PUMP DETAILS

LOWARA
a xylem brand

15SV03N030T

Technical data

Company name
Contact
Phone number
e-mail address

Operating data

Pumpe type	Single head pump			Fluid		Water, pure
No. of pumps / Reserve		1 / 0		Operating temperature t A	°C	4
Nominal flow	l/s	4.111		pH-value at t A		7
Nominal head	m	29.83		Density at t A	kg/m³	1000
Static head	m	0		Kin. viscosity at t A	mm²/s	1.569
Inlet pressure	kPa	0		Vapor pressure at t A	kPa	100
Environmental temperature	°C	20		Solids		0
Available system NPSH	m	0		Altitude	m	0

Pump data

Make	Lowara				Nominal	l/s	4.4	(4.4)
Speed		rpm	2900	Flow	Max-	l/s	6.7	
Number of stages			3		Min-	l/s		
Max. casing pressure		kPa			Nominal	m	34.2	
Max. working pressure		kPa	424.9	Head	at Qmax	m	20.1	
Head H(Q=0)		m	43		at Qmin	m	43.3	
Weight		kg	40	Shaft power		kW	2.1	(2.1)
	Max.	mm	105	Max. shaft power		kW	2.3	
Impeller R	designed	mm	105	Efficiency		%	71.33	
	Min.	mm	105	NPSH 3%		m	1.5	

Pump Materials

Pump body	Stainless steel / AISI 316L
Impeller	Stainless steel / AISI 316L
Diffuser	Stainless steel / AISI 316L
Outer sleeve	Stainless steel / AISI 316L
Shaft	Stainless steel / AISI 316
Adapter	Cast iron
Base	Aluminium
Coupling	Aluminium
SEAL HOUSING	Stainless steel / AISI 316L
Coupling protection	Stainless steel / AISI 304
Shaft sleeve and bushing	Tungsten carbide
Fill / drain plugs	Stainless steel / AISI 316
Tie rods	Stainless steel / AISI 431
Wear ring	Technopolymer PPS

Shaft Seal

e-SV Mechanical seal	Roten
e-SV - Uniten (-30 / +120 °C)	
1 - Rotating part	Silicon Carbide
2 - Stationary part	Resin impregnated carbon
3 - Elastomers	EPDM
4 - Springs	AISI 316
5 - Other components	AISI 316

Motor data

Manufacturer	Lowara	Electric voltage	400 V	Speed	2865 rpm	Insulation class	F
Specific design	IE3 3ph Flange Motor			Frame size	100 L	Colour	RAL 5010
Type	PLM 100R B14 3 kW						
Rated power	3 kW	Degree of protection	IP55				
Electric current	6.33 A						

Remarks:

LOWARA
a xylem brand

15SV03N030T

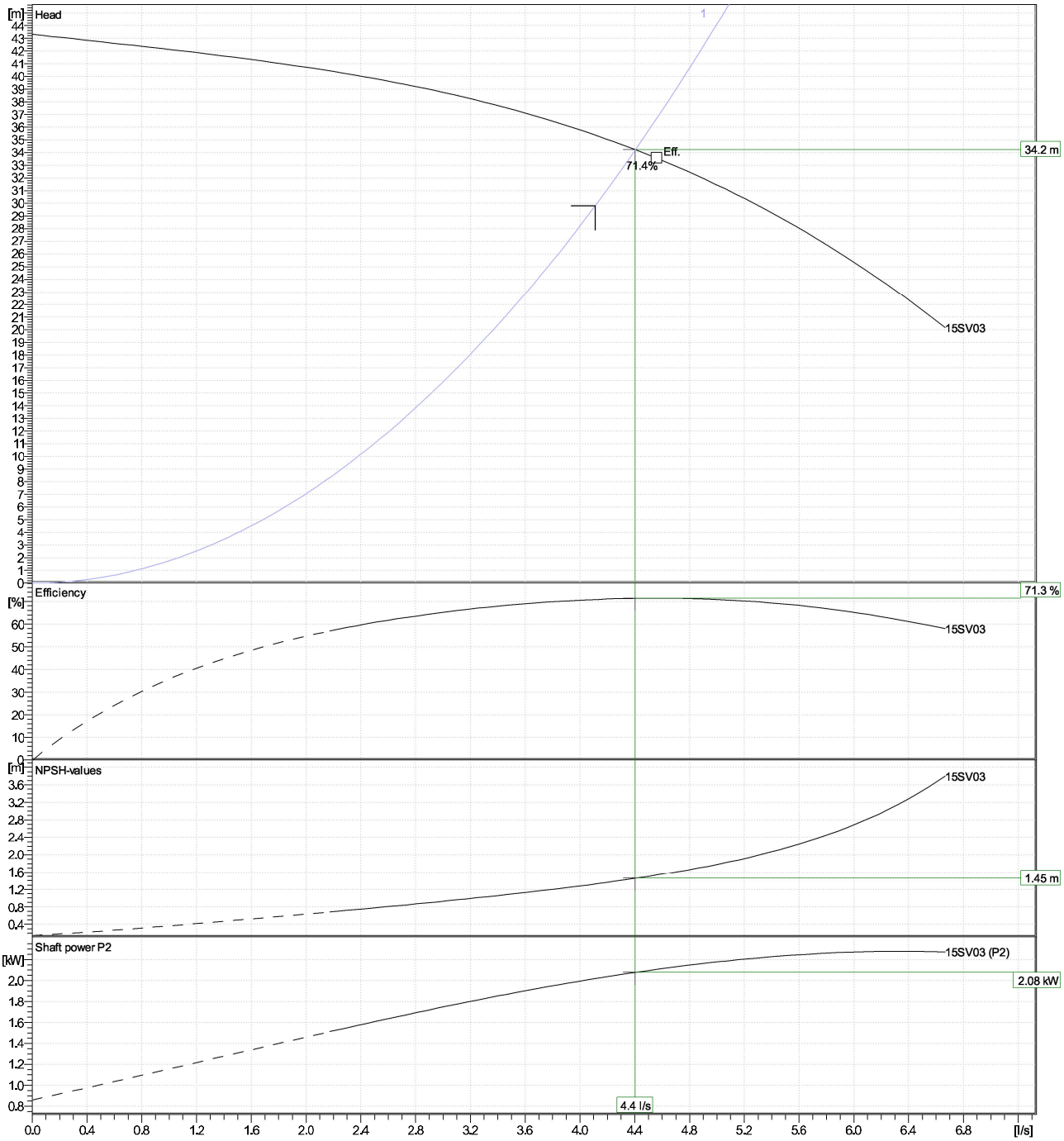
Performance curve

Company name
Contact
Phone number
e-mail address

Hydraulic data

Operating Data Specification		Hydraulic data (duty point)		Impeller design	
Flow	4.112 l/s	Flow	4.4 l/s	Impeller R	105 mm
Head	29.83 m	Head	34.2 m	Frequency	50 Hz
Static head	0 m	MEI >=0,7		Speed	2900 rpm

Power datas refered to:
Water, pure [100%] ; 4°C; 1000kg/m³; 1.57mm²/s
Performance according to ISO 9906:2012 – Grade 3B



Project			Created by	Jun Ting Seow	Last update 8/30/2022
Block	15SV03F030T		Created on	8/30/2022	

Program version: 64.0 - 27/06/2022 (Build 146)
Data version: 07/07/2022 15:55
User group(s): Xylem: Singapore - INT

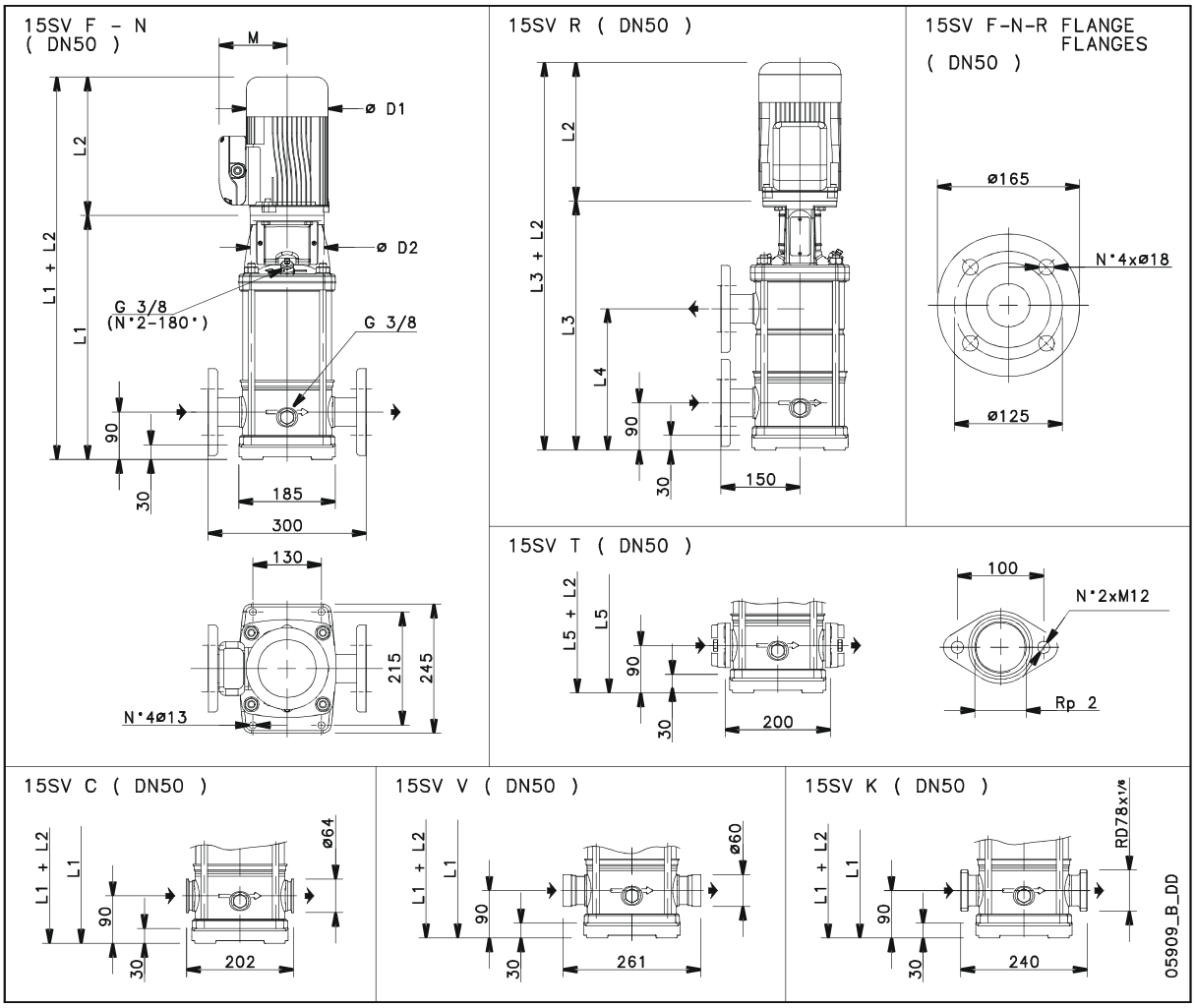
LOWARA
a xylem brand

15SV03N030T

Dimensions

Company name
Contact
Phone number
e-mail address

Drawing



Dimensions mm

D1 D2 L1 L2 L5 M	174 160 467 298 467 134					Weight 40 kg

Project			Created by	Jun Ting Seow	Last update 8/30/2022
Block	15SV03F030T		Created on	8/30/2022	
Program version	Data version	User group(s)			
64.0 - 27/06/2022 (Build 146)	07/07/2022 15:55	Xylem: Singapore - INT			

ESV LOWARA PUMP CATALOG

e-SV™ Series

STAINLESS STEEL VERTICAL MULTI-STAGE PUMPS

LOWARA
a xylem brand

Hydraulic performance range

extra efficient

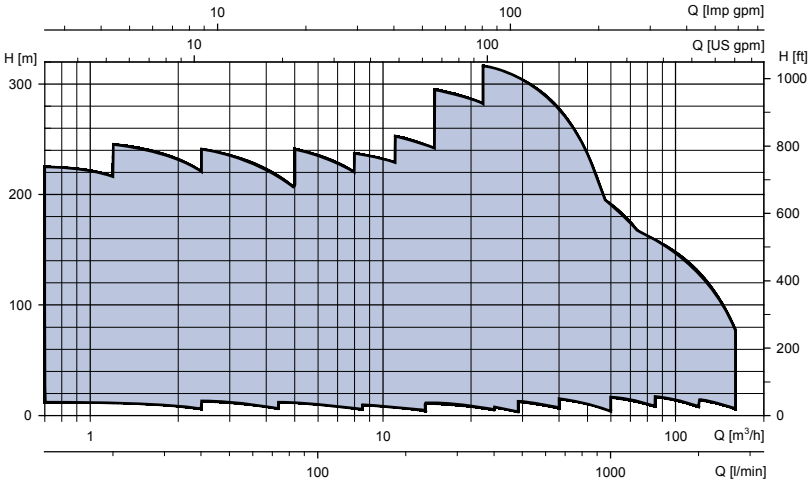
The e-SV™'s hydraulics, combined with a high-effi ciency motor (IE3) deliver maximum efficiency.

easy to maintain

The e-SV™'s design allows removal of the mechanical seal without having to remove the motor, reducing repair time by up to 50%. A standard DIN mechanical seal, wearing components, service tools and standard IEC motors enable faster and easier maintenance and servicing.

energy saving

Pumps are among the largest users of industrial energy. Do your part to reduce CO_2 emissions and your impact on the environment - and improve your bottom line - by taking advantage of the e-SV™'s lower energy requirement. Use a e-SV™ pump along with a variable speed drive such as Xylem's Hydrovar® or its Smart version, and save even more energy and money.



Benefits.

The e-SV™ range of pumps features 11 models, and can be specially configured for a wider range of applications. The line is interchangeable with Lowara's SSV series of vertical multi-stage pumps for added flexibility in meeting pumping requirements. Additionally, five e-SV™ manufacturing facilities around the world provide shorter lead times and faster service.

Applications.

Water supply and pressure boosting

Water treatment

Light industry

Irrigation and farming

Heating, ventilation and air-conditioning

Specifications.

Delivery	up to 160 m^3/h
Head	up to 330 m
Power supply	three-phase and single-phase 50 and 60 Hz
Power	standard motors from 0.37 kW to 55 kW
Maximum operating pressure	PN25-40 for sizes 1-22SV; PN16, PN25, PN40 for sizes 33-125
Temperature of pumped liquid	-30°C to +120°C standard version
Protection	IP55
Insulation class	F
Variable speed (on pumps and Booster Packages)	with Hydrovar® and other VFDs; Smart version with IE5 permanent magnet motor and embedded drive

Special versions.

Low NPSH

High Pressure up to 45 bars

High Temperature up to 150 and 180°C

Passivated and Electropolished

Horizontal installation

Space saving

Xylem |'zīləm|

1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

We're a global team unified in a common purpose: creating advanced technology solutions to the world's water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services settings. Xylem also provides a leading portfolio of smart metering, network technologies and advanced analytics solutions for water, electric and gas utilities. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.

For more information on how Xylem can help you, go to www.xylem.com

LOWARA.

xylem
Let's Solve Water

For information and technical support
Xylem Service Italia Srl

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Tel. (+39) 0444 707111
Fax (+39) 0444 491043
www.lowara.com
www.xylem.com

cod. 191002051 - P 03/18

HYDROVAR - VSD

WELCOME THE 5TH GENERATION

HYDROVAR

HYDROVAR FROM XYLEM HAS BECOME THE NAME OF CHOICE FOR CONTROLLING THE EFFICIENCY OF FIXED SPEED PUMPS.

xylem
Let's Solve Water

In 1993 HYDROVAR was as the world's first pump Now the 5th generation h setting a new standard.

HYDROVAR 1st generation

HYDROVAR 5th generation

established controller. as arrived and is

Typical applications.

What is HYDROVAR capable of?

HYDROVAR is an intelligent controller that matches pump performance to demand. It controls the speed of a standard IEC motor by converting the fixed voltage and frequency from the power supply line.

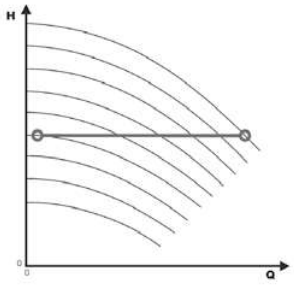
It can be fitted easily to any new pump system or retrofitted to existing pumps using the fast and easy “clip and play” mounting clamps.

Pump systems are very often oversized for the application and therefore using much more energy than needed.
With energy savings of up to 70% at partial loads alone, the typical investment payback period is less than 2 years, depending on energy costs and pump operating times.

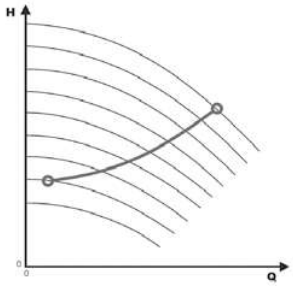
A motor running at 80% of its maximum speed uses 48% less energy and slashes carbon emissions.

The controls available include constant pressure, system curve, constant flow or via an external signal. In addition to these functions HYDROVAR can do things that are normally only performed by the most advanced computerized control systems such as: stopping the pump or pumps at zero demand; stopping the pump or pumps in case of water failure; allowing protection against dry running; a standard feature of a 2nd required input value that allows change over between two different pressure settings via an external switch; sensor failure and over temperature of inverter and motor which protects the pump and motor from under or overvoltage.

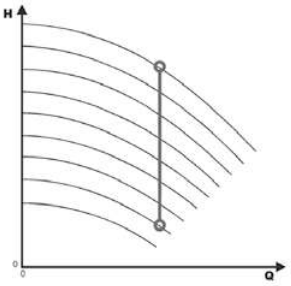
Other features include: automatic test starts; auto cyclic change of lead and lag pump units; a memory for any inverter fault signals; an operating hours run counter; two levels of password protection if required.



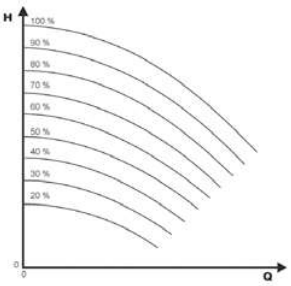
Control for constant pressure



Control to match a system curve



Control for constant flow



Control according to an external signal

HYDROVAR product overview.

Available from 1.5 to 22 kW in single or three phase, pump or wall mounted.

Pump mounted version will fit on any standard IEC motor. Optismised cooling of the HYDROVAR depending on the power and the speed of the pump is guaranteed by the motor fan.

Easy to commission, easy to setup and operate with the easy start up menu allowing you to walk through every step. New features include a larger screen display.

No external control panel needed.

No water hammer. The steady operation of the pump in partial loads also prevents water hammer, which normally arises in the start/stop operation of full speed pumps.

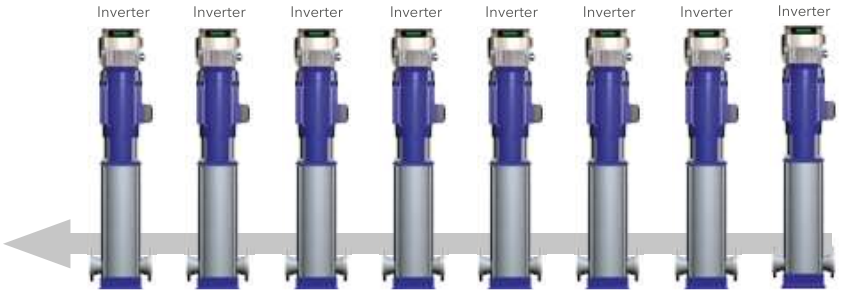
Lower starting current. High current peaks are prevented by adjusting the start ramp times as you can in a soft starter.

Multi-pump capability comes as standard which allows control from 1 to 8 pumps. Communicating with a central control system is also possible via an RS485 interface, and each HYDROVAR contains an individual microprocessor which operates independently if a failure occurs. Modbus and BACnet protocol fitted as standard.

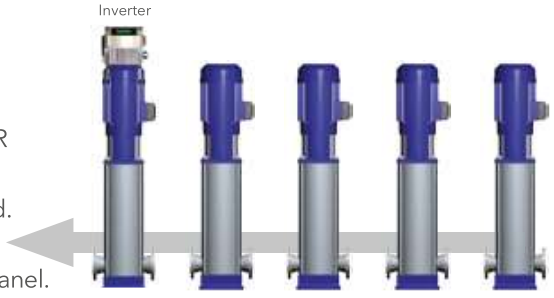
Lower noise from the pump because of lower speeds during operation. There is less noise in the pipeline and valves because of pump performance to the actual demand, and control along the system curve.

Less wear and less mechanical stress because of lower speed of the pumps during operation and no additional load in the starting moment because of the soft start feature.

Can link up to 8 pumps using HYDROVAR.



Multi controller, cascade relay:
This is where you can fit one HYDROVAR and up to five slave fixed speed pumps which are switched to on/off on demand. Using this type of system requires a premium card and an external control panel.



The 5th generation takes of robustness, safety, sec

Easy and safe accessibility for the wiring harness

- Separate wiring chamber with a dedicated cover
- All internal electronic components are protected

Range extension

- The new models are:
  1.5kW 3ph 380-460V
  1.5kW to 11kW 3ph 208- 240V
  3 kW and 4 kW 1ph 208-240V

Additional features of HYDROVAR:

- HYDROVAR can be fitted on any standard IEC motor up to 22 kW. Wall mounting kits are available on request
- No separate microprocessor is needed
- No separate control panels are needed
- No large pressure vessels are needed
- No anti-con heaters are needed as these are built in as standard
- IP55
- Error logs and real time and date calendar
- Quality aluminum body

Advanced motor control

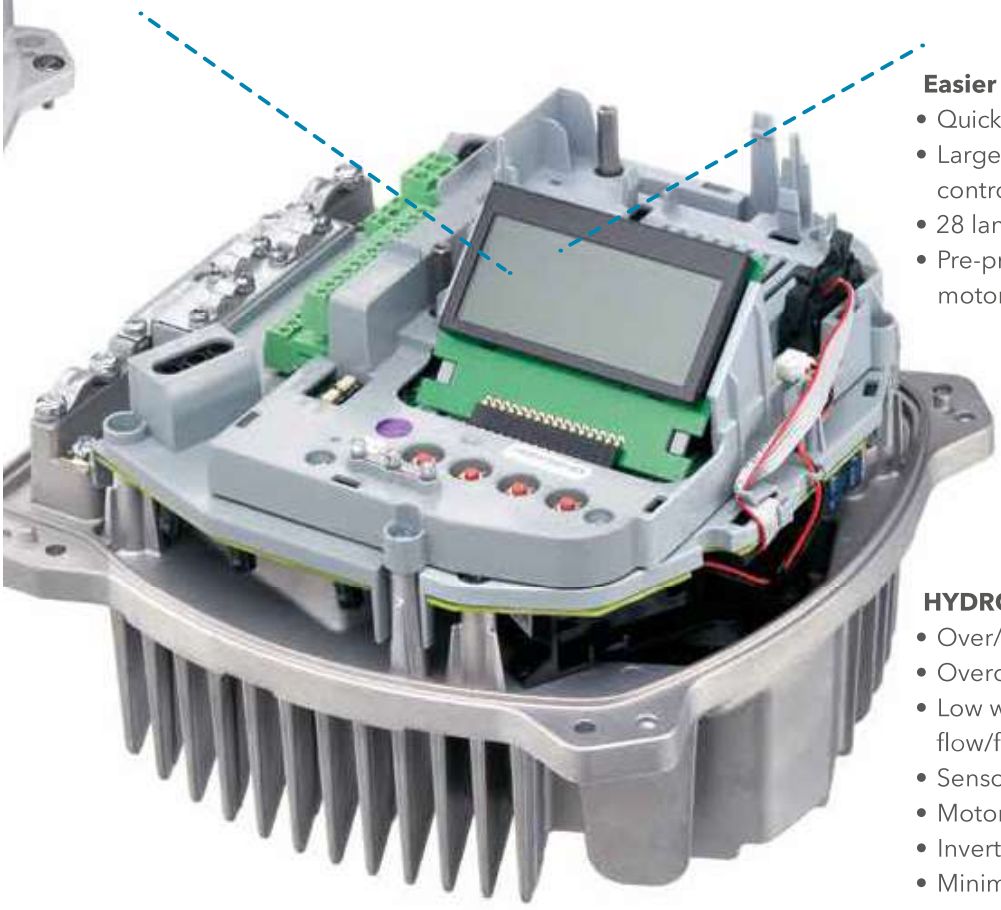
- Reduced heating of the motor
- Extended lifetime of the motor
- Due to built-in selectable software protection, motor PTC can be optional
- Minimised drive losses

HYDROVAR to a new level urity and performance.

THDi filter embedded
- Will extend the lifetime of equipment
- No need for line reactor filters
- Better quality of the grid power
- Reduced heating of the cables

Control offering
- Multi-pump capability come as standard from 1-8 pumps
- Constant pressure
- Constant flow
- System curve
- Via an 4-20ma or 0-10V external signal
- Automatic test and auto change over
- It stops at zero demand
- Integrated soft start/stop
- Complete set of analog and digital input/output
- The premium card also allows an additional 2 x inputs and 2 x outputs

Extended communication capabilities
- BACnet and Modbus as standard
- Wi-Fi card as an option



Easier to commission and to operate
- Quick start-up menu allowing faster set-up
- Larger LCD display with additional control parameters
- 28 languages within the software
- Pre-programmed parameter for standard motors

HYDROVAR built in protection
- Over/under voltage
- Overcurrent/output short protection
- Low water protection (by using pressure/ flow/float switch)
- Sensor failure
- Motor over temperature
- Inverter over temperature
- Minimum threshold/conveyer limit

Ecodesign directive.

EN 50598
The Ecodesign directive has been in place since 2011 and introduced minimum requirements for the efficiency of AC motors. These requirements have been gradually intensified. The EN 50598 standard defines efficiency classes for motor systems.

EN 50598-1
Integration of the frequency converter and motor into an "extended product" IE – a pump.

EN 50598-2
Similar to the IE classification of motors (where all Lowara motors are IE3), EN50598-2 introduces IE classes for frequency converters and IES classes for frequency converters plus motor systems (known as power drive systems). This new regulation was published in early 2015.

Classes IE0 – IE2 for frequency converters.

Classes IES0 – IES2 for power drive systems (frequency converter plus motor).

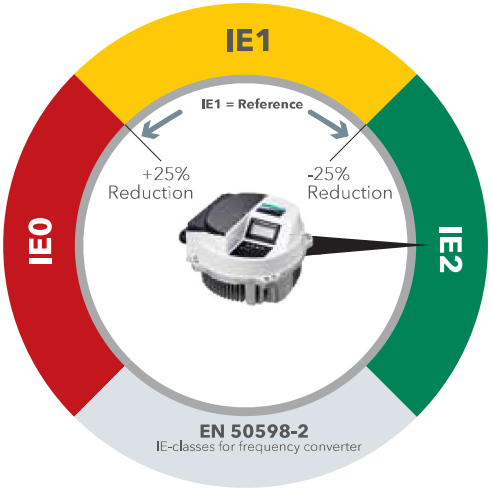
The EN 50598-2 standard defines efficiency classes from IE0 – IE2 for frequency converters. If a frequency converter has 25% greater losses than the reference value of IE1 then it is classified as IE0; if it has 25% lower losses than the reference value of IE1 then it is classified as IE2.

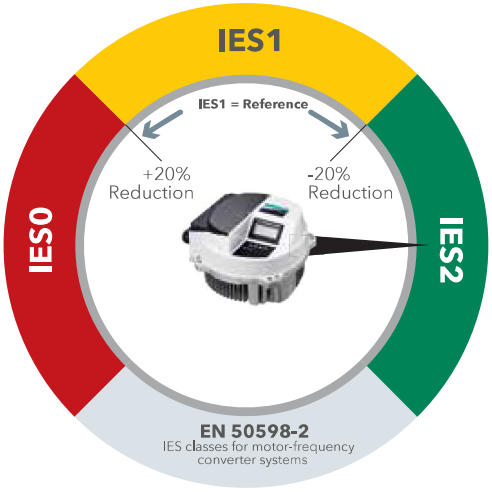
This new standard covers frequency converters that meet the following criteria:
- Power rating from 0.12 kW to 1000kW.
- Voltage range from 100V to 1000V.

Legal requirements
In Europe the minimum efficiency performance standards (MEPS) are expected to be at IE1 level in 2018.

HYDROVAR is classified as IE2 which is the most efficient in class; this efficiency measure includes the losses due to the built in RFI filters and DC chokes which come as standard up to 22kW in size.

When HYDROVAR is connected to a Lowara IE3 motor then the system will achieve the highest IES class – IES2.





HYDROVAR harmonics and EMC.

Hydrovar fulfills the product standard EN61000-3-2 for single phase and EN61000-3-12 for three phase.

Harmonics.
HYDROVAR comes with built in Total Harmonic Distortion current filters (THDi) to reduce harmonic interference. In most cases this is sufficient to avoid voltage pollution. Additional harmonic suppression may be required due to grid conditions or when multiple drives are installed.

Harmonics are associated with any load that uses a rectifier-based power supply such as radio or TV, computers and lighting ballasts – and other domestic white goods such as washing machines, microwaves and ovens which draw current in a non-sinusoidal fashion.

The level of harmonics reflected back to the supply network is usually regulated by the electricity supply utility. Harmonics are voltages and currents in the electrical system at frequencies that are multiples of the fundamental frequency.

Generally the greater the amount of installed electronic power switching equipment on site, the greater degree of harmonic distortion.
Put simply, harmonics reduce reliability, affect product quality and increase operating costs.

EMC.
HYDROVAR fulfills the product standard EN61800-3:2004 + A1: 2012 under the 1st Environment which includes domestic premises and buildings/facilities which are directly connected to a low voltage (e.g. 230/400V) mains supply which also supplies buildings used for domestic purposes.

HYDROVAR Vector Control (HVC).
The HVC automatically and continuously adjusts the output frequency and voltage to optimize the motor operation over a broad range of speeds and loads. For variable torque pump applications, there is no need to de-rate the motor for any operational speed.

HVC is superior to the traditional PWM control schemes in the following ways:
Full rated motor voltage is provided at rated frequency.
The output current wave shape is an almost a perfect sine wave.

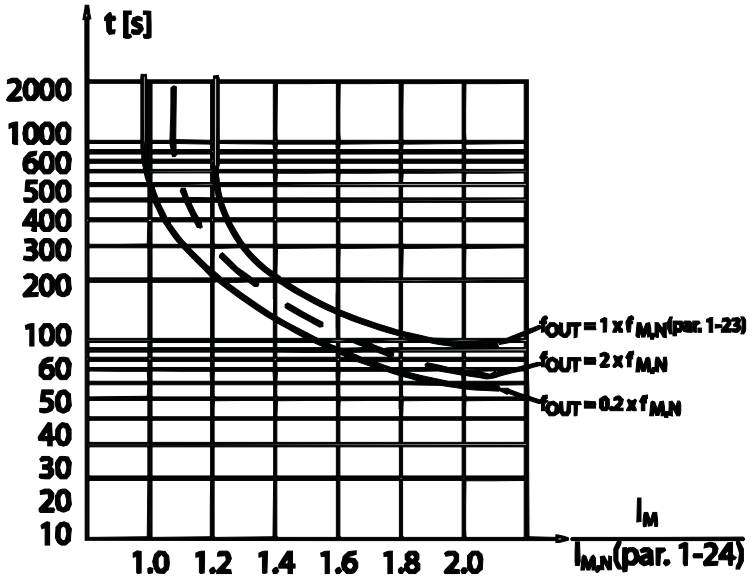
Automatically chooses motor control for the operating conditions:
The low speed switching pattern ensures reliable starts and smooth low speed operation.
The high speed switching pattern minimizes switching losses and maximizes drive efficiency. The HVC maximizes the performance and the efficiency of the system while minimized the heating of the motor which results in a longer life.

Automatic Motor Parameter Identification (AMPI).

AMPI is an algorithm to measure the electrical motor parameters on a motor at rest. This means that AMPI itself does not supply any torque. AMPI is useful when commissioning systems and optimising the adjustment of the frequency converter to the applied motor. Lowara 2 pole high efficiency IE3 50Hz surface motors have parameters already preset as default. This feature is particularly used where the default setting does not apply to the connected motor. The benefit of this feature is to maximize the control and efficiency of the HYDROVAR for any given standard asynchronous motor.

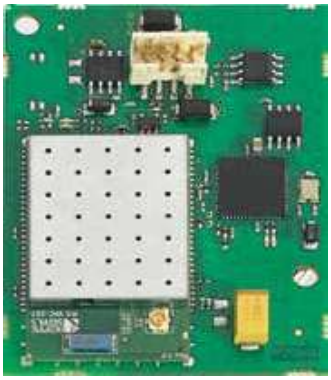
Motor thermal protection.

HYDROVAR has built in software thermal control (STC) so no need for fitting motor PTCs. The STC function is initialized at 1.125 x rated motor current and rated motor frequency. The STC function provides class 20 motor overload protection in accordance with the NEC. Motor thermal protection prevents the motor from overheating. The STC function is an electronic feature that simulates a bimetal relay that is based on internal measurements. The characteristic is shown in the following figure.



Optional components.

Premium card	Card which will allow up to 5 slave pumps and additional analog and 2 x inputs and 2 x outputs
Wi-Fi card	To connect HYDROVAR via wireless connection
Sensors	Different sensors are available from pressure, differential, temperature, flow indicator or level sensor
Wall mounting kit	Stainless steel wall mounting kit fitted with external cooling fan and connection box
Fan cowl mounting ring	Used for plastic fan cowls, 140mm or 155mm in diameter
Motor filters	-
Motor cables	Cable that is ready to connect to the unit and motor



Benefits.

Single-speed drives start motors abruptly, subjecting the motor to high torque and current surges up to 10 times the full-load current. In contrast, variable-frequency drives offer a "soft start" capability, gradually ramping up a motor to operating speed. This lessens mechanical and electrical stress on the motor system and can reduce maintenance and repair costs and extend motor life.

Other advantages of frequency controllers

Lower starting current

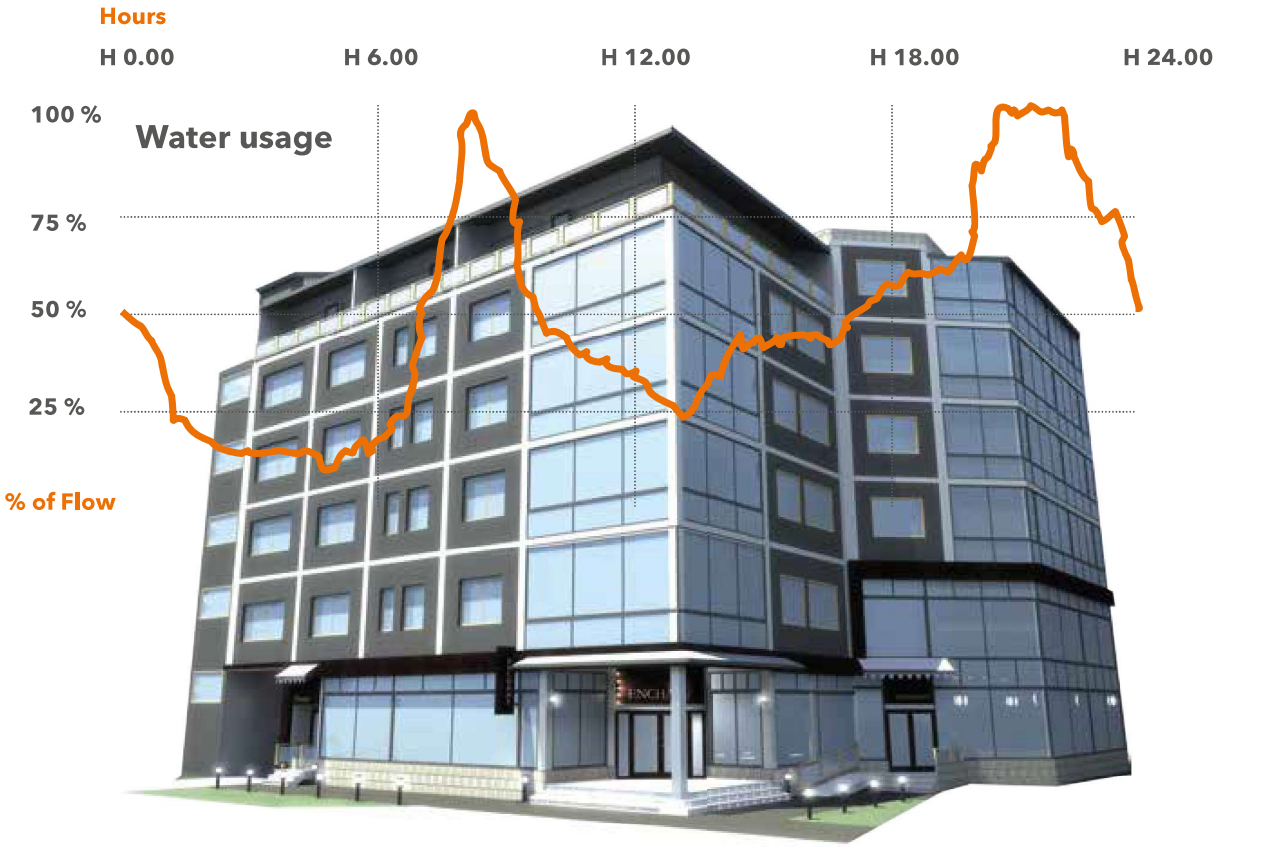
Reduced mechanical stress

Flexibility of operation

Reduced noise levels

Payback costs in energy and payback

Reduced hardware requirements – starters, power factor correction, metering/ monitoring, PI control, etc. no longer required



Water consumption in a hotel is not uniform during the day. The pumping system should be able to match the real needs of the users.

Life Cycle Cost (LCC) calculation.

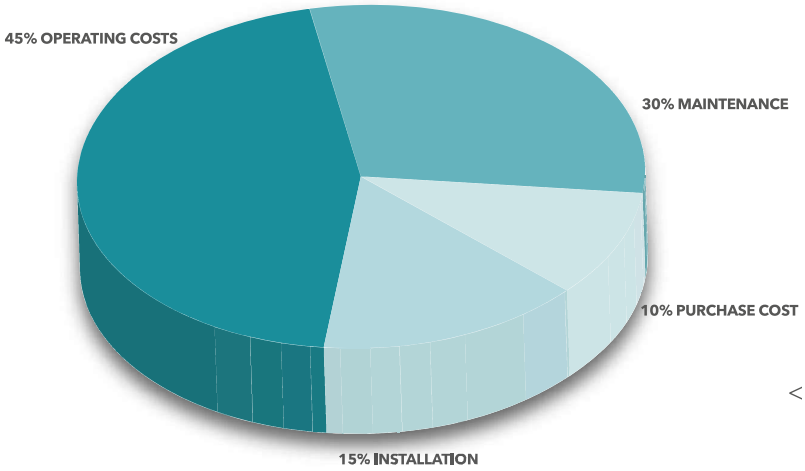
It's also important to look at Life Cycle Costs (LCC).
Pumping systems account for nearly 20% of the world's electrical energy usage. Some studies show that between 30 and 50% of energy consumed by a pump could be saved through the use of fitting a VSD. The main economic reasons for using LCC is because companies are becoming increasingly aware of the environmental impacts and looking at energy efficiency as one way of reducing emissions and preserving natural resources.
Existing pumping systems provide a greater opportunity for saving money not just by fitting VSDs but looking at installing new pumps which have higher hydraulic efficiencies and also motors which have changed over the years to become more efficient. This is due to the strict EU regulations which have been adopted over the past and coming years to save energy usage.

As a general guide these figures are realistic, but the percentages could change from job to job, depending on the size / type / and complexity of the installation. The idea here is to give the consultant the perspective that if you save on the energy cost – this makes up a huge part of the LCC, and therefore saving energy will save money.

Calculation of LCC = Life Cycle Costs

$$\mathbf{LCC = C_{ic} + C_{in} + C_e + C_o + C_m + C_s + C_d + C_{env}}$$

C_{ic}	Initial costs, purchase price (pump, pipe, valves, auxiliary)
C_{in}	Installation and commissioning
C_e	Energy costs
C_o	Operating costs
C_m	Maintenance costs
C_s	Downtime, loss of production
C_d	Decommissioning
C_{env}	Environmental



<< This picture shows the typical LCC of a 15 year life cycle of a pump.

Energy efficiency funding schemes.

The graph below is an indication of the benefits of fitting HYDROVAR to each fixed speed motor.

Please check with your local country government efficiency project schemes; grants may be available towards installing inverter technology on electric motors to achieve substantial energy savings by reducing motor speeds.

HYDROVAR cost savings examples

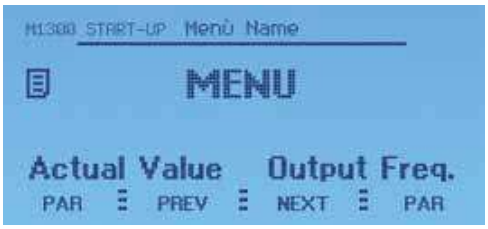
Size of motor for pump unit	**3 kW**	**3 kW**	**5.5 kW**	**5.5 kW**	**11 kW**	**11 kW**	**22 kW**	**22 kW**
Cost of energy (€)	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Flow in % of full rated flow	60	80	60	80	60	80	60	80
Weeks per year	48	48	48	48	48	48	48	48
Days per week running	5	5	5	5	5	5	5	5
Hours per day running	12	12	12	12	12	12	12	12
Cost of single HYDROVAR (€)	1,400	1,400	1,700	1,700	2,500	2,500	2,800	2,800
Cost of installation (€)	300	300	300	300	300	300	300	300
Interest rate (%)	3	3	3	3	3	3	3	3
Power used	0.65 kW	1.54 kW	1.19 kW	2.82 kW	2.38 kW	5.63 kW	4.75 kW	11.26 kW
Power saved	1.53 kW	1.24 kW	2.80 kW	2.28 kW	5.61 kW	5.56 kW	11.21 kW	9.13kW
Money saved in euros per year	968.65 euro's	788.45 euro's	1,775.85 euro's	1,445.50 uro's	3,551.71 euro's	2,890.99 euro's	7,103.42 euro's	5,781.98 euro's
Energy saved	4,402.94 kWh	3,583.87 kWh	8,072.06 kWh	6,570.43 kWh	16,144.13 kWh	13.140,86 kWh	32,288.26 kWh	26,281.73 kWh
Payback	**1.83 years**	**2.26 years**	**1.28 years**	**1.58 years**	**0.81 years**	**1 years**	**0.45 years**	**0.55 years**

Notes: we have based some assumptions on the examples of fitting HYDROVAR onto fixed speed motors:

1. The cost of energy, we have assumed 0.22 euros per kW.
2. We have used two % of the full flow rate being 60% and 80%.
3. We have used 48 weeks per year, 5 days per week, 12 hours per day.
4. We have based an average cost of the HYDROVAR.
5. We have assumed an average installation fitting cost.

With all this information we can use an estimated payback for fitting a HYDROVAR VSD in terms of time, money and power saved.

Start-up menu.



HYDROVAR start-up screen

START

AFTER 10 MINUTES IF THE START UP IS NOT COMPLETED THE HV WILL DISPLAY A WARNING SHOWING THE CUSTOMER TO COMPLETE IT.

LANGUAGE: SELECTION

MOTOR POWER

MOTOR SUPPLY

PRESET MOTOR

SOFTWARE THERMAL CONTROL (STC OF THE MOTOR)

OPERATING MODE: E.G. SERIAL OR SYNCHRONOUS

PUMP ADDRESS

CONSTANT PRESSURE OR CONSTANT DIFFERENTIAL PRESSURE

COMMENT: BY DEFAULT SOME PARAMETERS WILL CHANGE (RAMPS, SENSORS, HYSTERESIS ETC...)

DIMENSION UNIT: (BAR, PSI, M^3/H, G/MIN, MH2O, FT,..., %)

COMPLETED START UP ?

SENSOR RANGE PRESSURE TRANSMITER RANGE

REQUIRED VALUE

START VALUE

MIN. THRESHOLD

DELAY TIME

DATE - TIME (REAL TIME CLOCK / CALENDAR)

AUTO - START

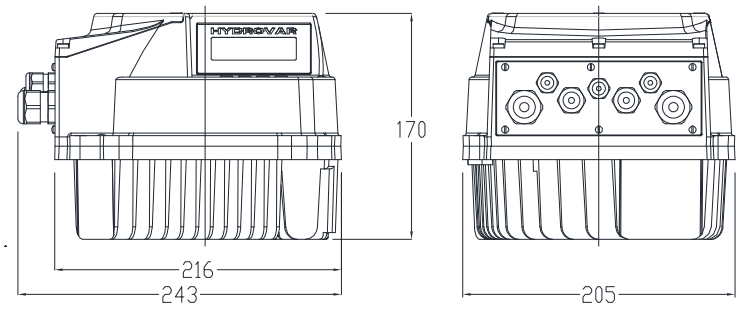
COMPLETED START UP ?

Energy savings in HVAC systems.

Energy is the largest cost of running any pump, with the biggest potential savings. HYDROVAR works with your system to make it efficient. This intelligent variable speed drive controls the pump exactly according to the current requirements of the user. Compared to an unregulated system, HYDROVAR saves up to 70% of the energy consumption (as tested by TÜV Austria, vogw0312-PIR-ZR). The smooth regulation at optimal operation increases not only the efficiency but also the life of the system's components and reduces maintenance costs.

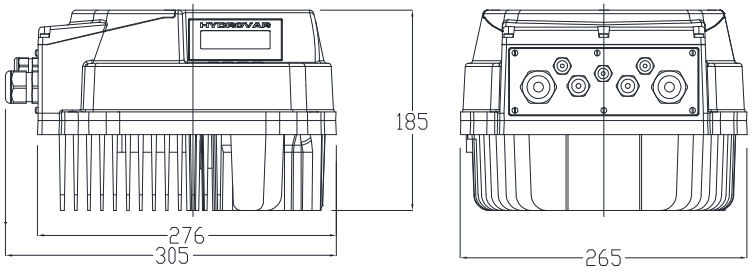
Dimension and weight.

Model A



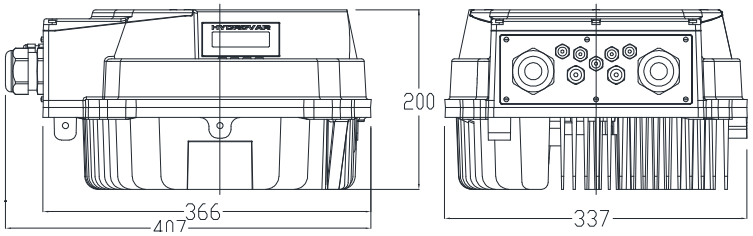
Model Type	Model Size	Maximum Weight
2.015	A	5,6 kg (12.31 lbs)
2.022	A	5,6 kg (12.31 lbs)
3.015	A	5,6 kg (12.31 lbs)
3.022	A	5,6 kg (12.31 lbs)
4.015	A	5,6 kg (12.31 lbs)
4.022	A	5,6 kg (12.31 lbs)
4.030	A	5,6 kg (12.31 lbs)
4.040	A	5,6 kg (12.31 lbs)

Model B



Model Type	Model Size	Maximum Weight
2.030	B	10,5 kg (23.14 lbs)
2.040	B	10,5 kg (23.14 lbs)
3.030	B	10,5 kg (23.14 lbs)
3.040	B	10,5 kg (23.14 lbs)
3.055	B	10,5 kg (23.14 lbs)
4.055	B	10,5 kg (23.14 lbs)
4.075	B	10,5 kg (23.14 lbs)
4.110	B	10,5 kg (23.14 lbs)

Model C



Model Type	Model Size	Maximum Weight
3.075	C	15,6 kg (34.39 lbs)
3.110	C	15,6 kg (34.39 lbs)
4.150	C	15,6 kg (34.39 lbs)
4.185	C	15,6 kg (34.39 lbs)
4.220	C	15,6 kg (34.39 lbs)

Electrical Data.

Model Type	Rated output	Nominal input voltage	Model Size	Max Input current (A)	Efficiency Rated (%) typical	Output voltage (V)	Max output current (A)	Output frequency (Hz)
2.015	1.5 kW	208-240±10% (Single phase)	A	11.6 A	94%	0-240 (Three phase)	7.5 A	15-70 (Hz)
2.022	2.2 kW	208-240±10% (Single phase)	A	15.1 A	93.5%	0-240 (Three phase)	10 A	15-70 (Hz)
2.030	3 kW	208-240±10% (Single phase)	B	22.3 A	93.5%	0-240 (Three phase)	14.3 A	15-70 (Hz)
2.040	4 kW	208-240±10% (Single phase)	B	27.6 A	93.5%	0-240 (Three phase)	16.7 A	15-70 (Hz)
3.015	1.5 kW	208-240±10% (Three phase)	A	7 A	96%	0-100% of supply voltage	7.5 A	15-70 (Hz)
3.022	2.2 kW	208-240±10% (Three phase)	A	9.1 A	96%	0-100% of supply voltage	10 A	15-70 (Hz)
3.030	3 kW	208-240±10% (Three phase)	B	13.3 A	96%	0-100% of supply voltage	14.3 A	15-70 (Hz)
3.040	4 kW	208-240±10% (Three phase)	B	16.5 A	96%	0-100% of supply voltage	16.7 A	15-70 (Hz)
3.055	5.5 kW	208-240±10% (Three phase)	B	23.5 A	96%	0-100% of supply voltage	24.2 A	15-70 (Hz)
3.075	7.5 kW	208-240±10% (Three phase)	C	29.6 A	96%	0-100% of supply voltage	31 A	15-70 (Hz)
3.110	11 kW	208-240±10% (Three phase)	C	43.9 A	96%	0-100% of supply voltage	44 A	15-70 (Hz)
4.015	1.5 kW	380-460±15% (Three phase)	A	3.9 A	96%	0-100% of supply voltage	4.1 A	15-70 (Hz)
4.022	2.2 kW	380-460±15% (Three phase)	A	5.3 A	96.5%	0-100% of supply voltage	5.7 A	15-70 (Hz)
4.030	3 kW	380-460±15% (Three phase)	A	7.2 A	96.5%	0-100% of supply voltage	7.3 A	15-70 (Hz)
4.040	4 kW	380-460±15% (Three phase)	A	10.1 A	96.5%	0-100% of supply voltage	10 A	15-70 (Hz)
4.055	5.5 kW	380-460±15% (Three phase)	B	12.8 A	97%	0-100% of supply voltage	13.5 A	15-70 (Hz)
4.075	7.5 kW	380-460±15% (Three phase)	B	16.9 A	97%	0-100% of supply voltage	17 A	15-70 (Hz)
4.110	11 kW	380-460±15% (Three phase)	B	24.2 A	97%	0-100% of supply voltage	24 A	15-70 (Hz)
4.150	15 kW	380-460±15% (Three phase)	C	33.3 A	97%	0-100% of supply voltage	32 A	15-70 (Hz)
4.185	18.5 kW	380-460±15% (Three phase)	C	38.1 A	97%	0-100% of supply voltage	38 A	15-70 (Hz)
4.220	22 kW	380-460±15% (Three phase)	C	44.7 A	97%	0-100% of supply voltage	44 A	15-70 (Hz)

Retrofitting.

Halve the cost of running a booster set in five steps.

Retrofiitting the ‘plug and play’ HYDROVAR units to a fixed speed booster set not only eliminates the need for a control panel but also introduces a soft start function, that when combined with the benefits of running a pump at a variable speed, can prolong the life of the pump and the water system. By reducing the in-rush current when the pump is turned on, parts such as motor bearings and pipe fittings are protected from hydraulic shock that can cause cavitation and breakdown.

Connecting a HYDROVAR couldn't be simpler; here we demonstrate an installation in just five steps:

1

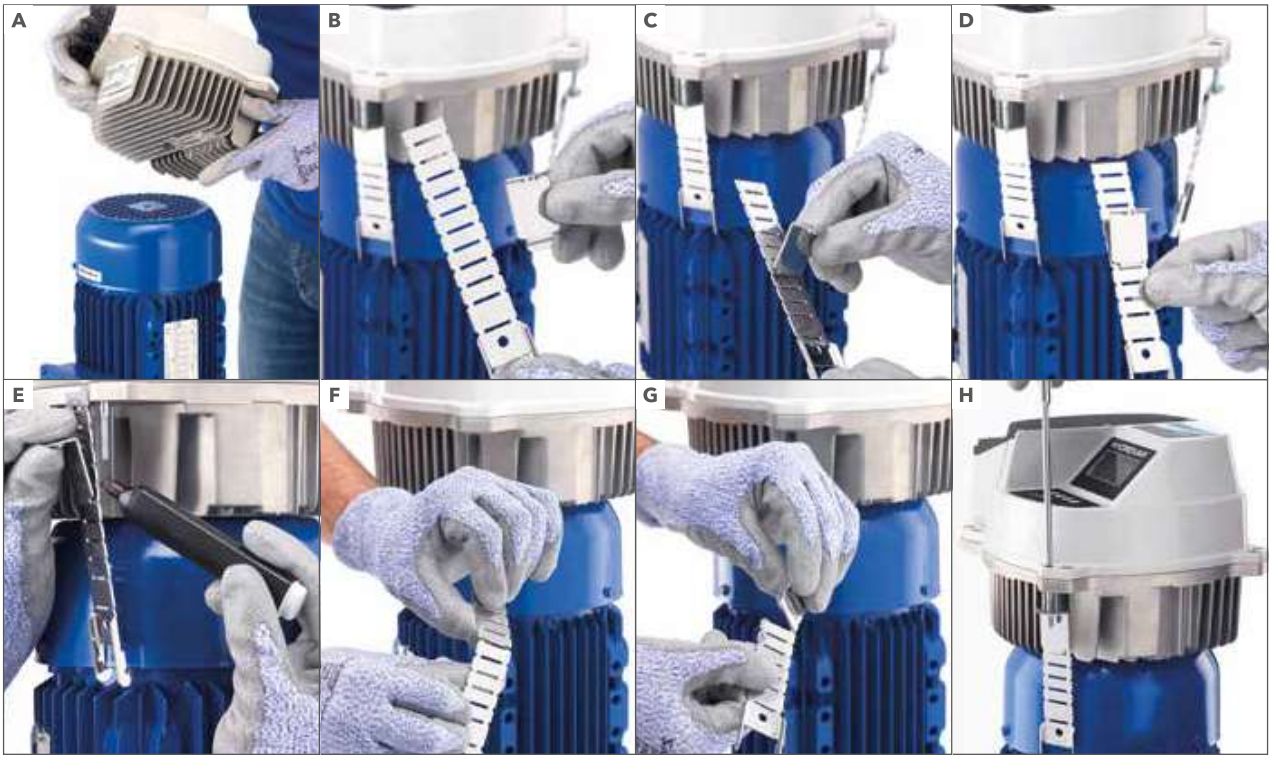
Step One: Assessment of the installation site and the current pump activity.

Before any HYDROVAR installation, the site and its current equipment should be assessed to determine the current level of energy being consumed and the kW of the motor. From here, the installer can calculate how much the booster set or heating pump is costing on an annual basis by calculating 0.22 Euros per hour for each kilowatt of energy consumed. An 11kW single pump will therefore cost €2.42 per hour to run at full speed. Once this cost has been multiplied by the number of pumps that are in use, the installer can explain in monetary terms what an average 50 per cent reduction in energy consumption would save the end user.

2

Step Two: Clamping the HYDROVAR into place.

The HYDROVAR sits directly onto the pump and utilises the cool air emitted from the fan vents to prevent overheating. This means that there is no need for an additional cooling unit, keeping the footprint of the HYDROVAR to a minimum and not utilising valuable wall space. Fixings are located on the outer casing so no need to remove the casing of the HYDROVAR as previous models. Use the four mounting clamps provided together with the central post pin and secure it to the metal fan cowl of the pump unit. The clamps are designed to fit all IEC motors. Stainless steel ring supports are available for motors fitted with plastic fan cowls. Wall mounted versions are available as an option.



3

Step Three: Pump Terminal Wiring.
After attaching the cable glands to the exposed gland plate on the left hand side of the HYDROVAR, unscrew and remove the front of the pump motor terminal box. Take the HYDROVAR connection cables (purchased separately or made using standard wires and connections) and feed the motor terminal end of the cable through the cable entry points, connecting it to the relevant terminals. If you are retrofitting the unit to an existing booster set then the power supply needs to be rerouted directly into the HYDROVAR. No PCT is required and this is now done by the internal software of the HYDROVAR. Once this is done, reattach the terminal front cover, ensuring that the water seal is correctly in place.

4

Step Four: HYDROVAR wiring.
Remove the wiring chamber cover and pass the other end of the connection cable through the cable inlet on the left hand side of the HYDROVAR, connecting it to the relevant power supply and signal wires. Once this is done, connect the transsducer cable (also called the sensor or pressure transmitter) to the HYDROVAR through the same gland plate. The loose end of the transducer must then be connected to the pipe as close to the pump as possible.

5

Step Five: Completion and programming.
After replacing the terminal cover lid of the HYDROVAR unit, programme the required bar pressure using the buttons and the screen. Depending on the number of pumps in the booster set, some very simple programming may be required. This is detailed clearly in the operating instructions manual. The first screen after powering up the unit will be the quick start guide after setting these parameters; the HYDROVAR will automatically begin its soft start and work to the system requirements.

Other products available in the Xylem porftolio.


LOWARA

Xylem |'zīləm|

1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

We're a global team unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

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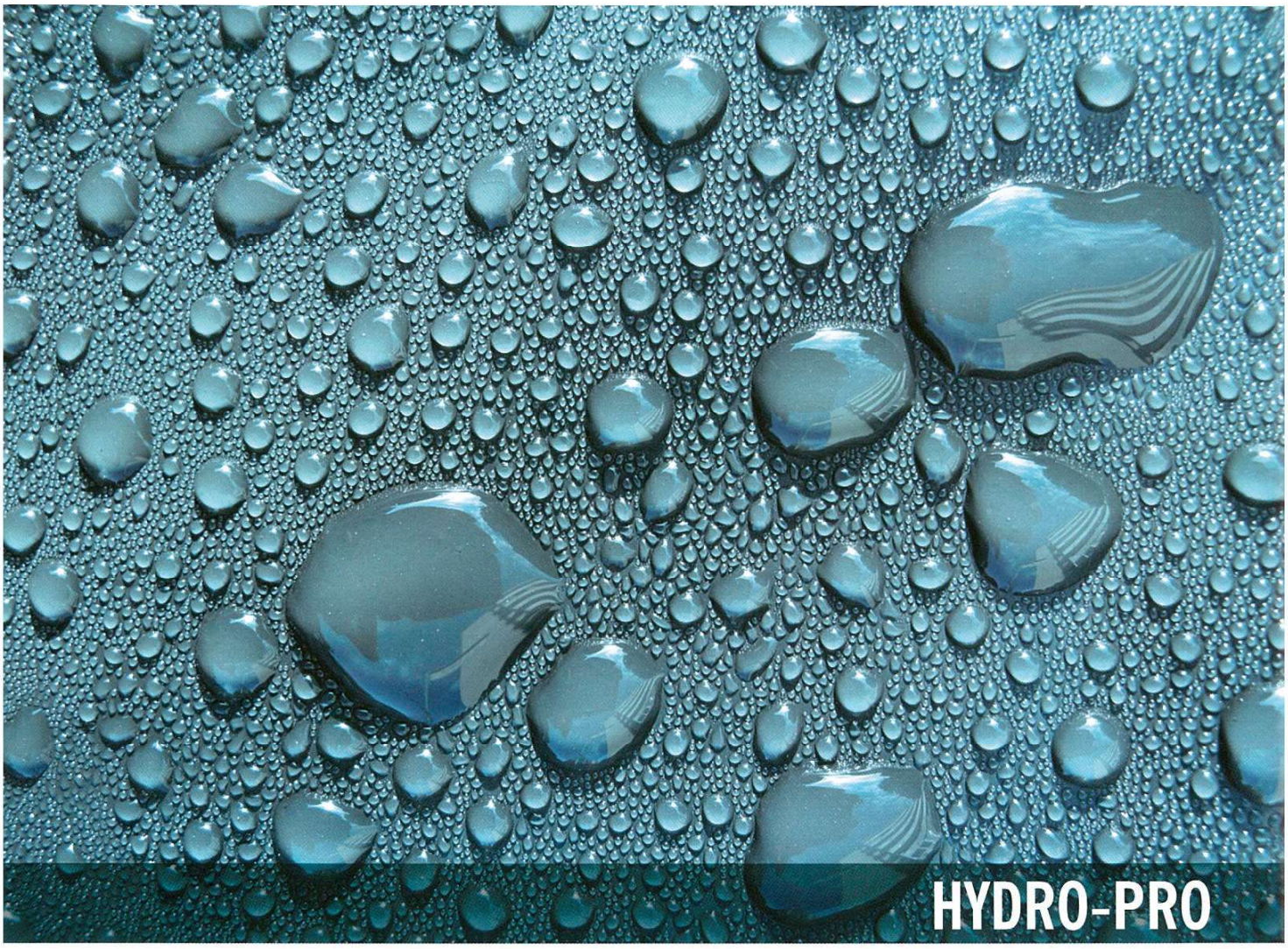
cod. 191007781 - P10/16

PRESSURE VESSEL



ZILMET®

acqua sanitaria | *sanitary water*

hydro-pro

Applicazioni: per elettropompe, come anticolpo d'ariete, per bollitori
Applications: for electric pumps, anti-water hummer, for water heaters

caratteristiche generali | *general features*

Vantaggi

Il vaso di espansione HYDRO-PRO, con il suo design compatto e il funzionamento ottimale della membrana non facilita la crescita batteriologica. È inoltre omologato a livello internazionale per l'uso con acqua potabile ed è disponibile in un'ampia gamma di modelli, con una capacità da 2 a 600 litri.

Caratteristiche tecniche

Valvola di precarica con protezione. Vaso in acciaio al carbonio per una lunga durata. Il sistema esclusivo di saldatura MIG elimina ogni spigolo o profilo tagliente all'interno del serbatoio e previene danni alla membrana e al rivestimento interno. Camera pressurizzata. Membrana in butile per isolare l'acqua dall'aria. Rivestimento esclusivo interno con polvere epossidica per evitare ogni corrosione. Vernice epossi-poliestere esterna evita la ruggine. Raccordo in acciaio.

Funzionamento

Il serbatoio HYDRO-PRO Zilmet è precaricato e controllato in fabbrica. La membrana a diaframma garantisce che l'acqua e l'aria non si mescolino assieme evitando così ogni possibilità di perdita di pressione e corrosione. Quando la pompa parte, l'acqua entra nel serbatoio poiché la pressione dell'impianto supera la pressione di precarica. Viene perciò accumulata acqua disponibile. Quando la pressione all'interno del serbatoio raggiunge la pressione dell'impianto la pompa si arresta. Nel serbatoio è stata accumulata la massima capacità d'acqua. Quando ci sarà nuovamente bisogno di acqua, la pressione all'interno del serbatoio spingerà l'acqua nell'impianto. Poiché il serbatoio HYDRO-PRO Zilmet garantisce la pressione in ogni momento inviando la massima quantità di acqua possibile, le partenze della pompa sono ridotte al minimo.

Advantages

Compact design with a seamless diaphragm, that never stretches or creases. There are no bubbles or corners to trap sediment, inhibiting bacterial growth; international approvals for use with potable water. Wide range available (from 2 to 600 litres).

Technical features

Protected precharge valve. Durable steel tank. Deep-drawn steel shell for extra strength. MIG welding process eliminates interior rough spots and sharp edges and prevents damage to diaphragm and liner. Pre-pressurized air chamber. Butyl diaphragm isolates water from air. Exclusive internal epoxy coating : no corrosion. External epoxy-polyester coating : no rusting. Mild steel connection.

Working

The Zilmet HYDRO-PRO tank leaves the factory already tested and pre-pressurized. Air and water do not mix, eliminating any possibility of "water-logging" through loss of air to the system ; no corrosion.
When the pump starts, water enters the tank as system pressure passes the pressure precharge. Only usable water is stored. When the pressure in the chamber reaches the maximum system pressure, the pump stops working. The tank is filled to its maximum capacity. When water will be needed again, pressure in the airside will push water into the system. Since the Zilmet HYDRO-PRO tank does not water log and delivers all possible water, minimum pumps starts are assured.

MADE IN ITALY

ZILMET

certificazioni | *certifications*

dati tecnici e dimensionali | *technical and dimensional data*

	Modello *Model*	Codice *Code*	Capacità *Capacity*	Ø Diametro *Ø Diameter*	H Altezza *H Height*	E	Raccordi *Connections*
			litri / *litres*	mm	mm	mm	
	HYDRO - PRO 2	11A0000200	2	142	196	-	1/2"G
	HYDRO - PRO 5	11A0000500	5	160	270	-	3/4"G
	HYDRO - PRO 8	11A0000800	8	200	280	-	3/4"G
	HYDRO - PRO 12	11A0001200	12	270	264	-	3/4"G
	HYDRO - PRO 18	11A0001800	18	270	349	-	3/4"G
	HYDRO - PRO 24	11A0002400	24	300	392	-	1"G
	HYDRO - PRO 24 H	11A0002434	24	300	333	-	1"G
	HYDRO - PRO 35	11A0003500	35	380	370	-	1"G
	HYDRO - PRO 50	11A0005000	50	380	505	153	1"G
	HYDRO - PRO 50 H	11A0005002	50	380	418	-	1"G
	HYDRO - PRO 50 IN LINE	11A0005017	50	380	497	-	1"G
1)	HYDRO - PRO 80	11A0008000	80	450	608	150	1"G
	HYDRO - PRO 105	11A0010500	105	500	665	165	1¼"G
	HYDRO - PRO 150	11A0015000	150	500	897	216	1¼"G
2)	HYDRO - PRO 200	11A0020000	200	600	812	225	1¼"G
	HYDRO - PRO 250	11A0025000	250	630	957	245	1½"G
	HYDRO - PRO 300	11A0030000	300	630	1105	245	1½"G
	HYDRO - PRO 400	11A0040000	400	630	1450	245	1½"G
	HYDRO - PRO 500	11A0050000	500	750	1340	290	1½"G
	HYDRO - PRO 600	11A0060000	600	750	1555	290	1½"G

descrizione dei materiali | *material description*

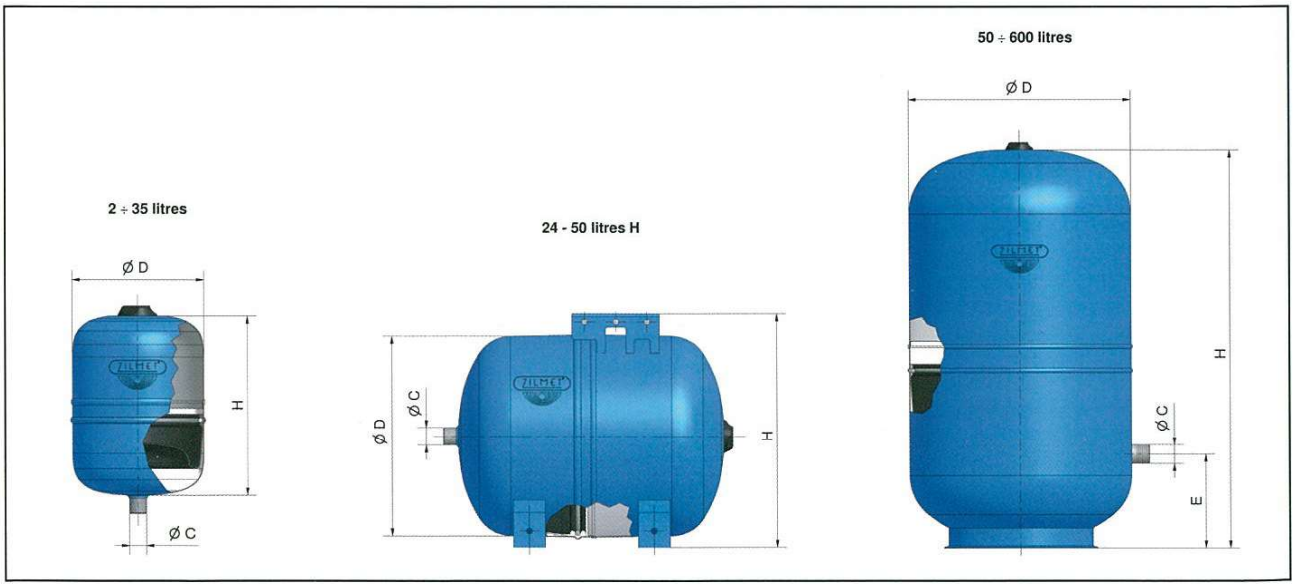
descrizione / *description*	**materiale**	***material***
corpo / *shell*	acciaio al carbonio*	*carbon steel**
raccordi / *connection*	acciaio al carbonio*	*carbon steel**
membrana interna / *fixed membrane*	butile**	*butyl***
colore / *colour*	blu/grigio (2 litri)	*blue/grey (2 litres)*

* rivestimento interno a polvere per uso alimentare / *internally coated with powder for alimentary purposes*
** per uso alimentare / *for alimentary purposes*

condizioni di utilizzo | *operating conditions*

pressione massima di esercizio/ *max. operating pressure*	*10 bar*
temperature di esercizio / *operating temperatures*	*-10 ÷ 99 °C*
precarica in fabbrica (2 litri) / *factory precharge (2 litres)*	*3.5 bar*
precarica in fabbrica (5÷8 litri) / *factory precharge (5÷8 litres)*	*3 bar*
precarica in fabbrica (12÷600 litri) / *factory precharge (12÷600 litres)*	*2 bar*

disegni tecnici | *technical drawings*



drawdown

Il drawdown riportato nelle tabelle è la quantità di fluido operativo immagazzinato all'interno del vaso d'espansione tra la pressione minima P_{MIN} e la pressione massima P_{MAX}.
The drawdown shown on the tables below is the amount of operating fluid stored in the expansion vessel / pressure tank between the minimum pressure P_{MIN} and the maximum pressure P_{MAX}.

ELETTROPOMPE - *ELECTRIC PUMPS*

Capacità *Capacity*	Pressione max. di esercizio *Max. working pressure*	Precarica *Precharge*	Pressione min. partenza pompa *Min. pump start pressure*	Drawdown $\frac{P_{MIN}}{P_{MAX}} = 4\ (5)^*$	Portata *Flow rate*	Drawdown $\frac{P_{MIN}}{P_{MAX}} = 6\ (7)^*$	Portata *Flow rate*	Drawdown $\frac{P_{MIN}}{P_{MAX}} = 8\ (9)^*$	Portata *Flow rate*	Drawdown $\frac{P_{MIN}}{P_{MAX}} = 10$	Portata *Flow rate*
litri/litres	bar	bar	bar	litri/litres	l/min	litri/litres	l/min	litri/litres	l/min	litri/litres	l/min
2	10	3,5	3,7	0,4	0,3	0,8	0,6	1,0	0,7	1,1	0,8
5	10	3	3,2	1,4	1,0	2,3	1,6	2,8	2,0	2,9	2,1
8	10	3	3,2	2,3	1,7	3,6	2,6	4,4	3,2	4,7	3,4
12	10	2	2,2	4,1	2,9	6,1	4,4	7,3	5,3	8,0	5,8
18	10	2	2,2	6,1	4,4	9,2	6,7	10,9	7,9	12,0	8,7
24	10	2	2,2	8,1	5,9	12,2	8,9	14,5	10,5	16,0	11,6
24	10	2	2,2	8,1	5,9	12,2	8,9	14,5	10,5	16,0	11,6
35	10	2	2,2	11,8	8,6	17,8	13,0	21,2	15,4	23,3	16,9
50	10	2	2,2	16,9	12,3	25,5	18,5	30,2	22,0	33,2	24,2
50	10	2	2,2	16,9	12,3	25,5	18,5	30,2	22,0	33,2	24,2
50	10	2	2,2	16,9	12,3	25,5	18,5	30,2	22,0	33,2	24,2
1) 80	10	2	2,2	27,0	19,6	40,7	29,6	48,3	35,1	53,2	38,7
105	10	2	2,2	35,4	25,8	53,4	38,9	63,4	46,1	69,8	50,8
150	10	2	2,2	50,6	36,8	76,3	55,5	90,6	65,9	99,7	72,5
2) 200	10	2	2,2	67,5	49,1	101,8	74,0	120,8	87,9	133,0	96,7
250	10	2	2,2	84,4	61,4	127,2	92,5	151,0	109,8	166,2	120,9
300	10	2	2,2	101,3	73,6	152,7	111,0	181,3	131,8	199,4	145
400	10	2	2,2	135,0	98,2	203,6	148,1	241,7	175,8	265,9	193,4
500	10	2	2,2	168,8	122,7	254,5	185,1	302,1	219,7	332,4	241,7
600	10	2	2,2	202,5	147,3	305,4	222,1	362,5	263,6	398,9	290,1

* Pressione massima dell'impianto per vasi di espansione con precarica pari a 3 e 3,5 bar (vasi con capacità 2, 5, 8 litri) / *Maximum system pressure for expansion vessels (2, 5, 8 litres) with precharge pressure at 3 or 3.5 bar*

NOTE / *NOTES*

1) Calcoli validi nell'ipotesi che la pressione minima di partenza della pompa sia superiore di 0,2 bar rispetto alla precarica del vaso di espansione / *Calculations made considering the minimum system pressure is 0.2 bar greater than the precharge pressure of the expansion vessel*

2) La formula utilizzata per il calcolo del drawdown è la seguente / *The formula for calculating the drawdown is the following:* **DRAWDOWN = {[(P_{MAX}+1)-(P_{MIN}+1)]* (P_{PREC}+1)* CAPACITÀ} / [(P_{MAX}+1)* (P_{MIN}+1)]**
P_{MAX}= pressione massima di arresto della pompa / *maximum pressure switch setting at which pump stops* • P_{MIN}= pressione minima di intervento della pompa / *minimum pressure switch setting at which pump starts*
P_{PREC}= pressione di precarica del vaso d'espansione / *precharge pressure of the expansion vessel* • Le pressioni sono espresse in bar (pressioni relative) / *All the pressures indicated are in bar (relative pressures)*

3) La formula per il calcolo della portata massima del sistema è la seguente / *The formula for calculating the maximum flow rate of the system is the following:* **Q = (DRAWDOWN * N)/ M**
Numero massimo di avvii della pompa per ora, N= 12 / *Maximum allowable pump starts per hour,* N= 12
Coefficiente moltiplicativo, M=16,5 (valido per il modello di calcolo adottato) / *Multiplying coefficient, M= 16.5 (for this calculation model)*

RISCALDAMENTO - *HEATING*

Capacità *Capacity*	Pressione max. di esercizio *Max. working pressure*	Precarica *Precharge*	Drawdown $\frac{P_{MIN}}{P_{MAX}} = 4\ (5)^*$	Drawdown $\frac{P_{MIN}}{P_{MAX}} = 6\ (7)^*$	Drawdown $\frac{P_{MIN}}{P_{MAX}} = 8\ (9)^*$	Drawdown $\frac{P_{MIN}}{P_{MAX}} = 10$
litri/litres	bar	bar	litri/litres	litri/litres	litri/litres	litri/litres
2	10	3,5	0,5	0,9	1,1	1,2
5	10	3	1,7	2,5	3,0	3,2
8	10	3	2,7	4,0	4,8	5,1
12	10	2	4,8	6,9	8,0	8,7
18	10	2	7,2	10,3	12,0	13,1
24	10	2	9,6	13,7	16,0	17,5
24	10	2	9,6	13,7	16,0	17,5
35	10	2	14,0	20,0	23,3	25,5
50	10	2	20,0	28,6	33,3	36,4
50	10	2	20,0	28,6	33,3	36,4
50	10	2	20,0	28,6	33,3	36,4
80	10	2	32,0	45,7	53,3	58,2
105	10	2	42,0	60,0	70,0	76,4
150	10	2	60,0	85,7	100,0	109,1
200	10	2	80,0	114,3	133,3	145,5
250	10	2	100,0	142,9	166,7	181,8
300	10	2	120,0	171,4	200,0	218,2
400	10	2	160,0	228,6	266,7	290,9
500	10	2	200,0	285,7	333,3	363,6
600	10	2	240,0	342,9	400,0	436,4

* Pressione massima dell'impianto per vasi di espansione con precarica pari a 3 e 3,5 bar (vasi con capacità 2, 5, 8 litri) / *Maximum system pressure for expansion vessels (2, 5, 8 litres) with precharge pressure at 3 or 3.5 bar*

NOTE / *NOTES*

1) Calcoli validi nell'ipotesi che la pressione minima di funzionamento dell'impianto sia uguale alla pressione di precarica del vaso di espansione / *Calculations made considering the minimum system pressure equals the precharge pressure of the expansion vessel*

2) La formula utilizzata per il calcolo del drawdown è la seguente / *The formula for calculating the drawdown is the following:* **DRAWDOWN = [1- ((P_{PREC}+1)/(P_{MAX}+1))] * CAPACITÀ**
P_{MAX}= pressione massima di funzionamento dell'impianto / *maximum system pressure* • P_{PREC}= pressione di precarica del vaso d'espansione / *precharge pressure of the expansion vessel*
Le pressioni sono espresse in bar (pressioni relative) / *All the pressures indicated are in bar (relative pressures)*

ATTENZIONE: il calcolo deve essere verificato da un tecnico specializzato ed autorizzato per considerare le reali caratteristiche dell'impianto. In ogni caso la pressione massima d'esercizio del vaso d'espansione deve essere almeno pari alla pressione massima del sistema.

ATTENTION: *the calculation has to be verified by a specialized and authorized technician for keeping into account the real characteristics of the system. In any case maximum working pressure of the expansion vessel must equal maximum system pressure at least.*

ZILMET

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PROJECT REFERENCE

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REFERENCE LIST OF XYLEM PUMPS INSTALLED IN SINGAPORE

1. 4-STY RESIDENTIAL HOUSE AT LIM TUA TOW ROAD
2. 5-STY FACTORY BUILDING AT YISHUN INDUSTRIAL PARK A
3. 5-STY SHOWROOM AT LENG KEE ROAD
4. 5-STY WELTECH FACTORY BUILDING AT UBI ROAD 4
5. 6-STY BOARDING HOUSE AT BEACH ROAD
6. 6-STY OFFICE BUILDING AT MIDDLE ROAD
7. 7-STY COMMERCIAL DEVELOPMENT AT HAVELOCK ROAD
8. 7-STY FACTORY BUILDING AT 5 KALLANG PUDDING ROAD
9. 7-STY OFFICE BUILDING AT TANNERY LANE
10. 7-STY OLYMPHIA DIARY BUILDING AT UBI ROAD 4
11. 7-STY UNCLE CHOO BUILDING AT UBI ROAD 4
12. 8-STY APARTMENT BUILDING AT GEYLANG LOR 12
13. 8-STY APARMENT BUILDING AT GEYLANG LOR 8
14. 8-STY FACTORY BUILDING AT GENTING LANE
15. ST MICHAEL CONDOMINIUM AT SERANGOON ROAD
16. HEWLETT PACKARD BUILDING AT 450 / 452 ALEXANDRA ROAD
17. KAKI BUKIT INDUSTRIAL PARK PHASE
18. PASIR PANJANG CONDOMINIUM
19. GRACE METHODIST CHURCH AT TELOK BLANGAH ROAD
20. ROXY SQUARE AT MARINE PARADE ROAD
21. VILLA MARINA CONDOMINIUM AT JALAN SEMPADAN
22. PARLIAMENT HOUSE AT HIGH STREET
23. 4-STOREY CONDOMINIUM AT CAVENAGH ROAD
24. LADYHILL CONDOMINIUM AT LADYHILL ROAD
25. CIVIL SERVICE INSTITUTE AT NORTH BUONA VISTA
26. JTC FLATTED FACTORY AT SERANGOON NORTH AVENUE 5 / AVENUE 3
27. ORCHARD SCOTTS CONDOMINIUM
28. SENTOSA BEAUFORT HOTEL
29. FERNHILL CONDOMINIUM
30. PALM GARDEN CONDOMINIUM
31. MAYFAIR CONDOMINIUM
32. GURKHA CANTOMENT COMPLEX
33. P O S BANK BUILDING (CAPITAL TOWER)
34. 7-STY FOOD FACTORY AT KAMPONG AMPAT ROAD FOR JTC
35. SODIUM HYPOCHLORITE DOSING PLANT FOR ENV AT JURONG ISLAND
36. AUTOMATIC VEHICLE WASH STATION AT CHOA CHU KANG
37. 30 STY CONDOMINIUM AT NEWTON ROAD
38. CHINESE HIGH BOARDING SCHOOL AT BUKIT TIMAH ROAD
39. HDB WOODLANDS FLATS - CONTRACT N6C5

SENTOSA PUMPING STATIONS

40. PUB - PRESSURE BOOSTER SYSTEMS FOR CHOA CHU KANG WATER WORK AND CHESTNUT WATER WORKS
41. BISHAN 8 CONDOMINIUM AT BISHAN ROAD
42. PARLIAMENT HOUSE
43. WINDERMERE CONDOMINIUM AT CHOA CHU KANG STREET 64
44. ITE AT BUKIT BATOK
45. 6 STY FLATTED FACTORY AT SERANGOON NORTH AVENUE 4 FOR JTC
46. US FILTER - PRESSURE BOOSTER SYSTEMS FOR ULU PANDAN SEWERA TREATMENT WORKS
47. NATIONAL INSTITUTE OF EDUCATION
48. 30 STOREY (81 UNITS) CONDO AT NEWTON ROAD
49. A & A TO EXISTING BUNGALOW AT 23A RIDOUT ROAD
50. KALLANG PRIMARY SCHOOL
51. IBM AT CHANGI BUSINESS PARK 9 STOREY MULTIPLE USER BUSINESS PARK AT CHANGI BUSINESS PARK CENTRAL
52. YISHUN COMMUNITY CENTRE
53. SPRINGLEAF TOWER AT PRINCE EDWARD ROAD
54. HENRY PARK PRIMARY SCHOOL
55. CHANGI SOUTH PARK 2/3/5 STOREY WAREHOUSE
56. RETAIL DEVELOPMENT AT TEKKA MALL
57. SAFRA YISHUN CLUBHOUSE
58. CHESTNUT SECONDARY SCHOOL
59. TECK WHYE SECONDARY SCHOOL
60. 4 STOREY FLAT AT SIRAT ROAD
61. ADDITION AND ALTERATION TO EXISTING INTEGRATED SIMULATOR CENTRAL AT SINGAPORE POLYTECHNIC
62. 2 BLOCKS 10 STOREY CONDOMINIUM AT LORONG LIMAU (PARC HAVEN)
63. EXECUTIVE CONDOMINIUM AT TAMPINES STREET 34 THE EDEN
64. CONSTRUCTION OF CARGO AGENTS BUILDING “B” AT CHANGI AIRFREIGHT CENTRE
65. NATIONAL TECHNOLOGY UNIVERSITY - SPOORTS AND RECREATION CENTRE
66. A & A TO STAGMONT CAMP
67. JINGSHAN PRIMARY SCHOOL AT ANG MO KIO AVENUE 2
68. GRADUATE STUDENT RESIDENCE AT NANYANG TECHNOLOGY UNIVERSITY
69. 456 UNITS CONDOMINIUM DEVELOPMENT AT BUKIT BATOK STREET 31 (THE MALDEIRA)
70. APEC SECRETARIAT AT HENG MUI KENG TERRACE
71. LIONS HOME AT TOA PAYOH LINK
72. A & A TO ARMY CAMP AT KHATIB
73. CHANGI PRISON COMPLEX AT CHANGI NORTH ROAD
74. DEYI SECONDARY SCHOOL
75. FACTORY AT TUAS LANE VIEW
76. 6 STOREY DEVELOPMENT & INTEGRATION TO PARAGON SHOPPING CENTRE
77. REPLACEMENT OF IRRIGATION PUMPSETS AT SEMBAWANG COUNTRY CLUB
78. TAMPINES NORTH PRIMARY SCHOOL
79. OPERA ESTATE PRIMARY SCHOOL
80. JALAN BESAR STADIUM

81. EUNOS TECHNOLOGY LINK
82. 4 STOREY CHURH AT UPPER PAYA LEBAR ROAD
83. DESIGN AND BUILD OF KEAT HONG CAMP
84. MARINA SQUARE
85. ST AEROSPACE AT 540 AIRPORT RD
86. CATHOLIC HIGH SCHOOL
87. RICHMOND HOTEL
88. CLARKE QUAY
89. ELIAS RD @ PASIR RIS
90. WHITE HOUSE PARK
91. NEW CHANGI PRISON
92. SINGAPORE HISTORY MUSEUEM
93. LIANG COURT
94. HANDY ROAD
95. GIRL COMPLEX
96. ADVENTURE CAMP
97. PRINCE CHARLES CRESCENT
98. FOOD COURT @ BEDOK RESERVOIR ROAD
99. KALLANG LEISURE PARK
100. BUGIS JUNCTION
101. TANGLIN MALL
102. JURONG POINT SHOPPING CENTER
103. TEMASEK POLY
104. MERASPRING CONDOMINIUM
105. GEYLANG COMMUNITY SERVICE CENTRE
106. MEDICAL CENTRE @ SINARAN DRIVE
107. SHANGRILA HOTEL
108. ECOTOURISM, SENTOSA
109. MANDAI ESTATE
110. HILLTOP CONDIMINIUM
111. RESORTS WORLD @ SENTOSA
112. WEST COAST CONDOMINIUM
113. DUCHESS CONDOMINIUM
114. OASIA HOTEL
115. 47 LOR G TELOK KARAU
116. MEYER CONDOMINIUM
117. CHUA CHI KANG LOT 1 SHOPPING MALL
118. 45, LEEDON PARK
119. REGENCY CONDOMINIUM
120. SERANGOON CENTRAL SHOPPING MALL
121. BIOPOLIS 3

ECHELON CONDO

122.REPUBLIC PLAZA
123.SUNTECH CITY
124.VIVO CITY SHOPPINFG CENTRE UPGRADING
125.CHANGI GENERAL HOSPITAL NEW EXTENSION.
126.TAN TOCK SENG HOSPITAL
127.CONNEXION HOSPITAL
128.CHANGI GENERAL HOSPITAL NEW PHASE.
129.NG TENG FONG GENERAL HOSPITAL.
130.CT HUB 1
131.CT HUB 2
132.NYP
133.CHIJMES A & A
134.K.K HOSPITAL UPGRADING
135.SKYLINE RESIDENCE.
136.PINES HOTEL
137.MARINA BY SAND UPGRADING
138.HILLION RESIDENCE – MIX DEVELOPMENT
139.ECHELON ALEXANDRA
140.VENTURE MIX DEVELOPMENT
141.MID-TOWN MIX DEVELOPMENT
142.SENG KANG GENERAL HOSPITAL
143.ONE MARINA
144.SINGAPORE GENERAL HOSPITAL
145.JURONG WEST FIRE STATION
146.WOODLAND CHILD CARE
147.PAYA LEBAR PLOT B & D
148.SENOKO FOOD HUB
149.BIJOU CONDOMINIUM
150.JTC TAMPINES CLEANROOM
151.CAAS CHANGI AIRPORT
152. CHANGI NAVEL BASE
153.ICPH AT AIRPORT ROAD
154.THE CLAN HOTEL
155.BLK 69 GEYLANG BAHRU
156.NO 2 LOYANG WALK
157. JTC FOOD BUILDING AT BUROH LANE
158.LUXUS HILL
159.348 JALAN BOON LAY
160.RADIN MAS COMMUNITY
161.MEDIA HUB
162.A&A WORKS AT FORT CANNING PARK

NG TENG FONG GENERAL

163. TRES RESIDENCES
164. MORAL NURSING HOME
165. SPORT FACILITY AT JURONG LAKE
166. GEYLANG POLICE CENTRE
167. 21 TAMPAINES FOOD FACTORY
168. KABASI CAMP
169. KRANJI CAMP
170. KOVAN CONDOMINIUM
171. A&A WORKS AT NTU
172. CHANGI NORTH NURSING HOME
173. A&A at NTU
174. MANDAI ANIMAL QUARANTINE
175. MANDAI BIRDPARK & WEST NODE (ON-GOING)
176. MANDAI RAINFOREST SOUTH STATION (ON-GOING)
177. MANDAI DAWTP2 (ON-GOING)
178. MANDAI STORMWATER & DETENTION PUMP SYSTEM AT MANDAI LAKE (ON-GOING)
179. WOODLANDS HEALTH CAMPUS (ON-GOING)
180. 30F JERVOIS ROAD -2 BLK OF 5 STY REESIDENTIAL WITH BASEMENT CARPARK & SWIMMING POOL (ON-GOING)
181. SENJA HAKWER CENTRE (ON-GOING)
182. PSA FINGER 2 AT TUAS (ON-GOING)

LTA:

1) All stations @ north south line
2) All stations @ north east line
3) All stations @ east west line
4) All stations @ circle line
5) All stations @ downtown line
6) CTE tunnel
7) KPE tunnel
8) Marina coast expressway (MCE)

SGBC CERTIFICATE

SINGAPORE GREEN BUILDING PRODUCT CERTIFICATE

AWARDED TO

Xylem Water Solutions Singapore Pte Ltd

3A International Business Park,
Tower B, #10-10/18 ICON@IBP,
Singapore 609935

FOR THE PRODUCT

Domestic Water Pump

PRODUCT BRAND

eSV Series

PRODUCT MODEL

1SV02, 1SV03, 1SV04, 1SV05, 1SV06, 1SV07, 1SV08, 1SV09, 1SV10, 1SV11, 1SV12, 1SV13, 1SV15, 1SV17, 1SV19, 1SV22, 1SV25, 1SV27, 1SV30, 1SV32, 1SV34, 1SV37,3SV02, 3SV03, 3SV04, 3SV05, 3SV06, 3SV07, 3SV08, 3SV09, 3SV10, 3SV11, 3SV12, 3SV13, 3SV14, 3SV16, 3SV19, 3SV21, 3SV23, 3SV25, 3SV27, 3SV29, 3SV31, 3SV33,5SV02, 5SV03, 5SV04, 5SV05, 5SV06, 5SV07, 5SV08, 5SV09, 5SV10, 5SV11, 5SV12, 5SV13, 5SV14, 5SV15, 5SV16, 5SV18, 5SV21, 5SV23, 5SV25, 5SV28, 5SV30, 5SV33,10SV01, 10SV02, 10SV03, 10SV04, 10SV05, 10SV06, 10SV07, 10SV08, 10SV09, 10SV10, 10SV11, 10SV13, 10SV15, 10SV17, 10SV18, 10SV20, 10SV21,15SV01, 15SV02, 15SV03, 15SV04, 15SV05, 15SV06, 15SV07, 15SV08, 15SV09, 15SV10, 15SV11, 15SV13, 15SV15, 15SV17,22SV01, 22SV02, 22SV03, 22SV04, 22SV05, 22SV06, 22SV07, 22SV08, 22SV09, 22SV10, 22SV12, 22SV14, 22SV17,33SV1/1A, 33SV1, 33SV2/2A, 33SV2/1A, 33SV2, 33SV3/2A, 33SV3/1A, 33SV3, 33SV4/2A, 33SV4/1A, 33SV4, 33SV5/2A, 33SV5/1A, 33SV5, 33SV6/2A, 33SV6/1A, 33SV6, 33SV7/2A 33SV7/1A, 33SV7, 33SV8/2A, 33SV8/1A, 33SV8, 33SV9/2A, 33SV9/1A, 33SV9, 33SV10/2A, 33SV10/1A, 33SV10,46SV1/1A, 46SV1, 46SV2/2A, 46SV2, 46SV3/2A, 46SV3, 46SV4/2A, 46SV4, 46SV5/2A, 46SV5, 46SV6/2A, 46SV6, 46SV7/2A, 46SV7, 46SV8/2A, 46SV8, 46SV9/2A, 46SV9,66SV1/1A, 66SV1, 66SV2/2A, 66SV2/1A, 66SV2, 66SV3/2A, 66SV3/1A, 66SV3, 66SV4/2A, 66SV4/1A, 66SV4, 66SV5/2A, 66SV5/1A, 66SV5, 66SV6/2A, 66SV6/1A, 66SV6, 66SV7/2A, 66SV7/1A, 66SV7, 66SV8/2A, 66SV8/1A, 66SV8

THE PRODUCT HAS BEEN ASSESSED ACCORDING TO THE ASSESSMENT CRITERIA OF SINGAPORE GREEN BUILDING PRODUCT CERTIFICATION SCHEME. IT HAS BEEN AWARDED THE RATING:

Director
SGBC Pte Ltd

Certificate Number	Original Issue Date	Revised Date	Valid Till
SGBP 4247/1	21 July 2021	-	20 July 2023

✓Good ✓✓Very Good ✓✓✓Excellent ✓✓✓✓Leader

The use and reliance on this certificate is subject to the terms and conditions of the Singapore Green Building Product Certification Scheme. Revised certificates may also be issued at the discretion of the Council. The certification status may be verified at the Singapore Green Building Council website (www.sgbc.sg).