ABB DRIVES FOR WATER

ACQ580 Irrigation Drives

Supplement Firmware Manual for ACQ580 Irrigation Drives

ACQ580-01…+ N6050+X1681 Irrigation wall-mounted drive (230V, 25-100 HP; 480V, 40-200 HP)
ACQ580-31…+N6050+X1681 ULH Irrigation wall-mounted drive (480V, 40-150 HP)
ACQ580-0P…+C192+F289 3R Irrigation drive package (230V, 25-100 HP; 480V, 40-200 HP)
ACQ580-3P…+C192+F289 3R Irrigation drive package (480V, 40-150 HP)

Power and productivity
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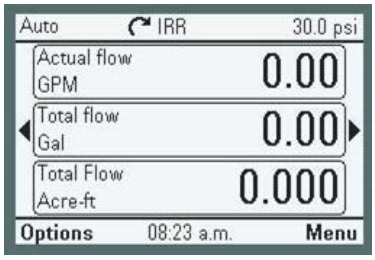
ACQ580 irrigation drives use irrigation specific software that is based on the ACQ580 pump control firmware. Use of irrigation specific software is indicated by the option code +N6050 for wall-mounted ACQ580 irrigation drives or option code +C192 for ACQ580 3R irrigation drive packages.

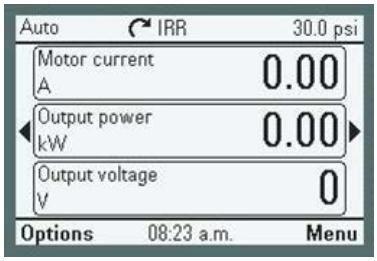
The information in this supplement manual details items that are unique to the ACQ580 irrigation drive package. See the ACQ580 pump control program firmware manual (*3AXD50000035867*) for additional information on ACQ580 software and parameters.

Irrigation specific home screens

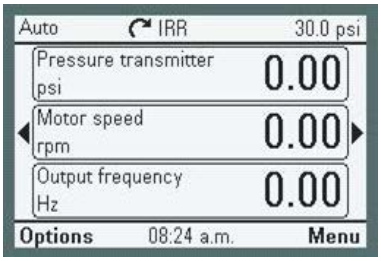
Three home screen options that been configured specifically for irrigation. The primary home screen includes the exclusive total flow, acre foot calculation.



Primary home screen



Secondary home screen

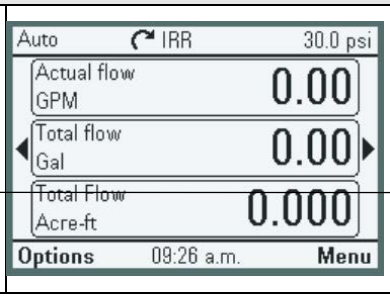


Tertiary home screen

How to start up the drive using First start assistant with the irrigation specific software

Note: Automatic selection of supply voltage is not supported in the ACQ580 ULH irrigation drives (ACQ580-31 or ACQ580-3P). You must select the supply voltage manually using parameter 95.01 Supply Voltage. Follow the instructions below.

Safety	
⚠	Do not start-up the drive unless you are a qualified electrician. Read and obey the instructions in chapter *Safety instructions* at the beginning of the *Hardware manual* of the drive. Ignoring the instructions can cause physical injury or death, or damage to the equipment.
☐	Check the installation. See chapter *Installation checklist* in the *Hardware manual* of the drive.
☐	⚠ Make sure there is no active start on (D|1 in factory settings, that is, default configuration). The drive will start up automatically at power-up if the external run command is on and drive is in the external control mode. Check that the starting of the motor does not cause any danger. **De-couple the driven machine** if: • there is a risk of damage in case of an incorrect direction of rotation, or • a **Normal** ID run is required during the drive start-up, when the load torque is higher than 20% or the machinery is not able to withstand the nominal torque transient during the ID run.
Hints on using the assistant control panel	
	The two commands at the bottom of the display (**Options** and **Menu** in the figure on the right), show the functions of the two softkeys and located below the display. The commands assigned to the softkeys vary depending on the context. Use keys ◄, ►, ▲ and ▼ to move the cursor and/or change values depending on the active view. Key ? shows a context-sensitive help page. For more information, see *ACx-AP-x assistant control panels user's manual* (*3AUA00000865685*)



1 – First start assistant guided settings: Language, date and time, and motor nominal values

☐ Have the motor or pump name plate data at hand.

Power up the drive.

☐ The First start assistant guides you through the first start-up.

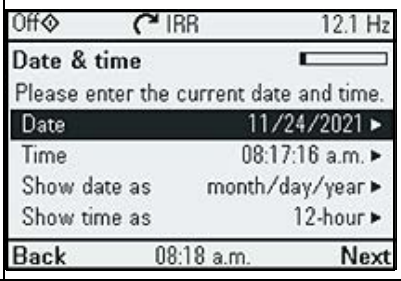
The assistant begins automatically. Wait until the control panel enters the view shown on the right.

Select the language you want to use by highlighting it (if not already highlighted) and pressing (**OK**).

☐ Set the date and time as well as date and time display formats.

- Go to the edit view of a selected row by pressing .
- Scroll the view with and .

Go to the next view by pressing (**Next**).

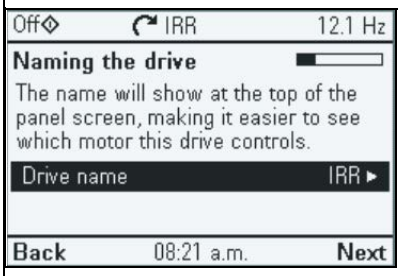


☐ To change a value in an edit view:

- Use and to move the cursor left and right.
- Use and to change the value.
- Press (**Save**) to accept the new setting, or press (**Cancel**) to go back to the previous view without making changes.

☐ To give the drive a name that will be shown at the top, press . If you do not want to change the default name (IRR), continue by pressing (**Next**).

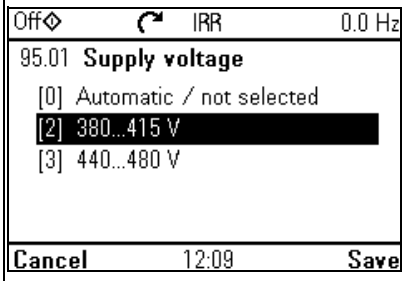
Hint: Name the drive, for example, Pump 1.



☐ ACQ580 ULH Irrigation drives: Select the supply voltage with parameter 95.01:

- In the First start assistant menu, select Exit and press (**Next**).
- In the Home view, press (**Menu**) to enter the Main menu.
- In the Main menu, go to **Parameters > Complete list > 95 HW configuration** by selecting the correct row and pressing (**Select**) repeatedly.
- Select parameter 95.01 and press (**Edit**).
- Select supply voltage **380…415** or **440…480** using keys and . Press (**Save**).
- Go back to the Main menu by pressing (**Back**) repeatedly.
- In the Main menu, select **First start assistant** and press (**Select**) to enter the First start assistant menu.

Continue with the following steps for commissioning the ACQ580.



Refer to the motor or pump nameplate for the following nominal value settings of the motor.
Enter the values exactly as shown on the motor or pump nameplate.

Example of a nameplate of an induction (asynchronous) motor

:

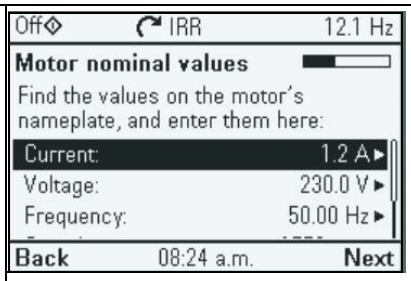
ABB Motors CE

3 ~ motor	M2AA 200 MLA 4						
IEC 200 M/L 55							
No							
Ins. cl. F					IP 55		
V	Hz	kW	r/min	A	cos φ	IA/IN	tE/S
690 Y	50	30	1475	32.5	0.83		
400 D	50	30	1475	56	0.83		
660 Y	50	30	1470	34	0.83		
380 D	50	30	1470	59	0.83		
415 D	50	30	1475	54	0.83		
440 D	60	35	1770	59	0.83		
Cat. no	3GAA 202 001 - ADA						
6312/C3			6210/C3			180 kg	
IEC 34-1							

☐ Check that the motor data is correct. Values are predefined on the basis of the drive size but you should verify that they correspond to the motor.

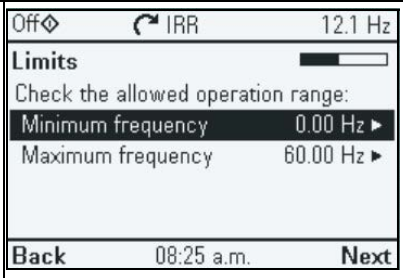
Go to the edit view of a selected row by pressing ▶.
- Scroll the view with ▲ and ▼.

Press (**Next**) to continue.



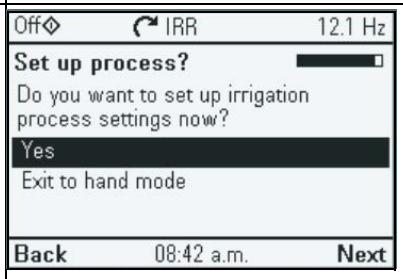
☐ Adjust the limits according to your needs.
- Go to the edit view of a selected row by pressing ▶.
- Scroll the view with ▲ and ▼.

Go to the next view by pressing (**Next**).

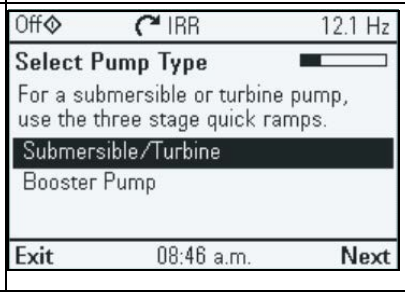


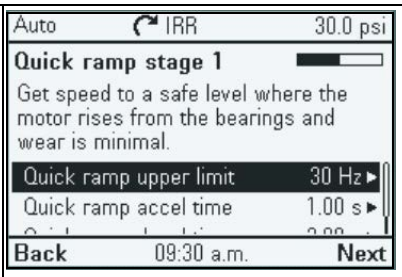
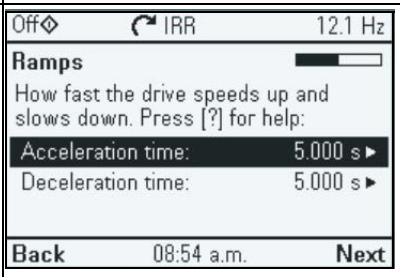
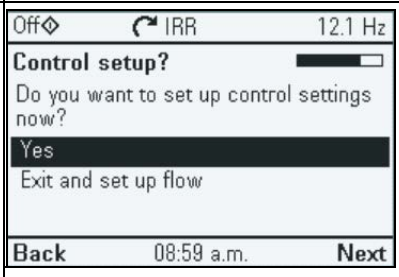
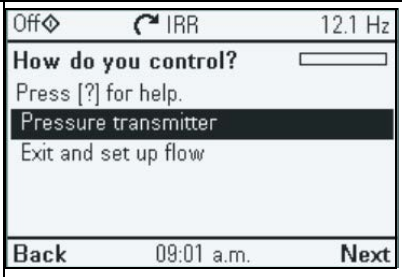
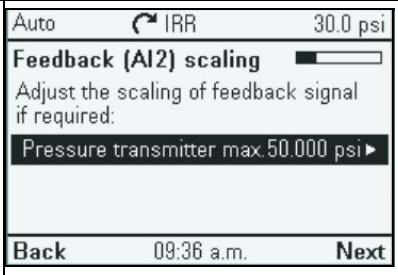
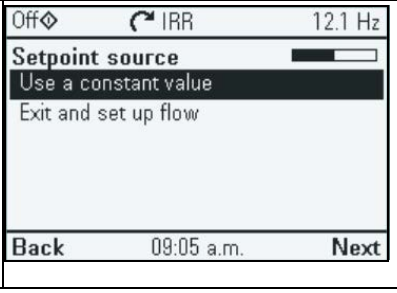
☐ If you want to set up irrigation process settings, select Yes and press **(Next)**.

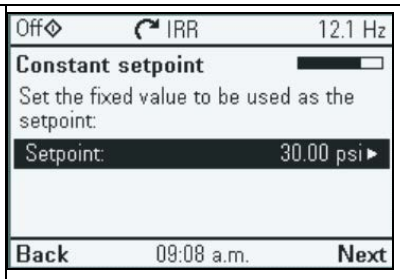
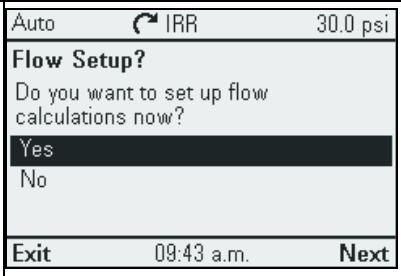
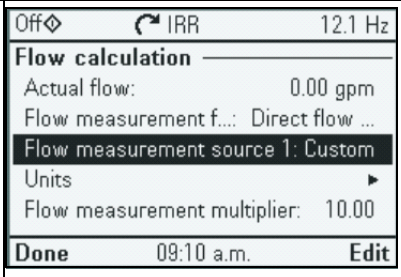
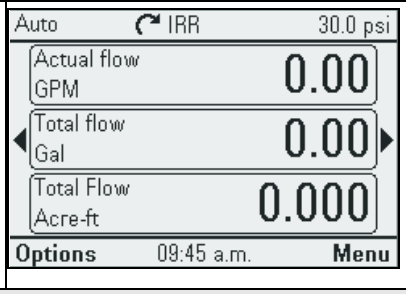
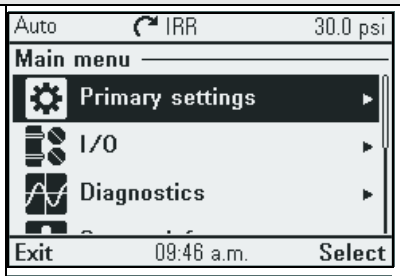
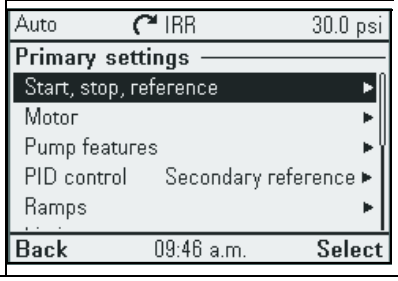
If you do not want to set up irrigation process settings, select Exit to hand mode and press **(Next)**.



☐ Select pump type; **Submersible/Turbine** or **Boost Pump** and press **(Next)**.



☐	If the pump type of Submersible/Turbine was selected, adjust the quick ramp settings for seconds and Hz by pressing ▶. • Scroll the view with ▲ and ▼. Press (Next) to continue.	
☐	If the pump type of Booster Pump was selected, adjust the ramp acceleration and deceleration times ▶. Press (Next) to continue.	
☐	If you want to set up control settings, select Yes and press (Next). If you do not want to set up control settings, select Exit and set up flow and press (Next).	
☐	If you want to control via a pressure transmitter, select **Pressure transmitter** and press (Next). If you do not want to control via a pressure transmitter, select **Exit and set up flow** and press (Next).	
☐	Adjust the scaling of feedback to your needs. • Go to the edit view of a selected item by pressing ▶. Press (Next) to continue.	
☐	If you want to use a constant value to your pressure transmitter, select **Use a constant value** and press (Next). If you do not want to use a constant value, select **Exit and set up flow** and press (Next).	

☐	Adjust the setpoint to your needs. • Go to the edit view of a selected item by pressing ▶. Press **(Next)** to continue.	
☐	If you want to set up flow calculations, select **Yes** and press **(Next)**. If you do not want to set up flow calculations, select **Exit to hand mode** and press **(Next)**.	
☐	Adjust flow calculations to your needs. • Go to the edit view of a selected item by pressing ▶ or by pressing **(Edit)**. • Scroll the view with ▲ and ▼. Press **(Done)** to complete first start assistant set up.	
☐	The Home view 1 monitoring the values of the selected signals is shown on the panel. There are three preconfigured Home view displays. Home view 1 is default Home view. You can browse them with keys ◀ and ▶.	
2 – Additional settings in the Primary settings menu		
☐	Make any additional adjustments, for example, pump protections, starting from the **Main** menu – press (**Menu**) to enter the **Main** menu. Select **Primary settings** and press (**Select**) (or ▶). In the **Primary settings** menu, select **Pump protections** and press (**Select**) (or ▶). To get more information on the **Primary settings** menu items, press ? to open the help page.	 

3 – Hand/Off/Auto operation

☐

The drive can be in remote control or local control, and in local control there are additionally two different modes.

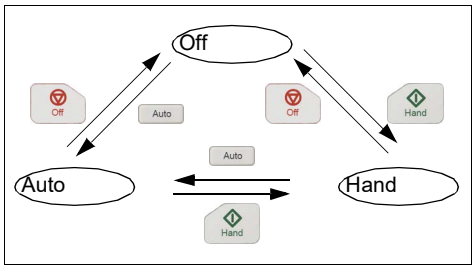
Remote control: Drive is controlled from the I/O or the fieldbus.

- Top row of the view shows Auto.

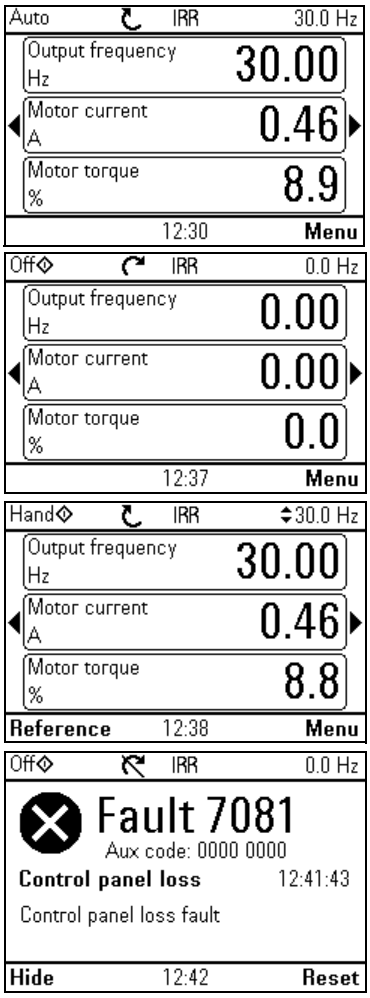
Local control: Drive is controlled from the control panel.

- Top row of the view shows Off, that is, the drive is in the Off mode. Drive is stopped.
- Top row of the view shows Hand, that is, the drive is in the Hand mode. Drive is running. The initial reference in the Hand mode is copied from the drive reference.
  Symbol ▲▼ on the top row indicates that you can change the reference with ▲ and ▼.

The following diagram shows the state transitions when you press the Hand, Off or Auto button:



Note: When you restart the drive while fault 7081 Control panel loss is active, the mode changes from Hand or Off to Auto.



Irrigation primary settings

The ACQ580 irrigation drive software contains a Primary Settings menu that allows you to adjust and define additional settings in the drive.

The Primary Settings and sub-settings in the ACQ580 irrigation drive are:

- Start, stop reference
  - Basic operation setup
  - Basic control setup
  - Auto control selection
  - Secondary auto control location
  - Interlocks/permissives
  - Stop mode
  - Constant frequencies
  - Start mode
  - Start delay
- Pump features
  - Flow protection
  - Pressure protection
  - Dry pump protection
  - Flow calculation
  - Soft pipe fill
- Motor
  - Nominal values
  - Start mode
  - Phase order
  - Switching frequency
  - Thermal protection estimated
  - Thermal protection measured
  - Stall protection
- Ramps
  - Quick ramps
  - Acceleration time
  - Deceleration time
  - Stop mode
  - Ramp time target frequency
- PID Control
  - PID assistant
  - Activate PID control
  - Start/stop from
  - Unit
  - PID status
  - Feedback
  - Setpoint
  - Tuning
  - Increase output: Feedback
  - Output
  - Sleep function
- Limits
  - Minimum frequency
  - Maximum frequency
  - Maximum current

- Fieldbus
  - Embedded fieldbus
  - Fieldbus adapter
- Fault functions
  - Auto-reset faults
  - Additional fault reset
  - Enable AI2 low detection
- Advanced functions
  - External events
  - Supervision
  - Timed functions
  - Confirmation for HAND/OFF
- Clock, region, display
  - Select drive
  - Language
  - Date & time
  - Units
  - Drive name
  - Contact info in fault view
  - Edit texts
  - Display settings
  - Show in lists
  - Edit Home view
  - Show inhibit pop-up
- Assistants
  - Irrigation Smart Assist
  - Basic operation setup
  - Basic control setup
  - Nominal values
  - ID run
  - PID assistants
  - Security
  - Control mode

Note that the Primary Settings menu enables you to program the majority of the drive functionality or features; more advanced configuration can be done via the parameters. For more information on the different parameters, see the Parameters chapter of the ACQ580 pump control program firmware manual (*3AXD50000035867*).

Irrigation total flow accumulated feature

The ACQ580 irrigation drive includes a total flow accumulated feature and the exclusive total flow, acre foot calculation. These features were developed specifically to meet the irrigation market's needs.

The parameters associated with these features are:

- P47.01 - Total flow - acre ft.
  - Total accumulated flow in unit acre ft
  - 1 acre ft. = 325,851.427 gallons
  - Parameter type is Real 32
  - Max value = 2,147,483.000
- P47.11 - Total flow days
  - Total number of days flow is accumulated before value is reset
  - Set value to zero (0) and set P47.12 to zero (0) to disable total flow reset function
- P47.12 - Total flow elapsed
  - Number of days elapsed in “total flow days” time period

Further information

Product and service inquiries

Address any inquiries about the product to your local ABB representative, quoting the type designation and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to www.abb.com/searchchannels.

Product training

For information on ABB product training, navigate to new.abb.com/service/training.

Providing feedback on ABB Drives manuals

Your comments on our manuals are welcome. Navigate to new.abb.com/drives/manuals-feedback-form.

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