

# DES410 SERIES

## POWER SUPPLY FOR DYNAMOMETERS BRAKES

### FEATURES

- For use with Magtrol WB Series Eddy-Current and PB Series Powder Brake Dynamometers
- Controlled current supply, with overvoltage factor >5
- Analog input for current set-point
- Selection of nominal current
- Control by digital inputs/outputs
- General alarm provided by relay
- 2 alarm outputs (temperature and electrical circuit)
- Available in either 115 or 230VAC



Fig. 1: DES410 Series | Power Supply in its cast-aluminum housing

### DESCRIPTION

The DES410 Series - Power Supplies are specially designed for the full range of Magtrol's Eddy-current and Magnetic Powder dynamometers with the design goal providing the best response time. The DES Series supplies are packaged in an industrial housing made of cast aluminum. This offers superior protection against radiated emissions in order to avoid any disruption of the surrounding electronics modules.

This housing must be installed directly on the test bench, next to the brake, as close as possible.

The DES410 Series supplies can be controlled by digital signals and analog set point coming from peripheral electronics. The DSP70XX Dynamometer Controller has been designed to work with the DES Series.

### CONTROL

The Power supply can be switched ON by remote control. The STAND-BY signal enables the output current to be delivered. This excitation current is controlled by a set-point in the 0-10VDC range. The nominal value of the excitation current is set by internal resistors. There are two discrete outputs for alarms (open collector). The first is the "Temperature Alarm". It will indicate if the cooling water of the Dynamometer or the inner temperature of the DES410 Series are out of limits. The second is the "Electrical Alarm". It occurs when an over

current or a short circuit is detected. The output current is immediately turned OFF and latched while the General Alarm Relay is set under its Alarm position. A low state for 200ms of the Stand-by signal resets the latch.

For applications with TANDEM Series Dynamometers, the DES Series units also control the power supply of the electromagnetic clutch.

### SUPPLY VOLTAGE

The main supply voltage of the DES Series is in the 115/230VAC - 50/60Hz range. The DES410 Series must be configured according to its supply voltage.

The model DES410 features a galvanic insulation between the main circuit and the dynamometer power.

The model DES411 does not have galvanic separation.

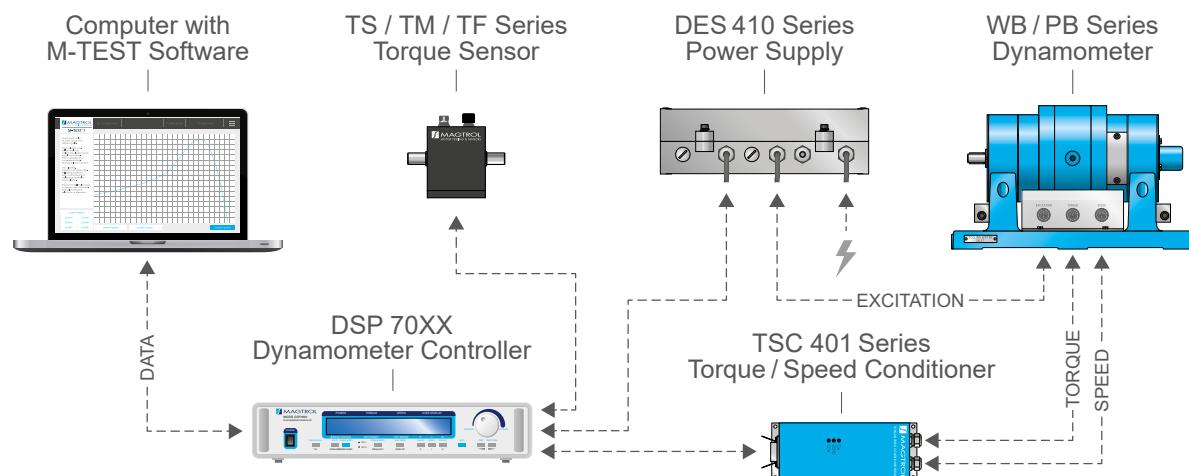
For safety reasons, **the DES Series case has to be grounded** and the use of a ground fault current circuit breaker is recommended.

## SPECIFICATIONS

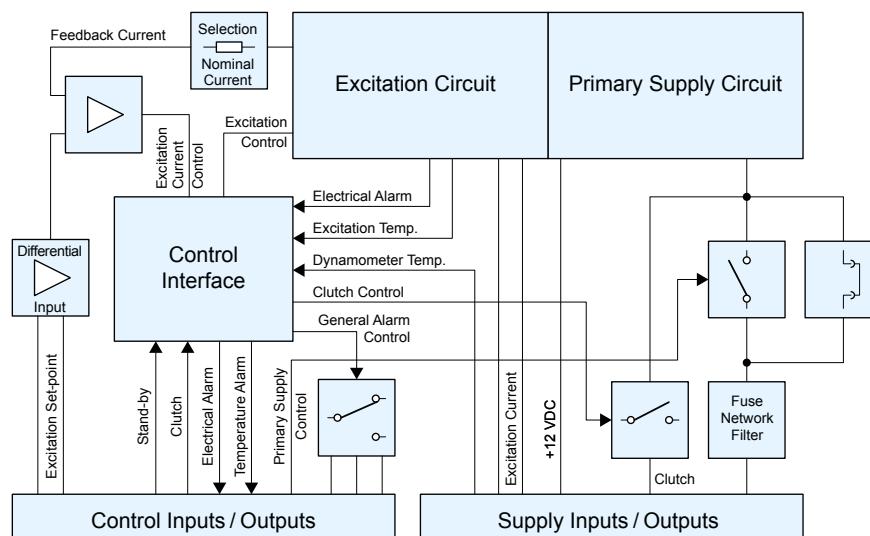
MODEL	DES 410	DES 411
For use with the dynamometer model	WB/PB43	WB/PB65, 115 and 15
<b>NETWORK SUPPLY</b>		
Voltage	115VAC / 230VAC ±15%	
Frequency	50 / 60Hz	
Fuse	T1A or T2A depending on the brake(s) 115 VAC / 230VAC	T2A to T12A depending on the brake(s) 115VAC / 230VAC
Maximum current	1A / 230VAC <sup>a)</sup> 2A / 115VAC <sup>a)</sup>	3A / 230VAC <sup>a)</sup> 6A / 115VAC <sup>a)</sup>
<b>ELECTROMAGNETIC CLUTCH SUPPLY</b>		
Voltage	115VAC / 230VAC	
Current	1A	
<b>SUPPLY FOR EXTERNAL USE</b>		
Voltage	12VDC ±5%	
Maximum Current	300 mA	
<b>SELECTION OF NOMINAL CURRENT</b>		
Selected by resistors	0.5/1/1.5/2A	2.5/4/5/7.5/10/12A
<b>EXCITATION SET-POINT</b>		
Voltage	0...10VDC	
Impedance	>50 kΩ	
<b>DIGITAL INPUTS (GALVANICALLY INSULATED)</b>		
Remote Control of Network Input (PSC)	Relay coil +24 VDC / 11 mA	
Control of the Electromagnetic Clutch	Optocoupler activated by +24 VDC / 2.5 mA	
STAND-BY (enable)	Optocoupler activated by either +24 VDC or +12VDC / 2.5 mA max	
<b>DIGITAL OUTPUTS (GALVANICALLY INSULATED)</b>		
Temperature Alarm	2 open collector outputs: U <sub>max</sub> = 40 VDC / I <sub>max</sub> = 3 mA	
Electrical Alarm		
<b>GENERAL ALARM</b>		
Relay Contact	2A / 30VDC	
<b>ENVIRONMENTAL CHARACTERISTICS</b>		
Operating Temperature	0 °C...+50 °C	
Storage Temperature	-20 °C...+70 °C	
Humidity	0...90 % according to DIN40040	
Protection Class	IP66	
Assembly	CAUTION: The housing must be electrically and thermally coupled to the metal frame of the test bench to allow heat dissipation.	
<b>MECHANICAL CHARACTERISTICS</b>		
Housing	Extruded cast aluminium	
Weight without cable	5.2 kg (11.5 lb)	
Weight with integrated cable	6.2 kg (13.7 lb)	

a) When using a clutch (TANDEM Series), increase the fuse by 1A for 230VAC and 2A for 115VAC.

## SYSTEM CONFIGURATION



## BLOCK DIAGRAM



## RELATED PRODUCTS

### WB & PB SERIES - DYNAMOMETERS



Fig. 2: PB 115 | Powder Dynamometer

The WB Series (Eddy-current) and PB Series (Magnetic Powder) dynamometers are particularly suitable for demanding applications requiring low (PB) to high (WB up to 65 000 rpm) speeds. The PB brakes develop their nominal torque already

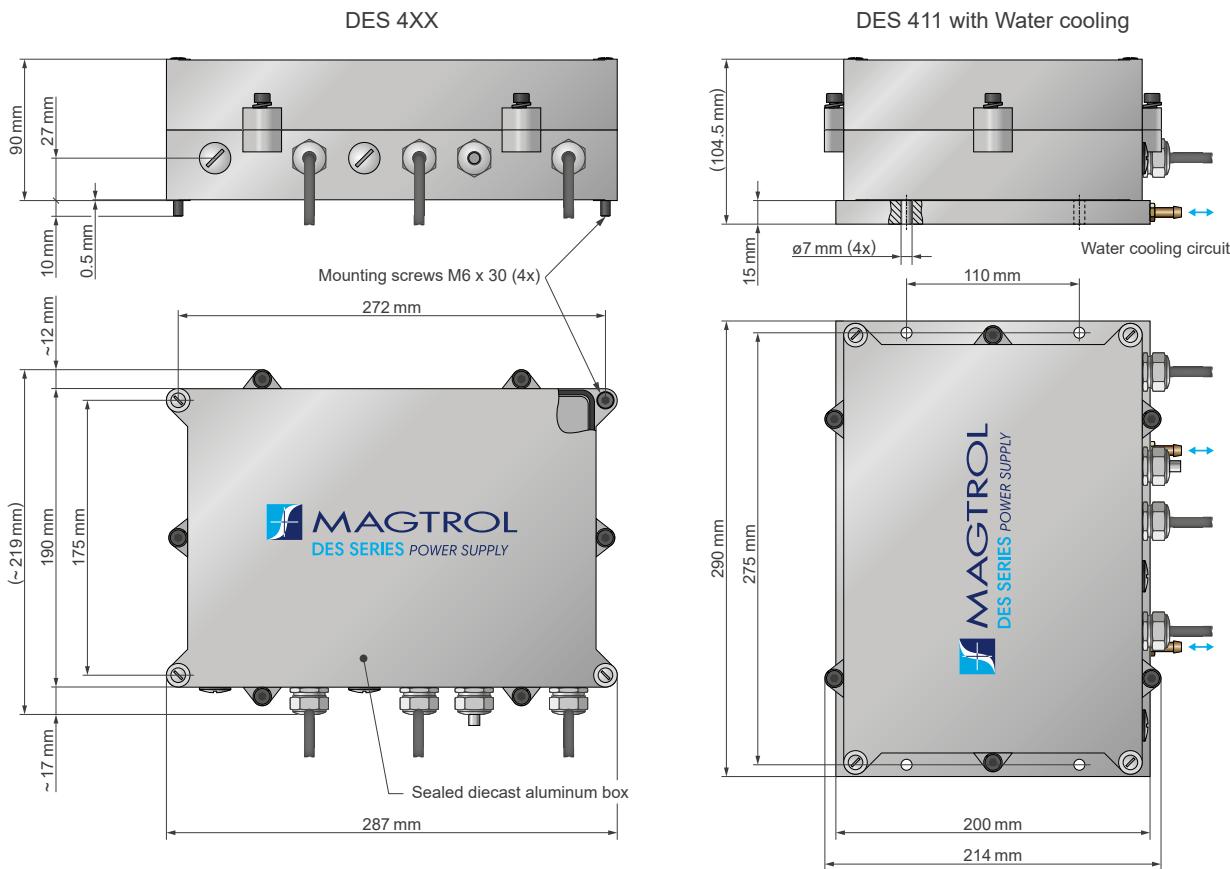
at standstill, while the WB brakes develop a braking torque proportional to the speed and their maximum torque is reached at nominal speed. The brake is cooled by water circulating in the stator. As a result, these dynamometers are able to dissipate high permanent loads (up to 140 kW). The WB and PB dynamometers incorporate a torque measuring system which has an accuracy of  $\pm 0.3\%$  to  $\pm 0.5\%$  at full scale.

### DSP 701X - DYNAMOMETER CONTROLLERS

Magtrol's Model DSP 701X Dynamometer Controller employs state-of-the-art Digital Signal Processing Technology to provide superior motor testing capabilities. Designed for use with any Magtrol Hysteresis (HD), Eddy-Current (WB) or Magnetic Powder (PB) Dynamometer, Magtrol In-Line Torque Transducer (TM/TS/TF) or auxiliary instrumentation, the DSP701X can provide complete PC control via the USB or optional IEEE-488 interface. With up to 500 readings per second, the DSP701X is ideally suited for both the test lab and the production line.



Fig. 3: DSP 7011 | Programmable Dynamometer Controllers

**DIMENSIONS**


The DES Series Power supplies are delivered with integrated cables (including connectors) with a length of 1.5m on the dynamometer connection side and 5m on the controller side.

The DES410 Series units are to be mounted on a metallic surface in order to allow ample heat dissipation.

**For safety reasons, the DES Series case has to be grounded.**

**CAUTION:** For 2-3-4 WB 15 and 2-4 PB 15 dynamometers, the DES 411 Power Supply with **integrated Water Cooling System** (see above drawing) need to be used.

**ORDERING INFORMATION**

When the DES410 Series is ordered separately from the dynamometer, it is absolutely necessary to specify which model of Eddy-current (WB Series) or Powder Brake (PB Series) Dynamometer will be used with the DES Series Power Supply

in order to limit the operating current and prevent possible damage to the dynamometer brake. **Mains voltage (115VAC or 230VAC) should also be defined when ordering.**

ORDERING NUMBER	DES 4	/ 2	-
10 : for Dynamometers WB/PB43			
11 : for Dynamometers WB/PB65, 115 and 15			
1 : without Water Cooling Plate			
2 : with Water Cooling Plate (required for use with 2-3-4 WB/PB15)			
Cable length Dynamometer side	Cable length Controller side		
1 :	5m (default)		
2 :	1.5m (default)	10m	
3 :		20m	
4 :		5m	
5 :	2.5m	10m	
6 :		20m	

Example: DES Series Power Supply, for use with 2WB43, with cable 1.5m (dynamometer side) and 10m (controller side) would be ordered as follows: **DES 410/212**

DES Series Power Supply, for use with 1PB115, with cable 2.5m (dynamometer side) and 5m (controller side) would be ordered as follows: **DES 411/214**

DES Series Power Supply, for use with 2WB15, with cable 1.5m (dynamometer side) and 20m (controller side) would be ordered as follows: **DES 411/223**

