

# NEX Control Panel

## Single-Phase, Duplex, Smart Pump Controller

Rev 1 - 08<sup>th</sup> September 2023  
Code - NEX-CDM & NEX-F

### INTRODUCTION

*The Newton NEX is a sophisticated duplex pump control panel with many unique features, that includes advanced pump operation, protection, diagnostic and telemetry features.*

*The panel is available in two versions, one suitable for pumping foul water and a version designed to be used for pumping surface and groundwater that features separate mains and inverter power supplies:*

- NEX-F for foul pumping
- NEX-CDM for surface and groundwater pumping operations for use with the [Newton CDM System](#)

*Self-diagnostic programs test the pumps on a weekly basis to prevent clog or seizure and to test pump performance parameters.*

*The NEX control panel will operate two 230V AC pumps to a maximum rated current of 12.5 amps and features advanced Machine Learning Technology developed specifically for pumping applications. The proprietary algorithm continuously monitors the tank fill time and discharge times and “learns” what is normal. Should the pump performance drop due to clogging, impeller damage, or changes in head conditions, the PSE function will trigger an alarm. This intelligent solution is not affected by flow variations into the tank and can detect pump Dry Run conditions.*

### KEY BENEFITS

- High level alarm, Pump fault alarm
- 3 x Volt-free contacts for transmitting various alarm and pump fault conditions to BMS (Building Management System) or other remote alarm/monitoring system such as the Victron Cerbo GX or Cerbo S GX communications and monitoring hub
- Multiple control mode can be selected with a DIP switch
- Float switch fault detection and backup control logic
- Pump fault detection, and automatic switching – Duty back-up
- Each pump circuit has a thermal-magnetic circuit breaker that provides pump disconnect and branch circuit protection
- Pump overload protection, PSE protection
- Pump over-temperature protection
- Weekly test run function
- Automatic alternate duty cycle
- NEX-CDM version features two independent power supply inputs - One for grid mains and the other for a battery-backed power supply via a [Newton Victron Battery Backup System](#)
- Automatic pump duty assist - If one pump cannot cope with the volume of water entering the sump, the second pump will auto-start to increase the pumping duty
- Monitoring and alarm conditions sent in real time via Modbus to BMS (Building Management System) and other enabled monitoring devices
- Automatic testing of each pump 7 days after its last operation - Tests ensure the pumps remain free from clogging and seizure. Problems detected during the 10 second test will be notified by alarm. Each control circuit has its own independent timer to ensure that each pump is tested at different times
- HOA switch allows for switching between Hand, Off and Auto modes
- Alarm reset, silence and test functions



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TECHNICAL DATA			
Features	Result		Units
	NEX-F	NEX-CDM	
Width	203		mm
Height	254		mm
Depth	102		mm
Weight	2.08	2.44	kg
IP Protection Grade	IP65		
Application Temperature	-5 to +40		°C
Application Humidity	50% at 40°C - non-condensing		
Max Altitude	2000		m
Rated Motor Current	2.5 to 12.5		Amps
Input Voltage - Single Phase	110/220/240		VAC - 50/60 Hz
Power Supply Inputs	1 x	2 x	
Water Level Switch Type	Sewage	Vertical	
Alarm Switch Type	Sewage	Finger	

## PUMPING MODES

### AUTOMATIC DUTY CYCLE

The pumping is shared between the two pumps, with pumping switched between the two pumps at each pumping operation.

### PUMP EXERCISE

If either pump has not operated for 168 hours, the pump will operate for 10 seconds.

### DUTY STANDBY

If the lead pump does not operate, the NEX panel will operate the lag (stand-by) pump to complete the required pumping operation. A warning alarm condition will result on the third occurrence of this situation.

### DUTY ASSIST

If the lead pump does not complete the pumping operation and the water level rises to a higher float switch, the lag (assist) pump will operate to complete the pumping cycle.

## FLOAT OPTIONS

### NEX-CDM

The panel is supplied with 2 x floats:

- **Vertical - Main Float** - Pump start/stop – Sequential operation of each pump at the start and stop levels of the float
- **Finger Switch - Alarm** – Alarm warning and Lag pump start (duty assist)

### NEX-F

The panel is supplied with either 2, 3 or 4 sewage capable floats:

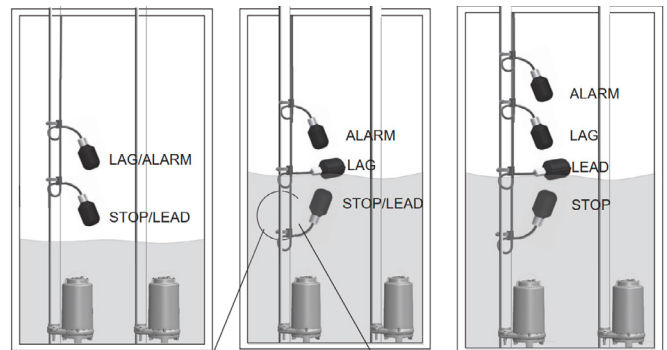


Figure 1 - Two Floats Control

Figure 2 - Three Floats Control

Figure 3 - Four Floats Control

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## PURCHASE CODES

NEX-CDM - Surface and groundwater pumping. 1 x Vertical Water Level Float. 1 x Alarm Float.

- Purchase Code: NEX-CDM



NEX-F – Foul pumping. Multiple float options:

- 2 x Sewage Floats – Purchase Code: NEX-F2
- 3 x Sewage Floats – Purchase Code: NEX-F3
- 4 x Sewage Floats – Purchase Code: NEX-F4



## BATTERY BACKUP

The NEX-CDM panel includes separate power supply connections for both mains and inverter power and should be used where battery-back-up systems are recommended, such as with surface and groundwater pumping operations. Sewage pumping systems include 24-hour storage and so do not require battery-back-up protection.

The size of the Victron inverter/charger and the minimum recommended size of the battery pack are dependent on factors such as the size of the pumps and whether both pumps are required to be pumping at the same time to increase pump duty (duty assist), which uses more power than with single pump and duty stand-by operation.

Pump Rated Power Output (W)	250	400	750
Minimum size Victron Inverter Required (W)			
Lead Pump Only	800	1200	2000
Lead and Lag (occurrence)	800	2000	3000
Lead & Lag (planned duty assist)	2000	2000	3000

Examples:

- 2 x 250w pumps with all water pumped by Lead pump at all times – Duty Standby: MultiPlus 12/800/35.
- 2 x 250w pumps with capability of duty assist during power outage: MultiPlus 12/2000/80.
- 2 x 400w pumps with all water pumped by Lead pump at all times – Duty Standby: MultiPlus 12/1200/50.
- 2 x 400w pumps with capability of duty assist during power outage: MultiPlus 12/2000/80.
- 2 x 750w pumps with all water pumped by Lead pump at all times – Duty Standby: MultiPlus 12/2000/80.
- 2 x 750w pumps with capability of duty assist during power outage: MultiPlus 12/3000/120.

Please reference the [Victron Inverter](#) Data Sheet for more detailed information.

## PACKAGING & HANDLING

The panel is supplied in a reinforced and protective cardboard box. Please handle with care.

## INSTALLATION INSTRUCTIONS

NEX-F - Please fully read the manufacturer Installation Instructions and Operational Manual before commencing installation.

NEX-CDM - Please fully read the manufacturer Installation Instructions and Operational Manual plus the [Newton NEX-CDM Quick Installation Guide](#) before commencing installation.

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## SPECIFICATION

Newton Waterproofing Systems work in partnership with RIBA NBS and [NBS Source](#), which integrates into project workflows, providing all product data from Newton's NBS BIM Objects, NBS Plus Clauses and RIBA Product Selector into one single source of product information.

NBS Source also hosts a large selection of Newton [case studies](#), as well as product [literature and certifications](#). A wide range of drawings are available [on our website](#).

## STORAGE

Store in dry conditions at temperatures between 5°C and 35°C. Do not expose to freezing conditions.

## HEALTH & SAFETY

Use appropriate PPE. Use products only as stated within this Data Sheet and associated Operational Manuals and Installation Guides. Only trained and qualified persons should undertake electrical installations.

## WARRANTY

The panel is supplied with a two-year back to base warranty which is dated from either the date of purchase or a proven date of installation. If the unit develops a fault during the warranty period, Newton Waterproofing Systems Ltd will repair or replace the unit under warranty. Contact the Newton sales office for a returns form which explains the returns procedure. The warranty will be invalidated if the unit is damaged because of improper handling, storage or installation, and in such cases a repair charge may be applicable.

Newton Waterproofing Systems reserve the right to update product literature at any time. Please always refer to our [website](#) for the latest versions.