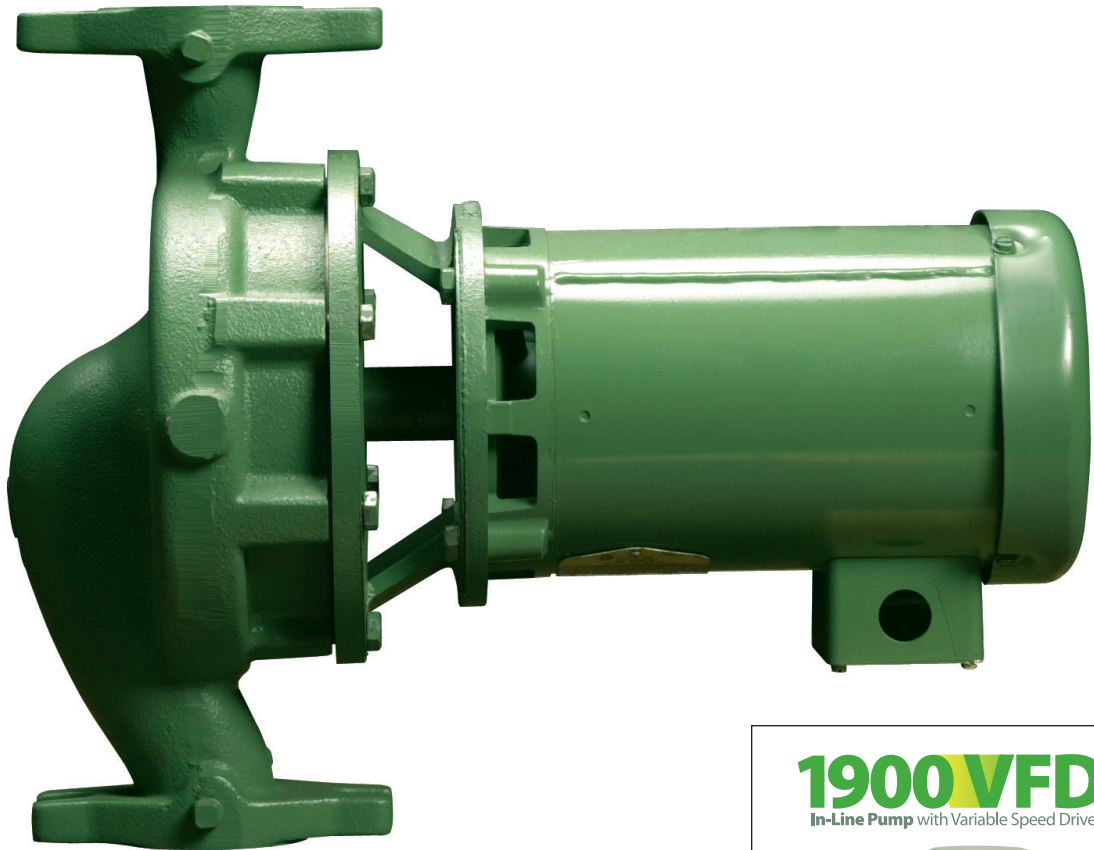


## 1900 Series In-Line Pumps



Featuring **eLink**<sup>®</sup>  
Taco *Connectivity*

Available with optional variable speed

**Taco**  
*Comfort Solutions*<sup>®</sup>  
A Taco Family Company

## Features & Benefits

- 2 -

### Quiet, dependable power and proven performance.

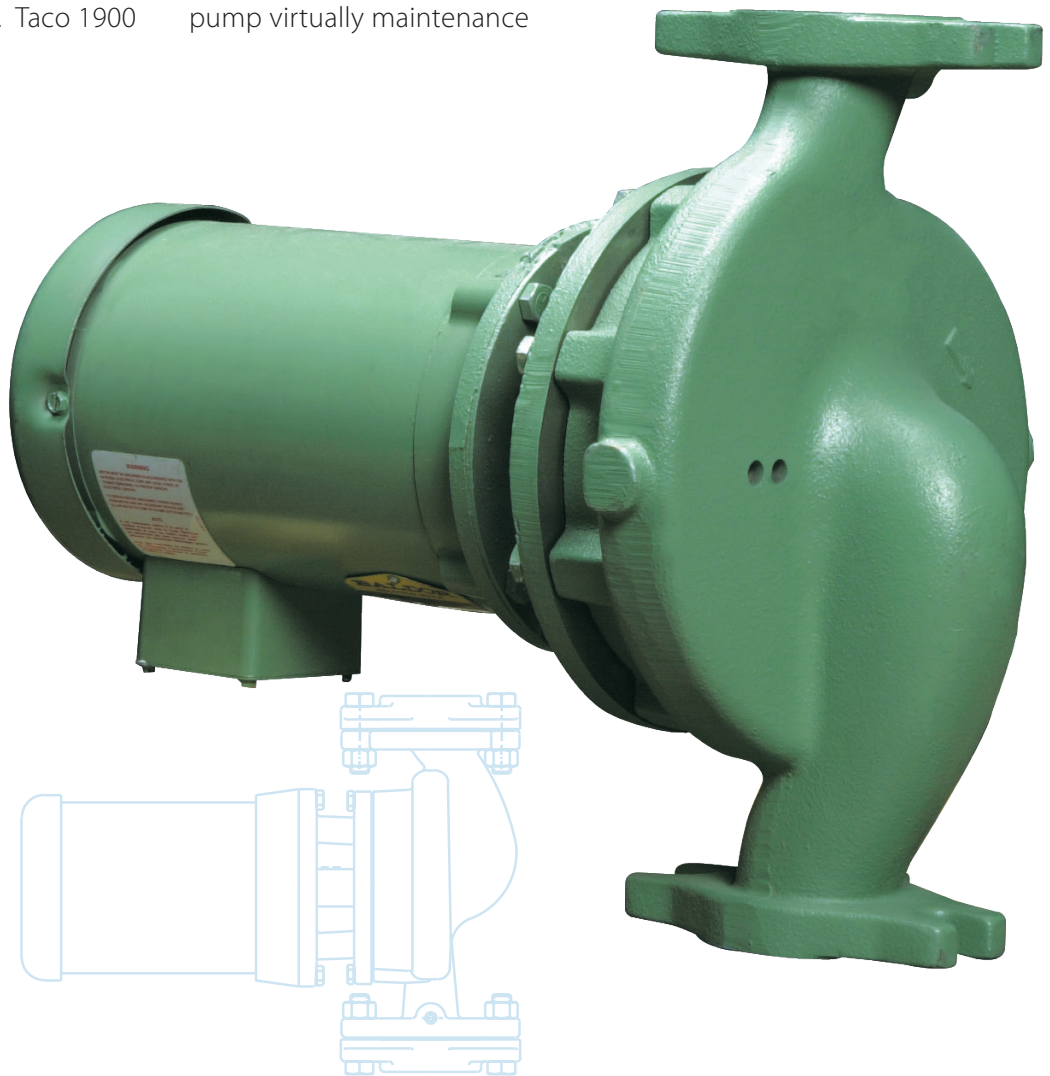
The 1900 Series close coupled in-line pumps meet the latest industry standards for hydraulic performance and reliability. Each is backed by Taco Comfort Solutions a worldwide leader in the design and manufacture of heating and cooling equipment since 1920. Taco 1900 Series pumps are available in five basic models ranging in size from 1-1/2" x 1-1/2" to 2" x 2" with a flow range of 10 to 250 GPM and head capabilities to 160 feet. Taco 1900

Series In-Line pumps are compact, energy efficient and can be installed anywhere in the piping layout.

The 1900 is designed to be self supported by the system piping (requiring no additional "strapping;" or external support) and can be mounted horizontally or vertically. Permanently sealed grease lubricated ball bearings in the motor make the 1900 Series pump virtually maintenance

free. All 1900 Series pumps are furnished with ceramic seals (standard) in order to meet a wide range of application requirements.

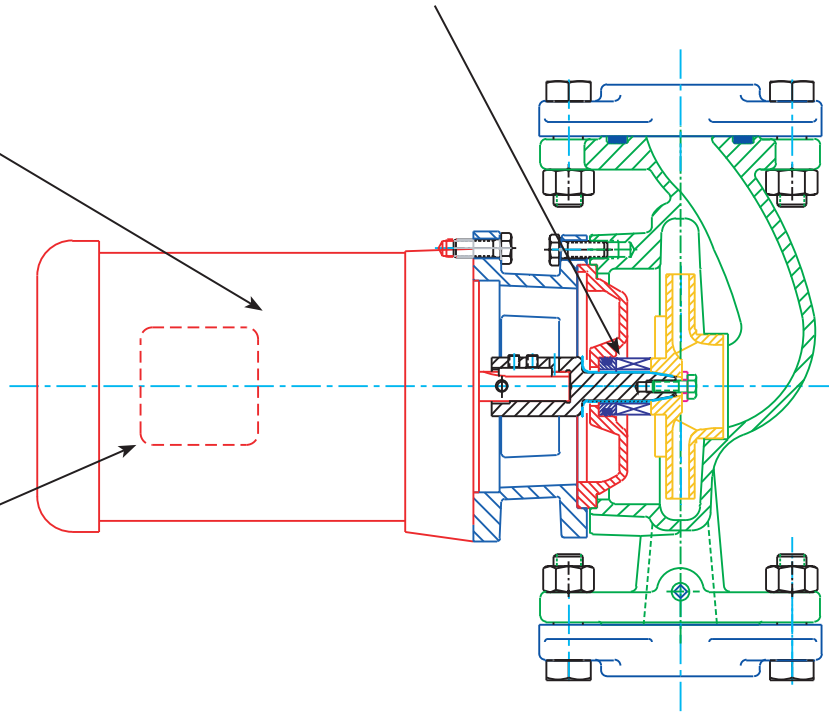
The standard mechanical seal is an industry-standard Type 21 design consisting of the rotating element (SS spring & retainer, EPT elastomers, and carbon mating ring) and ceramic seat. One seal size fits all models.



Standard ceramic seal meets the demands of a wide range of application requirements, and the Type 21 design facilitates quick and easy replacement simplifying maintenance.

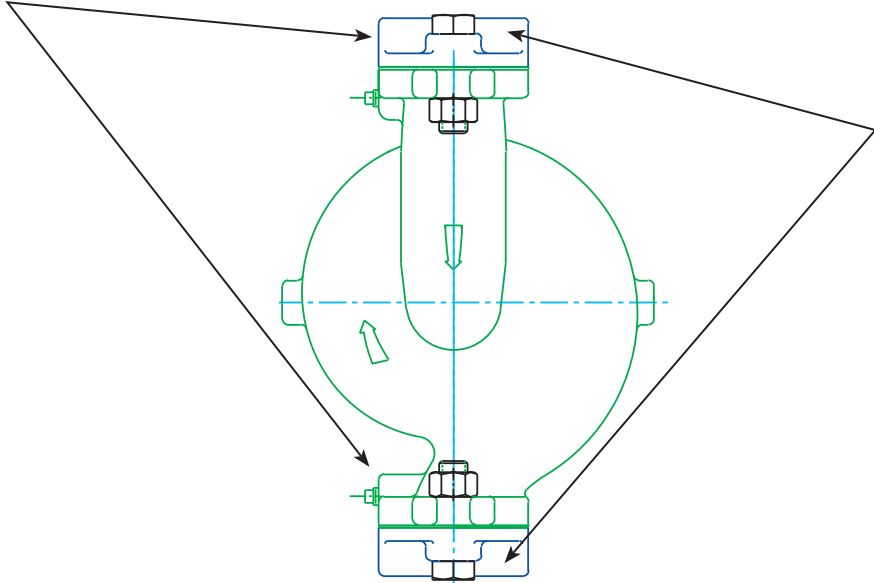
Rear pull out design allows servicing of the pump without disturbing the piping.

NEMA Standard 56  
Frame C Face Motor.



1/4 NPT pressure tapings on suction and discharge connections.

Companion flanges included.



## Features

## Benefits

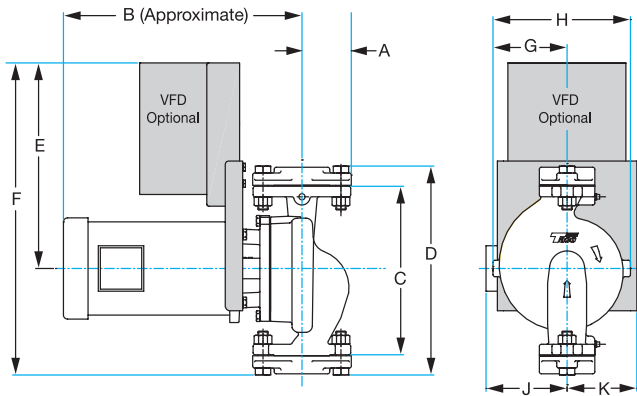
- Rugged Casing Design      The 1900 Series In-Line pump has a maximum operating pressure of 175psi, and a maximum operating temperature of 300°F. The 1900 Series pump is available in cast iron stainless-steel fitted construction or all stainless-steel construction , with NSF 61 Certification.
- Pressure Tappings      Pressure tappings allow for differential pressure readings to be taken across the pump.
- One Piece Enclosed Impeller      Dynamically balanced cast stainless-steel (304) impeller assures long life and higher pump efficiencies.
- Standard Mechanical Seal      "1900" Series In-Line Pumps utilize a rType 21 seal design which facilitates quick and easy replacement. Available in ceramic (standard) or the new "Sealide C" (for more aggressive system fluids) ensures the flexibility to meet a wide range of application requirements. One size seal fits all models.
- Motor      NEMA standard 56 frame C face motors\*.
- Parts Flexibility      Superior parts flexibility: one seal, and one shaft extension fits all models.
- Factory Tested      All "1900" Series In-Line pumps are factory tested, and are built in accordance with Hydraulic Institute Standards.

*\*3 HP 1750 rpm motors are TEFC, 5HP and 7 1/2 HP 3450 rpm motors are specially made OEM motors only available through authorized Taco distributors.*

## Operating Specifications

Description	Standard	Optional
Pressure	175psi Maximum Operating Pressure (125psi Flanges Standard)	--
Temperature Mechanical Seal	250°F	300°F
Motors	NEMA Standard 56 Frame C Face	--
Metering Ports	Tapped Suction & Discharge Ports Provided as Standard	--
Factory Tested	100% Factory Tested and built in Accordance with Hydraulic Standards	--
Pump Flanges	Available with the Pump	--

# Commercial Hydronic Application Information



## Materials of Construction

Description	Standard	Optional	NSF 61
Casing	Cast Iron	SS (304)	Stainless Steel
Impeller	One Piece Cast Stainless Steel	---	Stainless Steel
Shaft	SS (416)	---	SS (416)
Bracket	Cast Iron	Cast Iron with SS Face Plate	Cast Iron with SS Face Plate

## Pump Dimensions & Weights

English dimensions are in inches. Metric dimensions are in millimeters. Metric data is presented in ( ). Do not use for construction purposes unless certified. \* 1/4 HP AVAILABLE IN 1 PHASE ONLY.

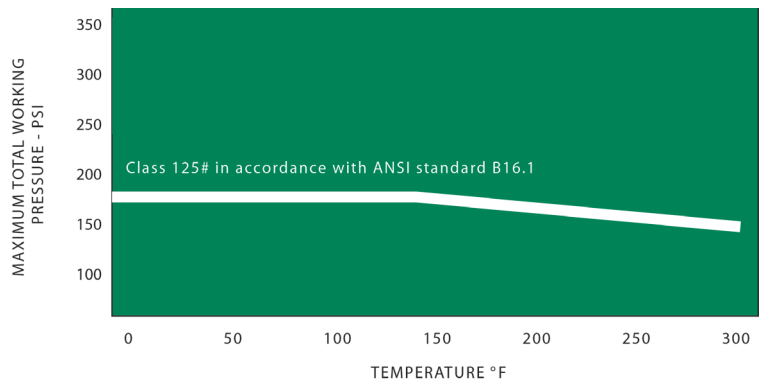
Model No.	Speed	Flange Size	H.P.	Dimensions (inches)									
				A	B	C	D	E	F	G	H	J	K
1911	1760	1-1/2" (38)	1/4* (.19)	3" (75)	10-1/4 (260)	12-7/8 (327)	14.8 (376)	21.24 (539)	4.52 (115)	8.38 (213)	5 (127)	4.25 (108)	
			1/3 (.25)										
			1/2 (.37)										
			1 (.75)										
	3500		1-1/2 (1.1)										
			2 (1.5)										
			3 (2.25)										
			5 (3.75)										
											7 (175)		
1915	1760	1-1/2" (38)	1/3 (.25)	3-1/8" (80)	13-1/2 (368)	16-1/8 (410)	14.8 (376)	22.86 (580)	5.15 (131)	9.75 (248)	5 (127)	4.25 (108)	
			1/2 (.37)										
			3/4 (.56)										
			1 (.75)										
	3500		1-1/2 (1.1)										
			2 (1.5)										
			3 (2.325)										
			5 (3.75)										
			7.5 (5.6)										
1919	1760	2" (51)	3/4 (.56)	3" (75)	14-1/2 (419)	17-3/8 (441)	14.8 (376)	23.49 (---)	5.74 (146)	11.19 (284)	5 (127)	4.25 (108)	
			1 (.75)										
			1 1/2 (1.1)										
			2 (1.5)										
1935	1760	2" (51)	1/2 (.37)	3-1/2" (89)	13-1/2 (343)	16-1/8 (410)	14.8 (376)	22.86 (580)	5.39 (137)	9.90 (251)	5 (127)	4.25 (108)	
			3/4 (.56)										
			1 (.75)										
			1-1/2 (1.1)										
	3500		2 (1.5)										
			3 (2.37)										
			5 (3.75)										
			7.5 (5.6)										
											7 (175)		
1941	1760	2" (51)	1-1/2 (1.1)	3-5/8" (92)	16-1/2 (419)	19-1/2 (495)	14.8 (376)	24.55 (623)	6.97 (177)	13.83 (326)	5 (127)	4.25 (108)	
			2 (1.5)										
			3 (2.37)										

# Commercial Hydronic Application Information

## Applications

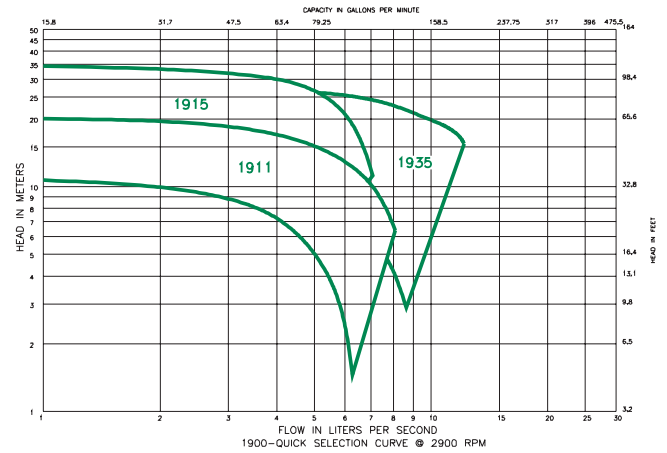
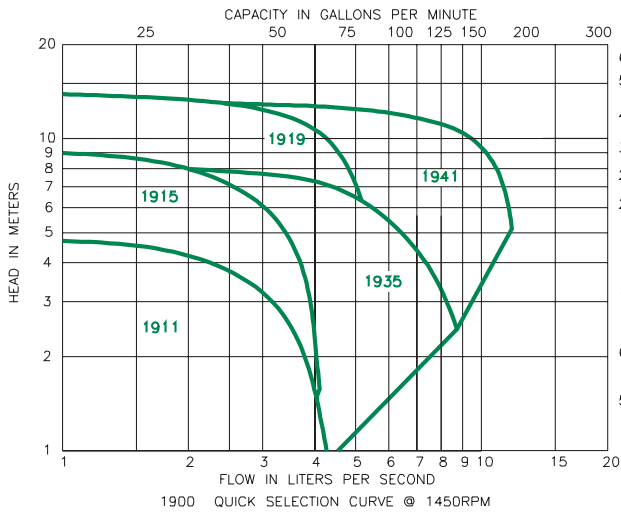
LoadMatch® Systems	Cooling Towers
Air Conditioning Systems	Golf Courses
Recirculation	Dry Cleaning Plants
Booster Service	Livestock Watering
Heating Systems	Bottle Washers
Laundry Equipment	Lawn Sprinklers

## Pressure Temperature Ratings



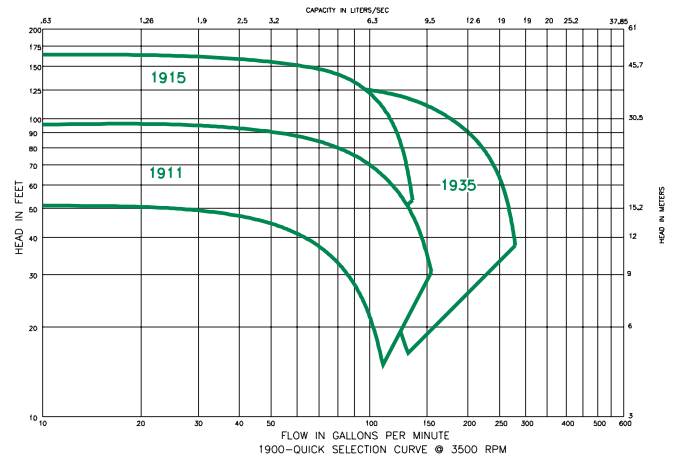
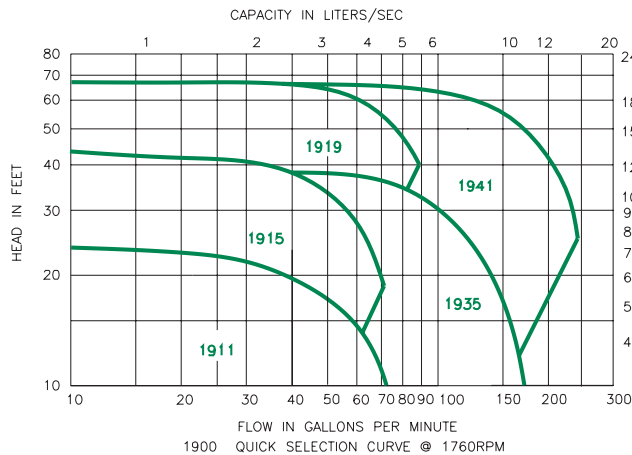
## 1900 Series Performance Field 50 Hz

Curves also available on TacoNet®



## 1900 Series Performance Field 60 Hz

Curves also available on TacoNet®





# 1900 VFD

In-Line Pump with Variable Speed Drive

Let the 1900 VFD operate your buildings with greater efficiency; using them to control your pumps can significantly reduce energy costs.

In many instances, the payback period for installing adjustable frequency drives in place of other flow control methods is less than 12 months.

Most HVAC systems are designed to keep the building cool on the hottest days and warm on the coldest days. Therefore, the HVAC system only needs to work at full capacity on the 10 or so hottest days and the 10 or so coldest days of the year. On the other 345 days, the HVAC system may operate at a reduced capacity. This is where a system with variable frequency drives (VFDs) can be used to match system flow to actual heating and cooling demands. The VFD can reduce the motor speed when full flow is not required, thereby reducing the power required and the electrical energy used.



## Three Phase



## Single Phase

*An HVAC system controlled by VFDs will go a long way in helping a new or existing building achieve greater energy efficiency. Not only will HVAC systems supplied by VFDs save money, but they also will increase the comfort of the building and reduce equipment maintenance costs and downtime. Plus, meeting the requirements of the Energy Policy Act of 2005 and achieving a more "green" system through LEED certification can offer more money-saving opportunities if the building is eligible for state and local government incentives. Ultimately, more efficient HVAC systems create more energy efficient buildings, which in turn conserves energy resources across the U.S. and the world.*

## Why Variable Speed Pumping?

### • Better Performance

- More efficient method of pump balancing
- Better system balancing
- Lower noise in piping
- Better control prevents cavitation
- Eliminates valve blow by
- Allowance for expansion
- Interim Performance at part load can be optimized

### • Longer equipment life

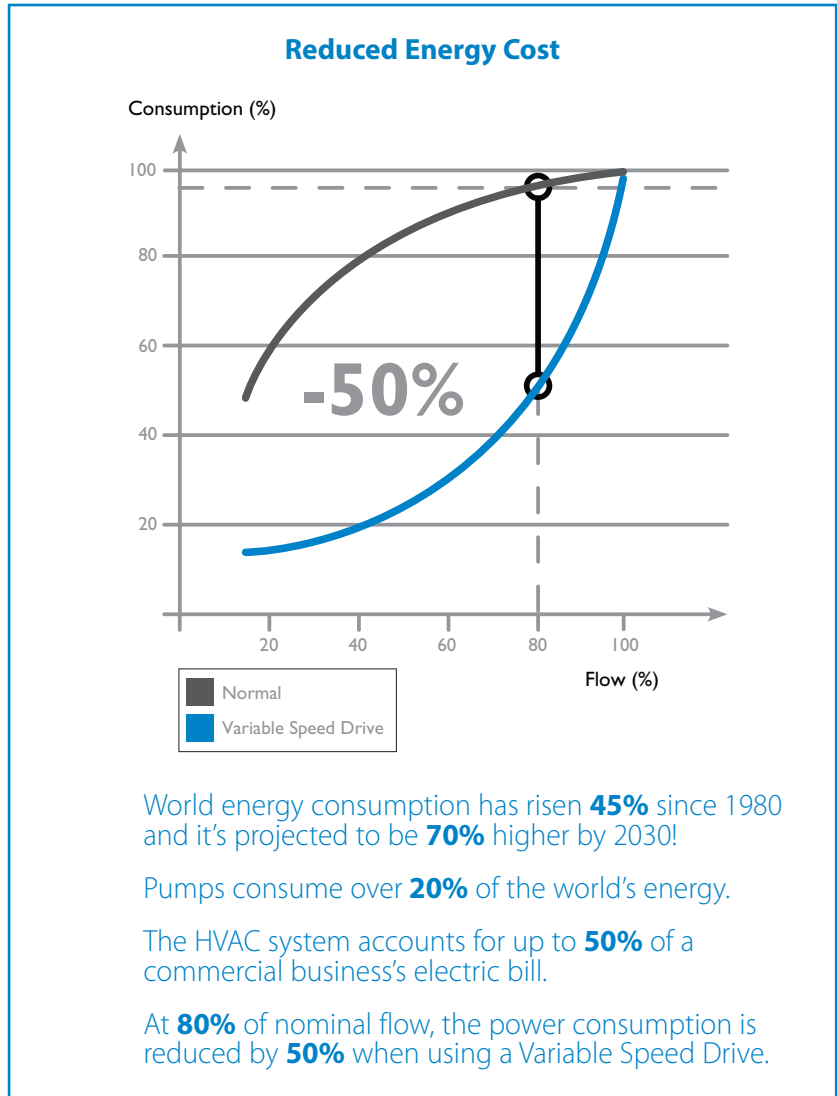
- Soft start/stop
- Rotating Equipment: Life = 1/speed
- Lower pressure on components
- Valve actuators absorb less pressure

### • Lower "System" Life Cycle & Installed Cost

- Reduced maintenance
- Lower "In Rush" current reduces wire and circuit breaker size
- Smaller pipe (design 10-12 ft/sec)
- Less tonnage required in chiller plant

### • Chiller plant optimization

- Less capacity goes further
- Better Delta Ts



## Features & Benefits for the 1900 VFD

- High efficiency premium motors
- Allow serial communication with pump
- Simple selection of drives
- Factory preset motor rotation
- Robust adjustable bracket design

### FLEXIBLE MOUNTING POSITIONS

The drive on the Single Phase Models is the **Advantage12**.



**Single Phase Models**

The drive indicated in photo of Three Phase Models has been changed. See **Advantage212** on page 14.



**Three Phase Models**



# Drive Selection



## SELECTION GUIDE

Motor HP	Input Voltage				
	Single Phase		3 Phase		
	100V – 120V	200V – 240V	200V – 240V	380V – 480V	525V – 600V
1/4	ATV12H037F1	ATV12H037M2	ATV12H037M3	ATV212H075N4	ATV312H075S6
1/3					
1/2					
3/4	ATV12H075F1	ATV12H055M2	ATV212H075M3X		
1		ATV12H075M2			
1 1/2	N/A	ATV12HU15M2	ATV212HU15M3X	ATV212HU15N4	ATV312HU15S6
2		ATV12HU22M2	ATV212HU22M3X	ATV212HU22N4	ATV312HU22S6
3					
5		N/A	ATV212HU40M3X	ATV212HU40N4	ATV312HU40S6
7 1/2			ATV212HU55M3X	ATV212HU55N4	ATV312HU55S6
<b>ADVANTAGE 12</b> For more information, See Taco Catalog #300-11			<b>ADVANTAGE 212</b> For more information, See Taco Catalog #300-10		<b>ADVANTAGE 312</b> For more information, See Taco Catalog #300-17
					



In order to provide the most efficient pump solution to our customers, Taco is now working with Schneider Electric.

This collaboration brings together Taco's pump technology with Schneider Electric Variable Frequency Drives and the drive packaging of Square D enclosures to offer the best overall pumping solution for our customers.



by Schneider Electric

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# Variable Speed Drive Specifications



## SINGLE PHASE APPLICATIONS Advantage 12

### Environmental characteristics

Conformity to standards		Advantage 12 drives have been developed to conform to the strictest international standards and the recommendations relating to electrical industrial control equipment (IEC, EN), in particular: IEC/EN 61800-5-1 ( low voltage), IEC/EN 61800-3 (conducted and radiated EMC immunity and emissions).
EMC immunity		IEC/EN 61800-3, Environments 1 and 2 (EMC requirements and specific test methods) IEC/EN 61000-4-2 level 3 (electrostatic discharge immunity test) IEC/EN 61000-4-3 level 3 (radiated, radio-frequency, electromagnetic field immunity test) IEC/EN 61000-4-4 level 4 (electrical fast transient/burst immunity test) IEC/EN 61000-4-5 level 3 (surge immunity test) IEC/EN 61000-4-6 level 3 (immunity to conducted disturbances, induced by radio-frequency fields) IEC/EN 61000-4-11 (voltage dips, short interruptions and voltage variations immunity tests)
Conducted and radiated EMC emissions for drives	ATV 12 ●●●● F1 ATV 12H018M3 ATV 12 ●037M3... ●U22M3	With additional EMC filter: ■ IEC/EN 61800-3, Environment 1 (public network) in restricted distribution: □ Category C1, at 2, 4, 8, 12 and 16 kHz for a shielded motor cable length ≤ 5 m □ Category C2, from 2 to 16 kHz for a shielded motor cable length ≤ 20 m ■ IEC/EN 61800-3, Environment 2 (industrial network): □ Category C3, from 2 to 16 kHz for a shielded motor cable length ≤ 20 m
	ATV 12 ●●●● M2	■ IEC/EN 61800-3, Environment 1 (public network) in restricted distribution: □ Category C1, at 2, 4, 8, 12 and 16 kHz for a shielded motor cable length ≤ 5 m □ Category C2: ATV 12H018M2... ●075M2, from 2 to 12 kHz for a shielded motor cable length ≤ 5 m and at 2, 4, 16 kHz for a shielded motor cable length ≤ 10 m □ Category C2: ATV 12HU15M2...HU22M2, from 4 to 16 kHz for a shielded motor cable length ≤ 5 m and at 2, 4, 8, 12 and 16 kHz for a shielded motor cable length ≤ 10 m  With additional EMC filter: ■ IEC/EN 61800-3, Environment 1 (public network) in restricted distribution: □ Category C1, at 2, 4, 8, 12 and 16 kHz for a shielded motor cable length ≤ 20 m □ Category C2, from 2 to 16 kHz for a shielded motor cable length ≤ 50 m ■ IEC/EN 61800-3, Environment 2 (industrial network): □ Category C3, from 2 to 16 kHz for a shielded motor cable length ≤ 50 m
CE marking		The drives are marked <b>CE</b> according to the European low voltage (2006/95/EC) and EMC (2004/108/EC) directives
Product certifications		UL, CSA, NOM, GOST and C-Tick
Degree of protection		IP 20
Vibration resistance	Drive not mounted on rail	According to IEC/EN 60068-2-6: □ 1.5 mm peak from 3 to 13 Hz □ 1 gn from 13 to 200 Hz
Shock resistance		15 gn for 11 ms according to IEC/EN 60068-2-27
Maximum ambient pollution Definition of insulation		Degree 2 according to IEC/EN 61800-5-1
Environmental conditions Use		IEC 60721-3-3 classes 3C3 and 3S2
Relative humidity		% 5...95 non condensing, no dripping water, according to IEC60068-2-3
Ambient air Operation temperature around the device	ATV 12H018F1, H037F1 ATV 12H018M2...H075M2 ATV 12H018M3...H075M3 ATV 12P ●●●●●	°C - 10... + 40 without derating Up to + 60, with the protective blanking cover removed and current derating of 2.2% per additional degree
	ATV 12H075F1 ATV 12HU15M2, HU22M2 ATV 12HU15M3...HU40M3	°C - 10... + 50 without derating Up to + 60, with the protective blanking cover removed and current derating of 2.2% per additional degree
Storage	ATV 12 ●●●●●	°C - 25... + 70
Maximum operating altitude	ATV 12 ●●●●●	m 1000 without derating
	ATV 12 ●●●● F1 ATV 12 ●●●● M2	m Up to 2000 for single-phase networks and corner grounded distribution networks, with current derating of 1% per additional 100 m
	ATV 12 ●●●● M3	m Up to 3000 meters for three-phase networks, with current derating of 1% per additional 100 m
Operating position Maximum permanent angle in relation to the normal vertical mounting position		 10° 10°

## SINGLE PHASE APPLICATIONS Advantage 12



### Drive characteristics

Output frequency range	Hz	0.5...400
Configurable switching frequency	kHz	Nominal switching frequency: 4 kHz without derating in continuous operation Adjustable during operation from 2 to 16 kHz Above 4 kHz in continuous operation, apply derating to the nominal drive current of: <ul style="list-style-type: none"> <li>■ 10% for 8 kHz</li> <li>■ 20% for 12 kHz</li> <li>■ 30% for 16 kHz</li> </ul> Above 4 kHz, the drive will reduce the switching frequency automatically in the event of excessive temperature rise.
Speed range		1...20
Transient overtorque		150...170% of the nominal torque depending on the drive rating and the type of motor
Braking torque		<ul style="list-style-type: none"> <li>■ Up to 70% of the nominal torque without resistor</li> <li>■ Up to 150% of the nominal motor torque with braking unit (optional) at high inertia</li> </ul>
Maximum transient current		150% of the nominal drive current for 60 seconds
Motor control profiles		<ul style="list-style-type: none"> <li>■ Standard profile (voltage/frequency ratio)</li> <li>■ Performance profile (sensorless flux vector control)</li> <li>■ Pump/fan profile (Kn<sup>2</sup> quadratic ratio)</li> </ul>

### Electrical power characteristics

Power supply	Voltage	V	100 - 15% to 120 + 10% single-phase for ATV 12●●●● F1 200 - 15% to 240 + 10% single-phase for ATV 12●●●● M2 200 - 15% to 240 + 10% three-phase for ATV 12●●●● M3								
	Frequency	Hz	50...60 ± 5%								
	Isc (short-circuit current)	A	≤1000 (Isc at the connection point) for single-phase power supply ≤5000 (Isc at the connection point) for three-phase power supply								
Drive supply and output voltages			<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Drive supply voltage</th> <th style="width: 70%;">Drive output voltage for motor</th> </tr> </thead> <tbody> <tr> <td>ATV 12 pppp F1</td> <td>100...120 single-phase 200...240 three-phase</td> </tr> <tr> <td>ATV 12 pppp M2</td> <td>200...240 single-phase</td> </tr> <tr> <td>ATV 12 pppp M3</td> <td>200...240 three-phase</td> </tr> </tbody> </table>	Drive supply voltage	Drive output voltage for motor	ATV 12 pppp F1	100...120 single-phase 200...240 three-phase	ATV 12 pppp M2	200...240 single-phase	ATV 12 pppp M3	200...240 three-phase
	Drive supply voltage	Drive output voltage for motor									
	ATV 12 pppp F1	100...120 single-phase 200...240 three-phase									
ATV 12 pppp M2	200...240 single-phase										
ATV 12 pppp M3	200...240 three-phase										
Maximum length of motor cable (including tap links)	Shielded cable	m	50								
	Unshielded cable	m	100								
Drive noise level	ATV 12H018F1, H037F1 ATV 12H018M2...H075M2 ATV 12H018M3...H075M3 ATV 12P ppppp	dBA	0								
	ATV 12H075F1 ATV 12HU15M2, HU22M2	dBA	45								
	ATV 12HU15M3...HU40M3	dBA	50								
Electrical isolation			Electrical isolation between power and control (inputs, outputs, power supplies)								

### Connection characteristics

(drive terminals for the line supply, the motor output and the braking unit)

Drive terminals		R/L1, S/L2/N, T/L3, U/T1, V/T2, W/T3, PA+/, PC/-	
Maximum wire size and tightening torque	ATV 12H018F1, H037F1 ATV 12H018M2...H075M2 ATV 12H018M3...H075M3 ATV 12P037F1 ATV 12P037M2...P075M2 ATV 12P037M3, P075M3		3.5 mm <sup>2</sup> (AWG 12) 0.8 Nm
	ATV 12H075F1 ATV 12HU15M2, HU22M2 ATV 12HU15M3...HU40M3 ATV 12PU15M3...PU40M3		5.5 mm <sup>2</sup> (AWG 10) 1.2 Nm

# Variable Speed Drive Specifications

- 12 -



## SINGLE PHASE APPLICATIONS Advantage 12

### Electrical characteristics (control)

Available internal supplies		Protected against short-circuits and overloads: <ul style="list-style-type: none"> <li>One 5 V <math>\overline{\text{---}}</math> supply (<math>\pm 5\%</math>) for the reference potentiometer (2.2 to 10 k <math>\Omega</math>) maximum data rate 10 mA</li> <li>One 24 V <math>\overline{\text{---}}</math> supply (<math>-15\%/+20\%</math>) for the control inputs, maximum data rate 100 mA</li> </ul>
Analog input	AI1	1 software-configurable voltage or current analog input: <ul style="list-style-type: none"> <li>Voltage analog input: 0...5 V <math>\overline{\text{---}}</math> (internal power supply only) or 0...10 V <math>\overline{\text{---}}</math>, impedance 30 k <math>\Omega</math></li> <li>Analog current input: X-Y mA by programming X and Y from 0...20 mA, impedance 250 <math>\Omega</math></li> </ul> Sampling time: < 10 ms Resolution: 10 bits Accuracy: $\pm 1\%$ at 25°C Linearity: $\pm 0.3\%$ of the maximum scale value Factory setting: Input configured as voltage type
Analog output	AO1	1 software-configurable voltage or current analog output: <ul style="list-style-type: none"> <li>Analog voltage output: 0...10 V <math>\overline{\text{---}}</math>, minimum load impedance 470 <math>\Omega</math></li> <li>Analog current output: 0 to 20 mA, maximum load impedance 800 <math>\Omega</math></li> </ul> Update time: < 10 ms Resolution: 8 bits Accuracy: $\pm 1\%$ at 25°C
Relay outputs	R1A, R1B, R1C	1 protected relay output, 1 N/O contact and 1 N/C contact with common point Response time: 30 ms maximum Minimum switching capacity: 5 mA for 24 V $\overline{\text{---}}$ Maximum switching capacity: <ul style="list-style-type: none"> <li>On resistive load (<math>\cos \phi = 1</math> and L/R = 0 ms): 3 A at 250 V <math>\sim</math> or 4 A at 30 V <math>\overline{\text{---}}</math></li> <li>On inductive load (<math>\cos \phi = 0.4</math> and L/R = 7 ms): 2 A at 250 V <math>\sim</math> or 30 V <math>\overline{\text{---}}</math></li> </ul>
LI logic inputs	LI1...LI4	4 programmable logic inputs, compatible with PLC level 1, standard IEC/EN 61131-2 24 V $\overline{\text{---}}$ internal power supply or 24 V $\overline{\text{---}}$ external power supply (min. 18 V, max. 30 V) Sampling time: < 20 ms Sampling time tolerance: $\pm 1$ ms Factory-set with 2-wire control in "transition" mode for machine safety reasons: <ul style="list-style-type: none"> <li>LI1: forward</li> <li>LI2...LI4: not assigned</li> </ul> Multiple assignment makes it possible to configure several functions on one input (for example: LI1 assigned to forward and preset speed 2, LI3 assigned to reverse and preset speed 3) Impedance 3.5 k $\Omega$
	Positive logic (Source)	Factory setting State 0 if < 5 V, state 1 if > 11 V
	Negative logic (Sink)	Software-configurable State 0 if > 16 V or logic input not wired, state 1 if < 10 V
Logic output	LO+	One 24 V $\overline{\text{---}}$ logic output assignable as positive logic (Source) or negative logic (Sink) open collector type, compatible with level 1 PLC, standard IEC/EN 61131-2 Maximum voltage: 30 V Linearity: $\pm 1\%$ Maximum current: 10 mA (100 mA with external power supply) Impedance: 1k $\Omega$ Update time: < 20 ms Logic output common (LO-) to be connected to: <ul style="list-style-type: none"> <li>24 V <math>\overline{\text{---}}</math> in positive logic (Source)</li> <li>0 V in negative logic (Sink)</li> </ul>
Maximum I/O wire size and tightening torque		1.5 mm <sup>2</sup> (AWG 14) 0.5 Nm
Acceleration and deceleration ramps		Ramp profile: <ul style="list-style-type: none"> <li>Linear from 0 to 999.9 s</li> <li>S ramp</li> <li>U ramp</li> </ul> Automatic adaptation of deceleration ramp time if braking capacities exceeded, although this adaptation can be disabled (use of braking unit)
Emergency braking		By DC injection: automatically as soon as the estimated output frequency drops to < 0.2 Hz, period adjustable from 0.1 to 30 s or continuous, current adjustable from 0 to 1.2 I <sub>n</sub>
Main drive protection features		Thermal protection against overheating Protection against short-circuits between motor phases Overcurrent protection between motor phases and earth Protection in the event of line overvoltage and undervoltage Input phase loss protection, in three-phase
Motor protection		Thermal protection integrated in the drive by continuous calculation of the I <sup>2</sup> t
Frequency resolution		Display unit: 0.1 Hz Analog inputs: 10-bit A/D converter
Time constant on a change of setpoint	ms	20 $\pm$ 1 ms



## THREE PHASE APPLICATIONS Advantage 212

Environmental Specifications	
Temperature ratings	0 to + 40°C operational without de-rating, up to 60°C with de-rating (see installation manual for deratings)
Altitude ratings	Up to 3,300 ft (1,000 meters) without de-rating, de-rate nominal current by 1% for each additional 330 ft (100m) up to 10,000 ft (3,000 m) Limit to 6,600 ft (2,000 m) if supplied by corner grounded distribution system
Humidity	Up to 95% non-condensing , IEC 60068-2-3
Vibration resistance	1.5 mm peak to peak from 3 to 13 Hz conforming to EN/IEC 60068-2-6, 1 gn from 13 to 200 Hz conforming to IEC/EN 60068-2-8
Shock resistance	15 gn for 11 ms conforming to IEC/EN 60068-2-27
Pollution degree	1 HP to 25 HP @ 200/240 V, 1 HP to 5 HP @ 380/480 V: Pollution degree 2 per IEC/EN 61800-5-1, 30 HP to 40 HP @ 200/240 V, 30 HP to 100 HP @ 380/480 V: Pollution degree 3 per IEC/EN 61800-5-1
Degree of protection: ATV212 H range ATV212 W range	IP20, Conformal coating per IEC 60721-3-3 classes 3C2 and 3S2, Type 1 with optional conduit kit IP54/Type 12, Conformal coating per IEC 60721-3-3 classes 3C2 and 3S2
Electrical Specifications	
Input voltage and HP range ATV212 W is available in 380/480 range only	200 – 15% to 240 +10%, Three phase input, Three phase output, 1 HP to 40 HP 380 – 15% to 480 +10%, Three phase input, Three phase output, 1 HP to 100 HP
Input frequency	50 Hz -5% to 60 Hz +5%
Galvanic isolation	Galvanic isolation between power and control (inputs, outputs and power supplies)
Drive input power section	Six pulse bridge rectifier
Drive output power section	IGBT inverter with pulse width modulated output
Power factor	Above 99%
Efficiency	Above 98% at full load
Switching frequency	Selectable from 6 to 16 kHz, 12 kHz nominal rating for 1 HP to 20 HP @ 200/240 V, 380/480 V Selectable: 6 to 16 kHz, 8kHz nominal rating for 30 HP to 40 HP @ 200/240 V, 30 HP to 100 HP @ 380/480 V
Acceleration and deceleration ramps	0.1 to 3200 seconds in 0.1 seconds increments
Frequency output range	0.5 to 200 hertz
Skip frequencies	Three adjustable skip frequency bands
Speed range	1 to 10
Integrated motor protection	Class 10 electronic overload protection
Asynchronous motor control profiles	Sensorless flux vector, 2 point volts/hertz, quadratic volts/hertz, energy savings mode: a optimization motor algorithm that automatically optimizes voltage based on load
Transient over current	110% nominal for 60 seconds, 180% for 2 seconds
Embedded functions	Over 50 functions dedicated to pump and fan applications
User interface	On board: 5 LED indicators for various functions, 4 digit, 7 segment LED display with 7 button keypad for: Run, Stop/Reset, Local/remote, Speed up, speed down, Mode selection and Enter. Quick start menu, fault history, I/O mapping, last-used menus, status monitoring and self diagnostics. Fault messages and status such as: power on time, elapsed time, motor run time, line voltage, motor current, ready to run, running, motor speed, etc.
Embedded communication	Embedded RJ45 port for remote keypad connection, Multi-loader, PC software, or Bluetooth dongle for So Mobile smart phone connection. Embedded 4 screw removable terminal for daisy chain connection for: Modbus, BACnet, Metesys N2, or Apogee P1 communication networks.
Harmonic abatement	Embedded reduced harmonic technology provides <35% THDI at VFD input terminals, which is equivalent to a 3% line reactor or DC choke. See technical paper 8800DB0702 for more information.
EMC compliance: ATV212 H and W N4 range: ATV212 W N4C range: ATV212H M3X range:	Integrated Class 2 EMC filter for radiated and conducted emissions, IEC 61800-3, category C2 and C3 Integrated Class 2 EMC filter for radiated and conducted emissions, IEC 61800-3, category C1 No integrated EMC filter (use optional filters to reduce emission levels)
Compliance	UL 508C, RoHS, IEC 61800-5-1, IEC/EN61000-3-12 THDI harmonic standard
Certifications	UL File E116875, CSA 2278406, UL 508C, Plenum rated per UL508C for UL1995 installations, C-Tick, NOM 117, CE marked



# Accessories & Options

## THREE PHASE APPLICATIONS Advantage 212



User interface options	For use with	Catalog number	QTY
Remote LCD display keypad	Advantage 212, 312, 32, 61, 71	VW3A1101	
8 line, 24 characters per line, plain text, 8 keys, rotary wheel, 60°C IP54 rated	—	—	
Remote LCD keypad mounting accessories	—	—	
IP54 rated kit for remote mounting LCD keypad on enclosure door	VW3A1101	VW3A1102	
Clear plastic door for use with VW3A1102 for IP65 rating and tamper resistance	VW3A1102	VW3A1103	
Female/Female right angle RJ45 adaptor, to connect cable and keypad.* (*not required if using VW3A1102)	VW3A1101	VW3A1105	
Remote LCD keypad mounting cables – equipped with two RJ45 connectors	—	—	
1 meter length	VW3A1101	VW3A1104R10	
3 meter length	VW3A1101	VW3A1104R30	
5 meter length	VW3A1101	VW3A1104R50	
10 meter length	VW3A1101	VW3A1104R100	
Multi-loader	Advantage 12, 212, 312, 32 Altistart 22	VW3A8121	
Use to copy configurations between like drives, PC Soft or SoMove PC software	—	—	
<b>Software</b>	<b>For use with</b>	<b>Catalog number</b>	
PCSoft	Advantage 21 and 212	Download at <a href="http://www.schneider-electric.us/go/drives">www.schneider-electric.us/go/drives</a>	
PC software use for: configuring monitoring and trouble shooting Altivar 212 drives Requires one of two cables (noted below) to connect a PC to the RJ45 Modbus port on the drive	—	—	
USB/RS485 cable: equipped with USB connector and RJ45 connector	Advantage and Altistart	TCSMCNAM3M002P	
RS 232-RS485 converter with SUB-D and RJ45 port, cable with two RJ45 connectors	Advantage 212	VW3A8106	
SoMove™ Mobile	Advantage 212	Download at <a href="http://www.schneider-electric.us/go/drives">www.schneider-electric.us/go/drives</a>	
Software for compatible mobile phones provides wireless interface similar to the LCD display Requires Modbus to Bluetooth adaptor to connect phone and Advantage 212 drive	—	—	
Modbus – Bluetooth adaptor: connects to RJ45 Modbus port on the drive	Advantage 12, 212, 312, 61, 71	VW3A8114	
<b>Communication option</b>	<b>For use with</b>	<b>Catalog number</b>	
LonWorks communication option card	Advantage 212	VW3A21212M	
Provides 4 screw terminal block for connection to LonWorks network Install in place of standard control board that comes mounted in the Advantage 212 drive The I/O count is reduce to 3LI, 1 AI and 1 NO/NC relay	—	—	
<b>Mounting kit</b>	<b>For use with</b>	<b>Catalog number</b>	
DIN rail mounting kit	Advantage 212H075M3X... 22M3X and Advantage 212H075N4...22N4	VW3A31852	
For installation on to 35mm wide DIN rail	—	—	



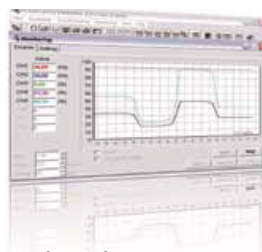
VW3A1101



VW31101, VW31102, VW31103, VW3A1104R10



VW3A8121



PCSoft™ Software



SoMove™ Mobile Software



VW3A21212M



### THREE PHASE APPLICATIONS Advantage 212

Default function setting	Function	Terminals	Characteristics
—	External power supply input	PLC	+24 Vdc input for external power supply for logic inputs Max. permissible voltage: 50 Vdc
	Internal supply	P24	Short-circuit and overload protection: 24 Vdc supply (min. 21 Vdc, max. 27 Vdc), maximum current: 200 mA
	Common	CC	0 Vdc common (2 terminals)
Fault relay	Configurable relay outputs	FLA FLB FLC	1 relay logic output, 1 N/C contact, and 1 N/O contact with common point Minimum switching capacity: 10 mA for 5 Vdc Maximum switching capacity: • On resistive load (cos $\phi$ = 1): 5 A for 250 Vac or 30 Vdc • On inductive load (cos $\phi$ = 0.4 and L/R = 7 ms): 2 A for 250 Vac or 30 Vdc Max. response time: 10 ms
Speed attained		RY RC	1 relay logic output, 1 N/O contact Minimum switching capacity: 3 mA for 24 Vdc Maximum switching capacity: • On resistive load (cos $\phi$ = 1): 3 A for 250 Vac or 30 Vdc • On inductive load (cos $\phi$ = 0.4 and L/R = 7 ms): 2 A for 250 Vac or 30 Vdc Max. response time: 7 ms $\pm$ 0.5 ms
F: Run forward R: Preset speed at 15 Hz RES: Reset	Configurable logic inputs	F R RES	3 programmable logic inputs, 24 Vdc, compatible with level 1 PLC, IEC 65A-68 standard Impedance: 4.7 k $\Omega$ Maximum voltage: 30 Vdc Max. sampling time: 2 ms $\pm$ 0.5 ms Multiple assignment makes it possible to configure several functions on one input Positive logic (Source): State 0 if $\phi$ 5 Vdc or logic input not wired, state 1 if $\phi$ 11 Vdc Negative logic (Sink): State 0 if $\phi$ 16 Vdc or logic input not wired, state 1 if $\phi$ 10 Vdc
Output frequency	Configurable analog output	FM	1 switch-configurable (SW101) voltage or current analog output: • Voltage analog output 0–10 Vdc, minimum load impedance 7.62 k $\Omega$ • Current analog output X–Y mA by programming X and Y from 0 to 20 mA, maximum load impedance: 970 $\Omega$ Max. sampling time: 2 ms $\pm$ 0.5 ms Resolution: 10 bits Accuracy: $\pm$ 1 % for a temperature variation of 60° C Linearity: $\pm$ 0.2%
—	Internal supply available	PP	Short-circuit and overload protection: One 10.5 Vdc $\pm$ 5% supply for the reference potentiometer (1 to 10 k $\Omega$ ), maximum current: 10 mA
Primary speed reference, 0–10 V	Configurable analog/ logic input	VIA	Switch-configurable voltage or current analog input: • Voltage analog input 0–10 Vdc, impedance 30 k $\Omega$ maximum voltage: 24 Vdc • Analog current input X–Y mA by programming X and Y from 0 to 20 mA, with impedance 250 $\Omega$ Max. sampling time: 3.5 ms $\pm$ 0.5 ms Resolution: 10 bits Accuracy: $\pm$ 0.6% for a temperature variation of 60° C Linearity: $\pm$ 0.15% of the maximum value This analog input is also configurable as a logic input Consult the Altivar 212 Programming Manual for more information
Secondary speed reference, 1–10 V	Configurable analog input	VIB	Voltage analog input, configurable as an analog input or as a PTC probe input Voltage analog input: • 0–10 Vdc, impedance 30 k $\Omega$ max. voltage 24 Vdc • Max. sampling time: 22 ms $\pm$ 0.5 ms • Resolution: 10 bits • Accuracy: $\pm$ 0.6% for a temperature variation of 60 °C • Linearity: $\pm$ 0.15% of the maximum value PTC probe input: • 6 probes max. mounted in series • Nominal value < 1.5 k $\Omega$ • Trip resistance 3 k $\Omega$ , reset value 1.8 k $\Omega$ • Short-circuit detection threshold < 50 $\Omega$
—	Graphic display terminal or Modbus	RJ45	Used to connect graphic display terminal or connect the drive to a Modbus fieldbus Note: for using Modbus on the RJ45, modify parameter F807 (see Modbus manual)
—	Fieldbus	Open style connector	Refer to communication manual related to the fieldbus



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