DV1
VAV Controller

D-Series Controls
PurpleSwift Software cc
Tel / Fax: +27 21 761 8264
Email: controls@purpleswift.com

The **DV1** is a full featured VAV controller. It operates in the slave master configuration and will drive up to 6 slave units. The DV1 will operate "stand alone" or as an integral part of a building management system (BMS). The control parameters, such as damper stroke time, can be set by the BMS and are stored in non volatile memory (EEPROM) to prevent them from being lost when the power is removed. All connections to the DV1 are by means of plug-in connectors which provides for quick, convenient installation, commissioning and maintenance.

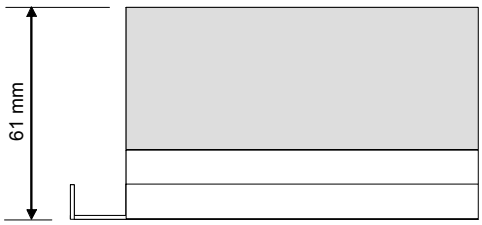
Features

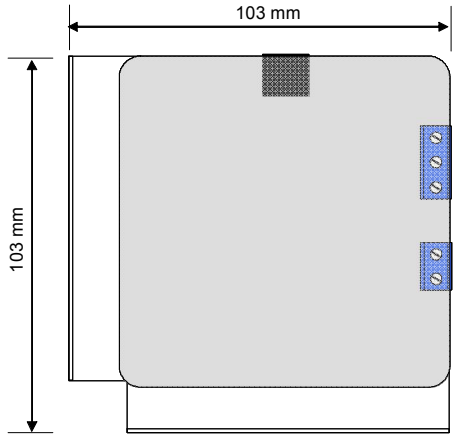
- PI control
- 3 point damper motor control output (24 VAC)
- Pulse proportional heater control signal (12 VAC for current valve)
- BMS communications support (Siemens Building Technologies System 600 compatible)
- Automatic "reversing" using second temperature sensor (supply air rescheduling)
- External "dial" setpoint input
- Load shedding function for maximum demand limiting
- Convenient plug-in connection system

Technical Data

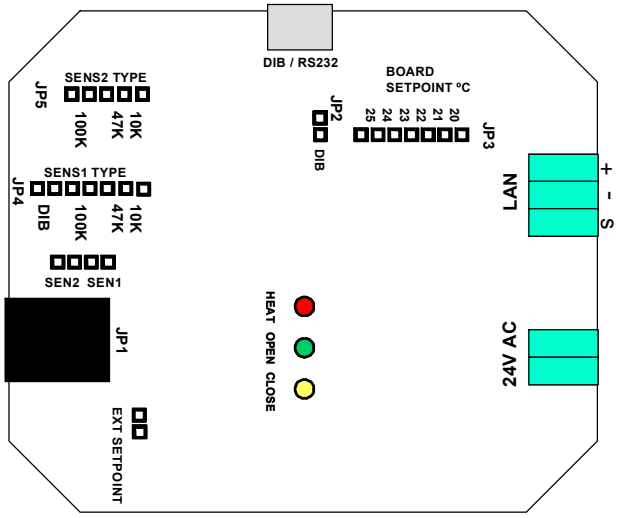
- Operating voltage 24 VAC, 3 VA + load
- Sensing elements - NTC thermistors 10k, 47k or 100k
- Temperature range -10 to 50ºC, 0.25ºC Resolution
- External setpoint
- Potentiometer 10k linear
- Temperature range 18 to 25ºC
- Onboard setpoint jumper 20 to 25ºC, 1ºC Steps
- 3 Position damper motor control output 24 VAC, 24 VA
- Pulse proportional heater control output 12 VAC, 1.7 VA
- 3 Position damper motor stroke period
- 50 Step mode 0.04 to 10 Secs, 0.04 Sec Steps
- 200 Step mode 1 to 255 Secs, 1 Sec Steps
- Pulse proportional heater control period 0.04 to 10 Secs, 0.04 Sec Steps
- Dead zone 0 to 50ºC, 0.25ºC Steps

Dimensions





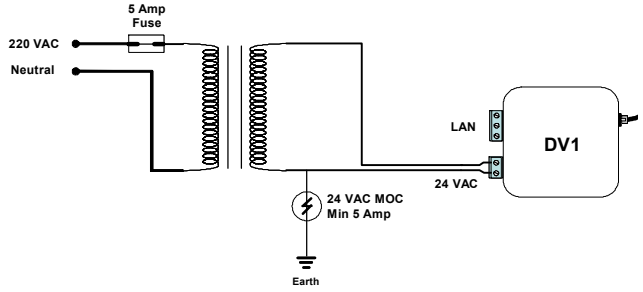
Connections



Earth Connections

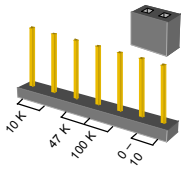
Note that the D-Series controllers are earthed through the LAN and due to the design the AC inputs will be forced to +12 VDC above the building earth. If either of the AC inputs were to be earthed, the controllers would be irreparably damaged.

To provide a safety, in the case where the 220 VAC shorts through to the transformer secondary circuit, place a 24 VAC MOV between the secondary and the building earth. This MOV will allow the secondary to float at +12 VDC but will earth any mains voltage allowing the supply safety to trip. The MOV must have a higher current rating that the supply safety device (Fuse or circuit breaker).

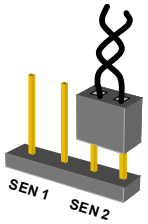


Controller Setup

The controllers must each be programmed with an address for BMS operation. The configuration program can be run from any IBM or compatible PC. The controller is connected to the PC serial port by means of the PC configuration cable.



The sensor type jumper must be set to the type of NTC thermostat that is used. There are 2 sensor type jumper selectors, one for the room temperature sensor and the other for the supply temperature sensor.



The actual sensors can be connected to the pins labeled SENS1 and SENS2. SENS1 is the room temperature while SENS2 is the supply temperature sensor.

If the external setpoint is used then it must be enabled from the configuration program. Similarly if the on-board setpoint jumper is required then it must be enabled from the configuration program.

All settings except the device address can be changed from the BMS. If the BMS is provided with a modem dial-in facility (recommended) then the DV1 controller settings can be changed from a remote site.

DV1 Points List (BMS)

Point	Description	Units	ON/OFF	Slope	Intercept	Type
1	ROOM TEMP	DEG C		0.25	-10	LAI
2	SUPPLY TEMP	DEG C		0.25	-10	LAI
3	SETPOINT	DEG C		0.25	-10	LAO
4	SETPNT DIAL	DEG C		0.25	-10	LAI
5	COOLING	PCT		0.5	0	LAI
6	HEATING	PCT		0.5	0	LAI
7	MIN POS	PCT		0.5	0	LAO
8	CONFIGURE	BITS		1	0	LAO
9	DEAD ZONE	DEG C		0.25	0	LAO
10	PULSE PERIOD	SECS		0.0417	0	LAO
11a	3 POINT TRAVEL	SECS		0.0417	0	LAO
11b	3 POINT TRAVEL	SECS		1	0	LAO
29	DAY.NGT		ON.OFF	1	0	LDO
30	HEAT DISABLE		ON.OFF	1	0	LDO
31	REVERSIN		ON.OFF	1	0	LDI

DV1 Configure Bits

The configure bits point (number 8) on the BAS system can be used to configure the DV1 controller once it is communicating on the LAN. These are the user changeable settings such as reversing disable.

This number represents 7 separate settings and to calculate the required number for the DV1 setup simply add the equivalent value from the table listed below.

Bit	Description	Value	Comment
0	Day (ON)	0	Use DAY command
0	Night (OFF)	1	Use NIGHT command
1	Use reversing	0	Use with second sensor
1	No reversing	2	
2 & 3	Cooling pulsed output (PWM)	0	
2 & 3	Cooling 1 Step (ON / OFF)	4	
2 & 3	Cooling valve	8	Same as damper but no min
2 & 3	Cooling damper	12	Usual setting
4	Current valve heating	0	Usual setting
4	Contactor heating	16	10 minute cycle (PWM)
5	Cooling [1 to 255] secs	0	
5	Cooling [0.04 to 10.2] secs	32	For very fast acting motors
6	Ignore PCB jumper setpoint	0	
6	Use PCB jumper setpoint	64	
7	Use EXT setpoint	0	
7	Ignore Ext setpoint	128	

Note: Refer to the D-Slave VAV Slave Unit documentation for more information on using the DV1 VAV Controller with D- Slaves.