# DES SERIES
## POWER SUPPLIES

## FEATURES

- For use with Magtrol WB Eddy-Current and PB 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 230 VAC


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

## DESCRIPTION

DES Series Power Supplies are specially designed for the full range of Magtrol's Eddy-current and Powder brake 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 DES Series supplies can be controlled by digital signals and analog set point coming from peripheral electronics. The DSP 7000 Dynamometer Controller has been designed to work with the DES Series.

## CONTROL

The Power supply can be switched ON by remote control. The SATND-BY signal enables the output current to be delivered. This excitation current is controlled by a set-point in the 0-10 V DC 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 DES 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 200 ms of the Stand-by signal resets the latch.

For applications with TANDEM dynanometers, 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 115/230 VAC - 50/60 Hz range. No selection is required.

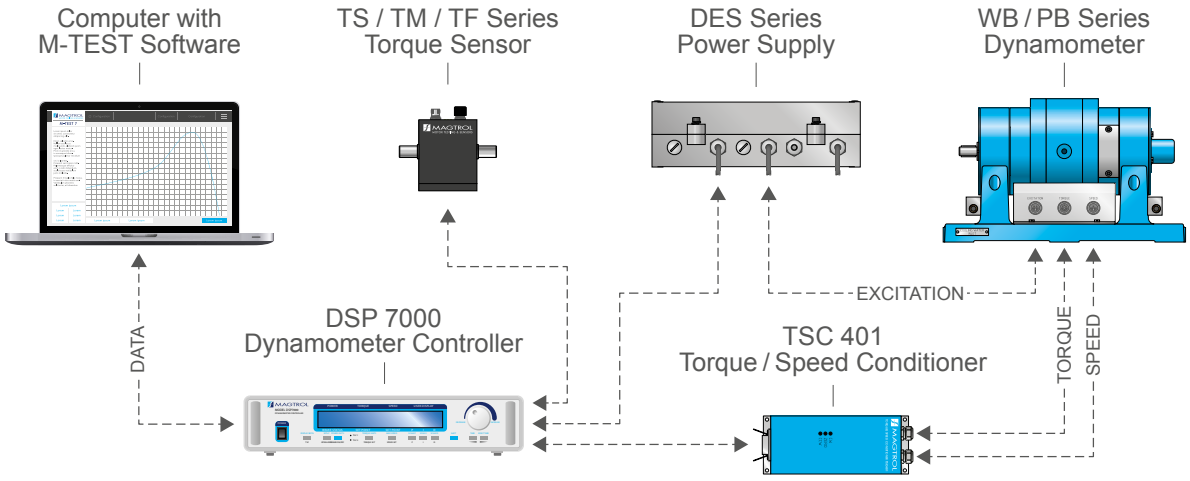
The DES 410 power supply features a galvanic insulation between the main circuit and the dynamometer power.

The DES 411 power supply 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.

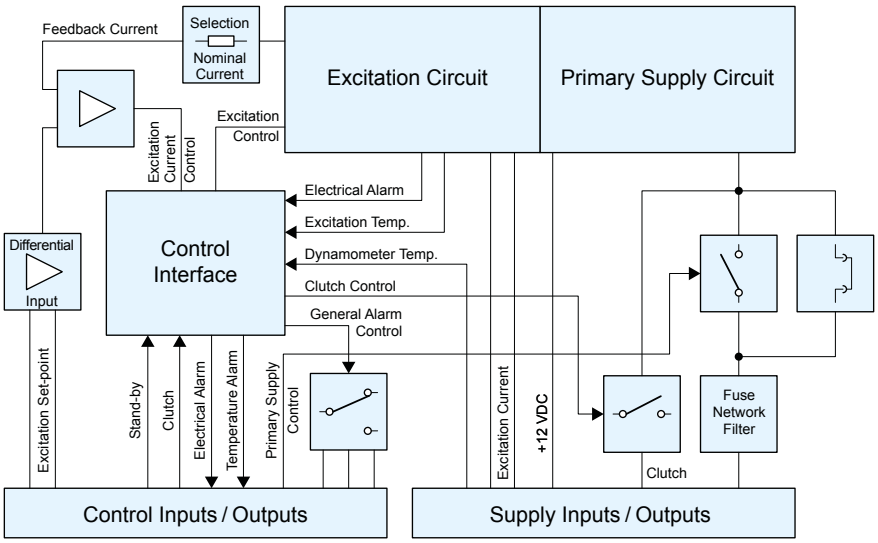
## SPECIFICATIONS

| MODEL | DES 410 | DES 411 |
|---|---|---|
| For use with the dynamometer model | WB / PB 2.7 and 43 | WB / PB 65, 115 and 15 |
| **NETWORK SUPPLY** | | |
| Voltage | 115 VAC / 230 VAC ±15 % | |
| Frequency | 50 / 60 Hz | |
| Fuse | T1A or T2A depending on the brake(s)<br>115 VAC / 230 VAC | T2A to T12A depending on the brake(s)<br>115 VAC / 230 VAC |
| Maximum current | 1A + clutch | 3A + clutch / 230 VAC<br>6A + clutch / 115 VAC |
| **ELECTROMAGNETIC CLUTCH SUPPLY** | | |
| Voltage | 115 VAC / 230 VAC | |
| Current | 1A | |
| **SUPPLY FOR EXTERNAL USE** | | |
| Voltage | 12 V DC ±5 % | |
| Maximum Current | 300 mA | |
| **SELECTION OF NOMINAL CURRENT** | | |
| Selected by resistors | 0.5 / 1 / 1.5 / 2A | 2.5 / 4 / 5 / 7.5 / 10 / 12A |
| **EXCITATION SET-POINT** | | |
| Voltage | 0 - 10 V DC | |
| Impedance | > 50 kΩ | |
| **DIGITAL INPUTS (GALVANICALLY INSULATED)** | | |
| Remote Control of Network Input (PSC) | Relay coil +24 V DC / 11 mA | |
| Control of the Electromagnetic Clutch | Optocoupler activated by +24 V DC / 2.5 mA | |
| STAND-BY (enable) | Optocoupler activated by either +24 V DC or +12 V DC / 2.5 mA max | |
| **DIGITAL OUTPUTS (GALVANICALLY INSULATED)** | | |
| Temperature Alarms<br>Electrical Alarm | 2 open collector outputs:<br>$U_{max}$ = 40 V DC / $I_{max}$ = 3 mA | |
| **GENERAL ALARM** | | |
| Relay Contact | 2A / 30 V DC | |
| **ENVIRONMENTAL CHARACTERISTICS** | | |
| Operating Temperature | 0 °C to + 50 °C | |
| Storage Temperature | -20 °C to + 70 °C | |
| Humidity | 0 to 90 % according to DIN 40040 | |
| Protection Class | IP 66 | |
| Assembly | CAUTION: The housing must be electrically and thermally coupled to the metal frame of the test bench to allow heat dissipation. | |
| **MECHANICAL CHARACTERISTICS** | | |
| Housing | Extruded cast aluminium | |
| Weight without cable | 5.2 kg (11.5 lb) | |
| Weight with integrated cable | 6.2 kg (13.7 lb) | |

## SYSTEM CONFIGURATION




## BLOCK DIAGRAM




## RELATED PRODUCTS

### WB & PB SERIES - DYNAMOMETER

Fig. 2: 1PB 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 65000 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 ±0.3 % to ±0.5 % at full scale.

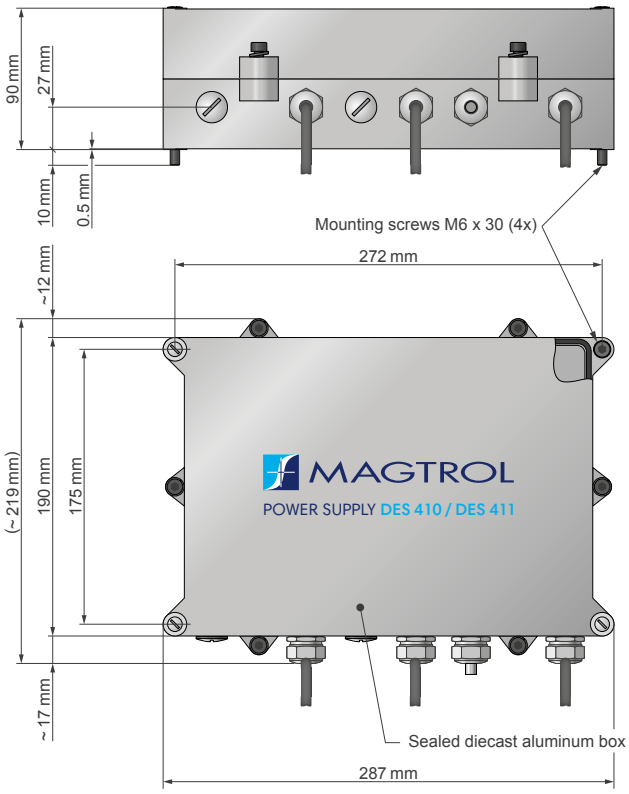
### DSP 7000 - HIGH-SPEED PROGRAMMABLE DYNAMOMETER CONTROLLERS

Magtrol's Model DSP 7000 High Speed Programmable Dynamometer Controller employs state-of-the-art Digital Signal Processing Technology to provide superior motor testing capabilities. Designed for use with any Magtrol Hysteresis, Eddy-Current or Powder Dynamometer, Magtrol In-Line Torque Transducer or auxiliary instrumentation, the DSP 7000 can provide complete PC control via the USB or optional IEEE-488 or RS-232 interface. With up to 500 readings per second, the DSP 7000 is ideally suited for both the test lab and the production line.

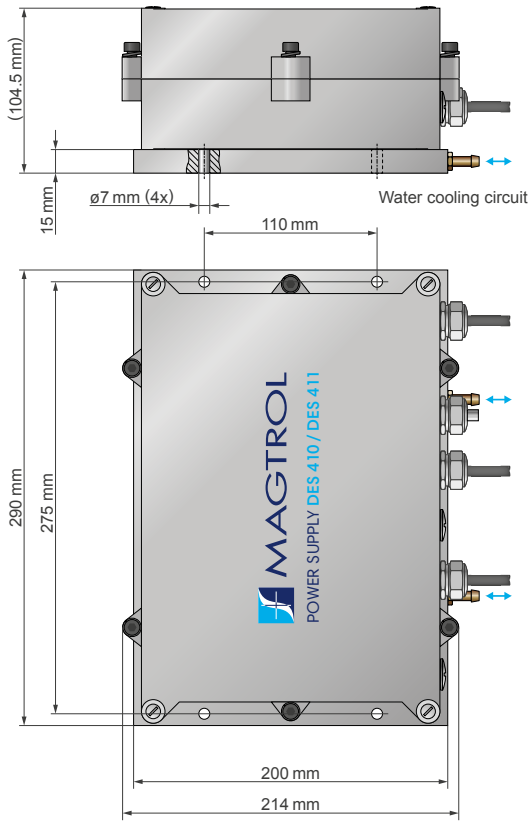
Fig. 3: DSP 7001 | Programmable Dynamometer Controllers

## DIMENSIONS

DES 410 & 411




DES 411 with Water cooling




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

The DES 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 411/12X Power Supply **with integrated Water Cooling System** (see above drawing) need to be used.

## ORDERING INFORMATION

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

| ORDERING NUMBER | DES 4 | _ _ | / 1 | _ | _ |
|---|---|---|---|---|---|

**10** : for WB / PB 2.7 and 43 Dynamometers
**11** : for WB / PB 65, 115 and 15 Dynamometers

**1** : without Water Cooling Plate
**2** : with Water Cooling Plate (required for use with 2-3-4 WB / PB 15)

| | Cable length Dynamometer side | Cable length Controller side |
|---|---|---|
| **1** : | 1.5 m (default) | 5 m (default) |
| **2** : | | 10 m |
| **3** : | | 20 m |
| **4** : | 2.5 m | 5 m |
| **5** : | | 10 m |
| **6** : | | 20 m |

Example: DES Series Power Supply, for use with 2 WB 43, with cable 1.5 m (dynamometer side) and 10 m (controller side) would be ordered as follows: **DES 410 / 112**

DES Series Power Supply, for use with 1 PB 115, with cable 2.5 m (dynamometer side) and 5 m (controller side) would be ordered as follows: **DES 411 / 114**

DES Series Power Supply, for use with 2 WB 15, with cable 1.5 m (dynamometer side) and 20 m (controller side) would be ordered as follows: **DES 411 / 123**





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