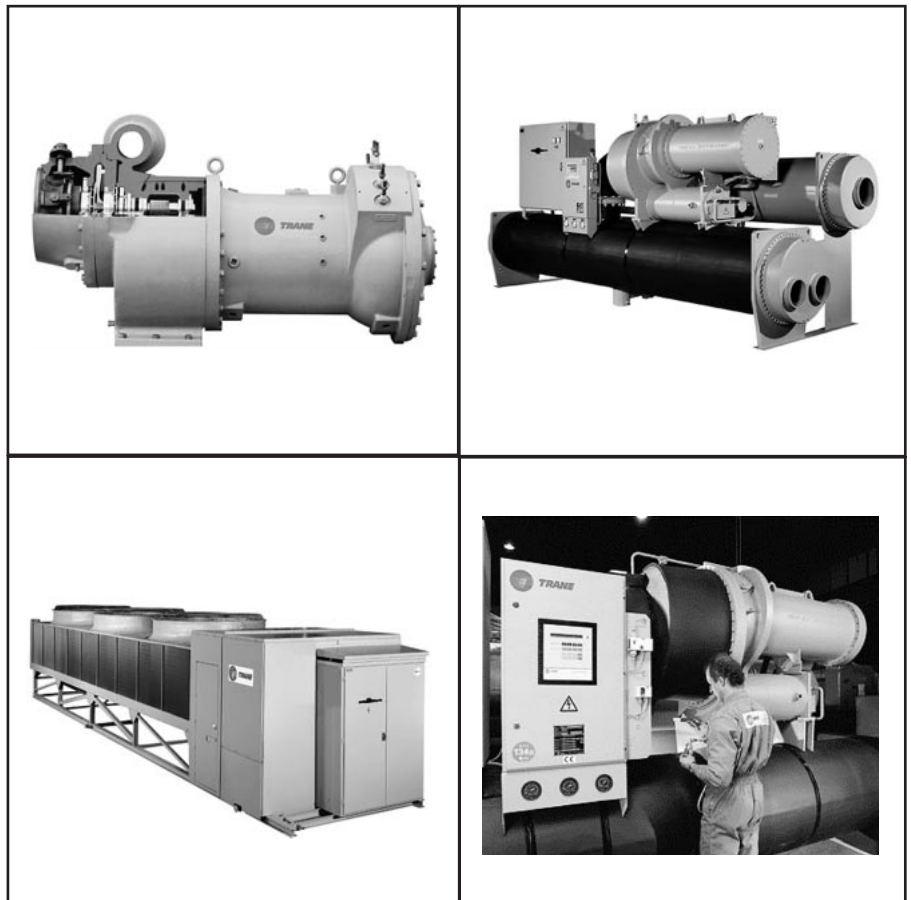




TRANE®

Maintenance manual

Centrifugal chillers



November 99

CTV-SVD01A-EN



Dear customer,

Thank you for your confidence **in choosing TRANE**

The commissioning of your TRANE equipment has been completed in accordance with our standard start-up procedures.

We confirm that the machine run log has been completed and registered with our factory under our **ISO 9001** Quality Management System.

The first stage of your warranty has been validated.

To keep your TRANE equipment operating at peak efficiency during the warranty period and to extend its life we recommend that regular maintenance procedures as detailed in the timetable contained within this maintenance guide must be carried out.

To guarantee that the service you receive is efficient, reliable and carried out by technically competent factory trained technicians certificated to the refrigerant handling standard, we strongly recommend that you enroll in one of our "**SécuriTrane**" Maintenance Programs.

As a commitment to our customers, we have created a nationwide service division called **Trane ServiceFirst**. At **Trane ServiceFirst** we offer all the benefits of after sales service direct from the manufacturer and we are committed to our mission statement to provide customer Care second to none.

We would be delighted to discuss your individual requirement with you. For further information regarding **SécuriTrane** please contact your local **TRANE ServiceFirst** Center.

We at Trane ServiceFirst look forward to providing you with Customer care second to none and again thank you for your confidence in choosing Trane.

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Recommended yearly service routine frequencies

Year	Commissioning	Inspection visit	Seasonal shut-down	Seasonal start-up	Annual maintenance	Preventive maintenance	40000 Hrs overhaul	Tube Analysis
1	X	X	X	X		XX		
2			X	X	X	XXX		
3			X	X	X	XXX		
4			X	X	X	XXX		
5	X	X	X	X	X	XXX		X(1)
6			X	X	X	XXX		
7	X	X	X	X	X	XXX		
8			X	X	X	XXX		
9			X	X	X	XXX		
10			X	X		XXX	X	X (1)
+10			Every year	Every year	Every year	3 every year	Every 40000 Hrs	Every 3 years

This timetable is applicable to units operating in normal conditions with an average of 4000 hours per year. If operating conditions are abnormally severe, an individual timetable must be made for that unit.

(1) Tube testing required if aggressive water conditions exist. Applies to condensers only on water cooled units.

Seasonal start up and shut down are mainly recommended for Comfort Air Conditioning and annual and preventive maintenance are mainly recommended for Process Application.

Maintenance routine

Commissioning

- Check installation of equipment/ pre-commission
- Check water flows and interlocks
- Configure unit control module
- Calibrate controls
- Check operational set points and performance
- Check operation of all safety devices
- Megger the motor compressor windings
- Check unit operation
- Record operating pressures, amperages and voltage
- Carry out leak test
- Fill out the start up log sheet and review with the operator.

Seasonal shut down

- Record operating pressures, amperages and voltage
- Carry out leak test
- Carry out oil analysis
- Check operation of machines/compare conditions of operation against original commissioning data
- Fill out the annual shut down visit log sheet and review with the operator.

Inspection visit

- Visit at the end of running in period
- Replace oil filter on each unit
- Carry out oil analysis
- Change the oil as required based upon results of the oil analysis
- Carry out leak test
- Inspect contacts & tighten terminals
- Record operating pressures, amperages and voltage
- Check operation of machines/compare conditions of operation against original commissioning data
- Fill out the inspection visit log sheet and review with the operator.

Maintenance routine

Seasonal start-up

- Check water flows and interlocks
- Check operational set points and performance
- Calibrate controls
- Check operation of all safety devices
- Inspect contacts and tighten terminals
- Megger the motor compressor windings
- Record operating pressures, amperages and voltage
- Carry out leak test
- Check configuration of unit control module
- Replace oil filter on each unit
- Carry out oil analysis
- Change the oil as required based upon results of the oil analysis
- Lubricate motors/dampers /bearing (where applicable)
- Check operation of machines/compare conditions of operation against original commissioning data
- Fill out the annual start up visit log sheet and review with the operator.

Preventive Maintenance

- Carry out leak test
- Record operating pressures, amperages and voltage
- Check operation of machines/compare conditions of operation against original commissioning data
- Fill out the inspection visit log sheet and review with the operator.

Annual Maintenance

- Check water flows and interlocks
- Check operational set points and performance
- Calibrate controls
- Check operation of all safety devices
- Inspect contacts & tighten terminals
- Megger the motor compressor windings
- Record operating pressures, amperages and voltage
- Carry out leak test
- Check configuration of unit control module
- Replace oil filter on each unit
- Carry out oil analysis
- Change the oil as required based upon results of the oil analysis
- Lubricate motors/dampers /bearing (where applicable)
- Check operation of machines/compare conditions of operation against original commissioning data
- Fill out the annual start up visit log sheet and review with the operator.

40000 Hours Overhaul

- Inspection visit plus
- Maintenance visit plus
- Compressor inspection including bearing change, tolerance check
- Fill out the 40000 hours overhaul log sheet and review with the operator.

Additional services

System upgrade

This Service provides a consulting service.

Upgrading your equipment will increase the unit reliability and can reduce the operating costs by optimizing the controls.

A list of solutions / recommendations to the system will be explained to the customer.

Actual upgrades for the system will be costed separately.

Operator training

This service includes training for the system operators or building engineers for the unit on site.

They will gain an overall understanding and improve the ability to operate and maintain the chiller.

Water treatment

This Service provides all of the necessary chemicals to properly treat each water system for the period designated.

The inspections will be conducted at agreed upon intervals and Trane Service First will submit a written report to the customer after each inspection.

These reports will indicate any conditions of corrosion, scaling, and algae growth in the system.

Refrigerant analysis

This Service includes a thorough analysis for contamination and solution upgrade

It is recommended that this analysis is performed every six months.

Annual cooling tower maintenance

This Service includes the inspection and maintenance of the cooling tower at least once a year.

This involves checking the motor.

24 hours duty

This service includes emergency calls outside of the office normal working hours.

This Service is only available with a Maintenance Contract, where available.

Additional services

Training

Our Trane Training Center, is able to support all your training needs. Refrigeration, theoretical, practical, general and specific training is carried out on a variety of our units. This training can be done in our Training Center or in an area defined by you.

Tube cleaning/coil cleaning

This Service includes mechanical or chemical cleaning of the tubes or coils.

ESP (Extended Service Programs)

This Service, only available within a Maintenance contract, provides three different warranty levels

ESP one	Parts only
ESP two	Parts and Labor
ESP three	Parts, Labor and refrigerant

5 years motor-compressor warranty

This Service will provide a 5 years parts and labor warranty for the motor compressor only. This Service is only available for units covered by a 5 years Maintenance Contract.

Remote monitoring service

This Service will require Trane technicians to remotely log onto the customer's system. It is used within a maintenance contract to optimize system efficiency. A diagnosis log report with the following information will be provided to the customer on a scheduled basis:

Tube Analysis

- Eddy Current Tube Testing for prediction of tube failure/ wear.
- Frequency-every 5 years for first 10 years (depending on the water quality), then every 3 years thereafter.

Scope of coverage

Description	Startup	Inspection visit	Seasonal shut-down	Seasonal start-up	Preventive maintenance	Annual maintenance	40000 Hrs overhaul
Check installation of equipment / pre-commission	█						
Check water flows and interlocks	█			█		█	
Carry out leak test	█	█	█	█	█	█	█
Configure unit control module	█						
Calibrate Controls	█			█		█	
Check configuration and functions of control modules	█			█		█	
Check operational set points and performance	█			█		█	
Check operation of all safety devices and interlocks	█	█		█			█
Inspect Contacts & Tighten Terminals	█			█		█	
Megger the compressor motor windings	█			█		█	
Carry out spectrometric oil analysis or oil replacement		█					█
Replace oil filter		█		█		█	
Lubricate motor/dampers/bearings (where applicable)		█		█		█	
Check unit operation	█	█	█	█	█	█	█
Record operating pressures, amperages and voltage.	█	█	█	█	█	█	█
Compare operation against original commissioning data		█					█
40000 Hrs overhaul							█
Complete start up visit procedure check sheet	█						
Complete inspection visit procedure check sheet		█					
Complete seasonal shut down visit procedure check sheet			█				
Complete seasonal start up visit procedure check sheet				█			
Complete inspection visit procedure check sheet					█		
Complete maintenance visit procedure check sheet						█	



Recommended yearly service routine frequencies

Year	Commissioning	Inspection visit	Seasonal shut-down	Seasonal start-up	Annual maintenance	Preventive maintenance	40000 Hrs overhaul	Tube Analysis
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+10								

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Seasonal start up and shut down are mainly recommended for Comfort Air Conditioning and annual and preventive maintenance are mainly recommended for Process Application.

Notes



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An American Standard Company



CTV-SVD01A-EN - 1199

Supersedes Y60 GE 002 E

Literature stocking location in Europe

Trane reserves the right alter any information without prior notice.



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