

# TMdrive-10e2 DP

## Dual Purpose Drive

The TM10e2 Dual Purpose (DP) Drive is the ideal solution for modernization projects where the user wishes to upgrade from a legacy DC system to a modern AC system. The TMdrive-10e2 Dual Purpose drive is capable of controlling either a DC or AC motor. This capability allows for flexibility in planning system modernizations in a manner that accommodates constraints created by operating demands and budgetary considerations. New AC motors can be powered and controlled using TM10e2 DP drives with AC motor control firmware installed. DC motors can be powered and controlled using TM10e2 DP drives with DC motor control firmware installed. DC Motors can be replaced at any time with AC motors and powered by the previously installed TM10e2 DP drives.

The Dual Purpose drive uses standard TMdrive-10e2 drive power and control hardware for both AC and DC motor control. When DC motors are upgraded to AC, the drive can be reconfigured for AC motor control by switching the firmware from the DC to the AC motor control function set. The drive can then be quickly returned to achieve the required operational performance.

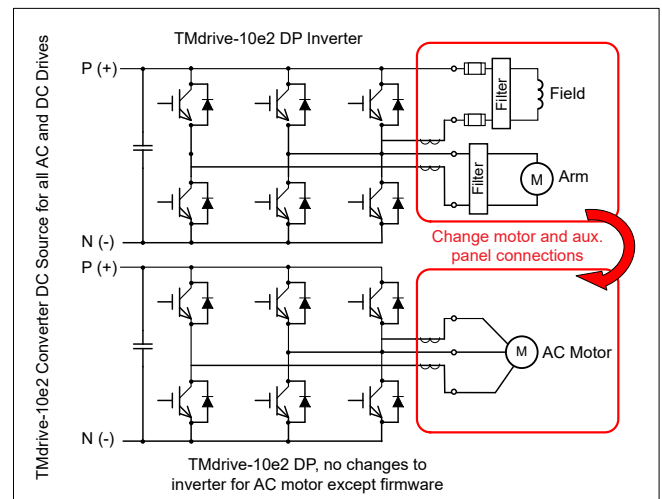


## Requirements

DC and AC motors have different physical and electrical requirements. In addition to the standard TMdrive-10e2 AC drive, an auxiliary panel with both armature and field filters is required for the DC motor, shown in the figure below.

## Features and Benefits

- Standard TMdrive-10e2 uses IGBT gating with Pulse Width Modulation
- Four quadrant regenerative operation from DC armature
- Non-reversing, non-plugging field power
- Standard TMdrive-10e2 converter DC source used for all AC and DC drives
- Converter operates with reduced harmonics and unity power factor for reduced impact on the plant power system



## TMdrive-10e2 DP drive ratings

When applying the TMdrive-10e2 Dual Purpose Drive as DC motor control, the AC KW capability is de-rated. The extra capacity becomes available again when the DC machine is upgraded to AC, allowing for a potential power increase based on process requirements. For the example shown here, the Frame 100 applied as a DC drive produces 32.3 KW. Applied as an AC drive the Frame 100 can produce up to 82.4 KW.

Frame	DC Bus Voltage	500 V DC Motor 150% OL		460 V AC Motor 150% OL	
		Max Current Rating	Motor KW	AC Current Rating	Motor KW
15	680	11.5	5.5	18.0	11.6
30	680	22.5	10.7	35.0	22.5
60	680	47.5	22.6	75.0	48.3
100	680	68.0	32.3	128	82.4
150	680	102	48.5	204	131
250	680	161	76.5	270	174
400	680	252	120	455	293
600	680	417	198	700	450
750	680	520	247	935	602
900	680	640	304	1150	740

## Comparison between Thyristor and IGBT Systems

The TMdrive-10e2-DP IGBT gating reduces armature RMS current ripple more than 3:1 compared to traditional 6-pulse thyristor drives. Reduced RMS ripple results in lower motor heating and better commutation. Legacy DC drive systems operate at a Power Factor (PF) between approximately 0 and 0.8 lagging with appropriately sized infrastructure. The TMdrive-10e2 regenerative converter operates at 1.0 PF with smaller cables and transformer requirements, higher efficiency and lower utility costs. If the existing utility infrastructure is marginal, it will be more robust after upgrading with the Dual Purpose Drive system.

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