Dicam Installation : Setting up fans

Fan speed control basically works straight from the box, but correct set up and post-installation checks are **essential** for reliable control.

|1| **Select connection** and channel type

|2| **Select phase** of fan control circuit

|3| **Calibrate** controller to fan response

|4| **Set Minimum** Speed

|5| **Write it down !**

|6| **Check DC** component.

1   Select connection

Connect fans either 2 wire or 3 wire (see over). Generally 1st stage fans should be 3 wire, and other stages (or on-off) should be 2 wire. But some fans can only be connected one or the other - check with your fan supplier if not sure.

Select channel type accordingly as a starting point for calibration. See also [FAN-HIPF].

2   Select Phase

```
CONFIG :
I/O Config : Output Channels : Types

    CH      TYPE              PHASE
    1       FAN-WR               0

                      0 = same phase
                      1 = another phase
       O u t p u t    2 = the other phase
       C h a n n e l  * = 3 phase
       Type             (read manual)
```

If you are sure the fan is on the same phase as the master unit, leave PHASE = 0. If you're not sure then follow these steps -

|1| Connect a lamp in place of the fan.

|2| Using Test Menu, set output to 100% and check lamp goes on full.

|3| Set to 0% and see it goes off.

|4| Set it to 20% and see that lamp is dim. If it does, phase selection is correct. Go to [5].

If it goes on full, phase setting is wrong. Config : Set to Phase 1 or (next time) to 2. Go to [2].

If you can't find the right phase setting, something else is incorrectly set, or you're doing the test wrong.

|5| Having found the right phase, write it down, connect fan and calibrate.

3   Calibrate

```
CONFIG
I/O Config : Output Channels : Setup

    CH      MIN     10%     90%
    1       10      25      112

    Engineers
    p r e s e t   10%           90%
    minimum       fan factor    fan factor
```

With calibration, fan control is reliable and predictable. Without calibration, fans could overheat and fan speeds are less predictable.

Calibration is determined by the 90% and 10% fan factors. For other speeds, it calculates using these values. The factors are entirely its own - they don't correspond to any other readings such as phase angle or voltage, etc.

The Toolkit program has an automated calibration function using a speed sensor. If you don't have them, follow these instructions.

|1| In the user menu, use Test - Outputs. Set the channel to 100% and tet it run up to full speed.

|2| Set it to 90%.
There should be a noticeable but not huge drop in speed (i.e. it should have slowed to 90%).
 If there is, the 90% factor is Ok.
 If there is little or no drop in speed, the 90% fan factor is too high.
 If there is a large drop in speed, the 90% fan factor is too low.

|3| Set it to 10%
Let it settle and estimate by eye. At 10%, generally blades are a little quicker than you can see.
If so, the 10% factor is Ok.
 If it's stopped or running very slowly, the 10% factor is too low.
 If running too fast, the 10% factor is too high.

|5| Restart and go to Config.

If 90% was too high, reduce it by 10 - e.g. from 112 to 102.
 If 90% was too low, increase it by 10.
If 10% was too high, reduce it by 10
 If 10% was too low, increase it by 10

[6]   Restart and go to user menu - Test.
Go back to [3].

Repeat this procedure, adjusting fan factors a little at a time until you have the right settings.

[7]   When you've found the right numbers, write them down!

You can use these numbers for the same fans being controlled the same way, but you must repeat this procedure for each type/size/make.

4   Set Minimum

The `engineers preset' min speed prevents setting too low a speed at the the user level. Please see also Min Vent in user manual.

The **installer** should set Min Speed in Configuration, the **user** should set Min Vent.

Leave 1st stage fans set to 10%. Set 2nd stage to 25% or more, set 3rd stage to 35% or more, as they have to compete with higher initial pressure.

5   Write it down !

Whenever you alter set up, write changes on the Config Default sheet (supplied with the controller) and keep with unit. This is invaluable if replacing hardware or upgrading program chips.

6   Check DC Component

Asymmetric mains leads to overheating and premature motor failure.

Check **every** fan which is being speed controlled, **whenever** a fan or driver is connected or replaced.

[1]   Using Test, Set fan to 25%.

[2]   Using a digital meter set to read DC, measure N to Lv at driver. Reading should be less than 4Vdc.

If the reading is high, the problem is likely to be a) the way your meter works (check it on mains); b) damaged driver card; c) high interference from master to driver.

Notes

Rewriting Channel Types
Warning - selecting a channel (under Channel Types reloads default values even if you make no no change. Always check Setup afterwards.

FAN-3WR and FAN-2WR
The **only** difference between FAN-2WR and FAN-3WR channel types is the default fan factor values. If you select FAN-3WR and set it to the same fan factors as FAN-2WR, it becomes the same!

Fans connected 2 wire need a bigger slice of the mains to produce a particular speed - because they don't have the continuous feed on the capacitor winding - so the 2WR fan factors are higher than the 3WR.

Default values			
TYPE	*MIN*	*10%*	*90%*
FAN-3WR	*10*	*25*	*112*
FAN-2WR	*10*	*32*	*131*

But note - these are **starting points** for calibration, they don't avoid need for calibration.

FAN-HIPF
Some fans have such a high power factor shift that they can get `stuck' at high speed (once they've been run up to full speed), even though the controller is reducing the amount of drive.

Changing from 3 wire to 2 wire connection may produce a solution, but FAN-HIPF may be needed.

FAN-HIPF has a special characteristic - to slow the fans down, it switches the output off for 3 seconds before giving an output at a lower level.

Here's a simple check, if you think FAN-HIPF may be needed -

[1]   Using Test, set it to 100% and let it run to full speed. Note brightness of channel LED on the apps board. Then set it 10%.

[2]   If the apps board LED dims but the fan stays on full speed, you may need FAN-HIPF. (If the LED doesn't dim, you have a set up fault.)

[3]   To confirm it, unplug the output channel connector for 3 seconds and plug it in again.
If the fan slows down now, then use FAN- HIPF.

Default values			
TYPE	MIN	10%	90%
FAN-HIPF	10	25	112

Further Advice
If you need further advice or help on speed control, please call Farmex on 0118 986 7252.