ottomotores

Energía que Mueve al Mundo

CUMMINS SERIE VTA

Definiciónes

Potencia Prime
Estos valores son aplicables para el suministro de energía eléctrica continua (a carga variable) en lugar de la red comercial + 10% sobrecarga

Potencia Stand by
Estos valores son aplicables para el suministro de energía eléctrica continua (con carga variable) en caso de falla de la red comercial. No se permite sobre-carga sobre estos valores.

Tabla de Potencias

Modelo	Voltaje	Prime kVA	Prime kWe	Stand-by kVA	Stand-by kWe
CNY600	220-440V	682	545	750	600

0.8 Factor de potencia

Información Técnica

Datos Técnicos	CNY600
Frecuencia:	60 Hz
Marca / Modelo	VTA28G5
Generador Modelo:	Stamford HCI534E
Número de Cilindros:	12 en V
Diametro por Carrera :in (mm)	5.5X6.0 (140X152)
Relación de Compresión:	13.1 : 1
Aspiración:	turbo y postenfriado
Velocidad:	1800 RPM
Potencia: BHP(kWm)	900 (671)
Presion Efectiva: psi (kPA)	232 (1599)
Velocidad dePiston: ft/min (m/s)	1800 (9.1)
Consumo a plena carga: lt / hr - 100%	173,00
Calor Expulsado en el Sistema de Escape: BTU/min (kWm)	28920 (508)
Calor Expulsado en el Sistema de Enfriamiento: BTU/min (kWm)	26065 (458)
Temperatura de Escape: ºF (ºC)	935 (502)
Flujo de Enfriamiento en el Radiador m³/seg - FPM	llame a fabrica
Flujo de Escape: cfm	5040 (2379)

Nota: Imagen de carácter ilustrativa ya que los equipos en foto pudieran incluir accesorios opcionales

Como leer nuestro codigo: Ejem: **CNY600**

C=Motor Cummins
N=Generador Newage Stamford
Y=60Hz-1800 RPM
600= Potencia del Equipo.

Ottomotores, S.A de C.V.
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Dimensiones

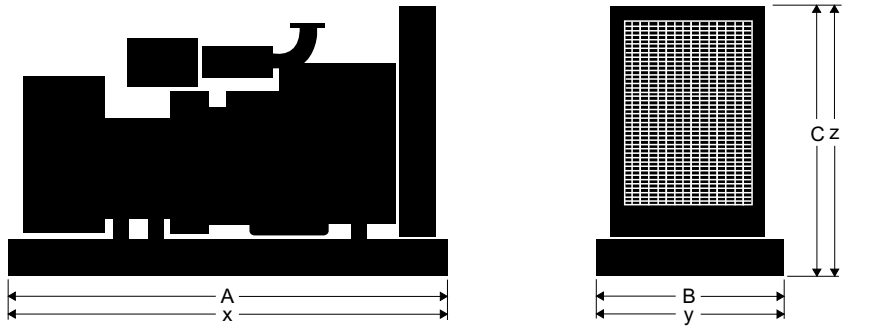

Tabla de Dimensiones

CNY600	Equipo con Base Estructural			Equipo con Base Tanque			Equipo con Caseta Acústica*		
	A	B	C	x	y	z	D	E	F
	380,00	145,00	237,55				595,00	180,00	246,00
	Peso: 4908,00 kgs						Peso: 2953,00 kgs		

En proceso. Llame a Fabrica

[*] Equipo opcional

Información Técnica

Nota: las condiciones de referencia estándar son de 25 ºC (77 º F) temperatura de entrada de aire. Todos los datos de desempeño de motores son basados en la potencia mencionada arriba.

Datos de consumo de combustible a plena carga con combustible diesel tienen una gravedad específica de 0,85.

Potencia en referencia a ? m.s.n.m.

Comercializado por:

Módulos de Control

Ottomotores tiene una posición única en la fabricación de grupos electrógenos utilizando en ellos módulos de control que cumplen con todos los niveles de requerimiento del mercado nacional y de exportación.

Las diferentes soluciones de controles que se tienen para nuestra gama de plantas generadoras, permite una operación simple en modo manual y automático, asi mismo permiten desarrollar proyectos de sincronía entre plantas generadoras o con la red de energía eléctrica.

La familia de módulos de control en transición abierta (DALE 3200) permite tener control en forma automática de la unidad de transferencia, asi como elmonitoreo del grupo generador.

Nuestro modulos de control cuentan con puerto de comunicación RS485 para la comunicación remota con el grupo generador.

Los módulos pueden ser monitoreados através de un exelente software para observar parámetros del equipo de manera facíl y rapida.

La familia de módulos de control para la sincronía (6100, 6050 y 6300),incorporan un amplio sistema de monitoreos ademas de conexion a Internet (LAN) o mensaje SMS via celular, o usando los puertos de comunicación RS485 a través de ModBus

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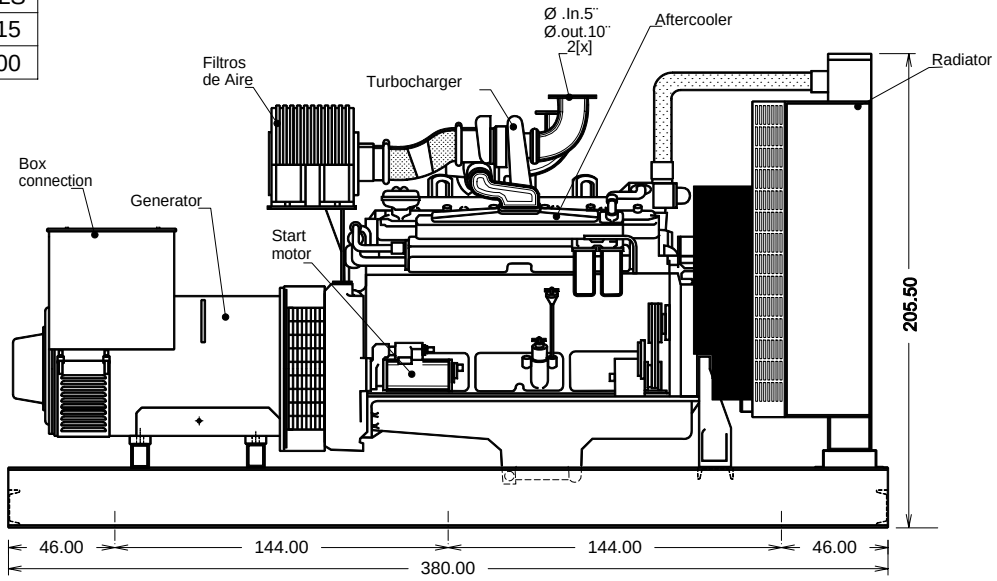
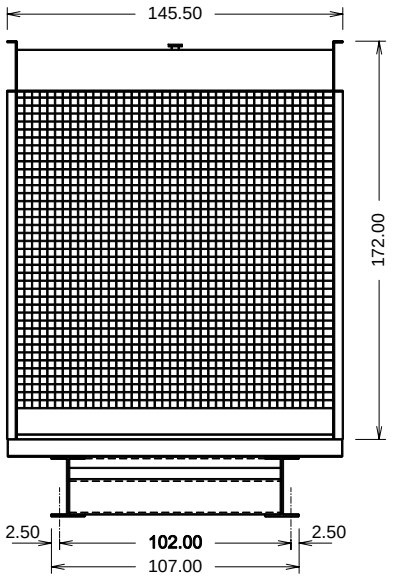
MODELS
CNE715
CNY600

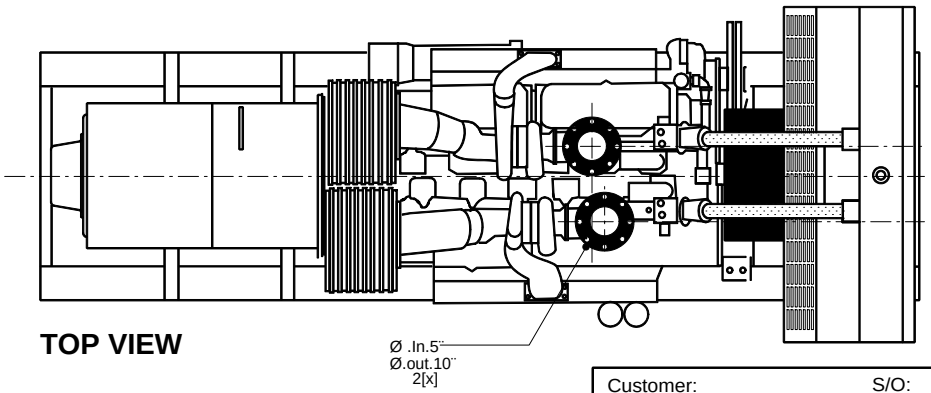


SIDE VIEW



FRONT VIEW

DESCRIPTION	
RADIATOR:	BEARWARD 53494-921
ENGINE:	VTA 28 G5
AIR: FILTER	AH1101
BASE FRAME:	BP-VTA-STF
# SPRING AVMS:	4 PZS



TOP VIEW

-THE GENSET DIMENSIONS ARE THE SAME BY FAMILY MODEL, THERE COULD BE ONLY DIFFERENCES ON THE ALTERNATOR LENGHT SEE SPECIFIC GENERAL ARRAGEMENT DRAWING OF CERTEIN MODEL

-TOTAL WEIGHT COULD VARY CHECK RATING CHART FOR EACH MODEL

Customer: S/O:

Rev.	Description	Date	Certificated

Reviews

Title: ***CUMMINS ENGINE VTA28G5 - STAMFORD ALTERNATOR***

Draw: R.G.C.	Revised: F.H.M.	Certificated: F.H.M.	Code: **CNE/Y-12**
Date: JAN 05th 2005	Date: JAN 05th 2005	Date: JAN 05th 2005	Dept.: Engineering

Marks: cms | Scale: s/e | Draw: | Of:

Ottomotores keeps the right to change the information with out prior notice

FO 023-0

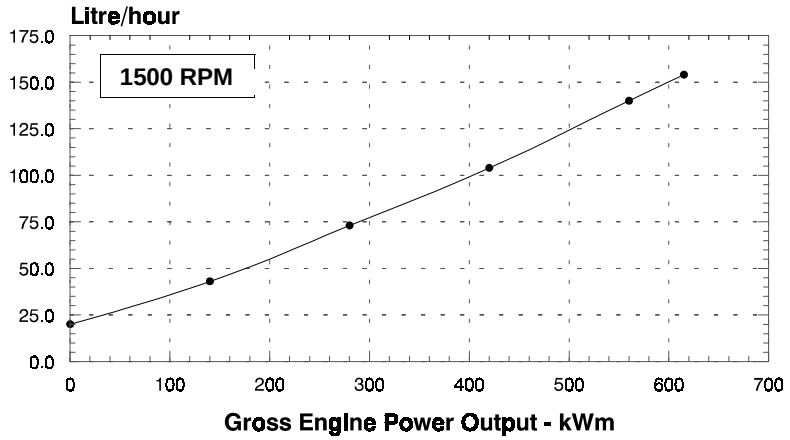
	CUMMINS ENGINE COMPANY, INC Columbus, Indiana 47201 **ENGINE PERFORMANCE CURVE**	Basic Engine Model: **VTA28-G5**	Curve Number: **FR-5122**	Page No.
		Engine Critical Parts List: **CPL: 1651**	Date: **9Sept96**	

Displacement : **28.0** litre (**1710** in^3)	Bore : **140** mm (**5.5** in.) Stroke : **152** mm (**6.0** in.)
No. of Cylinders : **12**	Aspiration : **Turbocharged and Aftercooled**

Engine Speed	Standby Power		Prime Power		Continuous Power	
RPM	kWm	BHP	kWm	BHP	kWm	BHP
1500	615	825	560	750	492	660
1800	671	900	608	815	504	675

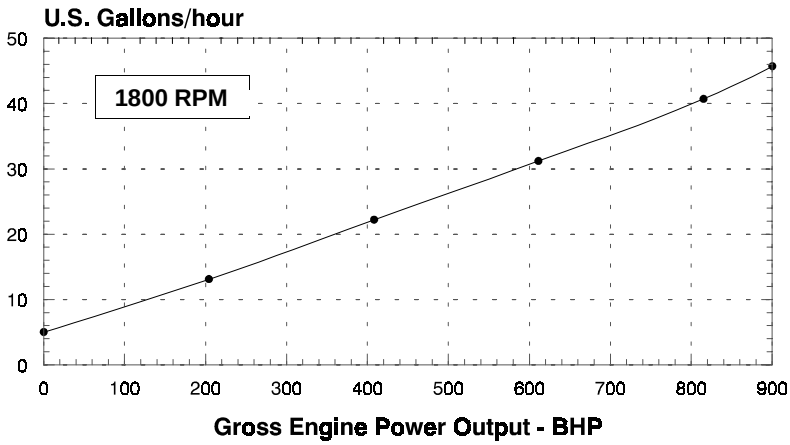
Engine Performance Data @ 1500 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm·h	lb/ BHP·h	litre/ hour	U.S. Gal/ hour
STANDBY POWER						
100	615	825	0.213	0.351	154	40.8
PRIME POWER						
100	560	750	0.213	0.350	140	37.0
75	420	563	0.211	0.347	104	27.5
50	280	375	0.222	0.365	73	19.3
25	140	188	0.61	0.427	43	11.3
CONTINUOUS POWER						
100	492	660	0.202	0.345	122	32.1



Engine Performance Data @ 1800 RPM

OUTPUT POWER			FUEL CONSUMPTION			
%	kWm	BHP	kg/ kWm·h	lb/ BHP·h	litre/ hour	U.S. Gal/ hour
STANDBY POWER						
100	671	900	0.219	0.361	173	45.7
PRIME POWER						
100	608	815	0.215	0.355	154	40.7
75	456	611	0.220	0.363	118	31.2
50	304	408	0.235	0.386	84	22.2
25	152	204	0.280	0.456	50	13.1
CONTINUOUS POWER						
100	504	675	0.216	0.356	128	33.9



CONVERSIONS: (Litres = U.S. Gal x 3.785) (Engine kWm = BHP x 0.746) (U.S. Gal = Litres x 0.2642) (Engine BHP = Engine kWm x 1.34)

Data shown above represent gross engine performance capabilities obtained and corrected in accordance with ISO-3046 conditions of 100 kPa (29.53 in Hg) barometric pressure [110 m (361 ft) altitude], 25 °C (77 °F) air inlet temperature, and relative humidity of 30% with No. 2 diesel or a fuel corresponding to ASTM D2.

See reverse side for application rating guidelines.

The fuel consumption data is based on No. 2 diesel fuel weight at 0.85 kg/litre (7.1 lbs/U.S. gal).

Power output curves are based on the engine operating with fuel system, water pump and lubricating oil pump; not included are battery charging alternator, fan, optional equipment and driven components.

D K. Trueblood

TECHNICAL DATA DEPT. **CERTIFIED WITHIN 5%** **CHIEF ENGINEER**

POWER RATING APPLICATION GUIDELINES FOR GENERATOR DRIVE ENGINES

These guidelines have been formulated to ensure proper application of generator drive engines in A.C. generator set installations. Generator drive engines are not designed for and shall not be used in variable speed D.C. generator set applications.

STANDBY POWER RATING is applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. Under no condition is an engine allowed to operate in parallel with the public utility at the Standby Power rating.

This rating should be applied where reliable utility power is available. A standby rated engine should be sized for a maximum of an 80% average load factor and 200 hours of operation per year. This includes less than 25 hours per year at the Standby Power rating. Standby ratings should never be applied except in true emergency power outages. Negotiated power outages contracted with a utility company are not considered an emergency.

CONTINUOUS POWER RATING is applicable for supplying utility power at a constant 100% load for an unlimited number of hours per year. No overload capability is available for this rating.

PRIME POWER RATING is applicable for supplying electric power in lieu of commercially purchased power. Prime Power applications must be in the form of one of the following two categories:

UNLIMITED TIME RUNNING PRIME POWER

Prime Power is available for an unlimited number of hours per year in a variable load application. Variable load should not exceed a 70% average of the Prime Power rating during any operating period of 250 hours.

The total operating time at 100% Prime Power shall not exceed 500 hours per year.

A 10% overload capability is available for a period of 1 hour within a 12 hour period of operation. Total operating time at the 10% overload power shall not exceed 25 hours per year.

LIMITED TIME RUNNING PRIME POWER

Prime Power is available for a limited number of hours in a non-variable load application. It is intended for use in situations where power outages are contracted, such as in utility power curtailment. Engines may be operated in parallel to the public utility up to 750 hours per year at power levels never to exceed the Prime Power rating. The customer should be aware, however, that the life of any engine will be reduced by this constant high load operation. Any operation exceeding 750 hours per year at the Prime Power rating should use the Continuous Power rating.

Reference Standards:

BS-5514 and DIN-6271 standards are based on ISO-3046.

Operation At Elevated Temperature And Altitude:

The engine may be operated at:

1800 RPM up to 4,000 ft (1220 m) and 104^{o} F (40^{o} C) without power deration.

1500 RPM up to 4,000 ft (1220 m) and 104^{o} F (40^{o} C) without power deration.

For sustained operation above these conditions, derate by 4% per 1,000 ft (300 m), and 1% per 10^{o} F (2% per 11^{o} C).

Cummins Engine Company, Inc.

Engine Data Sheet

ENGINE MODEL : **VTA28-G5** **CONFIGURATION NUMBER :** D153103DX02

DATA SHEET : DS-4886-B
DATE : 9Sept96
PERFORMANCE CURVE : FR-5122

INSTALLATION DIAGRAM
- Fan to Flywheel : 3626364
- Heat Exchanger Cooled : N.A.

CPL NUMBER
- Engine Critical Parts List : 1651

GENERAL ENGINE DATA

Type	4-Cycle; 40° Vee; 12-Cylinder Diesel	
Aspiration	Turbocharged and Aftercooled	
Bore x Stroke — in x in (mm x mm)	5.5 x 6.0 (140 x 152)	
Displacement — in^3 (liter)	1710 (28.0)	
Compression Ratio	13.1 : 1	
Dry Weight		
Fan to Flywheel Engine — lb (kg)	6395	(2900)
Heat Exchanger Cooled Engine — lb (kg)	6571	(2980)
Wet Weight		
Fan to Flywheel Engine — lb (kg)	6725	(3050)
Heat Exchanger Cooled Engine — lb (kg)	7012	(3180)
Moment of Inertia of Rotating Components		
• with FW 5013 Flywheel — $lb_m \cdot ft^2$ ($kg \cdot m^2$)	256	(10.8)
• with FW —— Flywheel — $lb_m \cdot ft^2$ ($kg \cdot m^2$)		
Center of Gravity from Rear Face of Flywheel Housing (FH 5020) — in (mm)	33.7	(856)
Center of Gravity Above Crankshaft Centerline — in (mm)	14.0	(356)
Maximum Static Loading at Rear Main Bearing — lb (kg)	1950	(885)

ENGINE MOUNTING

Maximum Bending Moment at Rear Face of Block — lb • ft (N • m)	1000	(1356)

EXHAUST SYSTEM

Maximum Back Pressure — in Hg (mm Hg)	3	(76)

AIR INDUCTION SYSTEM

Maximum Intake Air Restriction		
• with Dirty Filter Element — in H_2O (mm H_2O)	25	(635)
• with Normal Duty Air Cleaner and Clean Filter Element — in H_2O (mm H_2O)	10	(254)
• with Heavy Duty Air Cleaner and Clean Filter Element — in H_2O (mm H_2O)	15	(381)

COOLING SYSTEM

Coolant Capacity — Engine Only — US gal (liter)	21.2	(80)
— with HX 5149 Heat Exchanger — US gal (liter)	35.0	(132)
Maximum Coolant Friction Head External to Engine — 1800 rpm — psi (kPa)	10	(69)
— 1500 rpm — psi (kPa)	8	(55)
Maximum Static Head of Coolant Above Engine Crank Centerline — ft (m)	60	(18.3)
Standard Thermostat (Modulating) Range — °F (°C)	180 - 200	(82 - 93)
Minimum Pressure Cap — psi (kPa)	10	(69)
Maximum Top Tank Temperature for Standby / Prime Power — °F (°C)	220 / 212	(104 / 100)
Minimum Raw Water Flow @ 90°F to HX 5149 Heat Exchanger — US gpm (liter / min)	61	(231)
Maximum Raw Water Inlet Pressure at HX 5149 Heat Exchanger — psi (kPa)	150	(1034)

LUBRICATION SYSTEM

Oil Pressure @ Idle Speed — psi (kPa)	20	(138)
@ Governed Speed — psi (kPa)	50 - 90	(345 - 621)
Maximum Oil Temperature — °F (°C)	250	(121)
Oil Capacity with OP 5127 Oil Pan : High - Low — US gal (liter)	18 - 16	(68 - 61)
Total System Capacity (including Bypass Filter) — US gal (liter)	21.9	(83)
Angularity of OP 5127 Oil Pan — Front Down	30°	
— Front Up	35°	
— Side to Side	35°	

FUEL SYSTEM

Type Injection System	Direct Injection Cummins PT	
Maximum Restriction at PT Fuel Injection Pump — with Clean Fuel Filter — in Hg (mm Hg)	4.0	(102)
— with Dirty Fuel Filter — in Hg (mm Hg)	8.0	(203)
Maximum Allowable Head on Injector Return Line (Consisting of Friction Head and Static Head) — in Hg (mm Hg)	6.5	(165)
Maximum Fuel Flow to Injection Pump — US gph (liter / hr)	89	(337)

ELECTRICAL SYSTEM

Cranking Motor (Heavy Duty, Positive Engagement) — volt	24	
Battery Charging System, Negative Ground — ampere	35	
Maximum Allowable Resistance of Cranking Circuit — ohm	0.002	
Minimum Recommended Battery Capacity		
• Cold Soak @ 50 °F (10 °C) and Above — 0°F CCA	1200	
• Cold Soak @ 32 °F to 50 °F (0 °C to 10 °C) — 0°F CCA	1280	
• Cold Soak @ 0 °F to 32 °F (-18 °C to 0 °C) — 0°F CCA	1800	

COLD START CAPABILITY

Minimum Ambient Temperature for Aided (with Coolant Heater) Cold Start within 10 seconds — °F (°C)	50	(10)
Minimum Ambient Temperature for Unaided Cold Start — °F (°C)	40	(4)

PERFORMANCE DATA

All data is based on:
- Engine operating with fuel system, water pump, lubricating oil pump, air cleaner and exhaust silencer; not included are battery charging alternator, fan, and optional driven components.
- Engine operating with fuel corresponding to grade No. 2-D per ASTM D975.
- ISO 3046, Part 1, Standard Reference Conditions of:

Barometric Pressure : 100 kPa (29.53 in Hg)		Air Temperature : 25 °C (77 °F)	
Altitude : 110 m (361 ft)		Relative Humidity : 30%	

Steady State Stability Band at any Constant Load — %	+/- 0.25	
Estimated Free Field Sound Pressure Level of a Typical Generator Set; Excludes Exhaust Noise; at Rated Load and 7.5 m (24.6 ft); [1800 / 1500 RPM] — dBA	90 / 90	
Exhaust Noise at 1 m Horizontally from C_L of Exhaust Pipe Outlet Upwards at 45° [1800 / 1500 RPM] — dBA	112 / 112	

	STANDBY				PRIME POWER			
	60 hz		*50 hz*		*60 hz*		*50 hz*	
Governed Engine Speed — rpm	1800		1500		1800		1500	
Engine Idle Speed — rpm	575 - 650		575 - 650		575 - 650		575 - 650	
Gross Engine Power Output — BHP (kW_m)	900	(671)	825	(615)	815	(608)	750	(560)
Brake Mean Effective Pressure — psi (kPa)	232	(1599)	254	(1751)	210	(1448)	232	(1599)
Piston Speed — ft / min (m / s)	1800	(9.1)	1500	(7.6)	1800	(9.1)	1500	(7.6)
Friction Horsepower — HP (kW_m)	105	(78)	75	(56)	105	(78)	75	(56)
Engine Water Flow at Stated Friction Head External to Engine:								
• 3 psi Friction Head — US gpm (liter / s)	236	(14.9)	194	(12.2)	236	(14.9)	194	(12.2)
• Maximum Friction Head — US gpm (liter / s)	212	(13.4)	173	(10.9)	212	(13.4)	173	(10.9)
Engine Data with Dry Type Exhaust Manifold								
Intake Air Flow — cfm (liter / s)	2280	(1076)	1860	(878)	2065	(975)	1750	(826)
Exhaust Gas Temperature — °F (°C)	935	(502)	945	(507)	885	(474)	920	(493)
Exhaust Gas Flow — cfm (liter / s)	5040	(2379)	4340	(2048)	4635	(2188)	4210	(1987)
Radiated Heat to Ambient — BTU / min (kW_m)	5950	(105)	5325	(94)	5250	(92)	4795	(84)
Heat Rejection to Coolant — BTU / min (kW_m)	26065	(458)	21610	(380)	20985	(369)	19310	(339)
Heat Rejection to Exhaust — BTU / min (kW_m)	28920	(508)	26805	(471)	26710	(469)	24015	(422)

N.A. - Data is Not Available
N/A - Not Applicable to this Engine
TBD - To Be Determined

ENGINE MODEL : **VTA28-G5**
DATA SHEET : DS-4886-B
DATE : 9Sept96
CURVE NO. : FR-5122

CUMMINS ENGINE COMPANY, INC. Columbus, Indiana 47202-3005

FRAME HC534E/544E HCK534E/544E

WINDING 311

RATINGS	REFER TO RATINGS BOOK
OVERLOAD	REFER TO RATINGS BOOK
ALTITUDE	REFER TO RATINGS BOOK
AMBIENT TEMP.	REFER TO RATINGS BOOK

CONTROL SYSTEM SER. 3	SEPARATELY EXCITED BY P.M.G. FRAME DESIGNATION HC534		
A.V.R.	MX341	MX321	
VOLTAGE REGULATION	± 1.0%	± 0.5%	WITH 4% ENGINE GOVERNING
SUSTAINED SHORT CIRCUIT	REFER TO SHORT CIRCUIT DECREMENT CURVES OF THIS SECTION		

CONTROL SYSTEM SER. 4	SELF EXCITED FRAME DESIGNATION HC544		
A.V.R.	SX440	SX421	
VOLTAGE REGULATION	± 1.0%	± 0.5%	WITH 4% ENGINE GOVERNING
SUSTAINED SHORT CIRCUIT	SERIES 4 CONTROL DOES NOT SUSTAIN A SHORT CIRCUIT CURRENT		

INSULATION SYSTEM	CLASS H	
PROTECTION	IP22 STANDARD - IP23 OPTIONAL (5% DERATE)	
RATED POWER FACTOR	0.8	
STATOR WINDING	DOUBLE LAYER LAP	
WINDING PITCH	TWO THIRDS	
WINDING LEADS	12	
STATOR WDG. RESISTANCE	0.0043 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED	
ROTOR WDG. RESISTANCE	1.96 Ohms at 22°C	
R.F.I. SUPPRESSION	BS EN 50081/2-1/2 VDE 0875G VDE 0875N For other standards apply to the factory	
WAVEFORM DISTORTION	NO LOAD < 1.5 % NON-DISTORTING BALANCED LINEAR LOAD < 5.0 %	
MAXIMUM OVERSPEED	2250 Rev/Min	
BEARING DRIVE END **HC ONLY**	BALL. 6220 (ISO)	
BEARING NON-DRIVE END	BALL. 6314 (ISO)	
EFFICIENCY	REFER TO EFFICIENCY CURVES OF THIS SECTION	
	1 BEARING	2 BEARING **HC ONLY**
WEIGHT COMP. GENERATOR	1545 kg	1535 kg
WEIGHT WOUND STATOR	722 kg	722 kg
WEIGHT WOUND ROTOR	619 kg	588 kg
WR^2 INERTIA	9.00 kgm^2	8.70 kgm^2

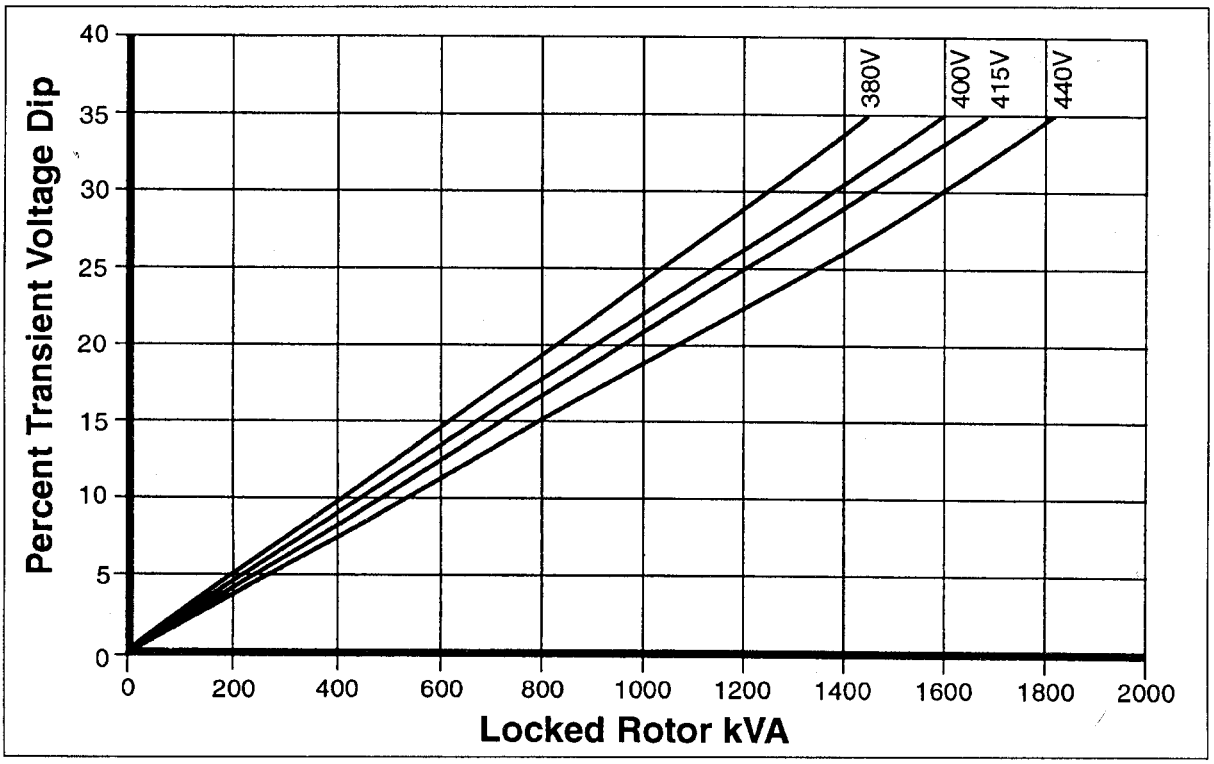
	50 Hz				60 Hz			
TELEPHONE INTERFERENCE	THF< 2%				TIF< 50			
COOLING AIR **FOR HC**	1.035 m^3/sec 2202 cfm				1.312 m^3/sec 2780 cfm			
COOLING AIR **FOR HCK**	1.23 m^3/sec 2615 cfm				1.59 m^3/sec 3366 cfm			
VOLTAGE SERIES STAR (Y)	380/220	400/231	415/240	440/254	416/240	440/254	460/266	480/277
VOLTAGE PARALLEL STAR (Y)	190/110	200/115	208/120	220/127	208/120	220/127	230/133	240/138
VOLTAGE EDISON DELTA (Δ)	220/110	230/115	240/120	250/125	240/120	254/127	266/133	277/138
kVA BASE RATING FOR REACTANCE VALUES	600	600	600	600	681	713	731	750
Xd DIR. AXIS SYNCHRONOUS	3.14	2.83	2.63	2.34	3.53	3.31	3.10	2.92
X'd DIR. AXIS TRANSIENT	0.17	0.14	0.14	0.13	0.17	0.16	0.16	0.14
X"d DIR. AXIS SUBTRANSIENT	0.11	0.10	0.10	0.09	0.12	0.11	0.11	0.10
Xq QUAD. AXIS REACTANCE	2.44	2.21	2.05	1.82	2.82	2.64	2.48	2.33
X"q QUAD. AXIS SUBTRANSIENT	0.26	0.24	0.22	0.19	0.34	0.31	0.29	0.28
X_L LEAKAGE REACTANCE	0.05	0.05	0.05	0.04	0.06	0.06	0.05	0.05
X_2 NEGATIVE SEQUENCE	0.19	0.16	0.15	0.14	0.23	0.21	0.20	0.19
X_0 ZERO SEQUENCE	0.09	0.08	0.07	0.06	0.10	0.09	0.09	0.08

REACTANCES ARE SATURATED	VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED
T'd TRANSIENT TIME CONST.	0.08 sec
T"d SUB-TRANSTIME CONST.	0.012 sec
T'do O.C. FIELD TIME CONST.	2.50 sec
Ta ARMATURE TIME CONST.	0.019 sec
SHORT CIRCUIT RATIO	1/Xd

ISSUE 8

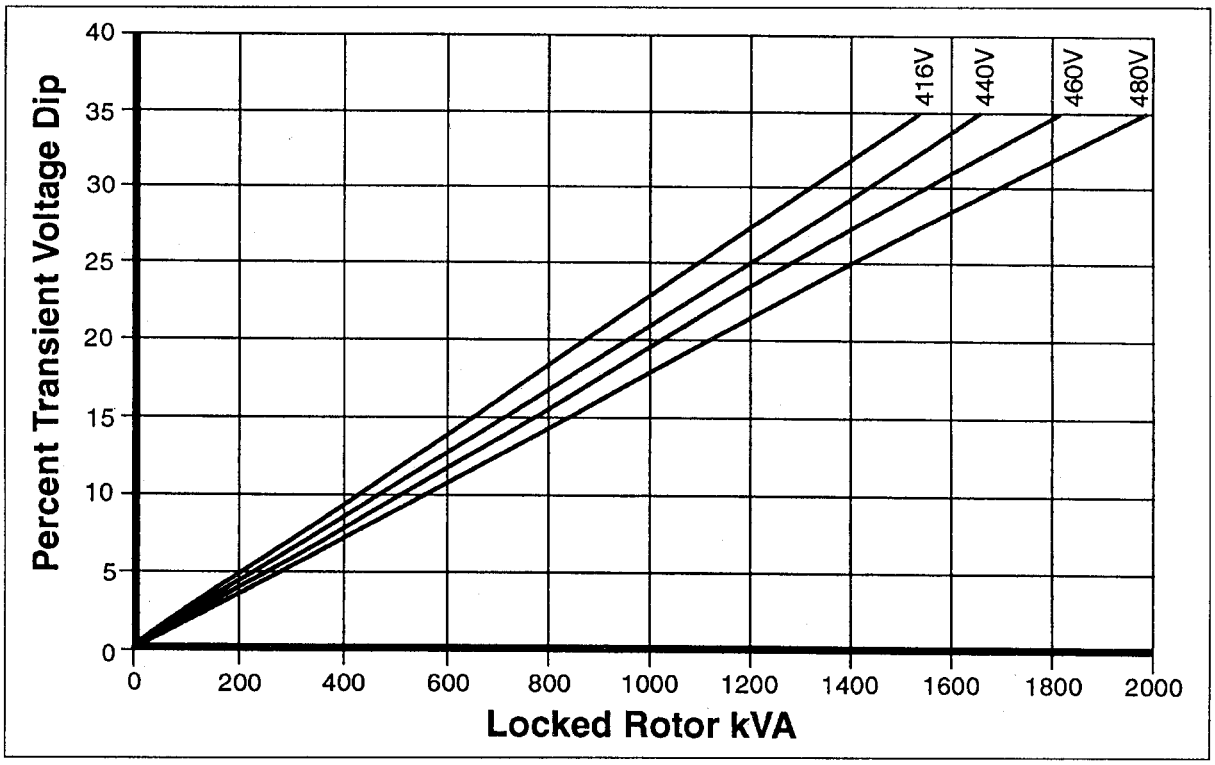
FRAME HC534E HCK534E 50 Hz

SERIES 3 WINDING 311
LOCKED ROTOR MOTOR STARTING CURVE



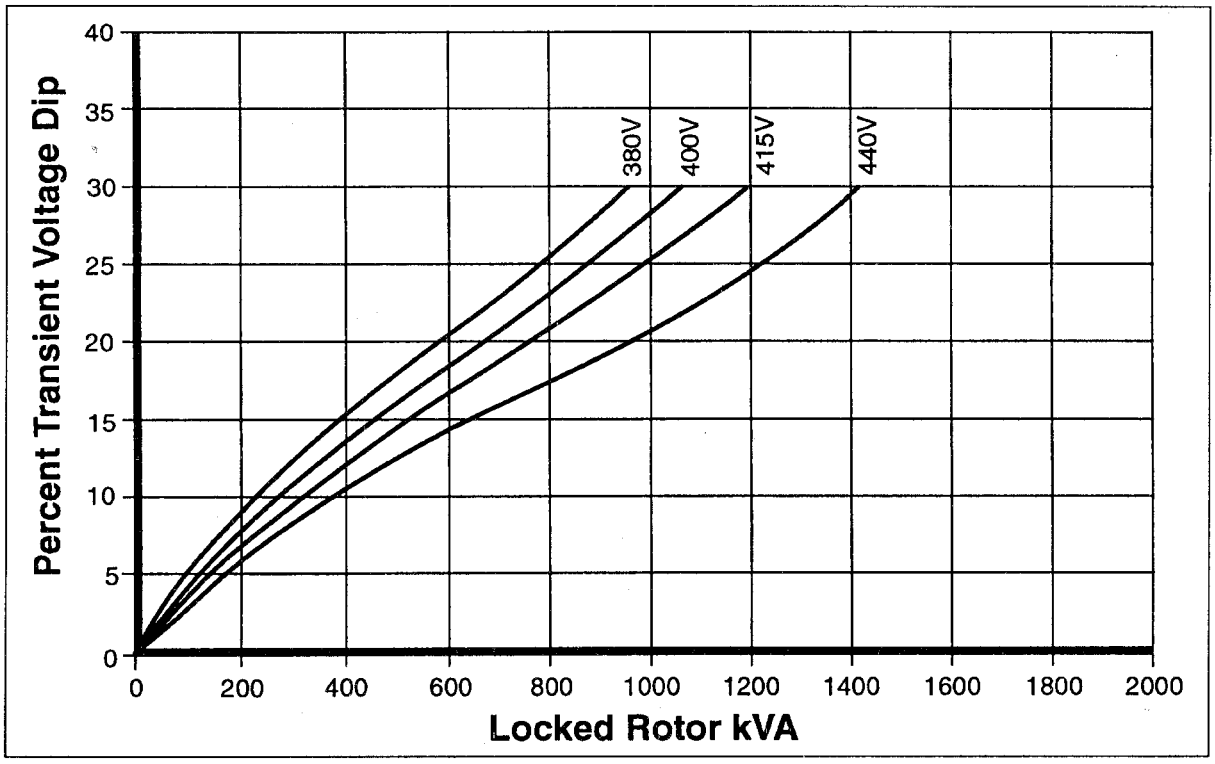
FRAME HC534E HCK534E 60 Hz

SERIES 3 WINDING 311
LOCKED ROTOR MOTOR STARTING CURVE



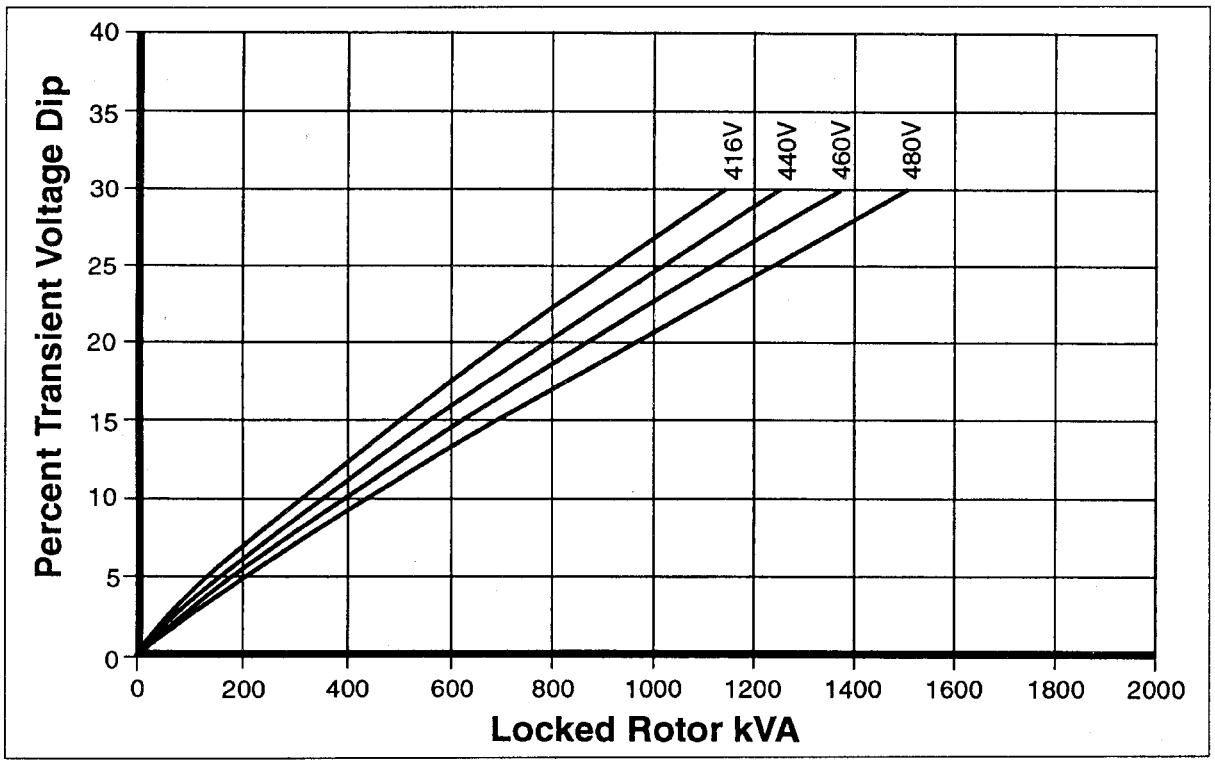
FRAME HC544E HCK544E 50 Hz

SERIES 4 WINDING 311
LOCKED ROTOR MOTOR STARTING CURVE

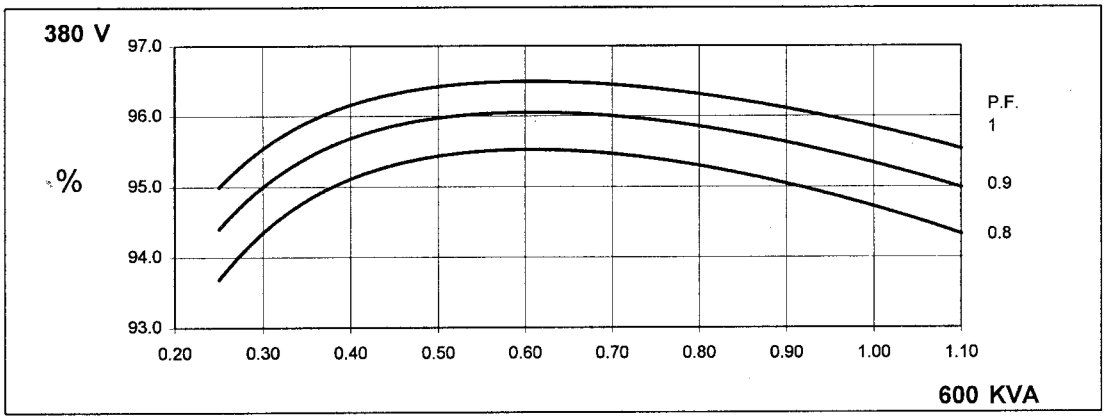


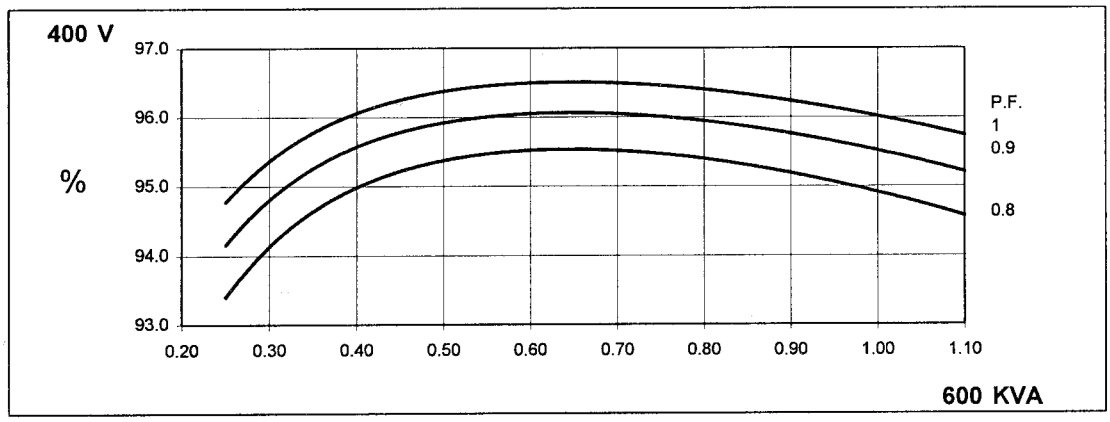
FRAME HC544E HCK544E 60 Hz

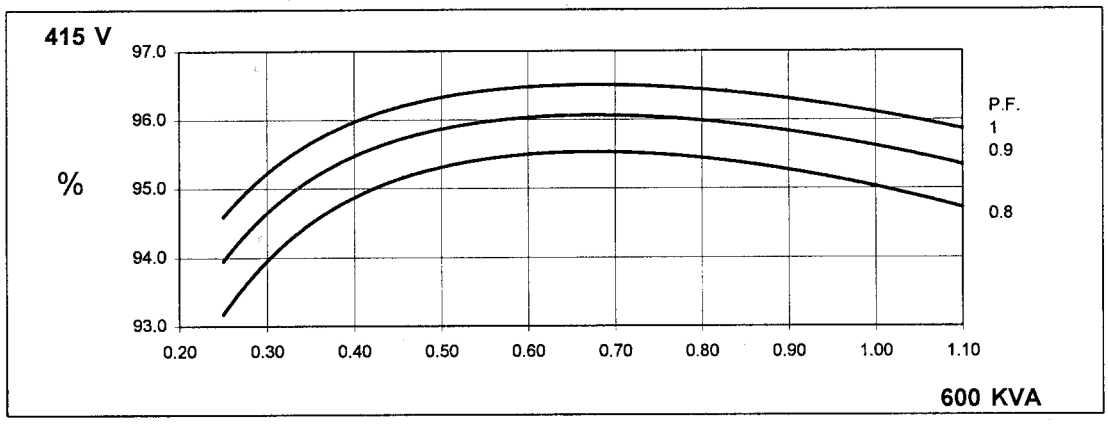
SERIES 4 WINDING 311
LOCKED ROTOR MOTOR STARTING CURVE

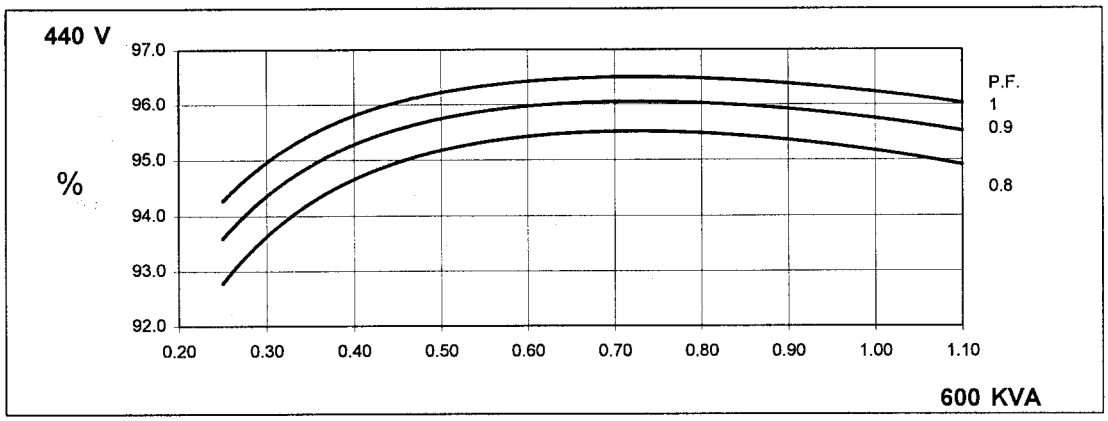


THREE PHASE EFFICIENCY CURVES

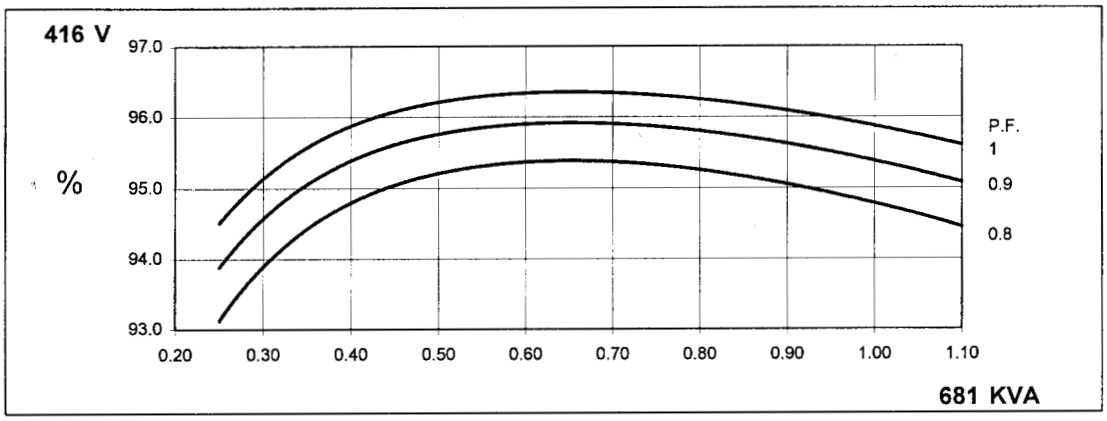


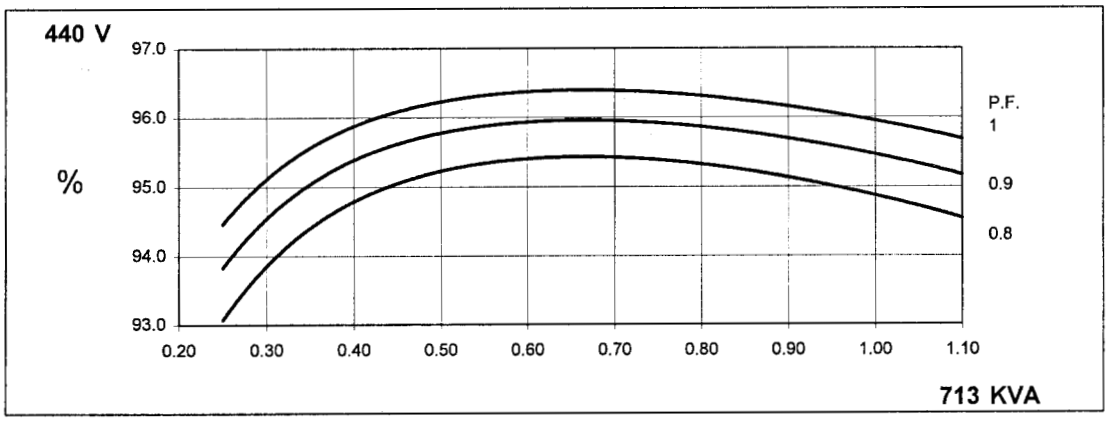


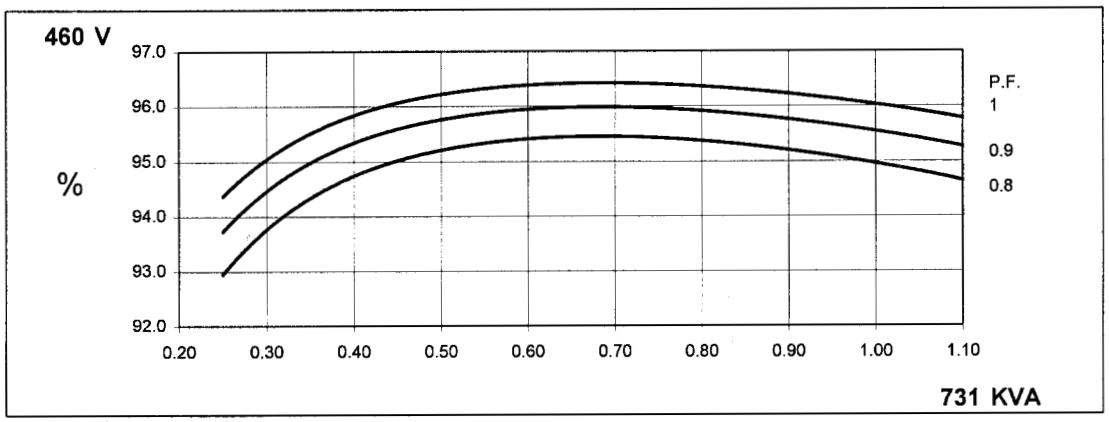


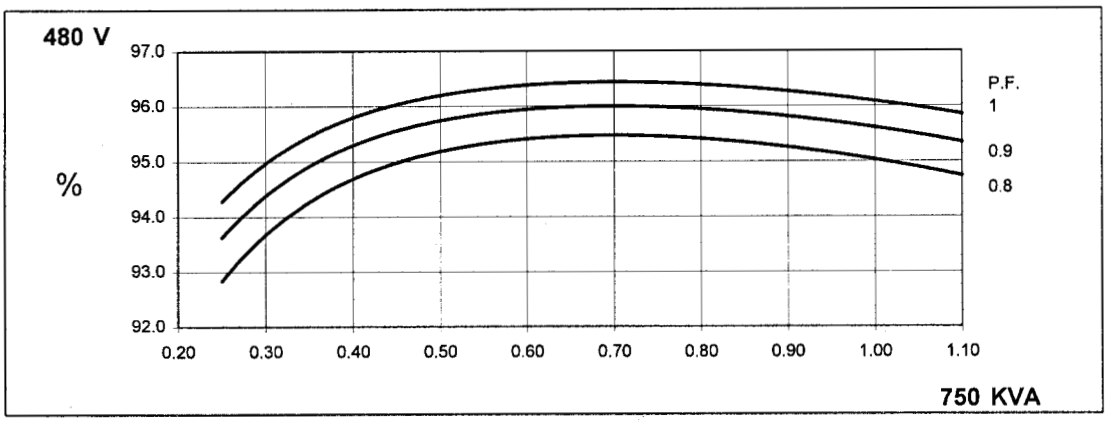


THREE PHASE EFFICIENCY CURVES





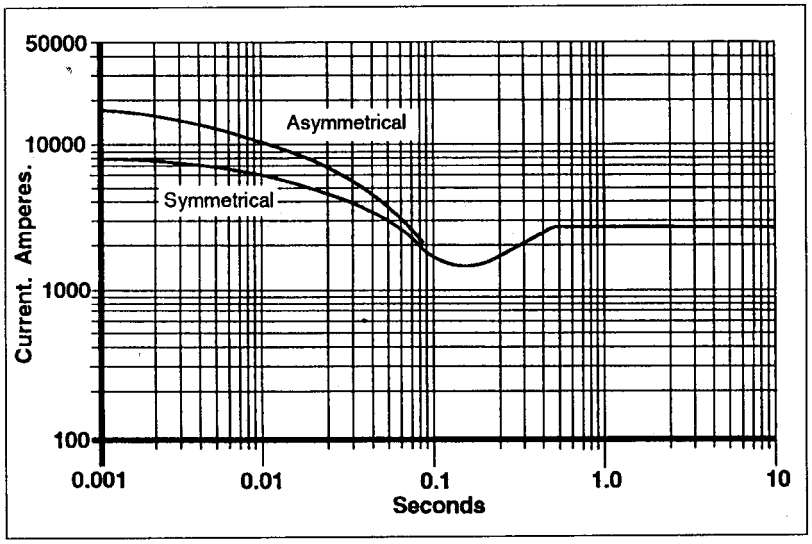




FRAME HC534E HCK534E 50 Hz

SERIES THREE
Three Phase Short Circuit Decrement Curve
No-load Excitation at Rated Speed

Based on series star (wye) connection



Note 1

The following multiplication factors should be used to adjust the values from curve between time 0.001 seconds and the minimum current point in respect of nominal operating voltage :

VOLTAGE	FACTOR
380 V	X 1.0
400 V	X 1.06
415 V	X 1.09
440 V	X 1.12

The sustained current value is constant irrespective of voltage level.

Note 2

The following multiplication factors should be used to convert the values calculated in accordance with NOTE 1 to those applicable to the various types of short circuit :

	3 PHASE	2 PHASE L-L	1 PHASE L-N
Instantaneous	X 1.00	X 0.87	X 1.30
Minimum	X 1.00	X 1.80	X 3.20
Sustained	X 1.00	X 1.50	X 2.50
Max. sustained duration	10 sec.	5 sec.	2 sec.

All other times are unchanged.

Note 3

Curves are drawn for Series Star (Wye) connected machines. For other connections the following multipliers should be applied to current values shown :

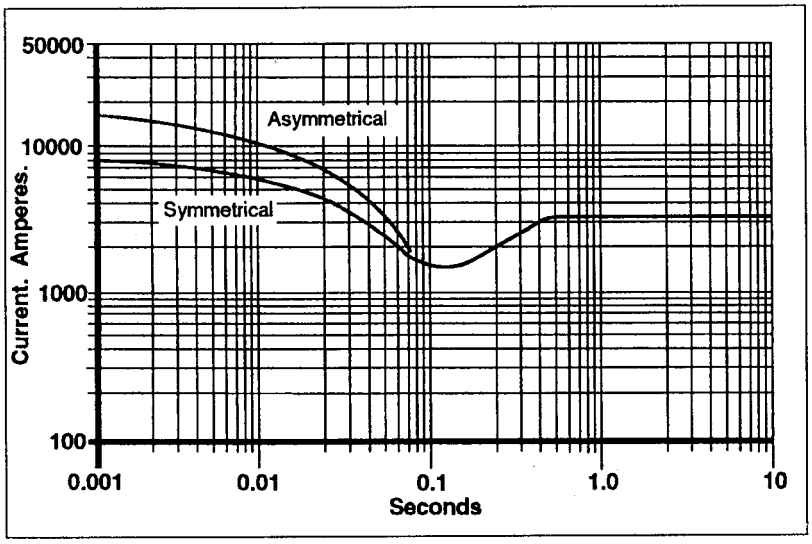
Parallel Star (Wye) Curve current value X 2
Series Delta (Δ) Curve current value X 1.732

Times are unchanged.

FRAME HC534E HCK534E 60 Hz

SERIES THREE
Three Phase Short Circuit Decrement Curve
No-load Excitation at Rated Speed

Based on series star (wye) connection



Note 1

The following multiplication factors should be used to adjust the values from curve between time 0.001 seconds and the minimum current point in respect of nominal operating voltage :

VOLTAGE	FACTOR
416 V	X 1.0
440 V	X 1.06
460 V	X 1.12
480 V	X 1.20

The sustained current value is constant irrespective of voltage level.

Note 2

The following multiplication factors should be used to convert the values calculated in accordance with NOTE 1 to those applicable to the various types of short circuit :

	3 PHASE	2 PHASE L-L	1 PHASE L-N
Instantaneous	X 1.00	X 0.87	X 1.30
Minimum	X 1.00	X 1.80	X 3.20
Sustained	X 1.00	X 1.50	X 2.50
Max. sustained duration	10 sec.	5 sec.	2 sec.

All other times are unchanged.

Note 3

Curves are drawn for Series Star (Wye) connected machines. For other connections the following multipliers should be applied to current values shown :

Parallel Star (Wye) Curve current value X 2
Series Delta (Δ) Curve current value X 1.732

Times are unchanged.

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