



Centurion Scientific Ltd

Technical Manual

C2012
C2004
C2041
C2015
C2006
CR2000
C2043
CW12
CYT04



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- Please note pictures are for illustration purposes only
- Wire colours may vary

Fixings

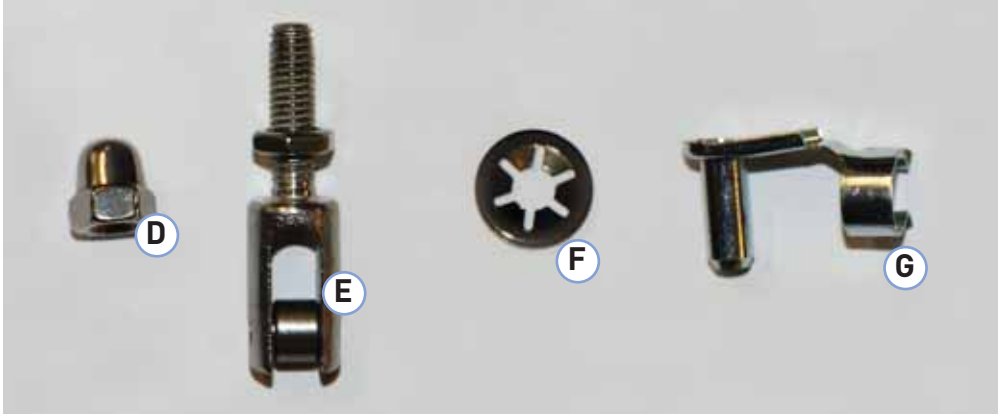
Side fixing screws



Side fixing screws

- A** M4 X 12mm (4)
Within hinged black cover
- B** M4 X 12mm (6)
Dome head screw
- C** M4 X 10mm (6)
Counter sunk screw

Lid Latch fixings



Lid Latch fixings

- D** M6 dome nut
- E** Lid lock latch

Gas strut fixings



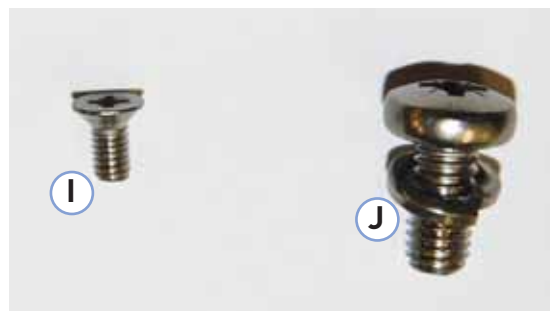
Gas strut fixings

- F** Gas strut lower fastening clip
- G** 6mm opening Gas strut clevis clip (Top)



- H** Emergency lid release plug (Black)
Located to under side of base

Motor top plate fixing screws



Motor top plate fixing screws

- I** Rotor recognition sensor
M3 X 6mm
Counter sunk screw
- J** M5 x 10
Pan head with spring washer



Help page

Tacho on display means the motor has not seen a revolution in 4 seconds. IT DOES NOT ALWAYS MEAN A TACHOMETER FAILURE. The use of tubes that are too long, or an obstruction can cause the same effect. Alternatively, a motor inverter or board failure meaning no power or revolution to the motor. Check the tubes and rotation first with an empty rotor. If it turns, then tubes are the problem. If it doesn't turn, then this would be the motor, inverter to the mains is at fault.

Always check that the display is lit, and the lid locks are fine.

Check tachometer using Test 13. **See page 3.**

Bal on display means an imbalance has occurred. If this bal display does not clear on restarting, then the detector or its 5 volt lines are broken. Check back to the circuit board. The detector is wired closed. A break in the 5 volt line will show this display. **See page 16.**

ALWAYS WEIGH AND OPPOSE SAMPLES IN AN EVEN FASHION IN THE ROTOR. This ensures a long life and good separations.

Lid on display means the lid is not closed properly. Push down hard on both edges of front section of lid.

It is imperative that you use a good strong work surface for any centrifuge to optimise separation and reduce noise.

Recommendations lid adjustment.

Centralise using not under lid latch

Codes shown on the LED Display



OPEn - You may now open the Lid



Lid? - Close the Lid



bAL? - An imbalance has occurred Please check the tubes are diagonally opposite and of the same weight.
Check if the tubes are broken If so use better quality, or if glass reduce the speed to the manufacturers recommended G force.

NOTE: If **druch** or **drluE** (drive) show please Contact Service Department, or refer to technical manual.

CR 2000 model only



rotor? - The sensor has found the speed to be incorrect to the rotors settings, it will have readjusted. Please recheck your speed and try again.
If this continues contact the service department.



rrEc ? - A problem with the sensor or inverter has occurred please contact the service department.

Test **tES**t Routine

(all C series LED models)

This allows you to turn on or off the buzzer and to check the sensors for, Tachometer, Rotor recognition, Lid open & Imbalance detector.



See 23 Each go 0/1 as you turn rotor or operate Imbalance detector or shut lid.

Centrifuge lid in open position. **Mains off at rear switch.**

Press function (keep held down) whilst turning on at rear switch. When test shows release function button.

Press time up arrow See numbers in time display go to 18

Buzzer off or on (0/1) 18

Set speed Rpm digits in 10 or 100 Rpm steps 19

EEtE St - E prom check Press Speed up arrow Number not shown

8888 88 - LED display check increment speed up arrow Number not shown

Rotor rec Tacho Lid open Imbalance 24

Turn rotor Turn rotor Close lid Push rotor to one side Display changes from 0 to 1

Bu2t St - Buzzer test press speed up arrow Number not shown

Do9t St - Watchdog test Press speed up arrow. **HELL 0** - (Hello) should display, then back to normal.

Circuit board replacement - LED

Part number: 3022301



- Subject to change R&D
- For illustration purposes only

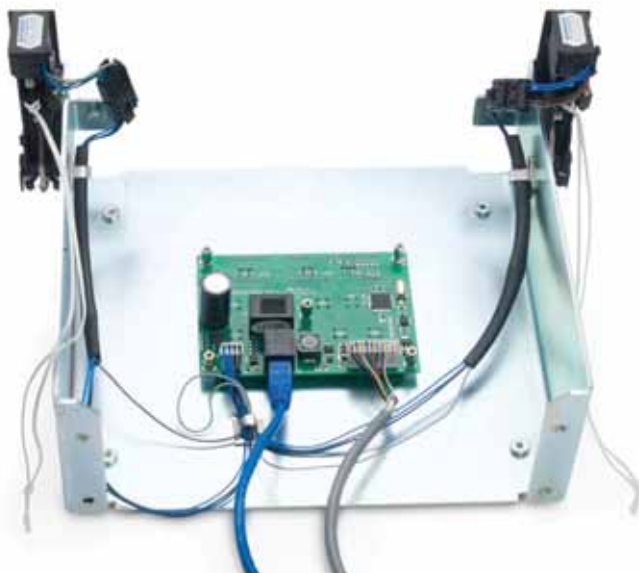
Dismantling sequence prior to replacement

NOTE: Remove mains electricity power cord first

- 1 Un-hinge black cap. Unscrew and remove 4 screws to front panel.
- 2 Remove all screws to composite sides (at rear). Both sides should now be removed. Store safely with consequent screws, washers and hinge caps (black).
- 3 Remove bottom clip to Gas Struts and pull off the bracket.
- 4 Remove black metal top cover with lid as follows.
- 5 Remove all M4 screws to rear, not around mains inlet. Then remove 2 counter sunk screws near front lid lock holes.
- 6 Pull off black top cover and lid. Place carefully to one side.
- 7 Unscrew and remove M4 screws underneath front panel, by pulling centrifuge forward over work surface. Not too far!
- 8 Unplug 10 way connector to circuit board.
- 9 Remove complete panel to another area.
- 10 Unplug 4 way connector to board and blue Ethernet Cable.
- 11 To remove circuit board unscrew all M3 pillar nuts to rear.
- 12 Slide off the M3 threaded rods carefully.

Replacement is reversal of above. **Do not over tighten the pillar nuts.**

Make sure rubber pads are fitted to the A6 switches before fitting.



Motor replacement



Part number: 1189001

(C2012, C2015, C2004, C2006, CR2000, Pro-Sep E, Pro-Sep S, Pro-Vet HE, Pro-Vet Multi, CR2000 with rotor recognition)

Part number: 1188001

(C2041)

Motor with cover and rotor recognition

Dismantling sequence prior to replacement.

NOTE: Remove mains electricity power cord first

- 1 Un-hinge black cap. Unscrew and remove 4 screws to front panel.
- 2 Remove all screws to composite sides (at rear). Both sides should now be removed. Store safely with consequent screws, washers and hinge caps (black).
- 3 Remove bottom clip to Gas strut(s) and pull off the bracket.
- 4 Remove black metal top cover with lid as follows.
- 5 Remove all M4 screws to rear, not around mains inlet. Then remove 2 counter sunk screws near front lid lock holes.
- 6 Pull off black top cover and lid. Place carefully to one side.
- 7 Remove stainless steel top cover to motor top, by removing 4 M5 screws.
- 8 Pull bowl up and out. Note under seal to bowl top position.
- 9 Unscrew with spanner or box key All 3 M8 nuts to motor chassis. Place to one side.
- 10 Unplug motor connection to mains in supply . Turn over motor to view bottom and remove 12 way cable plug to circuit board socket.

Motor with cover and rotor recognition sensor screws removed

Lay motor at an angle and fit the mains connector, then fit the 12 way small connector to bottom circuit board.

Fit the 3 way connector if so fitted.

Place motor over Anti vibration mounts and add spring washer's and M8 nuts. Tighten carefully by holding AV mounts to prevent any twist in the mounts. Not recommended.

Push rotor recognition sensor through hole in rubber boot if fitted the place bowl over motor. Make sure seal to barrier ring is fitted correctly (opening to centre rear for ventilation). Check free turning of motor and all satisfactory before refitting top and sides . As reversible of above.

Tachometer The tachometer is a horseshoe LED type, 5 volt, sensing dark and light current off the butterfly interrupter.

NO ADJUSTMENT necessary, apart from fix to array. Keep array clean for optimum use.



Inverter replacement

Part number: 6002001



Dismantling sequence prior to replacement

NOTE: Remove mains electricity power cord first

- 1 Un-hinge black cap. Unscrew and remove 4 screws to front panel.
- 2 Remove all screws to composite sides (at rear). Both sides should now be removed. Store safely with consequent screws, washers and hinge caps (black).
- 3 Remove bottom clip to Gas Struts and pull off the bracket.
- 4 Remove black metal top cover with lid as follows.
- 5 Remove all M4 screws to rear, not around mains inlet. Then remove 2 counter sunk screws near front lid lock holes.
- 6 Pull off black top cover and lid. Place carefully to one side.
- 7 Remove all wiring to inverter.
- 8 Unscrew and remove all 4 M4 screws to base of Inverter.

Replacement is reversal of above.


The replacement will be programmed for use. Do not change any parameters

Wiring to induction motor from inverter



Black to U
Brown or **Red** to V
Blue to W
Grey to PE (Next to W)
Grey to B7
(Above does not matter which direction)
PR to T1

Wiring to inverter from mains filter

Red/ Brown to L1
Blue/ Black to L2-N
Earth to Tag 



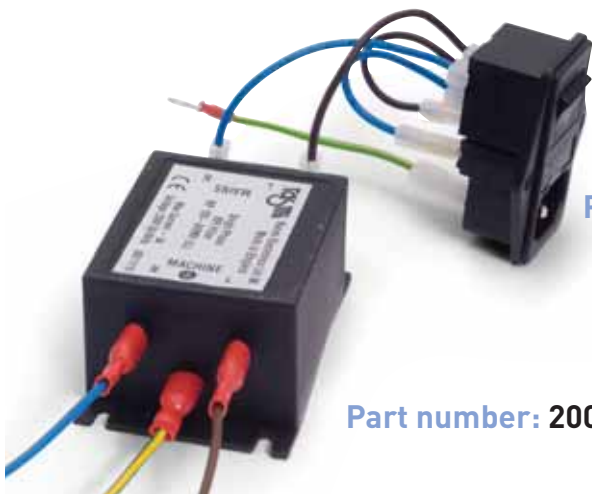
Mains inlet & filter replacement



Dismantling sequence prior to replacement

NOTE: Remove mains electricity power cord first

Mains inlet is double fused, with an IEC socket for power source. It is held in place with 2 X M3 screws. Fuses are 5X20mm, 6.3 (TA) Slow blow only.



Part number: 2000013

Part number: 2000073

- 1 Un-hinge black cap. Unscrew and remove 4 screws to front panel.
- 2 Remove all screws to composite sides (at rear). Both sides should now be removed. Store safely with consequent screws, washers and hinge caps (black).
- 3 Remove bottom clip to Gas Struts and pull off the bracket.
- 4 Remove black metal top cover with lid as follows
- 5 Remove all M4 screws to rear. Not around mains inlet. Then remove 2 counter sunk screws near front lid lock holes.
- 6 Pull off black top cover and lid. Place carefully to one side.
- 7 On rear panel unscrew 2 M3 countersunk screws holding mains inlet in place.
- 8 Disconnect tab connectors to filter and tab connectors to inverter.
- 9 Remove filter by unscrewing M4 screws

Replacement is reversal of above.

Note: EMC filter **must** be used to comply with EMC Regulations.



Lid lock replacement - LED

Part number: 6844000



Dismantling sequence prior to replacement.

NOTE: Remove mains electricity power cord first

- 1 Un-hinge black cap. Unscrew and remove 4 screws to front panel.
- 2 Remove all screws to composite sides (at rear) Both sides should now be removed. Store safely with consequent screws, washers and hinge caps (black).
- 3 Remove bottom clip to Gas Struts and pull off the bracket.
- 4 Remove black metal top cover with lid as follows.
- 5 Remove all M4 screws to rear, not around mains inlet. Then remove 2 countersunk screws near front lid lock holes.
- 6 Pull off black top cover and lid. Place carefully to one side.
- 7 Unscrew and remove M4 screws underneath front panel, by pulling centrifuge forward over work surface. Not too far!
- 8 Unplug 10 way connector to circuit board.
- 9 Remove complete panel to another area.
- 10 Unplug 4 way connector to board.
- 11 To remove Lid locks unscrew 2 x M6 Countersunk screws. (See A page 14)

Replacement is reversal of above.

Lid lock is powered via 12 volts through capacitor charging.

Adjustment

Latches (in lid) need to be centralised to lid lock opening. Adjust with under nuts



Lid seal replacement

Part number: 4171001

(C2004, C2006, CR2000)
Pro-Vet multi, Pro-Sep S
CW12, CYTO4

Part number: 4151001

(C2041)

Part number: 4191001

(C2012, C2015, Pro-Vet HE,
Pro-Sep E)



Dismantling sequence prior to replacement.

NOTE: Open centrifuge lid, then turn off and remove mains electricity power cord.

Remove old lid seal by gently pulling towards centre of bowl.

Replace by pushing u section into top wall all the way round.

NOTE the seal **MUST** be fitted correctly or damage may be caused if it releases from metalwork.

Gas strut replacement

Part number: 2172801

(C2004, C2006, CR2000)
Pro-Vet multi, Pro-Sep S
CW12, CYTO4

Part number: 2152801

(C2041)



Dismantling sequence prior to replacement

NOTE: Remove mains electricity power cord first

- 1 Un hinge black cap. Unscrew and remove 4 screws to front panel
- 2 Remove all screws to composite sides (at rear sides) Both sides should now be removed .Store safely with consequent screws, washers and hinge caps(black)
- 3 Remove bottom clip to Gas Struts and pull off the bracket
- 4 Unscrew other end of gas strut from Lid
- 5 Replace and reverse procedure of above



Imbalance detector

Part number: 2000104

This detector is wired normally closed, and uses a 5 volt DC supply from the circuit board. Any interruption in this supply line will mean that Bal will show on the display.



Dismantling sequence prior to replacement

NOTE: Remove mains electricity power cord first

- 1 Un-hinge black cap. Unscrew and remove 4 screws to front panel.
- 2 Remove all screws to composite sides (at rear). Both sides should now be removed. Store safely with consequent screws, washers and hinge caps (black).
- 3 Remove bottom clip to Gas Struts and pull off the bracket.
- 4 Remove black metal top cover with lid as follows.
- 5 Remove all M4 screws to rear, not around mains inlet. Then remove 2 counter sunk screws near front lid lock holes.
- 6 Pull off black top cover and lid. Place carefully to one side.
- 7 Remove stainless steel top cover to motor top, by removing 4 M5 screws.
- 8 Pull bowl up and out. Note under seal to bowl top position.
- 9 Unscrew 2 M4 screws, unplug socket to circuit board, then remove imbalance detector.
- 10 Replace with new detector, and replug into circuit board.
- 11 Adjust end shaft of detector to within 2-5mm of motor chassis.

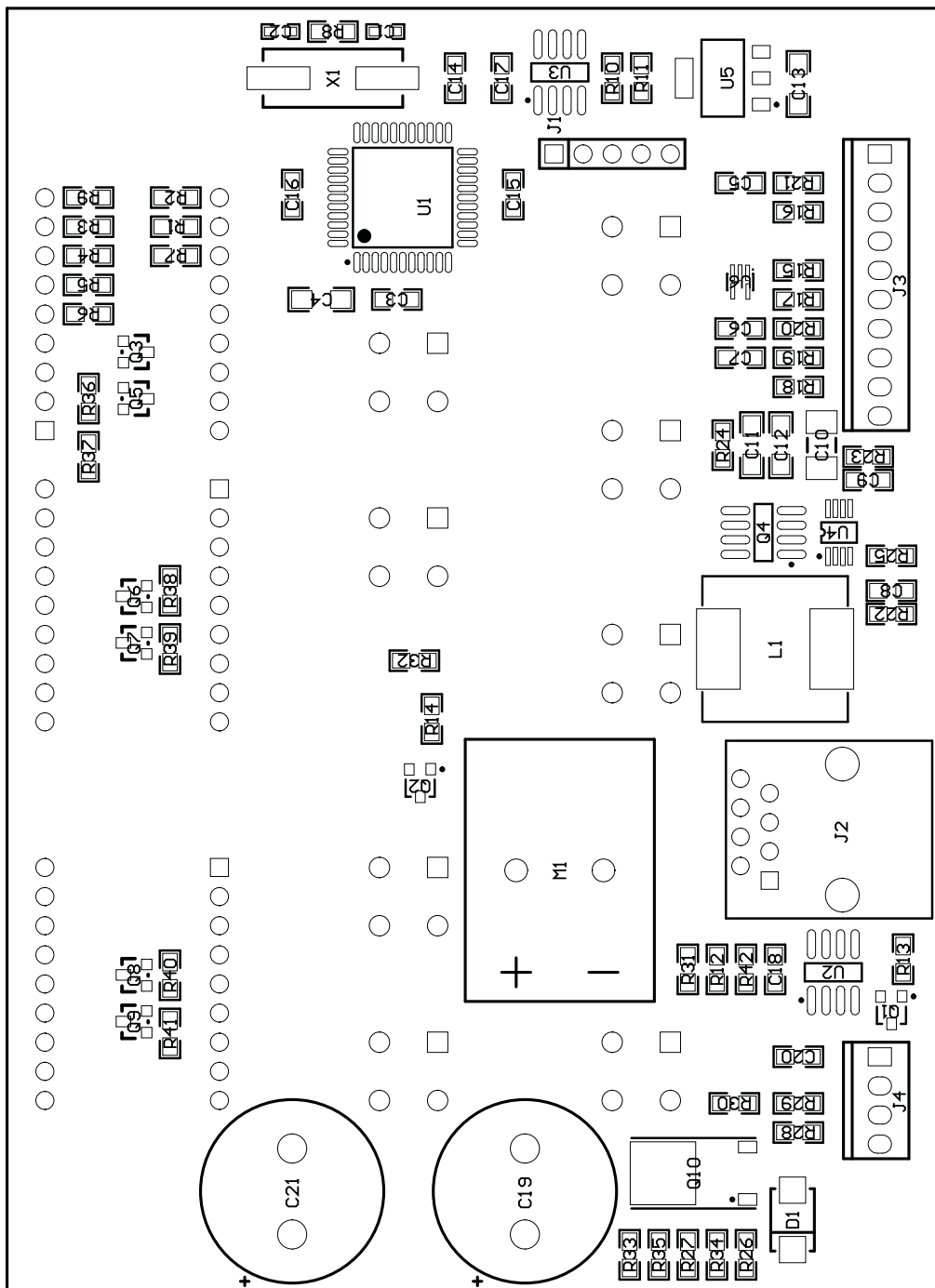
Note: check adjustment by using Test 13. Push motor to one side to check correctly interrupting detector.



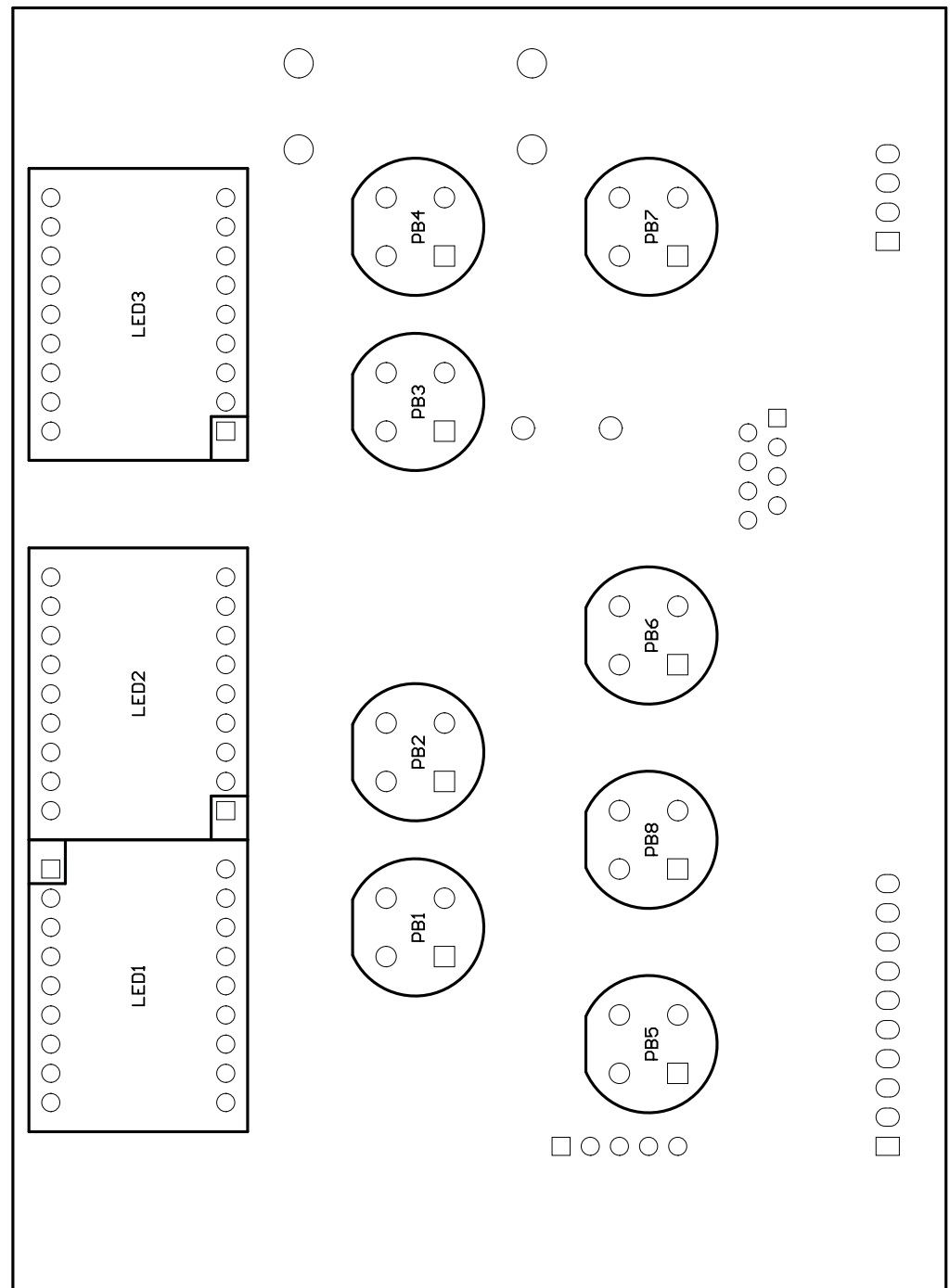
Circuit board replacement - LED

VS1223 MAIN Part List ISS C

Item	Quantity	Designator	Type	Value	Supplier	Part No	Buying	No Fit
1	1	M1	Buzzer PCB Mount 6v	KPMB-2206P	KEPO	KPMB-2206P	Rapid 35-3598	
2	1	C19	Capacitor Al Elec 35v +/-20% 105C	2200uF	Rubycon	35YXF2200M16X31.5	FEC 1144631	
3	1	C21	Capacitor Al Elec 35v +/-20% 105C	2200uF	Rubycon	35YXF2200M16X31.5	FEC 1144631	No Fit
4	4	C4, C11, C12, C13	Capacitor Ceramic Multi-Layer 10v 10% X7R 1206	10u	Any		FEC 1288264	
5	1	C10	Capacitor Ceramic Multi-Layer 35v 10% X9R 1210	10u	Any		FEC 1463373	
6	1	C8	Capacitor Ceramic Multi-Layer 50v 5% X7R 0805	1n	Any		FEC 1414860	
7	5	C5, C6, C7, C9, C20	Capacitor Ceramic Multi-Layer 50v 10% X7R 0805	10n	Any		FEC 1414862	
8	6	C3, C14, C15, C16, C17, C18	Capacitor Ceramic Multi-Layer 50v 10% X7R 0805	100n	Any		FEC 1414864	
9	2	C1, C2	Capacitor Multilayer Ceramic NPO 100v 5% SMT 0603	22p	Any		FEC 1414833	
10	1	X1	Crystal SMT HC49/US	7.3728MHz	Any		FEC 1457107	
11	1	D1	Diode Fast Rectifier 1.5A 200v SMB	RS2D	Vishay	RS2D	FEC 9550160	
12	1	J4	Header 0.1" 4 way	640454-4	Typo/AMP	640454-4	FEC 588480	
13	1	J3	Header 0.1" 10 way	1-640454-0	Typo/AMP	1-640454-0	FEC 588544	
14	1	J1	Header 0.1" 25 pin 5 way gold 11.8mm overall		Any		Rapid 22-0510	No Fit
15	1	J4	IC Buck Controller MSOP-8	LM3485MM	National	LM3485MM	FEC 1489251	
16	1	U6	IC CMOS Schmitt Inverter Gate SOT353	NL17SZ14DF12G	On-Semi	NL17SZ14DF12G	FEC 1468776	
17	1	J3	IC EEPROM Microwire 1Kb SO8	93LC46A-JSN	Microchip	93LC46A-JSN	FEC 1331458	
18	1	U1	IC Microprocessor PIC24F1QFP44	PIC24FJ32GA004-IPT	Microchip	PIC24FJ32GA004-IPT	FEC 1332295	
19	1	U2	IC RS485 Transceiver 5v SO8	ST485CDR	ST	ST485CDR	FEC 1564307	
20	1	J5	IC Voltage Regulator LDO 3.3v 0.8A SOT-223	LD1117S33	ST/Any	LD1117S33	FEC 1202826	
21	1	L1	Inductor 100uH 220mR 1.1A SMT 12x12mm	100uH	Typo	3631B101LL	FEC 1174029	
22	3	LED1, LED2, LED3	LED 7 Segment 0.56" Dual CA HE Blue	FN2-0562B0500BW	Forge-Europa	FN2-0562B0500BW	Forge-Europa	
23	1	R22	Resistor 1% 0.125W 0805	3k	Any			
24	1	R25	Resistor 1% 0.125W 0805	1k	Any			
25	1	R15	Resistor 5% 0.125W 0805	470R	Any			
26	1	R23	Resistor 5% 0.125W 0805	15k	Any			
27	1	R24	Resistor 5% 0.125W 0805	0R0	Any		Any	
28	1	R8	Resistor 5% 0.125W 0805	1M	Any			
29	17	R12, R13, R14, R26, R27, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42	Resistor 5% 0.125W 0805	4k7	Any			
30	3	R10, R20, R30	Resistor 5% 0.125W 0805	10k	Any			
31	3	R19, R21, R29	Resistor 5% 0.125W 0805	47k	Any			
32	4	R16, R17, R18, R28	Resistor 5% 0.125W 0805	2k2	Any			
33	9	R1, R2, R3, R4, R5, R6, R7, R9, R11	Resistor 5% 0.125W 0805	100R	Any			
34	1	J2	Socket RJ45 Jack 8W PCB Side Entry	HY53A8-8	HongYu	HY53A8-8	?	
35	8	PB1, PB2, PB3, PB4, PB5, PB6, PB7, PB8	Switch Push Button	D8F90 F1 LFS	C&K	D8F90 F1 LFS	Digkey 401-1970-ND?	
36	1	Q10	Transistor MOSFET N D-Pak	RFD16N05L5M	Fairchild	RFD16N05L5M	FEC 1017794	
37	1	Q4	Transistor MOSFET P+ Diode S08	FD52P753Z	Fairchild	FD52P753Z	FEC 1495205	
38	6	Q3, Q5, Q6, Q7, Q8, Q9	Transistor MOSFET P+ SOT23	BSS84	Any	BSS84	FEC 1094997	
39	2	Q1, Q2	Transistor NPN Small Signal SOT-23	BC817-25	Any	BC817-25	FEC 1228216	



Circuit board replacement - LED



Spare Parts list

For models:

C2004
C2006
CR2000
CYT04
CW12
Pro-Vet Multi
Pro-Sep S

Part Number	Description
1189001	Hanning Small motor
1185201	Anti vibration mounts blue dot (C2006 only)
1184205	Anti vibration mounts Robush (All others)
1080001	Complete Tacho & Imbalance Assembly
2000013	Mains inlet Switch complete
2000171	EMC filter complete with wiring
6002001	Inverter Emerson 3.7 KV
6100086	Ethernet Cable
3022301	LED Circuit board VS1223
6844000	Lid lock 12 volt Rharrbach
4071021	Bowl complete – stainless steel
4171001	Bowl seal (top)

* No discount on these items



Spare Parts list

For models:

C2012

C2015

Pro-Vet HE

Pro-Set E

Part Number	Description
1189001	Hanning Small motor
1184203	Anti vibration mounts Orange
108001	Complete Tacho & Imbalance assembly
2000013	Mains inlet Switch complete
2000171	EMC filter complete with wiring
6002001	Inverter Emerson 3.7KV
6100086	Ethernet Cable
3022301	LED Circuit board VS1223
6844000	Lid lock 12 volt Rharrbach
4091021	Bowl complete – Stainless steel
4191001	Bowl seal (top)

* No discount on these items

Spare Parts list

For models: C2041

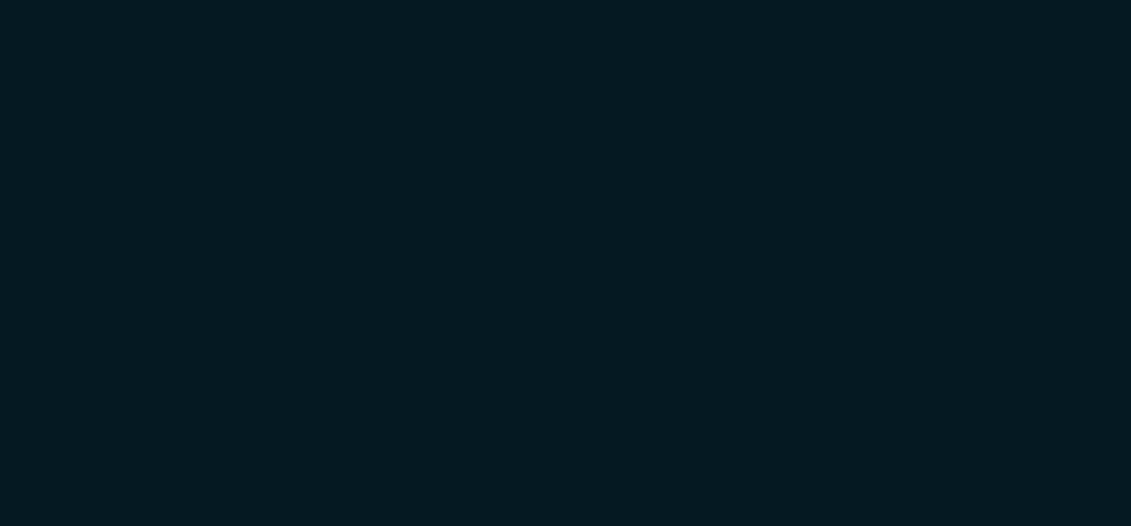
Part Number	Description
1188001	Hanning large Motor
1184202	Anti Vibration mounts Large
1080001	Complete Tacho & Imbalance assembly
2000013	Mains inlet switch complete
2000171	EMC Filter complete with wiring
6002001	Inverter Emerson 3.7KV
6100086	Ethernet Cable
3022301	LED Circuit board VS1223
6844000	Lid lock 12 volt Rharbach
4051021	Bowl complete – Stainless steel
4151001	Bowl seal (top)

* No discount on these items



User's Notes





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