

ADVANCED QUICK START INSTRUCTION SHEET

The Main Menu allows access to all of the drive parameters. Below is a short list of advanced pumping functions commonly used in irrigation applications.

LOW POWER DETECTION

The drive has the ability to calculate the no-flow power at any operational speed. This allows for an alternative sleep mode (low speed/low power) for pumps with flat performance curves and/or varying suction head. It also allows for dry pump protection (high speed/low power). In order to use low power detection, the relationship between power & speed can be entered automatically by running Low Power Auto Setup in Par. 22-20 & following the prompts. When finished, accept the results and choose from these options:

- 22-23:** No Flow Function: Select "Sleep Mode" if you want the pump to wake up on pressure drop, or "Stop & Trip" if you would like the pump to stay off. Stop & trip requires a manual reset at the drive.
- 22-24:** No Flow Delay: Sets the time that the power of the pump must be below its calculated value before the drive goes to "Sleep".
- 22-26:** Dry Pump Function: Select "Manual Reset Trip" to protect the pump when it runs out of water. This protection requires manual reset at the drive.

- 22-27:** Dry Pump Delay: Sets the time that the power must be below its calculated value before the drive shuts down.
- 22-44:** Wake-up Ref./FB Difference: Enter the pressure drop, as a % of set-point, that you want the drive to "Wake-up" at.
- 22-45:** Set-point Boost: This will boost the pressure in the system by the % of set-point pressure before the pump goes to "Sleep" to extend the off time of the pump.

Upon testing if the drive fails to execute the No Flow Function in Par. 22-23, or if it does so prematurely, the No Flow Power Detection can be fine-tuned using the following parameters:

- 22-31:** Power Correction Factor: This value adjusts the calculated value in Par.
- 22-30:** If No Flow is not detected, this value should be raised above 100%. If No Flow is detected prematurely, this value should be lowered below 100%.

CAUTION

Before running the Low Power Auto Setup, verify that devices between the shutoff valve & pump (piping, valves, pressure tank, gauge, transducer, etc.) can tolerate 85% of the shut off head generated by the pump taking into account its suction head.

END OF CURVE (BROKEN PIPE) FUNCTION

The End of Curve condition occurs when the pump cannot maintain a feedback pressure within 97.5% of its set-point when running at its maximum speed, as defined by Par 4-14. To enable end of curve protection, set these parameters:

- 22-50:** End of Pump Curve Function: Select "Manual Reset Trip" to stop the pump when it is unable to attain set-point pressure. This protection requires manual reset at the drive.
- 22-51:** End of Pump Curve Delay: Sets the time that the feedback must be below set-point before the drive executes Par. 22-50.

EMPTY PIPE FILL MODE

When a drive maintaining a constant pressure is started into an empty system, the drive will go to full speed after the ramp time expires in Par. 3-41 because the feedback pressure is below its set-point. The drive can be programmed to run at a specific speed for a specific amount of time or until the feedback pressure is above a specified level. If the pressure in the system is greater than the value set in Par. 29-05, the drive will immediately go to its set-point pressure so that the pipe fill mode only operates when necessary.

- 29-00:** Pipe Fill Enable: Set to enable.
- 29-02:** Pipe Fill Speed: Run the drive in hand to determine an appropriate fill speed and enter its value in Hz.
- 29-03:** Pipe Fill Time: Enter a time long enough to allow the pipe to fill at the speed rate value of Par. 29-02.
- 29-05:** Filled Set-Point: Set to a pressure feedback value for the drive to be released from the value of Par. 29-02.

INITIALIZING THE DRIVE

When a drive performs or has alarms inconsistent with field conditions or programming, "Initializing" the drive (rebooting) will sometimes be helpful. When the drive is Initialized, all parameters will revert to their default settings. To save your settings, initialize the drive and restore your settings by following these steps:

- 0-50:** LCP Copy: Select "All To LCP" to copy all your parameters from the control card to the display/programmer.

Turn of the power to the drive and wait at least 10 seconds after the display goes dark to proceed. Hold down the "Status", "Main Menu", and "OK" buttons while re-enabling the power. Release the buttons and look for an "Initializing" message on the screen to confirm success.

- 0-50:** LCP Copy: Select "All From LCP" to copy all your parameters from the display/programmer back to the control card. Wait until the screen reverts to the parameter screen to proceed.



VARIABLE FREQUENCY DRIVE QUICK START INSTRUCTION SHEET

REV. 2020

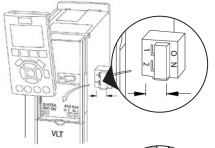
NEED ASSISTANCE?

MLS Customer Service & Support

- 503.878.4299
- cscontrols@mitchelllewis.com
- mitchelllewis.com



GETTING STARTED



Step 1: Remove the keypad faceplate and locate the switch for the **A-54 Dip Switch**. Move the switch to the right, or "1" position.



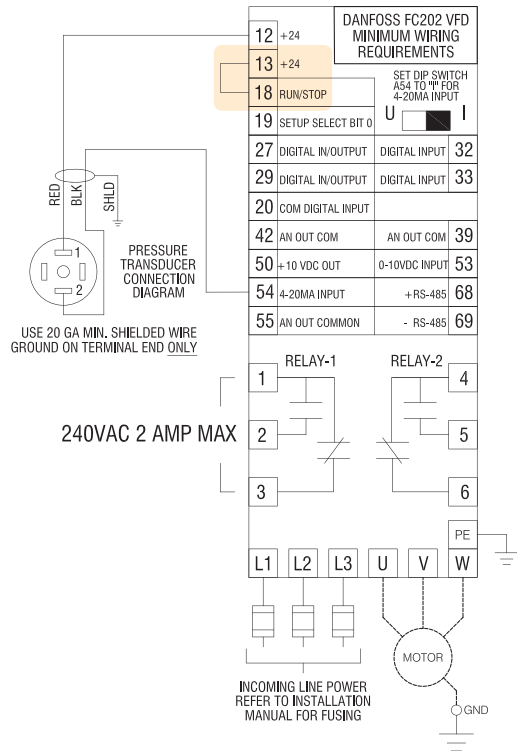
Step 2: Using the provided jumper wire, connect points **13 & 18**.



Step 3: Press the **Quick Menu** button and scroll down to Personal Menu to set standard parameters per your application.

OUT OF THE BOX WIRING BASICS

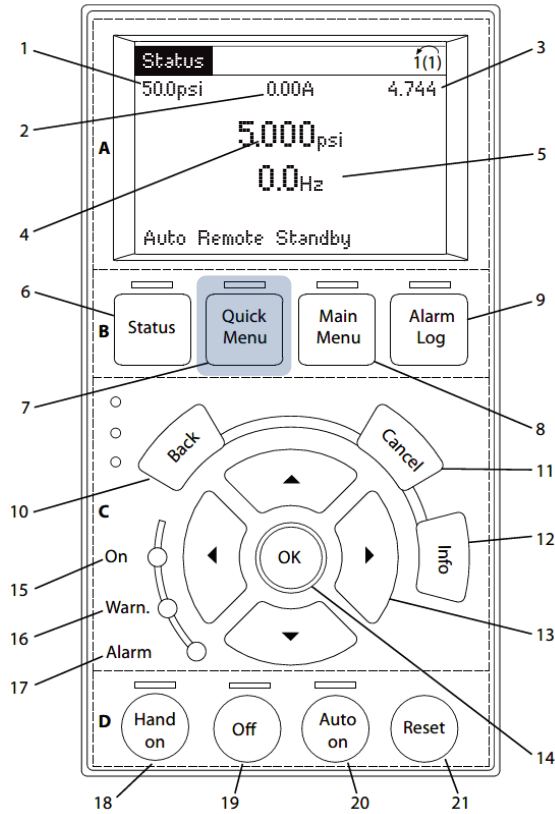
(For value added drive, see diagram inside door)



WARNING

Touching the electrical parts of the Danfoss FC202 may be fatal, even after it has been disconnected from the AC line! Always be sure that power has been removed from the drive for at least 50 minutes before working with the power circuitry of the drive.

KEY PAD BASICS



- Displays the pressure set-point as defined by parameter 20-21.
- Displays the power load in kilowatts when the motor is running.
- Displays the current load in amps when the motor is running.
- Displays the pressure transducer 4-20 mA feedback value.
- Displays the speed of the pump in Hz.
- Displays the operational status of the drive.
- Displays the location of the run command.
- Displays the drives current status (running, ramping, sleeping, etc.).
- Returns the display/programmer to the default screen.
- Custom menu for simple pressure maintenance applications.
- Complete menu for more advanced functions.
- Lists the last 10 alarms with run hours and values at time of fault.

- Returns you to the previous command or programming level.
- Cancels any command or parameter change in progress.
- Press anytime for an explanation of parameter or variable.
- Press to acknowledge any changes to a parameter.
- Use left and right arrow keys to navigate between parameter groups.
- Use the up and down arrow keys to navigate within parameter groups.
- Starts the pump in an open loop, taking its speed reference from the up and down arrow keys.
- Stops the pump after ramp down time set in parameter 3-42.
- Starts the pump in a closed loop control scheme utilizing feedback from a pressure transducer to maintain your pressure set-point.
- Resets the drive after a fault.

QUICK START PERSONAL MENU

Use the following quick commissioning instructions for a typical pressure maintenance application: press the quick menu button, press OK and use the down arrow key to access the following parameters:

- 20-21:** Set-Point: Enter the discharge pressure you wish to maintain.
- 4-12:** Minimum Speed: For submersible pumps, the valve needs to be set at a 30 Hz minimum to comply with the submersible motor manufacturer's requirements. This can also be used for water lubed turbine pumps to ensure stuffing box lubrication, or wastewater pumps to maintain minimum discharge velocities.
- 4-18:** Current Limit: Enter the motor name plate service factor.
- 3-41:** Ramp Up: Sets the time it takes for the motor speed to get from 0% to 100%.
- 3-42:** Ramp Down: Sets the time it takes for the motor speed to get from 100% to 0%.
- 3-84:** Initial Ramp: Time in seconds that it takes for the motor to reach its minimum speed set in par.
- 4-12:** To comply with submersible motor manufacturer's requirements, set time to 1.0 sec. This can also be used for water lubed turbine pumps to ensure expedient lubrication.



- 3-85:** Check Valve Ramp: Time in seconds that it takes for the motor to stop after reaching its minimum speed set in par. 4-12. To comply with submersible motor manufacturer's requirements, set time to 1.0 sec. This can also be used for water lubed turbine pumps to ensure lubrication.
- 22-22:** Low Speed Detection: Set to "Enabled" to make the pump "Sleep" when the speed of the pump drops below the value set in par.
- 22-23:** No Flow Function: Select "Sleep Mode" if you want the pump to sleep in a No-Flow condition.
- 22-24:** No Flow Delay: This is the amount of time in seconds that the speed of the pump must be below the value set in par. 22-29 before the pump will "Sleep".
- 22-29:** No Flow Low Speed: Set the speed in Hz that you wish the pump to sleep.
- 22-44:** Wake-up Ref./FB Difference: Set the % of set-point pressure drop you want for the pump to "Wake-Up".
- 22-45:** Set-point Boost: Set the % of set-point pressure raised above set-point you want before the pump goes "To Sleep".
- 1-21:** Power in HP: Enter the motor name plate horsepower.
- 1-22:** Voltage: Enter the motor name plate voltage.
- 1-24:** Current: Enter the motor name plate full load current.
- 1-25:** Speed: Enter the pump motor name plate nominal speed.
- 1-29:** Automatic Motor Adaptation: Set to "Enable Complete AMA", press OK, and follow the onscreen instructions.
- 0-50:** LCP Copy: When all adjustments have been made, set this parameter to "All from LCP" to copy all settings to the keypad. These parameters will then be available in an emergency to restore the drives settings.