

GLOBAL PUMP SOLUTION DOOCH

60Hz



# BOOSTER PUMP SYSTEM

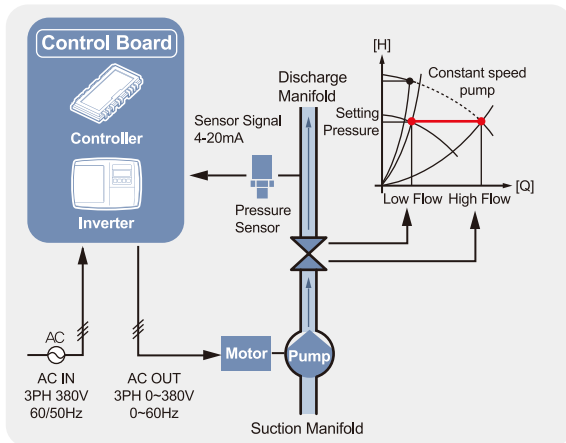
IOP, XQP, NSQP, NSQ, N747D SERIES

## Booster System

DOOCH booster system supplies the constant pressurized water to the residential buildings and high rise office buildings, where it is required.

## Features

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



## Applications

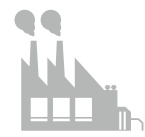
- Apartments
- Residential Buildings
- Office Buildings
- Hotels
- Industry



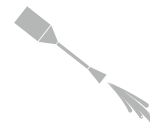
Pressurization



Boiler System



Industrial Circulation Pump Cooling System



High Pressure Washing System



Sprinkler



R/O Filtration

## System Specification

Method of Control	Individual VFD	General Inverter
<b>Models</b>	IOP, XQP, NSQP, NSQ - Series	747D-Series
<b>Operation Method</b>	Controlled by a VFD installed on each and every pumps	Controlled by one inverter on one pump
<b>Installation</b>	Indoor	
<b>Temperature</b>	-10°C~+40°C	
<b>Liquid Type</b>	Clean Water	
<b>Liquid Temp.</b>	0°C~70°C	
<b>Pump</b>	Vertical Multi-stage Pump	
<b>No. Of Pumps</b>	2~6 (NSQ Exception)	
<b>Power</b>	3PH×380V×60Hz	3PH×220/380V×60Hz
<b>Inlet/Outlet Manifold</b>	Stainless Steel	

## Definition of model

# XQ P - 3 XR(L)10-6 - 80A



**Manifold Dimensions**

**Pump Model**




- \* Pump Type - XR : Cast iron(Pump Head, Pump Casing)
- XRL : Stainless steel(Pump Head, Pump Casing)

**Number of Pumps**









**Premium Model**

"P" Indicates	Without "P" indicates
7" Touch screen LCD monitor	3.5" Color display
	













**Inverter Type**

MODEL	XQ-Drive	NSQ-Drive	N747D
Features	V.F.D. for pumps 	V.F.D. for pumps 	General inverter in a control panel 
Specification	<b>Motor Power</b> : 0.75~22kW <b>Input</b> : 3Φ×380~440V <b>Output</b> : 3Φ×380~440V <b>Frequency</b> : 50/60Hz	<b>Motor Power</b> : 0.75~22kW <b>Input</b> : 3Φ×380~440V (0.75~22kW) <b>Output</b> : 3Φ×380V <b>Frequency</b> : 50/60Hz	<b>Motor Power</b> : 0.75~110kW <b>Input</b> : 3Φ×220/380V <b>Output</b> : 3Φ×380V <b>Frequency</b> : 50/60Hz





## Control Specifications/Features

	IOP-Series IoT Individual VFD booster pump system	XQP-Series Individual VFD booster pump system
<b>Appearance</b>	  <p>조달우수제품</p>	
<b>Features</b>	<ul style="list-style-type: none"> <li>• Panel with 10.1" LCD Touch monitor (IP55)</li> <li>• All pumps controlled by individual inverters</li> <li>• Real-time monitoring with IoT function                             <ul style="list-style-type: none"> <li>- Various information such as usage patterns, trends, etc.</li> <li>- Analyze annual flow and energy consumption</li> <li>- Real-time usage flow detection function</li> <li>- Available to check the trip details and management details</li> </ul> </li> <li>• Equipped with DC reactor to suppress harmonics, EMC filter to reduce noise</li> </ul>	<ul style="list-style-type: none"> <li>• All pumps are fitted with an integrated V.F.D. which are directly mounted on the motor</li> <li>• Newly designed V.F.D. hardware (XQ Drive)</li> <li>• Pumps ranges from 0.75kW~22kW</li> <li>• 2~6 Electronically speed controlled pumps</li> <li>• Equipped with a 7.0" Touch Monitor Low energy consumption <b>(Above 30kW, 747D-Series is required)</b></li> </ul>
<b>Inverters</b>	<p>V.F.D. for pumps(XQ-Drive)</p>   <p>고효율기자재</p>	<p>V.F.D. for pumps(XQ-Drive)</p>   <p>고효율기자재</p>
<b>Type of Manifolds</b>	 <p>Standard Manifold</p>	 <p>Standard Manifold</p>
<b>Panel</b>	 <p>10.1" Integrated Monitoring Panel with Touch Screen LCD</p>	 <p>7" LCD Touch Screen Monitor</p>

## Control Specifications/Features

	<b>747D-Series</b> Inverter with panel booster pump system	<b>NSQ-F-Series</b> Individual VFD booster pump system	<b>NSQ-Series</b> Individual VFD booster pump system
<b>Appearance</b>			
<b>Features</b>	<ul style="list-style-type: none"> <li>Control panel is integrated with a general inverter which controls the pumps within the system.</li> <li>Pumps range from 0.75kW~110kW</li> <li>2~6 Electronically speed controlled pumps</li> <li>Constant discharge pressure</li> <li>Low energy consumption</li> <li>Equipped with Dooch's own N747D controller</li> </ul>	<ul style="list-style-type: none"> <li>All pumps are fitted with an integrated V.F.D. which are directly mounted on the motor</li> <li>Newly designed V.F.D. hardware (NSQ Drive)</li> <li>Pumps range from 0.75kW~22kW</li> <li>2~6 Electronically speed controlled pumps</li> <li>Equipped with a 7.0" Touch Monitor</li> <li>Low energy consumption</li> </ul>	<ul style="list-style-type: none"> <li>3.5" Color display(The latest GUI is applied)</li> <li>All pumps are fitted with an integrated V.F.D. which are directly mounted on the motor</li> <li>Newly designed V.F.D. hardware (NSQ Drive)</li> <li>Pumps range from 0.75kW~22kW</li> <li>2~3 Electronically speed controlled pumps</li> <li>Low energy consumption</li> </ul>
<b>Inverters</b>	<p>General Inverter</p> 	<p>V.F.D. for pumps(NSQ-Drive)</p> 	<p>V.F.D. for pumps(NSQ-Drive)</p> 
<b>Type of Manifolds</b>	 <p>Standard Manifold</p>	 <p>Standard Manifold</p>	 <p>Standard Manifold</p>
<b>Panel</b>	 <p>General Inverter within the Panel</p>	 <p>7" LCD Touch Screen Monitor</p>	 <p>Side Panel with individual circuit breakers (The latest GUI is applied)</p>

#### Control Specifications/Features

	XQ-XR(L) Series Built-in VFD vertical multi-stage centrifugal pump	NSQ-XR(L) Series Built-in VFD vertical multi-stage centrifugal pump
<b>Appearance</b>		
<b>Features</b>	<ul style="list-style-type: none"> <li>• Integrated V.F.D. which are directly mounted on the motor</li> <li>• Newly designed V.F.D. hardware (XQ Drive)</li> <li>• Low energy consumption</li> <li>• Compact design, no need for additional control panels</li> </ul>	<ul style="list-style-type: none"> <li>• Integrated V.F.D. which are directly mounted on the motor</li> <li>• Newly designed V.F.D. hardware (NSQ Drive)</li> <li>• Low energy consumption</li> <li>• Compact design, no need for additional control panels</li> </ul>
<b>Inverters</b>	 <p>Premium V.F.D. for pumps (XQ-Drive)</p>	 <p>V.F.D. for pumps (NSQ-Drive)</p>
<b>Manifolds</b>	 <p>Exclusive piping for V.F.D. pumps</p>	 <p>Exclusive piping for V.F.D. pumps</p>

## History Of Dooch's Booster Systems

### Generation: 1



#### Pressure Control Booster System

- Pressure ON/OFF switch
- Pressure Diviation
- Pressure Differences :  $\pm 1.2 \text{ kgf/cm}^2$

1985~

### Generation: 2



#### General Inverter Booster System

- Single pump RPM controlled
- General Inverter
- Centralized Control
- Stable Pressure
- Pressure Differences :  $\pm 0.7 \text{ kgf/cm}^2$

1995~

### Generation: 2.5



#### V.F.D. Booster System (Partial)

- Specific pumps RPM controlled via V.F.D.
- Stable Pressure
- Pressure Differences :  $\pm 0.5 \text{ kgf/cm}$
- Half pump system
- Max. power saving

2005~

### Generation: 3



#### Individual V.F.D. Booster System

- All pumps equipped with V.F.D.
- Stable Pressure
- Color 7" LCD Touch Monitor
- High Reliability
- Pressure Differences :  $\pm 0.3 \text{ kgf/cm}^2$

2005~

### Generation: 3.5



#### Individual V.F.D Booster System

- 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 :  $\pm 0.3 \text{ kgf/cm}^2$

2015~

### Generation: 4



#### IoT Individual V.F.D Booster System

- Real-time monitoring as IoT function
- All pumps RPM controlled
- All pumps equipped with V.F.D.
- EMC Filter/DC reactor internally installed
- Color 10.1" LCD Touch Monitor
- Stable Pressure, power saving
- Pressure Differences :  $\pm 0.3 \text{ kgf/cm}^2$

2021~

## Premium XQ-Drive

XQ DRIVES is pump-specific variable frequency drives 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 energy consumption.

As the drives have a self-cooling and motor-independent structure, they 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 a DC reactor are also installed within the XQ Drives.



## Technical Specification

Available Power	0.75~22kW
Input Power	3Φ×380V~440V
Output Power	3Φ×380V~440V
Frequency	50/60Hz
Max. Frequency	60Hz
IP Class	IP 55
Max. Distance Of Pressure Transmitter	Max. 10m
Ambient Temp.	-10℃~+40℃

## Protections

- 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

Available Power	0.75~22kW
Input Power	3Φ×380~440V (0.75~22kW)
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## NSQ-Drive Features

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### One Pump Controller OPC-1000/OPC-1001

One pump controller OPC-1000 and OPC-1001 are applicable for any general inverter, and this product enables the latest pump control function of pump inverter.

Since this product is applicable for any general inverter, it can be utilized without limitation of pump power.

Also, this product is easy to set up the pressure and provides various pump protection functions.



### Specification

<b>Input Power</b>	1Φ×200~240V / 50~60Hz
<b>Communication Port</b>	RS485 communication MOD BUS-RTU CAN communication (Internal communication)
<b>Display</b>	3.5" TFT TRUE COLOR LCD(320×240) : OPC-1001 3×LED : OPC-1000
<b>Multi-function Input/Output</b>	RUN/STOP, RESET, EMSTOP, Pressure sensor input(2ea), Low water level sensor, Multi-function digital input(3ea), Multi-function analogue input (1ea), RUN/STOP, FAULT relay output, Multi-function analogue output(1ea)
<b>Control Signal</b>	RUN/STOP, RESET, EMSTOP, Analogue signal input, Frequency command analogue output RUN/STOP, FAULT relay signal

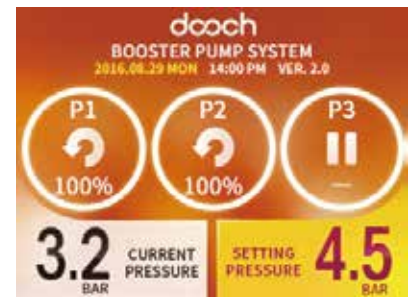
### Properties

- Control for Static pressure and Differential pressure  
- 2 pressure sensor wiring available
- Pump control with General inverter available  
(No limitation for inverter capacity)
- Interactive control available up to 6 pumps  
(Maximization of system stability)
- Pump protection function available  
(High pressure, Low pressure, and Pressure sensor error)
- Control parameter set-up via Keypad  
(For the case of OPC-1000, optional item)
- Log indication for Pump/Inverter operation  
(Key pad type only)

### Color Monitor TM3.5

TM 3.5 monitor receives the data from pumps with inverters, and provides the integrated information for user's easy understanding.

Also, it is easy to set the system pressure, and user can understand the various pump information such as pump operation log or alarm log, with user-friendly UX and GUI.



### Specification

<b>Input Power</b>	1Φ×200~440V / 50~60Hz
<b>Communication Port</b>	RS485 communication MOD BUS-RTU
<b>Display</b>	3.5" TFT TRUE COLOR LCD(320×240)
<b>Multi-function Input/Output</b>	SYSTEM RUN output relay contact SYSTEM FAULT output relay contact
<b>Storage Medium</b>	SD card available (Logging data storage)
<b>Update Port</b>	USB ×1EA

### Properties

- Full color display
- Easy to set the pressure
- Icons includes; History of Run/Alarm and various information
- Languages includes; Korean/Chinese/English
- RS-485: Integrated communication with each drive information
- USB PORT: Firmware upgrade port
- Available up to 3 pumps
- Logging data records  
(Setting pressure, Current setting, Operation data of each pump)

## Pump-specific Internet modem DL-1000

### Input power specification

Rated voltage	AC220V
Rated frequency	60Hz

### Product specification

Product size	140 x 140 x 44mm
Product weight	1.1Kg

### Communication method(Booster pump communication)

Communication method	RS-485 / Ethernet communication
Communication protocol	Mod-bus(RTU mode)
Server communication	TCP / IP



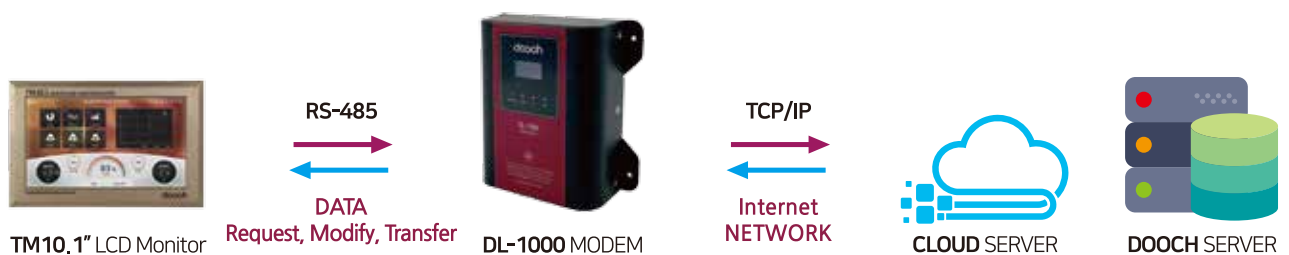
## The name & port of the parts

No.	Description	Remark
①	Power input	AC220V
②	USB port	
③	Service port for update	
④	RS-485 Communication port	Booster pump connection
⑤	LAN(TCP/IP)	Internet connection



## Composition

- Connect booster pump system and cloud server
- Transfer data collected from booster pump to data cloud server
- Transfer command from monitoring system to booster pump





## Features

- Full Color Display
- Touch Screen Interface
- User-Friendly/Easy to function
- Icons includes; History of Run/Alarm and other various information
- Languages include; Korean/Chinese/English
- RS 485: Integrated communication
- USB PORT: Firmware upgrade port

## Specification

- 7" TFT LCD
- Touch Screen Monitor
- RS-485 PORT : 2 ports
- CAN COM. PORT : 1
- Run/Alarm contact
- Power: 220~440V
- Temp. & Humidity : -10~40℃ / 90% Under
- USB PORT

## Model Application

Models	Available	Unavailable
NSQ-Series		●
NSQP-Series	●	
XQP-Series	●	

※ P: Indicates a TM 7.0" Touch Monitor is included with the system

## 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)

	<b>Ratio</b> Current operating ratio		<b>Current</b> Current Value
	<b>Power</b> Current power consumption		<b>Frequency</b> Current operating frequency
	<b>Accumulated Power</b> Current Power accumulation		<b>Output Power</b> Current Output Power

6. Status
7. Run History
8. Set-Up

## Features

- Full-color display
- User-friendly touch screen interface
- Easy to set pressure
- Icons include; History of run/alarm and other various information
- Languages include; Korean/English/Chinese
- Integral monitoring system; gather information of each drive via CAN communication
- Comfortable UX Interface/GUI; high-quality user recognition rate & operability
- Easy firmware upgrade with usb port



## Configuration of LCD Monitor



Category	Screen layout
1	Pump status
2	Trend
3	Current date/time
4	Current pressure value
5	Run/Stop
6	Settings
7	Current operation ratio/ Total flow rate
8	Run history
9	Indicator
10	Current pressure

## Functions

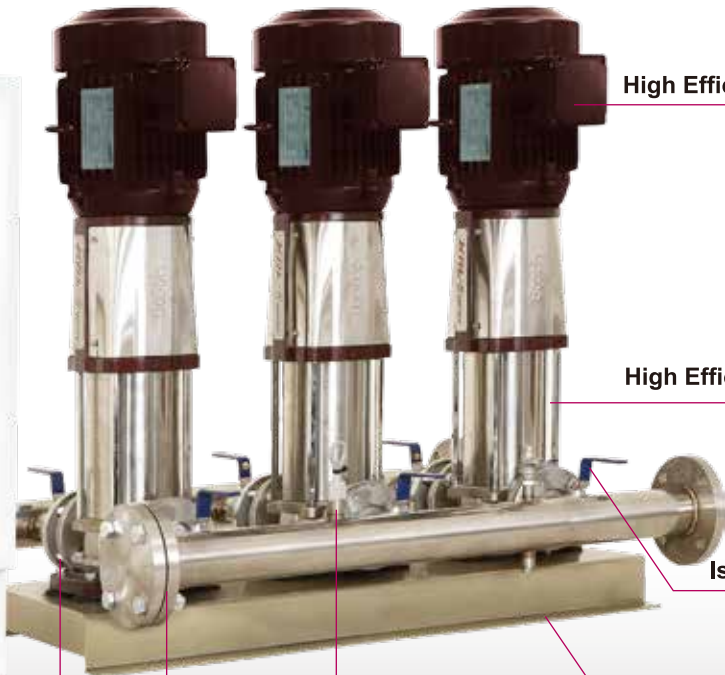
- Lcd touch screen – Large LCD screen; indicate various information graphically
- Language selection – Korean(Standard)/English/Chinese
- Digital I/O function – Run system by external digital input/control function; stop, alarm etc.
- Analog I/O function – Convert 4~20mA of external signal internally or internal signal externally
- Schedule run – Operatable in different pressure values by time/date/month
- Record & save run history – Record and save various run histories in SD card on a real-time basis
- Indicate & save alarm content – Indicate and save various alarm/breakdown content
- Remote monitoring system – Monitor running status & alarm remotely with integrated contact
- CAN communication – Connected with booster pump system
- RS-485 communication – Connected with external devices

#### N747D Series System

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



General Inverter



High Efficiency Motor

High Efficiency pump

Isolating Valve

Base  
(Material : SS 400)

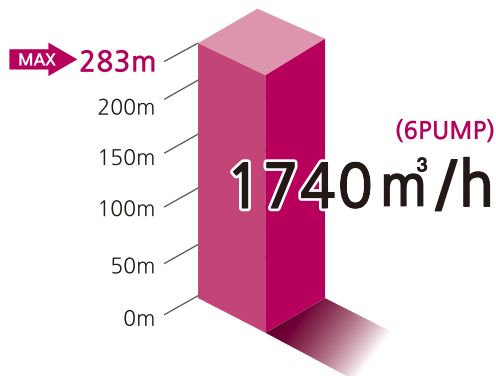
Low-Water Level Detector

Non-return Valve

Manifold  
(Material : STS 304)

## Specification

- Max. Flow(Q) : 1,740m<sup>3</sup>/h
- Max. Head (H) : 283m
- Pump Connection : Up to 6 Pumps
- Motor Power: 0.75~110kW (1~150HP)
- Power specification : 3Φ×220/380V / 60Hz



## Features

- 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
- Lowest possible energy consumption

## Functions

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

## Main Components



General Inverter within the panel

Option

STS Panel box, Outdoor double box

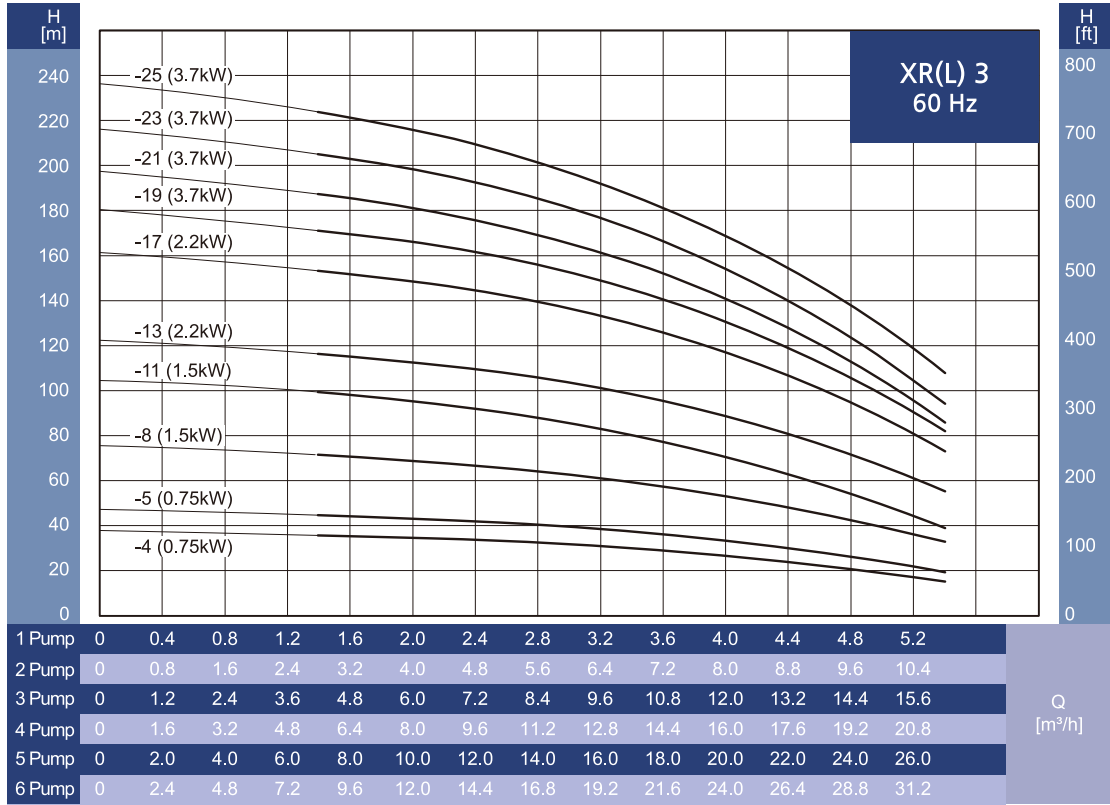


High Efficiency Pump  
XR(L) Series

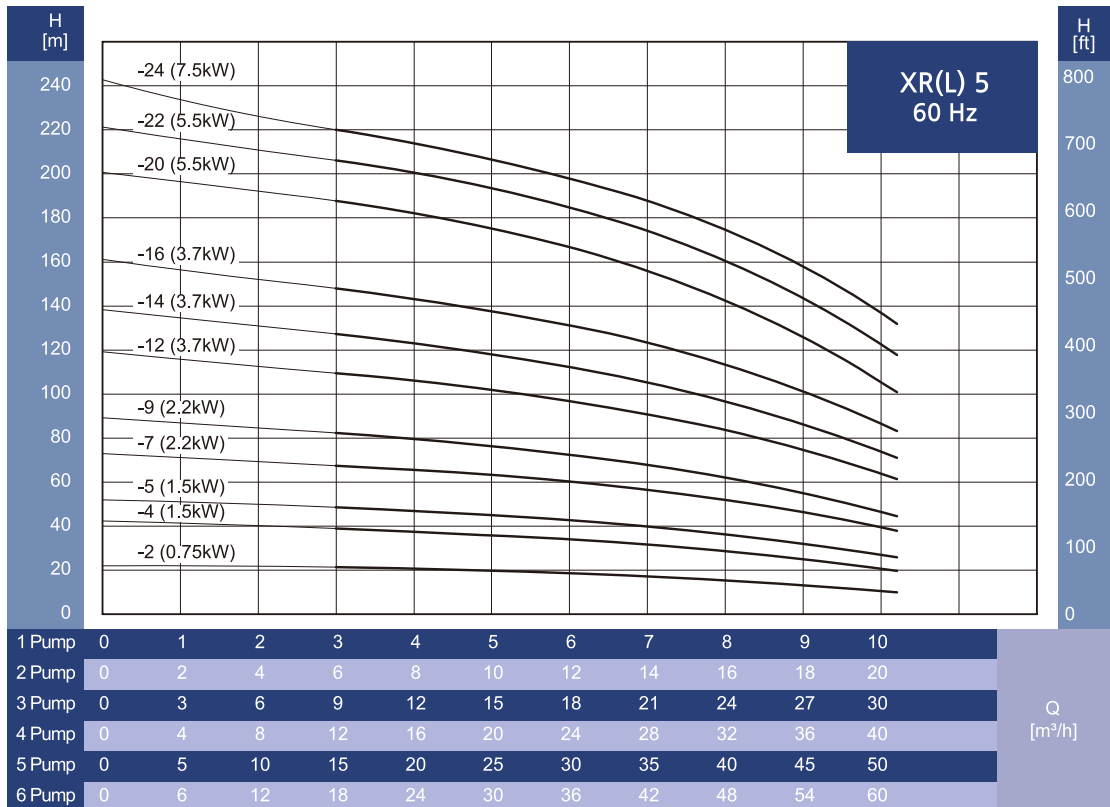


Standard Manifold

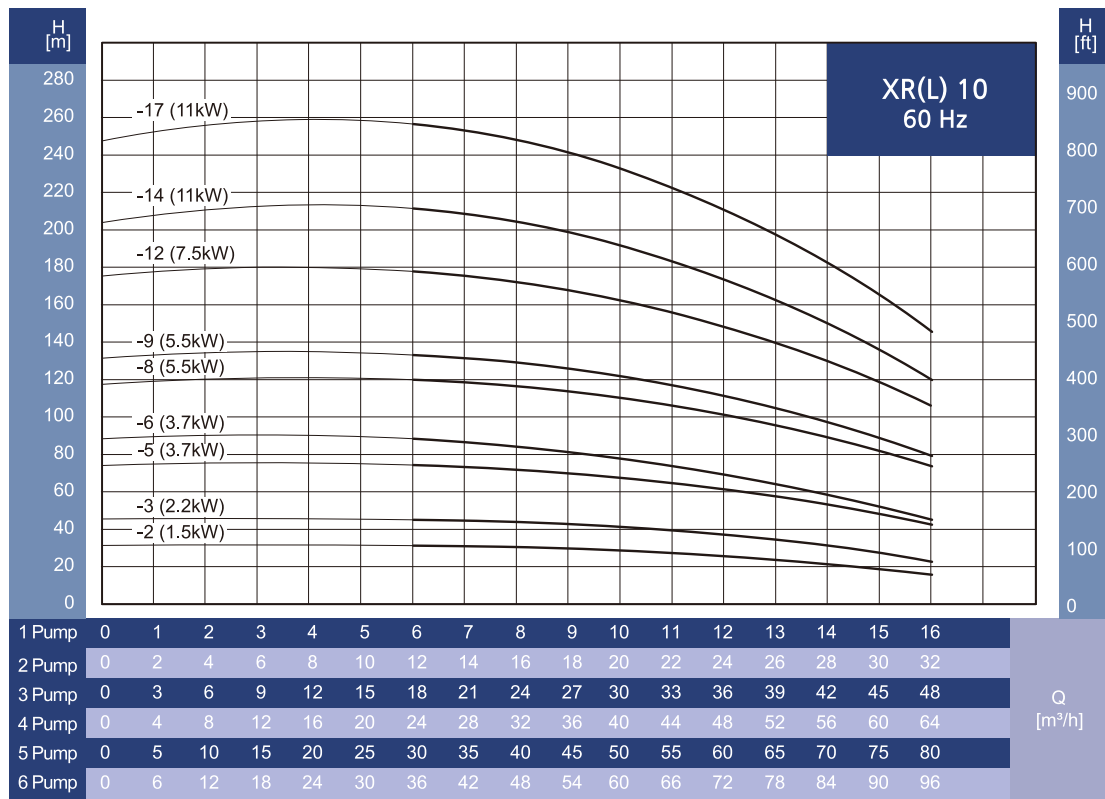
#### XR(L) 3 Series



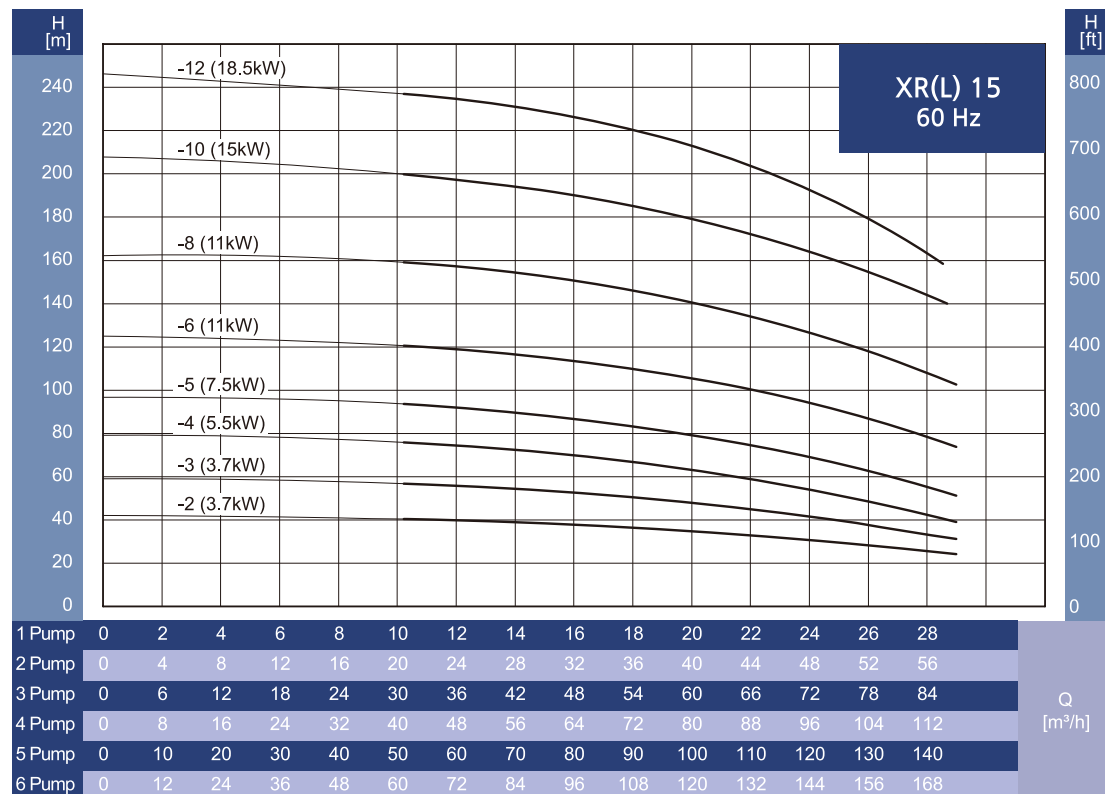
#### XR(L) 5 Series



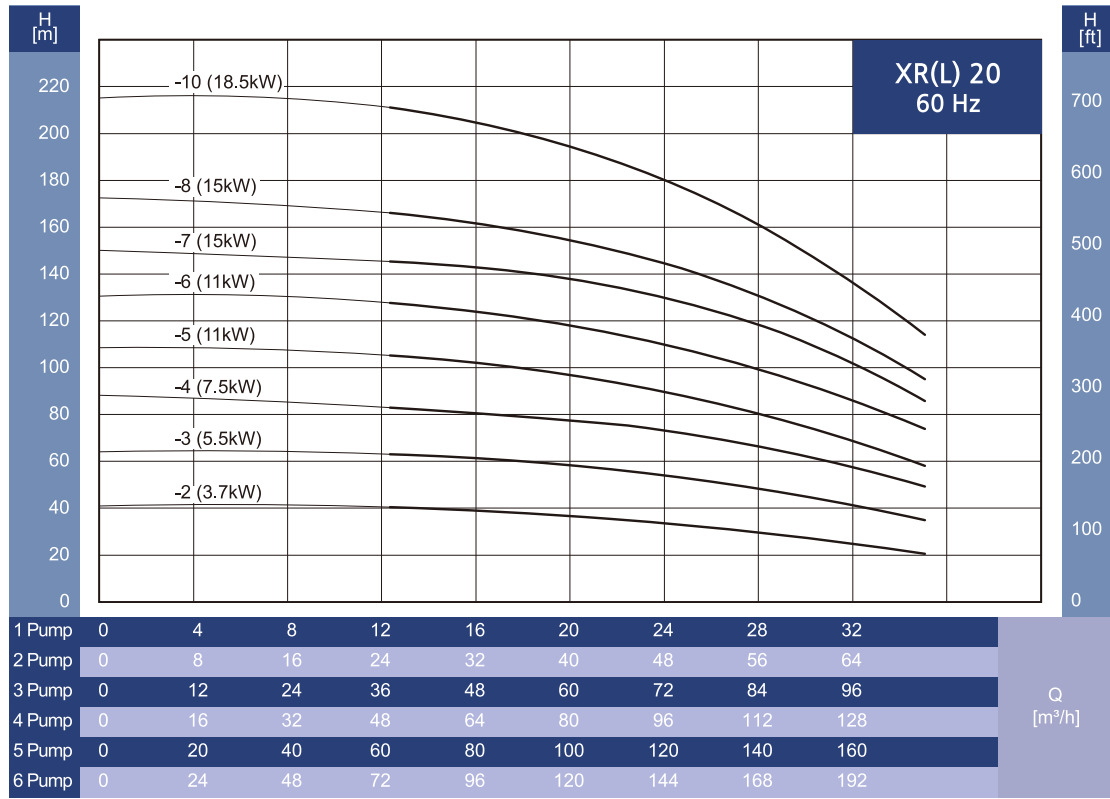
#### XR(L) 10 Series



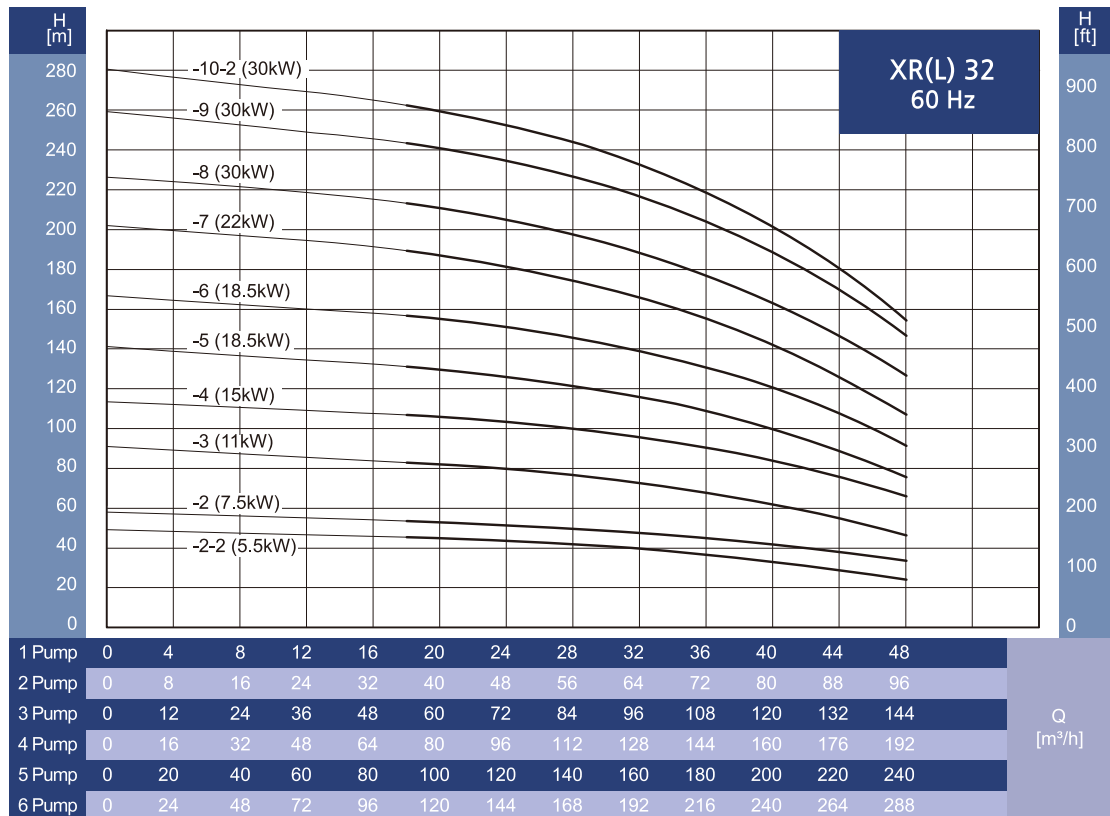
#### XR(L) 15 Series



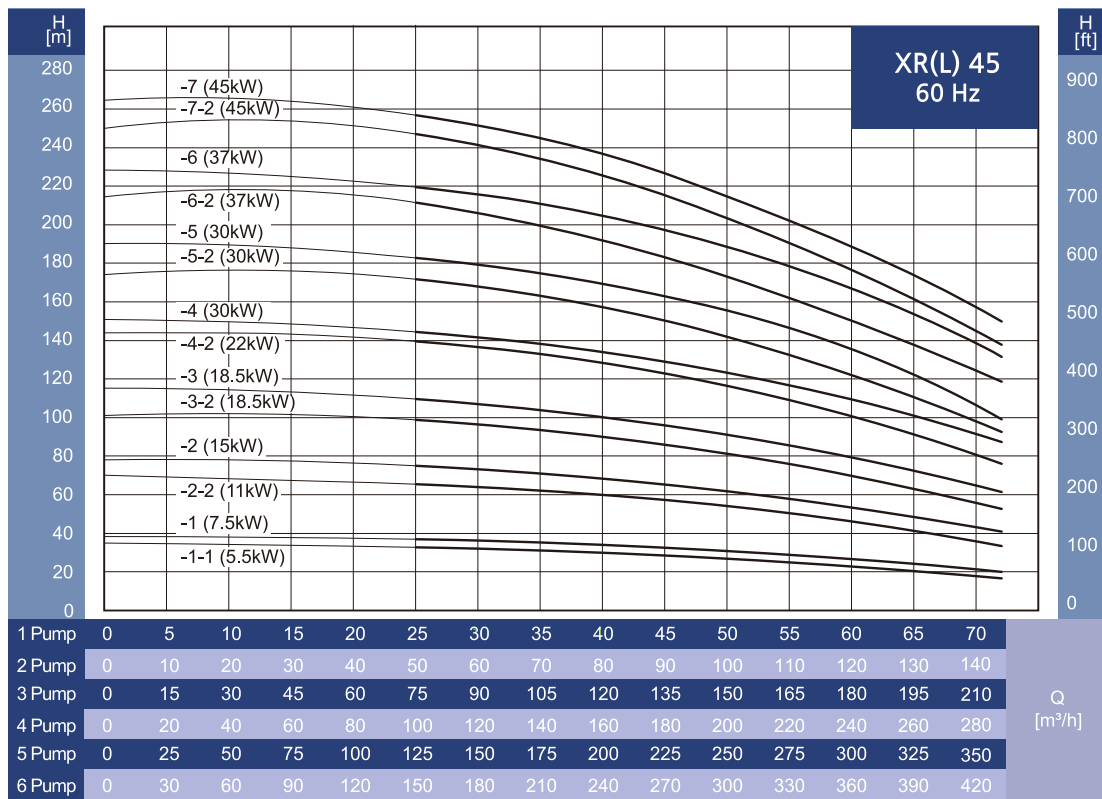
#### XR(L) 20 Series



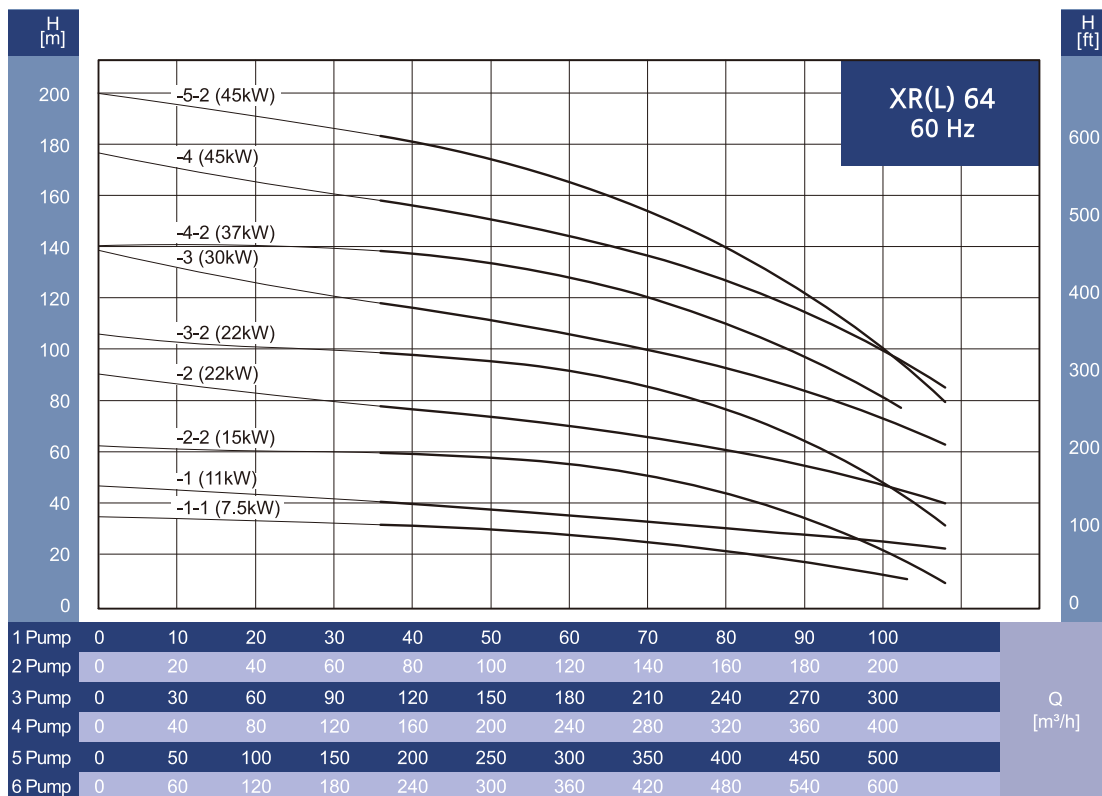
#### XR(L) 32 Series



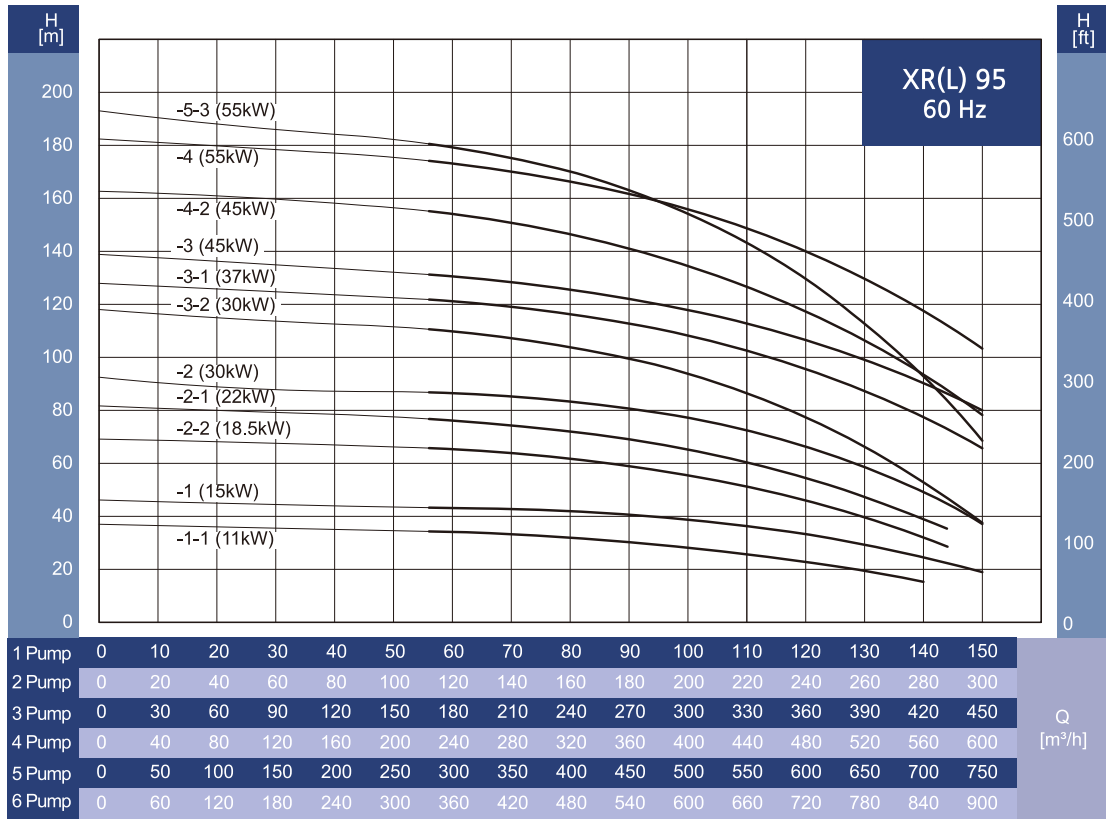
#### XR(L) 45 Series



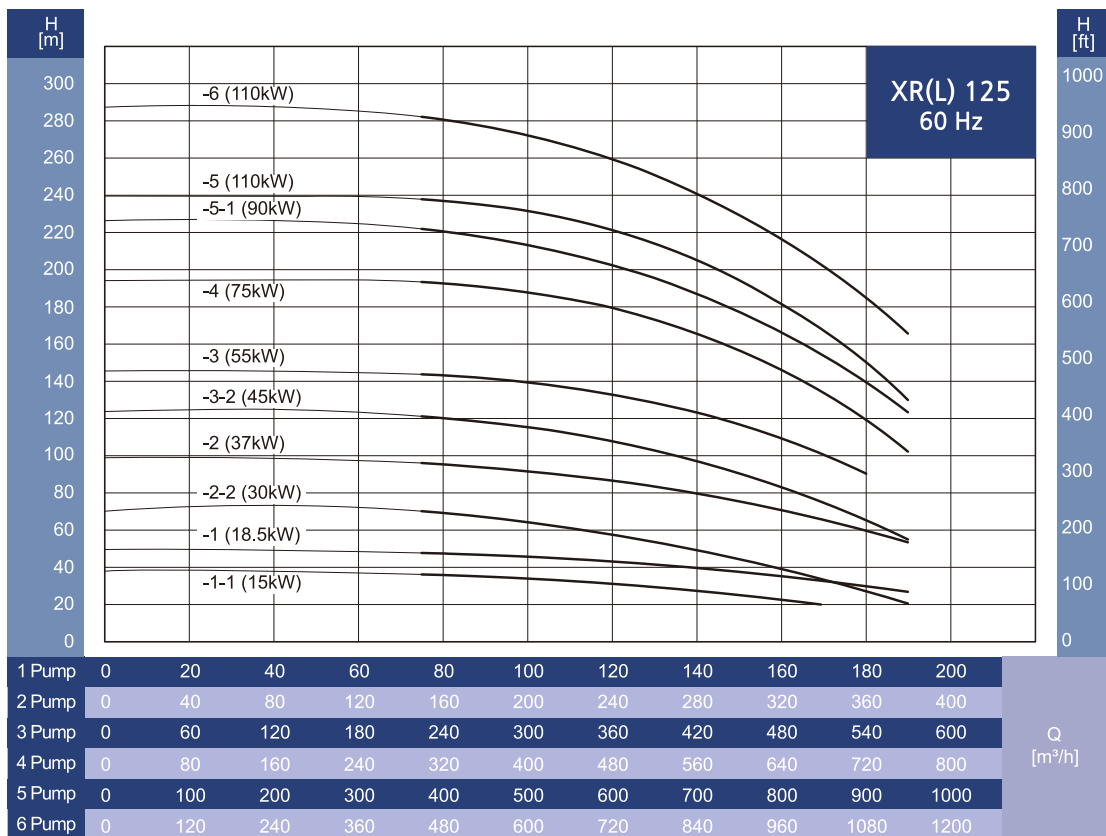
#### XR(L) 64 Series



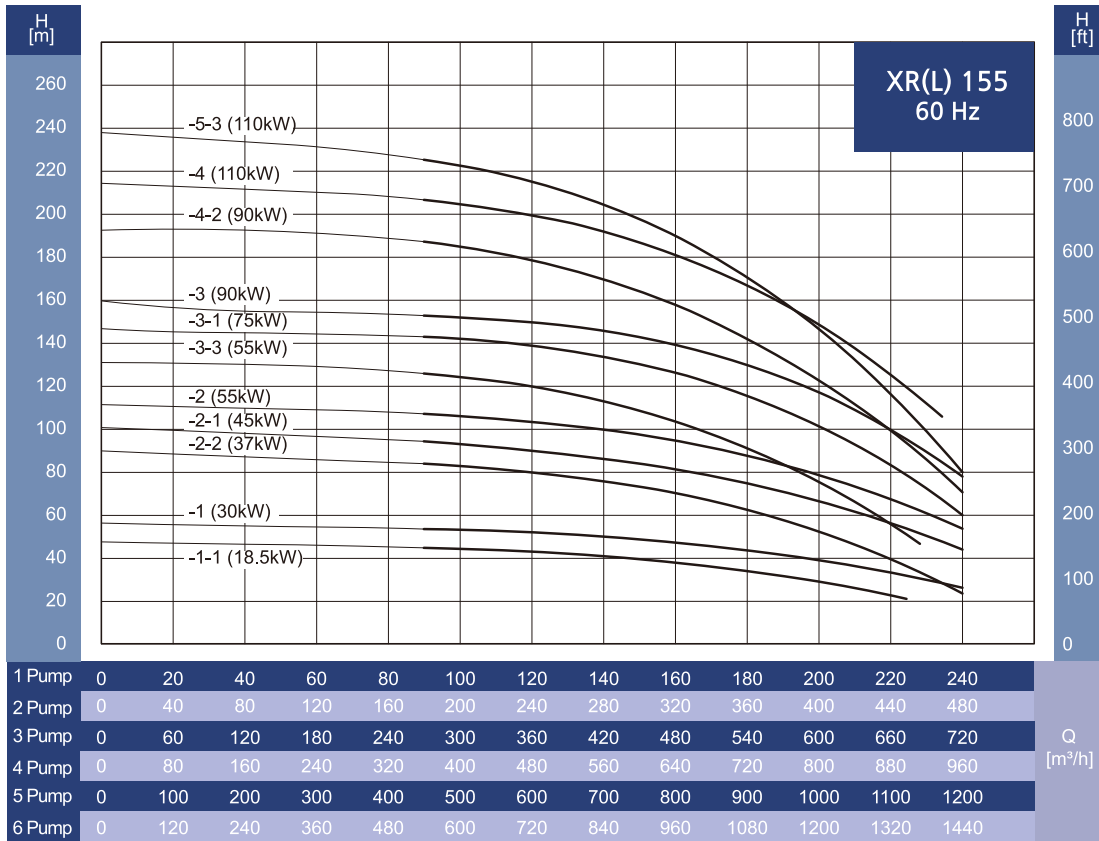
#### XR(L) 95 Series



#### XR(L) 125 Series



#### XR(L) 155 Series



#### XR(L) 185 Series

