

Resource
Data Management

Brooklands Case Controller

Commissioning/User Guide

Revision 2.2c



PR0029L-ACF

Contents

| | |
|---|----|
| Description | 3 |
| Addressing | 3 |
| Id | 3 |
| Parameter Settings | 3 |
| Valve Type Selection | 3 |
| Case Lights | 4 |
| On Line Status | 4 |
| Connections | 4 |
| Case Clean Switch | 4 |
| Default Parameter settings | 4 |
| Parameter Descriptions | 7 |
| Probe allocations | 9 |
| Fan Speed | 9 |
| CO2 App | 9 |
| Probe Type * | 9 |
| When used in conjunction with a Mercury switch (PR0018-PHI) | 9 |
| EEV Control using Pressure | 9 |
| Maximum Operating Pressure (MOP) | 9 |
| Servicing | 10 |
| Inputs and Outputs | 10 |
| Hardware Options | 11 |
| External Tray Features | 11 |
| Wiring Loom (PR0024) | 12 |
| Specification | 12 |



Please ensure all power is switched off before installing or maintaining this product.

Description

The RDM Brooklands control tray PR0029L-ACF is a control system. The tray is used in conjunction with the Brooklands wiring loom which connects to the tray using a 19 pole multiway connector. This loom connects to all the low voltage components in the cabinet, these being the temperature probes, refrigeration solenoid valve (24vdc), evaporator fans (24vdc) and a fan fail signal (volt free). There is a separate mains voltage connector which connects to the cabinet lights. Two versions of the Brooklands tray (PR0029-ACF & PR0037) have an additional mains connector for use with mains voltage evaporator fans.

The tray is designed to be used on sites utilising a standard refrigerant or CO2. The unit has a Solid State Relay (SSR) and through the in-built software the user can set the valve type for Mechanical Liquid Line Valve (LLV) or Electronic Expansion Valve (EEV) control. The PR0029L provides a varying low voltage output supply to control the evaporator fans. The PR0029L ACF and PR0037 provides a mains feed to control the evaporator fans, the PR0037 has the addition of a higher specification relay to drive LED lights. The RJ45 connector found at the rear of the tray is a serial RS232 port and must be connected to an appropriate communications module such as an IP Futura Module (PR0016) or Mercury switch (PR0018 or PR0018-PHI) or RS485 Legacy Module (PR0026). This allows communication with compatible front ends such as the RDM Data Manager or Data Director.

The RDM Brooklands tray PR0033 is fitted with an electro-mechanical relay to drive a LLV and the PR0033E has an SSR to operate an EEV. The PR0033/E series control tray is designed to be used only on IP networks only and must be connected to an appropriate IP communications module or Mercury Switch. The tray has the addition of a PWM (Pulse width modulated) output for controlling intelligent evaporator fans. The controller has a "CO2 App parameter" to allow them to be used in conjunction with an RDM Data Manager, Plant Pack Controller and CO2 Pump Station for load shedding on CO2 sites.

See RDM Data Manager user guides for more information on CO2 Load Shedding

Addressing

The controller will log onto the network when it is first powered up. You must set the address using the front accessed rotary switches prior to power up. If you change the location of a tray from one case section to another, you should change the rotary switches to the new address before powering up the tray in the new location.

NOTE: V1.3 software does not support Genus RS485 networking.

Id

To set the network id, use the front accessed rotary switches and set the address of your choice. Each device on the network must have a unique address number.

(Normally set to Bay/case number such as 103 = Bay10 case 3)

Parameter Settings

All parameter settings are modified using the RDM Data Manager front-end alarm panel, a service or install level password is required to alter any settings. Default settings are shown below

Valve Type Selection

The PR0029L & PR0037 Brooklands control tray has a parameter to set the valve type (EEV or TEV) via the front end if the controller software is version V2.0 or higher or V7.5 or higher. On earlier software versions, V6.9 or above, the valve type can only be changed using a PC connected to the controller. If the tray has V1.4 software then the valve type cannot be changed and is fixed as EEV only. The default factory setting is EEV.

The PR0033 Brooklands control tray can only be used with a thermostatic expansion valve (TEV).

The PR0033E Brooklands control tray can only be used with an electronic expansion valve (EEV).

On the PR0033/E range there is no user settable parameter to set valve type, this is fixed to the hardware type PR0033 or PR0033E.



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Case Lights

Timers either locally in the tray or remotely at the front end normally control the case lights automatically. If there are no timers set up from the front end or if there is no network connection, the lights default to on.

On Line Status

The case status indicator is used to display the network status: -

Alternate Red/Green: - logging on

Alternate Red/Green/Amber: - has address but not on-line

Fixed temperature band colour (Red, Green or Yellow): - online

Connections

There is **No** status indicator on this version of the Brooklands Tray. The RS232 serial port of the communications module plugs into the rear of the tray (RJ45 connector). All case wiring connects to the two flying leads at the back of the tray. (19 way and 3 way)

The power lead plugs into the rear of the case and is the **ONLY** method of isolation. The power lead must be removed before the lid is removed.

Case Clean Switch

THIS IS NOT AN ISOLATOR. The case clean switch will turn power off to all outgoing circuits and send signals to the front-end indicating the case has been manually switched to case clean mode. The controller will remain powered and will continue to communicate with the front end panel which will only generate an offline alarm if there is a genuine power failure or communications failure.

Default Parameter settings

| Parameter | Range | Step | Units | Default | PR0029L LLV | PR0029L EEV | PR0029L/37 LLV 230V ACF | PR0029L/37 EEV 230V ACF | PR0033 LLV | PR0033E EEV |
|--------------------|----------------------------|-------|-------|---------|----------------|----------------|-------------------------------|-------------------------------|---------------|----------------|
| Yellow Cycle temp. | -49.0 to 30.0 | 0.1 | Deg C | 2.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Red Cycle temp. | -49.0 to 30.0 | 0.1 | Deg C | 4.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Green Cycle temp. | -49.0 to 30.0 | 0.1 | Deg C | 8.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Cut-in diff. | 0.0 to 10.0 | 0.1 | Deg C | 1.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Control weight | 0 to 100 | 1 | % | 40 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Superheat Ref. | 4.0 to 12.0 | 0.1 | Deg C | 6.0 | | ✓ | ✓ | ✓ | | ✓ |
| EEV Prop. Gain | 0.0 to 100.0 | 0.1 | - | 2.2 | | ✓ | ✓ | ✓ | | ✓ |
| EEV Integ. Gain | 0.0 to 100.0 | 0.1 | - | 1.8 | | ✓ | ✓ | ✓ | | ✓ |
| EEV Integ. Time | 00:00 to 23:59 | 00:01 | mm:ss | 03:00 | | ✓ | ✓ | ✓ | | ✓ |
| Fan Speed | 0 to 5 | 1 | - | 3 | ✓ | ✓ | | | | |
| Temp. Band | Yellow/Red/Green / Ambient | - | - | Yellow | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Probe Type | PT1000/ NTC 3K | - | - | PT1000 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |



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| Parameter | Range | Step | Units | Default | PR0029L LLV | PR0029L EEV | PR0029L/37 LLV 230V ACF | PR0029L/37 EEV 230V ACF | PR0033 LLV | PR0033E EEV |
|------------------|---------------------------------|-------|-------|-----------|----------------|----------------|-------------------------------|-------------------------------|---------------|----------------|
| Evap Select | Local/ Remote | - | - | Local | | ✓ | ✓ | ✓ | | ✓ |
| Div Value | 0 to 100 | 1 | % | 50 | | ✓ | ✓ | ✓ | | ✓ |
| Ctrl Probe Type | Air Probe/ Logging | - | - | Air Probe | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PWM | 0 to 100 | 1 | % | 80 | | | | | ✓ | ✓ |
| Valve Type | EEV/LLV | 1 | - | EEV | ✓ | ✓ | ✓ | ✓ | | |
| Co2 App | Off Mode 1 Mode 2 | 1 | - | Off | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Alarm delay | 00:00 to 99:00 | 01:00 | mm:ss | 20:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Yellow UT Alarm | -49.0 to 60.0 | 0.1 | Deg C | -3.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Yellow OT Alarm | -49.0 to 60.0 | 0.1 | Deg C | 5.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Red UT Alarm | -49.0 to 60.0 | 0.1 | Deg C | -2.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Red OT Alarm | -49.0 to 60.0 | 0.1 | Deg C | 6.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Green UT Alarm | -49.0 to 60.0 | 0.1 | Deg C | 0.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Green OT Alarm | -49.0 to 60.0 | 0.1 | Deg C | 12.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Yel Prod UT Alm | -49.0 to 60.0 | 0.1 | Deg C | -1.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Yel Prod OT Alm | -49.0 to 60.0 | 0.1 | Deg C | 6.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Red Prod UT Alm | -49.0 to 60.0 | 0.1 | Deg C | 0.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Red Prod OT Alm | -49.0 to 60.0 | 0.1 | Deg C | 9.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Grn Prod UT Alm | -49.0 to 60.0 | 0.1 | Deg C | 4.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Grn Prod OT Alm | -49.0 to 60.0 | 0.1 | Deg C | 12.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Defrost Start | 00:00 to 23:50 | 00:01 | hh:mm | 01:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Defrost Number | 0 to 8 | 1 | - | 6 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| No Defrost Time | 0 to 25 | 1 | - | 8 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Def. term. temp. | -49.0 to 30.0 | 0.1 | Deg C | 8.0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Defrost min time | 00:00 to 99:00 | 01:00 | mm:ss | 15:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Defrost max time | 00:00 to 99:00 | 01:00 | mm:ss | 45:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Drain down time | 00:00 to 24:00 | 00:15 | mm:ss | 01:30 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Recovery time | 00:00 to 99:00 | 01:00 | mm:ss | 30:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Defrost Mode | Local/ Remote | - | - | Local | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Fans in Def | Off/On | - | - | On | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Lights Mode | Local/Remote/Man Off/ Man On | - | - | Local | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |



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| Parameter | Range | Step | Units | Default | PR0029L LLV | PR0029L EEV | PR0029L/37 LLV 230V ACF | PR0029L/37 EEV 230V ACF | PR0033 LLV | PR0033E EEV |
|----------------|----------------|-------|-------|---------|----------------|----------------|-------------------------------|-------------------------------|---------------|----------------|
| Sun Lights On | 00:00 to 23:59 | 00:01 | hh:mm | 08:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Sun Lights Off | 00:00 to 23:59 | 00:01 | hh:mm | 20:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mon Lights On | 00:00 to 23:59 | 00:01 | hh:mm | 08:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mon Lights Off | 00:00 to 23:59 | 00:01 | hh:mm | 20:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Tue Lights On | 00:00 to 23:59 | 00:01 | hh:mm | 08:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Tue Lights Off | 00:00 to 23:59 | 00:01 | hh:mm | 20:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Wed Lights On | 00:00 to 23:59 | 00:01 | hh:mm | 08:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Wed Lights Off | 00:00 to 23:59 | 00:01 | hh:mm | 20:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Thu Lights On | 00:00 to 23:59 | 00:01 | hh:mm | 08:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Thu Lights Off | 00:00 to 23:59 | 00:01 | hh:mm | 20:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Fri Lights On | 00:00 to 23:59 | 00:01 | hh:mm | 08:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Fri Lights Off | 00:00 to 23:59 | 00:01 | hh:mm | 20:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Sat Lights On | 00:00 to 23:59 | 00:01 | hh:mm | 08:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Sat Lights Off | 00:00 to 23:59 | 00:01 | hh:mm | 20:00 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |



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Parameter Descriptions

| Parameter | Description |
|--------------------|---|
| Yellow Cycle temp. | When the temperature band is set to yellow range (see Temp. Band Parameter Below) this will be the cut in temperature. |
| Red Cycle temp. | When the temperature band is set to red range (see Temp. Band Parameter Below) this will be the cut in temperature. |
| Green Cycle temp. | When the temperature band is set to green range (see Temp. Band Parameter Below) this will be the cut in temperature. |
| Cut-in diff. | This is the differential below cut in temperature where refrigeration will cut out. |
| Control weight | Percentage of the Air-On temperature that is used to calculate the control temp. The remaining percentage will be used on the Air-Off temperature. Example; P-03 set to 30% Control temp = 30% Air-on and 70% Air-off |
| Superheat Ref. | The controller will attempt to maintain this superheat value (EEV only) |
| EEV Prop. Gain | These are the parameters to fine tune the valve PID feedback control loop, these parameters should be left as default and only be changed in exceptional circumstances. |
| EEV Integ. Gain | |
| EEV Integ. Time | |
| Fan Speed | The fan speed output will run the fans depending on the voltage set at fan speed parameter (1 = 16Vdc. 2 = 18Vdc. 3 = 20Vdc. 4 = 22Vdc. 5 = 24Vdc. (PR0029 only)) The PWM output (PR0033 & PR0033E only) will run the evaporator fans at this pre-set percentage of full speed (PWM Parameter). PR0029L ACF and PR0037 trays have fixed speed mains fans. |
| Temp. Band | This selects the temperature band that the cabinet will run at, yellow, red, green or ambient, this is set according to the type of product in the cabinet. Temperature alarm settings will automatically change accordingly. |
| Probe Type | As standard the tray uses PT1000 temperature probes however NTC 3K probes can be used by setting this parameter to 1. Note that the log probe remains as a PT1000 |
| Evap Select | The superheat for EEV control can be calculated using different means to suit the application. Local - Based on the value of the Evaporator and Suction line temperature probe inputs connected directly to the controller. Rem1 - The local suction line temperature probe and a local suction pressure measured by a transducer connected to the refrigeration case island Mercury Hub (PR0018-PHI). The pressure read from the Mercury Hub pressure transducer is converted to a temperature based on the gas type being used by the system. This temperature is transmitted to all controllers connected to the Mercury Hub. Rem2/3 - Not used at present. |
| Div Value | This parameter is used in conjunction with a Mercury Switch pressure application (Evap. select set to Rem1). When the Mercury Switch generates the MOP (Maximum operating pressure) alarm the controller reduces the maximum valve opening to this percentage. For example if this parameter is set to 50% and the MOP alarm is generated then the maximum valve opening will be limited to 50%. Therefore as the controller pulses the valve the maximum the valve will open is 50%. |
| Ctrl Probe Type | Switches between using the air-on probe(s) and the Logging probe. Note the control temperature will still be a derivative of the weighted average of the control probe + Air-off probe(s) |
| PWM | Pulse Width Modulation, this applies only to trays with PWM controlled fans (PR0033 & PR0033E), this is the percentage of maximum speed the fans will run at. |
| Valve Type | Selects between mechanical liquid line valve (LLV) and electronic expansion valve (EEV) |
| Co2 App | When used in conjunction with a Data Manager load shedding system, this parameter selects how the valve and fans will operate if a load shedding signal is received from the Data Manager. Mode 1 – Evaporator fans off, valve open 100% on Load Cycling Mode 2 – Evaporator fans off, valve closed to 0% on Load Cycling |
| Alarm delay | Delay for the over and under-temperature alarms |
| Yellow UT Alarm | Under temperature alarm set point when set to yellow range. This alarm uses the control temperature. |
| Yellow OT Alarm | Over temperature alarm set point when set to yellow range. This alarm uses the air off temperature. |
| Red UT Alarm | Under temperature alarm set point when set to red range. This alarm uses the control temperature. |
| Red OT Alarm | Over temperature alarm set point when set to red range. This alarm uses the air off temperature. |
| Green UT Alarm | Under temperature alarm set point when set to green range. This alarm uses the control temperature. |



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| Parameter | Description |
|-------------------------|--|
| Green OT Alarm | Over temperature alarm set point when set to green range. This alarm uses the air off temperature |
| Yellow Product UT Alarm | Logging probe under temperature alarm set point when set to yellow range. |
| Yellow Product OT Alarm | Logging probe over temperature alarm set point when set to yellow range. |
| Red Product UT Alarm | Logging probe under temperature alarm set point when set to red range. |
| Red Product OT Alarm | Logging probe over temperature alarm set point when set to red range. |
| Green Product UT Alarm | Logging probe under temperature alarm set point when set to green range. |
| Green Product OT Alarm | Logging probe over temperature alarm set point when set to green range. |
| Defrost Start | When defrost mode is set to "Local", this is the start time for the 1 st defrost |
| Defrost Number | When defrost mode is set to "Local", this is the number of defrosts per day equally spaced from the start time. |
| No Defrost Time | If the controller misses a defrost command for any reason, a defrost will initiate after this time has elapsed from the last defrost. Normally set to 2 hours over the normal defrost period. |
| Def. term. temp. | The defrost will terminate when the temperature of the air off probe(s) reaches this value. |
| Defrost min time | Minimum time that a defrost will use. Defrost can't terminate until this time has elapsed. If termination temperature is reached during this period the controller will not continue the refrigeration cycle until the end of the defrost min period. |
| Defrost max time | Time period after defrost minimum that defrosts are allowed to terminate. |
| Drain down time | A period after defrost period to allow the draining of any surplus water. |
| Recovery time | The valve is switched on at the start of this period to allow the temperature to recover to the normal operating point. This period also inhibits the OT alarm. Note that if the air-off temperature is still above the OT alarm setpoint when this period expires, an immediate OT alarm occurs; there is not a further alarm delay. |
| Defrost Mode | Allows the user to set the defrost mode: - Local: Uses the internal parameters (see above) Remote: Requires a defrost schedule in the front end. |
| Fans in Def | Allows the fans to run during defrost or not. |
| Lights Mode | Allows the user to set the lights mode: - Always off Always on Use a local schedule (see below) Use a remote schedule (Set up in the system front end) |
| Sun Lights On | When lights mode set to Local, Sunday On Time. |
| Sun Lights Off | When lights mode set to Local, Sunday Off Time. |
| Mon Lights On | When lights mode set to Local, Monday On Time. |
| Mon Lights Off | When lights mode set to Local, Monday Off Time. |
| Tue Lights On | When lights mode set to Local, Tuesday On Time. |
| Tue Lights Off | When lights mode set to Local, Tuesday Off Time |
| Wed Lights On | When lights mode set to Local, Wednesday On Time. |
| Wed Lights Off | When lights mode set to Local, Wednesday Off Time |
| Thu Lights On | When lights mode set to Local, Thursday On Time. |
| Thu Lights Off | When lights mode set to Local, Thursday Off Time. |
| Fri Lights On | When lights mode set to Local, Friday On Time. |
| Fri Lights Off | When lights mode set to Local, Friday Off Time. |
| Sat Lights On | When lights mode set to Local, Saturday On Time. |
| Sat Lights Off | When lights mode set to Local, Saturday Off Time. |



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Probe allocations

| | |
|-----------------------|---------------------------|
| Probe 1 Air on left | Probe 5 Product probe |
| Probe 2 Air off left | Probe 6 Evaporator inlet |
| Probe 3 Air on right | Probe 7 Evaporator outlet |
| Probe 4 Air off right | |

Fan Speed

The fan speed output will run the fans depending on the voltage set at fan speed parameter (1 = 16Vdc. 2 = 18Vdc. 3 = 20Vdc. 4 = 22Vdc. 5 = 24Vdc. (PR0029 only))

The PWM output (PR0033 & PR0033E only) will run the evaporator fans at this pre-set percentage of full speed (PWM Parameter).

Before Adjusting the fan speed parameters firstly determine the fan type fitted to the case.

PR0029L ACF and PR0037 trays have fixed speed mains fans.

CO2 App

Needs to be set to Mode 1 or Mode 2 when using CO2 Load Cycling

Mode 1 – Evaporator fans off, valve open 100% on Load Cycling.

Mode 2 - Evaporator fans off, valve closed 0% on Load Cycling.

Probe Type *

NTC 3K Probes can be used by setting this parameter to 1.

Note that the log probe remains as a PT1000

When used in conjunction with a Mercury switch (PR0018-PHI)

EEV Control using Pressure

The Mercury Switch (PR0018-PHI) can be used for EEV control on an island by island basis. In an EEV application the evaporator in temperature probe reading for a case controller can be obtained from the Mercury switch on which the controller is connected. A suction pressure transducer is connected from the case Island to the 4-20mA input of the Mercury Switch and the pressure read from this transducer is converted to a temperature based on the gas type being used by the system. This temperature is transmitted to each controller (Rem Evap Temp) connected to the switch and along with the suction temperature probe local to the controller the superheat is calculated. Please note that RDM recommended that the evaporator in temperature probe is fitted as the controller will use this to calculate the superheat in the event of a communication loss with the Mercury Switch. Setting parameter "Evap Select" to "Remote" allows for the use of this remote temperature provided by the Mercury Switch. Please see the Mercury Switch user document (PR0018-PHI) for further details.

Maximum Operating Pressure (MOP)

Maximum Operating Pressure (MOP) support added to Brooklands Controller. MOP is a remote command sent from the Mercury switch (PR0018-PHI) to the controller to either close or reduce the EEV valve opening when a predetermined pressure is reached. This MOP value is configured in the Mercury switch setup. When the Mercury Switch generates a MOP alarm the controller reduces the maximum valve opening (Div Value) to this percentage. For example if the "Div Value" parameter is set to 50% and the MOP alarm is generated then the maximum valve opening will be limited to 50%. Therefore as the controller pulses the valve the maximum the valve will open to is 50%. For Mechanical Valve Controllers the LLV is closed for the MOP alarm duration.



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Servicing

There are no serviceable parts. The only parts that are replaceable on this tray are the front panel mounted fuses. If replacement fuses are required they must match the original size.

Fuses: HRC conforming to IEC60127 (32 x 6.3mm)

Fans (F1) 3.15A (T)

Lights (F2) 3.15A (T)

Controller (F3) 0.25A (F)

Valve (F4) 0.25A (T)

Fuse rating may vary depending on the age of the tray so please check with the controller label for tray you are using.

Inputs and Outputs

| Inputs | Range | Step | Units | PR0029L LLV | PR0029L EEV | PR0029L/37 LLV 230V ACF | PR0029L/37 EEV 230V ACF | PR0033 LLV | PR033E EEV |
|----------------------|---|-------|-------|-------------|-------------|----------------------------|----------------------------|------------|------------|
| Control temp. | -49.0 to 60.0 | 0.1 | Deg C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Air on temp. | -49.0 to 60.0 | 0.1 | Deg C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Air off temp. | -49.0 to 60.0 | 0.1 | Deg C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Air on Left | -49.0 to 60.0 | 0.1 | Deg C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Air off Left | -49.0 to 60.0 | 0.1 | Deg C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Air on Right | -49.0 to 60.0 | 0.1 | Deg C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Air off Right | -49.0 to 60.0 | 0.1 | Deg C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Product Probe | -49.0 to 60.0 | 0.1 | Deg C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Evaporator Probe | -49.0 to 60.0 | 0.1 | Deg C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Suc. Line Probe | -49.0 to 60.0 | 0.1 | Deg C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Fan Fail | Alm/Ok | - | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Superheat | -49.0 to 60.0 | 0.1 | Deg C | | ✓ | | ✓ | | ✓ |
| Rem Evap Temp. | -49.0 to 60.0 | 0.1 | Deg C | | ✓ | | ✓ | | ✓ |
| MOP | Off/On | - | - | | ✓ | | ✓ | | ✓ |
| CO2 | Off/On | - | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| EEV Opening | 0 to 100 | 0.1 | % | | ✓ | | ✓ | | ✓ |
| LLV | Closed/ Open | - | - | ✓ | | ✓ | | ✓ | |
| Trim Heater | Off/On | - | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Case Fans | Off/On | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Lights | Off/On | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PWM | 0 to 100 | 1 | % | | | | | ✓ | ✓ |
| Last Def. Time | 00:00 to 23:59 | 00:01 | hh:mm | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Last Def. Length | 00:00 to 03:00 | 00:01 | hh:mm | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Last Def. Ctrl Temp. | -49.0 to 60.0 | 0.1 | Deg C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Last Def. Type | None/ Internal/ External/ Network/ Timed/ Forced | - | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

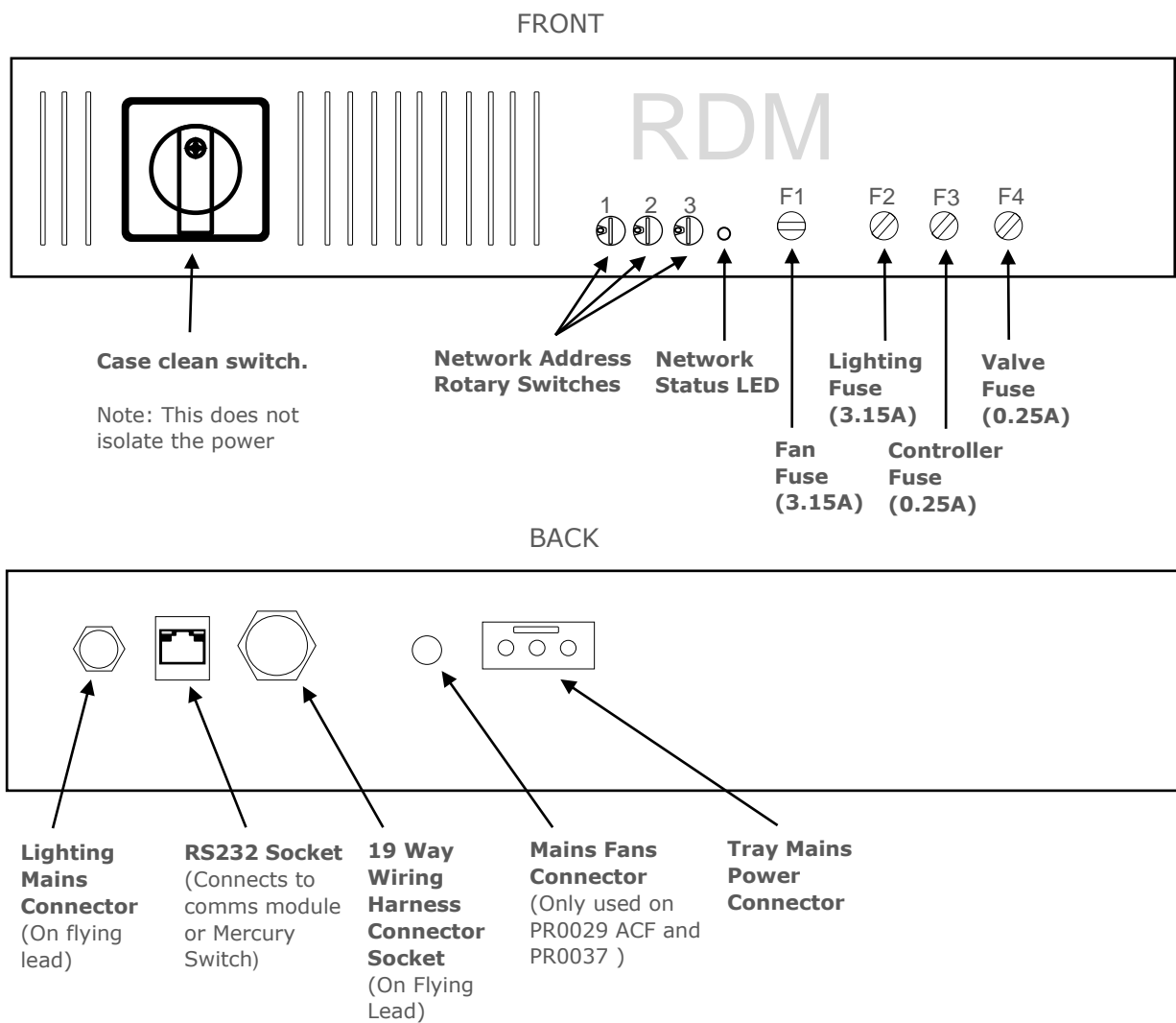


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Hardware Options

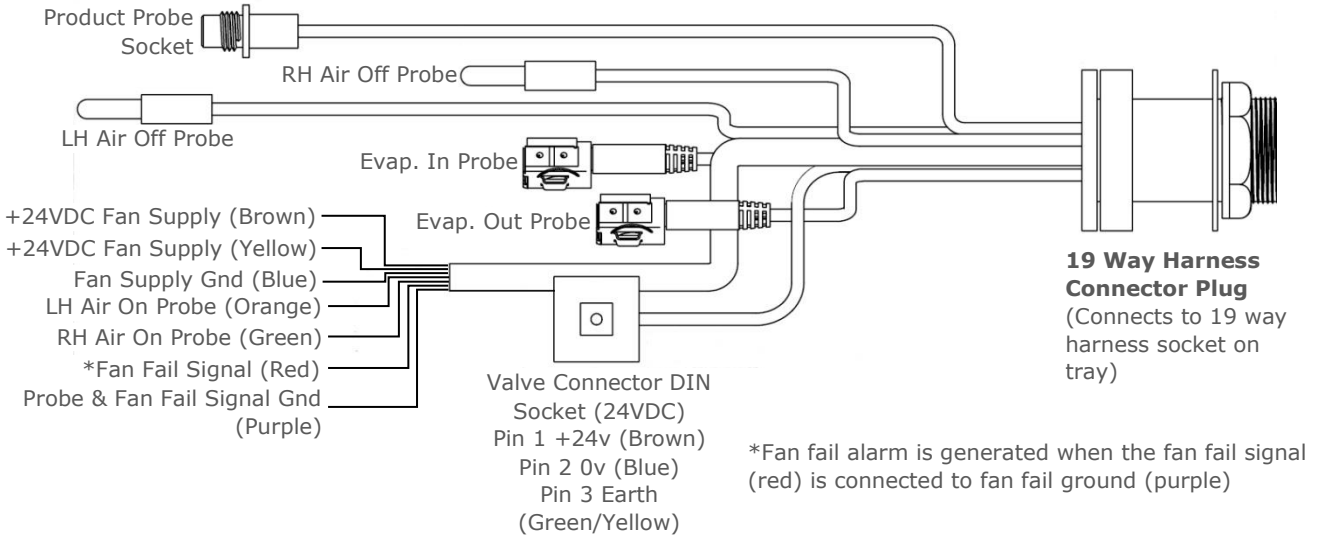
| Part Number | EEV Control | LLV Control | PWM Fans | 230VAC Fans | LED Lighting |
|-------------|-------------|-------------|----------|-------------|--------------|
| PR0029L | ✓ | ✓ | X | X | X |
| PR0029L ACF | ✓ | ✓ | X | ✓ | X |
| PR0033 | X | ✓ | ✓ | X | X |
| PR0033E | ✓ | X | ✓ | X | X |
| PR0037 | ✓ | ✓ | X | ✓ | ✓ |

External Tray Features



Please ensure all power is switched off before installing or maintaining this product.

Wiring Loom (PR0024)



Specification

| PR0029L ACF Brooklands Case Controller | |
|---|--|
| Supply Voltage Range | 240 Vac ±10% |
| Supply Frequency | 50Hz |
| Typical supply current (Excluding relay load) | <1 Amp |
| General | |
| Operating temperature range | +5°C to +50°C |
| Storage temperature range | -20°C to +65°C |
| Environmental | Indoor use at altitudes up to 2000m, pollution degree 2, installation category II. Voltage fluctuations not to exceed ±10% of nominal voltage. |
| Size | 188mm (W) x 78.5mm (H) x 648mm (D) |
| Approx. Weight | 4.13kg |
| Safety | EN61010-1: 2010 |
| EMC | EN61326:2013 |
| Ventilation | There is no requirement for forced cooling ventilation |
| Class 2 Insulation | No protective Earth is required and none should be fitted. Earth connection is functional only. |
| Connections | Relay and probe: RDM wiring harness PR0024 Power: 3 pin GST18 Lights: 3 pin M12 |



Please ensure all power is switched off before installing or maintaining this product.

| | |
|---|---|
| | 240V Fans: 2 pin M12 RS232: RJ45 |
| Relay Specification | |
| Relay 1, EEV, Solid State (PR0029L, 29L-ACF, 33E, 37) | |
| Output Current Rating | 3A max, 20mA min |
| Output Voltage Rating | 24-240 VAC |
| | Note: Valve supply and return are limited by internal 24Vac 12VA transformer |
| Relay 1, Valve, Mechanical (PR0033E) | |
| Contact Type | SPDT |
| Contact Rating | 10A @ 250Vac (30Vdc) Resistive (CosΦ = 1) 7.5A Inductive (CosΦ = 0.4) |
| | Note: Valve supply and return are limited by internal 24Vac 12VA transformer |
| Relay 2, Lights, Standard (PR0029L, 29L-ACF, 33, 33E) | |
| Contact Type | SPDT |
| Contact Rating | 10A @ 250Vac (30Vdc) Resistive (CosΦ = 1) 7.5A Inductive (CosΦ = 0.4) Peak inrush current (20ms): 20A |
| Fuse | 3.15A, 1500V Breaking Capacity, Type T |
| | NOTE: The lights output is protected by a 3.15A fuse so the lights cannot draw any more than this under normal running. |
| Relay 2, Lights, High Inrush (PR0037) | |
| Contact Type | N/O |
| Contact Rating | 16A @ 250Vac Resistive (CosΦ = 1) Peak inrush current (20ms): 80A |
| Fuse | 3.15A, 1500V Breaking Capacity, Type T |
| | NOTE: The lights output is protected by a 3.15A fuse so the lights cannot draw any more than this under normal running. |
| Relay 3, Fans | |
| Contact Type | SPDT |
| Contact Rating | 10A @ 250Vac (30Vdc) Resistive (CosΦ = 1) 7.5A Inductive (CosΦ = 0.4) |
| Fuse | 3.15A, 1500V Breaking Capacity, Type T |
| Inputs | |
| Probe Input resistance | 3.01K Ohms |
| Probe Input type | PT1000 |



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