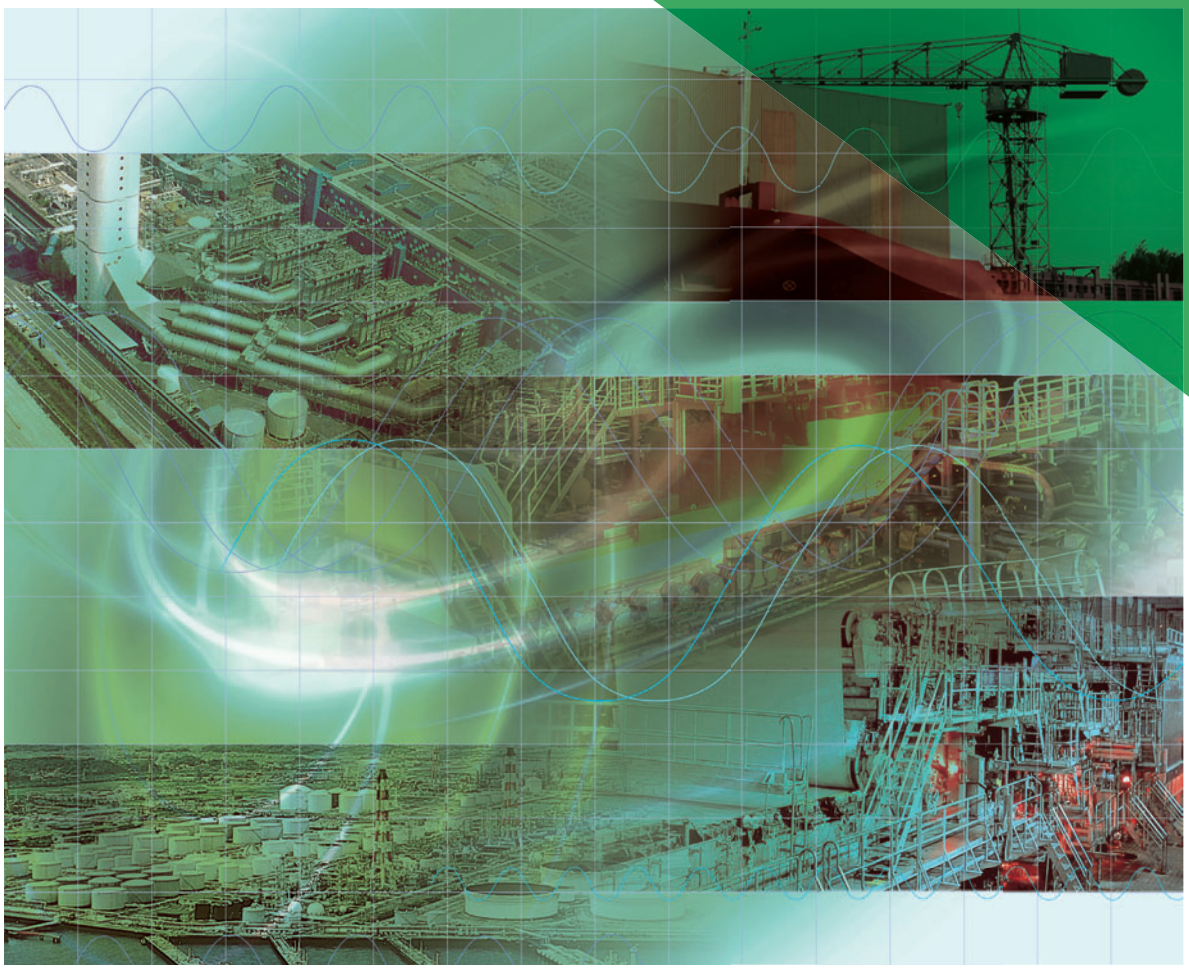
TMEiC

We drive industry

TMdrive™

AC/DC DRIVE Series

New Drive Generation for All Applications



TOSHIBA MITSUBISHI-ELECTRIC INDUSTRIAL SYSTEMS CORPORATION

TMEIC (Toshiba Mitsubishi-Electric Industrial Systems Corporation) as a new global leader in the field of electrical products and engineering has developed drive products under the TMdrive trademark by integrating leading technology and service capability of Toshiba Corporation, Mitsubishi-Electric Corporation and General Electric Company.
Based on more than a century of their experience in converting electrical power into productive performance, TMEIC offers the best drive system solution with peak performance, reliable quality and optimum profitability.

● Innovative Concepts of TMdrive

1 State-of- the art Power Device Technology

- High-tech large power devices with two options (IEGT*1,GCT*2)
- Continuous and stable supply of versatile devices (Diode, IGBT*3, IEGT, GCT)
- Extraordinary expertise in application of large power devices

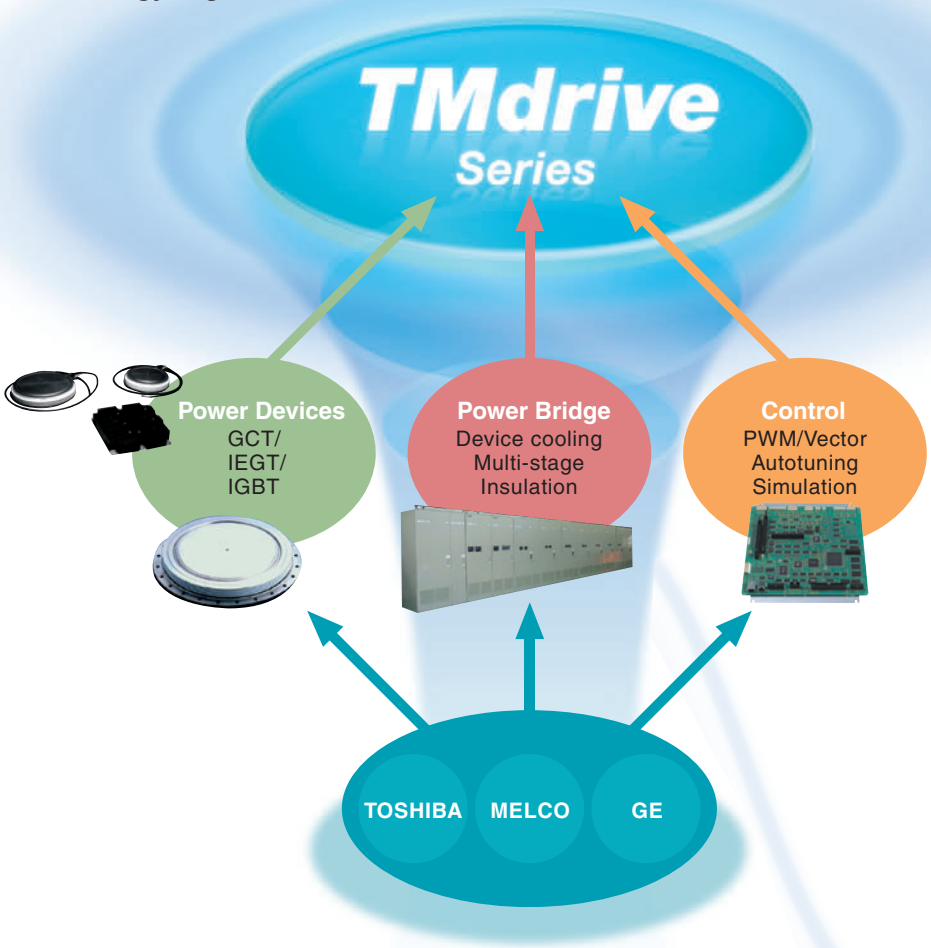
2 Compliance to Global Standards

- Global standard voltages (460/575/690V、2.3/3.3/4.16/6.6/11kV)
- Global rules (IEEE, UL(cUL), CSA & IEC(CE))

3 Merged Intelligent Technology

- **High power quality** : High efficiency, little high-harmonics
- **High performance** : High performance 32 bit micro-processor (Model PP7), Autotuning
- **Open communication:** Global/Defacto standard LAN systems (Profibus, DeviceNet, ISBus, TOSLINE, MELPLAC)

● Technology Migration



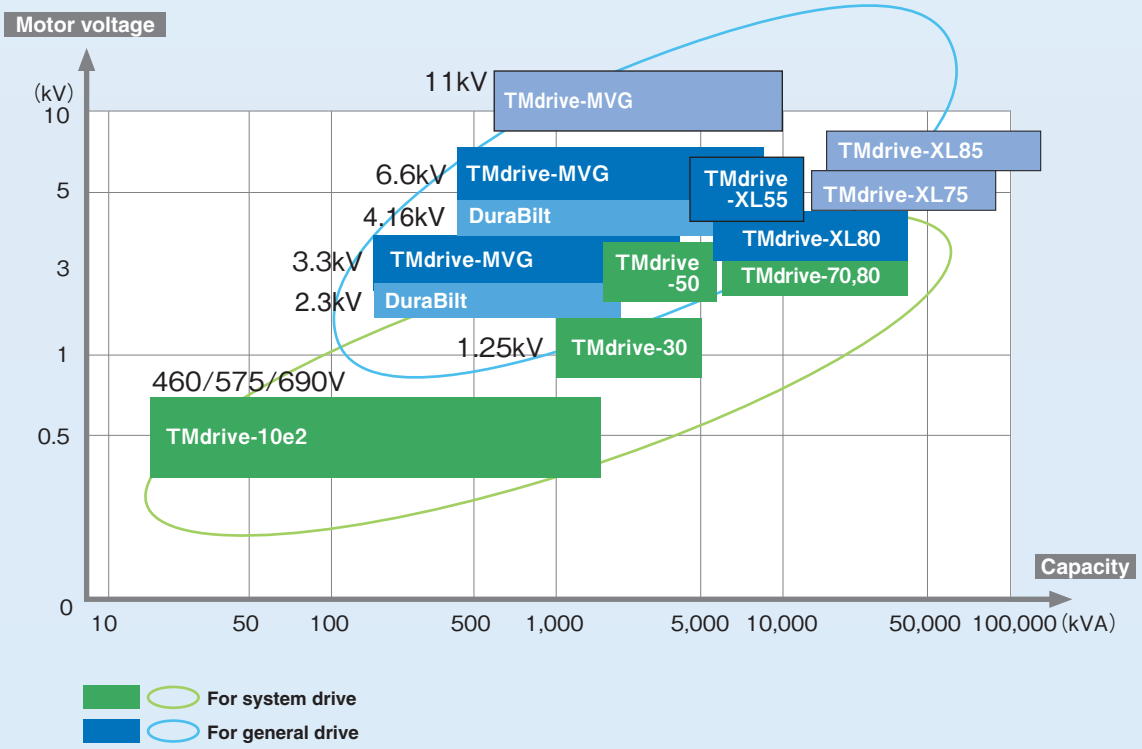
*1 IEGT: Injection Enhanced Gate Transistor *2 GCT : Gate Commutated Turn-off Thyristor *3 IGBT: Insulated Gate Bipolar Transistor

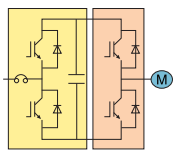
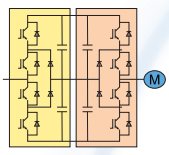
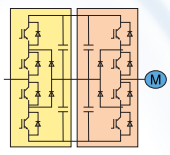
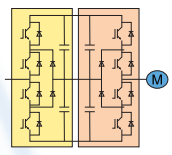
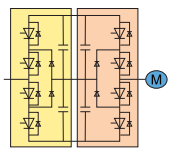
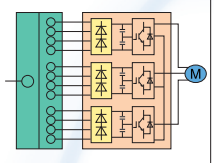
AC Drives for System Application

TMdrive-10e2	A flexible LV IGBT inverter applicable up to 690V and 2,400kVA. Compact multi-stage units with 250kVA or less can be mounted in one cubicle.
TMdrive-30/50	A mid range MV inverter with 1250/3000V output voltage. This is suitable for metal processing line, mining and marine.
TMdrive-70/80	A large water-cooled up-to-date Inverter using large IEGT or GCT power devices. These were awarded as Excellent Power-saving Products in 2001 and 2002.

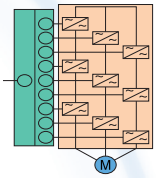
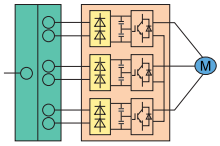
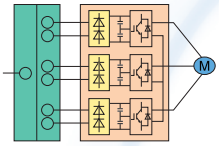
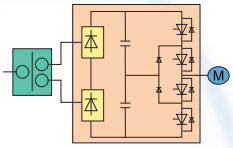
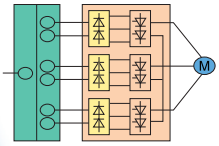
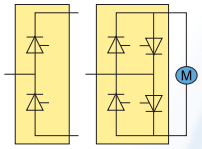
AC Drives for General Application

DuraBilt 5i	2.3/4.16kV MV inverter directly connected to MV motor (in North America).
TMdrive-MVG	3.3/6.6/10/11kV MV inverter.
TMdrive-XL55	Water cooled IGBT inverter for general purpose applications up to 16MVA.
TMdrive-XL75	IEGT inverter for large compressor or other large capacity applications up to 80MVA.
TMdrive-XL80	GCT inverter for large compressor or other large capacity applications up to 30MVA.
TMdrive-XL85	Extra large inverter for large compressor or other large power application up to 120MVA.



Product	LV AC Drive	MV AC Drive				
	TMdrive-10e2(Inverter) TMdrive-P/D/T10e2(Converter)※	TMdrive-30 TMdrive-P/D/T30	TMdrive-50 TMdrive-P/D50	TMdrive-70 TMdrive-P/D70	TMdrive-80 TMdrive-P/D80	DuraBilt for North America
Typical View						
Line-side converter	Common converter with IGBT(P), diode(D) or thyristor(T)※	Common converter with IGBT(P), diode(D) or thyristor(T)	Common converter with IGBT(P), diode(D)	Common converter with IEGT(P), or diode(D)	Common converter with GCT(P) or diode(D)	24 pulse diode converter
Inverter	2 level PWM*1	3 level PWM-NPC*3	3 level PWM-NPC	3 level PWM-NPC	3 level PWM-NPC	3 level PWM-NPC (2.3 kV) 5 level PWM (4.16 kV)
Device in inverter	IGBTs	IGBTs	IGBTs	IEGTs	GCTs	IGBTs
Cooling system	Heatpipe air cooled	Heatpipe air cooled	Water cooled	Water cooled	Water cooled	Forced air cooled
Output voltage	460/575/690 V	1.25 kV	3.3 kV	3.3 kV	3.3 kV	2.3/4.16 kV
Maximum capacity	1800kVA/460 V 2400kVA/690 V	4,000 kVA	6,000 kVA(2×3000 kVA)	40 MVA(4×10 MVA)	24 MVA(2×12 MVA)	2500 kVA/2.3 kV 5000 kVA/4.16 kV
Overload	150%-60 sec.	150%-60 sec.	150%-60 sec.	150%-60 sec.	150%-60 sec.	115%-60 sec.
Max output freg	200 Hz	120 Hz	60 Hz	60 Hz	60 Hz	60/120 Hz
Speed control	Resolver, Encoder, V/F*2 control, Sensorless	Encoder, Resolver, V/F control, Sensorless	Resolver, Encoder	Resolver, Encoder	Resolver, Encoder	Sensorless vector, V/F control
Motor Type	Induction motor	Induction motor, Synchronous motor	Induction motor, Synchronous motor	Induction motor, Synchronous motor	Induction motor, Synchronous motor	Induction motor Synchronous motor
Major application	Process industries, Material handling, Dynamo meter	Metal processing, Marine, Mining	Metal processing, Marine, Mining	Metal rolling mill, Compressor, Utility	Metal rolling mill, Compressor	Pump, Fan, Blower, Extruder, Mixer
Features	10e2: max. 8 stages	Compact with heatpipe technology, Regen with IGBT/Thyristor	High efficiency, Clean AC power, Compact	High efficiency, Clean AC power, Compact	High efficiency, Clean AC power, Compact	Clean AC power, No sensor required for most application
Circuit diagram	TMdrive-P10e2, -10e2  In case of IGBT converter	TMdrive-P30, -30  In case of IGBT converter	TMdrive-P50, -50  In case of IGBT converter	TMdrive-P70, -70 	TMdrive-P80, -80 	Transformer Cells  In case of 4.16kV
Release schedule	Current	Current	Current	Current	Current	Current

※TMdrive-P10e2: IGBT converter
TMdrive-D10e2: Diode converter
TMdrive-T10e2: Thyristor converter

					DC Drive
TMdrive-MVG	**TMdrive-XL55**	**TMdrive-XL75**	**TMdrive-XL80**	**TMdrive-XL85**	**TMdrive-DC (LEOPACK/MELNARD)**
					
Diode converter 18 pulse(3.3 kV) 18 or 36 pulse(6.6 kV) 54 pulse(10 kV) 30 pulse(11 kV)	36 pulse diode converter	36 pulse diode converter	12 or 24 pulse diode converter	36 pulse diode converter	Thyristor
Multi-level PWM	5 level PWM	5 level PWM	3 level PWM-NPC	5 level PWM	—
IGBTs	IGBTs	IEGTs	GCTs	GCTs	—
Forced air cooled	Water cooled	Water cooled	Water cooled	Water cooled	Forced air cooled
3.3/6.6/10/11 kV	6.6 kV	6 kV	3.8 kV	7.2 kV	440/750/900/1200 V
3000 kVA/3.3 kV 6000 kVA/6.6 kV 10000 kVA/11 kV	16 MVA(2×8 MVA)	80 MVA(4×20 MVA)	30 MVA(2×15 MVA)	120 MVA(4×30 MVA)	850 kW/440 V 9100 kW/1200 V
125%-60 sec.	100%-Conti.	110%-60 sec.	110%-60 sec.	110%-60 sec.	150%-60 sec.
60/120 Hz(3.3/6.6 kV) 60/72 Hz(10/11 kV)	60/250 Hz	60/200 Hz	60/100 Hz	60/200 Hz	DC
Sensorless vector, V/F control	V/F control, Sensorless vector	V/F control, Sensorless vector	V/F control, Sensorless vector	V/F control, Sensorless vector	Resolver, Encoder
Induction motor Synchronous motor	Induction motor Synchronous motor	Induction motor Synchronous motor	Induction motor Synchronous motor	Synchronous motor	DC motor
Pump, Fan, Blower, Extruder, Mixer	Compressor Pump, Fan, Blower, Extruder, Mixer	Compressor Pump, Fan, Blower	Compressor Pump, Fan, Blower, Extruder, Mixer	Compressor	Various application
Clean AC power, No sensor required for most application.	Clean AC power, No sensor required for most application.	Clean AC power, No sensor required for most application.	Clean AC power, No sensor required for most application.	Higher efficiency and PF compared to LCI or Cycloconverter	Grade-up is possible by replacement
Transformer Cells  In case of 3.3kV	Transformer TMdrive-XL55 	Transformer TMdrive-XL75 	Transformer TMdrive-XL80 	Transformer Cells 	 Non-regen. Regen.
Current	Current	Current	Current	Current	Current

✻1 PWM: Pulse Width Modulation ✻2 V/F: Voltage/Frequency
✻3 NPC: Neutral Point Cramped

With extraordinary expertise in power conversion and an integrated approach worldwide, TMEIC offers drive solutions for all industrial applications where drives are essential.

Power Utility

- Blower
- Feed pump
- Circulating pump

Water/ Waste water Plant

- Pump
- Fan

Marine

- Propulsion
- Winch

TM

Some of the areas where

Iron & Steel Industries

- Rolling mill
- Process line
- Blower

Mining, Ore processing Industries

- Winder
- Pump
- Fan
- Conveyer
- Kiln

Material handling, Transportation

- Crane
- Conveyer
- Lift
- Ropeway

drive

TMEIC possesses specialized expertise are:

Chemical & Petrochemical Industries

- Compressor
- Pump
- Extruder
- Mixer

Pulp & Paper Industries

- Paper machine
- Process line
- Boiler

TOSHIBA MITSUBISHI-ELECTRIC INDUSTRIAL SYSTEMS CORPORATION

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To users of our inverters:

Our inverters are designed to control the speeds of three-phase induction motors for general industry.

PRECAUTIONS

- Read the entire “Instruction Manual” carefully for important information about safety, handling, installation, operation, maintenance, and parts replacements.
- When using our inverters for equipment such as nuclear power control equipment, aviation and space flight control equipment, traffic equipment, and safety equipment, and there is a risk that any failure or malfunction of the inverter could directly endanger human life or cause injury, please contact our headquarters, branch, or office printed on the front and back covers of this catalogue. Such applications must be studied carefully.
- When using our inverters for critical equipment, even though the inverters are manufactured under strict quality control, always fit your equipment with safety devices to prevent serious accident or loss should the inverter fail (such as failure to issue an inverter trouble signal).
- Do not use our inverters for any load other than three-phase induction motors.

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