



Yantra Harvest Energy Pvt. Ltd.

Company Overview

Save energy, for the benefit of Nation



YANTRA GROUP OF COMPANIES

**Yantra Automation
Pvt.Ltd**

**Yantra Harvest
Energy Pvt. Ltd**

Brief History

- Leading Control & Automation Company
- Rich experience of 30 years in Industry
- Energy Solution providers
- Rockwell's Largest Channel Partner in India
- HARVEST's Exclusive Partner for MV DRIVE

Our Products



MV Drives

MV Soft Starters

Energy Meters

LV Drives

About Harvest

- Leader & Harvest Electric Technology
- Largest MVD Supplier in China – 25% Market Share
- More than 3100 MV Drive Installations
- About 1400 installations in Power Plant
- Installations in Power, Metal, Oil & Gas Refinery, Cement, Water, Mining Sectors

The Sales Figures of Harvest Medium Voltage Variable Frequency Drives

Date: 31 December 2009

Total units: 3276

Industry	Sales figures
Power Generation	1413
Metal	619
Cement	395
Oil & Gas	329
Water & Sewage	167
Mining	123
Others	230

About Leader & Harvest

Capacity	Sales figures
<2MW	2819
$\geq 2\text{MW}$, <3MW	355
$\geq 3\text{MW}$, <5MW	81
$\geq 5\text{MW}$	12

Our Experience

- **RELIANCE ENERGY (Dahanu project) – Under Earning without Investment Scheme**
 - PA FAN – 1350KW/6.6KV, 02 Nos Power Saving - 280KW/H – Per VFD
 - CE PUMP – 880KW/6.6KV, 02Nos Power Saving - 175KW/H – per VFD
- **RELIANCE ENERGY (Samalkot, A.P.) – Under Earning without Investment Scheme**
 - HPBFP– 1380KW/6.6KV 01 No. Power Saving -350KW/H
- **RELIANCE ENERGY (Goa) – Under Earning without Investment Scheme**
 - HPBFP– 400KW/6.6KV 01 No. Power Saving - 93KW/H
- **APGENCO, Dr.NTTPS, VTPS – Vijayawada Thermal Power Station.**
 - ID Fan – 1600KW/6.6KV 02Nos. Power Saving – 356KW/H per VFD.
- **Monnet Ispat & Energy Ltd., Raigard, C.G. – Under Earning without Investment Scheme**
 - CWP – 775 KW/6.6KV 02 Nos – 210 KW/Hr saving/VFD
- **JSW Limited, Bellary, Hospet, – Under Earning without Investment Scheme**
 - Converter ID Fan – 1500KW/6.6KV – 01 No. – Under Execution.
- **HPCL – MPSPL Project – Loni**
 - Main Pump – 1000KW/6.6KV – 01 No. – Under Execution.
- **Rajasthan Rajya Vidyut Utpadan Nigam Limited – Kota Super Thermal Power Station**
 - CEP – 700KW/6.6KV, 01 No. – Under Execution.

Commercial Benefits – Earning without Investment



Commercial Benefits With our Payout of Saving Scheme

- Earn without Investment is only scheme where you do not have to invest anything initially from your Capital Cash flow. Later you will pay on Monthly basis from the amount you are Saving (still **no investment from cash flow**) - ESCO
- No Investment, hence same amount can be used for some other profit making offers.
- Guaranteed Energy Saving.
- Monthly EMI starts only after project success and Energy saving is proved, Hence EMI is paid from Saving itself.
- 80% Depreciation benefit from the day one of Invoice, so Amount from the depreciation can be used for Cash flow.
- Global Environmental Brand Enhancement for company, being Energy Saving Project – Without any Advertisement or Investment.
- Best Service Availability provided by VFD Vendor – As money is not released till 24 Months.
- No Technical or commercial consultancy required as Investment is Totally dependent on Project success.

Energy Saving in CEP – 2A - Dahanu

Data of CEP-2A with operating from DOL breaker SF6

✓ CEP-2A discharge pressure (Head)	: 21.3 Kg/cm ²
✓ Dearator level	: 6.9 Kg/cm ²
✓ Flow	: 640 T/hr
✓ Motor speed	: 50 Hz = 1480 rpm
✓ Current	: 59.2 Amp
✓ Power consumed by CEP without MV drive	: 590KWH

Data of CEP-2A with operating from MV drive

✓ CEP-2A discharge pressure	: 16.5 Kg/cm ²
✓ Dearator Level	: 6.9 Kg/cm ²
✓ Flow	: 640 T/hr
✓ Motor Speed	: 45.4 Hz = 1362 rpm
✓ Control Valve CD14 Position	: 86% open
✓ Current	: 40.4 Amp
✓ Power consumed by CEP with MV drive	: 415KWH

Energy Saving in CEP – 2A - Dahanu

Measurement of parameter during load run

Parameter	Without Drive	With Drive
Control valve position	60 % open	86% open
Current	59 A	40A
Power	590KW	415KW

Energy saving achieved per Hour = 175 KWH

Energy Saving in CEP – 2A - Dahanu

RELIANCE Energy
Anil Dhirubhai Ambani Group

Reliance Infrastructure Limited
Dahanu Thermal Power Station
Agwan, Dist : Thane (Maharashtra)
401608 , India
Ph: 02528- 225001- 6
Fax: 02528-222576

Our Ref: REL/DTPS/

To Whom So Ever It May Concern

In continuance with certificate issued by this office on 10th January 2008, we are pleased to confirm that we have achieved ENERGY SAVING as below, since commissioning of HARVEST M V Drives by Yantra Automation Pvt. Ltd.

SN	Application	Drive Rating	Commissioning Dt.	Saving	
				kWH	%
1	P A Fan	1350kW x 6.6KV - 2nos	October 2007	350	25
2	C E Pump	880kW x 6.6KV - 1 no	March 2007	175	30

We further confirm that a repeat order has been placed on Yantra Automation Pvt. Ltd. for supply & installation of 880kW x 6.6KV M V Drive for CE Pump in other unit at DTPS.

This certificate is being issued as per request from Yantra Automation Pvt. Ltd. & does not absolve them from any contractual obligations with Reliance energy Limited.

For Reliance energy Ltd.


C. V. Prasad Rao
Station Head DTPS

Station: Dahanu
Date: 20/05/08

Energy Saving in HPBFP – REL. Samalkot

HPBFP Operating Data without VFD

- Generation at base load (nearly):
- HPBFP Discharge Flow: 207 T/H.
- HPBFP Discharge pressure: 121 bar.
- HP ECO outlet Pressure: 115 bar
- HP Drum Pressure: 76 to 77 bar
- Control valve position: 30 to 35%
- Operating frequency: 50 Hz
- Power Consumption: 1100 KW.

HPBFP Operation Data with VFD

- HPBFP Discharge Flow: 207 T/H.
- HPBFP Discharge Pressure: 90 to 91 bar.
- HP ECO outlet Pressure: 86 to 87 bar.
- HP Drum Pressure: 76 to 77 bar
- Control Valve position: 60 to 70%
- Operating frequency with Drive: 43 Hz.
- Power consumption: 800 to 810 KW.

Nearly, 290 to 300 KW of saving with VFD at base load.

Energy Saving in ID Fan - APGENCO

Running Data before VFD:

- Scoop Opening: 70 to 75%
- Inlet Vanes: 100% open.
- O/L damper: 100% open.
- Total air Flow at full load: 700TPH
- Fan Speed: 680 rpm (approx)
- Suction pressure: -130 mmwc.
- Furnace Pressure to be maintained at full load: -15 mmwc \pm 5 mmwc.
- Current: 155 to 160 Amps
- Consumption = 1463KW to 1500 KW

Running Data with VFD:

- Scoop Opening: 100%
- Inlet Vanes: 100%
- O/L Dampers: 100%
- Total air flow at full load: 700
- TPH Suction Pressure: -130 mmwc.
- Motor speed: 43 Hz = 640 rpm
- Furnace Pressure to be maintained at full load: -15 mmwc \pm 5 mmwc.
- Current: 100 to 120 Amps
- Consumption = 1150 KW to 1190 KW

- Power factor improved to 0.97.
- Efficiency of Drive: 96 to 97%

Energy Saving = 350 to 375 KW

Energy Saving in APGENCO



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ANDHRA PRADESH POWER GENERATION CORPORATION LTD
Dr. NARLATA RAO THERMAL POWER STATION
IBRAHIMPATNAM - 521 456.

To Whom So Ever It May Concern


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In continuance with certificate issued by this office on 26th December 2009, we are pleased to confirm that we achieved ENERGY SAVING as below, since commissioning of HARVEST Drives by Yantra Automation Pvt Ltd.

S.No.	Application	Drive Rating	Date of Commissioning	Savings per month	
				MWH	%
1	ID Fan	1600KW X 6.6 KV - 2 Nos.	27/11/2009	531	24

This certificate is issued as per the request from Yantra Automation Pvt. Ltd. and does not absolve them from any contractual obligations with Dr. NTTPS, APGENCO, Vijayawada.

Station : Dr.NTTPS
Date : 24-01-2010


CHIEF ENGINEER
Operation & Maintenance
Dr.NTTPS, APGENCO
Chief Engineer
O & M / Dr. N.T.T.P.S
Ibrahimpatnam - 521 456

AFFINITY LAW

HP \propto PRESSURE * FLOW

PRESSURE \propto SPEED²

FLOW \propto SPEED

HP \propto SPEED³

-- FANS --

- ID / FD Fans
- Primary Air fans
- Return fans
- Cooling tower fans
- Ventilation fans
- Dryer fans

20 % REDUCTION IN SPEED REDUCES 45 % ENERGY CONSUMPTION

AFFINITY LAW

HP \propto PRESSURE * FLOW

PRESSURE \propto SPEED²

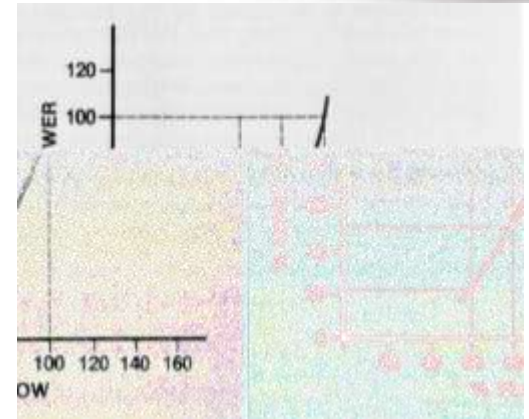
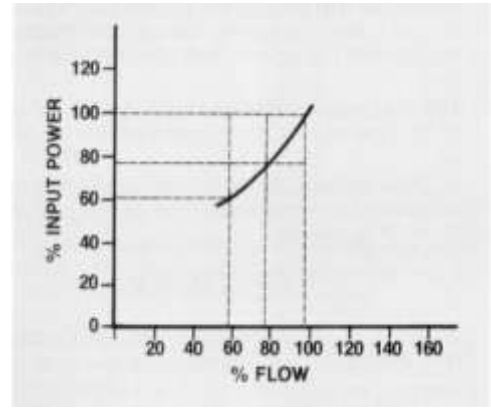
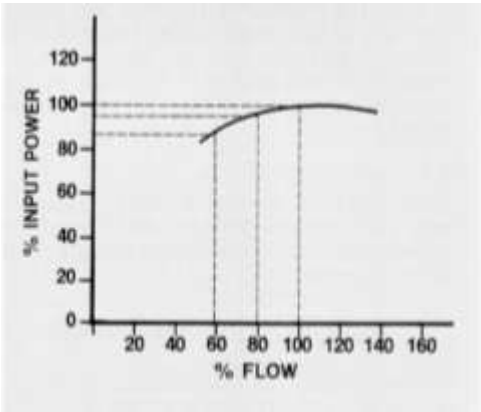
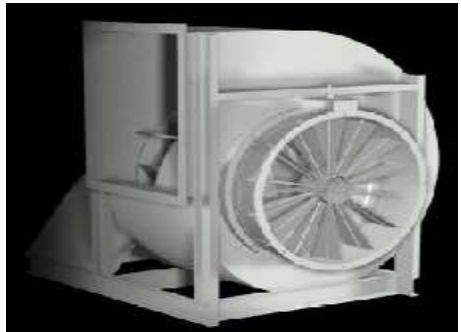
FLOW \propto SPEED

HP \propto SPEED³

– PUMPS –

- CWP
- CEP
- BFP
- Wastewater pumps
- Pipeline pumps
- Chiller pumps

Energy Saving Comparison : IGV/Damper/VFD



Reduction in Speed by 10% reduces energy consumption by 27%

Harvest MV AC Drive



Drive Technology



Phase Shifting Transformer Cabinet

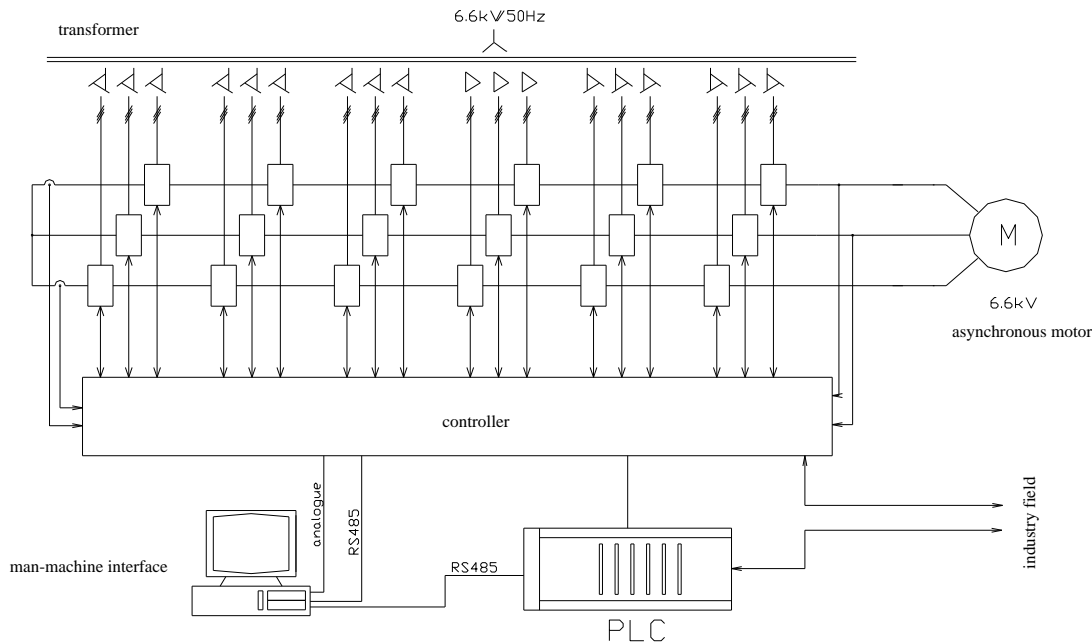


Power Cell Cabinet



Controller Cabinet

System Structure of Harsvert VFD



- » Multi Level Cascaded SPWM Technology
- » High Input Voltage – High Output Voltage
- » Fibre Optic Communication



Control System consists of

- » **Main Controller**
- » **Industrial Control Computer**
- » **PLC**

- **Rugged IGBT power circuit**
- **Each cell tested at full current**
- **Historical Operations & Fault Records**
- **Extended under-voltage operation (-30%)**
- **Power loss “ride-through” (5 Cycle)**
- **Fiber optic communication**
- **On-line monitoring and diagnostics**
- **No pollution in Electrical Line.**
- **No Noise Pollution - Noise level below 85db**

There are following benefits along with energy saving using VFD

- **Smooth Start/Stop of Motor**
- **Precise & Accurate Flow control**
- **All Protection Electronically**
- **Being an Energy saving device customer can claim 80% depreciation at very first year**
- **Improved power factor > 0.95**
- **Work with existing Standard Induction Motor.**

There's lots We can do
to Save Energy to help the World!

