INCA

CONTROL PTY LTD
UNIT 14/62 OWEN ST
GLENDENNING NSW 2761
A.B.N 54 131 353 636

Phone:(02) 96753815
Fax: (02) 96751381
Email: sales@incacontrol.com.au
Web: www.incacontrol.com.au

Design & Manufacture of:
Custom-built switchboards
Electronic control equipment
AC/DC pumping controls
Installation & service

INCA MODEL

PVRW1

SINGLE VARIABLE SPEED RAINWATER PRESSURE SYSTEM

USER MANUAL
Inca Reference PVRW1

Technical Support
Pumps & Mechanicals – Pump supplier
Controls – Inca Control Pty Ltd
Phone 02 9675 3815

TABLE OF CONTENTS

Drawing supplied separately

1.0 Control Panel Overview

1.1 Features

- Display of System Pressure on Variable Speed Drive
- VSD fault shutdown
- Terminals for 24VAC mains water solenoid standard
- Voltage free contacts for each VSD fault/Mains Water on
- Useable with any 4-20mA loop powered Pressure Transducer

1.2 Description

The pressure control panel is designed to maintain a system discharge pressure via pressure set point adjustable on VSD. The display on the VSD shows the actual live pressure input received from the system discharge pressure transducer. It also displays the pump operating condition.

User Interface

Keypad — Nil

Inputs

2 wire plus shield connected to terminals located on panel base plate for pressure transducer.

Outputs

Motors — 3 wire plus earth sized to suit motor FLC connected directly to VSD.

Power Supply

Either 415V 3phase neutral & earth or 240V Active, neutral & earth power supply sized to suit the total load of the motor & must have a protection circuit breaker sized to suit the starting characteristics of the motor.

Mechanical Specification

Enclosure — Mild steel powder coated RAL 7035 IP54.

Pump Unit — See Pumping detail by Pump supplier.

Environmental Specification

Operating Temp — -10 to 50deg C

Relative Humidity — Do not install in areas of high humidity. Locate control panel internally where possible to help reduce heat & weather damage & increase mechanical life.

Vibration — Do not install in a location that is subject to large amounts of vibration.

2.0 Installation

Note: If any damage to control panel if found, please notify Inca Control Pty Ltd as soon as possible prior to installation.
The control panel can be wall mounted separately from the pumping unit; distance is governed by the cable sizing to the motor.
It is recommended that the control panel is within view of the pumping unit for safety reasons. If not in view lockable isolating switches must be installed at the pump motors.

2.1 Mechanical Installation

Mount the control panel via the mounting holes in each corner at the back of the enclosure using minimum 6mm screws, nuts & locking washers, or masonry anchors.
Install in a dry well ventilated location that matches with environmental specification in 1.2 above.

2.2 Sensor Installation

Locate the pressure transducer in the discharge pipe work as close as practical to the control panel.

2.3 Electrical Installation

Note: All cable entries must enter via the bottom of the cabinet. If cables are entered via the roof Inca Control Pty Ltd reserve the right to withdraw warranty because of the possibility of shaving entering sensitive electronic equipment.

Transducer wiring

The pressure transducer must be wired in 1 pair overall screened data cable. This type of cable provides the most protection against electrical noise & allows a more accurate outcome.
Connect to the sensor as per data supplied by the sensor supplier
At the control panel connect the positive lead to terminal No10 & the return signal to terminal No11.
The screen must be solidly earthed, with a saddle clamp providing the best screening earth.

Motor Wiring

The motor must be wired in cabling sized to suit the motor power requirement.
The motor is to be connected in star or delta as instructed by the nameplate on the motor.
The cabling entering into the motor terminal box shall be glanded unless a submersible motor is being used in this case the pump lead is supplied by the pump manufacturer.

The cable entering the control panel end can be glanded using standard nylon glands & run directly to the VSD terminals. The cables screen must be earthed via the supplied screening saddle.

2.4 Maintenance

Check that all connections are tight as copper is soft & can work loose.
Check that all controls are functioning as intended.
Check & ensure that the ventilation mats are regularly cleaned as reduced air flow will damage the drive.

3.0 Connections

All connections should be applied by consulting the correct drawing supplied within the panel. The information below is a general reference guide and should **not** be used without the drawing provided.

3.1 Power Supply

The PVC2 control panel is available in either 415VAC or 240VAC supply.

415VAC Supply-	Terminals on 3 pole isolator located inside the panel and the neutral terminal.
240VAC Supply-	Terminals on 1 pole circuit breaker and the neutral terminal.

All Earth terminations are to the earth point provided at the bottom of the panel mounting plate.

3.2 Motor

Motors are connected to terminals T1, T2, T3 on the bottom of the overloads.

Pump1 - C1 and
Pump 2 - C2.

3.3 Pressure Transducer

Terminals 10 & 11 (positive to terminal 10)

3.4 Voltage Free Contacts

All connections of Voltage Free Contacts are connected directly to the BMS relay supplied within the panel.

Relay 1-	Pump No.1 Run
Relay 2-	Pump No.2 Run
Relay 3-	Pump No.1 Fail
Relay 4-	Pump No.2 Fail
Relay 5-	VSD Fault

3.5 Mains Water By-Pass (Option)

Low Level Float Switch-
Terminals 20 & 21

24VAC Mains Water By-Pass Solenoid-
Terminals 23 & 24

4.0 VSD Set point Adjustment

System is factory set at 50% of the transducer scale (example 500kpa for a 1000kpa sensor). If a higher set point is required, close OFF the system discharge valve and slowly turn clockwise the dial located on the front of the VSD until the required pressure is obtained.

The screen will reflect this as a % of the transducer.

If the pressure overshoots, turn the dial on the VSD back (anti-clockwise) a little, release the system pressure and repeat the process until the desired pressure is obtained.

The system will sleep when the pump speed is less than 60% + 1 sec and wake when the pump speed is above 70% + 1 sec.

10.15 (Sleep Frequency) Adjustment

To adjust the frequency at which the drive will 'sleep', using the keypad on the drive press the ENTER key once. Then using the ^ V keys select 10. Press ENTER once, then select 15 using the ^ V keys. To enter 10.15 press the ENTER key.

A frequency will now be displayed. Using the ^ V keys, select the desired 'sleep' frequency and then press ENTER.

To enter more adjustments, press the MODE key and repeat the process or to return to the original display, press the MODE key twice.

*Note: Factory setting for the 'sleep' frequency is **30.00***

10.16 (Wakeup Frequency) Adjustment

To adjust the frequency at which the drive will 'wakeup', using the keypad on the drive press the ENTER key once. Then using the ^ V keys select 10. Press ENTER once, then select 16 using the ^ V keys. To enter 10.16 press the ENTER key.

A frequency will now be displayed. Using the ^ V keys to select the desired 'wakeup' frequency.

To return to the original display, press the MODE key twice.

*Note: Factory setting for the 'wakeup' frequency is **35.00***

5 Operation

5.1 System Operation

The system is designed to maintain a constant pressure in the discharge line of a pumping system. The duty pump will start & ramp up to a pre-determined speed set on the VSD, maintaining the set point pressure for 1 second (sleep/wake up detection time) before going to sleep providing it has reached its minimum frequency value.
The pressure will fall to the wake-up frequency set point where the duty pump will then start the cycle once again.
Each time the system goes to sleep the duty pump will be alternated to the next pump ready for the next operation.
If a motor fails by overload, the standby pump will be started & will remain as duty until the failed pump is put back on line.
If a VSD fault occurs the pump will **not** operate.

5.2 Duty Selector Switch

Each function of the switch is selected by operating the appropriate selector on the Panel facia.

Duty Selector: Pump 1/auto/pump2 controls the alternation of the mains powered pumps.
Pump 1, when selected will make Pump No1 the duty pump.
Auto, when selected in auto the mains pumps will alternate after each operation.
Pump 2, when selected will make Pump No2 the duty pump.

Important Note:

If either PUMP 1 or 2 is selected on the duty selector and that pump fails, the system will **NOT** function.
If AUTO is selected on the duty selector and a pump fails, the stand-by pump will become the duty.

5.3 Mains Water By-Pass (Option)

If the panel is fitted with the Mains Water By-Pass option, the valve will remain energised (closed) whilst ever the pumping system is operating normally. If both pumps fail, this valve will be de-energised (open) and provide Mains Water to the system.

5.0 Warranty Statement

The Products manufactured by Inca Control Pty Ltd is guaranteed against faulty workmanship for a period of 12 months from the date of delivery.

Our obligation assumed under this guarantee is limited to the replacement of parts which, by our examination are proved to be defective & have not been misused, carelessly handled, defaced or damaged. This guarantee is VOID where the purchaser has modified or repairs have been made or attempted by anyone except an authorised representative of Inca Control Pty Ltd.

Products for attention under guarantee (unless otherwise agreed) must be returned to the factory freight paid and, if accepted for free repair, will be returned to the customers address in Australia free of charge.

Equipment supplied by Inca Control Pty Ltd, but manufactured by others is covered by their manufacturers warranty only.

When returning the product for service or repair, a full description of the fault must be given and the mode of operation used when the product failed

In addition to the above, equipment manufactured, installed & commissioned by Inca Control Pty Ltd, within the Sydney Metropolitan Area, includes onsite replacement.

In any event Inca Control Pty Ltd has no other obligation or liability beyond replacement or repair of this product.

NOTES: