



HVAC Cascade Option Module

USER GUIDE



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DECLARATION

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The manufacturer accepts no liability for any consequences resulting from inappropriate, negligent or incorrect installation.

The contents of this User Guide are believed to be correct at the time of printing. In the interests of a commitment to a policy of continuous improvement, the manufacturer reserves the right to change the specification of the product or its performance or the contents of the User Guide without notice.

SAFETY

This option is specifically designed to be used with the HVAC variable speed drive product and is intended for professional incorporation into complete equipment or systems. If installed incorrectly it may present a safety hazard. The HVAC drive uses high voltages and currents, carries a high level of stored electrical energy, and is used to control mechanical plant that may cause injury. Close attention is required to system design and electrical installation to avoid hazards in either normal operation or in the event of equipment malfunction.

Please read the SAFETY NOTICE carefully, and all Warning and Caution boxes elsewhere.

WARRANTY

All Bardac Drives products carry a 2-year warranty, valid from the date of manufacture. Complete warranty info available online.

SAFETY NOTICES

WARNING is given where there is a hazard that could lead to injury or death of personnel.

CAUTION is given where there is a hazard that could lead to damage to equipment.

It is the responsibility of the installer to ensure that the equipment or system into which the product is incorporated complies with the EMC legislation of the country of use. Within the European Union, equipment into which this product is incorporated must comply with 89/336/EEC, Electromagnetic Compatibility.

WARNING Within the European Union, all machinery in which this product is used must comply with the Directive 89/392/EEC, Safety of Machinery. In particular, the equipment should comply with EN60204-1.

CAUTION

- Store the option module in its box until required. It should be stored in a clean and dry environment. Temperature range -40°F to +140°F.
- Install the option module into the drive by inserting the module into the option module port, as shown in the mechanical installation section. Do not use undue force in inserting the option module into the port.

WARNING

- Drives and the option module should be installed only by qualified electrical persons and in accordance with local and national regulations and codes of practice.
- **Electric shock hazard!** Disconnect and ISOLATE the drive before attempting any work on it. High voltages are present at the terminals and within the drive for up to 10 minutes after disconnection of the electrical supply.
- Where the electrical supply to the drive is through a plug and socket connector, do not disconnect until 10 minutes have elapsed after turning off the supply.

SPECIFICATIONS

Model Number:	T2-CASCD-IN
Compatibility:	V3 Series (HVAC) P2 Series* <i>*limited functionality</i>
Max Relay Switching Voltage:	250V AC / 30V DC
Max Relay Switching Current:	6A (250V AC) / 5A (30V DC)
Environmental:	14°F ... +122°F
Conformity:	IP20, UL94V-0
Terminal Torque:	0.5Nm (4.5 lb-in)

STANDARDS CONFORMITY

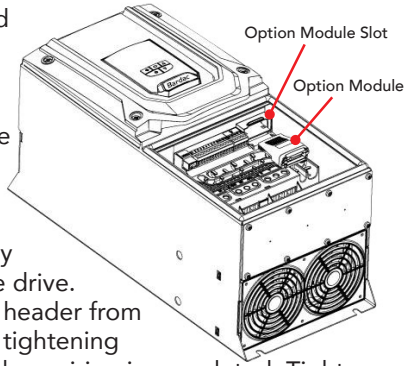
A drive fitted with this option module complies with the following standards:

- CE-marked for Low Voltage Directive.
- IEC 664-1 Insulation Coordination within Low Voltage Systems.
- UL 840 Insulation Coordination for electrical equipment.
- EN50081-2 EMC Generic Emissions Standard, Industrial Level.
- EN50082-2 EMC Generic Immunity Standard, Industrial Level.
- Enclosure ingress protection, EN60529 IP00, NEMA 250.
- Flammability rating according to UL 94.



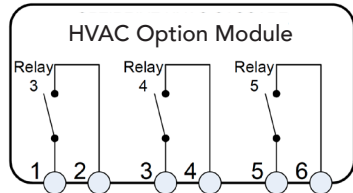
MECHANICAL INSTALLATION

- Option module inserted into drive option module port.
- DO NOT use excessive force when inserting the option module into the options port.
- Ensure the expansion module is fitted securely before powering on the drive.
- Remove terminal block header from option module prior to tightening connections. Replace when wiring is completed. Tighten to Torque setting provided in Specifications.



OPTION MODULE CONTROL TERMINALS

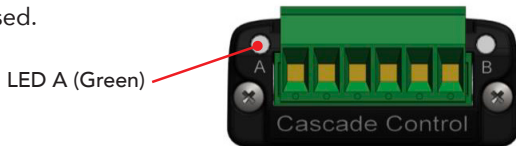
- | Pin | Function |
|-----|-----------------|
| 1 | Relay 3 Common |
| 2 | Relay 3 Contact |
| 3 | Relay 4 Common |
| 4 | Relay 4 Contact |
| 5 | Relay 5 Common |
| 6 | Relay 5 Contact |



LED STATUS INDICATION

The cascade module has a Status LED – LED A (Green).

- LED A: Constant Green Indication - Modular is OK
 - LED A: Flashing Green Indication – No Communication with drive
 - LED A: LED Off Indication – No power to module
- LED B is not used.



V3 SERIES HVAC DEFAULT OPERATION

The additional relays will assume default configuration while the DOL cascade function is disabled. Default (none cascade) functions are listed in the table below) Once the DOL cascade function is enabled (P8-14 = 1) the relays will assume DOL operation as detailed in the 'V3 HVAC cascade operation' section of this manual.

Default Operation (DOL Cascade disabled, P8-14=0)

Relay 3	Drive Healthy Indication (close on Healthy)
Relay 4	Drive Fault Indication (close on fault)
Relay 5	Drive Running Indication (close on enable)

V3 HVAC CASCADE RELAY CONFIGURATION SUMMARY

P8-14	P9-41	Function Selected
0	0	Default Operation
1	0	Cascade Operation
N/A	1	PLC Logic Defined Operation

CONNECTION OF THE CASCADE MODULE TO P2 SERIES

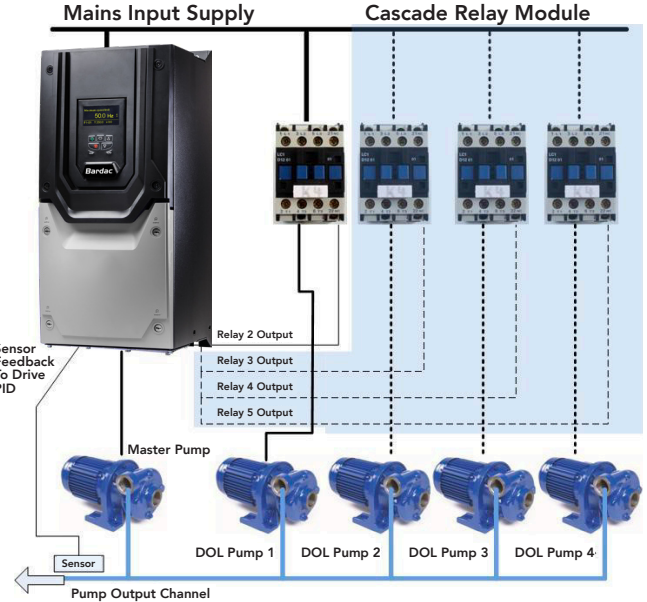
The HVAC Cascade Expansion module can be used with a P2 Series model drive. For P2 Series operation, the default or PLC defined functionality is available, but there is no option to implement Cascade control. The table below shows relay configuration summary when the module is connected to P2 Series drive.

P9-41	Function Selected
0	Default Operation
1	PLC Logic Defined Operation

Default operation is identical to the V3 Series default operation.

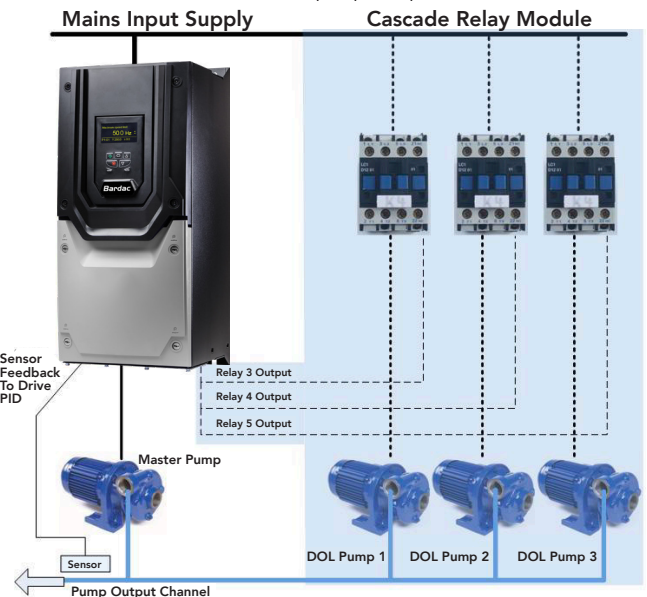
V3 SERIES HVAC CASCADE OPERATION

The V3 Series HVAC DOL Cascade control uses a maximum of three relays from the cascade option module and the 2nd user relay from the standard drive terminals, giving the potential for 4 separate pumps under DOL control. The cascade option module is required if the system requires more than 1 DOL pump or when the 2nd user relay on the drive is required for another function. The basic configuration for the drive and DOL pumps is shown below.



In this configuration the 2nd drive relay is used to control the first DOL pump with the cascade module controlling the remaining DOL pumps. In this configuration P2-18 must be set to 8 to configure the 2nd drive relay for DOL pump control. P8-14 must be set to enable the DOL cascade function and P8-15 must be set with the number of pumps that make up the cascade system (from 1 to 4). The relays in the cascade module are assigned automatically starting with the lowest numbered relay.

If the 2nd relay is not assigned to DOL control then the configuration is as shown below and a maximum of 3 DOL pumps are permitted.



For this configuration, only parameters P8-14 and P8-15 need be set and the relays in the cascade module are assigned automatically starting with the lowest numbered relay. When cascade mode is enabled (P8-14 = 1), the relays contained on the cascade option module are dedicated to the cascade function.