifice	Orifice	Orifice
Dimensions crated						
Length	(mm)	672	860	1045	1045	1045
Width	(mm)	357	340	390	380	380
Height	(mm)	577	580	695	790	790
Dimensions uncrated						
Length with feet	(mm)	667	821	1030	1100	1100
Length without feet	(mm)	667	821	1030	1003	1003
Width with feet	(mm)	332	400	420	365	365
Width without feet	(mm)	277	327	366	365	365
Height	(mm)	517	567	623	790	790
Weight						
Weight uncrated	(kg)	36	54	58	87	87
Weight crated	(kg)	37	56	60	89	89
Refrigerant Connections						
Type		Flare	Flare	Flare	Flare	Flare
Suction line	(inches)	1/2	5/8	5/8	3/4	3/4
Liquid line	(inches)	1/4	3/8	3/8	3/8	3/8
R407C Refrigerant Charge	(kg)	1.0	1.7	2.3	2.4	2.4

Notes:
(1) at 27°C db /19°C wb indoor and 35°C outdoor
(2) at 7°C db /6°C wb outdoor and 20°C indoor
(3) Wire channel @ 35°C ambient max.
(4) at nominal airflow with standard drive
(5) for fan system

Installation

Table 4 - Heat pump R407C (2/2)

Performances		TWK 536 SB	TWK 536 SC	TWK 048 SC	TWK 060 SC
Indoor unit		**MWD 536 CB**	**MWD 536 CB**	**MWD 048 CB**	**MWD 060 CB**
Cooling Capacity (1)	(kW)	9.05	9.05	11.00	12.40
Cooling mode power input	(kW)	3.99	3.99	4.86	5.73
Heating Capacity (2)	(kW)	11.20	11.20	13.70	15.30
Heating mode power input	(kW)	3.56	3.56	4.38	4.91
Main Power supply	(V/Ph/Hz)	230/1/50	400/3/50	400/3/50	400/3/50
Sound Power Level in high speed	(dB(A))	44	44	53	63
Units Amps					
Current	(A)	6.24.6	11.1	11.3	12.7
Starting Amps	(A)	116.0	52.0	64.0	72.5
Recommended Fuse size (AM) type gG		40	20	20	20
Recommended Power Wire	nb wires x mm^2	3 x 6	4 x 2.5	4 x 2.5	4 x 2.5
Recommended Control Interconnection Wire	nb wires x mm^2	2 x 1.5	2 x 1.5	2 x 1.5	2 x 1.5
Max wire length (3)	(m)	50	50	50	50
Compressor					
Number		1	1	1	1
Type		Scroll	Scroll	Scroll	Scroll
Model		ZR 48 K3E PFJ	ZR 48 K3E TFD	ZR 61 KCE TFD	ZR 72 KCE TFD
Number of speeds		1	1	1	1
Number of motors		1	1	1	1
Maximum Continuous Current	(A)	23.5	10.0	10.0	11.4
Locked Rotor Amps	(A)	114.0	50.0	65.5	74.0
Motor RPM	(rpm)	2900	2900	2900	2900
Crankcase Heater	(W)	-	-	-	-
Outdoor Coil					
Fin Type		Wavy 3B	Wavy 3B	Wavy 3B	Wavy 3B
Tube size	(mm)	9.52	9.52	9.52	9.52
Tube Type		Inner Groove	Inner Groove	Inner Groove	Inner Groove
Height	(mm)	762	762	1219	1219
Length	(mm)	855	855	855	855
Face Area	(m^2)	0.650	0.650	1.048	1.048
Number of rows		2	2	2	2
Number of circuits		2	2	4	4
Fins per feet	(fpf)	180	180	240	240
Outdoor Fan					
Type		Axial	Axial	Axial	Axial
Number		1	1	2	2
Diameter	mm (inches)	508(20)	508(20)	457(18)	457(18)
Number of speeds		1	1	1	1
Airflow (4) (5)	(m^3/h)	3400	3400	4600	4600
Number of motors		1	1	2	2
Motor (5)	(kW)	0.229	0.229	0.29	0.29
Rated Amps (5)	(A)	1.05	1.05	1.20	1.20
Locked rotor Amps (5)	(A)	2.04	2.04	2.00	2.00
Motor RPM	(rpm)	900	900	930	930
Capacitor per fan	(µF)	5	5	4	4
Power supply	(V/Ph/Hz)	230/1/50	230/1/50	230/1/50	230/1/50
Indoor Fan					
Airflow (3) (4)	(m^3/h)	1650	1650	2190	2300
Expansion device					
Cooling mode		Orifice	Orifice	Orifice	Orifice
Dimensions crated					
Length	(mm)	1045	1045	1045	1045
Width	(mm)	380	380	390	390
Height	(mm)	790	790	1389	1389
Dimensions uncrated					
Length with feet	(mm)	1100	1100	1030	1030
Length without feet	(mm)	1003	1003	1030	1030
Width with feet	(mm)	365	365	420	420
Width without feet	(mm)	365	365	366	366
Height	(mm)	790	790	1246	1246
Weight					
Weight uncrated	(kg)	89	89	105	108
Weight crated	(kg)	91	91	108	111
Refrigerant Connections					
Type		Flare	Flare	Braze	Braze
Suction line	(inches)	3/4	3/4	1 1/8	1 1/8
Liquid line	(inches)	3/8	3/8	3/8	3/8
R407C Refrigerant Charge	(kg)	2.6	2.6	3.3	3.75

Notes:
(1) at 27°C db /19°C wb indoor and 35°C outdoor
(2) at 7°C db /6°C wb outdoor and 20°C indoor
(3) Wire channel @ 35°C ambient max.
(4) at nominal airflow with standard drive
(5) for fan system

Installation

Table 5 - Heat pump R22 (1/2)

Performances ***Indoor unit***		**TWK 512 RB** **MWD 512 DB**	**TWK 518 RB** **MWD 518 DB**	**TWK 524 KB** **MWD 524 DB**	**TWK 530 KB** **MWD 530 DB**
Cooling Capacity (1)	(kW)	3.30	5.00	6.40	8.30
Cooling mode power input	(kW)	1.51	1.62	2.70	3.30
Heating Capacity (2)	(kW)	3.50	5.90	7.50	9.30
Heating mode power input	(kW)	1.20	1.35	2.21	2.92
Main Power supply	(V/Ph/Hz)	230/1/50	230/1/50	230/1/50	230/1/50
Sound Power Level in high speed	(dB(A))	36	43	40	44
Units Amps					
Current	(A)	6.0	8.0	11.3	19.1
Starting Amps	(A)	28.7	44.0	72.0	97.0
Recommended Fuse size (AM) type gG		16	20	20	25
Recommended Power Wire	nb wires x mm^2	3 x 1.5	3 x 2.5	3 x 2.5	3 x 4
Recommended Control Interconnection Wire	nb wires x mm^2	2 x 1.5	2 x 1.5	2 x 1.5	2 x 1.5
Max wire length (2)	(m)	50	50	50	50
Compressor					
Number		1	1	1	1
Type		Rotary	Rotary	Rotary	Reciprocating
Model		RH207 VHAT	PH31 VNET	CK32K3-PFZ	CR37KQ-PFT
Number of speeds		1	1	1	1
Number of motors		1	1	1	1
Maximum Continuous Current	(A)	5.5	7.0	11.0	18.5
Locked Rotor Amps	(A)	31.0	43.0	75.0	85.5
Motor RPM	(rpm)	2850	2900	2900	2900
Crankcase Heater	(W)	-	-	-	-
Outdoor Coil					
Fin Type		Wavy 3B	Wavy 3B	Wavy 3B	Wavy 3B
Tube size	(mm)	9.52	10.52	11.52	12.52
Tube Type		Inner Groove	Inner Groove	Inner Groove	Inner Groove
Height	(mm)	508	559	559	762
Length	(mm)	420	755	755	855
Face Area	(m^2)	0.213	0.420	0.420	0.650
Number of rows		2	2	2	2
Number of circuits		2	4	4	4
Fins per feet	(fpf)	180	180	180	180
Outdoor Fan					
Type		Axial	Axial	Axial	Axial
Number		1	1	1	1
Diameter	mm (inches)	406(16)	457(18)	457(18)	508(20)
Number of speeds		1	1	1	1
Airflow (3) (4)	(m^3/h)	1050	2020	2020	3400
Number of motors		1	1	1	1
Motor (4)	(kW)	0.08	0.14	0.14	0.23
Rated Amps (4)	(A)	0.35	0.60	0.60	1.05
Locked rotor Amps (4)	(A)	0.7	1	1	2.04
Motor RPM	(rpm)	930	930	930	900
Capacitor per fan	(µF)	2.5	2	2	5
Power supply	(V/Ph/Hz)	230/1/50	230/1/50	230/1/50	230/1/50
Indoor Fan					
Airflow (3) (4)	(m^3/h)	550	820	1100	1370
Expansion device					
Cooling mode		Orifice	Orifice	Orifice	Orifice
Dimensions crated					
Length	(mm)	672	860	860	1045
Width	(mm)	357	340	340	380
Height	(mm)	577	580	580	790
Dimensions uncrated					
Length with feet	(mm)	667	821	821	1100
Length without feet	(mm)	667	821	821	1003
Width with feet	(mm)	332	400	400	365
Width without feet	(mm)	277	327	327	365
Height	(mm)	517	567	567	790
Weight					
Weight uncrated	(kg)	36	54	58	87
Weight crated	(kg)	37	56	60	89
Refrigerant Connections					
Type		Flare	Flare	Flare	Flare
Suction line	(inches)	1/2	5/8	5/8	3/4
Liquid line	(inches)	1/4	3/8	3/8	3/8
R22 Refrigerant Charge	(kg)	1.2	1.4	1.7	2.4

Notes:
(1) at 27°C db /19°C wb indoor and 35°C outdoor
(2) at 7°C db /6°C wb outdoor and 20°C indoor
(3) Wire channel @ 35°C ambient max.
(4) at nominal airflow with standard drive
(5) for fan system

Installation

Table 5 - Heat pump R22 (2/2)

Performances ***Indoor unit***		**TWK 536 KB** **MWD 536 DB**	**TWK 048 KC** **MWD 048 DB**	**TWK 060 KC** **MWD 060 DB**
Cooling Capacity (1)	(kW)	9.90	13.50	15.80
Cooling mode power input	(kW)	4.2	5.10	5.90
Heating Capacity (2)	(kW)	11.10	15.10	17.70
Heating mode power input	(kW)	3.66	4.45	5.20
Main Power supply	(V/Ph/Hz)	230/1/50	400/3/50	400/3/50
Sound Power Level in high speed	(dB(A))	44	53	63
Units Amps				
Current	(A)	21.9	9.0	10.6
Starting Amps	(A)	116.0	64.0	72.5
Recommended Fuse size (AM) type gG		40	20	20
Recommended Power Wire	nb wires x mm^2	3 x 6	4 x 2.5	4 x 2.5
Recommended Control Interconnection Wire	nb wires x mm^2	2 x 1.5	2 x 1.5	2 x 1.5
Max wire length (2)	(m)	50	50	50
Compressor				
Number		1	1	1
Type		Reciprocating	Reciprocating	Reciprocating
Model		CR47KQ-PFZ	CRPQ-0450-TFD	CRNQ-0500-TFD
Number of speeds		1	1	1
Number of motors		1	1	1
Maximum Continuous Current	(A)	21.0	8.0	10.0
Locked Rotor Amps	(A)	105.0	55.0	65.0
Motor RPM	(rpm)	2900	2900	2900
Crankcase Heater	(W)	-	27	27
Outdoor Coil				
Fin Type		Wavy 3B	Wavy 3B	Wavy 3B
Tube size	(mm)	13.52	14.52	15.52
Tube Type		Inner Groove	Inner Groove	Inner Groove
Height	(mm)	762	1219	1219
Length	(mm)	855	855	855
Face Area	(m^2)	0.650	1.048	1.048
Number of rows		2	2	2
Number of circuits		4	6	6
Fins per feet	(fpf)	180	240	240
Outdoor Fan				
Type		Axial	Axial	Axial
Number		1	2	2
Diameter	mm (inches)	508(20)	457(18)	457(18)
Number of speeds		1	1	1
Airflow (3) (4)	(m^3/h)	3400	4600	4600
Number of motors		1	2	2
Motor (4)	(kW)	0.23	0.29	0.29
Rated Amps (4)	(A)	1.05	1.20	1.20
Locked rotor Amps (4)	(A)	2.04	2	2
Motor RPM	(rpm)	900	930	930
Capacitor per fan	(µF)	5	4	4
Power supply	(V/Ph/Hz)	230/1/50	230/1/50	230/1/50
Indoor Fan				
Airflow (3) (4)	(m^3/h)	1650	2190	2300
Expansion device				
Cooling mode		Orifice	TXV	TXV
Dimensions crated				
Length	(mm)	1045	1045	1045
Width	(mm)	380	390	390
Height	(mm)	790	1389	1389
Dimensions uncrated				
Length with feet	(mm)	1100	1030	1030
Length without feet	(mm)	1003	1030	1030
Width with feet	(mm)	365	420	420
Width without feet	(mm)	365	366	366
Height	(mm)	790	1246	1246
Weight				
Weight uncrated	(kg)	89	105	108
Weight crated	(kg)	91	108	111
Refrigerant Connections				
Type		Flare	Flare	Flare
Suction line	(inches)	3/4	1 1/8	1 1/8
Liquid line	(inches)	3/8	3/8	3/8
R22 Refrigerant Charge	(kg)	2.6	3.5	4.5

Notes:
(1) at 27°C db /19°C wb indoor and 35°C outdoor
(2) at 7°C db /6°C wb outdoor and 20°C indoor
(3) Wire channel @ 35°C ambient max.
(4) at nominal airflow with standard drive
(5) for fan system

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Installation

Dimensions

Figure 2 - Unit dimensions

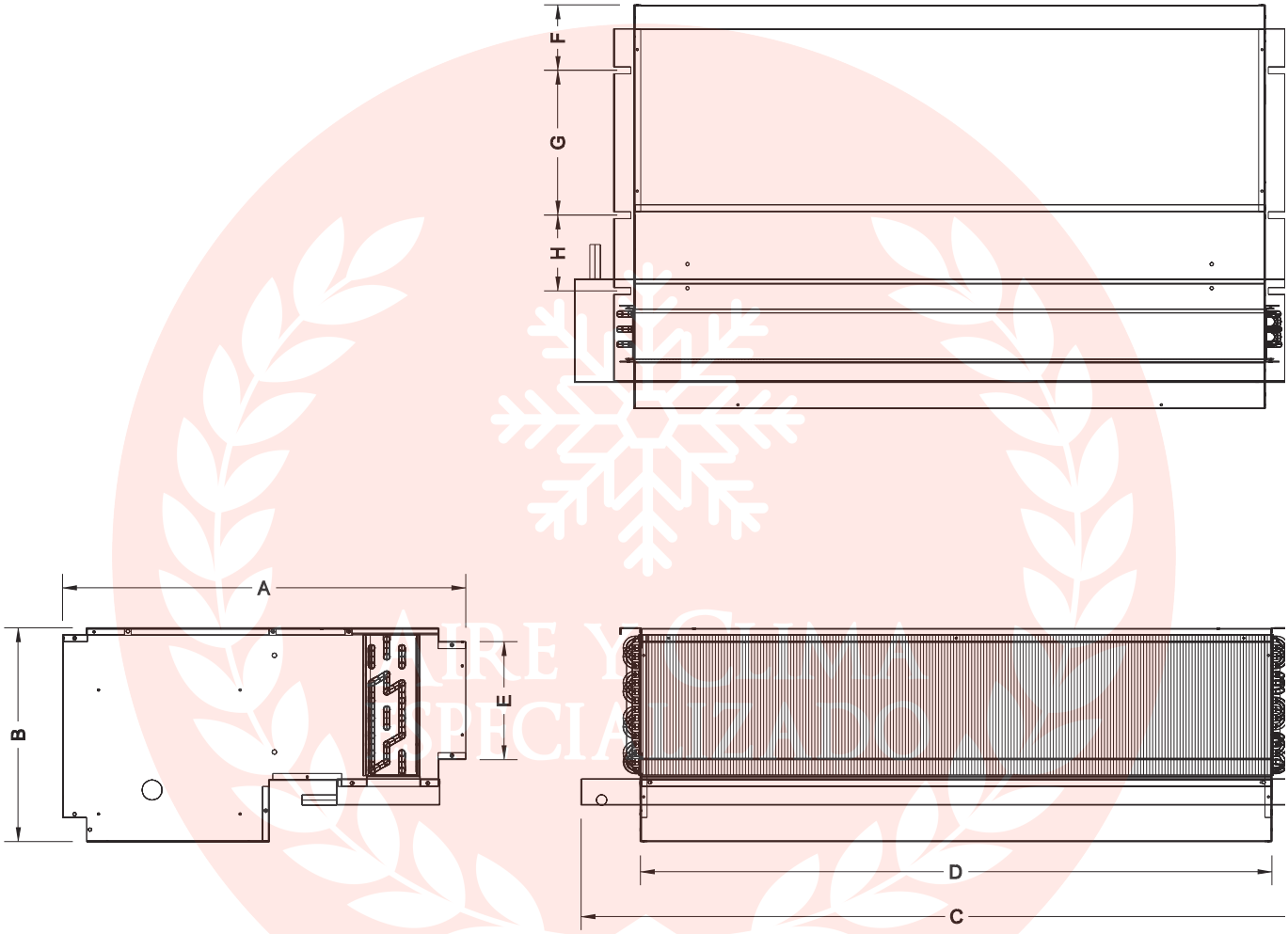

Table 6 - Unit dimensions (inch/mm)

	A	B	C	D	E	F	G	H
MCD/MWD 512	23 (578)	12 (305)	38.5 (980)	31.6 (803)	6.7 (170)	3.3 (87)	8.3 (210)	4.3 (110)
MCD/MWD 518	23 (578)	12 (305)	38.5 (980)	31.6 (803)	6.7 (170)	3.3 (87)	8.3 (210)	4.3 (110)
MCD/MWD 524	23 (578)	12 (305)	42.9 (1090)	36.1 (920)	6.7 (170)	3.3 (87)	8.3 (210)	4.3 (110)
MCD/MWD 530	23 (578)	12 (305)	48.3 (1228)	42.1 (1069)	6.7 (170)	3.3 (87)	8.3 (210)	4.3 (110)
MCD/MWD 536	23 (578)	12 (305)	48.3 (1228)	42.1 (1069)	6.7 (170)	3.3 (87)	8.3 (210)	4.3 (110)
MCD/MWD 048	27.7 (703)	15.4 (395)	43 (1091)	36 (920)	13.3 (337)	4.2 (110)	12.2 (310)	8.1 (205)
MCD/MWD 060	27.7 (703)	15.4 (395)	49 (1245)	42.1 (1070)	13.3 (337)	4.2 (110)	12.2 (310)	8.1 (205)

Installation

Power and control wiring

Table 7 - Control interconnection

Outdoor unit	Number of wires x section area (mm²) Including ground wire
TTK 512	3 x 2.5
TTK 518	2 x 1.5
TTK 524	2 x 1.5
TTK 530	2 x 1.5
TTK 536	2 x 1.5
TTK 048	2 x 1.5
TTK 060	2 x 1.5
TWK 512	5 x 1.5
TWK 518	5 x 1.5
TWK 524	5 x 1.5
TWK 530	6 x 1.5
TWK 536	6 x 1.5
TWK 048	6 x 1.5
TWK 060	6 x 1.5

Table 8 - Power supply outdoor unit (1)

	Number of wires x section area (mm²) Including ground wire
TTK/TWK 512	-
TTK/TWK 518	3 x 2.5
TTK/TWK 524	3 x 2.5
TTK/TWK 530	4 x 2.5
TTK/TWK 536	4 x 2.5
TTK/TWK 048	4 x 2.5
TTK/TWK 060	4 x 2.5

(1) Indoor and outdoor units are powered separately
(2) Number of wires and section area are given for a maximum wire length of 50m. If the wire is longer than 50m, these must be recalculated.

Table 9 - Power supply indoor unit (1)

	Without electric heater	With electric heater
	Number of wires x section area (mm²)	Number of wires x section area (mm²)
MCD/MWD 512	3 x 1.5	3 x 2.5 / 3 x 4
MCD/MWD 518	3 x 1.5	3 x 4
MCD/MWD 524	3 x 1.5	3 x 4
MCD/MWD 530	3 x 1.5	4 x 4
MCD/MWD 536	3 x 1.5	4 x 4
MCD/MWD 048	3 x 1.5	4 x 4
MCD/MWD 060	3 x 1.5	4 x 4

(1) Indoor and outdoor units are powered separately
(2) Number of wires and section area are given for a maximum wire length of 50m. If the wire is longer than 50m, these must be recalculated.

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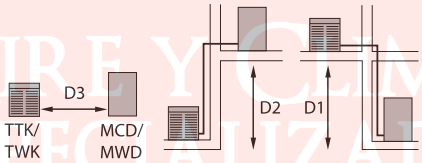
Installation

Choice of installation position

To ensure correct installation, the following points must be considered.

- The ceiling must be strong enough to support the weight of the unit.
- Choose a place where it will be easy to comply with the recommended clearances, taking into account the additional space required due to external accessories.
- Take into consideration the drilling of the holes in the walls to connect the unit.
- Make sure the maximum distances between the two units are not exceeded. See Figure 3 and Table 10.

Figure 3- Recommended clearances and maximum lengths used between two units



Preparing the ceiling and installing the unit

Drill holes in the ceiling to fix the threaded rods according to the dimensions given the Dimensions section. The angle brackets can also be used to space the drill holes. Access is necessary on the refrigerant connection side to facilitate installation, maintenance and access to the cabinet.

Four 8 mm diameter threaded rods must be securely fixed into the ceiling. Introduce the other end of the rods through the slots of the unit suspension brackets. Position the shock absorbers, add washers and screw the nuts down until the unit is correctly supported. The unit must be perfectly level in both directions to ensure correct evacuation of the condensates. If there is enough space, a rubber or neoprene sheet can be placed between the ceiling and the unit.

Table 10 - Recommended piping R407C/R22

		D3	D2	D1	Line diameter (inches)	
Outdoor unit	Indoor unit	(m)	(m)	(m)	Gas	Liquid
TTK/TWK 512	MCD/MWD 512	20	12	15	1/2	1/4
TTK/TWK 518	MCD/MWD 518	24	18	24	5/8	3/8
TTK/TWK 524	MCD/MWD 524	24	18	24	5/8	3/8
TTK/TWK 530	MCD/MWD 530	12 40	12 18	12 24	5/8 7/8	3/8
TTK/TWK 536	MCD/MWD 536	18 40	18	18 24	3/4 7/8	3/8
TTK/TWK 048	MCD/MWD 048	24 40	18	24	7/8 1 1/8	3/8
TTK/TWK 060	MCD/MWD 060	18 40	12 18	18 24	7/8 1 1/8	3/8 1/2

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Installation

Refrigerant connections

It is possible to remove the electrical cabinet to facilitate access to the refrigerant connection.

Installation procedure

- Make sure the route taken by your refrigerant lines is as short as possible.
- Limit pressure losses in the lines which may be caused by crushing of the lines, a large number of bends or bending radii that are too small.
- Slope all the gas lines leaving the indoor unit so that oil can return to the compressor by gravity.
- Prevent any possibility of oil trapped in the gas lines.

CAUTION!
An insufficiently lubricated compressor may break down.

If the vertical difference in level between the units is greater than 2.5 m, an oil trap must be positioned at the bottom of the vertical line, and an additional trap must be positioned every 7.5 m of vertical elevation to allow oil return to the compressor. There are no special technical recommendations for liquid lines because of the well-balanced mixture of refrigerant and oil. Movement of the liquid refrigerant also causes the oil to move.

Passage of the tube and cable bundle

Before drilling into the wall

- make sure there are no pipes or electrical cables in the wall at the place where you are going to drill provide a protective sleeve for the bundle of tubes and cables at the point where it passes through the hole (Figure 4). If permitted by legislation, the condensate drainage line can also be included in the bundle. Wrap tape around all the lines and cables from the bottom of the outside unit to the point where the piping enters the wall. Carry out the same operation for each circuit.

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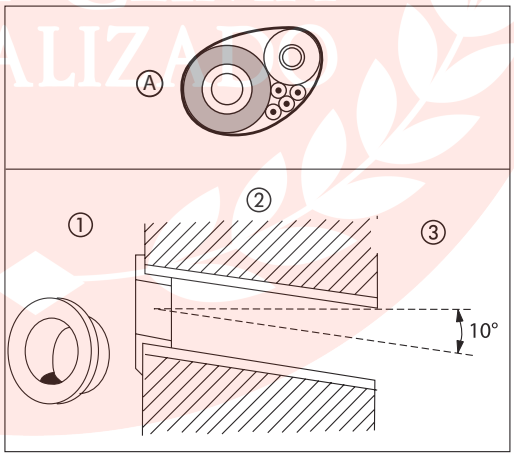
Figure 4 - Protective sleeve



A = Cable bundle
1 = Wall
2 = Inside
3 = Outside

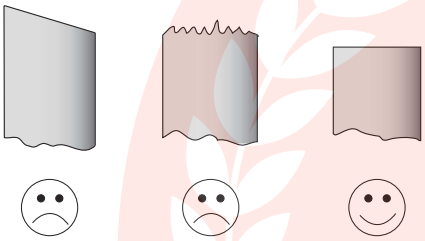
Installation

Screw/flare connections

CAUTION!
When cutting, deburring and splaying the tubes, keep the end of the tube down to make sure that copper waste does not fall into the lines.

Cut the copper tube using a pipe-cutter only (do not use a metalsaw). Hold the tube downwards when deburring it.

Figure 5 - Deburring recommendations



Unscrew the Flare nuts which are placed on the beginnings of the indoor unit lines. Put the Flare nut onto the tube. Splay the tube. Connect the refrigerant tubes to the indoor unit. Tighten the Flare nuts using the recommended tightening torques in Table 11. Insufficient tightening will cause refrigerant leaks. Use flat wrenches only (see Figure 6). Repeat the operation for each circuit.

Figure 6 - Tightening flare nuts

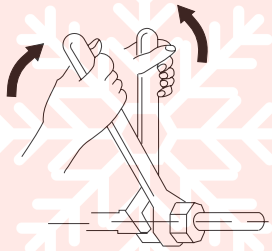


Table 11 -Recommended tightening torques

Line diameter	Tightening torque (kg/cm)
1/4"	150-200
3/8"	350-400
1/2"	500-550
5/8"	600-650
3/4"	700-750

Brazed connections
These lines will be created on the installation site. They will be installed according to normal trade practice by qualified personnel, in compliance with local legislation.

1. Remove the plugs from the units' refrigerant connections just before connecting the piping, when all the connections on the refrigerant lines have been terminated. This will prevent contamination by humidity. Remove the rubber plugs from the ends of the tubes.
2. Use a clean dry copper tube for refrigeration installations.
3. Use silver brazing alloy only. Do not overheat the welds and carry out nitrogen scavenging inside the tubes to prevent oxidization during brazing.
4. Once all the other connections have been made, debraze or cut the plug on the outdoor unit's refrigerant line connections. Proceed in the same way as for brazing of the indoor unit's lines.

Line insulation
To prevent heat losses and condensation, both liquid and gas lines must be thoroughly insulated.

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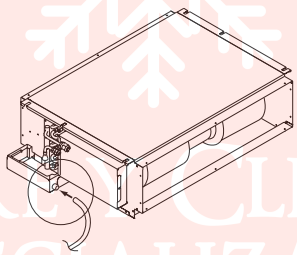
Installation

Condensate connections

The unit must be perfectly level in both directions. Connect the indoor unit's condensate tray to a condensate drainage line. The unit is equipped with a 20 mm diameter smooth tube connection. To ensure correct condensate flow, the drainage tube must be given a 10° slope. There must not be a condensate trap at any point in the line. However, a trap can be provided to prevent outside air from being taken in by the indoor unit. If the tube enters a room, insulate it to prevent condensation damage.

Figure 7 - Condensate drainage connections



Electrical connections

All the wiring and earthing arrangements must comply with local legislation.

WARNING!
Never open the indoor or outdoor unit without first disconnecting the power supply. There is a risk of electrocution.

CAUTION!

1. Check the electrical characteristics on the unit's nameplate. Make sure the wiring complies with the manufacturer's electrical diagram and local legislation.
2. Connect the units using one or more lines protected by an electrical disconnect device.
3. Ground each unit.
4. The cables must not touch the refrigerant lines, the motors or other moving parts and metal edges.
5. The manufacturer does not assume any liability for problems caused by modifications made to the unit's internal wiring.
6. Tighten the terminals securely.
7. For the electrical connections, refer to the interconnection diagrams attached with the machine.

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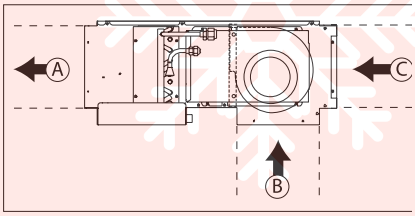
Installation

Connecting the ducts

Units can be equipped with rectangular discharge and/or intake from the bottom or intake from the back ducts.

WARNING!
The pressure loss in the network and the accessories must not exceed the unit's available static pressure given in the selection data. The design and installation shall be done by a qualified technician and according to local regulations.

Figure 8 - Discharge and intake duct possibilities



A = Discharge
B = Intake from the bottom
C = Intake from the back

Table 12 - Duct connection dimensions

Unit size	Length (mm)	Height (mm)
512/518	748	198
524/530/536	948	248
048/060	1148	298

Filtering

Filtering the air is necessary to ensure the unit's correct operation. The unit is supplied with a filter.

Installing the wired controller

Location

- Do not install thermostats near or above a source of heat (i.e. direct sunlight, hot lamps or radiator).
- Do not expose the controller to the indoor unit discharge air stream.
- Do not place in a confined space.

Wiring

Electrical interconnection between units must be in accordance with national, state and local codes. Units must be grounded. Refer to the wiring diagrams that are shipped with the unit.

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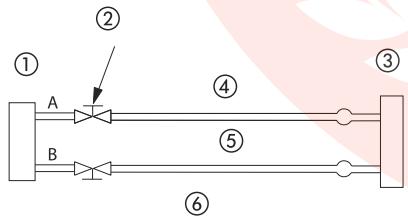
Operation

Creating a vacuum

For this operation, use a pump capable of creating a vacuum of 1 mm Hg (1.3mbar) or less. To create the vacuum you must connect the pump to the Schrader pressure connection on service valve A located on the outdoor unit (gas line). To use the vacuum pump, follow the pump manufacturer's instructions. Create a vacuum up to 2 mm Hg (2.6mbar) or less. Once the value of 2mm Hg or less has been reached, an increase in pressure will be observed after a certain time. The maximum permissible increase is 1 mm Hg after 15 minutes. If the increase is greater and remains at a constant value, this means there is too much humidity in the system. In this case, break the vacuum using dry nitrogen and start the vacuum creation procedure again.
A continuous increase in pressure means there is a leak in the system.

WARNING!
Valves A and B must not be opened before the installation of the refrigerant circuit has been completely finished, or the refrigerant charge will be lost.

Figure 9 - Refrigerant circuit

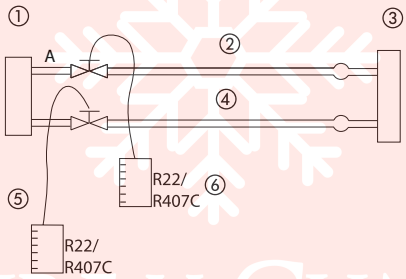


1 = Outdoor unit
2 = Vacuum pump
3 = Indoor unit
4 = Gas line
5 = Liquid line
6 = TTK/TWK cooling mode

Additional refrigerant charge

Once the system has been vacuum pumped and is in operation and if the distance between the units is greater than 6m, it may be necessary to add an additional charge. Table 13 indicates the amounts of refrigerant to add per additional meter of line. Once the appropriate amount of refrigerant has been added, fully open liquid line valve and check the operating pressure.

Figure 10 - Adding refrigerant charge



1 = Outdoor unit
2 = Gas line
3 = Indoor units
4 = Liquid line
5 = For sizes 512 to 524
6 = For sizes 530 to 060

R22 Refrigerant
While the unit is operating, charge the unit with gas through the service Schraeder valve located at the compressor suction. R22 refrigerant can also be added in liquid phase in the liquid line: see method used for R407C. Never add liquid in the suction line of the compressor.

R407C Refrigerant
WARNING! add only R407C refrigerant in liquid state. Never add liquid in the suction line of the compressor period. Use service Schraeder valve located on the liquid line to charge the unit. While the unit is operating, close partially the service valve in order to create a lower pressure downstream the service valve. Add the refrigerant necessary. Control the added weight with a scale.

Table 13 - Additional refrigerant charge

Liquid line	Gas line	Additional R22/R407C charge (g)
1/4"	1/2"	26
5/16"	5/8"	36
3/8"	5/8"	60
3/8"	3/4"	60
3/8"	7/8"	63
3/8"	1 1/8"	68

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Operation

Fan speed

Refer to the selection data to select the static pressure according to the flow rate. From this it is possible to deduce a fan rotation speed. Once you have chosen the speed, refer to the interconnection diagram to connect the room thermostat to the unit electric cabinet in order to power the correct selected speed.

Configuration and operation

The unit is equipped with a control board that manages operation of the split system. It is fitted with 4 switches, SW1-1 to SW1-4.

Before start-up by a qualified technician

Once the system has been installed, it is recommend to carry out the following checks.

1. Make sure no tools or debris have been left inside, around or on top of the unit.
2. Unit is perfectly level in both directions.
3. Check the electrical connections have been correctly done. Check the electric power supply corresponds to the units' nameplates.
4. Make sure the disconnect switches have been disengaged.
5. Check the refrigerant lines are fixed securely.
6. Check if the condensate drain pan is correctly installed.
7. Check the piping connections and the water-tightness of the connectors using an appropriate leak detection method. Check the connections on the site have been tightened.
8. Make sure the gas piping and the condensate drainage tube are insulated properly to prevent problems with trickling of condensation water.
9. Check the fan turns freely.
10. Make sure the intake and discharge ducts are not blocked.
11. Check the filters are correctly positioned. Show the user how to change the filters.
12. Power up the system and observe operation carefully: make any necessary adjustments.
13. Explain to the user how to operate the unit.

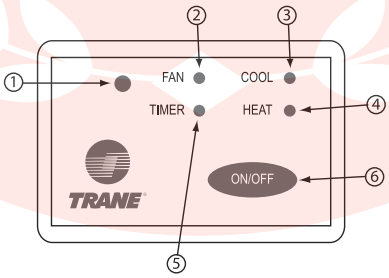
Unit display and emergency switch operation

Four lamps on the unit display show operating status. In case of loss of the remote control unit, the system can be operated temporarily by the emergency switch. The emergency switch changes the system mode of operation by cycling through the following modes:

➠ FAN ➠ COOL ➠ HEAT ➠ AUTO ➠ OFF ➠.

COOL, HEAT and AUTO operation are at fixed setting of 24°C. Fan speed is controlled by the AUTO mode. FAN only operation is at HIGH fan speed.

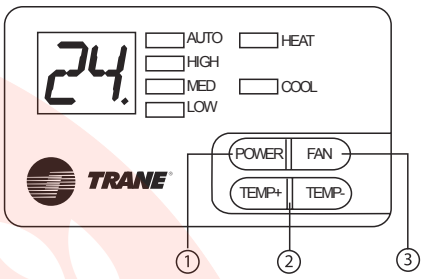
Figure 11 - Unit display



1 = Remote control receiver - this picks up the infrared signals from the wireless controller
2 = Fan lamp- lit when the fan is operating
3 = Cooling lamp - lit when the unit is operating in COOL mode (or COMP ON in AUTO mode)
4 = Heating lamp - lit when the unit is operating in HEAT mode (or heater ON in the HEAT mode of AUTO mode)
5 = Timer lamp - lit when the system is being controlled by the timer
6 = Emergency switch

Wired controller operation

Figure 12 - Wired controller



1 = Press to turn on or off the unit, passing through the different modes: OFF à COOL à HEAT.
2 = Press TEMP + to increase the setting temperature. Press TEMP - to decrease the setting temperature. The setting temperature will blink for 4 seconds, then the current room temperature will display.
3 = Press to select the required fan speed. The speed will be shown by LED indicators:

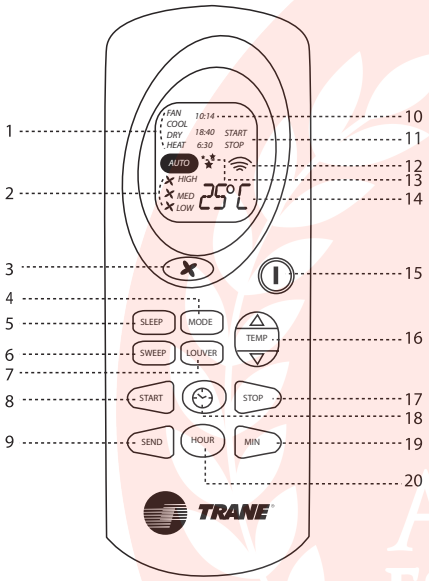
AUTO ➠ HIGH ➠ MEDIUM ➠ LOW ➠

Operation

Wireless controller operation

To use the wireless controller, point the transmitter head directly towards the unit receiver to emit infrared signals.

Figure 13 - Wireless controller



1. Operating mode
2. Fan speed
3. Fan button
4. Sleep button
5. Mode button
6. Sweep button - to turn on/off the sweep motor
7. Louver button
8. Timer (start) button
9. Send button - to transmit all parameters shown on the LCD to the main control board
10. Clock
11. Timer (start/stop)
12. Transmit mode (lit when remote is being used)
13. Sleep mode
14. Temperature (range: 16-30°C)
15. Power button
16. Temperature setting button
17. Stop button
18. Clock setting button
19. Minute setting button
20. Hour setting button

Auto (optional)

The unit can be put into 5 different modes (FAN, COOL, DRY, HEAT and AUTO). The cycling will be:

➠ FAN ➠ COOL ➠ DRY ➠ HEAT ➠ HEAT ➠ AUTO ➠

When the system is in AUTO mode, the display on the remote controller will show COOL and HEAT modes at the same time.

Louver (optional)

To change the angle of the louver: if the button is pressed and released, the angle of the louver is changed one step at a time. If the button is pressed and held, the angle of the louver is changed until the button is released.

Sleep mode

For COOL mode, the setting temperature will be automatically raised 1°C after 1 hour. For HEAT mode, the setting temperature will be automatically lowered 1°C after 1 hour.

When the system is in SLEEP mode, pressing the SLEEP button will cancel the SLEEP function. When the system is in SLEEP mode, pressing the TEMP button will raise the setting temperature 1°C from the last setting.

When the system is in SLEEP mode and the unit is stopped by a power failure or is turned off, the SLEEP function will be canceled.

Clock

To set the clock:

- Press the clock setting button (Figure 13, 18). The time display will blink.
- Press the HOUR button to set the hour. (Figure 13, 20)
- Press the MIN button to set the minutes. (Figure 13, 19)
- Press the clock setting button again. The time display will stop blinking.

Auto start

The unit can be programmed to start automatically. To program:

- Press the START button. (Figure 13, 8) The time display will blink.
- Press the HOUR button to set the hour. (Figure 13, 20)
- Press the MIN button to set the minutes. (Figure 13, 19)
- Press the START button again. The time display will stop blinking.

Auto stop

The unit can be programmed to stop automatically. To program:

- Press the STOP button. (Figure 13, 17) The time display will blink.
- Press the HOUR button to set the hour. (Figure 13, 20)
- Press the MIN button to set the minutes. (Figure 13, 19)
- Press the STOP button again. The time display will stop blinking.

Maintenance

WARNING!
Disconnect the unit's power supply before servicing the unit. When servicing the units, make sure that the air passages through the coils (both internal and external) are clean, and free of dirt and debris.

Periodic maintenance

CAUTION!
Failure to follow these instructions may cause damage to the unit. The frequency of servicing will depend on the conditions for use of the unit, and will be determined by regular inspections.

1. Check the condensate piping is not blocked.
2. Turn the fan blades manually and make sure they are not damaged. Clean them if necessary and verify their alignment.
3. Motor - check the wiring, and ensure the commutators are operating correctly. Replace any damaged components.
4. Disconnection of power and electrical components - check for correct operation.
5. Refrigerant circuit - use an appropriate leak detection method to check for leaks.
6. Tighten all the screws and bolts.
7. Make sure that the air passages through the coils (both internal and external) are clean, and free of dirt and debris.
8. Clean the filter by beating it and applying suction in the opposite direction to the airflow.

Handling the filter

1. To remove the filter, slightly push the 4 clips down.
2. Remove the filter.
3. To put the filter back, just clip the filter back into place

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Maintenance

Table 14 - Troubleshooting

Symptoms	Possible causes	Checks	Corrective action
No cooling or heating	A. Compressor or fan is not operating.	1. Loose electrical connections.	1. Tighten the connections if necessary.
		2. Check the fuses and wiring.	2. Replace the fuses if necessary.
	B. The fan is operating but the compressor does not start.	1. Check the compressor's wiring and winding resistors.	1. If the check shows the motor windings are broken or earthed, replace the compressor.
		2. Check the capacitor	2. Replace if necessary.
	C. The compressor is operating but the fan does not start.	1. Check the fan motor, the capacitor or the wiring.	1. Repair or replace
	D. Control switch is defective, incorrectly wired or adjusted.	1. Check the control switch connections and the temperature setting.	1. Change the setting. Replace if defective.
Insufficient heating or cooling	A. Lack of refrigerant fluid.	1. Check there are no leaks.	1. Drain, repair and recharge.
	B. Insufficient air volume.	1. Check the air filter.	1. Clean and replace.
		2. Check the fin assemblies are clean.	2. Clean if obstructed.
		3. Check the fan.	3. If the fan is loose on its shaft, tighten the fixing bolts.
		4. Check the wiring and capacitors.	4. Repair or replace
	C. Obstructed capillaries or blocked orifice.	1. Check there is no humidity in the system.	1. Drain and recharge.

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Maintenance

Symptoms	Possible causes	Checks	Corrective action
The system operates for too long or continuously.	A. Control switch no longer responds to the ambient temperature.	1. Check operation and connections of the control switch.	1. Replace the control switch if it is defective.
	B. Loss of refrigerant fluid.	1. Check there are no leaks in the system.	1. Repair and recharge.
	C. Insufficient ventilation.	1. Check the air circulation in the condenser.	1. Make sure air circulation is satisfactory. Move the outdoor unit if necessary.
	D. Incorrectly adjusted control switch.	1. Check the set point.	1. Adjust or replace if defective.
System operates in short cycles.	A. Defective control switch	1. Check operation of the control switch.	1. Replace if defective.
	B. Insufficient air circulation.	1. Check air circulation in the indoor and outdoor units.	1. Clean the coil and filter if necessary.
	C. Insufficient or excess refrigerant fluid.	1. Check if there are leaks or excess pressure.	1. Repair if there are leaks. Add or remove refrigerant fluid.
	D. Incorrect electric power supply.	1. Check the electric power supply.	1. Find cause and stabilise the power supply.
Internal coil frozen.	A. Insufficient refrigerant fluid.	1. Check if there are leaks in the system.	1. Repair the leak and recharge.
	B. Insufficient air circulation.	1. Check the filter.	1. Clean and put back in position.
		2. Check the fin block.	2. Clean the fins. If the filter is missing, install one.
		3. Check the fan.	3. Fan free on the bearing, tighten the fixing screws - connection fault, find the cause and repair.
	C. Defective anti-frost sensor.	1. Check the sensor.	1. Replace if necessary.
Unit is noisy	A. Defective installation.	1. Check installation of the compressor and motor.	1. Tighten any loose components.
		2. Check the fan position.	2. If the fan is rubbing against a part, re-align it.
		3. Check for vibrations of piping and crankcase.	3. Find the cause and repair.
		4. Check positioning of unit concerning noise and vibrations.	4. Find the cause and repair.
	B. Motor bearings are worn.	1. Check the motor.	1. Replace the motor if necessary.
	C. Noisy compressor.	1. Check if the compressor is losing oil.	1. Locate the leak, repair and add oil.
	D. Excess refrigerant fluid or oil.		1. Remove the excess charge.

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Trouble-shooting (electric heating only)

Table 15 - Trouble-shooting (electric heating only)

No heating.	A. Incorrect control switch setting.	1. Check the thermostat's set points and operation.	1. Change the settings.
	B. Defective control switch.	1. Check operation and the signal to the heating device.	1. Repair or replace.
	C. Defective heater temp. limit switch.	1. Check the heater temp. limit switch.	1. Replace the defective switch.
	D. Unit wiring is incorrect.	1. Check the wiring.	1. Modify the wiring as indicated on the wiring diagram.
	E. The heater temperature limit switch has opened.	1. Check tightness of the indoor unit's fan on its shaft.	1. Tighten the fixing screws.
	F. Dirty air filter.	1. Check the filter.	1. Clean the filter.
	G. Indoor unit coil fins obstructed.	1. Check the filter is not missing.	1. Fix the filter.
	H. Defective electrical component.	1. Check all the components are correct. 2. Check the fin block.	1. Replace the defective component. 2. Clean the fins.

Controller troubleshooting

The controller has a built-in self-diagnostic function. The following LEDs are used to indicate the problem or status.

Auto/High/Medium/Low LEDs show fan speed setting.

Cool LED shows the COOL operating mode.
- If the cooling fail protection is active, this LED will be blinking with the signal as per Figure 14, A.
- If anti-overheat or low ambient protection is active, this LED will be blinking with the signal as per Figure 14, B.

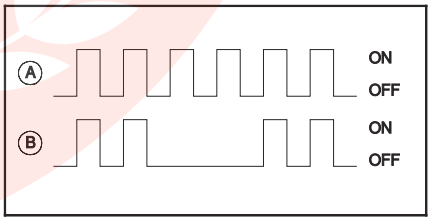
Heat LED shows the HEAT operating mode.
- If the heating fail protection is active, this LED will be blinking with the signal as per Figure 14, A.
- If the compressor overload protection is active, this LED will be blinking with the signal as per Figure 14, B.

7-segment LED (2 digits) shows the room temperature if lit, and the setting temperature while blinking.

Dot LED after the first digit of 7-segment LED, if blinking indicates any of the room, freeze or defrost sensor is open or short circuit.

Dot LED after the second digit of 7-segment LED, indicates that the compressor is on if lit, and indicates either the freeze or defrost protection is active if blinking.

Figure 14 - LEDs blinking signals



On-board setting

There is 1 jumper location on the main control board which is related to this setting. If the jumper is put at OP4 location, both heat pump and heater can be operated. If not, only heat pump can be operated.

Notes

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Safety recommendations

To avoid accidents and damage, the following recommendations should be observed during maintenance and service visits :

1. Never apply pressure higher than 7 bar for tests.
2. Disconnect the main supply before any servicing on the unit.
3. Service work on the refrigeration system and the electrical system should be carried out only by qualified and experienced personnel.

Maintenance contract

It is strongly recommended that you sign a maintenance contract with your local Service Agency. This contract provides regular maintenance of your installation by a specialist in our equipment. Regular maintenance ensures that any malfunction is detected and corrected in good time and minimizes the possibility that serious damage will occur. Finally, regular maintenance ensures the maximum operating life of your equipment. We would remind you that failure to respect these installation and maintenance instructions may result in immediate cancellation of the warranty.

Training

The equipment described in this manual is the result of many years of research and continuous development. To assist you in obtaining the best use of it, and maintaining it in perfect operating condition over a long period of time, the constructor has at your disposal a refrigeration and air conditioning service school. The principal aim of this is to give operators and maintenance technicians a better knowledge of the equipment they are using, or that is under their charge. Emphasis is particularly given to the importance of periodic checks on the unit operating parameters as well as on preventive maintenance, which reduces the cost of owning the unit by avoiding serious and costly breakdown.

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