GLOBAL PUMP SOLUTION DOOCH

50Hz

BOOSTER PUMP SYSTEM
XQP, MQ, N747D, (H)NSQ(P) SERIES
Booster System

Dooch’s Booster Systems provides constant pressured water where it is required whether in residential buildings or high rise office buildings. It maintains the lowest possible energy consumption in accordance with the water demand to control the No. of pumps and the speed of the motor.

Features

- Outstanding reliability
- High efficiency
- Fully integrated, all-in-one systems
- Systems to match every need and requirement
- Easy installation and operation

Applications

- Apartments
- Residential Buildings
- Office Buildings
- Hotels
- Industry

Pressurization
Boiler System
Industrial Circulation Pump Cooling System
High Pressure Washing System
Sprinkler
R/O Filtration

System Specification

<table>
<thead>
<tr>
<th>Method of Control</th>
<th>Individual VFD</th>
<th>General Inverter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Models</td>
<td>XQP, NSQ(P), HNSQ(P)</td>
<td>MQ - Series</td>
</tr>
<tr>
<td>Operation Method</td>
<td>Controlled by a VFD installed on each and every pumps</td>
<td>Controlled by one inverter on one pump</td>
</tr>
<tr>
<td>Installation</td>
<td>Indoor</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>-10℃~40℃</td>
<td></td>
</tr>
<tr>
<td>Liquid Type</td>
<td>Clean Water</td>
<td></td>
</tr>
<tr>
<td>Liquid Temp.</td>
<td>0℃~70℃</td>
<td></td>
</tr>
<tr>
<td>Pump</td>
<td>Vertical/Horizontal Multi-stage Centrifugal Pump</td>
<td></td>
</tr>
<tr>
<td>No. Of Pumps</td>
<td>2~6</td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>3PH×380V×50Hz</td>
<td>1PH×220V×50Hz (XQP Exception)</td>
</tr>
<tr>
<td>Inlet/Outlet Manifold</td>
<td>Stainless Steel</td>
<td></td>
</tr>
</tbody>
</table>
# Control Specifications/Features

<table>
<thead>
<tr>
<th>Appearance</th>
<th>MQ-Series: Multi-Inverter Booster System</th>
<th>747D-Series: Single Inverter Booster System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control panel is integrated with a general inverter which controls the pumps within the system.</td>
<td>Pumps range from 0.75kW~22kW</td>
<td>Control panel is integrated with a general inverter which controls the pumps within the system.</td>
</tr>
<tr>
<td>Pumps range from 0.75kW~110kW</td>
<td>2~6 Electronically speed controlled pumps</td>
<td>Pumps range from 0.75kW~110kW</td>
</tr>
<tr>
<td>Constant discharge pressure</td>
<td>Low energy consumption</td>
<td>Constant discharge pressure</td>
</tr>
<tr>
<td>Low energy consumption</td>
<td>Equipped with Dooch’s own 747D controller</td>
<td>Low energy consumption</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Features</th>
<th>MQ-Series: Multi-Inverter Booster System</th>
<th>747D-Series: Single Inverter Booster System</th>
</tr>
</thead>
<tbody>
<tr>
<td>All pumps are connected via an integrated V.F.D. which are located within the MQ Panel</td>
<td></td>
<td>Control panel is integrated with a general inverter which controls the pumps within the system.</td>
</tr>
<tr>
<td>Pumps range from 0.75kW~22kW</td>
<td>2~6 Electronically speed controlled pumps</td>
<td>Pumps range from 0.75kW~110kW</td>
</tr>
<tr>
<td>Constant discharge pressure</td>
<td>Low energy consumption</td>
<td>Constant discharge pressure</td>
</tr>
<tr>
<td>Low energy consumption</td>
<td>Above 30kW, 747D-Series is required</td>
<td>Low energy consumption</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inverters</th>
<th>MQ-Series: Multi-Inverter Booster System</th>
<th>747D-Series: Single Inverter Booster System</th>
</tr>
</thead>
<tbody>
<tr>
<td>V.F.D. for pumps(XQ-Drive)</td>
<td>V.F.D. installed within the Panels(MQ)</td>
<td>General Inverter</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Manifolds</th>
<th>MQ-Series: Multi-Inverter Booster System</th>
<th>747D-Series: Single Inverter Booster System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Manifold</td>
<td>Standard Manifold</td>
<td>Standard Manifold</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7” LCD Touch Screen Monitor</td>
<td>V.F.D. within the panel</td>
<td>General Inverter within the Panel</td>
</tr>
</tbody>
</table>
## Control Specifications/Features

<table>
<thead>
<tr>
<th>Appearance</th>
<th>NSQP-Series</th>
<th>NSQ-Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Image]</td>
<td>![Image]</td>
<td>![Image]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All pumps are fitted with an integrated V.F.D. which are directly mounted unto the motor</td>
</tr>
<tr>
<td>• Newly designed V.F.D. hardware (NSQ Drive)</td>
</tr>
<tr>
<td>• Pumps ranges from 0.75kW~22kW</td>
</tr>
<tr>
<td>• 2~6 Electronically speed controlled pumps</td>
</tr>
<tr>
<td>• Equipped with a 7.0” Touch Monitor</td>
</tr>
<tr>
<td>• Low energy consumption</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inverters</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Image]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Manifolds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Manifold</td>
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<table>
<thead>
<tr>
<th>Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Image]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>V.F.D. for pumps(NSQ-Drive)</th>
<th>V.F.D. for pumps(NSQ-Drive)</th>
</tr>
</thead>
</table>

| 7” LCD Touch Screen Monitor | Side Panel with individual circuit breakers |
## Control Specifications/Features

<table>
<thead>
<tr>
<th></th>
<th><strong>HNSQP-Series</strong> Individual Inverter Booster System (In-line Type Manifolds)</th>
<th><strong>HNSQ-Series</strong> Individual Inverter Booster System (In-line Type Manifolds)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td><img src="image1" alt="Image of HNSQP-Series" /></td>
<td><img src="image2" alt="Image of HNSQ-Series" /></td>
</tr>
</tbody>
</table>
| **Features**     | - All pumps are fitted with an integrated V.F.D. which are directly mounted onto the motor  
                  - Newly designed V.F.D. hardware (NSQ Drive)  
                  - Pumps ranges from 0.75kW~22kW  
                  - 2~6 Electronically speed controlled pumps  
                  - Equipped with a 7.0" Touch Monitor  
                  - Low energy consumption | - All pumps are fitted with an integrated V.F.D. which are directly mounted unto the motor  
                  - Newly designed V.F.D. hardware (NSQ Drive)  
                  - Pumps ranges from 0.75kW~22kW  
                  - 2~6 Electronically speed controlled pumps  
                  - Low energy consumption |
| **Inverters**    | ![V.F.D. for pumps(NSQ-Drive)](image3)                                        | ![V.F.D. for pumps(NSQ-Drive)](image4)                                        |
| **Type of Manifolds** | ![In-Line Type Manifolds](image5)                                         | ![In-Line Type Manifolds](image6)                                         |
| **Panel**        | ![7" LCD Touch Screen Monitor](image7)                                       | ![Side Panel with individual circuit breakers](image8)                      |

*50Hz Booster Pump System*
### Control Specifications/Features

<table>
<thead>
<tr>
<th>Appearance</th>
<th>XQ-XR(L) Series Premium V.F.D. Multi-stage Vertical Pump</th>
<th>NSQ-XR(L) Series V.F.D. Multi-stage Vertical Pump</th>
</tr>
</thead>
</table>
| Features   | - Integrated V.F.D. which are directly mounted unto the motor  
- Newly designed V.F.D. hardware (XQ Drive)  
- Low energy consumption  
- Compact Design, no need for additional control panels | - Integrated V.F.D. which are directly mounted unto the motor  
- Newly designed V.F.D. hardware (NSQ Drive)  
- Low energy consumption  
- Compact Design, no need for additional control panels |
| Inverters  | - Premium V.F.D. for pumps (XQ-Drive) | - V.F.D. for pumps (NSQ-Drive) |
| Manifolds  | - Exclusive piping for V.F.D. pumps | - Exclusive piping for V.F.D. pumps |
History Of Dooch's Booster Systems

### Generation: 1
- Pressure ON/OFF switch
- Pressure Diviation
- Pressure Differences: ± 1.2 kgf/cm²
- 1985~

### Generation: 2
- Single pump RPM controlled
- General Inverter
- Centeralized Control
- Stable Pressure
- Pressure Differences: ± 0.7 kgf/cm²
- 1995~

### Generation: 2.5
- Specific pumps RPM controlled via V.F.D.
- Stable Pressure
- Pressure Differences: ± 0.5 kgf/cm
- Half pump system
- Max. power saving
- 2005~

### Generation: 3
- All pumps equipped with V.F.D.
- Stable Pressure
- Color 7" LCD Touch Monitor
- High Reliability
- Pressure Differences: ± 0.3 kgf/cm²
- 2005~

### Generation: 3.5
- All pumps RPM controlled
- All pumps equipped with V.F.D.
- EMC Filter/DC reactor internally installed
- Color 7" LCD Touch Monitor
- Stable Pressure, power saving
- Pressure Differences: ± 0.3 kgf/cm²
- 2015~
Premium XQ-Drive

XQ-DRIVES are pump specific variable frequency drive that manages pump performance to match a wide range of system conditions and requirements. Adjusting the pump speed is the most efficient means of controlling pump flow and reducing the energy consumption. As the drives are self-cooling and motor-independent structure, it can be mounted directly on the motor or on the wall. XQ DRIVES are equipped with the latest GUI 3.5” color LCD display. A noise filtering EMC filter and DC reactor is also installed within the XQ DRIVES.

Technical Specification

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Power</td>
<td>0.75–22kW</td>
</tr>
<tr>
<td>Input Power</td>
<td>3Φ×380V–440V</td>
</tr>
<tr>
<td>Output Power</td>
<td>3Φ×380V–440V</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60Hz</td>
</tr>
<tr>
<td>Max. Frequency</td>
<td>60Hz</td>
</tr>
<tr>
<td>IP Class</td>
<td>IP 55</td>
</tr>
<tr>
<td>Max. Distance Of Pressure Transmitter</td>
<td>Max. 10m</td>
</tr>
<tr>
<td>Ambient Temp.</td>
<td>-10°C–+40°C</td>
</tr>
</tbody>
</table>

Protection

- Dry Running
- Low Water Level Detection
- Over/Under Voltage Inverter
- Min. Flow Stop
- Temp. Pressure Setting
- Sensor Failure
- Pump Freezing
- Pump Overload

XQ-Drive Features

1. 3.5” LCD Display (Graphical User Interface)
2. Energy Savings up to 70%
3. Multi-pump control capacity of up to 6 pumps
4. Hydraulic control functions included
5. Electrical and hydraulic pump protections
6. Automatic recovery after power failure
7. Easy retrofitting on existing pump system
8. Flexible installation either directly on a standard I.E.C. motors or on walls
9. EMC filter and DC reactor built-in
   - Reduce noise and harmonic distortion
NSQ-Drive

NSQ-DRIVES are pump specific variable frequency drive that manages pump performance to match a wide range of system conditions and requirements. Adjusting the pump speed is the most efficient means of controlling pump flow and reducing the energy consumption. As the drives are self-cooling and motor-independent structure, it can be mounted directly on the motor or on the wall.

Technical Specification

<table>
<thead>
<tr>
<th>Available Power</th>
<th>0.75~22kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Power</td>
<td>1Φ×200<del>230V (0.75</del>2.2kW)</td>
</tr>
<tr>
<td></td>
<td>3Φ×380<del>440V (0.75</del>22kW)</td>
</tr>
<tr>
<td>Output Power</td>
<td>3Φ×380V</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60Hz</td>
</tr>
<tr>
<td>Max. Frequency</td>
<td>60Hz</td>
</tr>
<tr>
<td>IP Class</td>
<td>IP 55</td>
</tr>
<tr>
<td>Max. Distance Of Pressure Transmitter</td>
<td>Max. 10m</td>
</tr>
<tr>
<td>Ambient Temp.</td>
<td>-10℃~+40℃</td>
</tr>
</tbody>
</table>

Protections

- Dry Running
- Low Water Level Detection
- Over/Under Voltage Inverter
- Min. Flow Stop
- Temp. Pressure Setting
- Sensor Failure
- Pump Freezing
- Pump Overload

NSQ-Drive Features

1. Energy Savings up to 70%
2. Multi-pump control capacity of up to 6 pumps
3. Hydraulic control functions included
4. Electrical and hydraulic pump protections
5. Automatic recovery after power failure
6. Easy retrofitting on existing pump system
7. Flexible installation either directly on a standard I.E.C. motors or on walls
**SQ-Drive**

SQ-DRIVE is a single phrase variable frequency drive that manages pump performance to match a wide range of system conditions and requirements. Adjusting the pump speed is the most efficient means of controlling the pump flow and reducing the energy consumption. SQ-Drive is a motor-independent structure, it can be mounted directly on the motor or on the wall.

### Technical Specification

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Power</td>
<td>0.55~1.1kW</td>
</tr>
<tr>
<td>Input Power</td>
<td>1Φ×220V</td>
</tr>
<tr>
<td>Output Power</td>
<td>3Φ×220V</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60Hz</td>
</tr>
<tr>
<td>Max. Frequency</td>
<td>60Hz</td>
</tr>
<tr>
<td>IP Class</td>
<td>IP 55</td>
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<tr>
<td>Max. Distance Of Pressure Transmitter</td>
<td>Max. 10m</td>
</tr>
<tr>
<td>Ambient Temp.</td>
<td>-10℃~+40℃</td>
</tr>
</tbody>
</table>

### Protections

- Dry Running
- Low Water Level Detection
- Over/Under Voltage Inverter
- Min. Flow Stop
- Temp. Pressure Setting
- Sensor Failure
- Pump Freezing
- Pump Overload

### SQ-Drive Features

1. Stand alone inverter for a single pump
2. Hydraulic control functions included
3. Electrical and hydraulic pump protections
4. Hydraulic control functions included
5. Easy retrofitting on existing pump systems
6. Flexible installations (motor, wall)
7. Small compact design and space saving
8. FND display for easy status monitoring and programing
GUI(Graphic User Interface) Introduction

1. Current Date and Time
2. Setting Pressure Value
3. Current Pressure Value
4. Current Output Ratio
5. Icon/Current condition of each pumps (Up to 6 pumps)
6. Status
7. Run History
8. Set-Up
XQP Series System

- 7” LCD Touch Monitor
- XQ-Drive
- High Efficiency Motor
- Pressure Transmitter
- Non-return Valve
- High Efficiency Pump
- Isolating Valve
- Base (Material: SS 400)
- Manifold (Material: STS 304)
- Low-Water Level Detector
Features

- 7” color LCD touch monitor
- Each pump are individually controlled by a XQ drive
- High reliability (Multi-master control)
- Constant discharge pressure
- Reduced tank and panel sizes
- Less wear of the system during operation
- Compact assembly and installation
- High reliability with an installation of two pressure transmitter
- Lowest possible energy consumption
- Up to 22kW and connection of up to 6 pumps

Functions

- Pressure settings
- Alternative operation
- Pump Freeze Protection
- Automatic detection of low flow on discharge
- Automatic recovery after power outage
- XQ drive will protect the pump
- Operation display and storage
- Equipped with an RS485

Main Components

- 7” LCD Touch Screen Monitor embedded into the Panel
- V.F.D. XQ-Drive
- High Efficiency Pump XRL Series
- Standard Manifold

Specification

- Max. Flow(Q) : 780m³/h
- Max. Head (H) : 245m
- Pump Connection : Up to 6 Pumps
- Motor Power: 0.75~22kW (1~30HP)

Pressure settings

- Alternative operation
  - Alternative operation refers to the total sum of the power accumulated
  - This in-return ensures that the operating of each pump will be the same and extends the life-line of each pump as the wear is evenly distributed amongst the pumps.
NSQP Series System

- 7” LCD Touch Monitor
- NSQ-Drive
- High Efficiency Motor
- Isolating valve
- Base (Material: SS 400)
- Low-Water Level Detector (Material: STS 304)
- High Efficiency pump
- Manifold (Material: STS 304)
**Features**

- 7" color LCD touch monitor
- Each pump are individually controlled by a NSQ drive
- High reliability (Multi-master control)
- Constant discharge pressure
- Reduced tank and panel sizes
- Less wear of the system during operation
- Compact assembly and installation
- High reliability with an installation of two pressure transmitter
- Lowest possible energy consumption
- Up to 22kW and connection of up to 6 pumps

**Main Components**

- Pressure settings
- Alternative operation
- Pump Freeze Protection
- Automatic detection of low flow on discharge
- Automatic recovery after power outage
- NSQ drive will protect the pump
- Operation display and storage
- Equipped with an RS485
NSQ Series System

- High Efficiency Motor
- Power Box
- Check Valve
- Isolating Valve
- Base (Material: SS 400)
- Manifold (Material: STS 304)
- Low-Water Level Detector
- Pressure Transmitter
- NSQ-Drive

VARIABLE SPEED CONTROLLED BOOSTER SYSTEM
Features

- 7" color LCD touch monitor
- Each pump are individually controlled by a NSQ drive
- High reliability (Multi-master control)
- Constant discharge pressure
- Reduced tank and panel sizes
- Less wear of the system during operation
- Compact assembly and installation
- High reliability with an installation of two pressure transmitter
- Lowest possible energy consumption
- Up to 22kW and connection of up to 6 pumps

Functions

- Pressure settings
- Alternative operation
- Pump Freeze Protection
- Automatic detection of low flow on discharge
- Automatic recovery after power outage
- NSQ drive will protect the pump
- Operation display and storage
- Equipped with an RS485

Main Componets

- Alternative Operation
  - Alternative operation refers to the total sum of the power accumulated
  - This in-return ensures that the operating of each pump will be the same and extends the life-line of each pump as the wear is evenly distributed amongst the pumps.
Features
- 7” color LCD touch monitor
- Each pump are individually controlled by a VFD module within the panel
- High reliability (Multi-master control)
- Constant discharge pressure
- Reduced tank and panel sizes
- Less wear of the system during operation
- Compact assembly and installation
- High reliability with an installation of two pressure transmitter
- Lowest possible energy consumption
- Up to 22kW and connection of up to 6 pumps

Functions
- Pressure settings
- Alternative operation
- Pump Freeze Protection
- Automatic detection of low flow on discharge
- Automatic recovery after power outage
- Operation display and storage
- Equipped with an RS485

Main Components

Max. Flow(Q) : 780m³/h
Max. Head (H) : 245m
Pump Connection : Up to 6 Pumps
Motor Power: 0.75~22kW (1~30HP)
N747D Series System

Single-inverter booster pump
(General inverter within the panel)

- High Efficiency Motor
- Isolating Valve
- Base (Material: SS 400)
- Low-Water Level Detector
- Manifold (Material: STS 304)
- Check Valve
**Specification**

- Max. Flow (Q): 780 m³/h
- Max. Head (H): 330 m
- Pump Connection: Up to 6 Pumps
- Motor Power: 0.75~110kW (1~150HP)

**Specification**

- N747D Controller built within the panel
- System is operated by a single general inverter
- Up to 110kW with a general inverter
- Constant discharge pressure
- Reduced tank and panel sizes
- Less wear of the system during operation
- Compact assembly and installation
- High reliability with an installation of two pressure transmitter
- Lowest possible energy consumption

**Functions**

- Pressure settings
- Alternative operation
- Pump Freeze Protection
- Automatic detection of low flow on discharge
- Automatic recovery after power outage
- LCD Monitor
- Operation display and storage
- Equipped with an RS485

**Main Components**

- General Inverter within the panel
- High Efficiency Pump XRL Series
- Standard Manifold
XQ-XR(L) Series
PREMIUM VFD MULTI-STAGE PUMP

**XQ-XR(L)**

- High-Efficiency Motor
- Power ON/OFF switch
- Pressure Tank
- Check Valve
- Pressure Transmitter
- Base
- XQ-Drive
XQ-XR(L) pumps are built on the basis of XR(L) pumps. Enhanced with the XQ-Drive, the XR(L) pump together with the appropriate sensor is turned into an intelligent, variable speed pumping system. The XQ-Drives are frequency converter integrated into the pump which adjusts the motor speed to provide constant pressure or differential pressure to the flow rate.

**Functions**
- Pressure settings
- Alternative operation
- Pump Freeze Protection
- Automatic detection of low flow on discharge
- Automatic recovery after power outage
- XQ drive will protect the pump
- Operation display and storage
- Equipped with an RS485

**XQ-XR(L) Benefits**
- 3.5” color display
- Built-in EMC filter/DC reactor
  - Reduce noise and harmonic distortion
- Energy Saving (Up to 50%)
- Maintains constant pressure
- Simplicity (Eliminates separate control panels)
- Soft start functionality to minimize mechanical stress on the pumping system

**Main Components**

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**Specification**
- Max. Flow: 130m³/h
- Max. Head: 245m
- Motor Power: 0.75~22kW (1~30HP)
- Input Power: 3Φ×380V~440V / 50 & 60Hz
- Output Power: 3Φ×380V / 50 & 60Hz

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**XQ-XR(L) Series**
**PREMIUM VFD MULTI-STAGE PUMP**

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**VERTICAL PUMP**
**VFD Multi-Stage Pump**

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**INVERTER**
NSQ-XR(L)

NSQ-XR(L) pumps are built on the basis of XR(L) pumps. Enhanced with the NSQ-Drive, the XR(L) pump together with the appropriate sensor is turned into an intelligent, variable speed pumping system. The NSQ-Drives are frequency converter integrated into the pump which adjusts the motor speed to provide constant pressure or differential pressure to the flow rate.

Specification

- Max. Flow : 130㎥/h
- Max. Head : 245m
- Motor Power : 0.75~22kW (1~30HP)
- Input Power : 3Φ×380V~440V / 50 & 60Hz
  1Φ×220V~230V / 50 & 60Hz
- Ouput Power : 3Φ×220V~380V / 50 & 60Hz

Functions

- Pressure settings
- Alternative operation
- Pump Freeze Protection
- Automatic detection of low flow on discharge
- Automatic recovery after power outage
- NSQ drive will protect the pump
- Operation display and storage
- Equipped with an RS485

NSQ-XR(L) Benefits

- Energy Saving (Up to 50%)
- Maintains constant pressure
- Simplicity (Eliminates separate control panels)
- Soft start functionality to minimize mechanical stress on the pumping system

Main Components

XR(L) Series + NSQ-Drive + Pressure tank + Check Valve