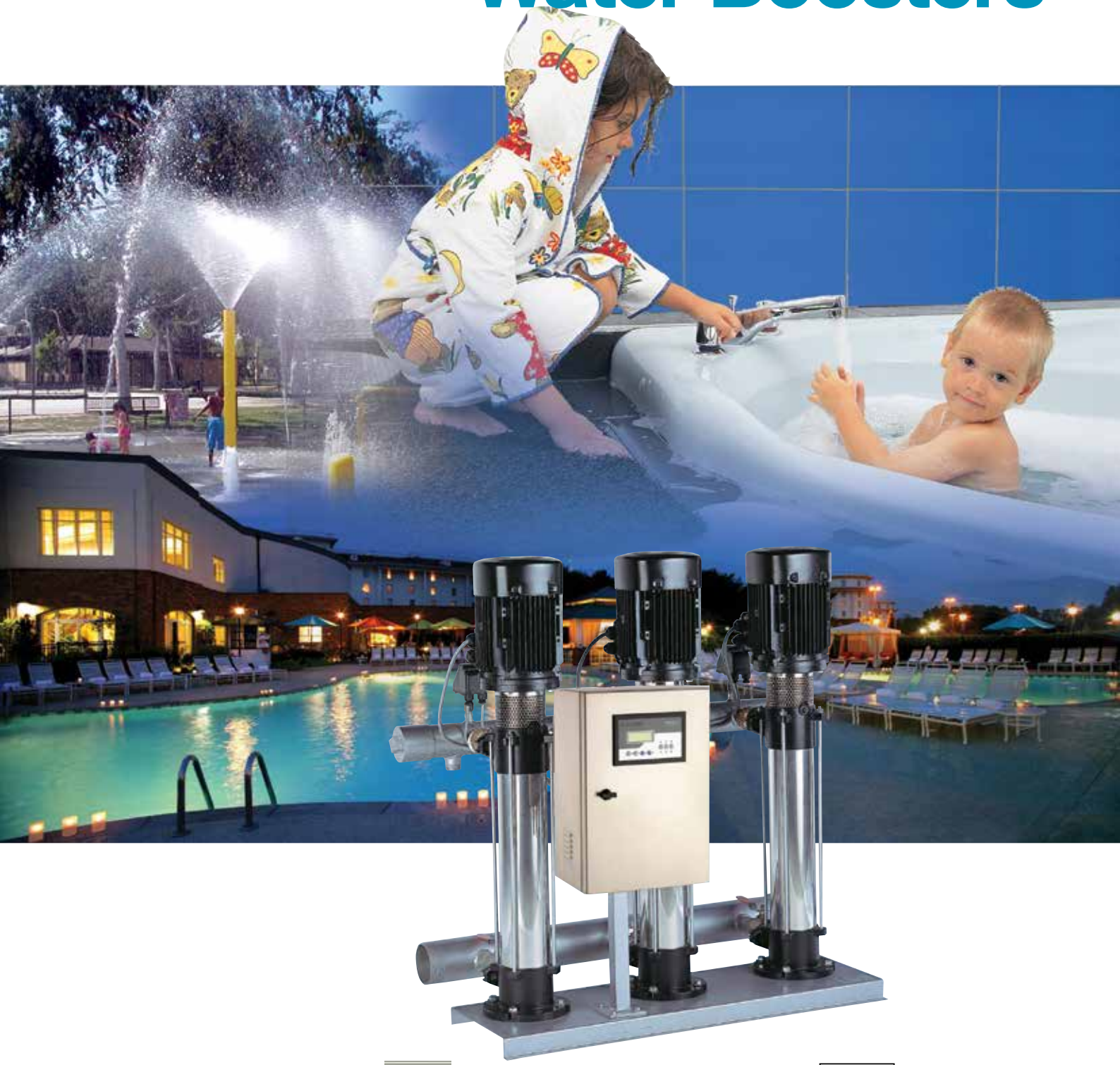
ALARKO

ALD S/F Series
Water Boosters



Alarko Water Boosters

Wide Product Range

Wide product and model range, can meet different requirements and conditions up to 10 bar pressure and Maximum 123 m^3/h flow: 21 models for single pump, 21 models for twin pumps, 21 models for triple pumps, so there are totally 63 models.

Standard ALD Serial

Alarko Carrier rises quality standard level presented to its users by experiences for semi-century and developments and innovations on ALD water boosters. It presents economic and reliable solutions to keep the irrigation and process water on the requested level by special designed, compacted and reliable water boosters.

Frequency Controlled ALDF Serial

This serial was developed in order to provide maximum energy saving and comfort. ALDF water boosters have variable frequency driver (VDF) system which reduce pump cycle according to decreased flow and pressure requirement. Also they have unique, matchless protection and high efficiency by inverters.

ALDF water boosters have the following features;

- Economic by high efficient engines are electronic controlled,
- Matchless protected by increased safety systems,
- More esthetical by LCD control panel,
- More ergonomic by compact structure,
- User friendly software
- Complying with building automation systems (Optional)
- Time saving by simple installation
- More quiet
- Little expansion tank capacity.

Villas, apartments, buildings

In the hospitals, business centres and schools,

hotels, social facilities and holiday villages

plant houses and farms,

Reliable High Technology

1. MEMBRANE TANK: Stores pressurized water, decreases starts and stops of pumps. Prevents the fittings from shocks and vibrations. Hygenic and scentless. It is not included to standard water booster set, it is supplied optionally.

2. OUTLET COLLECTOR: It is coated by galvanize. Check-valve on the pump outlet end prevents water given to installation with pressuring to turn back to pump. Also presostats and manometer are located on.

3. MOTOR: Special design for for vertical operating conditions 3-380 V, 50 Hz.

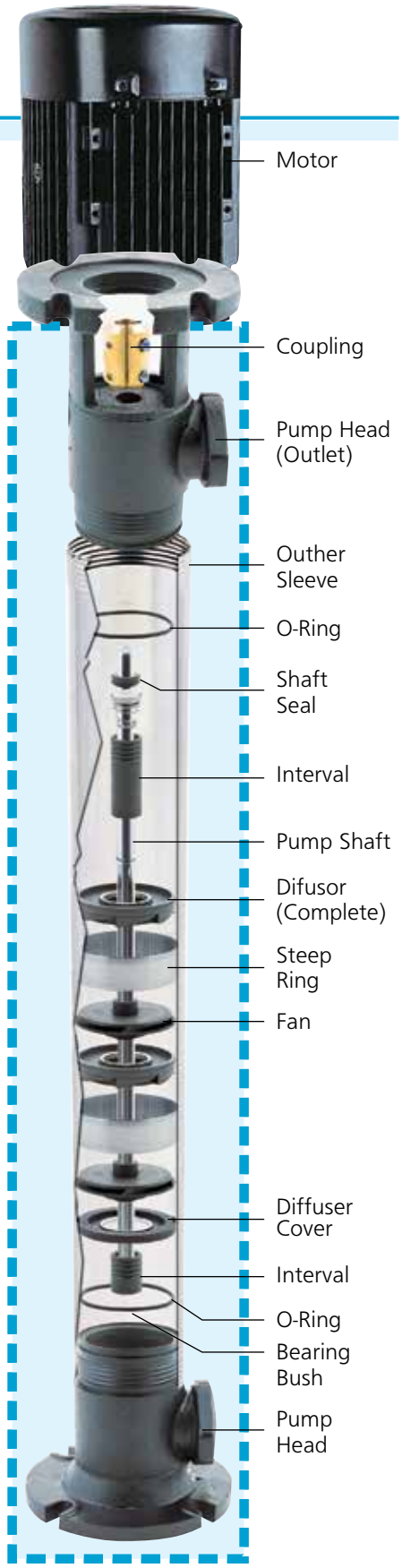
4. CONTROL PANEL: Developed, smart electronic control management system in Alarko water boosters with multi pumps. Remote control panel with turn on/off key and thermic protected contactor in the water boosters with unique pump.

5. FLEXIBLE HOSE: It supplies water connection between pump group and membrane tank. Galvanize or plastic hose can be used. However, assembly of the flexible hose is very simple. It does not require special proficiency. It is supplied optionally.

6. INLET COLLECTOR: There is a special valve on every pump inlet in the water boosters with twin or triple galvanize coated pumps. So, in case one of the motopumps break down, the other continues to supply water and the broken one can be removed to be fixed.

7. BASE: It is coated by galvanize. It can be fixed onto base quickly. It prevents vibration and noise.

8. FLOAT SWITCH: It prevents water booster to run after the water finishes in the tank. When tank is full, water booster keeps to run automatically.



PRESSURE SWITCH:
It make pumps run or stop as supplying pressure in the installation. There are presostats equals to pumps quantity. There are a presostat in order to high pressure safety in ALDF serial. It is adjusted as performing sort control and as running pumps at the most efficient point.

PUMP MATERIAL:
High quality and proper for working under the variable conditions.

Pump Heads	GG20
Outher Sleeve	Rustproof, X2CrNi1911/X2CrNiMo17122
Pump Shaft	Rustproof, X46Cr13
Diffuser	30 % fibreglass reinforce
Impeller	30 % fibreglass reinforce
Shaft Seal	Ceramic/Carbon
Coupling	Bronze

New Generation Smart Electronic Control Management

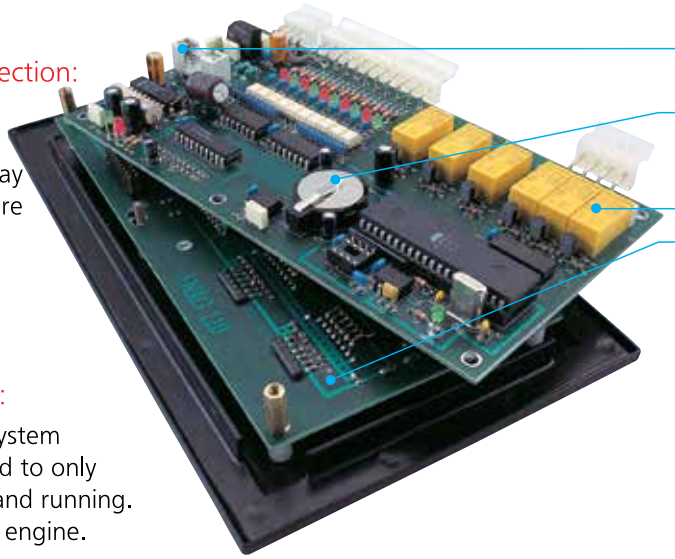
Electronic microprocessor control management system, which controls and arranges all operation functions of water booster with twin and triple pumps, supplies economic and safe usage. Control management system is collected in a compact interior and outer designed panel is delivered as assemblied onto water booster and as all connections are prepared.

Frequency Control Advantages

- High energy saving
- Lower starter current (In the pump connected to inverter)
- Lower water-hammer stroke risk with adjustable start and stop time
- Sensetive pressure measurement by pressure transmitter
- Quieter run
- Less volume membrane tank usage
- Less location requirement for installation
- High Safety and comfort
  - MIS: Motor Identification System
  - EASR: Equal Aging System by Rotation (On/Off pumps)
  - DCP: Digital - Touchmatic Control Panel
  - AMS: Automatic Mod Shift (Shifting to manual mod while breakdown)
  - HPPS: High Pressure Protection System (At high pressure increases)
  - Pmin: System Blockage at high pressure decreases Protection of instant pressure decrease because of blocking in suction or explosion in force)

Waterless Running Protection:

Water level in the feed booster tank is always checked by water level relay and level electrode. If there is not water in the tank, electronic management system prevent pumps.



Operator Panel Protection: In 24 V AC entrance, 2A glass fuse,3,2 V Ni-Cd pil It provides the information during the power cut be saved.
Microprocessor
Display Card

False Pressure Signal Protection:

Electronic management system prevents pump instant movements because of water waves.

Extensive Current Control:

Electronic management system cut the power, when motor absorbe extensive power and it protect engine from burning.

Motor Phase Protection:

Electronic Management System prevent engine is remained to only two phase while starting and running. If phase cuts, it stops the engine.

Phase Sequence Control:

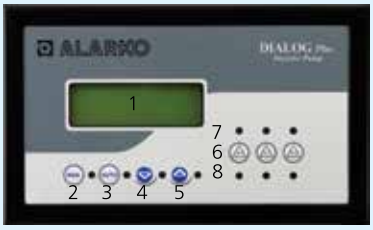
Electronic management system controls whether if phase connections are in a correct sequence or not. Also it prevents pumps turn down at the start.

Sequential Automatic Working:

Electronic management system provides pump activation as water flow and facility pressure are constant and pump sequence deactivation while using decreases.

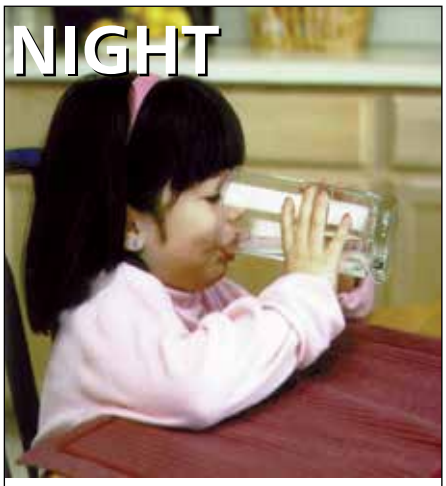
- The pump is activated firstly changes at every usage.
- Thus, engine and pumps using time get equal.

1. LCD Display: Some information such as water booster present run mode (manual(automatic), total run time of every pump, run and stopped pumps, defects and types (turning down, extensive current, waterless working) can be reached.

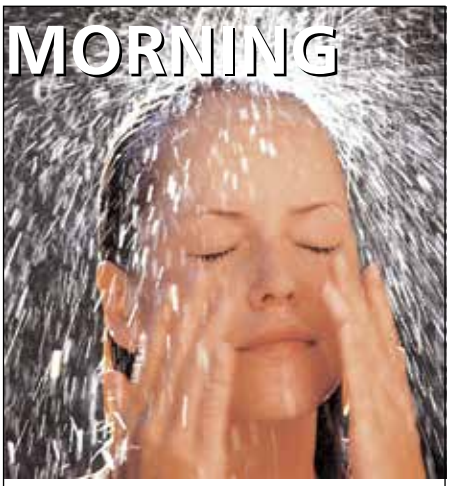


2. Button for shifting to Manual Mode / exit window button and LED
3. Button for shifting to automatic mode and LED
4. Changing of Parameter values
5. Entering to parameter screen and movement on parameter screen entrance and exit
6. Manual pump run buttons
7. LEDs, show pump running
8. Warning LEDs for broken pump.

Panel quantity is changed due to pump number. Above panel is belong to water booster with triple pumps.



need: A glass of water
0,1 lt/sec.

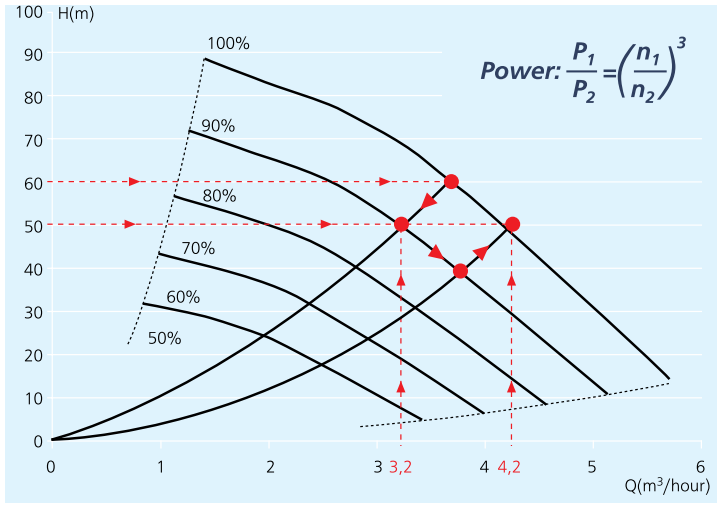


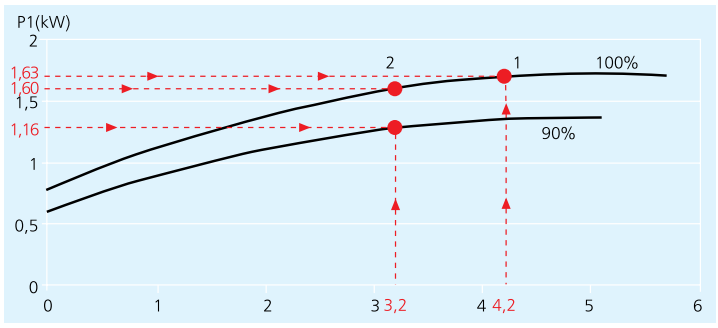
Need: Washer
1 lt/sec.

Need: Garden watering
10 lt/sec.

System whose capacity is the most flexible due to the need in the pump systems is water booster system. In the same system, demand change for 0,1 lt/sec-10 lt/sec can be occurred.

Curve Change in the Pump, Whose Revolutions Per Minute Changed





- Pump revolution reduces according to decreased flow and pressure need.
- Because of less power need, less power consumption than power supply's need is occurred.
- By reducing of pump entrance power, very big energy saving is obtained. For example, when pump revolution per minute reduces 10%, energy saving for 27% can be obtained.

Water boosters run at lower capacity level than maximum capacity level. As seen on the following table, water boosters run with 50% capacity of 84% life period. Fort his reason, dramatic energy saving is obtained with frequency inverter usage.

Obtained energy saving by using inverter in standard water booster.

PERFORMANCE TEST: 1,5 kW Electropump Constant Pressure (29 mWc)

Q	Hm	F	Annual Usage Ratio	Inlet Power (kW)		Diff.	Electrical Saving
(lt/sec.)	(mWc)	(Hz)	(%)	Standard	F. Inverter	(kW)	(kwh / year)
1.5	29	50	7	1.68	1.68	0	0
1.125			9	1.68	0.86	0.82	646
0.75			33	1.53	0.69	0.84	2.428
0.375			51	1.23	0.44	0.79	3.529
				Total Annual Energy Saving			6.604

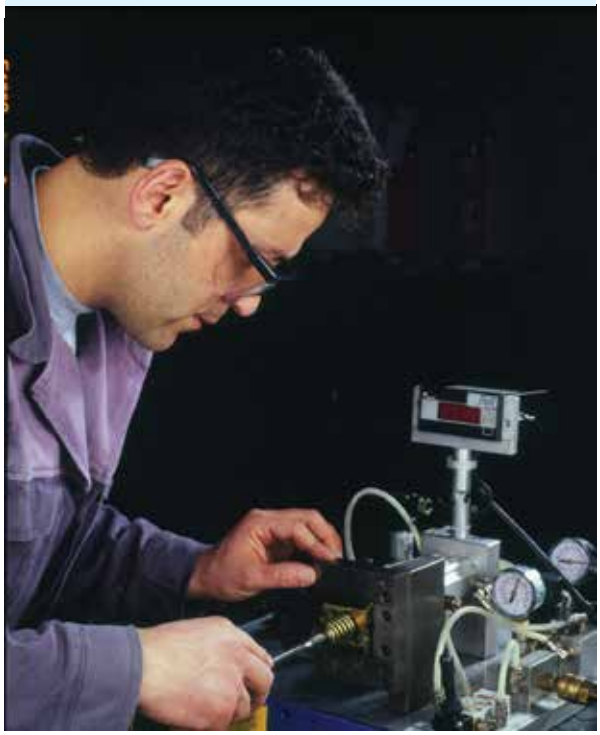
Technical Specifications

TRIPLE PUMP TYPES	Motor Power (HP)	Water Inlet/Exit (inch)*	M.T. Connection (inch)**	Weight		
				ALD (kg)	ALDF (kg)	ALDM (kg)
403/10-1	1	1"-1"	1"	37	45	36
403/15-1	1,5	1"-1"	1"	40	49	38
403/16-1	2	1"-1"	1"	44	52	42
406/11-1	2	1"-1"	1"	42	50	-
406/15-1	3	1"-1"	1"	50	59	-
406/18-1	4	1"-1"	1"	57	66	-
408/10-1	3	1 1/2"-1 1/2"	1 1/2"	40	49	-
408/14-1	4	1 1/2"-1 1/2"	1 1/2"	50	59	-
408/17-1	5,5	1 1/2"-1 1/2"	1 1/2"	65	74	-
610/8-1	4	1 1/2"-1 1/2"	1 1/2"	92	101	-
610/10-1	5,5	1 1/2"-1 1/2"	1 1/2"	103	112	-
610/12-1	7,5	1 1/2"-1 1/2"	1 1/2"	111	122	-
615/7-1	5,5	1 1/2"-1 1/2"	1 1/2"	101	110	-
615/9-1	7,5	1 1/2"-1 1/2"	1 1/2"	109	120	-
615/10-1	10	1 1/2"-1 1/2"	1 1/2"	116	126	-
620/7-1	7,5	2"-2"	2"	107	118	-
620/8-1	10	2"-2"	2"	114	124	-
620/9-1	10	2"-2"	2"	115	125	-
631/6-1	15	2"-2"	2"	135	150	-
631/7-1	15	2"-2"	2"	136	151	-
631/8-1	15	2"-2"	2"	137	152	-

TRIPLE PUMP TYPES	Motor Power (HP)	Water Inlet/Exit (inch)*	M.T. Connection (inch)**	Weight		
				ALD (kg)	ALDF (kg)	ALDM (kg)
403/10-2	1	2"-1 1/2"	1"	87	89	85
403/15-2	1,5	2"-1 1/2"	1"	92	94	89
403/16-2	2	2"-1 1/2"	1"	97	99	93
406/11-2	2	2"-1 1/2"	1"	81	83	-
406/15-2	3	2"-1 1/2"	1"	102	105	-
406/18-2	4	2"-1 1/2"	1"	110	113	-
408/10-2	3	2 1/2"-2"	1 1/2"	70	73	-
408/14-2	4	2 1/2"-2"	1 1/2"	79	82	-
408/17-2	5,5	2 1/2"-2"	1 1/2"	100	103	-
610/8-2	4	3"-2 1/2"	1 1/2"	127	130	-
610/10-2	5,5	3"-2 1/2"	1 1/2"	149	152	-
610/12-2	7,5	3"-2 1/2"	1 1/2"	163	169	-
615/7-2	5,5	3"-2 1/2"	1 1/2"	147	150	-
615/9-2	7,5	3"-2 1/2"	1 1/2"	161	167	-
615/10-2	10	3"-2 1/2"	1 1/2"	174	180	-
620/7-2	7,5	4"-3"	2"	167	173	-
620/8-2	10	4"-3"	2"	175	181	-
620/9-2	10	4"-3"	2"	177	183	-
631/6-2	15	4"-3"	2"	217	228	-
631/7-2	15	4"-3"	2"	219	230	-
631/8-2	15	4"-3"	2"	221	232	-

TRIPLE PUMP TYPES	Motor Power (HP)	Water Inlet/Exit (inch)*	M.T. Connection (inch)**	Weight		
				ALD (kg)	ALDF (kg)	ALDM (kg)
403/10-3	1	2 1/2"-2"	1"	102	104	98
403/15-3	1,5	2 1/2"-2"	1"	127	129	122
403/16-3	2	2 1/2"-2"	1"	113	115	107
406/11-3	2	2 1/2"-2"	1"	162	107	-
406/15-3	3	2 1/2"-2"	1"	170	169	-
406/18-3	4	2 1/2"-2"	1"	105	177	-
408/10-3	3	3"-2 1/2"	1 1/2"	100	107	-
408/14-3	4	3"-2 1/2"	1 1/2"	108	115	-
408/17-3	5,5	3"-2 1/2"	1 1/2"	135	142	-
610/8-3	4	4"-3"	1 1/2"	162	169	-
610/10-3	5,5	4"-3"	1 1/2"	195	202	-
610/12-3	7,5	4"-3"	1 1/2"	215	221	-
615/7-3	5,5	4"-3"	1 1/2"	193	200	-
615/9-3	7,5	4"-3"	1 1/2"	213	219	-
615/10-3	10	4"-3"	1 1/2"	232	238	-
620/7-3	7,5	5"-4"	2"	227	233	-
620/8-3	10	5"-4"	2"	236	242	-
620/9-3	10	5"-4"	2"	239	245	-
631/6-3	15	5"-4"	2"	299	310	-
631/7-3	15	5"-4"	2"	302	313	-
631/8-3	15	5"-4"	2"	305	316	-

Selection Criteria



- While water booster is defined, selection should be performed as run interval is matched with the top point of efficiency curve.

- Water booster with twin or triple pump can be used instead of water booster with unique pump In this case, No pressure waving, is created because a big pump entering and existing to circuit, is occurred and demurrage current reduces. For example, instead of unique water booster with 15 m^3/h flow, water booster with twin pumps (one of them has 7,5 m^3/h flow) or water booster with triple pumps (one of them has 5 m^3/h flow) can be selected.

- If conditions are proper, water boosters with multi pumps can run like a spare water booster. For this reason, even a pump deactivates, other pumps can give the required flow. For example, if need for flow is 10 m^3/h, a water booster has twin pumps (every pump has 10 m^3/h) or a water booster has triple pumps (every pump has 5 m3/h) can be selected.

Note: Pipe diameters are given due to galvanize pipes. İnterior diameter of the plastic pipes are thinner than galvanize pipe's diameter. If plastic pipe is used, dimension, which meets interior diameter of galvanize pipe, should be used.

(*) Water enter and water exit diameters are equal on the pump. But, induction installation should be pushed for one size bigger than the present size. For example, if inlet is 2", induction installation will be like 2,5"

(**) MT Membrane pressure balance tank.

Selection Method

For water booster selection, required pressure (Hm) and requiered flow (Q) values should be known. Determining of Hm and Q:

Required Pressure = Hmin (mWc) = h + Δh + 15

h - Height between location of hydrophpre and top of usage floor (meter)
Δh - Pressure loss because of calcic pipe, water meter, armature in the installation. Δh is accepted as %20 of (h).

Δh = 0.2h

15 - Determined value from required pressure at the highest usage level. For example: 1,5 m is for 1,5 bar. If requestes pressure is changes, this value also changes.

Required Flow = Q (m^3/hour) = Number of people, who use water x Personal Daily Consumption x F/1000

Number of people, who use water :
- In apartment blocks = apartment quantity x Number of people live in evey apartment.
- In hotels, barracks, hospitals = bed quantity
- In school and creches = number of student
- Business centre= total staff number

Personal Daily Consumption (lt/day) value is selected by Table 1.
F- Simultaneous Usage Coefficient, it shows the possibility of maximum water using at the same time. It is selected from Table 2.

Table 1: Individual Water Consumption for Sample Locations

Location Type		Daily Personal Consumption (lt/person)
In the housing	With washbasin	60-80
	Shower	80-115
	With vessel	120-200
Hotel	Shower	100
	With vessel	150-200
Hospital		200-500
School		5
Pre - School		80-100
Creche		100-150
Barracks		60-80
Restaurant		10-20
Gardening		1,5 lt/m^2 for one time
Car washing		100 lt/day

Table 2: Synchronization Coefficient for Individual Water Consumption

Location Type		Coefficient
Houses	1-5 apartments	0,66
	6-10 apartments	0,45
	11-20 apartments	0,40
	21-50 apartments	0,35
	51-100 apartments	0,30
	More than 100 apartments	0,25
Hotels	1-20 beds	0,40
	21-50 beds	0,40-0,30
	More than 50 beds	0,30-0,20
Hospitals	50-500 beds	0,30-0,20
	501-1000 beds	0,20-0,15
	1001-2000 beds	0,15-0,10
Schools		0,30
Pre-School		0,40
Barracks		0,40-0,30
Business Centre		0,30

Selection Sample 1:

Water booster selection for a building has 7 floors and 21 apartments.
Calculating of the required pressure.
h = (7 floors + 1 floor cellar) x 2,8 m (one floor height) - 22,4 m
Δh = 0,2 x h = 0,2 x 22,4 meter = 4,48 meter.
Required Min. Pressure = Hmin = 22,4 + 4,48 +15 = 41,88 mWc= 4,1 bar.

Apartment Quantity

Personal Daily Consumption = 100 lt/day (It was selected from Table 1).

F - Synchronization Coefficient = 0,35 ((It was selected from Table 2)

Required Flow = Q = 21x5x100x0,35/1000
= 3,6 m^3/hour

(While determining flow, it was assumed that 5 people lives in every apartment.)

Booster Selection:

According to upper calculation, pressure interval 40-50 meters or 40-70 meters so 403/10-1 or 403/15-1 models, which can give average 3,5m^3/h for thecurrent pressure interval, can be selected.

Selection Sample 2:

Water booster selection for an hotel has 9 floors and 30 rooms.
Calculating of the required pressure.

h = (9 floors+1 floor cellar) x 2,8 m (one flor height) = 28 m
Δh = 0,2 x h = 0,2 x 28 meters = 5,6 meters.

Required Min. Pressure = Hmin = 28 + 5,6 +15
= 48,6 mWc ≈ 50 mWc = 5 bar.

Personal Daily Consumption = 150 lt/day (It was selected from Table 1).

F - Synchronization Coefficient = 0.3 ((It was selected from Table 2).

= Q = 270 rooms x 2 beds x 150 x 0,3 /1000

Required Flow = 24,3 m^3/hour

(While determining flow, it was assumed that two beds are for every room)

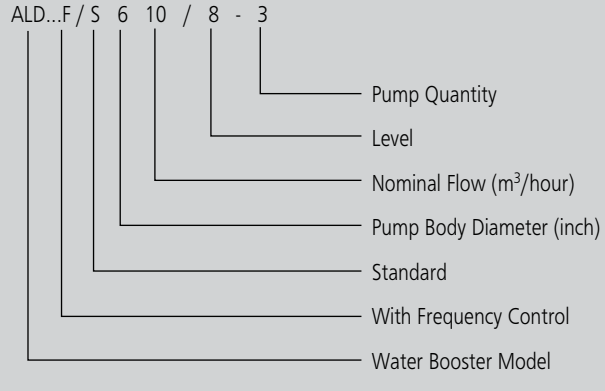
Water Booster Selection:

According to upper calculation, pressure interval 50-70 meters or 50 - 80 meters, 631/7-1 or 408/14-3 (For 50 - 70 interval), 610/10-2 (For 50 - 80 interval)
which can give average 24,3 m^3/h.

SIMPLE AND QUICK SELECTION BY INTERNET

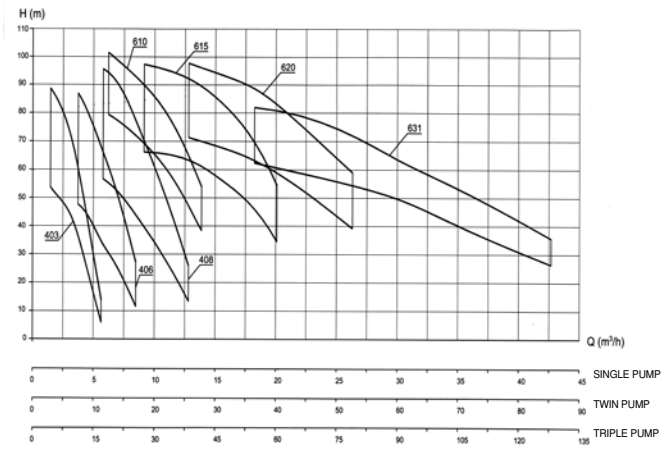
Water booster can be selected quickly by selection program in www.alarko-carrier.com.tr Price can be informed.
Quotation form can be prepared

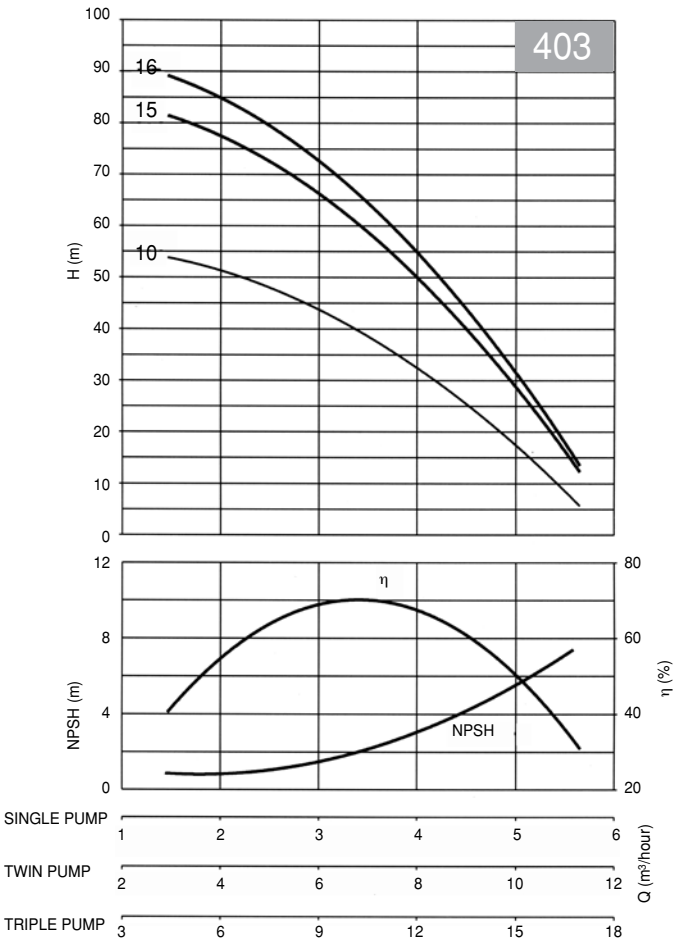
ORDER NOTATION

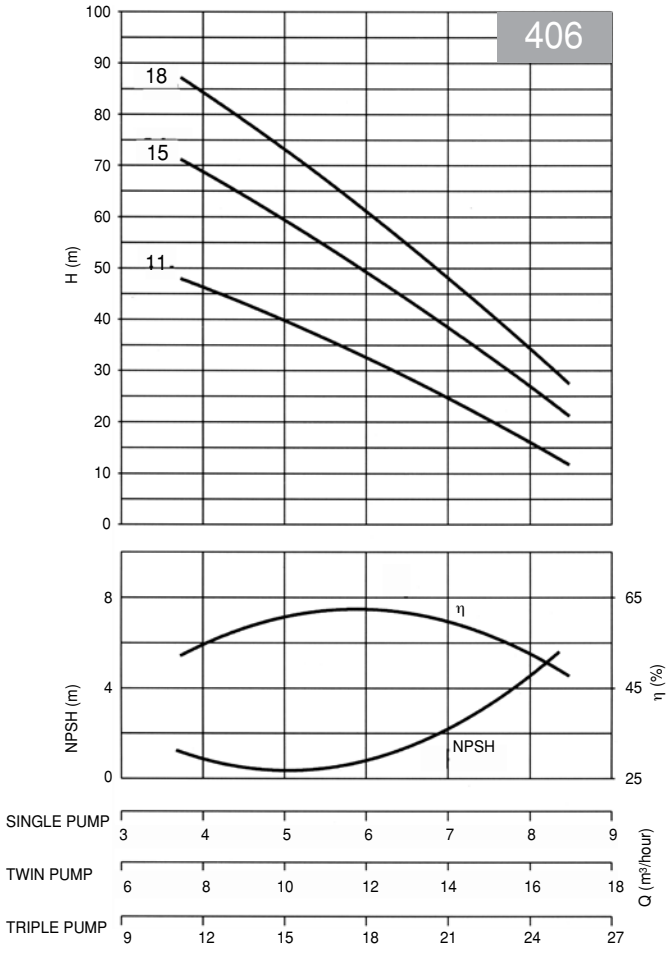


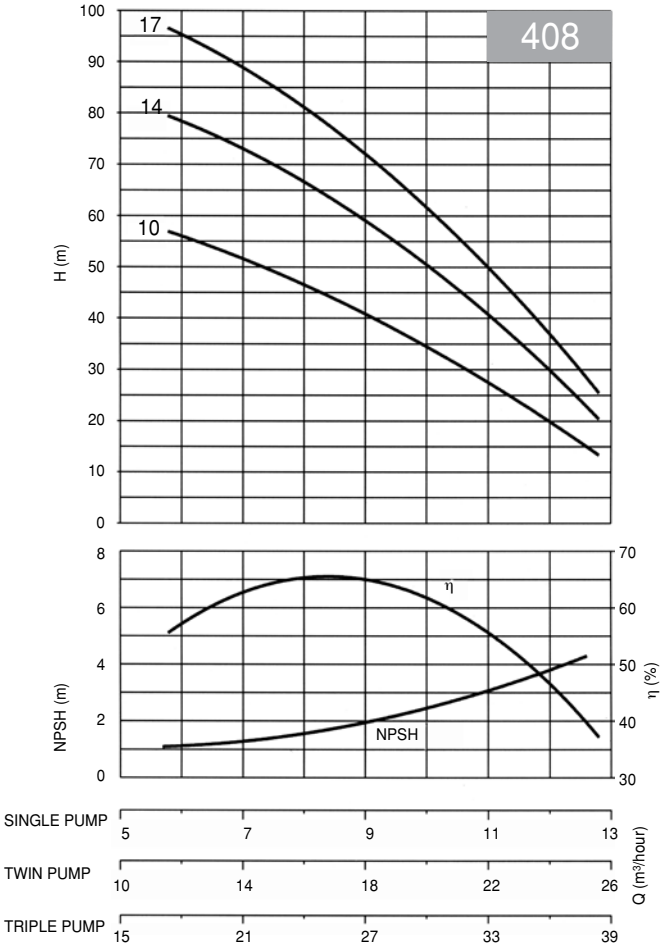
Pump Curves of ALD 400 Serial

General Curves

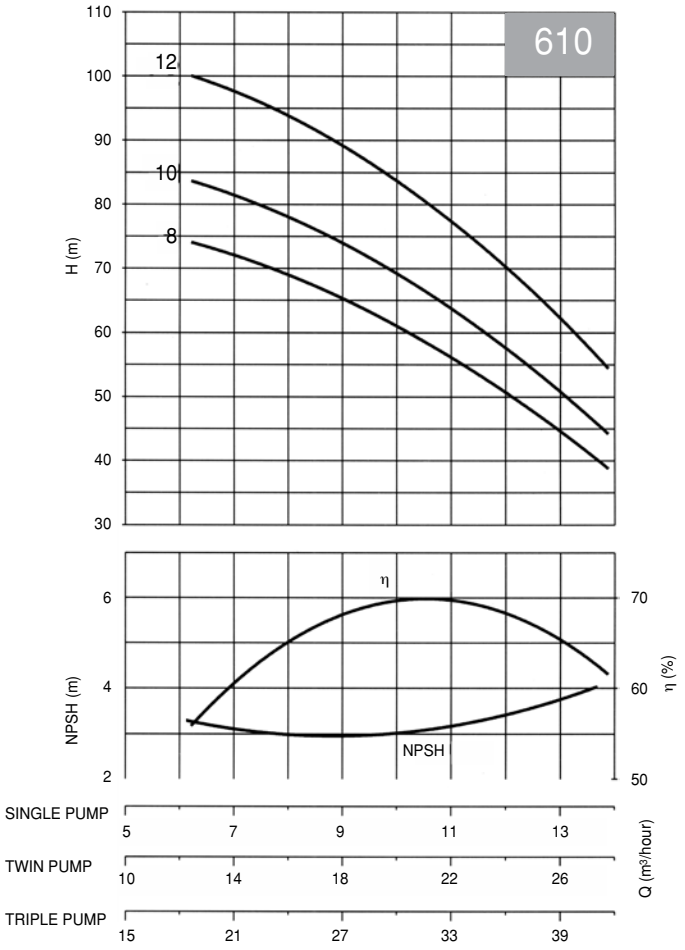


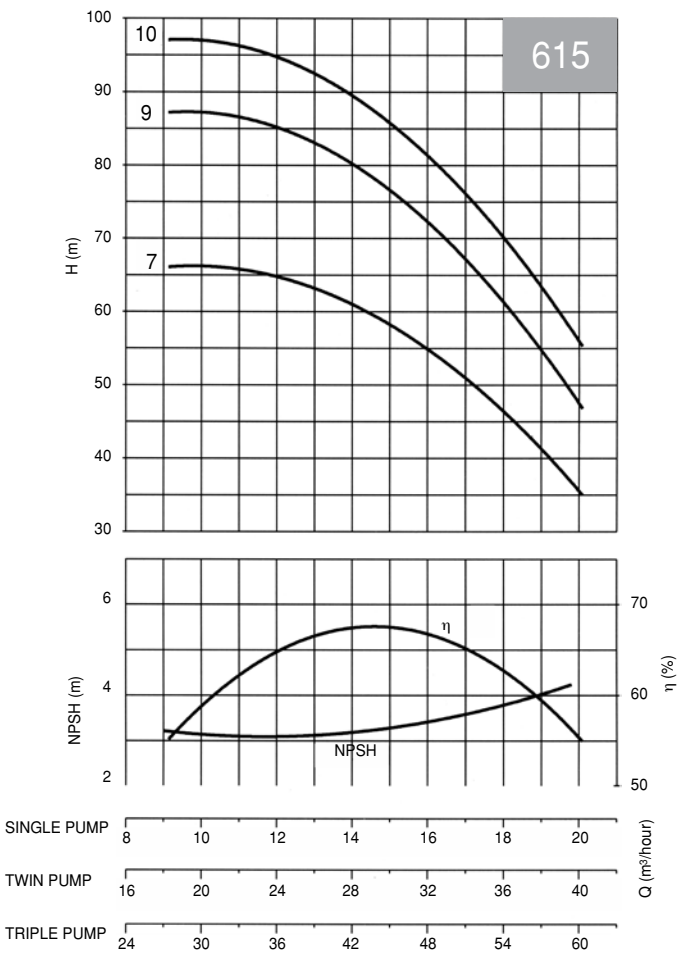


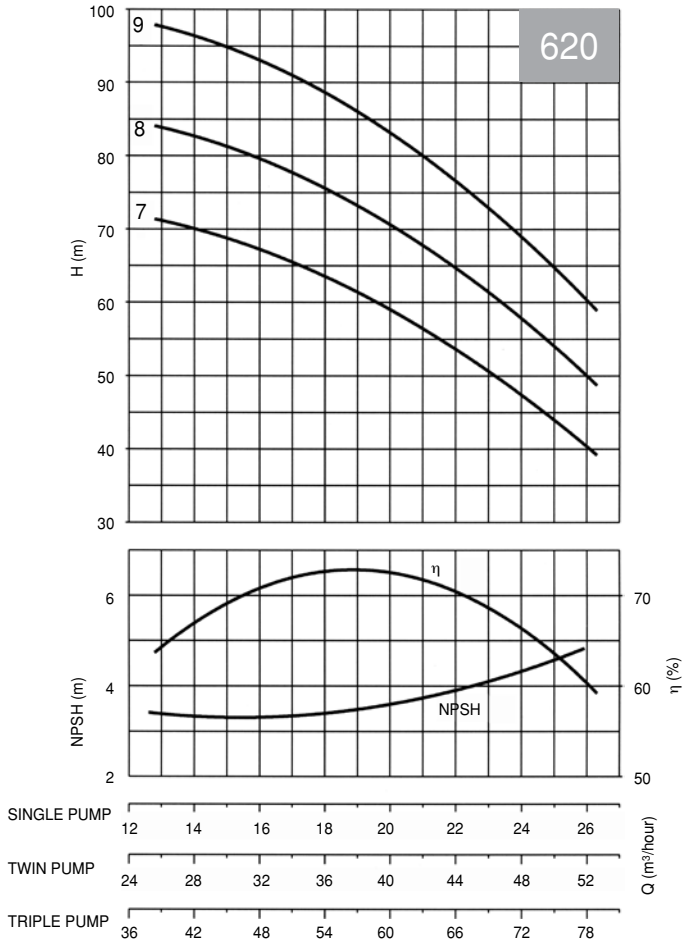


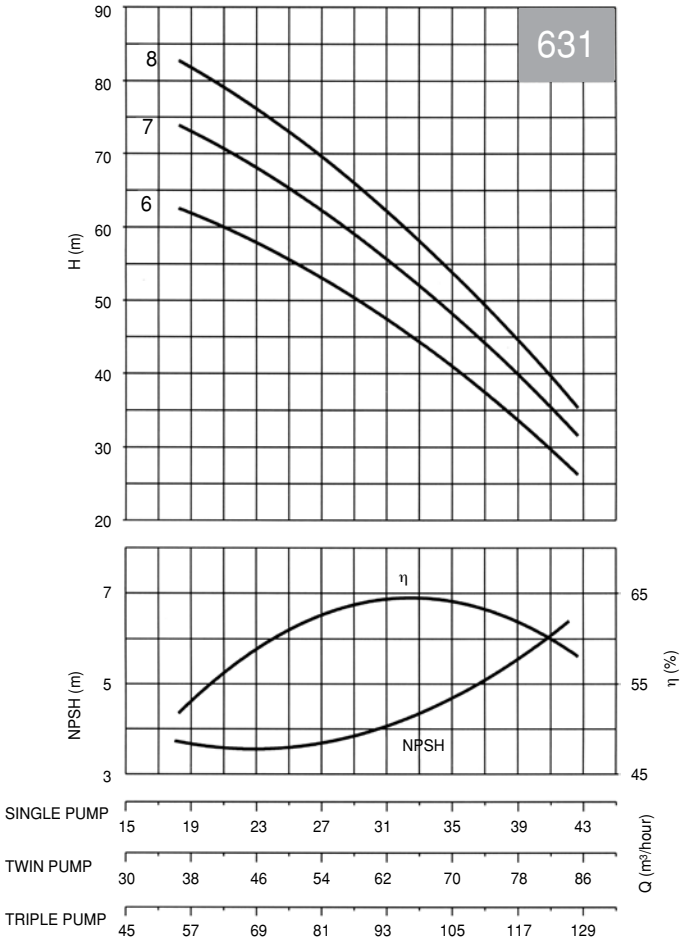


Pump Curves of ALD 600 Serial



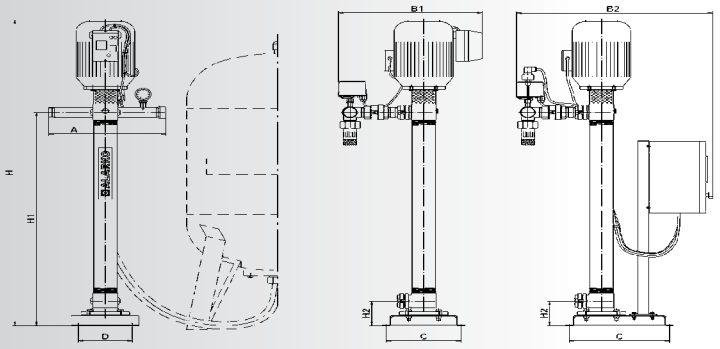






Dimensions

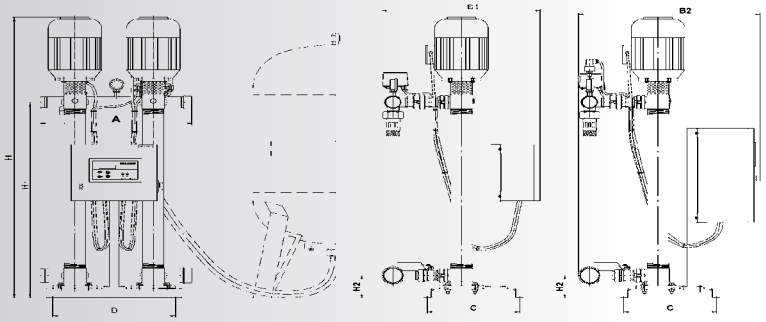
WATER BOOSTERS WITH SINGLE PUMP



ALD ALDF

TYPES	A	B1	B2	C	D	H	H1	H2
403/10-1*	434	477	-	278	200	944	578	121
403/15-1*	434	477	-	278	200	1094	728	121
403/16-1*	434	487	-	278	200	1144	758	121
403/10-1	434	477	686	372	200	939	578	121
403/15-1	434	477	686	372	200	1089	728	121
403/16-1	434	487	686	372	200	1136	758	121
406/11-1	434	487	686	372	200	1129	751	121
406/15-1	434	487	706	372	200	1326	923	121
406/18-1	434	496	706	372	200	1485	1052	121
408/10-1	434	512	743	372	200	1131	728	121
408/14-1	434	521	743	372	200	1341	908	121
408/17-1	434	533	743	372	200	1495	1043	121
610/8-1	514	574.8	805.8	412	250	1042.5	583.5	101.5
610/10-1	514	586.8	817.8	412	250	1151.5	673.5	101.5
610/12-1	514	606.8	807.8	412	250	1292.5	763.5	101.5
615/7-1	514	586.8	817.8	412	250	1065.5	587.5	101.5
615/9-1	514	606.8	807.8	412	250	1210.5	681.5	101.5
615/10-1	514	699.8	802.8	412	250	1257.5	728.5	101.5
620/7-1	516	613.8	814.8	412	250	1164.5	635.5	101.5
620/8-1	516	708.8	814.8	412	250	1217.5	688.5	101.5
620/9-1	516	708.8	814.8	412	250	1270.5	741.5	101.5
631/6-1	516	708.8	812.8	412	250	1218.5	651.5	101.5
631/7-1	516	708.8	812.8	412	250	1280.5	713.5	101.5
631/8-1	516	708.8	812.8	412	250	1342.5	775.5	101.5

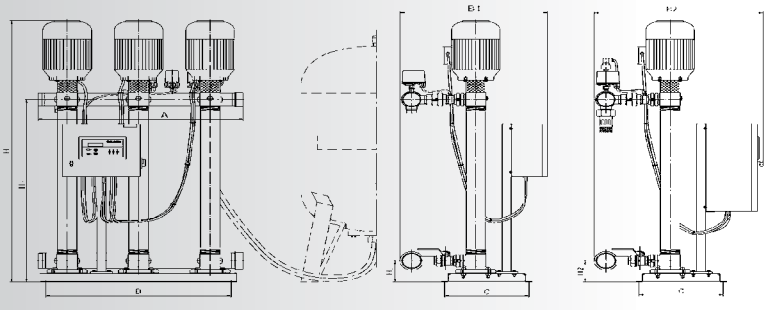
WATER BOOSTERS WITH TWIN PUMPS



ALD ALDF

TYPES	A	B1	B2	C	D	H	H1	H2
403/10-2*	616	635	-	-	502	944	578	121
403/15-2*	616	635	-	-	502	1094	728	121
403/16-2*	616	635	-	-	502	1144	758	121
403/10-2	616	635	710	710	502	939	578	121
403/15-2	616	635	710	710	502	1089	728	121
403/16-2	616	635	710	710	502	1136	758	121
406/11-2	616	635	710	710	502	1129	751	121
406/15-2	616	635	710	710	502	1326	923	121
406/18-2	616	635	710	710	502	1485	1052	121
408/10-2	617	669	744	744	502	1131	728	121
408/14-2	617	669	744	744	502	1341	908	121
408/17-2	617	669	744	744	502	1495	1043	121
610/8-2	717	759.8	834.8	834.8	650	1067,5	608,5	126,5
610/10-2	717	759.8	834.8	834.8	650	1176,5	698,5	126,5
610/12-2	717	759.8	854.8	854.8	650	1317,5	788,5	126,5
615/7-2	717	759.8	834.8	834.8	650	1090,5	612,5	126,5
615/9-2	717	759.8	854.8	854.8	650	1235,5	706,5	126,5
615/10-2	717	759.8	874.8	874.8	650	1282,5	753,5	126,5
620/7-2	719	782.8	877.8	877.8	650	1189,5	660,5	126,5
620/8-2	719	782.8	897.8	897.8	650	1242,5	713,5	126,5
620/9-2	719	782.8	897.8	897.8	650	1295,5	766,5	126,5
631/6-2	719	782.8	897.8	897.8	650	1243,5	676,5	126,5
631/7-2	719	782.8	897.8	897.8	650	1305,5	738,5	126,5
631/8-2	719	782.8	897.8	897.8	650	1367,5	800,5	126,5

WATER BOOSTERS WITH TRIPLE PUMPS



ALD ALDF

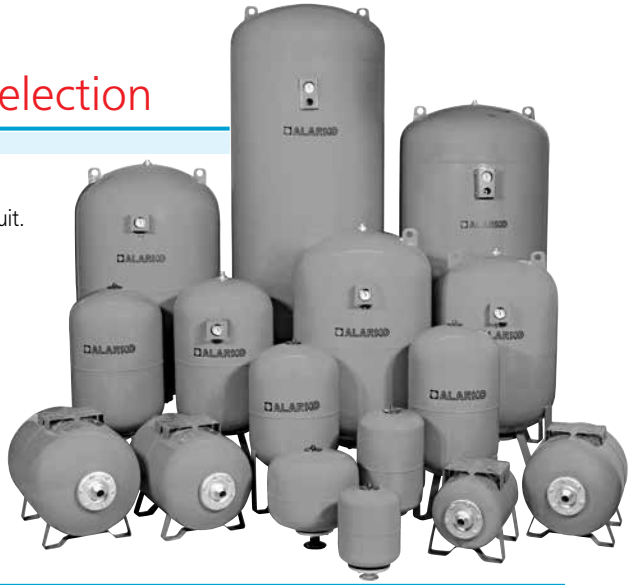
TYPES	A	B1	B2	C	D	H	H1	H2
403/10-3*	917	652	-	378	830	944	578	121
403/15-3*	917	652	-	378	830	1094	728	121
403/16-3*	917	652	-	378	830	1144	758	121
403/10-3	917	652	757	378	830	939	578	121
403/15-3	917	652	757	378	830	1089	728	121
403/16-3	917	652	757	378	830	1136	758	121
406/11-3	917	652	757	378	830	1129	751	121
406/15-3	917	652	777	378	830	1326	923	121
406/18-3	917	652	777	378	830	1485	1052	121
408/10-3	917	683	808	378	830	1131	728	121
408/14-3	917	683	808	378	830	1341	908	121
408/17-3	917	683	808	378	830	1495	1043	121
610/8-3	1119	789.8	884.8	408	1.050	1067,5	608,5	126,5
610/10-3	1119	789.8	884.8	408	1.050	1176,5	698,5	126,5
610/12-3	1119	789.8	884.8	408	1.050	1317,5	788,5	126,5
615/7-3	1119	789.8	884.8	408	1.050	1090,5	612,5	126,5
615/9-3	1119	789.8	884.8	408	1.050	1235,5	706,5	126,5
615/10-3	1119	771.8	886.8	408	1.050	1282,5	753,5	126,5
620/7-3	1119	824.8	919.8	408	1.050	1189,5	660,5	126,5
620/8-3	1119	806.8	921.8	408	1.050	1242,5	713,5	126,5
620/9-3	1119	806.8	921.8	408	1.050	1295,5	766,5	126,5
631/6-3	1119	806.8	921.8	408	1.050	1243,5	676,5	126,5
631/7-3	1119	806.8	921.8	408	1.050	1305,5	738,5	126,5
631/8-3	1119	806.8	921.8	408	1.050	1367,5	800,5	126,5

Front views are belong to ALD models.

*for ALDM model

All measurements are mm

Membrane Pressure Balance Tank and Selection



It should absolutely be used with water booster.

- Because of stocking pressured water, reduces pump's inlet-outlet frequency to the circuit.
- It absorbes possible pressure shocks in the installation.
- It is not included to water booster set.
- There is manometer on the tanks has 100 lt and more volume
- Water pressure can be observed via manometer, while water booster runs.
- If water in the tank is discharged, manometer shows pressure of air in the tank.
- Tank's operation pressure should be equal with or more than pump's closed valve

TANK SELECTION

Tank volume is determined by the following formula:

$$V_{tank} = 0{,}33 \times Q_{max} \times \frac{(P_{max}+1)}{\Delta P \times a}$$

Q_{max} - Max flow, pump can give to system. or required pik flow for use area (lt/h)

P_{max} - Max pressure in the system (bar). It is enough that pressure is more than 2-3 bars than min pressure on the housing practises.

P_{min} - Min pressure in the system (bar). If the value is not known, it is calculated by Formula.

ΔP - Pressure difference (P_{max} - P_{min}).

a - Max start-stop quantity of pump motor is allowed per 1 hour (shift) (quantity - hour)

This number (max) for motor up to 1,1 kW, in Ministry of Public Works "1999 Unit Price and Tarriffs" nook 180 times/hours. For motors more than 1,1kW 40 times/h are given.)

V_{tank} is min. tank volume. Tank has more volume than this value can be used.

While tank volume enlarges, pressure waves and activation noise of water booster become less. Motor's life period is extended. Energy consumption is reduced.
Smaller tank can be selected for industrial applications where water consumption flow is more standard according to social using.

Selection Sample:

Determination of membrane tank volume ans pressure is required for building has 7 floors and 21 apartments:

Q_{max} = 3.600 lt/hour (Look at Water Booster Selection, Sample 1)

P_{max} = 6 bar

ΔP = 2 veya 3 can be assumed. Let us assume 2 bar.

a = 40

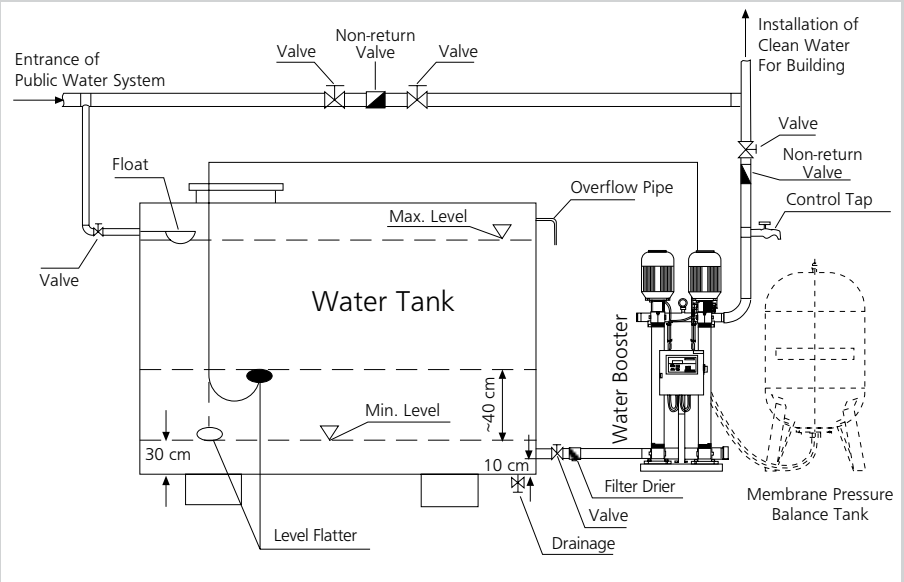
$$V_{tank} = 0{,}33 \times 3.600 \times \frac{(6+1)}{(2x40)} = 103{,}9 \text{ lt.}$$

100 lt tank can be selected. For ALDF tank selection, found tank capacity by the above calculation should be multiple with 0,1.

RIGHT ASSEMBLY

- Suction from the low level must not be performed. Tank should be near to water booster and be at the same level. Water booster must not be connected to public water system directly.
- Pumps must not be forced while water induction. For this reason, water booster induction diameter must never shrank.
- Pump should be bigger for one size than water entrance value in water boosters with unique pump. Induction installation should be structured as suction collector's diameter in water boosters with triple pumps.
- Interior diameter of the plastic pipes are thinner than galvanize pipe's diameter. If plastic pipe is used, dimension, which meets interior diameter of galvanize pipe, should be used.
- Water booster's base should be fixed onto ground. (If it is possible, onto rubber blocks) Installation load must not be carried by water booster.

SAMPLE WATER BOOSTER INSTALLATION



Alarko water boosters are produced in this facility

ALARKO CARRIER GEBZE COMPLEX - ACGC

ACKG has covered area for 36.800 m^2 and totally 60.500m^2 in Gebze Organized Industry Site. Construction was started to built on July 1st 1999 and it was finished on November 1st 2000. In the Main Production Facility of Alarko Carrier, renewed its production technology and modernized its organization, has ISO 9001 certification. In tihs facility, air conditioning unit, burner, fan, coil, hydrophore, submersible and circulation pump, cooling group, cooling tower, central heating boiler, air equipment, central heating radiator. On the other hand, in Dudullu Organized Industry Site, Radiator Production Facility, has covered area for 9.250 m^2 and totally 18.000 m^2, produces panel radiator. 650 employees work in production facility and 324 employees work in management, sales and marketing departmants, and 22 employees work in R&D department. 996 employees work in Alarko Carrier totally.

TSEK

Note: Right for any change because of technological developments is reserved.

ALARKO

Carrier

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