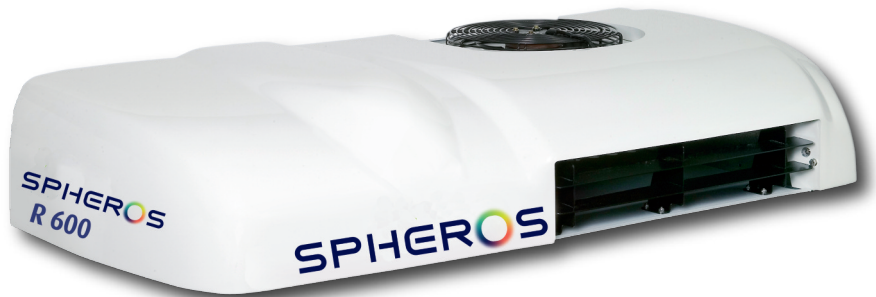


# SPIHEROS

TRANSPORT REFRIGERATION UNITS FOR LDVS AND SMALL TRUCKS

## R-SERIES

R500/510/600/610



## Operators Manual

ADVANCED TECHNOLOGY – YOU CAN RELY ON.

# R-Series 500/510/600/610

## OWNERS DETAILS

Company Name	
Physical Address	
	Code
Postal Address	
	Code

Tel No. (H)											
Tel No. (W)											
Cell No.											

## VEHICLE/FRIDGE DETAILS

Registration No:
Date of Sale:
Model/series:
Unit serial No:
Refrigeration gas type:
PCB Model & Rev:
Software version:

## SPHEROS SOUTH AFRICA OPERATOR'S MANUAL

This operator's manual is for the R Series range of Direct Drive units.

The manual includes service intervals, safety information, trouble shooting and other information to assist in the operation and maintenance of the equipment.

Following the correct maintenance program will avoid costly down time. It is essential that during the warranty or contract period (should there be a service contract in place) that the unit is serviced and maintained by an authorised Spheros South Africa dealer only.

Spheros South Africa products are subject to constant improvement. Therefore specifications, design, operation or equipment may change without prior notice.

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Original edition

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Date: June 2024

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Should you require further information, do not hesitate to contact your nearest Spheros South Africa dealer.

# R-Series 500/510/600/610

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This operator's manual is for the Koolvan "R" series truck engine driven units, including electric stand-by.

The manual includes service intervals, safety information, trouble shooting and other information to assist in the operation and maintenance of the equipment.

Following the correct maintenance program will avoid costly down time. It is essential that during the warranty or contract period (should there be a service contract in place) the unit is serviced and maintained by an authorised Spheros South Africa dealer only.

Should you require further information, do not hesitate to contact your nearest Spheros South Africa dealer.

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## SAFETY GUIDE

### INSTALLATION

When installing or removing the unit correct lifting equipment should always be used. Do not stand beneath a unit that is being lifted.

### SERVICE AND MAINTENANCE

The unit has many moving parts. Covers and gills have been fitted with customer safety in mind. Always stop the unit before carrying out service and maintenance. This includes pre-trip inspections.

### REFRIGERANTS

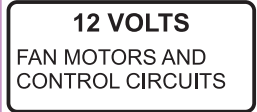


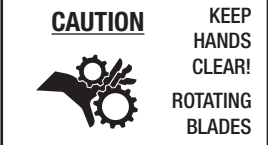



It is recommended, in line with current legislation for the refrigeration industry, only persons who have completed the Safe Handling of Refrigerants course and are registered with ACRICSA (The Governing Body), carry out services on your refrigeration system. Contact your nearest Spheros South Africa Dealer.

### ELECTRICAL

Relatively high voltages are used for the electric motor standby drive. Inside the control box there are a combination of low voltage DC for the control circuits and high voltage AC components for driving the electric motor. It is therefore recommended that only personnel who have had the correct factory training carry out service and repairs on the electrical system. Contact your nearest Spheros South Africa Dealer.

## R-Series 500/510/600/610

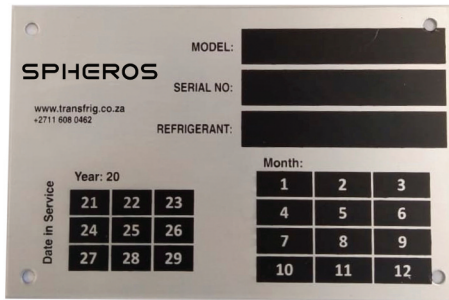
### IMPORTANT SYMBOLS ON SPHEROS SA UNITS

 <p><b>12 VOLTS</b> FAN MOTORS AND CONTROL CIRCUITS</p>	Voltage indication.
	Warning sign, electric shock hazard.
 <p>THIS UNIT IS CHARGED WITH <b>R404A</b></p>	Type of refrigerant used
 <p><b>CAUTION</b> KEEP HANDS CLEAR! ROTATING BLADES</p>	Warning sign, moving machinery hazard
 <p><b>RECOMMENDED</b> <b>FUCHS RENISO</b> <b>TRITON</b> <b>SE 68</b> <b>COMPRESSOR OIL</b></p>	Type of compressor oil to be used
 <p><b>FAN ROTATION</b></p>	Direction of fan rotation
 <p><b>CHECK OIL LEVEL DAILY</b> EXCESS OIL WILL CAUSE OVERFLOW WHEN HOT</p>	Oil level indication

## UNIT IDENTIFICATION

Each unit is identified with a nameplate containing the relevant serial number.

The serial plate contains the year and month the unit was manufactured.



Position of plate on unit under cover or underneath condenser



The serial number and model type must always be used in the event of warranty claims and spares purchase.

# R-Series 500/510/600/610

## FEATURES

### ◆ Description

The Spheros South Africa "R" series are split two-piece units for fresh or frozen applications on LDV's, small trucks and panel vans.

The roof or bulkhead mount condenser frame is fabricated from epoxy (coated 3cr12) and stainless steel and the evaporator from aluminium and stainless steel.

### ◆ Options

Truck engine driven only or truck engine with electric standby. Over road refrigeration is by means of a compressor driven directly off the vehicle crankshaft and is available in 12 or 24 volts. Electric standby is available with a choice of 220V 1 phase or 380v 3 phase.

### ◆ Defrost

Thermostatically controlled hot gas defrost.

### ◆ Refrigerant

R404A/R134A

### ◆ Application

The refrigeration system will refrigerate insulated bodies as tabulated.

Models	Approximate maximum body lengths @ given box temperatures		
	0°C	-18°C	-25°C
R500	3.2m	2.7m	2.3m
R600	4.2m	3.5m	3.2m

**Note:** In order to ensure the correct application, ambient temperature, body insulation and number of door openings must be taken into consideration. Please consult your Spheros South Africa dealer before final selection.

### ◆ Simple operations

The required temperature is set on the thermostat. The control changes automatically to the over road system when the truck ignition is switched on and to the electric standby when the electric mains cable is plugged in and switched on.

			R 500 / R 510	R 600 / R 610
Cooling Capacity @30°C ambient R404A	Road		kW	kW
		0°C	2,3	3,1
	Electric	-20°C	1,5	1,8
		0°C	1,5	1,8
		-20°C	0,9	1
Air Volume Flow (m³/h)			1400	2200
Weight (kg)	Road only		65	115
	Electric standby		70	120
Road compressor			TCC115	TCC115
Electric Motor			50 Hz / 60 Hz	50 Hz / 60 Hz
	Power (kW)	220V	2,2	2,2
		380V		
	Current consumption (A)	220V 1ph	14	14
		220V 3ph	9,3	9,3
		380V	5,4	5,4



## TECHNICAL SPECIFICATIONS

ITEM	R500T	R600T	R500TE	R600TE
Refrigeration Settings				
HP Cut Out	26 bar (377 psi)	26 bar (377 psi)	26 bar (377 psi)	26 bar (377 psi)
HP Cut In	20 bar (290 psi)	20 bar (290 psi)	20 bar (290 psi)	20 bar (290 psi)
LP Cut Out	0,207 bar (3 psi)	0,207 bar (3 psi)	0,207 bar (3 psi)	0,207 bar (3 psi)
LP Cut In	1,24 bar (18 psi)	1,24 bar (18 psi)	1,24 bar (18 psi)	1,24 bar (18 psi)
CPR valve (TE version only)	-	-	1,7 bar (24,5 psi)	1,7 bar (24,5 psi)
Refrigerant Type	R404A	R404A	R404A	R404A
Refrigerant Qty (Approx)	800g	800g	1,8kg	1,9kg
Compressor				
Compressor Type	TCCI	TCCI	TCCI	TCCI
Compressor Model	TCCI15	TCCI15	TCCI15	TCCI15
Compressor Oil – POE 68	160ml	160ml	160ml	160ml
Add an extra 200 ml to system when installing and commissioning				
Electric Motor				
kW Rating 220 Volt			2,2	2,2
kW RATING 380 Volt			2,2	2,2
220 Volt – O/Load Setting			14 amps	14 amps
380 Volt – O/Load Setting			5,4 amps	5,4 amps

# R-Series 500/510/600/610

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## PRE TRIP INSPECTION



This inspection should be carried out prior to loading. If the following is strictly adhered to, this should save costly downtime.

## PRE COOLING THE INSULATED BODY

- ◆ Prior to loading inspect the inside and outside of the insulation skin for delamination and holes. Inspect door seals and door closing mechanisms. Doors that will not close properly and punctures of the insulation material will affect the refrigeration unit's ability to maintain correct temperature. Check that loading materials such as cardboard and shrink-wrapping have not entered the evaporator, as this will cause damage to fan motors and fan blades.
- ◆ Switch the unit on and set the temperature controller to the desired set point (the temperature at which the product must be transported). This ensures that the empty box can achieve the correct temperature for the product being loaded.

## OPERATING THE UNIT

All Spheros South Africa “R” series units are equipped with in-cab controls. This allows the driver to operator the unit from the driver’s seat and to be able to monitor temperature of the load at all times.



### ROAD START UP

1. Start vehicle engine.
2. Move toggle switch to “on” position.
3. Wait for the temperature controller display to indicate box temperature. Cooling will then commence.
4. Check temperature controller set point is correct.  
(See set point instructions if adjustment is required) – See page 12.

### ROAD SHUT DOWN

1. Move toggle switch to “off” position.
2. Switch vehicle ignition off.

### ELECTRIC START UP

1. The unit is supplied with a 10 metre electric cable (for TE only). Plug one end of the cable into the appliance inlet of the unit. Plug the other end into the external supply point.
2. Move toggle switch to “on” position.
3. Wait for the temperature controller display to indicate box temperature, cooling will then commence.
4. Check if thermostat (temperature controller) set point is correct.  
(See set point instructions if adjustment is required) – See page 12.

### OPERATING THE UNIT CONTINUED

#### ELECTRIC SHUT-DOWN

1. Move toggle switch to “off” position.
2. Remove electric cable.

#### CHANGING SET POINT

Press and hold the **SET** button and hold for more than 2 seconds to change the set point value.

The value of the set point will be displayed and the °C will start flashing.

To change the set point value press the **up** ↑ or the **down** ↓ within 10 seconds.

To store the new set point value push the **SET** button again.

**To lock the keyboard**, press the **up** ↑ and **down** ↓ buttons together for more than 3 seconds. The **POF** message will be displayed and the keyboard will be locked. At this point it will be possible only to see the set point value if up or down buttons are depressed.

**To unlock the keyboard**, press the **up** ↑ and **down** ↓ buttons together for more than 3 seconds. The **PON** message will be displayed and the keyboard will be unlocked.

## LOADING

Spheros South Africa Refrigeration units are designed to maintain and not reduce the temperature of the product. It is therefore imperative that the Driver/Operator checks that the product is at the correct temperature at the time of loading.

Care should be taken when loading the truck that airflow around the product is continuous, loading on pallets is recommended. Air is blown out of the evaporator and must be able to circulate through the load and return along the floor of the body in a continuous cycle.

Loading the product too high and blocking the return air ducts, may result in short cycling. This often freezes the top row of product.

## RECOMMENDED TEMPERATURE GUIDE

Below is a guide to recommended temperature settings for a few products. These are recommendations only. For further information on set point refer to customer/supplier.

PRODUCT	SET-POINT RANGE
Ice Cream	-25°C
Frozen Meats Vegetables and Seafood	-18° to -20°C
Dairy Products	+2° to +4°C
Fresh Meats	+2° to +5°C
Fresh Fruits and vegetables	+4° to +8°C

Door opening should be kept to a minimum, each time the doors are opened warm air and moisture enters the body. It is recommended during delivery cycles that the unit should be stopped whilst unloading.

# R-Series 500/510/600/610

## TROUBLE SHOOTING

Spheros South Africa strives to achieve the highest possible standards. Should problems arise with your unit, below is a general guide to help the operator carry out some basic checks prior to calling an Authorised Dealer for assistance.

PROBLEM	CAUSE	REMEDY
Unit switches on but doesn't cool down	Evaporator fans not working	Check fuses
	Evaporator iced up	Manual defrost
	Belt slipping	Adjust
	Refrigerant low	Contact Spheros SA agent
Unit doesn't switch on	Ignition fuse blown	Check fuse
	Units fuse blown	Check fuses



## MAINTENANCE SCHEDULE – REQUIRED SERVICE

The recommended maintenance schedules are designed to give the maximum reliability and operation to your unit, thus ensuring trouble free usage.

**\*Note:** Free Post-delivery inspection (PDI) within 1 month of delivery to validate the warranty.

**\*Note:** The unit must be serviced at a maximum interval of 3 months, or 10,000 vehicle kilometres.

**\*Note:** Compressor oil must be changed every 12 Months.

R500 600T & R500 600TE												
Type of Service	PDI	A	A	A	B	A	A	A	B	A	A	A
Months	50 hr	3	6	9	12	15	18	21	24	27	30	33
Type of Service	B	A	A	A	B	A	A	A	B	A	A	A
Months	36	39	42	45	48	51	54	57	60	63	66	69

## R-Series 500/510/600/610

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### SERVICE SCHEDULE

#### A SERVICE

- ◆ Check engine idler pulleys and bearings
- ◆ Check Temperature controller for calibrations
- ◆ Check CPR value setting
- ◆ Check and adjust all belts
- ◆ Check refrigerant level
- ◆ Check defrost operation



## SERVICE SCHEDULE

### B SERVICE

- ◆ Carry out A Service
- ◆ Clean evaporator and condenser coils
- ◆ Change filter drier
- ◆ Change compressor oil, road and electric
- ◆ Check compressor mounting bracket and bolts for tightness
- ◆ Check all bolts, screws and mounting bolts for tightness
- ◆ Check control box for wiring and loose components

# R-Series 500/510/600/610

## DEALER NETWORK SPHEROS SA APPROVED SERVICE DEALER NETWORK

COMPANY	AREA	CONTACT
Cool Perfection	Bloemfontein	Geoff Stannard
Zero Temp (Updealers)	Botswana - FrancisTown	Vaughan Granville
Airtron	Botswana - Gaborone	Jeremy Babbage
Trans Fridge Botswana	Botswana - Gaborone	Louisa Barnard
E.R.T.S	Cape - George	Peter Carney
G.R.A	Cape - George	Danie Pio
Cool Tranz	Cape Town	Des Bradford
Cool Tranz	Cape Town	Shane Bradford
Maxicool	Cape Town	Ian Gilmour
Cool Perfection	Durban	Geoff Stannard
Fridgetranz	Durban	Christo Brown
Transfrig Border E.L.	East London	Adrian v.d. Merwe
Spheros	Gauteng - Linbro Park	Kobus van Rensburg
Spheros	Gauteng - Linbro Park	Kent Donaldson
RTS	Gauteng - Midrand	Daphne / Bonny
AC & R Refrigeration	Gauteng - Pretoria	Peter Griezel
Refsatrans	Gauteng - Vaal Triangle	Walther Ravyse
Cool Link Technics Ltd	Kenya	James Kamande
Specialised Fibre Glass	Kenya	Ross Field
Instant Service Repairs	Klerksdorp	Ruan
Topax Workshop	Klerksdorp	Jose Da Silva
Walvisbay Refrigeration	Namibia - Walvisbay	Allester Dronia
Cool Coenie Ref	Namibia - Windhoek	Conrad Stols
Cooltheron	Nelspruit	Eben Theron
Shivers cc	Polokwane	PJ Weir
Transfrig Eastern Cape (Queentek)	Port Elizabeth	Karel Wolmarans
Mother Cool	Swaziland	Ean Sauerman
SS Stander Herstelwerke	Upington	Fanie Stander
Repair	Zimbabwe - Bulawayo	Clive Hill
Cold Control	Zimbabwe - Harare	Theo da Fonseca

PHONE	CELL	EMAIL
+2731 914 0170	+2782 468 3861	geoff@coolperfection.co.za
+267 74 052 903	+267 74 052 903	vaughan@zerotemp.co.bw
+267 74 629 121	+267 74 629 121	airtron.babbage@gmail.com
+267 72 336 704	+267 72 336 704	louisa@tfb.co.bw
+2772 963 3020	+2772 963 3020	erts.george@gmail.com
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+2754 331 1245	+2782 823 1292	ssstanderherstel@telkomsa.net
+263 29 261349/50	+263 78 278 1131	projects@refair.co.za
+263 77 418 69 82 / 83	+263 77 418 69 82 / 83	theo@hms.co.zw

## WARRANTY

(This version of the above super cedes all previous written and/or implied policies issued by the company). Sphero South Africa (Pty) Ltd and its subsidiaries warrants each new unit for 12 months in respect of defective parts and workmanship effective from date of commissioning or 15 months from date of factory dispatch (whichever is the shorter) and spare parts for a period of 3 months from date of installation or 6 months from date of factory dispatch (whichever is shorter) providing that the unit or spare part is installed by an authorised Spheros South Africa distributor or dealer. Spheros South Africa's obligations under this warranty are limited to repairing or replacing, at its option, by an authorised Spheros South Africa distributor or dealer any part or parts found to be defective during the warranty period.

### 1. EXCLUSIONS FROM THIS WARRANTY

- a) Any part or parts of products becoming defective as a result of negligence, accident or other casualty.
- b) Owner's failure to adhere to the Spheros South Africa recommended maintenance procedures to provide normal maintenance such inter alia, tightening of belts, cleaning coils, loss of refrigeration, drier replacement or improper voltage or electrical connections.
- c) Equipment failure due to specification error, guidelines for which are issued by Spheros South Africa from time to time.
- d) Operation in a manner contrary to Spheros SA printed or implied instructions.
- e) Compressor engine mount adapter kits and their installation if not supplied and installed by Spheros South Africa or approved and authorized distributor or dealer.
- f) Refrigerant leaks (other than caused by component failure) which occur in excess of 45 days after date of commissioning the equipment.
- g) Failure of equipment, which has been modified without specific Spheros South Africa approval.
- h) Wearing parts such as belts, filters, driers, fuses, which fail after 90 days from commissioning.
- i) All labour time outside of normal working hours.
- j) All traveling time and accommodation expenses.
- k) Any consequential costs in contract or tort including payment of any damages of whatever nature, whether general or special, which may be sustained by the purchaser in consequence of any defect of whatever nature as may be found to exist in, relation to, the equipment or any portion thereof.

## WARRANTY

### 2. CONDITIONS OF WARRANTY

- a) Spheros South Africa neither assumes nor authorizes any person to assume for it, any obligation or warranty other than stated in this warranty.
- b) Spheros South Africa reserves the right to make changes in design or improvements of its products or parts thereof without obligation to make or install such changes or improvements in or upon products covered in this warranty.
- c) Spheros South Africa approved dealers does not warrant the workmanship of the installer, other than Spheros South Africa and will not bear any cost due to faulty or incorrect installation or shipping damage or product loss.
- d) Spheros South Africa will not be liable for loss of time, labour, equipment rental or other expense while products are out of service.

**First service validates full warranty (50 hr).**

This is the sole and only warranty supplied by Spheros South Africa and no other condition of warranty will be recognised unless it is an official written document supplied by the said company.

# R-Series 500/510/600/610

## SERVICE

(REFER TO MAINTENANCE SCHEDULE) – SEE PAGE 15

All maintenance should be performed by an authorised Spheros South Africa Dealer (as detailed in this book) and at the stipulated hours or time intervals.

<b>PDI SERVICE VALIDATES WARRANTY WITHIN 1 MONTH OF INSTALLATION</b>
<b>KM READING</b>
<b>DATE</b>
<b>DEALERS SIGNATURE/STAMP</b>

<b>SERVICE A</b>
<b>KM READING</b>
<b>DATE</b>
<b>DEALERS SIGNATURE/STAMP</b>

<b>SERVICE A</b>
<b>KM READING</b>
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<b>SERVICE A</b>
<b>KM READING</b>
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<b>SERVICE B</b>
<b>KM READING</b>
<b>DATE</b>
<b>DEALERS SIGNATURE/STAMP</b>

<b>SERVICE A</b>
<b>KM READING</b>
<b>DATE</b>
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**SERVICE**

(REFER TO MAINTENANCE SCHEDULE) – SEE PAGE 15

SERVICE A

KM READING

DATE

DEALERS SIGNATURE/STAMP

SERVICE A

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SERVICE B

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## R-Series 500/510/600/610

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### SERVICE

(REFER TO MAINTENANCE SCHEDULE) – SEE PAGE 15

SERVICE B

KM READING

DATE

DEALERS SIGNATURE/STAMP

SERVICE A

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**SERVICE**

(REFER TO MAINTENANCE SCHEDULE) – SEE PAGE 15

SERVICE A

KM READING

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DATE

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## R-Series 500/510/600/610

## NOTES

[illegible]

## NOTES

[illegible]



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