



NEWTON Electro-Hydraulic Valve Actuation Unit

VALVE ACTUATION SYSTEMS

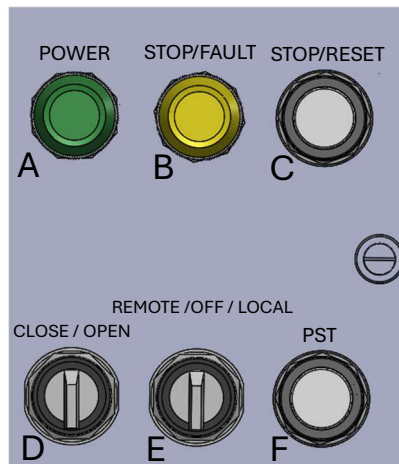


Figure 1. Control panel (left) and needle valve to control flow (right)

OPERATION INSTRUCTIONS

1. MANUAL OPEN / CLOSE

- a. Using a 5mm hex key, turn the needle valve (Figure 1.G) clockwise until it is completely closed. Alternatively, powering the solenoid coil has the same effect as closing the needle valve.
 - i. The included 5mm hex key is clipped to the enclosure floor under the needle valve.
- b. Actuating the hydraulic handpump will now open the pipeline valve.
 - i. The hand pump handle is clipped on the right interior wall of the main enclosure.
- c. To close the pipeline valve release pressure by turning the needle valve counterclockwise to open it.
 - i. Note that if the solenoid is powered during manual operation opening the needle valve will not close the pipeline valve.

2. SELECTING CONTROL MODE

- a. Select the desired control mode using the 3-position switch (Figure 1.E). Turning fully clockwise will select local control mode, and turning fully counterclockwise will select remote control mode.
 - i. The central switch position (“OFF”) between local and remote modes disables local and remote control functionality, which effectively shuts fail-close valves.

3. MOTORIZED OPEN / CLOSE

- a. Prior to motorized operation ensure that the needle valve (Figure 1.G) is open by at least one counterclockwise turn. Open further to allow more flow and close the pipeline valve faster.
- b. In local control mode the 2-position switch (Figure 1.D) will open/close the valve. Turn fully clockwise to open the valve. Turn fully counterclockwise to close the valve.
 - i. Altering the switch position during a PST will not take effect until after the PST ends.
- c. In remote control mode a continuous 24VDC signal applied to input 7 (Section 8) will open the valve. A continuous 24VDC signal applied to terminal 99 (section 8) will close the valve.
 - i. Note that if no open or close signal is present, the valve will fail closed.
 - ii. The close signal has priority over the open signal.
 - iii. Altering the signal during a PST will not take effect until the PST ends.

4. STOP COMMAND

- a. The stop command will hold the valve in its current position. The solenoid will energize to hold pressure in the actuator, and the motor will not be able to run.

- i. The amber stop/fault light (Figure 1.B) will light while a stop command is active.
- b. The stop command has priority over open/close commands and will cancel any active PST.
- c. In remote control mode, while a continuous 24VDC signal is applied to input 11 (section 5) a stop command will be active. Turn off the signal to remove the stop command.
- d. In local control mode press the stop/reset pushbutton (Figure 1.C) to activate a stop command. Press the pushbutton again to cancel the command and resume operation.
- e. See Section 6 for resetting the system if the motor watchdog timer activates a stop command.

5. PARTIAL STROKE TEST (PST)

- a. Prior to initiating a PST ensure that the needle valve (Figure 1.G) is open by at least two counterclockwise turns.
 - i. If the needle valve is closed the pipeline valve will be unable to close and the PST will timeout after the PST watchdog timer expires.
 - ii. The green pilot light will blink in a 1 second cycle while a PST is active.
- b. The following requirements must be met to initiate a PST:
 - i. The open limit switch is tripped.
 - ii. The appropriate control mode (local or remote) is selected (Section 2).
 - iii. No stop commands are active (Section 4).
- c. To locally initiate a PST, press the PST pushbutton (Figure 1.F).
 - i. Holding the pushbutton is not required and will not affect the PST beginning.
 - ii. To cancel the PST, push the PST pushbutton again.
- d. To remotely initiate a PST, send a momentary 24VDC signal to input 10 (Section 5, Figure 2).
 - i. Sending a continuous signal is not required and will not affect the PST beginning.
 - ii. To cancel the PST, send a second momentary 24VDC signal to input 10.
- e. If the PST watchdog timer expires prior to PST completion the PST will be cancelled. After a completed PST, a failed PST, or a cancelled PST the system returns to regular operation.
 - i. PST progress may be monitored by monitoring the valve position via limit switch feedback.
 - ii. A stop command during a PST will cancel the PST and hold the valve in position.

6. LOW HYDRAULIC PRESSURE & MOTOR WATCHDOG TIMER

- a. If low hydraulic pressure is detected the motor will run to restore the desired pressure level.
 - i. This ensures that the valve remains open and should trigger prior to the valve drifting off the open limit switch.
 - ii. The green pilot light will blink in a 0.25 second cycle while low hydraulic pressure is present.
- b. If the motor watchdog timer expires a stop command will be activated.
 - i. To reset the system, press the local stop/reset pushbutton (Figure 1.C).
 - ii. The motor watchdog timer is shorter than the PST timer.

7. PILOT LIGHT INDICATORS

- a. The green pilot light (Figure 1.A) is lit when power is supplied to the control's enclosure.
 - i. The green pilot light blinks to indicate the following system statuses:
 - 1. 0.25 second blink cycle: Low hydraulic pressure (Section 6)
 - 2. 1 second blink cycle: PST is active (Section 5)
 - 3. 2 second blink cycle: Both open & close limit switches are tripped.
 - ii. Blinking cycles have equal priority.
 - 1. If you think multiple cycles are active, check the PLC screen for statuses.
- b. The amber pilot light (Figure 1.B) is lit when a stop command is active.
 - i. If the stop is caused by the motor watchdog timer expiring, press the local stop/reset pushbutton to clear the stop.

8. TERMINAL ASSIGNMENTS (Reference A&M Drawing # 10891)

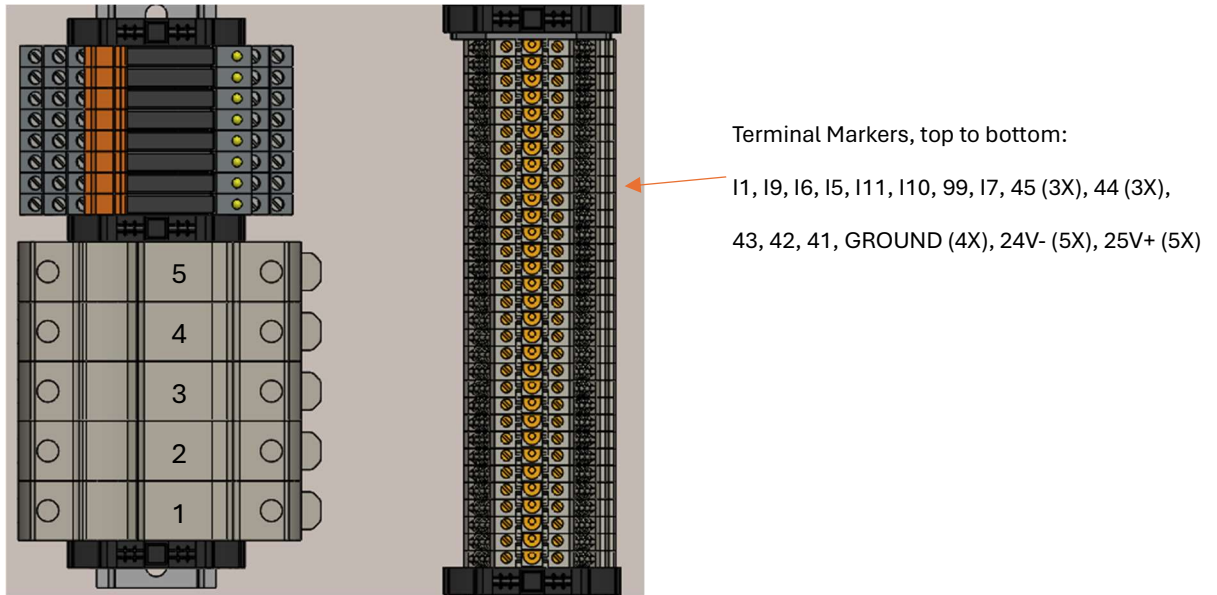


Figure 2. Terminal blocks (labeled) in customer connections enclosure (1/2" NPT wiring entrance hubs)

Table 1. Terminal identifiers and function (references Figure 2)

Terminal	Description	Feedback/Input	Signal Duration
24V+	24VDC+ from controls (on 5A fuse)		
24V-	24VDC- (common) from controls		
GROUND	Grounded to enclosure		
41	Supply power 480VAC 3Ph: Lead 1		
42	Supply power 480VAC 3Ph: Lead 2		
43	Supply power 480VAC 3Ph: Lead 3		
I5	Open limit switch	Feedback	Continuous 24VDC+ signal when tripped
I6	Close limit switch	Feedback	Continuous 24VDC+ signal when tripped
I9	PST limit switch	Feedback	Continuous 24VDC+ signal when tripped
I1	Remote mode active	Feedback	Continuous 24VDC+ signal when remote mode is selected
45	24VDC+ for feedback relays		
**Q5	PST failure alert	Feedback	20-second 24VDC+ signal when PST watchdog timer expires
44	24VDC- for remote signal relays		
I7	Remote open signal	Input	24VDC+ continuous to open valve
99	Remote close signal	Input	24VDC+ continuous to close valve
I10	Remote PST signal	Input	Momentary 24VDC+ to start PST, second signal to cancel PST
I11	Remote stop signal	Input	Continuous 24VDC+ to activate stop command.

**Active in program, not wired for use. To take this feedback, connect to relay output Q5 of the PLC (PLC expansion module Q1)

Table 2. Fuse holder layout (references Figure 2)

Identifier	Fuse Size	Fuse Type	Description
1	5A	UL Midget Class CC Time Delay	480VAC 3Ph supply power: L1
2	5A	UL Midget Class CC Time Delay	480VAC 3Ph supply power: L2
3	5A	UL Midget Class CC Time Delay	480VAC 3Ph supply power: L3
4	5A	UL Midget Class CC Time Delay	24VDC controls
5	5A	UL Midget Class CC Time Delay	24VDC solenoid coil