Innovation, Reliability

Intelli*Drive* V900

Robust, Over-Engineered, Efficient

Heavy Duty Performance
Fail-Safe Design Features

Constant motor speed is not suitable for all operations in all conditions, adjustable speed is required for some applications.

Intelli***Drive*** **V900** Series AC Motor Speed Control Devices are 3 Phase modern speed controller that applies with IPM-SPWM technique which can set the speed of the motor to the desired value from zero to the high starting torque in desired time.

It is a new generation motor speed control device which is designed for harshest utility conditions using the latest technology in terms of software and hardware.

The Intelli***Drive*** **V900** allows the user to adjust the application parameters which are common in 90% of all VFDs without battling the user with complex technologies via its user-friendly HMI.

The Intelli***Drive*** **V900** VFD Series, motor speed controllers, is available in AC motors for a wide range of applications, mainly for industrial applications, ventilation systems requiring speed adjustment

Product Snapshot

- Cutting-Edge Design
- SPWM Modulation / IPM Module Power Stage
- Comptatible with harsh, challenging grids
- Easy installation & commissioning
- The programming menu is built in a simple structure that the user can easily understand.
- Multiple motors can be connected to the output of the unit
- Up to 50% energy savings
- Reduced noise levels
- Rational initial parameter
- Starting Torque
- Variable Torque / Constant Torque
- Overloadability
- 40 °C, 45 °C, 50 °C Ambient temperature
- Metal Body
- Cooling
- Warranty, Service Support

Fields of Use

Airports & Aviation | Financial Sectors & Banking | Industry | Oil & Gas PetroChemistry | Facilities, Hotels, Buildings | Railways

Intelli*Drive* V900 at A Glance

VFD Systems is essential in every aspect in industry, HVAC systems, building management systems, transportation systems & infrastructures, energy distribution field, mining field, oil & gas - petrochemical industry, food & beverages industries.

And every application has similarities and its own characteristics at the same time.

Below we will examine some of the fields of application of **Intelli*Drive* V900** :

Motor Starting/ Inrush Control

There is a growing need for installing large-capacity motors on pumps and compressors in various industries. Motor power ratings are commonly over 1000 hp and sometimes as high as 60,000 hp.
Starting these motors and their connected loads is often a major challenge, since motor starting currents are typically 600–650% of their rated full load current (FLA).

This “motor inrush current” can produce large voltage drops that are not acceptable to the utility providers and disrupt the rest of the plant power system.
Selecting the best starting strategy at the early stages of a project is very important.

This selection will impact the integrity of the system, initial capita investment, operating costs and longterm reliability.

Direct On Line Starting

Standard DOL motor draws 600–650% of motor full load current. However, by modifying the rotor design the inrush can be reduced to 500% or even 300%.

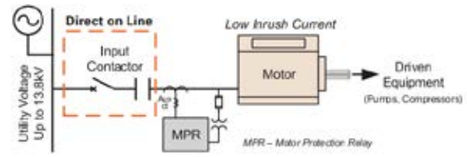


Figure 1a shows an electrical one-line of the low inrush motor starting scheme.

This starting method may cause excessive voltage drop in utility, if the grid is strong, that can be used, if the grid is weak, infrastructure robustness and response shall be highly evalutaed.
And the user must not start the motor under full load or partial load in this type of starting.

Solid State Starter

A soft starter is a thyristor voltage controller to smoothly ramp up the voltage at the motor terminals.
Soft starters use a controller that allows a timed ramp of output voltage and current limit. When the soft starter reaches full voltage, the bypass contactor closes. The available motor torque, is proportional to the square of the voltage. For example, a 20% reduction in voltage results in only 64% torque so it is important to determine the lowest acceptable inrush current to start the load. Typical applications includem pumps, fans, compressors, and blowers.

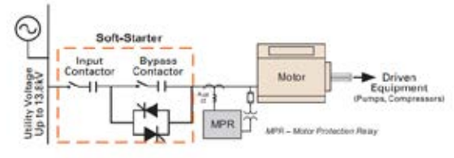
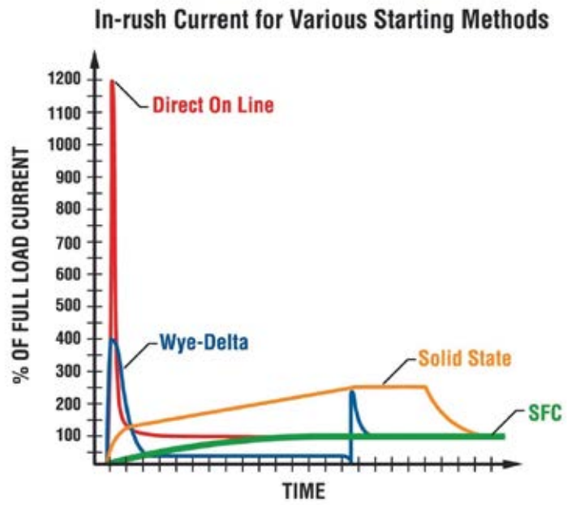


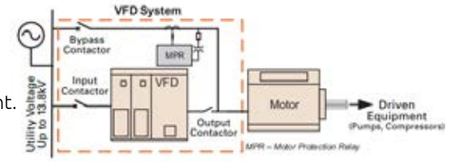
Figure 2 shows an SSRV one-line soft starter.



Intelli*Drive* V900 (VFD)

The VFD converts utility supply into variable voltage and frequency (speed). One of the benefits of the IntelliDrive V900 VFD is that the inrush current never exceeds the motor FLA.
When a VFD is employed for starting, a smaller drive can be used. A VFD scheme can be used to start two or more motors sequentially and synchronize them to the line. Unlimited number of starts per hour are allowed.

Figure 3 shows VFD and bypass arrangement.



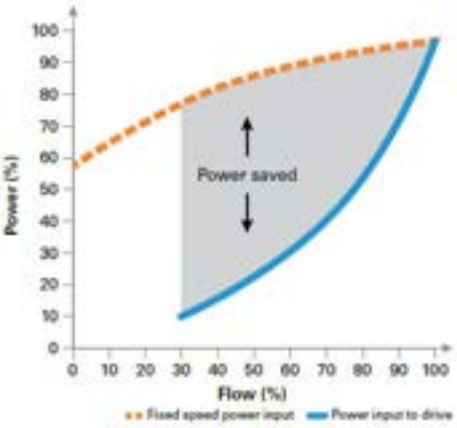
Power Conversion & Conditioning | tsine

E.g.1 Controlling Flow

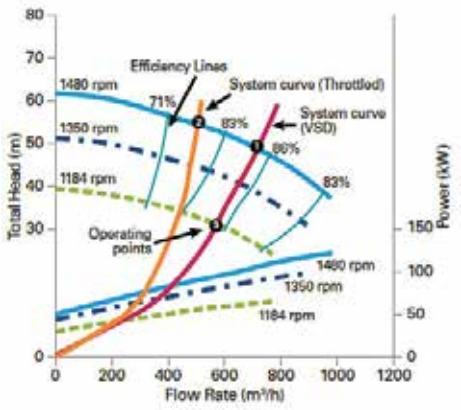
Whether it is familiar tools such as food mixers or electric drillers or in more powerful versions, the pump speed must be adjusted to control the flow of water or industrial chemicals to ensure airflow regulation in large heating and air conditioning systems.

- However, variable-speed AC drives are often used in more complex and challenging environments, such as water and wastewater processing, paper mills, tunnel drilling, oil drilling platforms or mining.

Like fans, using a variable frequency drive (VFD) to control the flow rate from a pump rather than using simple throttle control can result in large power and therefore cost savings. This is illustrated in following Figure, where the broken line indicates the power input to a fixed-speed motor and the solid line indicates the power input to a variable frequency drive.



- The shaded area represents the power saved by using a variable frequency drive for a given flow. Pump power saving of using VFD vs throttle valve



- In a similar way to using damper control in fan applications, using throttle control for pumping applications results in a drop in pump efficiency, whereas the efficiency remains higher when the output is regulated by speed control. This is illustrated in Figure 3.

Slip Compensation

Regardless of the load, the reference speed given to the motor speed by the automatic correction of the frequency is kept constant. All applications where the load torque varies greatly and the speed range is kept wide.

Motor-Provided Voltage / Frequency Ratio

Setting the voltage / frequency ratio depending on the characteristics of the utility, the characteristics of the motor and the application.
For all fixed or variable moment applications without over speed or with over speed

- **IntelliDrive V900 VFD; normal operation also controls the stress on the system & saves energy when performing a potential speed control.**

Switching Frequency

The switching frequency is modulated to reduce the noise of the motor for all applications requiring good driving quality at low speed.
The device generates a signal in sinusoidal form with PWM (Pulse Wide-Modulation).
With the 8KHz switching frequency, the motor' s operation is silent.

Frequency Conversion Gain

In transient regimes, it provides driver adaptation to various power machines with the optimal operation possible.
All applications from low-inertia and fast-cycling machines to high-inertia centrifuges.

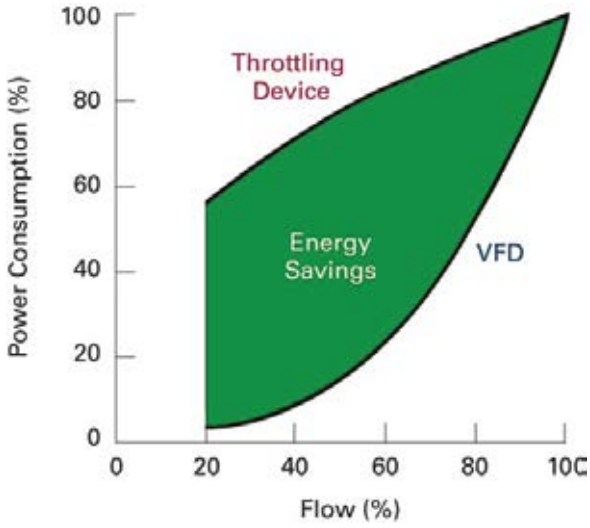
Automatic adaptation to the ramping ramp

If the set time is too short due to high inertia, it will adapt to the deceleration ramp.
In all applications that do not require controlled stopping in the deceleration ramp.

Energy Savings

It saves energy in fan & cooling applications up to 50% and pays back the initial investment in a year, In pump applications saves up to 30% and RoI becomes 2 years.

Energy efficiency in flow control

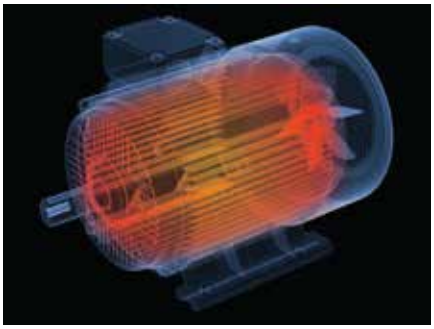


Protects Both The Application & Itself

The motor is protected against overload and overheating.

IntelliDrive V900 AC Motor Drivers have protections against overvoltage, undervoltage, overcurrent and short circuit as standard.

Electric motors can be overheating without VFD systems.

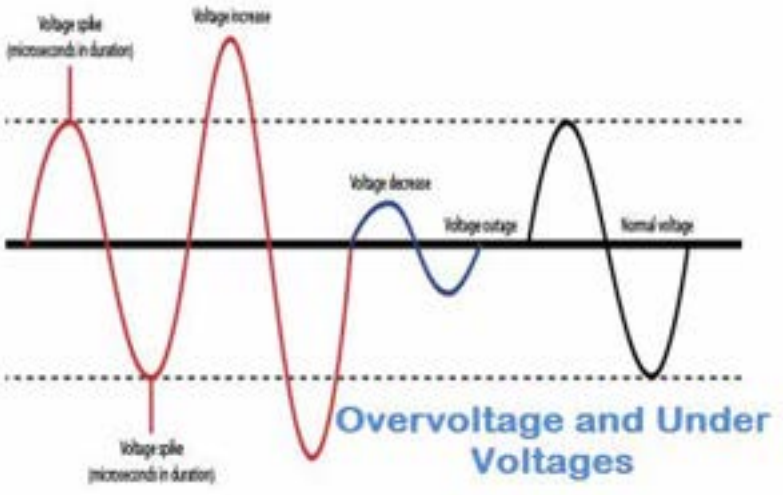


Over Current Protection

If the motor current exceeds 200% of the nominal current, the device switches to protection.

Short Circuit Protection

The IntelliDrive has smart short circuit protection.



Over Voltage Protection

If the mains voltage exceeds rated voltage + 15%, after the 115% of the rated voltage, the device switches to protection.

Low Voltage Protection

If the mains voltage goes below rated voltage -15%, the device switches to protection.

Hot to Choose Your VFD

Your application's load conditions and ambient temperature are two of the most important factors that influence the determination of the correct driver power. If load conditions require sudden peak currents, you need to select the drive power on the motor label.

	Starting Method	Stiff Network	Weak Network	Starting under Full Load or Partial Load	Relative Cost
1	Direct on Line (DOL)	Preferable; if voltage drop is excessive, evaluate 2–4	Results in unacceptable voltage drop	Preferable; otherwise use 4	100%
2	Low Inrush Current DOL	Preferable; if voltage drop is excessive, evaluate 2–4	Evaluate power system capabilities; if not, use 4	Not recommended	120%–180%
3	Solid State Reduced Voltage (SSRV) Starter	Only if DOL is unacceptable and no harmonic concern	Evaluate power system capabilities; if not, use 4	Not recommended	160%
4	Variable Frequency Drive (VFD)	If soft start or variable speed required	Guaranteed to work	Can start under full load	250%

Parameters @ 480V L-L

Model	Technical Paramerers			Dimensions	Connections Ød
	Motor Rated Power KW	110% Loading A @ 480V L-L	%160 Overloading A		
IDV900HD-1/,75	0,75	1,9	3,04	147x73x123	M4
IDV900HD-1/1,5	1,5	3,3	5,28	147x73x123	
IDV900HD-3/2,2	2,2	4,4	7,04	232x104x164	
IDV900HD-3/3,0	3	5,7	9,12	232x104x164	
IDV900HD-3/4,0	4	7,9	12,64	232x104x164	
IDV900HD-3/5,5	5,5	10,3	16,48	232x104x164	
IDV900HD-3/7,5	7,5	12,7	20,32	297x168x169	M5
IDV900HD-3/11	11	19	30,4	297x168x169	
IDV900HD-3/15	15	25,3	40,48	410x220x240	
IDV900HD-3/18,5	18,5	29,7	47,52	410x220x240	
IDV900HD-3/22	22	34,8	55,68	410x220x240	
IDV900HD-3/30	30	48,3	77,28	551x280x237	M6
IDV900HD-3/37	37	57,8	92,48	551x280x300	
IDV900HD-3/45	45	71,3	114,08	691x280x300	
IDV900HD-3/55	55	83,9	134,24	691x280x300	
IDV900HD-3/75	75	116,4	186,24	831x280x300	
IDV900HD-3/110	90	177	283,2	970x280x336	M8
IDV900HD-3/110	110	167,8	268,48	970x280x336	
IDV900HD-3/132	132	205,8	329,28	970x280x336	
IDV900HD-3/160	160	249,4	399,04	1310x400x323	
IDV900HD-3/200	200	312,7	500,32	1310x400x323	

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