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## AQUAMATIC AMV-FE

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### **BOOSTER SET WITH ENHANCED CONTROLS**

with Fire Sprinkler Mode

for combined domestic water and sprinkler systems to BS 9251:2021

# AQUAMATIC AMV-FE

## BOOSTER SET WITH ENHANCED CONTROLS

### OVERVIEW

The Aquamatic AMV-FE range of quality assured cold water pressure booster sets, is designed to increase the pressure of the cold/hot water services within a building where the existing incoming mains or feed tank is not capable of supplying sufficient system pressure. The range incorporates efficient inverter driven variable speed pumps, which continually vary the motor speed to match the changing flow demand pattern, whilst maintaining a constant system duty pressure. This mode of operation, adjusting the pump's motor speed to the building's flow requirements, reduces the power consumption dramatically when compared to fixed speed motor control.

Our AMV-FE pump sets are manufactured to allow all of the 2 to 8 pumps (more if required) to run together if necessary. So pumps may be sized with or without a standby pump. All are programmed to run in staged cascade operation as the flow demand increases and similarly as demand decreases. All pumps are assembled on a common base frame with a Microprocessor, control panel and all necessary valves and fittings to ensure ease of installation and efficient, reliable operation.

'Fire Press' mode where a combined domestic and residential sprinkler booster set is needed to integrate into systems designed in accordance with BS9251:2021.

### Features

- Energy Efficient Variable Speed Blueflux® motors to EuP IE3 grade (0.75kW to 2.2kW motors exceed EuP IE4 grade)
- '2020Plus' Microprocessor/Transducer Control for long term reliability and accuracy with 'REPRESS' hydraulic shock system protection
- Automatic Cascade Control for all pumps
- User Friendly Keypad & illuminated 2 line LCD Display for 'Plain English' information for both system status and system pressure
- Electronic Low Water Cut-Out for pump dry running protection, with auto re-start upon water restoration
- All pumpsets are WRAS approved and are ECA Energy Technology Listed Product
- BMS Volt Free Enhanced package fitted as standard
- Built to Latest CE Requirements and in accordance with ISO9001
- 304 Stainless steel pipework as standard
- Flows and Heads to client's requirements
- BS9251 'Fire Press' mode for combined domestic and sprinkler systems

### SPECIFICATION

Cold Water Pressure Booster Pump Set arranged for operation as duty pump with assist standby pump(s) all under efficient variable speed motor control via

Aquatech Pressmain 2020Plus microprocessor control panel requiring single/three phase electrical supply (as appropriate – see below). Complete with interconnecting wiring and all necessary valves and fittings which form the suction and discharge manifolds. All complete on a steel base frame. Designed, manufactured and tested in accordance with ISO9001 quality assurance procedures, using PED and WRAS approved components suitable for potable water specification. Compliant with all relevant European Community Directives as required by UK law and CE marked.

Automatic variable speed pump motor control by Aquatech Pressmain 2020Plus microcontroller for long term reliability and accurate pressure measurement by 392 transducer. Automatic alternations of all pumps to even run times with adjustable pump running time. Sequential pump starting to avoid overloading electric supply. Hand/off/auto switches for each pump on panel fascia. Motor overload protection. Electronic low water protection, interlocked door isolator, RS232/485 serial communication port. Data logging function, indicators for pumps run, hand, off and auto. "User Friendly" fascia mounted keypad for entering/retrieving data and system parameters, with illuminated 2 line LCD display for pressure, faults and information in plain English.

Also indicating: Power on, System Working Pressure, System status, twin Low and High Water Level in feed tank (where fitted - see page 4), Low System Pressure, High System Pressure, Pump Hours run, Pump Failed, Transducer Failed and service reminder. Our 2020plus enhanced micro software also features the RE-PRESS power restoration electronic safety system, offering the end user a controlled system refill following electrical supply failure, protecting against hydraulic shock.

In addition to the above there is the "BMS Enhanced" package fitted which gives 8 volt free relay outputs, pump tripped lights on panel fascia. The above equipment is complete with all necessary terminals, labels and interconnections, enclosed in a sheet steel, dust and damp proof housing with lockable door to IP55.

### Finish

Pump bodies are finished in electrophoresis coating. Panel is powder coated. Stainless steel pipework is left unpainted for effect.



### Control Pressure Vessel

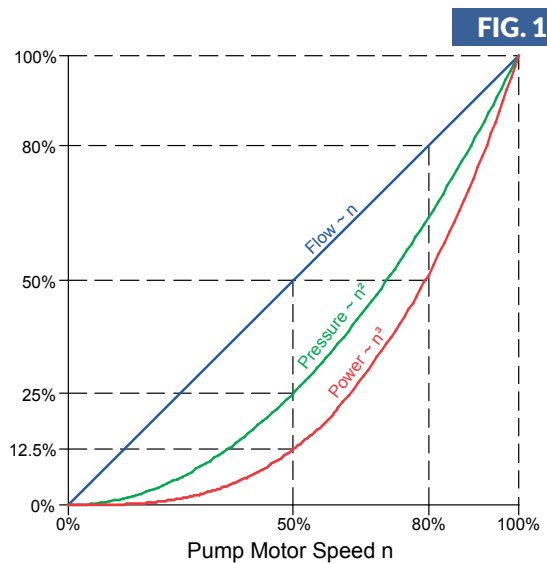
To assist with the constant pressure controls a suitably sized WRAS flow through design pressure vessel is provided complete with a flowjet combined isolating and drain valve.

**Flowjet** – Flow through, shut-off and discharge valve

## VARIABLE SPEED PUMPING PRINCIPLE

The basic concept is to alter the pump speed to match exactly the required demand of water to the system, using the principle that flow rate is directly proportional to pump speed. The electricity consumed by the pump motor is proportional to the cube of the pump speed. It can be shown (Fig. 1) that a 20% reduction in flow rate from the peak demand will reduce the power consumed by the motor by 50%. As the flow demand continues to decrease further savings in pump motor power consumption can be achieved.

Not only does this produce a saving in electricity consumption but it also provides other benefits such as reduced strain on the pumpset and system components by excessive pressure and water hammer, smoother and quieter operation through “ramped” acceleration and deceleration of the pump. Also constant pressure output is available where over-pressure could have an adverse effect on the system such as when refurbishing old buildings using the existing pipework or where calorifiers have a limited pressure rating.



## AMV-FE OPTIONAL FEATURES & ANCILLARIES

### Pipework Material Options

Aquatech Pressmain will supply 304 Stainless steel pipework manifolds as standard, however we can provide Galvanised, ABS, UPVC, 316 Stainless Steel or Copper from the HY-AV & BTE product ranges.

### Flexible Connections

Made from EPDM rubber and WRAS approved for potable water applications, this spherical bellows type flexible coupling joint will absorb pipe movements, isolate vibration, reduce system noise. Gaskets are not required and the joints are easily and speedily installed.

### Anti Vibration Mountings

When fitted this turret type mount will isolate the pump package from the ground or floor-mounting surface. The mounting will arrest and reduce pump rotation starting inertia and associated vibration being transmitted through the ground or floor-mounting surface, which could potentially cause a noise problem.

### High & Low Level Feed Tank Alarm Probe: LWP3

Up to two high and two low LWP3 tank probes can be connected to the 2020Plus control panel. This probe is available for side and top mounting and provides a visual warning of tank high level via the control panel fascia. BMS link is also provided via the shared level volt free output.

### GRP Weather Proof Enclosure

Where internal plant room space is at a premium or where a unit needs to be remotely located this fully encapsulated 25mm pre-insulated GRP enclosure may provide the ideal solution. It is supplied with an internal frost stat, heater, natural vents and access door with Yale lock.

### Acoustic Attenuation Enclosure

Although the standard package meets stringent EC noise levels, this enclosure is specifically designed for noise sensitive applications. Typically an insertion loss of approximately 30dB(A) can be achieved in most applications. Enclosures are supplied complete with naturally ventilated acoustic louvres, removable panels for easy pump maintenance and glazed vision panel for viewing pump controls fascia.

### Remote Alarm Panel

Suitable for wall mounting where indications of warning and alarm conditions are required remote from the unit's location.

### Distribution Manifolds

Prefabricated with our proven in-house copper extrusion method. Can be assembled with any number of individual stabbings and combination of isolating, non-return, double check valve & water meters to suit the building installation requirements.

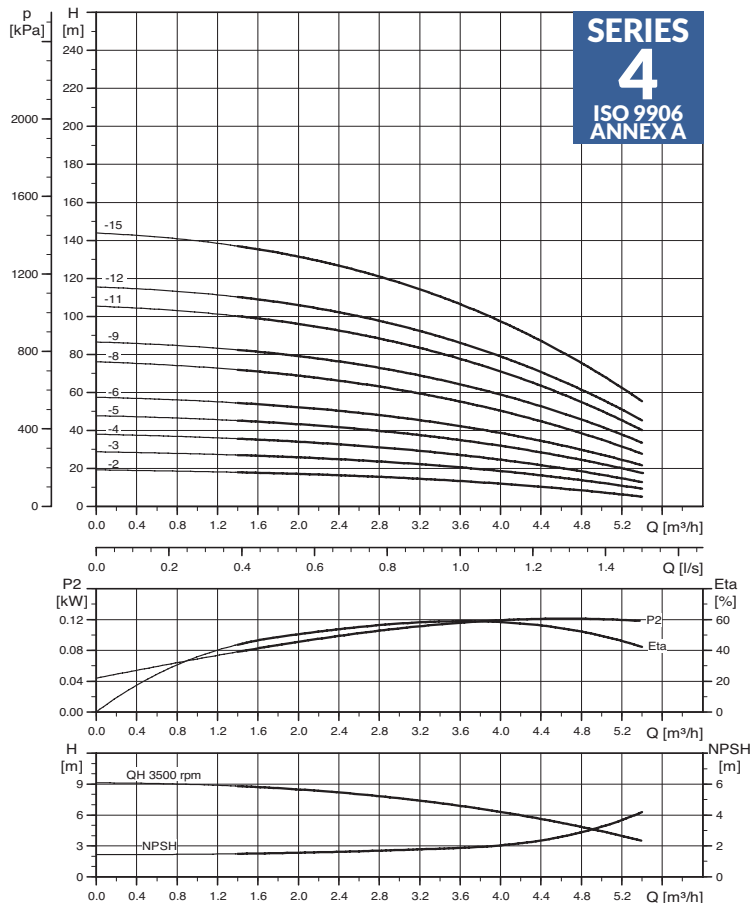
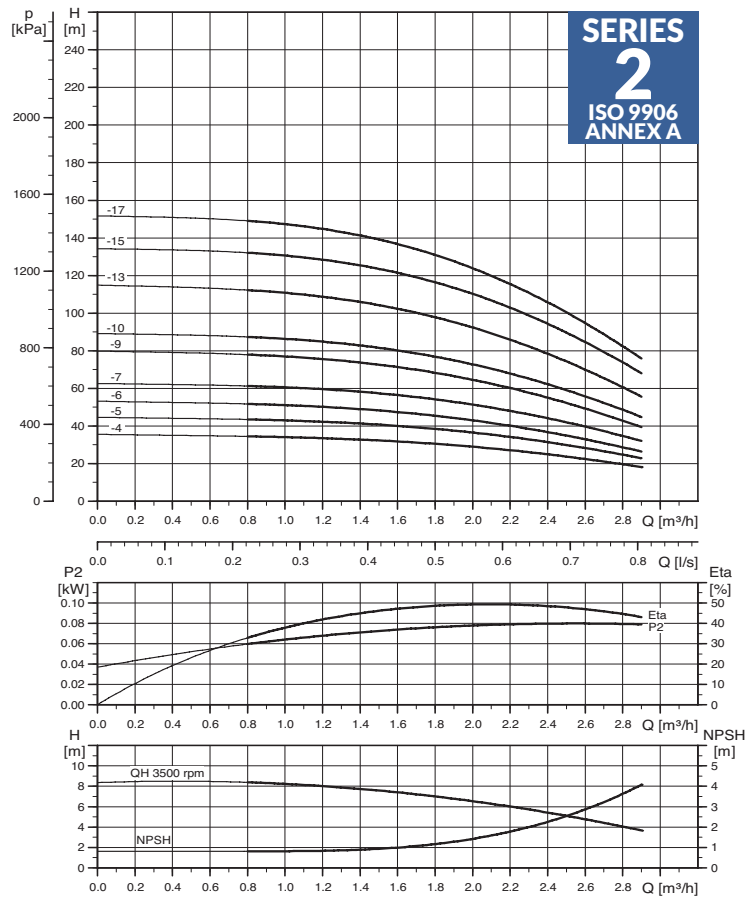
### Control Panel Options

In addition to the standard features listed we can provide and are not limited to the following options; Emergency Stop Button; Pump run volt free contacts; Individual pump isolators; Anti-Condensation panel heater; Volt meter & switch; 4-20ma pressure output.

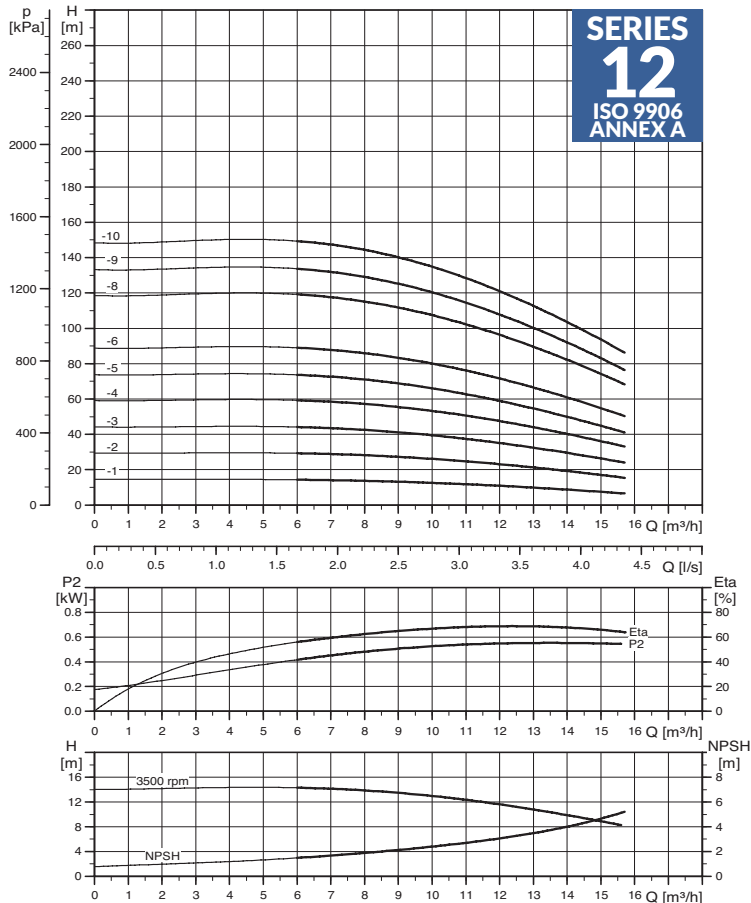
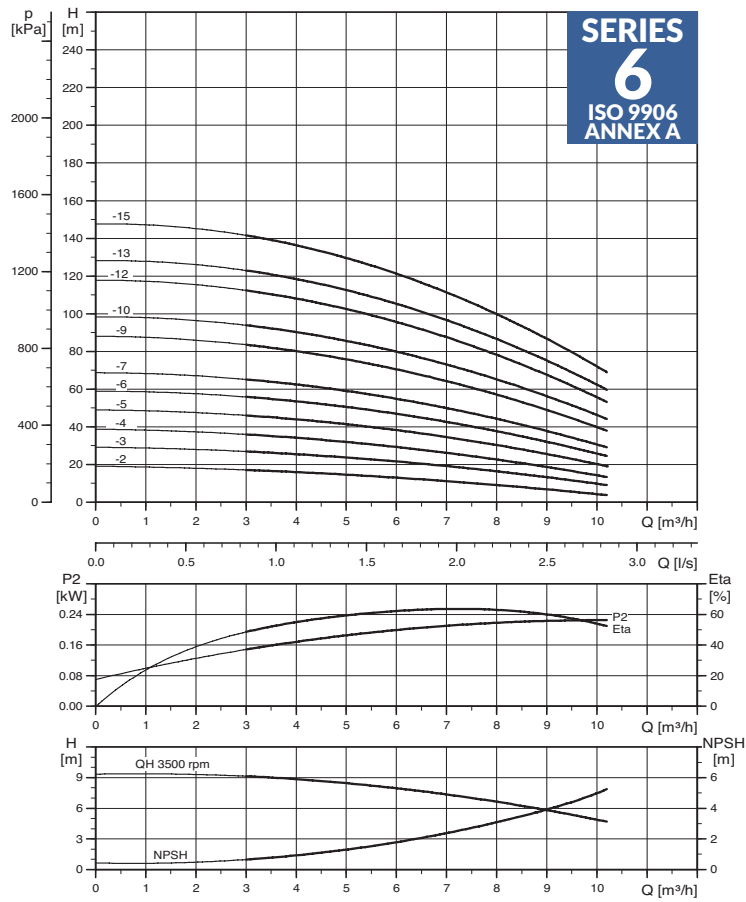
### Aquavent

Designed to help assist with the draining down and refilling of pressure boosted water supply pipework by helping to prevent damaging pressure shocks from occurring. Whether a system pipework is drained down intentionally for maintenance or unintentionally as a result of the pressure booster set stopping, either by power interruption or a low water condition there is the potential of pressure shocks when the pressure booster restarts.

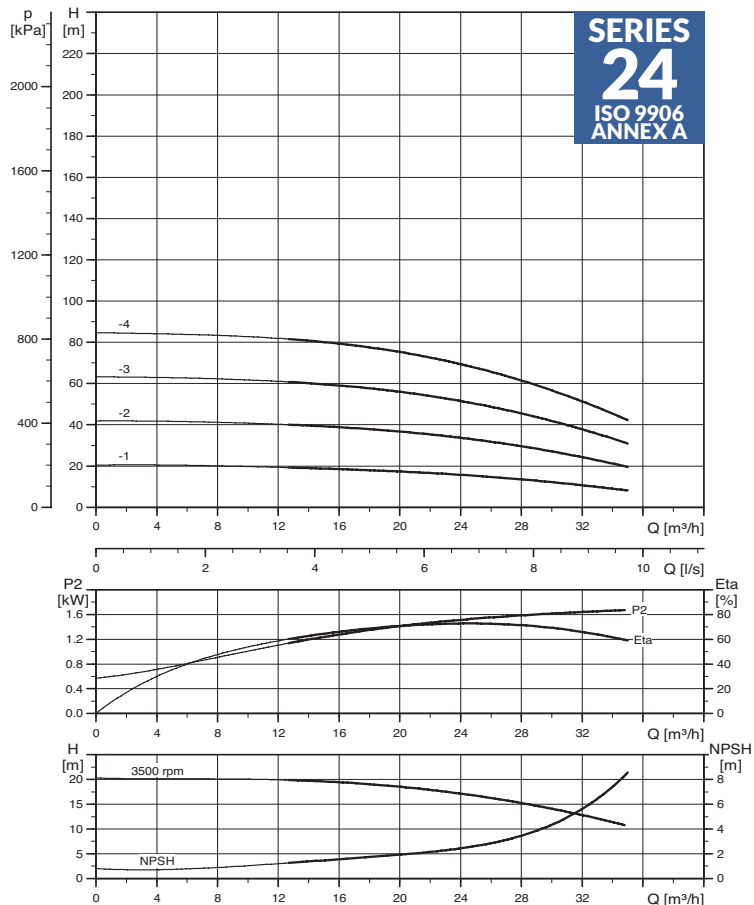
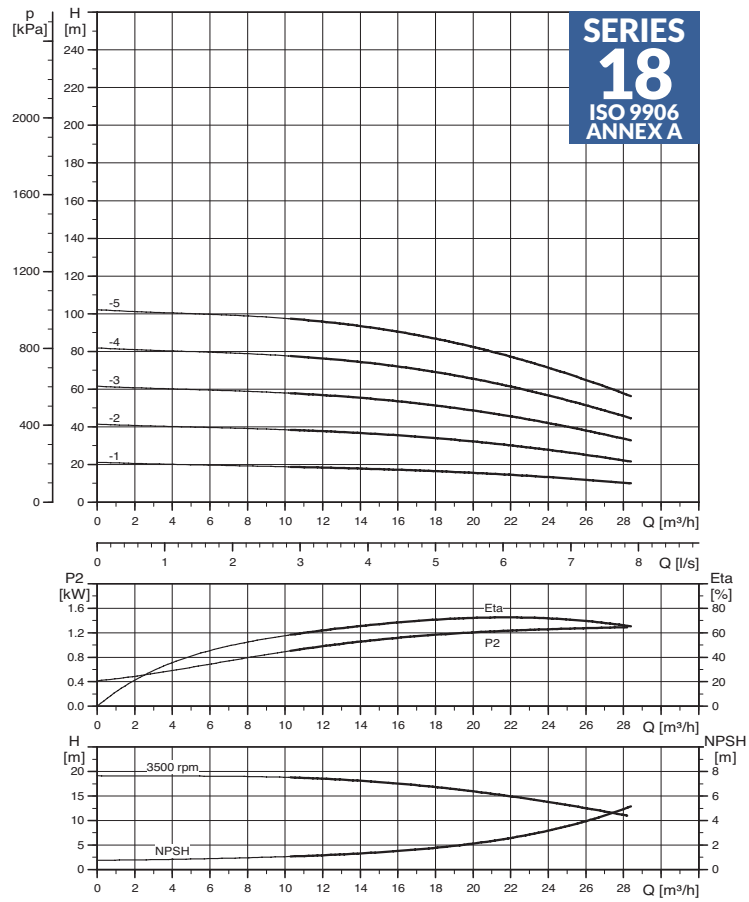
# INDIVIDUAL PUMP SELECTION CURVES SERIES 2 & 4



# INDIVIDUAL PUMP SELECTION CURVES SERIES 6 & 12



# INDIVIDUAL PUMP SELECTION CURVES SERIES 18 & 24



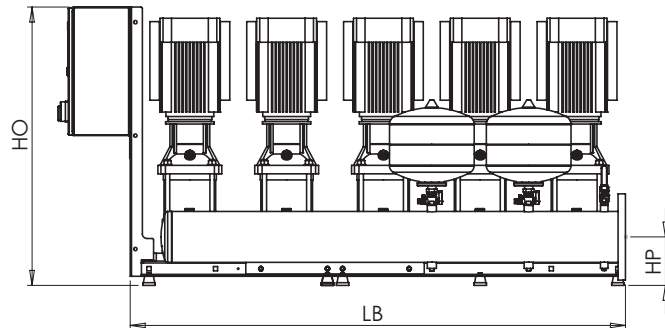
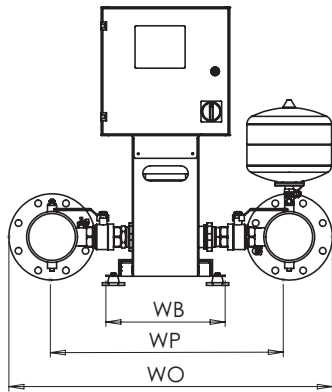
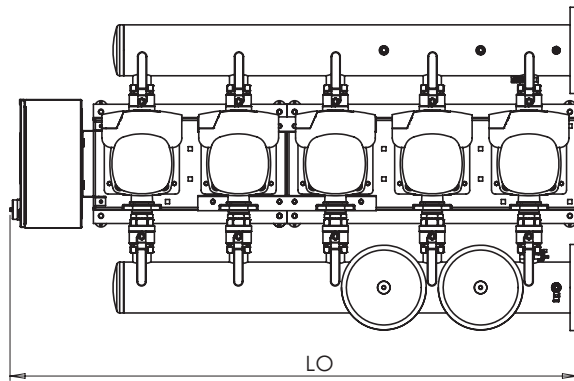
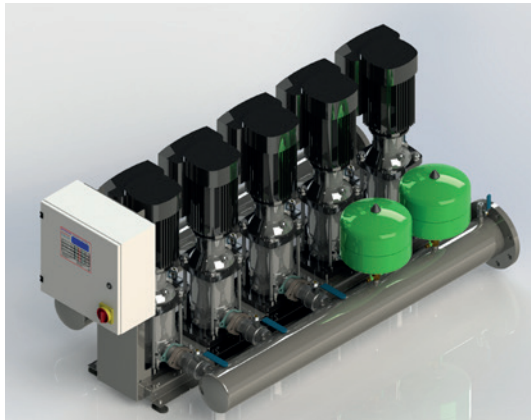








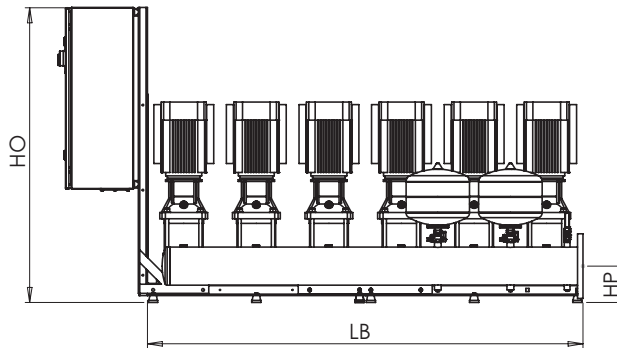
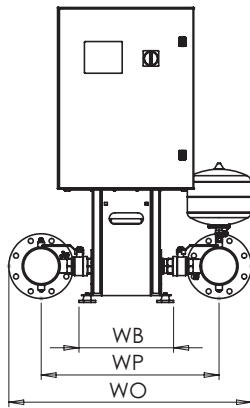
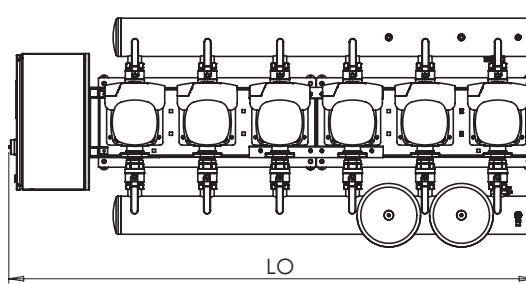
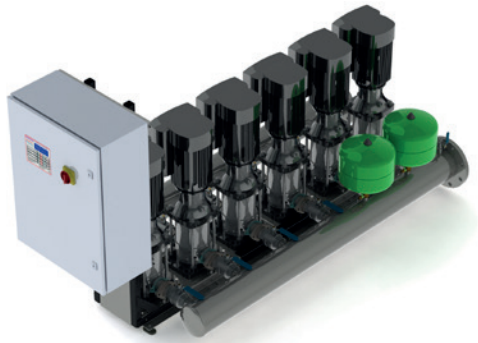
# FIVE PUMP MODEL AMV5-FE DIMENSIONS



## AQUAMATIC AMV5-FE VARIABLE SPEED FLOW-THROUGH COLD WATER BOOSTER

PUMP TYPE	kW PER PUMP	FULL LOAD CURRENT 1Ph 240V AMPS	FULL LOAD CURRENT 3Ph 415V AMPS	TOTAL DRY WEIGHT OF UNIT (KG)	SOUND LEVEL dB(A)	BOOSTER SET DIMENSIONS [+/- 10mm]							FLANGE SIZE	VESSEL(S)	1 Ph 240V STOCKCODE	3 Ph 415V STOCKCODE	ETL RECLAIM MODEL NUMBER FOR EACH MOTOR 1PH 230V	ETL RECLAIM MODEL NUMBER FOR EACH MOTOR 3PH 400V
						LO	WO	HO	HP	LB	WB	WP						
12-1	0.75	24.5	9.5	392	58	1880	1075	920	160	1650	420	785	DN150 PN16	2X 12 LTR	BWJ-521001	BWJ-541001	80A 2 H 0.75	80A 2 I 0.75
12-2	1.5	45.5	16	487	64	1880	1075	920	160	1650	420	785	DN150 PN16	2X 12 LTR	BWJ-521002	BWJ-541002	90SC 2 H 1.5	80B 2 I 1.1
12-3	2.2	N/A	22	512	64	1880	1075	920	160	1650	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-541003	N/A	90LD 2 I 2.2
12-4	3	N/A	33	462	70	1880	1075	920	160	1650	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-541004	N/A	100LC2-D1
12-5	3	N/A	33	462	70	1880	1075	920	160	1650	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-541005	N/A	112MC2-D1
12-6	4	N/A	42.5	547	75	2000	1075	1500	160	1650	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-541006	N/A	112MC2-D1
12-8	5.5	N/A	57	647	80	2000	1075	1500	160	1650	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-541008	N/A	132SC2-D1
12-9	5.5	N/A	57	647	80	2000	1075	1500	160	1650	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-541009	N/A	132SC2-D1
12-10	7.5	N/A	76	657	72	2000	1075	1500	160	1650	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-541010	N/A	132SD2-D1
18-1	1.5	45.5	16	492	64	1880	1075	920	160	1650	420	785	DN150 PN16	2X 12 LTR	BWJ-521501	BWJ-541501	90SC 2 H 1.5	80B 2 I 1.1
18-2	3	N/A	33	457	70	1880	1075	920	160	1650	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-541502	N/A	100LC2-D1
18-3	4	N/A	42.5	542	75	2000	1075	1500	160	1650	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-541503	N/A	112MC2-D1
18-4	5.5	N/A	57.0	632	80	2000	1075	1500	160	1650	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-541504	N/A	132SC2-D1
18-5	7.5	N/A	76.0	657	72	2000	1075	1500	160	1650	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-541505	N/A	132SD2-D1
24-1	2.2	N/A	22.0	512	64	1880	1075	920	160	1650	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-542001	N/A	90LD 2 I 2.2
24-2	4	N/A	42.5	537	75	2000	1075	1500	160	1650	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-542002	N/A	112MC2-D1
24-3	5.5	N/A	57.0	627	80	2000	1075	1500	160	1650	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-542003	N/A	132SC2-D1
24-4	7.5	N/A	76.0	652	72	2000	1075	1500	160	1650	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-542004	N/A	132SD2-D1

# SIX PUMP MODEL AMV6-FE DIMENSIONS



AQUAMATIC AMV6-FE VARIABLE SPEED FLOW-THROUGH COLD WATER BOOSTER																		
PUMP TYPE	KW PER PUMP	FULL LOAD CURRENT 1Ph 240V AMPS	FULL LOAD CURRENT 3Ph 415V AMPS	TOTAL DRY WEIGHT OF UNIT (KG)	SOUND LEVEL dB(A)	BOOSTER SET DIMENSIONS [+/- 10mm]							FLANGE SIZE	VESSEL(S)	1 Ph 240V STOCKCODE	3 Ph 415V STOCKCODE	ETL RECLAIM MODEL NUMBER FOR EACH MOTOR 1PH 230V	ETL RECLAIM MODEL NUMBER FOR EACH MOTOR 3PH 400V
						LO	WO	HO	HP	LB	WB	WP						
12-1	0.75	29	11	475	58	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	BWJ-621001	BWJ-641001	80A 2 I 0.75	80A 2 I 0.75
12-2	1.5	54.2	18.8	589	64	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	BWJ-621002	BWJ-641002	90SC 2 H 1.5	80B 2 I 1.1
12-3	2.2	N/A	26	619	64	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-641003	N/A	90LD 2 I 2.2
12-4	3	N/A	39.2	559	70	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-641004	N/A	100LC2-D1
12-5	3	N/A	39.2	559	70	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-641005	N/A	112MC2-D1
12-6	4	N/A	50.6	631	75	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-641006	N/A	112MC2-D1
12-8	5.5	N/A	68	751	80	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-641008	N/A	132SC2-D1
12-9	5.5	N/A	68	751	80	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-641009	N/A	132SC2-D1
12-10	7.5	N/A	90.8	763	72	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-641010	N/A	132SD2-D1
18-1	1.5	54.2	18.8	595	64	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	BWJ-621501	BWJ-641501	90SC 2 H 1.5	80B 2 I 1.1
18-2	3	N/A	39.2	553	70	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-641502	N/A	100LC2-D1
18-3	4	N/A	50.6	625	75	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-641503	N/A	112MC2-D1
18-4	5.5	N/A	68.0	733	80	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-641504	N/A	132SC2-D1
18-5	7.5	N/A	90.8	763	72	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-641505	N/A	132SD2-D1
24-1	2.2	N/A	26.0	619	64	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-642001	N/A	90LD 2 I 2.2
24-2	4	N/A	50.6	619	75	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-642002	N/A	112MC2-D1
24-3	5.5	N/A	68.0	727	80	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-642003	N/A	132SC2-D1
24-4	7.5	N/A	90.8	757	72	2300	1075	1500	160	1970	420	785	DN150 PN16	2X 12 LTR	N/A	BWJ-642004	N/A	132SD2-D1

# AQUAMATIC AMV SERIES INSTALLATION GUIDANCE NOTES

## ELECTRICAL

Units are designed for a 240 volt AC 1Phase 50Hz electrical supply for motors up to 1.5 kW and 415 volt AC 3phase 50 Hz electrical supply for motors above 1.5 kW. Electrical design and equipment conforms to BSEN 60204-1-1993 regulations, it is important that all subsequent wiring and protection equipment reflects this.

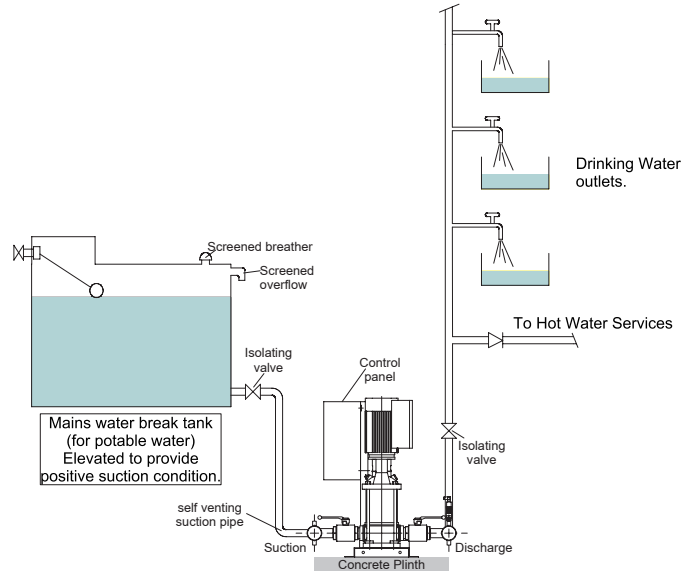
## HYDRAULIC

The design of this unit enables it to be located in any position in a plant room with the minimum of inconvenience to pipework layout. Installer to fit isolating valves on break tank supply and riser to system. Note: Additional check valve/s should not be fitted on the suction or discharge pipework.

## MECHANICAL

The unit should be mounted on a flat, slightly raised plinth and bolted down. Aquatech Pressmain recommend that when the unit is installed adequate room for servicing access is left around the unit. A gap of around 500mm is preferable. The selected pumps are designed for quiet operation and are virtually vibration free.

**Typical pipework arrangement using variable speed cold water pressure booster set feeding hot & cold water services.**



## COMMISSIONING

Following electrical, hydraulic and mechanical installations as above, all units should be commissioned by Aquatech Pressmain service team.

## CONSTRUCTION STANDARDS FOR AMV PRESSURE BOOSTER SETS

COMPONENT	MODEL/SERIES	STANDARDS/CLASS	REMARKS
Pumps	2 to 24	Vertical Multi-stage	WRAS Approved
Mechanical Seal	Carbon / Ceramic	DIN 24960	WRAS Approved
Motor for Pumps	TEFC	IP55, Class F Insulation	EuP Ready
Isolating Valves	Ball Valve	PTFE Ball Seat (with locking handle)	WRAS Approved / BS9251
Non-Return Valve	Disk Type	Stainless Steel	DIN
Suction & Discharge Manifolds	Stainless Steel EN1057 (304)	Entire unit WRAS Approved	Approval Number 0710086
Control Panels	2020Plus Series	IP55, BSEN 60204 part1:1998 89/3366/eec	CE Marked
Microprocessor	2020Plus	93/68/EEC	Designed In House
Hydraulic Accumulators	Flow through	PED 97/23/EC	WRAS Approved
Quality System	ISO 9001	BSI Registered	CERT No. FM33090



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