

INSTRUCTION MANUAL

IM224R04



Hydrovar[®]

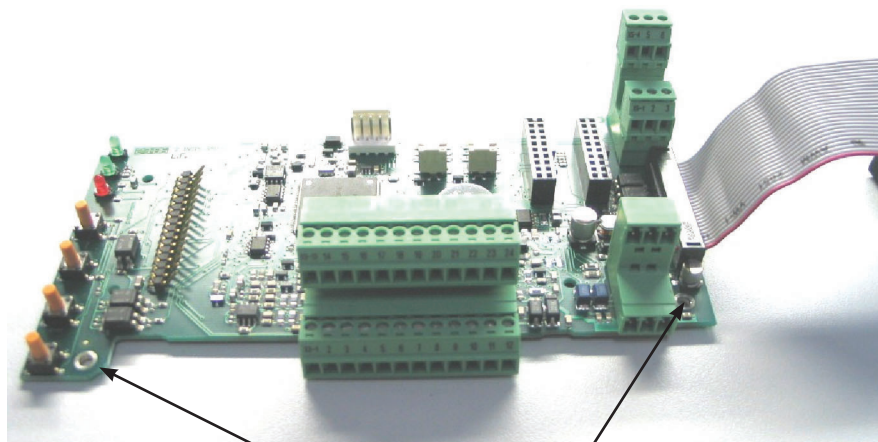
Variable Speed Control

HV, 2 HP - 15 HP VERSION 0307

SERVICE MANUAL

Section A

Troubleshooting the Control Card (using a Multimeter). *Power Supply disconnected!!!*



**GND Connection to Power Unit
(attached via the screws)**

The following tests have to be made without connected cables.

1) Internal Resistance - Digital Inputs:

Low Water

X3/1 (GND) - X3/11

=> 90k Ω / 2.5M Ω

External ON/OFF (release)

X3/1 (GND) - X3/7 => 14k Ω

Configurable Digital Input (Digi 1):

X3/1 (GND) - X3/9 => 14k Ω

Digital Inputs (Dig 2 / Dig 3 / Dig 4):

X3/1 (GND) - X3/5 / 6 / 15

=> 20k Ω

2) Internal Resistance of the Analogue Current Inputs:

(Sensor 1/2 - Req. Val 1/2)

X3/1 (GND) - X3/2 / 4 / 18 / 23 => 50 Ω

3) Capacity of Electronic Ground to Earth:

X3/1 (GND) - earth => 60nF

Important to bleed off Hf- Disturbances!

X3	24	+24V	Additional power supply ** max. 100 mA
	23		Current signal input (required val. 2) 0-20mA / 4-20mA [Ri=50 Ω]
	22	└	
	21		Analog output 2 4-20mA [Ri=500 Ω]
	20		Analog output 1 0-10 VDC
	19	+10V	
	18		Current signal input (required val. 1) 0-20mA / 4-20mA [Ri=50 Ω]
	17	└	
	16	└	Voltage signal input (required value 2) 0-10 VDC *DIG 4
	15		
X3	14	└	Voltage signal input (required value 1) 0-10 VDC
	13		
	12	└	
	11	└	Low water
	10	└	
	9	└	Configurable digital input 1 DIG 1
	8	└	
	7	└	External ON/OFF (release)
	6		Actual-value-voltage input sensor 1 *DIG 2
	5		Actual-value-voltage input sensor 2 *DIG 3
X3	4		Actual-value-current input sensor 2
	3	+24V	Sensor supply ** max. 100 mA
	2		Actual value current input sensor 1
	1	└	Ground

Section A *(continued)*

Troubleshooting the Control Card (using a Multimeter).
Power Supply disconnected!!!

Note



When the HYDROVAR is connected to power supply, the components of the power unit as well as certain Components of the Control Card remain under voltage.

Touching these components seriously endangers life!

All work, carried out at opened HYDROVAR, must be performed by qualified and authorized technicians.

The following tests have to be made without connected cables.

1) Sensor Power Supply:

X3/1 (GND) - X3/3 => 24 VDC

X3/1 (GND) - X3/24 => 24 VDC

2) Internal Ref. for Analog Output:

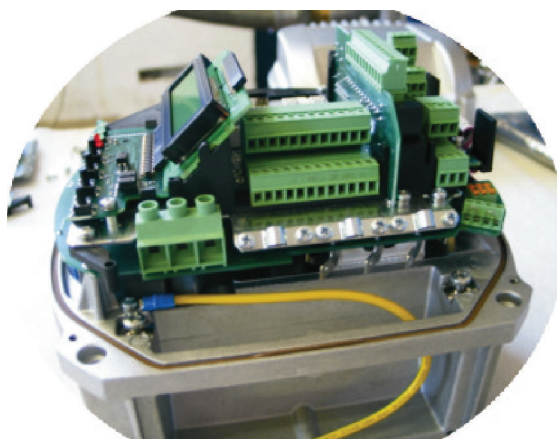
X3/1 (GND) - X3/19 => 10 VDC

3) Digital Inputs:

External On/Off X3/ 7 - X3/8 (GND) => 5 VDC

Conf. Digital Input 1 X3/ 9 - X3/10 (GND) => 5 VDC

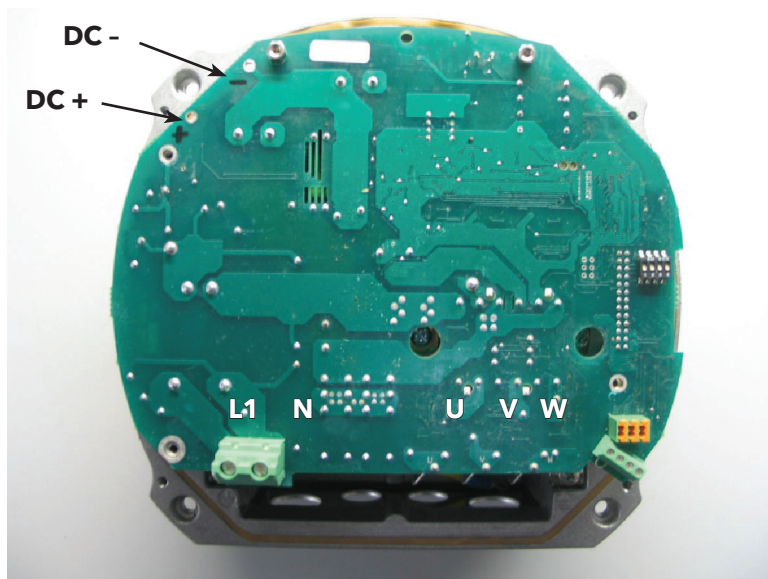
Low Water X3/ 11 - X3/12 (GND) => 5 VDC



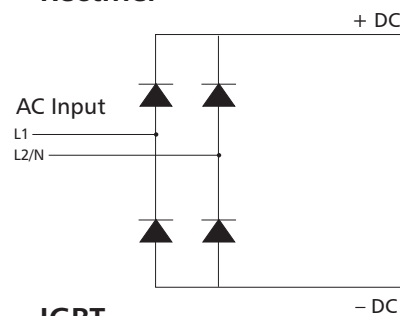
Section B

Troubleshooting the Rectifier and the IGBT Module (using a Multimeter).
Power Supply disconnected!!!

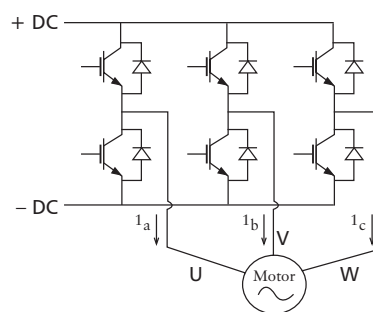
Single Phase Unit HV 2, 3 HP



Rectifier



IGBT



Commercial Water

Check the following values:

Black Wire (GND)	Red Wire of Multimeter	Result
Rectifier Values		
L1 N	DC+	OL (Overload)
L1 N	DC-	0.54 V
DC+	L1 N	0.57 V
DC-	L1 N	OL (Overload)
IGBT Values		
DC+	U V W	0.48 V
DC-	U V W	OL (Overload)
U V W	DC+	OL (Overload)
U V W	DC-	0.45 V

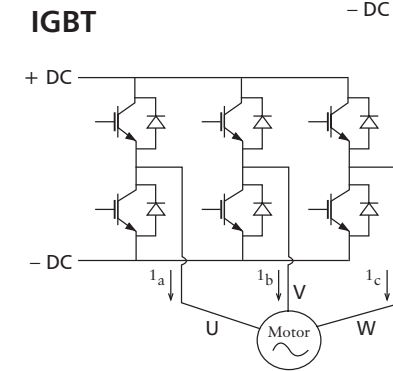
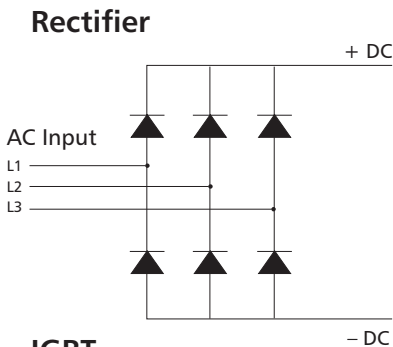
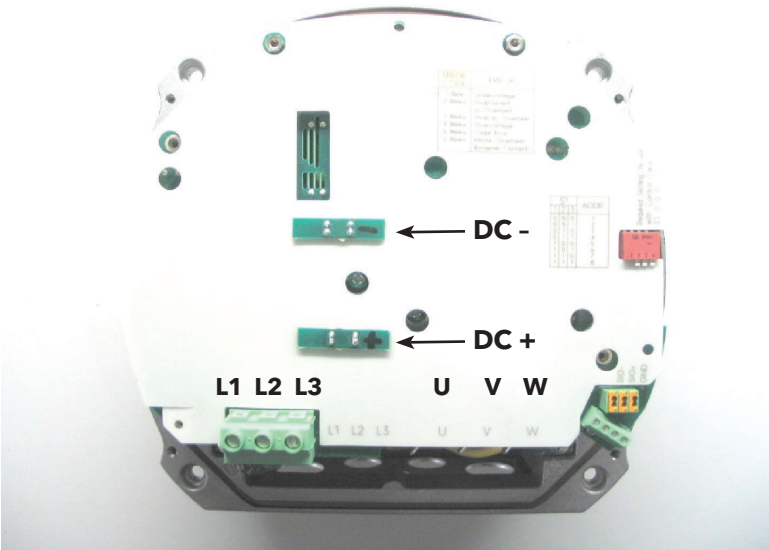
NOTE: Put multimeter on diode check ()

Result:

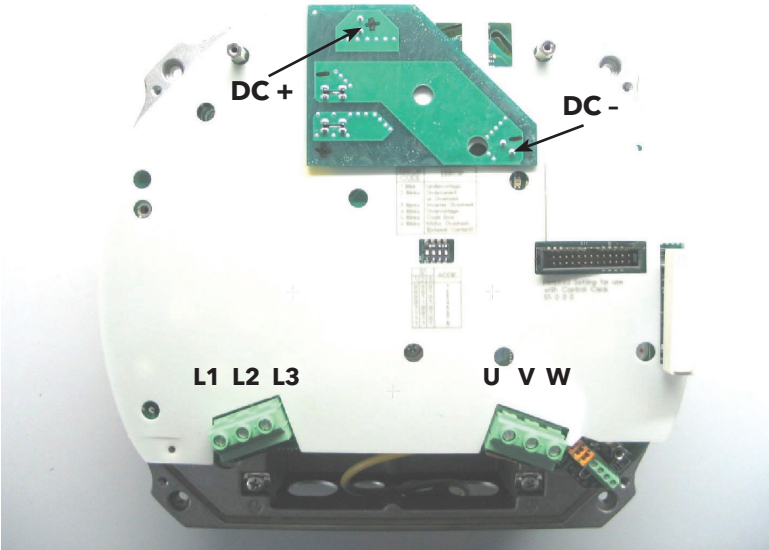
- If the above mentioned values between power supply and DC part are significantly different
=> **Rectifier** may be damaged.
- If values between motor connection and DC part are significantly different
=> **IGBT** module may have a failure.

Commercial Water

Three Phase Unit HV 3, 5 HP



Three Phase Unit HV 7.5, 15 HP



Commercial Water

Check the following values:

Black Wire (GND)	Red Wire of Multimeter	Result
Rectifier Values		
L1 L2 L3	DC+	OL (Overload)
L1 L2 L3	DC-	0.40 - 0.54 V
DC+	L1 L2 L3	0.40 - 0.54 V
DC-	L1 L2 L3	OL (Overload)
IGBT Values		
DC+	U V W	0.420 - 0.635 V
DC-	U V W	OL (Overload)
U V W	DC+	OL (Overload)
U V W	DC-	0.40 - 0.45 V

NOTE: Put multimeter on diode check ()

Result:

- If the above mentioned values between power supply and DC part are significantly different
=> **Rectifier** may be damaged.
- If values between motor connection and DC part are significantly different
=> **IGBT** module may have a failure.

Xylem |'zīləm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

We're a global team unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

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