

DES410 SERIES

POWER SUPPLY FOR DYNAMOMETERS BRAKES

USER MANUAL

www.magtrol.com



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PURCHASE RECORD

To ensure continuity of information and to facilitate technical support, Magtrol invites you to note below some essential data about your equipment (model, serial number, date of purchase, etc.). The model number and serial number can be found on the identification plate (aluminum) or on the label (white or metallic) affixed to each unit. Please refer to these numbers when contacting a Magtrol representative about your equipment.

Model Number : _____

Serial Number : _____

Purchase Date : _____

Purchased From : _____

SAFETY PRECAUTIONS

**WARNING**

WARNING! IN ORDER TO MINIMIZE RISKS, IT IS OF UTMOST IMPORTANCE TO RESPECT THE CURRENT SAFETY STANDARDS WHEN PLANNING, CONFIGURING AND OPERATING A MEASUREMENT DRIVE TRAIN.

**CAUTION**

CAUTION! OPERATE THE DES 410 SERIES POWER SUPPLY WITH GREAT CAUTION! THE DEVICE MAY BE IRREVERSIBLY DAMAGED IF IMPACTED MECHANICALLY (FALL), CHEMICALLY (ACIDS) OR THERMALLY (HOT AIR, VAPOR).

1. Make sure that all Magtrol electronic products are earth-grounded, to guarantee personal safety and proper operation.
2. Check line voltage before operating electronic equipment.
3. Make sure that all rotating parts are equipped with appropriate safety guards.
4. Periodically check all connections and attachments.
5. Always wear protective glasses when working close to rotating elements.
6. Never wear a necktie or baggy clothes when standing close to rotating elements.
7. Never stand too close or bend over the rotating drive chain.

QUALIFIED PERSONNEL

Persons in charge of installing and operating the DES 410 Series Power Supplies must have read and understood this user manual, paying extra close attention to all safety-related information.

The DES Series Power Supplies is a high-precision product integrating recent measurement techniques. The sensor can give rise to residual dangers if used and manipulated in a non-compliant way by unqualified personnel.

This device must be handled by qualified personnel according to the technical requirements and the above-mentioned safety instructions. This is also true when using power supplies related product or accessories (e.g. Torque Sensors, Dynamometer,...).

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PREFACE

PURPOSE OF THIS MANUAL

This manual contains all the information required for the setup, connection and general use of Magtrol's DES Series Powers Supplies. To achieve maximum capability and ensure proper use, please read this manual in its entirety before operating the unit. Keep the manual in a safe place for quick reference whenever a question should arise.

WHO SHOULD USE THIS MANUAL

This is written for operators installing the power supply as part of a test system that measures the torque on transmission chains. The operator is assumed to have the necessary technical knowledge in electronics and mechanical engineering enabling him to install the DES Series Power Supply without risk.

MANUAL ORGANIZATION

This section gives an overview of the structure of the manual and the information contained within it. Some information has been deliberately repeated in different sections of the document to minimize cross-referencing and to facilitate understanding through reiteration.

The structure of the manual is as follows:

- Chapter 1: **INTRODUCTION** – Contains the technical data sheets for Magtrol's DES 410 Series Power Supply, which describe the units and provide detailed technical characteristics.
- Chapter 2: **INSTALLATION / CONFIGURATION** – Provides information needed for the setup of the DES 410 Series in a test system, and their integration with Magtrol electronic control units.
- Chapter 3: **MAINTENANCE, REPAIR & CALIBRATION** – Provides information on maintenance, repair and calibration procedures, should the need arise.
- Chapter 4: **SERVICES INFORMATION** – Information, contacts and addresses relative for repair and/or calibration.

SEMANTICS

In this manual, different terminologies may be used to speak about the «DES 410 Series Power Supply». The primary purpose is to make this user manual useful and easy to read.

Below you will find different terminology used such as: «Power Supply», «Supply», «Device», «Supply Unit», «Supply System»,... are synonyms; «DES XXX Series», «DES 4XX Series» or «DES Series» are all abbreviations for «DES 410 Series Power Supply», etc.

The term «Series» stands for all the products of the series (e.g. DES 4XX Series refers to DES 400 - DES 499).

CONVENTIONS USED IN THIS MANUAL

The following symbols and type styles may be used in this manual to highlight certain parts of the text:

**NOTICE**

Indicates information considered important but not hazard related.

This is intended to draw the operator's attention to complementary information or advice relating to the subject being treated. It introduces information enabling the correct and optimal function of the product.

**CAUTION**

INDICATES A HAZARDOUS SITUATION THAT, IF NOT AVOIDED, COULD RESULT IN MINOR OR MODERATE INJURY.

THIS IS ALSO USED TO DRAW THE OPERATOR'S ATTENTION TO INFORMATION, DIRECTIVES, PROCEDURES, ETC. WHICH, IF IGNORED, MAY RESULT IN DAMAGE TO THE MATERIAL BEING USED. THE ASSOCIATED TEXT DESCRIBES THE NECESSARY PRECAUTIONS TO TAKE AND THE CONSEQUENCES THAT MAY ARISE IF THESE PRECAUTIONS ARE IGNORED.

**WARNING**

INDICATES A HAZARDOUS SITUATION THAT, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.

THIS INTRODUCES DIRECTIVES, PROCEDURES, PRECAUTIONARY MEASURES, ETC. WHICH MUST BE EXECUTED OR FOLLOWED WITH THE UTMOST CARE AND ATTENTION, OTHERWISE THE PERSONAL SAFETY OF THE OPERATOR OR THIRD PARTY MAY BE AT RISK. THE READER MUST ABSOLUTELY TAKE NOTE OF THE ACCOMPANYING TEXT, AND ACT UPON IT, BEFORE PROCEEDING FURTHER.

**DANGER**

INDICATES A HAZARDOUS SITUATION THAT, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY. THE SIGNAL WORD «DANGER» IS TO BE LIMITED TO THE MOST EXTREME SITUATIONS.

THIS INTRODUCES DIRECTIVES, PROCEDURES, PRECAUTIONARY MEASURES, ETC. WHICH MUST BE EXECUTED OR FOLLOWED WITH THE UTMOST CARE AND ATTENTION, OTHERWISE THE PERSONAL SAFETY OF THE OPERATOR OR THIRD PARTY MAY BE AT RISK. THE READER MUST ABSOLUTELY TAKE NOTE OF THE ACCOMPANYING TEXT, AND ACT UPON IT, BEFORE PROCEEDING FURTHER.

The safety symbol may subsequently vary depending on the source of the hazard. Below are examples:



Various safety pictograms according to ISO 7010

1. INTRODUCTION

1.1 GENERAL INFORMATION

The DES 410 Series Power Supplies are designed for use with Magtrol's Eddy-Current Dynamometers (WB Series), Magnetic Powder Brake Dynamometers (PB Series) and Double Dynamometers In-Line (TANDEM Series). The DES 410 Series supply the current to the coils of the brake within the dynamometer. They are controlled by an electronic peripheral such as the Magtrol DSP 70XX - Dynamometer Controller.



NOTICE

The DES 410 Series is intended for use in an industrial environment and meets the standard IEC 61326-1 class B / Industrial Electromagnetic Environment.

For the immunity test, a deflection $\pm 3\%$ FSD (Full Scale Deflection) and $\pm 6\%$ FSD is admitted for each performance criteria A and B.

1.2 MODELS AND VERSIONS

The DES 410 power supply is available in different models depending on its production period.

MODEL	P/N	DYNAMOMETERS	CONTROLLER
DES 410	234-410-000-1XX	WB/PB43	DSP 700X
	234-410-000-2XX		DSP 701X
DES 411	234-411-000-1XX	WB/PB 65, 115 and 15	DSP 700X
	234-411-000-2XX		DSP 701X

Please refer to the P/N (part number) on the device's identification label (*see Fig.1-1*) to determine its version. Alternatively, you can also differentiate looking on the connectors at the ends of cables (*see Fig.1-2*).

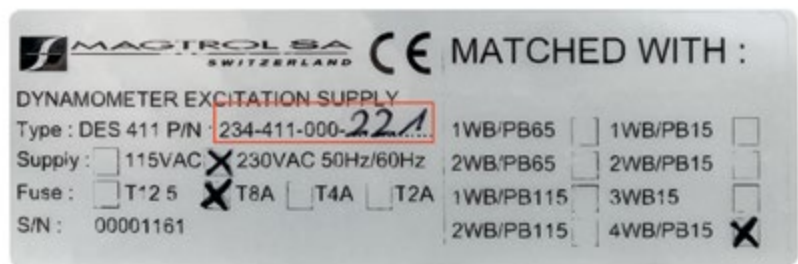


Fig.1-1 DES 411 - Identification Label - Locating Part Number

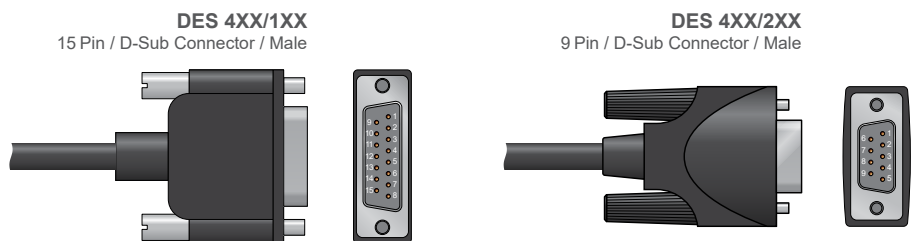


Fig.1-2 Check the controller cable connector to identify the DES model.

1.3 DATASHEET

DES 410 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 230 VAC



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 200 ms 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.

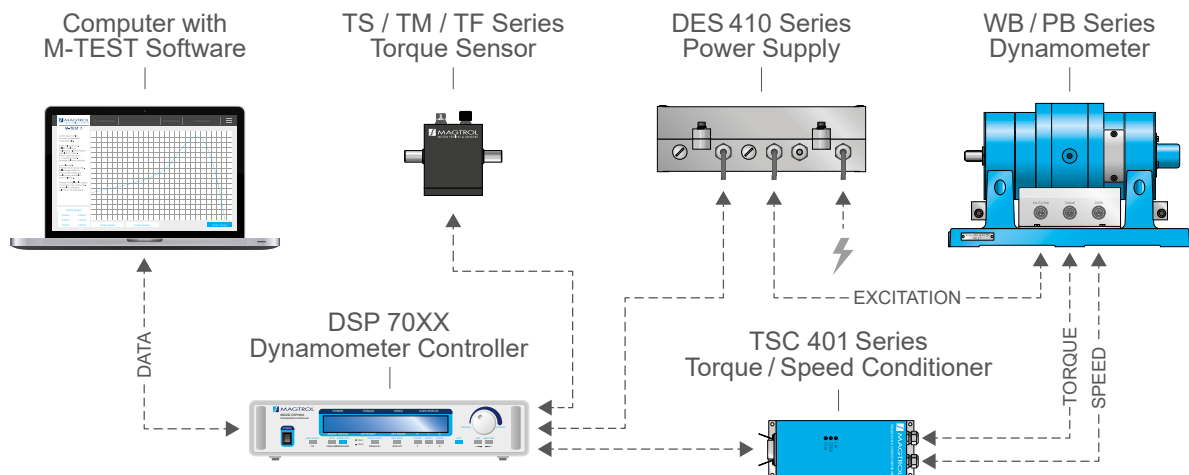
For safety reasons, **the DES Series case has to be grounded** and the use of a ground fault current circuit breaker is recommended.

SPECIFICATIONS

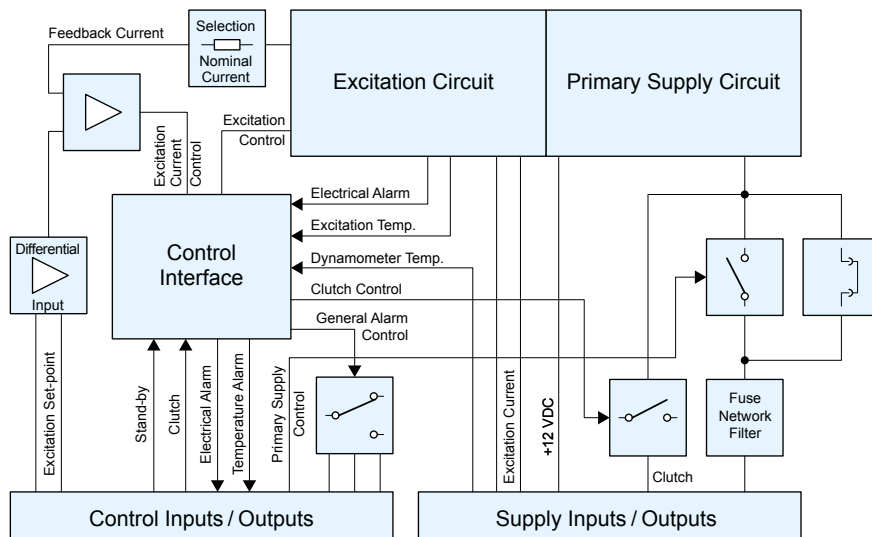
MODEL	DES 410	DES 411
For use with the dynamometer model	WB/PB43	WB/PB65, 115 and 15
NETWORK SUPPLY		
Voltage	115 VAC / 230 VAC ±15 %	
Frequency	50 / 60 Hz	
Fuse	T 1A or T2A depending on the brake(s) 115 VAC / 230 VAC	T2A to T 12A depending on the brake(s) 115 VAC / 230 VAC
Maximum current	1A / 230 VAC ^{a)} 2A / 115 VAC ^{a)}	3A / 230 VAC ^{a)} 6A / 115 VAC ^{a)}
ELECTROMAGNETIC CLUTCH SUPPLY		
Voltage	115 VAC / 230 VAC	
Current	1A	
SUPPLY FOR EXTERNAL USE		
Voltage	12 VDC ±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 VDC	
Impedance	> 50 kΩ	
DIGITAL INPUTS (GALVANICALLY INSULATED)		
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 +12 VDC / 2.5 mA max	
DIGITAL OUTPUTS (GALVANICALLY INSULATED)		
Temperature Alarm	2 open collector outputs: U _{max} = 40 VDC / I _{max} = 3 mA	
Electrical Alarm		
GENERAL ALARM		
Relay Contact	2A / 30 VDC	
ENVIRONMENTAL CHARACTERISTICS		
Operating Temperature	0 °C ... +50 °C	
Storage Temperature	-20 °C ... +70 °C	
Humidity	0 ... 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)	

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

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 65000rpm) 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 140kW). 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.

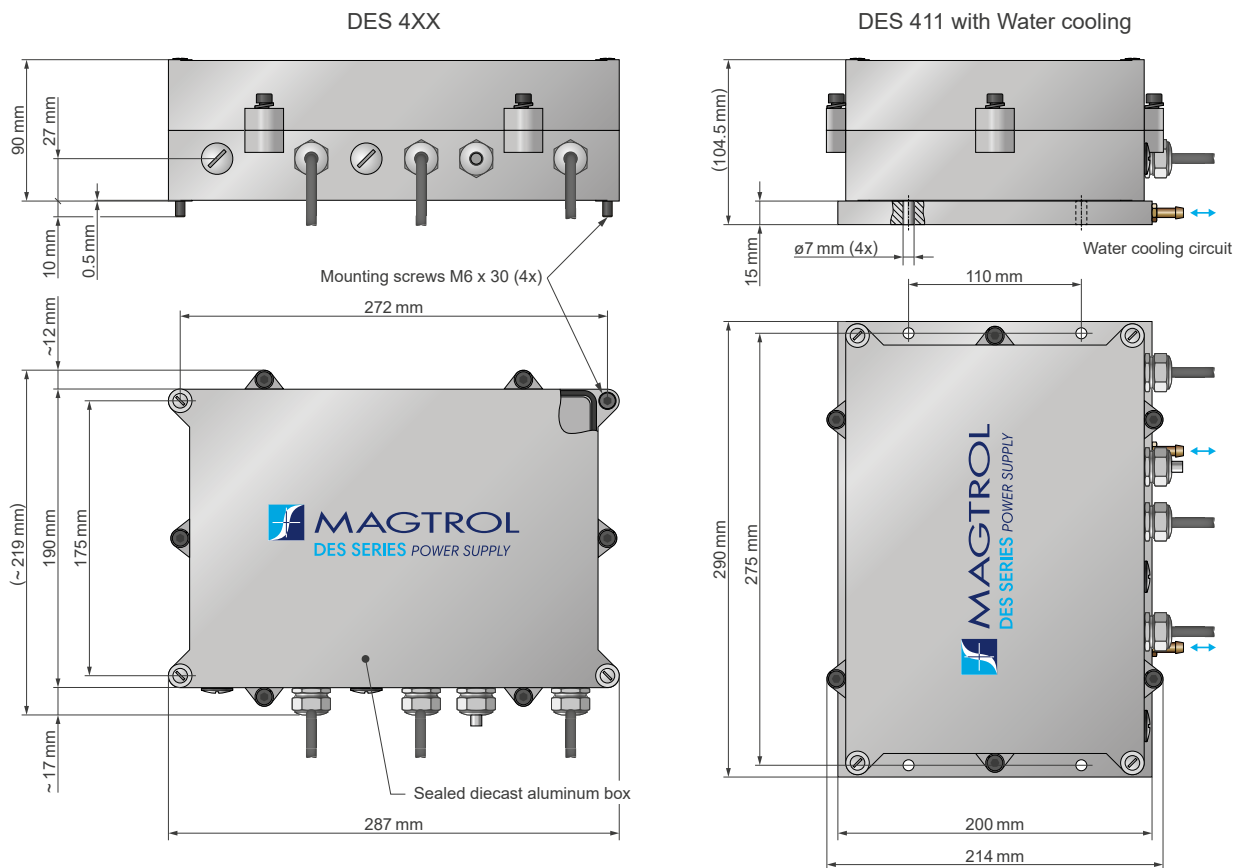
DSP 701X - DYNAMOMETER CONTROLLERS

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 DSP 701X can provide complete PC control via the USB or optional IEEE-488 interface. With up to 500 readings per second, the DSP 701X 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 5 m on the controller side.

The DES410Series 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 DES411 Power Supply **with integrated Water Cooling System** (see above drawing) need to be used.

ORDERING INFORMATION

When the DES410Series 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/PB 43						
11 : for Dynamometers WB/PB 65, 115 and 15						
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 :	1.5m (default)	5m (default)				
2 :		10m				
3 :		20m				
4 :	2.5m	5m				
5 :		10m				
6 :		20m				

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

DESSeries Power Supply, for use with 1PB 115, with cable 2.5m (dynamometer side) and 5m (controller side) would be ordered as follows: **DES 411/214**

DESSeries Power Supply, for use with 2WB 15, with cable 1.5m (dynamometer side) and 20m (controller side) would be ordered as follows: **DES 411/223**

2. INSTALLATION / CONFIGURATION

2.1 GENERAL DESCRIPTION

The housing of the Power Supply must be electrically and thermally connected to the metal frame of the Test Bench System to allow correct heat dissipation.

The test bench as well as its structure must be connected to earth (ground).

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

The dimensions necessary for mounting the housing of the power supply are provided below (see Fig.2-1). The data sheet (see section 1.3 - Datasheet) provides all other dimensions necessary for the installation of the Power Supply. The housing of the DES Series has 4 holes for mounting and includes the necessary fixing screws (4x DIN 912 M6 x 30 mm - Hexagon socket head cap screws).

To reach the mounting holes, it is necessary to remove the 6 screws from the cover of the power supply.

Once the unit is installed and calibrated, for safety reasons, it is necessary to replace and secure the cover of the Power Supply. The cover has to be mounted with the Magtrol's logo or Yellow warning symbols placed as shown below.

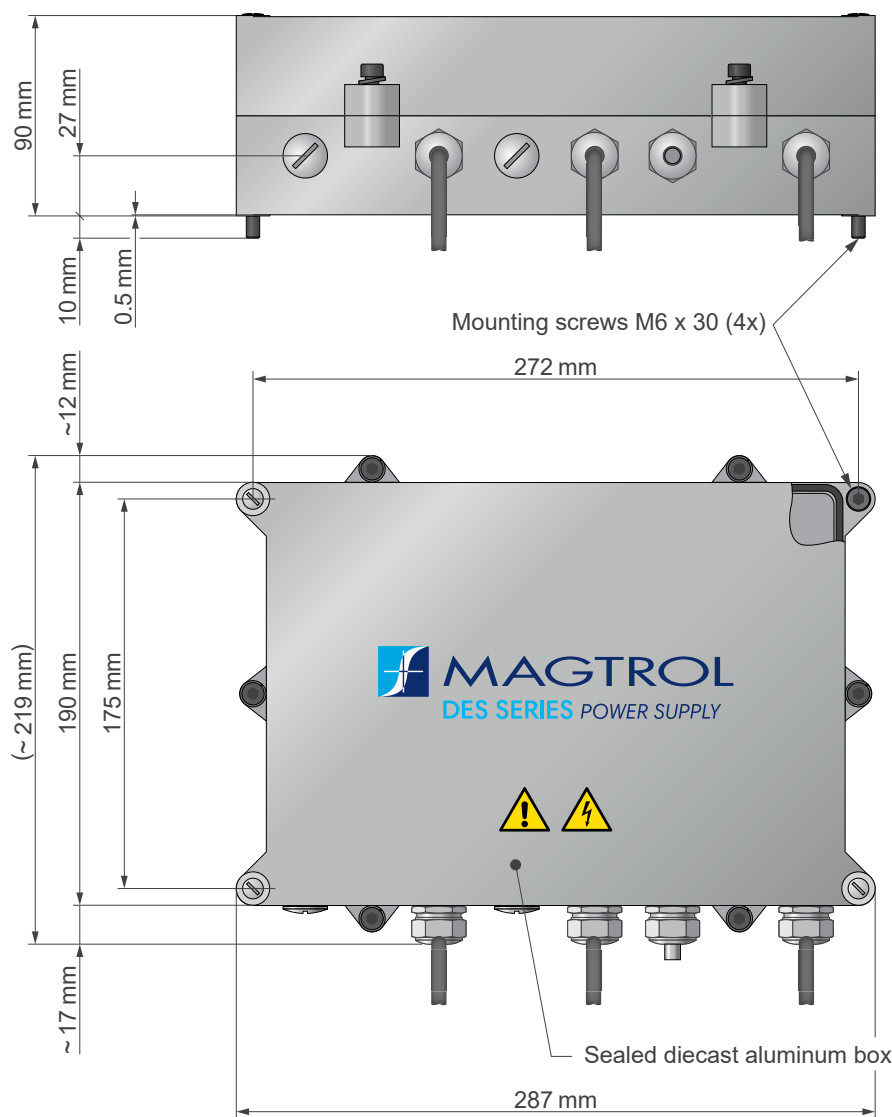


Fig.2-1 Dimensions required for mounting the DES Series housing

2.2 SAFETY WARNING



WARNING

DES 410 SERIES POWER SUPPLY MUST ALWAYS BE GROUNDED !

MAKE SURE THE DES SERIES IS TURNED OFF AND DISCONNECTED FROM THE CONTROLLER FOR 3 MINUTES BEFORE REMOVING THE HOUSING COVER. THE USER OR A THIRD PARTY COULD BE SERIOUSLY OR EVEN FATALY INJURED IF THESE WARNINGS ARE IGNORED.

THE USE OF A 6 A / 30 mA GROUND FAULT CIRCUIT BREAKER IS RECOMMENDED.

2.3 MOUNTING DES SERIES

Depending on the dynamometer model used, the DES power supply must be mounted with or without a cooling plate (see Fig.2-2).

MODEL	COOLING PLAT	CURRENT	DYNAMOMETERS MODEL									
			1WB/PB 43	2WB/PB 43	1WB/PB 65	2WB/PB 65	1WB/PB 115	2WB/PB 115	1WB/PB 15	2WB/PB 15	3WB 15	4WB/PB 15
DES 410	Without	≤5A	x	x								
DES 411					x	x	x	x	x			
DES 411	With	>5A								x	x	x

Fig.2-2 Definition table of the assembly with or without cooling plate



CAUTION

ANY DES POWER SUPPLY MUST BE MOUNTED ON A METALLIC SURFACE TO ALLOWS AMPLE HEAT DISSIPATION.

2.3.1 MOUNTING WITHOUT COOLING

The Power Supply can be mounted on a support fixed to the table or directly to the test bench. An example of such mounting is given in illustration below (see Fig.2-3)

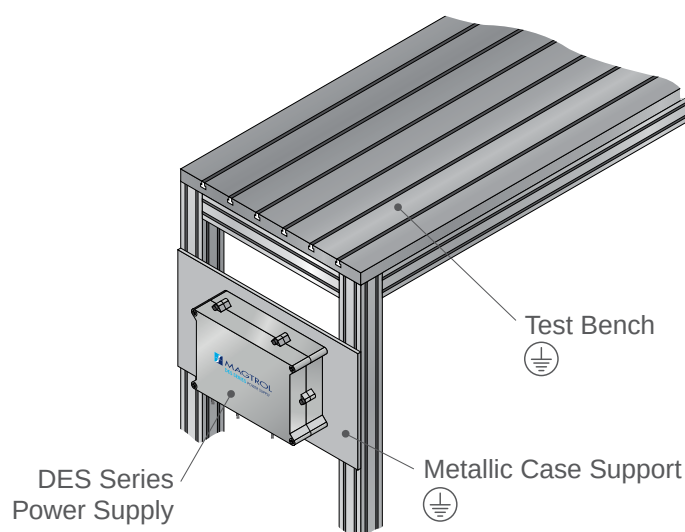


Fig.2-3 DES Series Power Supply mounted to the table of a test bench without cooling

2.3.2 MOUNTING WITH COOLING PLATE (OPTIONAL)

For a DES Power Supply providing an excitation current higher than 5 A (Dynamometer models: 2WB/PB 15 and larger), a cooling plate is required.

Magtrol recommends the use of the Cooling Plate , P/N: 234-311-900-011. (see Fig.2-4).

Another solution is to mount the DES Series on a metal plate having a minimal dimensions of 500 x 500 x 2 mm. It is necessary to mill holes in the plate for the feet of the unit in order to get a good thermal contact using heat sink compound to improve the thermal coupling. This plate can then be mounted to the test bench table. In both cases, with the power supply fixed to the cooling plate, it is recommended to attach the plate to the test bench (see Fig.2-5)



CAUTION

THE WATER FLOW THROUGH THE COOLING PLATE MUST BE EQUAL TO 30 l/h. THE DIFFERENTIAL PRESSURE SHOULD NOT BE LESS THAN 0.05 bar. FURTHERMORE, THE ABSOLUTE PRESSURE AT THE INLET SHOULD NOT EXCEED 1.5 bar.

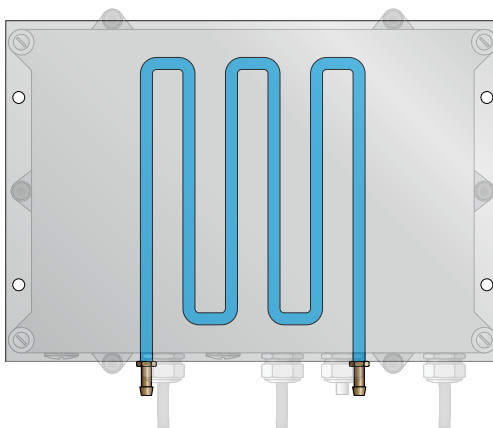


Fig.2-4 Cooling Plate (P/N 234-311-900-011)

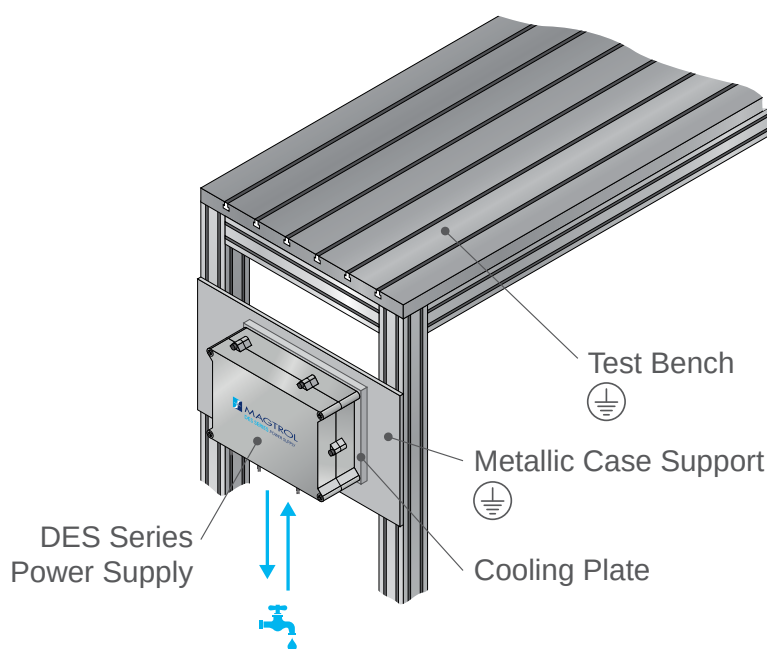


Fig.2-5 DES Series Power Supply with cooling plate (DES 411) mounted on the test bench table

2.4 CONNECTION BETWEEN THE VARIOUS UNITS

A Test Bench System may includes not only the Dynamometer (WB / PB Series) but also a Torque Transducer (TS, TM, TF Series), a Torque/Speed Conditioner (TSC Series) and Power Supply (DES Series). The test bench may be controlled by a DSP 70XX Programmable Controller and/or by the means of dedicated software (M-TEST). The diagram below (see Fig.2-6) shows the connection between the various units in a test bench.

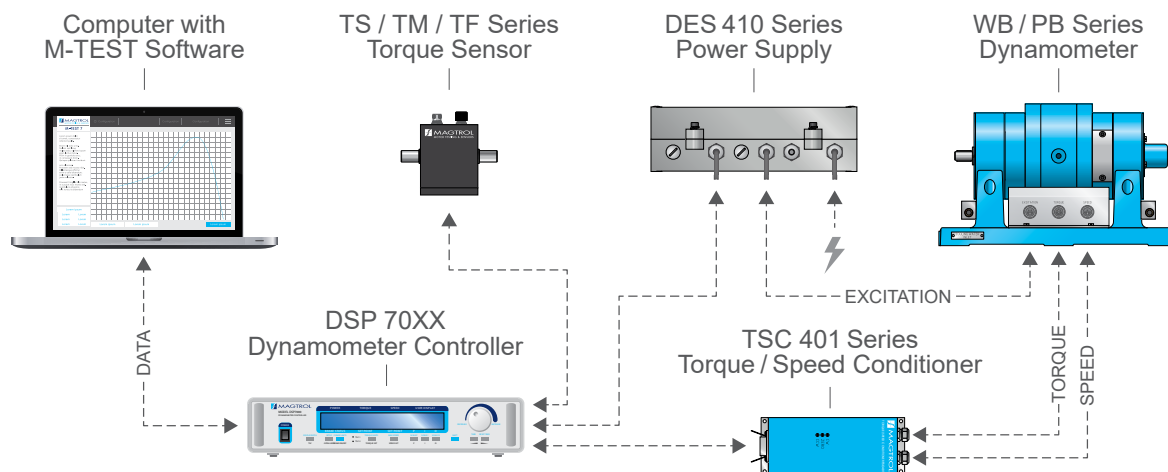


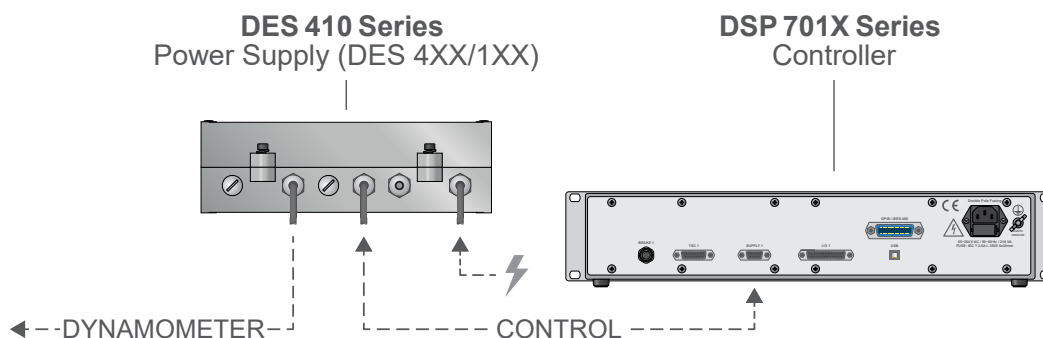
Fig.2-6 Connection between the various units in a test bench



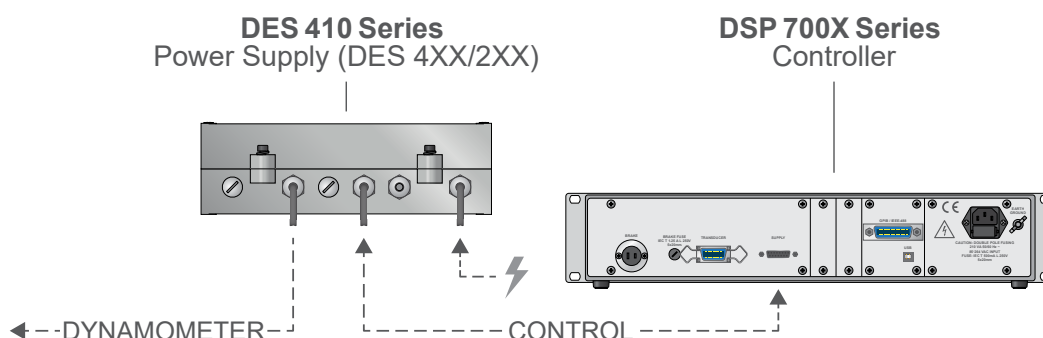
NOTICE

The DES 4XX/1XX is backwards compatible with the old version of our Controller DPS 6001.

2.4.1 CONNECTION WITH DSP 701X



2.4.2 CONNECTION WITH DSP 700X



2.4.3 CONNECTION WITH TANDEM SERIES DYNAMOMETER

When used with a TANDEM Series dynamometer, the second DES Series will be used to power the electromagnetic clutch. This particular configuration will require additional wiring on the DES, which will be specified when ordering the system.

The TANDEM Series dynamometers combine a WB Series dynamometer (eddy-current) and a PB Series dynamometer (magnetic powder). This combination extends the test range by taking advantage of the qualities of each dynamometer (e.g., high torque at low speed).

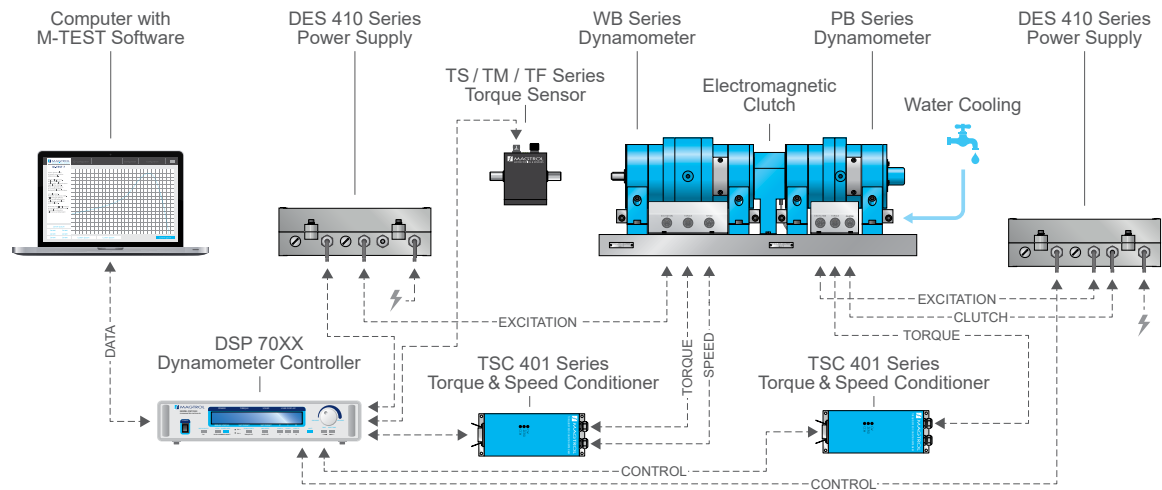


Fig.2-7 Connection diagram for using a TANDEM Series dynamometer

2.5 CONNECTING THE DES SERIES POWER SUPPLY

The DES Series Power Supplies are sold as a kit, with the cables already connected.

The DES Power Supplies are equipped with a stuffing gland which allows cables to pass through the wall of the housing of the unit while maintaining the seal of the housing and holding the cables.

2.5.1 CABLING

Since 2020, Magtrol initiated an upgrade of its devices connectivity. Technological advances, improved compatibility, and security of supply justify this change despite the complications it entails. This affects all of our products, and solutions have been implemented to ensure compatibility. When placing your orders, please ensure that the connectors are compatible with your system's equipment.

This means that, depending on the version, the DES power supply may have different connectors at the end of the cable. The old generation of DES power supplies is equipped with a D-Sub 15-pin / male connector. The new generation is equipped with a D-Sub 9-pin /male connector (*see Fig.2-8*).

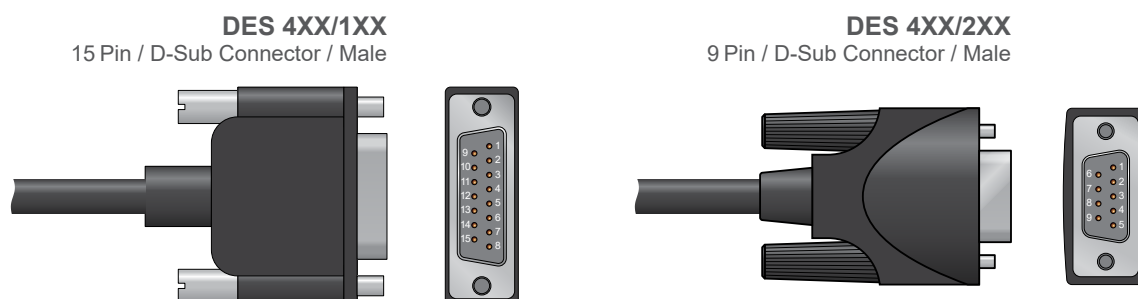


Fig.2-8 The different connector models that can be mounted on the control cable

2.5.2 REPLACEMENT CABLE

If you need to replace the DES cables (change in length, damage, etc.), you can order new cable according to the table below.

DIAGRAM	PN	CONNECTOR	LENGTH	FROM	TO	NAME
	994-405-000-01X	D-Sub 9-pin / Male	5.0 m	DES 4XX / 2XX	DSP 701X	ES 405/01
	994-405-000-02X		10.0 m			ES 405/02
	994-405-000-03X		20.0 m			ES 405/03
	984-405-000-01X	D-Sub 15-pin / Male	5.0 m	DES 4XX / 1XX	DSP 700X	ER 405/01
	984-405-000-02X		10.0 m			ER 405/02
	984-405-000-03X		20.0 m			ER 405/03
	943-147-000-01X	LEMO Circular 4-pin / Male	1.5 m	DES 410	WB/PB 43	EH 147/01
	943-146-000S001		2.5 m			EH 146/S001
	973-104-000-01X	CANNON Circular 4-pin / Female	1.5 m	DES 411	WB/PB 65, 115, 15	EN 104/01
	973-104-000S002		2.5 m			EN 104/S002



CAUTION

REPLACING CABLES IS YOUR OWN RESPONSIBILITY. MAGTROL CANNOT BE HELD LIABLE FOR ANY DAMAGE TO MAGTROL OR THIRD-PARTY PRODUCTS OR FOR ANY INJURY TO THE USER RELATED TO REPLACING THE DES SERIES CABLES.

FOR THIS REASON, MAGTROL STRONGLY RECOMMEND THAT YOU HAVE YOUR DEVICE RE-PAIRED OR MODIFIED BY MAGTROL'S AFTER-SALES SERVICE TEAM.

2.5.3 PASSING UNSHIELDED CABLES INTO STUFFING GLAND

1. Strip the conductors from the various cables.
2. Remove the lid of the power supply housing by unscrewing its six screws.
3. Pass the cables into the stuffing gland by proceeding as follows (*see Fig.2-9*):
 - a. Unscrew element (1) Counterclockwise. Element (4) must not be removed from the housing.
 - b. Remove joints (2) and (3) from element (1). These two elements allow the stuffing gland to adapt to various diameters of cable. Element (2) can be removed from element (3) by simply pushing it outwards.
 - c. Pass the cables through elements (1), (2) (if used), (3) and (4).
 - d. Reassemble the elements of the stuffing gland and, before replacing element (1), lubricate the seal (3) with silicone as indicated (*see Fig.2-9*). Tighten element (1) so that it projects beyond joints (2) and/or (3) to provide the degree of seal required.
4. Connect the conductors of the various cables to the terminals of the power supply unit.
5. Replace the cover of the power supply housing and tighten its six screws.



CAUTION

DO NOT DAMAGE THE SEALS WITH SHARP EDGED OBJECTS.

CHECK THAT NO FOREIGN BODY CAN SLIDE BETWEEN THE ELEMENTS OF THE STUFFING GLAND AND DE-GREASE THE SURFACE OF THE CABLE THAT WILL COME IN CONTACT WITH THE SEAL.

THE SEALING OF THE STUFFING GLAND CANNOT BE GUARANTEED IF THESE INSTRUCTIONS ARE NOT OBSERVED.

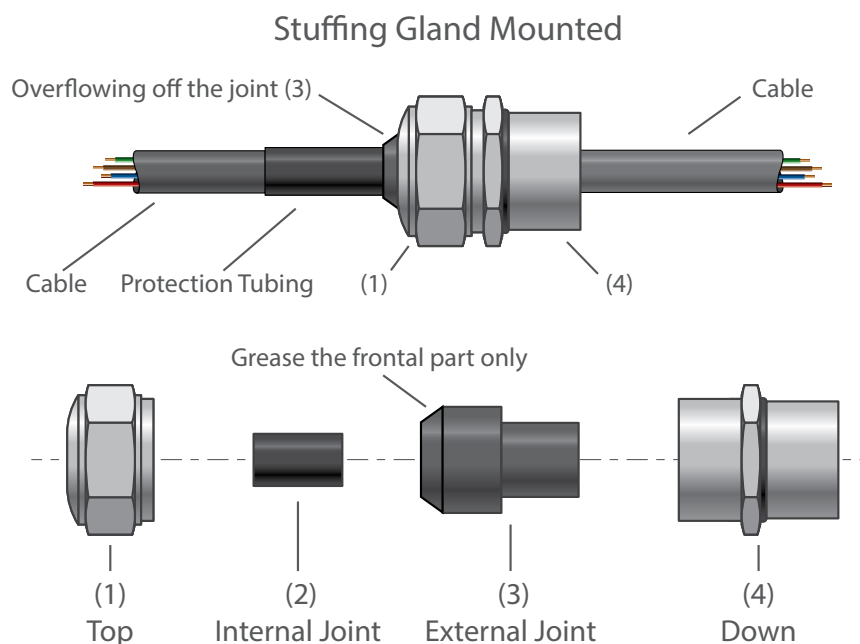


Fig.2-9 Stuffing gland (Overview and separated)

2.5.4 PASSING SHIELDED CABLES INTO STUFFING GLAND (WITH EMC STUFFING GLAND)

For ES/ER 405, EH 147 and EN 104 cables (see section 2.7 - Connection Diagrams), EMC type stuffing gland are used.

1. Strip the conductors from the various cables.
2. Remove the lid of the power supply housing by unscrewing its six screws.
3. Pass the cables into the stuffing gland by proceeding as follows (see Fig.2-9):
 - a. Unscrew element (1) Counterclockwise. Element (4) must not be removed from the housing.
 - b. Remove joints (2) and (3) from element (1). These two elements allow the stuffing gland to adapt to various diameters of cable. Element (2) can be removed from element (3) by simply pushing it outwards.
 - c. Pass the cables through elements (1), (2) (if used), (3).
 - d. Strip the cable (outer sheath) to the elements (3) output and cut the shield over 5-8 mm as show (see Fig.2-10). Pass the stripped cable through the element (4).
 - e. Connect the shield on the metallic part of element (3) as show (see Fig.2-10).
 - f. Reassemble the elements of the stuffing gland (take care that the shield remains in place) and, before replacing element (1), lubricate the seal (3) with silicone as indicated (see Fig.2-9). Tighten element (1) so that it projects beyond joints (2) and/or (3) to provide the degree of seal required.
4. Connect the conductors of the various cables to the terminals of the power supply unit.
5. Replace the cover of the power supply housing and tighten its six screws.

**CAUTION**

DO NOT DAMAGE THE SEALS WITH SHARP EDGED OBJECTS.

CHECK THAT NO FOREIGN BODY CAN SLIDE BETWEEN THE ELEMENTS OF THE STUFFING GLAND AND DE-GREASE THE SURFACE OF THE CABLE THAT WILL COME IN CONTACT WITH THE SEAL.

THE SEALING OF THE STUFFING GLAND CANNOT BE GUARANTEED IF THESE INSTRUCTIONS ARE NOT OBSERVED.



Fig.2-10 Connect Shield of EMC Stuffing gland

2.6 CONFIGURATION OF THE DES SERIES POWER SUPPLY

The configuration of the DES Series Power Supply requires a selection of fuses, resistors and solder links in accordance with the dynamometer model and the main supply voltage.

2.6.1 DES 410 MAIN BOARD (FUSES, SOLDER LINKS & CONTACTS LOCATION)

The contacts SW 1 and SW 2 must be left **Open** to allow the DSP 70XX to control the primary supply circuit.

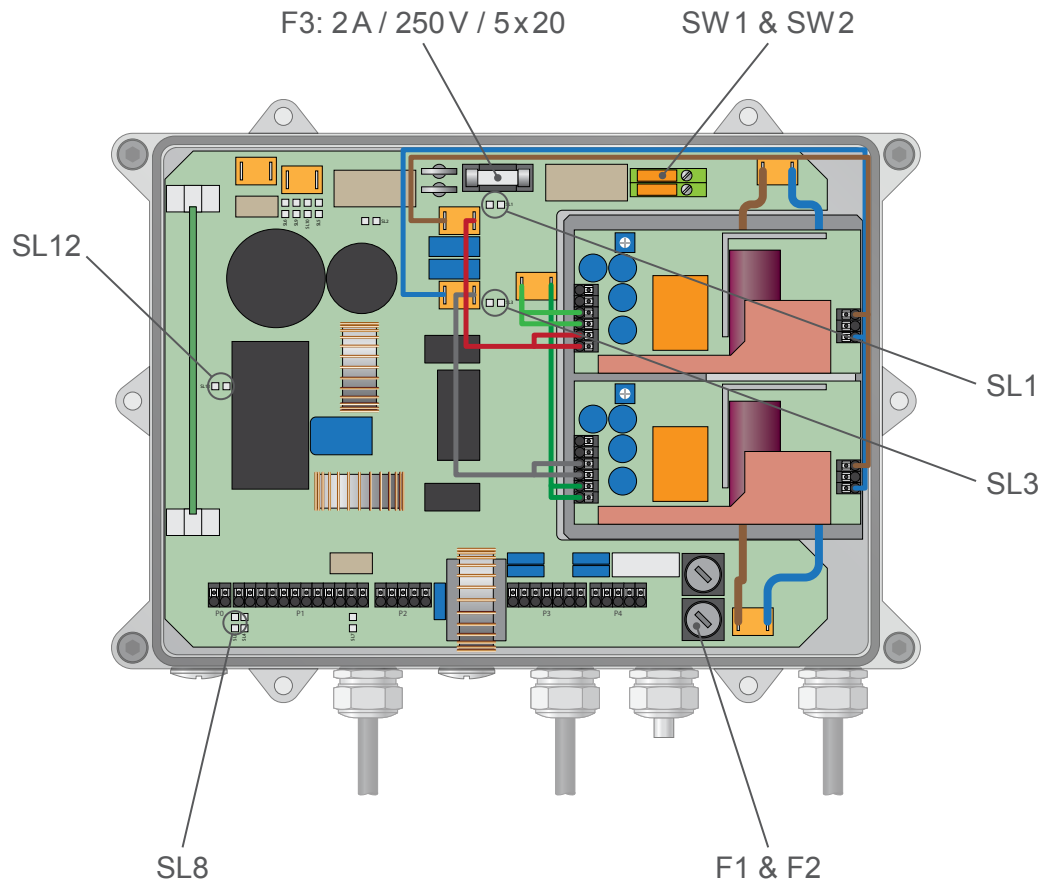


Fig.2-11 Location of fuses, solder links & contacts on the DES 410 circuit

2.6.2 DES 411 MAIN BOARD (FUSES, SOLDER LINKS & CONTACTS LOCATION)

The contacts SW 1 and SW 2 must be left **Open** to allow the DSP 70XX to control the primary supply circuit.

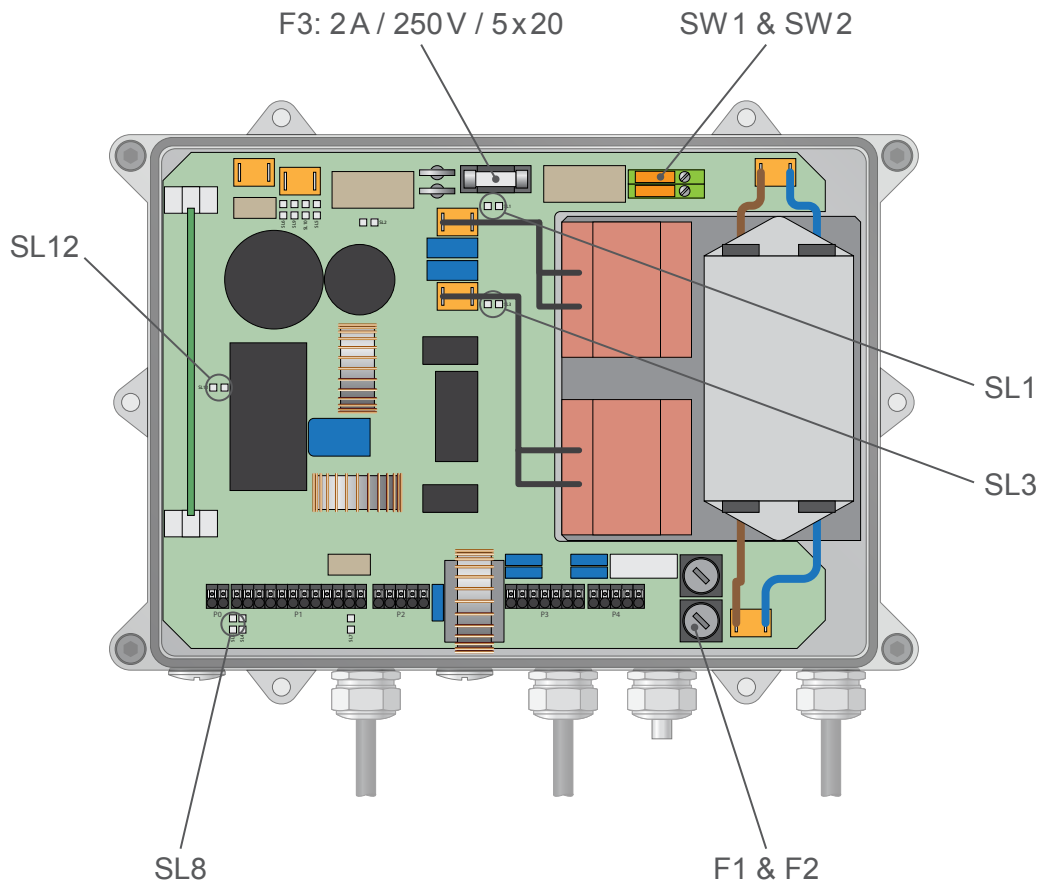


Fig.2-12 Location of fuses, solder links & contacts on the DES 411 circuit

2.6.3 DES SERIE CPLD BOARD (RESISTORS & SOLDER LINKS LOCATION)



Fig.2-13 Location of resistors & solder links on the DES Series circuit

2.6.4 MAIN BOARD SET-UP

- SL12:** solder link is done for 230VAC only.
- SL1 & SL3:** (DES 411 only) they are to be done only for the xWB/PB 15 under 100 - 115VAC.
- F3:** 2AT / 250V / 5x20; whatever the main supply voltage.
- SW1 & SW2:** must be open to allow the DSP 7000 to control the primary supply circuit.
- F1=F2:** xxAT / 250V / 6.3x32; in accordance with table below
- SL8:** is done when «Water Flow» is not used; opened when used.

2.6.5 CPLD BOARD SET-UP

- R39 & R102:** in accordance with table below
- SL1:** solder link always open unless otherwise stated.

2.6.6 SET-UP VALUES

DYNAMOMETER WB / PB SERIES	DES SERIES						
	DES MODEL		LEX [A]	R39 [Ω]	R102 [Ω]	F1, F2	
	410	411				115VAC	230VAC
1WB43 / 1PB43	X		1.0	1.21K	90.9K	T2A	T1A
2WB43 / 2PB43	X		2.0	3.16K	21.5K		T2A
1WB65 / 1PB65		X	2.5	499	N/A	T4A	T2A
2WB65 / 2PB65		X	5.0	1.54K	57.6K	T8A	T4A
1WB115 / 1PB115		X	2.5	499	N/A	T4A	T2A
2WB115 / 2PB115		X	5.0	1.54K	57.6K	T8A	T4A
1WB15 / 1PB15		X	4.0	1.10K	100K	T8A	T4A
2WB15 / 2PB15		X	7.5	2.61K	26.1K	T12A	T8A
3WB15		X	10.0	3.83K	15.8K		
4WB15 / 4PB15		X	12.0	4.64K	11.5K		



CAUTION

MAKE SURE THE FUSE VALUE IS CORRECT. THE UNIT IS NO LONGER PROTECTED WHEN THE VALUE OF ONE OR ALL OF THE FUSES IS TOO HIGH. HOWEVER, THE FUSES ARE LIKELY TO BLOW PREMATURELY IF THEIR VALUE IS NOT SUFFICIENT.

2.7 CONNECTION DIAGRAMS

2.7.1 DES 410 WITH DSP 701X

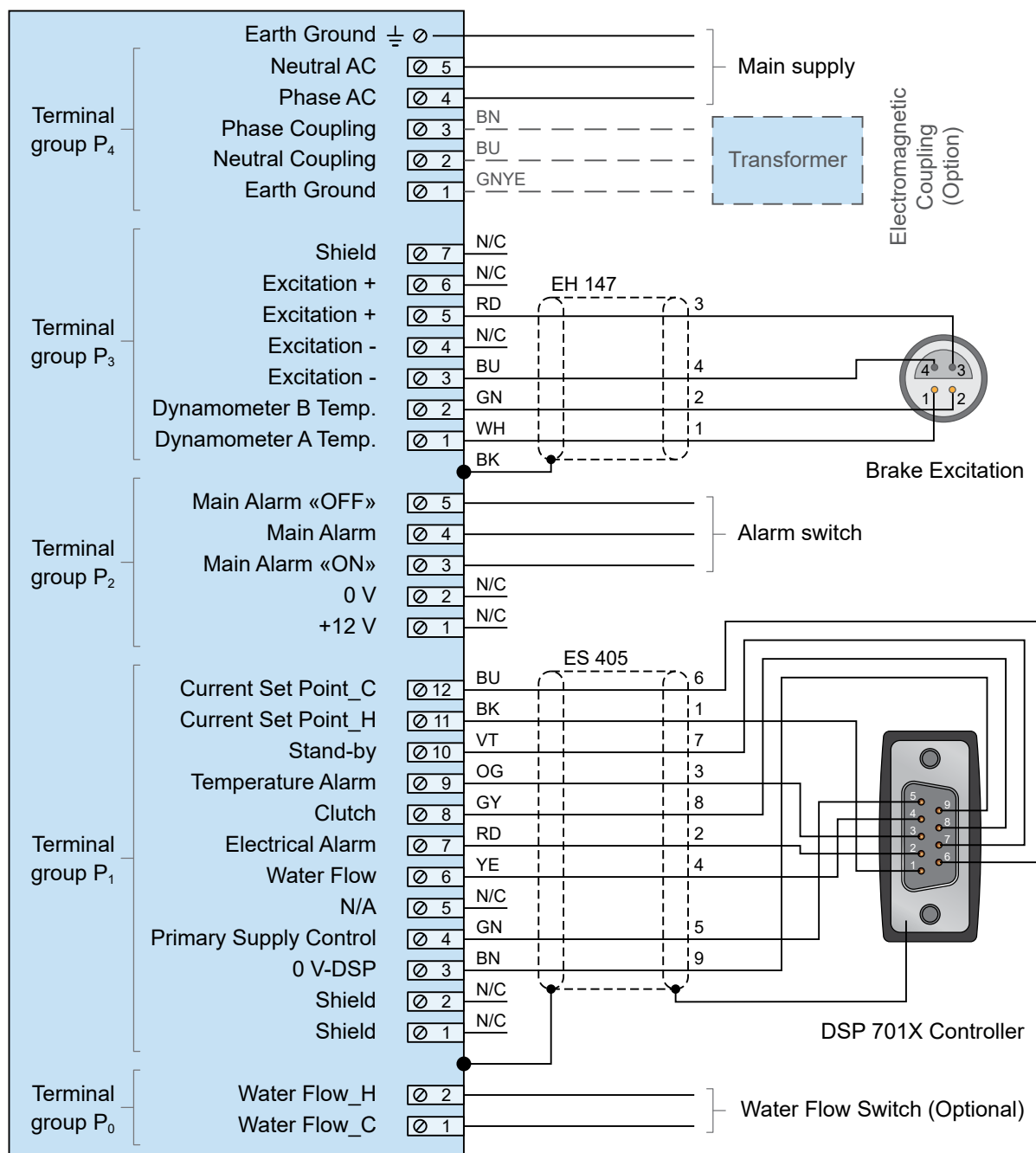


Fig.2-14 Connection of the DES 410 Power Supply to the Magtrol DSP 701X Controller.



NOTICE

For EH147 and ES405 cables, using EMC type stuffing gland, ensure cable shield makes good contact with the aluminium housing.

2.7.2 DES 410 WITH DSP 700X

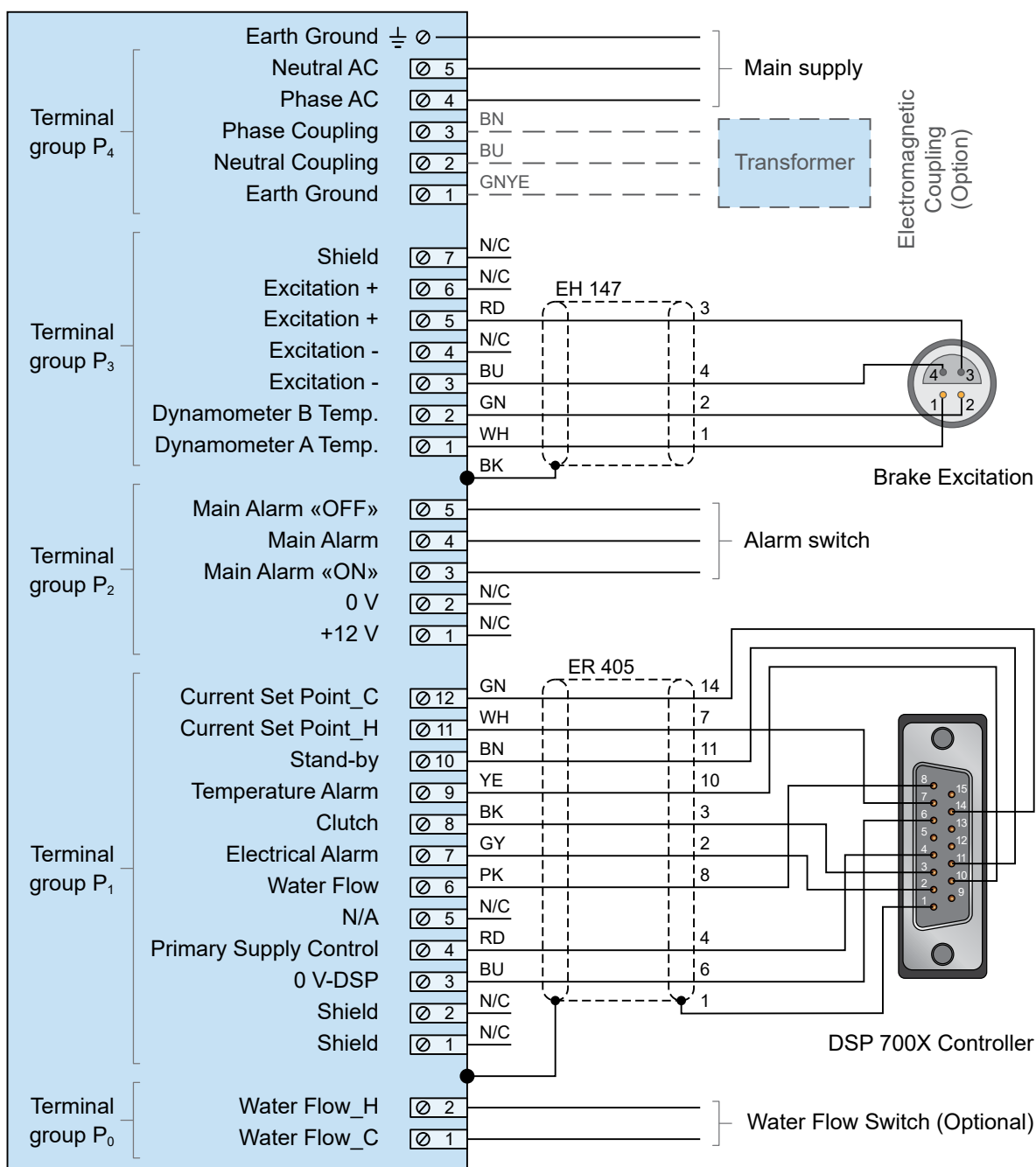


Fig.2-15 Connection of the DES 410 Power Supply to the Magtrol DSP 700X Controller.

**NOTICE**

For EH147 and ER405 cables, using EMC type stuffing gland, ensure cable shield makes good contact with the aluminium housing.

2.7.3 DES 411 WITH DSP 701X

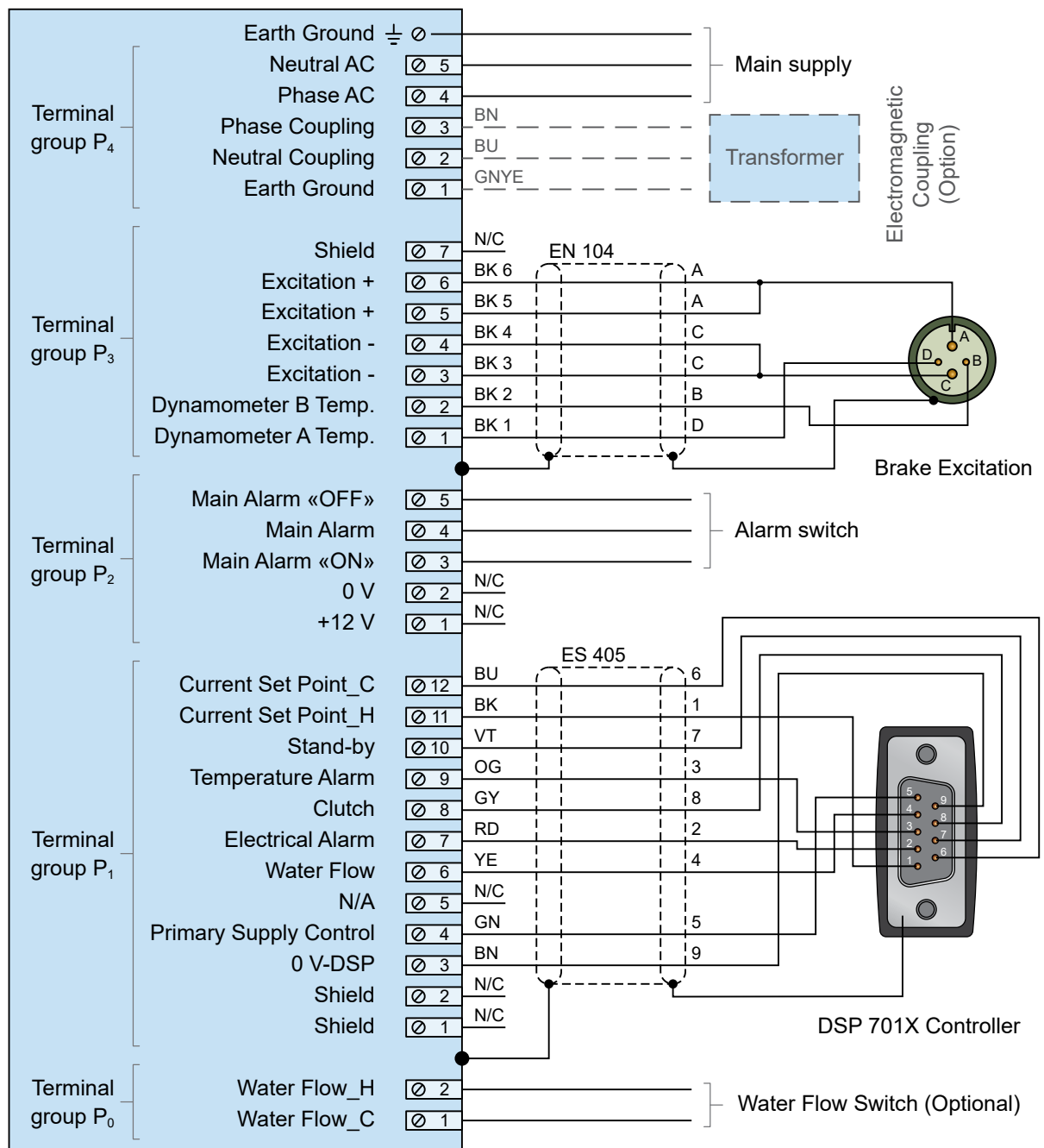


Fig.2-16 Connection of the DES 411 Power Supply to the Magtrol DSP 701X Controller.



NOTICE

For EN 104 and ES 405 cables, using EMC type stuffing gland, ensure cable shield makes good contact with the aluminium housing.

2.7.4 DES 411 WITH DSP 700X

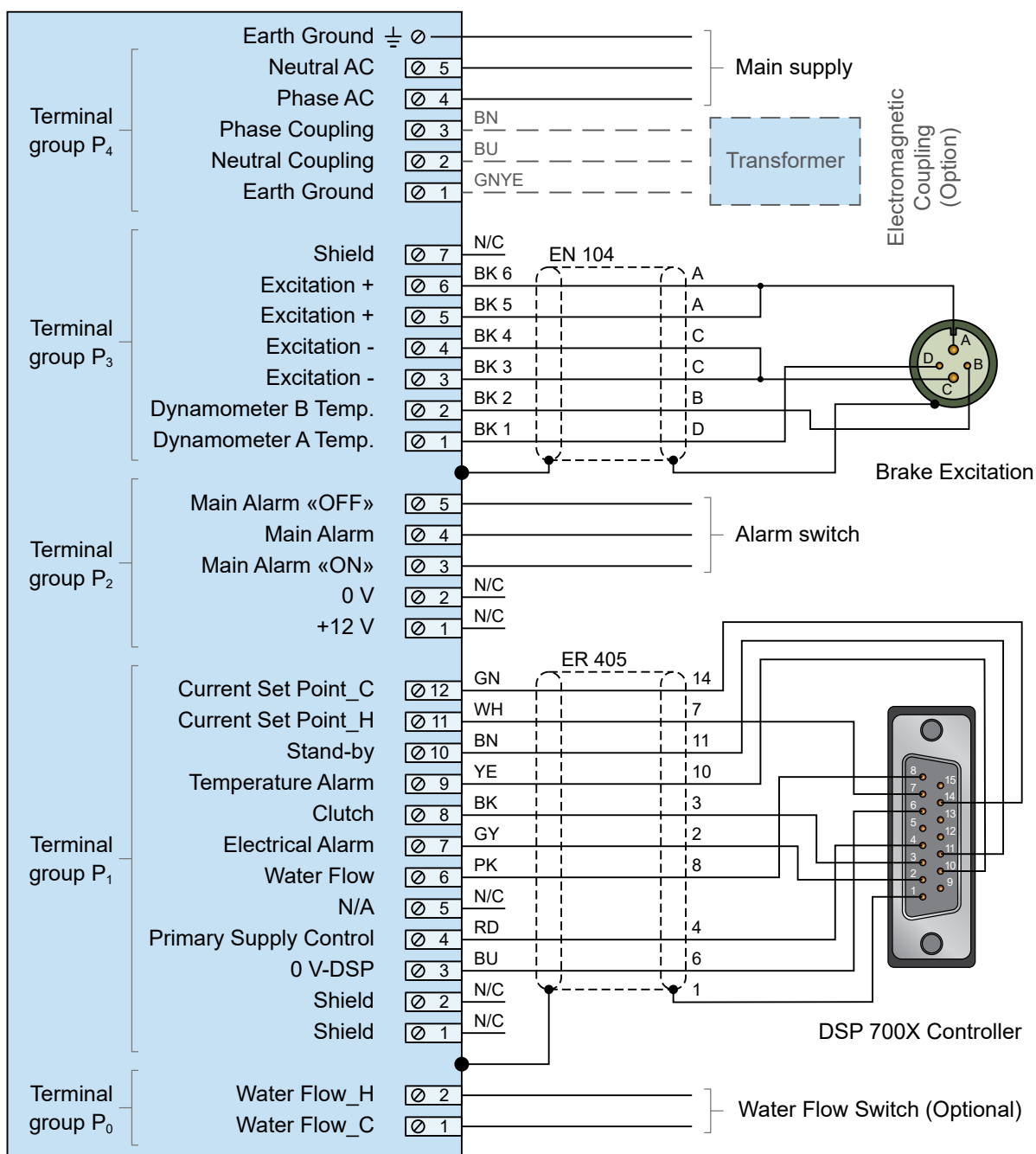


Fig.2-17 Connection of the DES 411 Power Supply to the Magtrol DSP 700X Controller.

**NOTICE**

For EN104 and ER 405 cables, using EMC type stuffing gland, ensure cable shield makes good contact with the aluminium housing.

3. MAINTENANCE, REPAIR & CALIBRATION

3.1 MAINTENANCE

Magtrol DES Series Power Supply are virtually maintenance-free.

**CAUTION**

THE USER MUST NOT ATTEMPT TO CHANGE OR REPAIR ANY COMPONENTS HIMSELF. FOR ALL MAINTENANCE OR REPAIR OPERATIONS, PLEASE RETURN THE DEVICE TO MAGTROL.

IF A PROBLEM IS SUSPECTED, MAGTROL SHOULD BE CONTACTED SO THAT ARRANGEMENTS CAN BE MADE TO PERFORM ANY REPAIRS IN THE FACTORY.

FAILURE TO COMPLY MAY RESULT IN SERIOUS DAMAGE TO THE DEVICE OR MAY INVALIDATE THE WARRANTY.

3.2 REPAIR

In case of a defect, please see chapter *see chapter SERVICES INFORMATION* of this manual. Whether you are directed to ship your equipment back to MAGTROL INC. in the United States or MAGTROL S.A. in Switzerland, it is very important to include the following information with your return shipment:

1. Model number, part number, serial number, order number and date of acquisition
2. Description of the defect and the conditions in which it appeared
3. Description of the test bench (drawing, photographs, sketches, etc.)
4. Description of the tested object (drawing, photographs, sketches, etc.)
5. Description of the test cycle

**CAUTION**

MAINTENANCE MUST BE PERFORMED BY MAGTROL IN ORDER TO GUARANTEE FUTURE MEASURING ACCURACY.

To allow MAGTROL to complete the work in the best possible time, carefully pack the torque transducer and follow the procedure outlined *see chapter SERVICES INFORMATION* of this manual.

3.3 CALIBRATION

When the DES Series Power Supply is purchased as part of a complete motor test system it is calibrated by Magtrol according to the dynamometer with which it will be used.

Calibration requires specific tools. If you are facing a calibration need, please contact our customer service. Returning the device directly to the Magtrol factory is both advantageous and economical. We can guarantee a dedicated calibration for the device performed by one of our specialists. In addition, any wear and tear requiring maintenance will be immediately taken care of by our after-sales service team.

SERVICES INFORMATION

RETURNING MAGTROL EQUIPMENT FOR REPAIR AND/OR CALIBRATION

When returning equipment to MAGTROL INC. (United States) or MAGTROL S.A. (Switzerland) for repair and/or calibration, a completed **Return Material Authorization (RMA) form is required.**

Please consult the «Services/Return and Calibration» section on our web site www.magtrol.com, in order to choose the most appropriate recipient for your needs.

Depending on where the equipment is located and which unit(s) will be returned, you will be directed to either ship your equipment back to MAGTROL, Inc. in the United States or MAGTROL S.A. in Switzerland.

RETURNING EQUIPMENT TO MAGTROL INC. (UNITED STATES)

1. Visit the «Services/Return and Calibration» section of Magtrol's web site www.magtrol.com to initiate an RMA procedure. Complete the RMA form online and submit.
2. An RMA number will be issued to you via e-mail. Include this number on all return documentation.
3. Ship your equipment to: **MAGTROL, INC.**
70 Gardenville Parkway
Buffalo, NY 14224 | USA
Attn: Repair Department
4. After Magtrol's Repair Department receives and analyzes your equipment, a quotation listing all the necessary parts and labor costs, if any, will be faxed or e-mailed to you.
5. After receiving your repair estimate, provide Magtrol with a P.O. number as soon as possible. A purchase order confirming the cost quoted is required before your equipment can be returned.

CONTACT FOR AFTER SALES SERVICE AT MAGTROL INC.

After Sales, Repair & Calibration Services

phone +1 716 668 5555 ext. 115

fax +1 716 668 3162

e-mail service@magtrol.com

RETURNING EQUIPMENT TO MAGTROL S.A. (SWITZERLAND)

1. Visit the «Services/Return and Calibration» section of Magtrol's web site www.magtrol.com to initiate an RMA procedure; complete the RMA form online and submit.
2. After your request has been reviewed, you will receive an email containing an RMA number and dedicated return instructions including specifics about shipping details. The RMA number will be a Magtrol SA internal repair order (SR-xxxx) reference.

Any **shipment sent without an RMA risks delays and possible rejection**, so please wait until you receive the email with the details you will need to properly return your equipment.

Any **equipment returned for credit must be approved** prior to return and is subject to a re-stocking fee.

CONTACT FOR AFTER SALES SERVICE AT MAGTROL S.A.

After Sales, Repair & Calibration Services

phone +41 26 407 30 00

fax +41 26 407 30 01

e-mail repair@magtrol.ch

REVISIONS TO THIS MANUAL

The contents of this manual are subject to change without prior notice. The latest updated versions of our manuals are available and downloadable at any time on Magtrol's website www.magtrol.com in the « SUPPORT » section.

To ensure that you have the latest version, compare the issue date (on the back of this manual) with the last updated document available on our website.

The table of revisions below lists the significant updates that have been made.

REVISION DATES

DATE	EDITION	CHANGE	SECTION(S)
Dec. 2025	2nd Edition - rev. C	Updated the datasheet Global update related to DSP701X Adding information to identify the DES model Additional information regarding cables	1.3 All 1.2 2.5.1, 2.5.2
Jul. 2023	2nd Edition - rev. B	Corrected error in DES411 => DSP 7000 diagram. On terminal P3 all cables are black. Color designation update to IEC 60757:2021	2.8
Jan. 2022	2nd Edition - rev. A	Updated all informations concerning the new TM Series; Global update regarding the continuous updates; Global reorganization and new design for the manual Added information about localisation of SL8	All 2.7.2
Feb. 2014	1st Edition - rev. A	Passing shielded cables into stuffing gland procedure added Figure 2-6 Update Stuffing gland view Notes about EMC stuffing gland was added Figure 2-10 and 2-11 Update connecting drawing	2.6.2, 2.6, 2.8,2.9, 2.8,2.9
Oct. 2013	1st Edition		

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👤 Worldwide Network of Sales Agents

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