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Interfaces: **DAD01** « single quadrant », **DAD02** « absolute value », **DAD03** « speed or current setpoint inversion », **DAD04** « ramp card » **DAD05** « Encoder signal Distribution », **DAD06** « Motor load rate », **DAD07** « Motor load rate with logic output »

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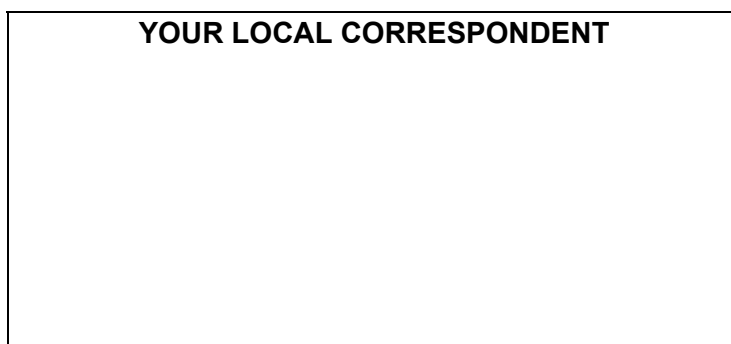
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Characteristics and dimensions subject to change without notice.

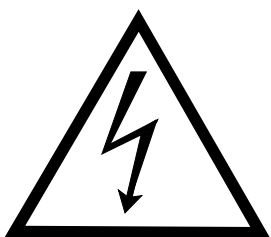


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SAFETY

Servodrives present two main types of hazard :

- Electrical hazard



Servoamplifiers may contain non-insulated live AC or DC components. Users are advised to guard against access to live parts before installing the equipment.

Even after the electrical panel is de-energized, voltages may be present for more than a minute, until the power capacitors have had time to discharge.

Specific features of the installation need to be studied to prevent any accidental contact with live components :

- Connector lug protection ;
- Correctly fitted protection and earthing features ;
- Workplace insulation (enclosure insulation humidity, etc.).

General recommendations :

- Check the bonding circuit;
- Lock the electrical cabinets;
- Use standardised equipment.



- Mechanical hazard

Servomotors can accelerate in milliseconds. Moving parts must be screened off to prevent operators coming into contact with them. The working procedure must allow the operator to keep well clear of the danger area.

All assembly and commissioning work must be done by **qualified** personnel who are familiar with the safety regulations (e.g. VDE 0105 or accreditation C18510).

Interfaces: **DAD01** « single quadrant », **DAD02** « absolute value », **DAD03** « speed or current setpoint inversion », **DAD04** « ramp card » **DAD05** « Encoder signal Distribution », **DAD06** « Motor load rate », **DAD07** « Motor load rate with logic output »

Upon delivery

All servoamplifiers are thoroughly inspected during manufacture and tested at length before shipment.

- Unpack the servoamplifier carefully and check it is in good condition.
- Also check that data on the manufacturer's plate complies with data on the order acknowledgement.

If equipment has been damaged during transport, the addressee must file a complaint with the carrier by recorded delivery mail within 24 hours.

Caution :


The packaging may contain essential documents or accessories, in particular :

- User Manual,
- Connectors.

Storage

Until installed, the servoamplifier must be stored in a dry place safe from sudden temperature changes so condensation cannot form.

Special instructions for setting up the equipment

	CAUTION
	<p>For this equipment to work correctly and safely it must be transported, stored, installed and assembled in accordance with this manual and must receive thorough care and attention.</p> <p>Failure to comply with these safety instructions may lead to serious injury or damage.</p> <p>The cards contain components that are sensitive to electrostatic discharges. Before touching a card you must get rid of the static electricity on your body. The simplest way to do this is to touch a conductive object that is connected to earth (e.g. bare metal parts of equipment cabinets or earth pins of plugs).</p>

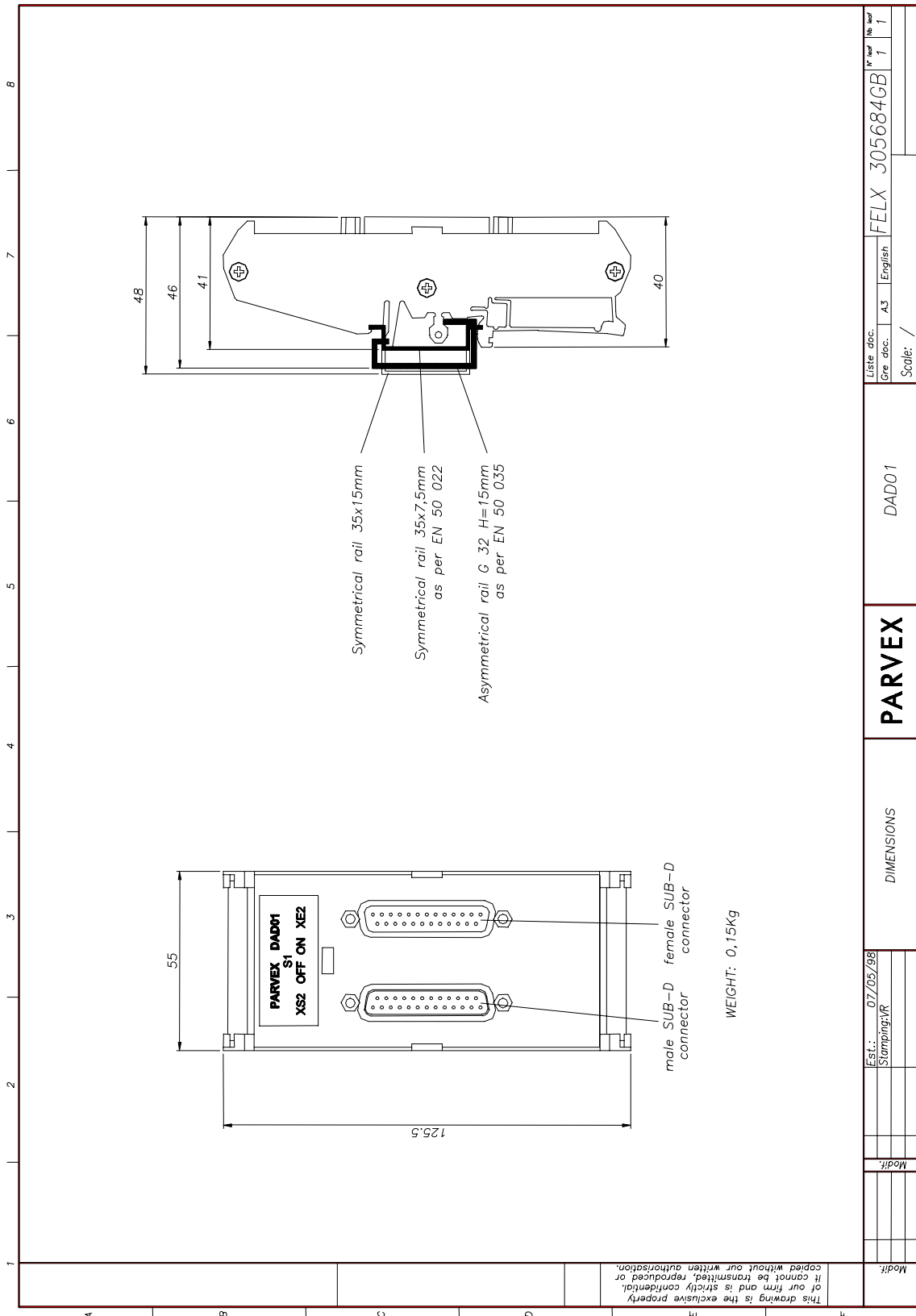
1. DAD01 « SINGLE QUADRANT » INTERFACE

1.1 General information :

This optional card can be used with digital drives such as the Digivex drives: DSD, DPD, DMD... It is fixed on the DIN rail and is connected to the Digivex by a 25 pin «SUD-D» male plug and by a 25 pin «SUD-D» female plug to an external source that gives the analog instruction to the drives. It allows the DIGIVEX to control a **clockwise-rotating** motor either over **two quadrants** (motor and generator) or exclusively the **motor quadrant** (no electrical braking) depending on the status of an externally controlled **logic input**. For counter-clockwise rotation, the motor is controlled either on two quadrants or exclusively in the generator quadrant (no motor torque available) depending on the logic input status. Notice **the single quadrant function is designed for clockwise rotation**.

1.2 Dimensions :

See the drawing on the following page - FELX 305684



Modif:		Est.: 07/05/98		DIMENSIONS		PARVEX		DAD01		Liste abc. / Gre abc. / A3 / English / FELX 305684GB		N° def / Nb def / 1 / 1	
Modif:		Stamping/VR								Scale: /			

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1.3 Connection Diagram :

Connection between the external source and the DAD01 is by the 25 pin SUB-D female plug marked XE2 and connection between the DAD01 and the Digivex drive (SUB-D marked X2) by the 25 pin SUB-D male marked XS2.

DAD01 SUB-D XE2	FUNCTION DAD01	DAD01 → Shield → DIGIVEX		
		SUB-D XS2	Cable DIG04544R1	SUB-D X2
1	Direct thru	1		1
2	EA2+ : external current limitation input	2		2
3	Direct thru	3		3
4	SA2+ : current measurement analog output	4		4
5	Direct thru	5		5
6	Direct thru	6		6
7	Direct thru	7		7
8	Direct thru	8		8
9	EL1+ : "SINGLE QUADRANT" logic command (not propagated from XE2/9 to XS2/9). Not connected.	9		9
10	Direct thru	10		10
11	Direct thru	11		11
12	Direct thru	12		12
13	Direct thru	13		13
14	Direct thru	14		14
15	EA2- : external current limitation input	15		15
16	Direct thru	16		16
17	SA2- : current measurement analog output Direct thru	4		4
18	Direct thru	18		18
19	Direct thru	19		19
20	Direct thru	20		20
21	EL1- : "SINGLE QUADRANT" logic command (not propagated from XE2/21 to XS2/21). Not connected.	21		21
22	Direct thru	22		22
23	Direct thru	23		23
24	Direct thru	24		24
25	Direct thru	25		25
Shielding	Direct thru	Shielding		Shielding

EA+ = + analog input,
EA- = - analog input,

EL+ = + logic input,
EL- = - logic input

SA+ = hot point analog output
SA- = 0V reference analog output

The electrical connection between the DAD01 and the Digivex is made by a 25 x 0.25mm² cable with a general shielding. The distance between the DAD01 and the Digivex must not exceed 4 meters.

For more information about the cabling and the cables, please see in the Digivex's literature the chapters dealing with these connections.

1.4 Functional description :

The principle used is for current limitation to be cancelled automatically when the current setpoint becomes negative (generator clockwise). If the current setpoint becomes positive again, the system re-enables current limitation imposed from outside.

All servoamplifier signals are copied lead to lead except for:

1.4.1 Logic Input 1 (EL1+ / EL1-) :

This type 2 optocoupled 24V input (conforming to IEC 1131-2, see DIGIVEX documentation section on Input/Output Characteristics) becomes the input for validating the "Single Quadrant" function. To validate the function, 24V must be applied across the input. The servoamplifier end input is not connected (signal not transmitted to the servoamplifier SUB-D connector). Caution if this input at the servoamplifier end were intended to activate another functionality, it becomes inaccessible leaving only the functionality activated by a logic "0" on X2/9 - X2-21.

1.4.2 Analog Input 2 (SA2+ / SA2-) :

This output must be assigned to the "Current Setpoint" variable with suitable scaling (use the DIGIVEX PC interface).

This output is used to measure the servoamplifier current setpoint with a very fine scale: typically 10V for 1A for a DPD100 servoamplifier (for other servoamplifiers this gradient needs to be re-adapted). It is used for detecting when the current goes negative.

1.4.3 Current Limitation Analog Input (EA2+ / EA2-) :

The "External Current Reduction Validated" function must be active (DIGIVEX PC user interface). This differential type input is transmitted to the servoamplifier with an attenuation factor of 0.93 in normal operation. Scale reduction does not allow total pulse current to be reached with a 0/+10V current limitation command (this is not a problem for most applications). Polarity must be observed: positive voltage to EA+ (XE2/2) and earth to EA2- (XE2/17).

When the function is validated, the servoamplifier current setpoint goes negative, the module reduces the current limitation value to less than 150 mV, which is the equivalent of less than 1.5% of the servoamplifier pulse current. As soon as the setpoint goes positive again, this automatic reduction is cancelled. Current is reduced in less than 10 ms (typically 5 ms).

1.4.4 S1 Inverter :

An inverter marked S1 is accessible for users on the front panel of the DAD01 module. Delivered as standard in the OFF position, the "Single Quadrant" function is validated by applying a voltage to the EL1 logic input. In the ON position, the "Single Quadrant" function is permanently active whatever the status of logic input EL1.

2. DAD02 « ABSOLUTE VALUE » INTERFACE

2.1 General information :

This optional card can be used with digital drives such as the Digivex drives: DSD, DPD, DMD... It is fixed on the DIN rail and is connected to the Digivex by a 25 pin «SUD-D» male plug and by a 25 pin «SUD-D» female plug to an external source that gives the analog instruction to the drives. It allows the DIGIVEX to output two exclusively positive analog bits in the form of absolute values (7 bits + 1 positive sign bit, i.e. 0/ = 10V at max. 3 mA) as images of the status of internal variables previously assigned by the PC WINDOWS or DTP001 interface to signed analog outputs available at X2/3-X2/16 for ANA1 and X2/4-X2/4-X2/17 for ANA2.

2.2 Dimensions :

See the drawing on the following page - FELX 305814

2.3 Connection Diagram :

Connection between the external source and the DAD02 is by the 25 pin SUB-D female plug marked XE2 and connection between the DAD02 and the Digivex drive (SUB-D marked X2) by the 25 pin SUB-D male marked XS2.

DAD02 SUB-D XE2	FUNCTION DAD02	DAD02 → Shield → DIGIVEX		
		SUB-D XS2	Cable DIG04544R1	SUB-D X2
1	Direct thru	1		1
2	Direct thru	2		2
3	ANA1 : positive assignable analog output 0/+10V at max. 3 mA	3		3
4	ANA2 : positive assignable analog output 0/+10V at max. 3 mA	4		4
5	Direct thru	5		5
6	Direct thru	6		6
7	Direct thru	7		7
8	Direct thru	8		8
9	Direct thru	9		9
10	Direct thru	10		10
11	Direct thru	11		11
12	Direct thru	12		12
13	Direct thru	13		13
14	Direct thru	14		14
15	Direct thru	15		15
16	Direct thru	16		16
17	Direct thru	4		4
18	Direct thru	18		18
19	Direct thru	19		19
20	Direct thru	20		20
21	Direct thru	21		21
22	Direct thru	22		22
23	Direct thru	23		23
24	Direct thru	24		24
25	Direct thru	25		25
Shielding	Direct thru	Shielding		Shielding

The electrical connection between the DAD02 and the Digivex is made by a 25 x 0.25mm² cable with a general shielding. The distance between the DAD02 and the Digivex must not exceed 4 meters.

For more information about the cabling and the cables, please see in the Digivex's literature the chapters dealing with these connections.

2.4 Functional description :

The principle is to provide analog outputs always with the same sign regardless of changes in the variables selected using the DIGIVEX PC interface or the DTP001 terminal.

All the other servoamplifier signals are copied lead to lead:

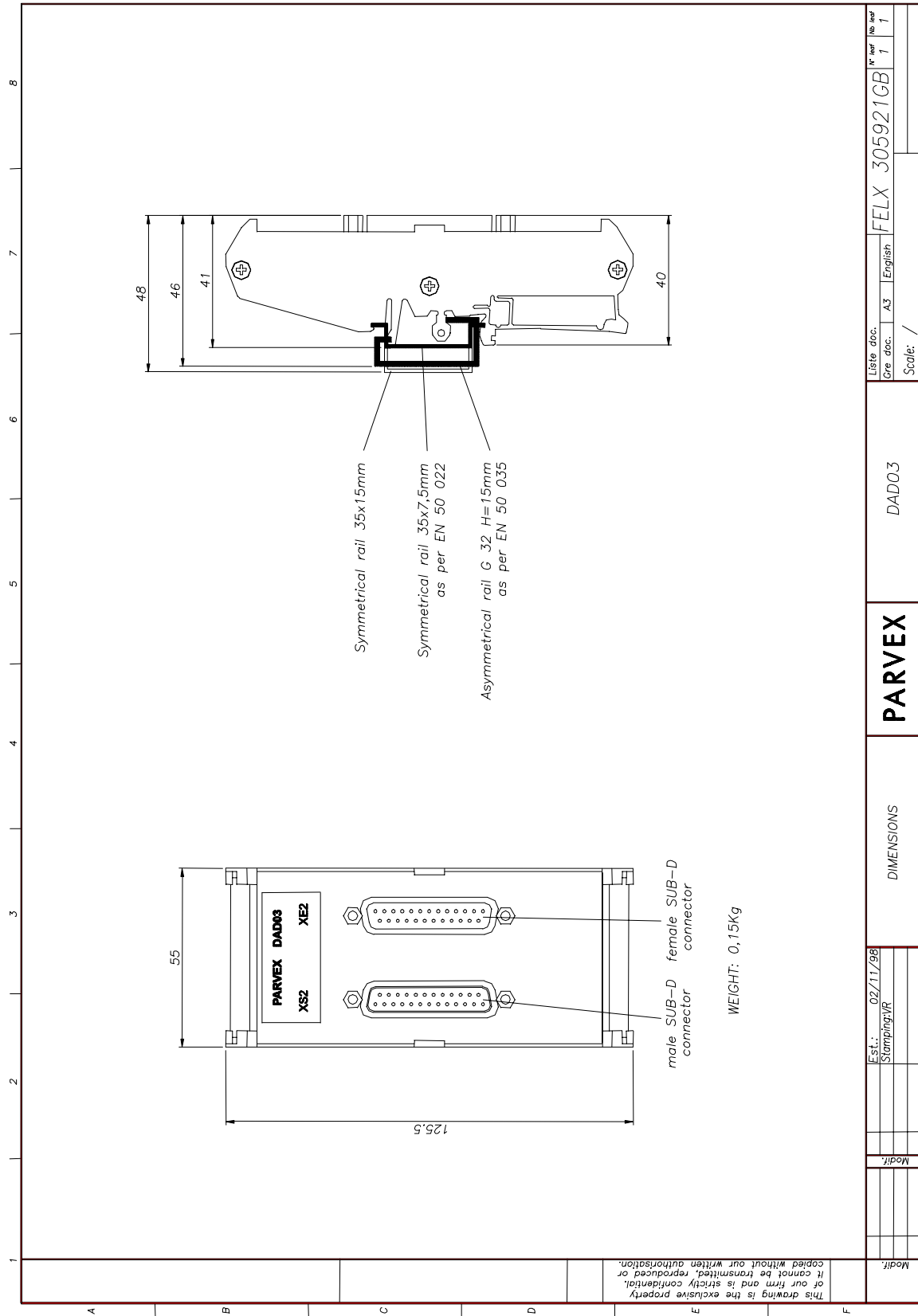
3. - INTERFACE « SPEED OR CURRENT SETPOINT INVERSION » DAD03

3.1 General information :

This optional card can be used with digital drives such as the Digivex drives: DSD, DPD, DMD... It is fixed on the DIN rail and is connected to the Digivex by a 25 pin «SUD-D» male plug and by a 25 pin «SUD-D» female plug to an external source that gives the analog instruction to the drives. This interface allows inversion of the speed or current setpoint depending on the logic status of input EL1.

3.2 Dimensions :

See the drawing on the following page - FELX 305921



A		B		C		D		E		F	
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Modif.		Modif.		Modif.		Modif.		Modif.		Modif.	
Est.: 02/11/98		Stamping:VR		DIMENSIONS		PARVEX		DAD03		Liste doc. FELX 305921CB Gre. acc. A3 English N° rev 1 Nb rev 1 Scale: /	

3.3 Connection Diagram :

Connection between the external source and the DAD03 is by the 25 pin SUB-D female plug marked XE2 and connection between the DAD03 and the Digivex drive (SUB-D marked X2) by the 25 pin SUB-D male marked XS2.

DAD03 SUB-D XE2	FUNCTION DAD03	DAD03 → Shield → DIGIVEX		
		SUB-D XS2	Cable DIG04544R1	SUB-D X2
1	Speed and current setpoint + or -	1		1
2	Direct thru	2		2
3	Direct thru	3		3
4	Direct thru	4		4
5	Direct thru	5		5
6	Direct thru	6		6
7	Direct thru	7		7
8	Direct thru	8		8
9	Choice of EL1+ setpoint polarity	9		9
10	Direct thru	10		10
11	Direct thru	11		11
12	Direct thru	12		12
13	Direct thru	13		13
14	Speed and current setpoint + or -	14		14
15	Direct thru	15		15
16	Direct thru	16		16
17	Direct thru	4		4
18	Direct thru	18		18
19	Direct thru	19		19
20	Direct thru	20		20
21	Choice of EL1+ setpoint polarity	21		21
22	Direct thru	22		22
23	Direct thru	23		23
24	Direct thru	24		24
25	Direct thru	25		25
Shielding	Direct thru	Shielding		Shielding

The electrical connection between the DAD03 and the Digivex is made by a 25 x 0.25mm² cable with a general shielding. The distance between the DAD03 and the Digivex must not exceed 4 meters.

For more information about the cabling and the cables, please see in the Digivex's literature the chapters dealing with these connections.

3.4 Functional description :

The principle used is to invert the setpoint inputs when logic input EL1 switches to "1".

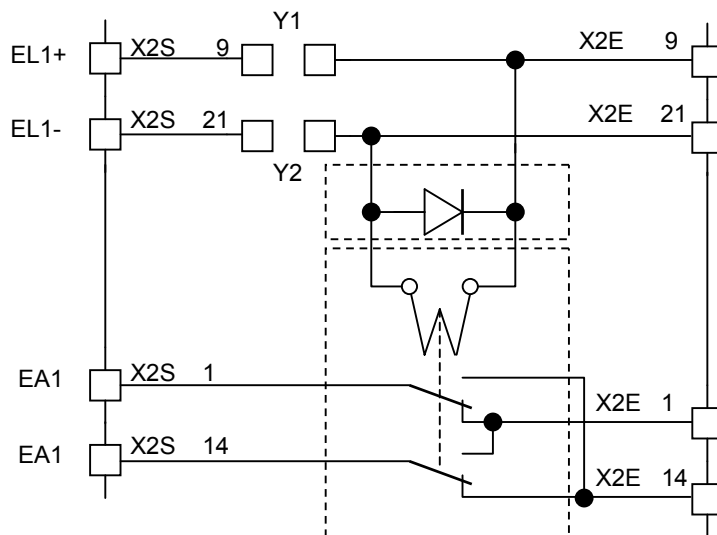
All the servoamplifier signals are copied lead to lead except for:

3.4.1 Logic Input 1 (EL1+ / EL1-) :

This type 2 optocoupled 24V input (conforming to IEC 1131-2, see DIGIVEX documentation section on Input/Output Characteristics) becomes the input for validating the "INVERSION" function. To validate the function, 24V must be applied across the input. The servoamplifier end input is not connected (signal not transmitted to the servoamplifier SUB-D connector). Caution if this input at the servoamplifier end were intended to activate another functionality, it becomes inaccessible leaving only the functionality activated by a logic "0" on X2/9 - X2-21.

3.4.2 Analog Input 1 (EA1+ / EA1-) :

A relay, when activated via logic input 1 inverts electrical connections EA1+ and EA1- between connectors XE2 and XS2.



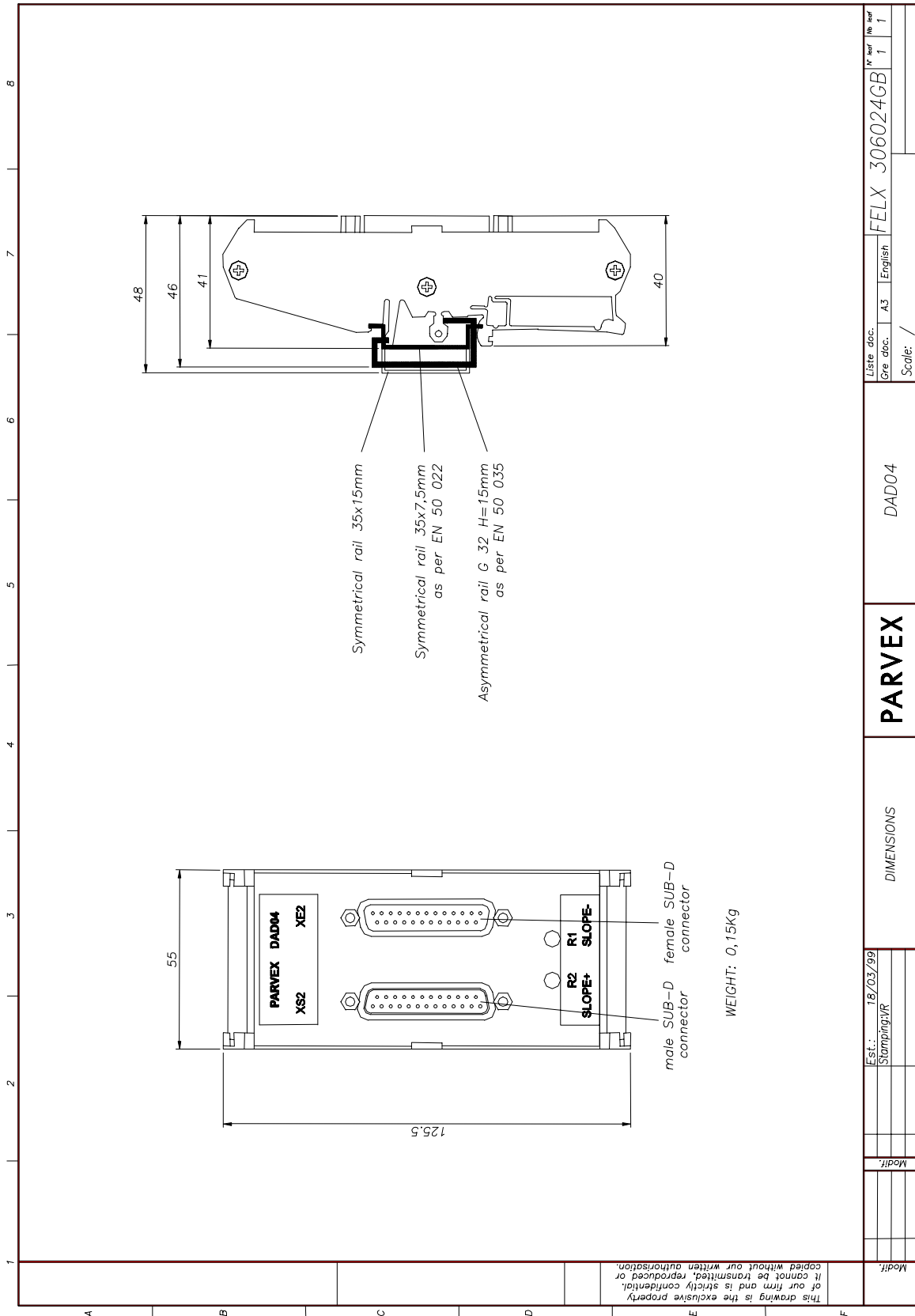
4. - INTERFACE « RAMP CARD » DAD04

4.1 General information :

This optional card can be used with digital drives such as the Digivex drives: DSD, DPD, DMD... It is fixed on the DIN rail and is connected to the Digivex by a 25 pin "SUD-D" male plug and by a 25 pin "SUD-D" female plug to an external source that gives the analog instruction to the drives. There is no compatibility problem with the software on the digital drives. The purpose of this card is to set a "ramp" function on the speed reference or on the current reference.

4.2 Dimensions :

See the drawing on the following page - FELX 306024



Modif.	Modif.	Est. : 18/03/99	Stamping/IR	DIMENSIONS			PARVEX	DAD04	Liste doc. : Cre doc. : A3 English Scale: /	N° part 1	N° ref 1	FELX 306024GB

4.3 Connection Diagram :

Connection between the external source and the DAD04 is by the 25 pin SUB-D female plug marked XE2 and connection between the DAD04 and the Digivex drive (SUB-D marked X2) by the 25 pin SUB-D male marked XS2.

DAD04 SUB-D XE2	FUNCTION DAD04	DAD04 → Shield → DIGIVEX		
		SUB-D XS2	Cable DIG04544R1	SUB-D X2
1	Reference ramp positive	1		1
2	Direct thru	2		2
3	Direct thru	3		3
4	Direct thru	4		4
5	Direct thru	5		5
6	Direct thru	6		6
7	Direct thru	7		7
8	Direct thru	8		8
9	Direct thru	9		9
10	Direct thru	10		10
11	Direct thru	11		11
12	Direct thru	12		12
13	24 volt supply	13		13
14	Reference ramp negative	14		14
15	Direct thru	15		15
16	Direct thru	16		16
17	Direct thru	4		4
18	Direct thru	18		18
19	Direct thru	19		19
20	Direct thru	20		20
21	Direct thru	21		21
22	Direct thru	22		22
23	Direct thru	23		23
24	Direct thru	24		24
25	Common of 24 volt supply	25		25
Shielding	Direct thru	Shielding		Shielding

The electrical connection between the DAD04 and the Digivex is made by a 25 x 0.25mm² cable with a general shielding. The distance between the DAD04 and the Digivex must not exceed 4 meters.

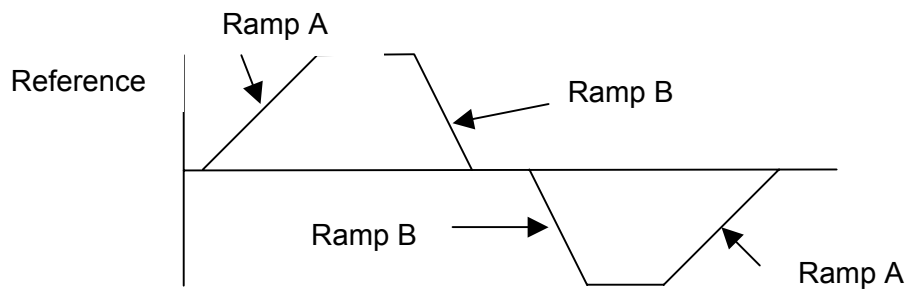
For more information about the cabling and the cables, please see in the Digivex's literature the chapters dealing with these connections.

4.4 Functional description :

The ramp can be adjusted by certain potentiometers between 0.06V/s and 0.6V/s
 The ramp time is increased when rotating the potentiometer clockwise.

reference	Minimum time	Maximum
0 - 5V	0.3s	3s
0 - 10V	0.6s	6s

Ramps A and B can be adjusted independently
 Ramp A = Potentiometer R2
 Ramp B = Potentiometer R1



5. DAD05 ENCODER SIGNAL DISTRIBUTION INTERFACE

5.1 Introduction

This option card can be used with DIGIVEX DMD, DSD and DPD digital variable speed drives and DIGIVEX DMM, DSM and DPM variable speed drive positioners providing that they are fitted with encoder interface cards.

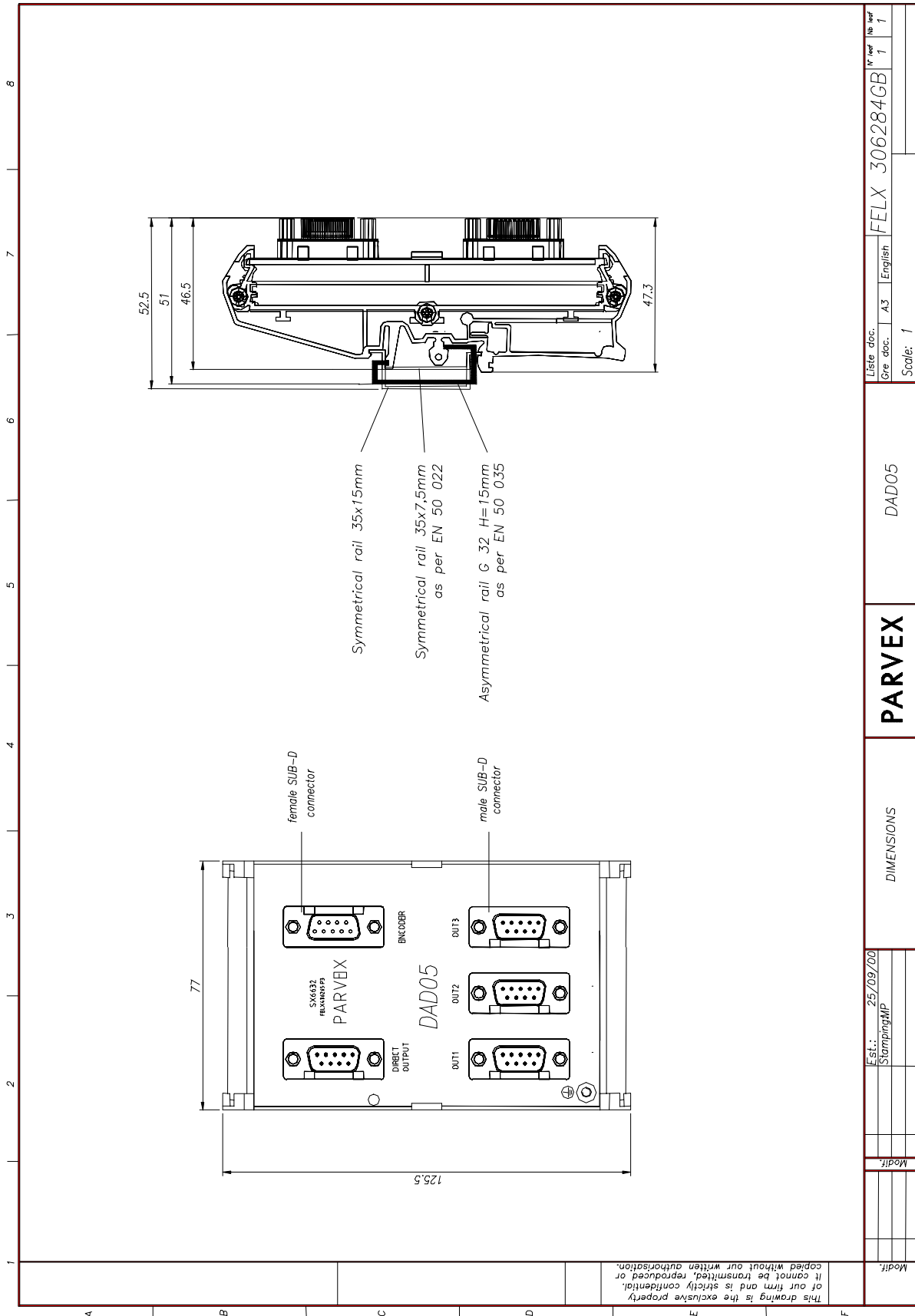
This card fixes on to "DIN Rail" and distributes signals coming from an incremental encoder or from an encoder emulation card to various users.

This option card which does not have any on-board software comprises:

- an encoder input, marked ENCODER (9-pin, female SUB-D socket)
- a direct encoder output, marked DIRECT OUTPUT (9-pin, male SUB-D plug), through which another DAD05 interface can be connected
- 3 amplified encoder outputs, marked OUT1, OUT2 and OUT3 (9-pin, male SUB-D plugs)

5.2 Dimensions

See plan FELX 306284 on following page



Modif.		Est.: 25/09/00 Stamping/JP		DIMENSIONS		PARVEX		DAD05		Liste doc. N° doc.		FELX 306284GB		N° rev		1	
Modif.										Cre doc.		A3		English		1	
																Scale: 1	

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5.3 Connections

5.3.1 ENCODER SUB-D Socket (9-pin, female SUB-D socket)

CONTACT	TYPE	ROLE	Characteristics
5	Output	+5V	+5V encoder power supply: 250 mA maximum output
9	Output	0V	Caution! It is essential to have +5V power supply input to the 5 and 9 sockets of the DIRECT OUTPUT plug
7	Input	<u>A</u>	Encoder channel A
3	Input	A	Encoder channel A
8	Input	<u>B</u>	Encoder channel B
4	Input	B	Encoder channel B
6	Input	<u>Top0</u>	Encoder channel Top0
2	Input	Top0	Encoder channel Top0

This socket is also used to connect:

- a full range track, incremental encoder, with line driver complying with the RS422 standard, 5V supply voltage, 250 mA maximum consumption, 500 kHz maximum frequency on both A and B signals
- a Parvex SC6631 or SC6639 encoder emulation card

The encoder channels are interconnected internally via a 26LS32 "LINE DRIVER" circuit. The electrical interface complies with the RS422 serial link differentials' standard. The electrical characteristics are therefore closely linked with this component's usage.

5.3.2 DIRECT OUTPUT SUB-D Socket (9-pin, male SUB-D plug)

CONTACT	TYPE	ROLE	Characteristics
5	Input	+5V	+5V encoder power supply: 250 mA maximum
9	Input	0V	
7	Output	<u>A</u>	Encoder channel A
3	Output	A	Encoder channel A
8	Output	<u>B</u>	Encoder channel B
4	Output	B	Encoder channel B
6	Output	<u>Top0</u>	Encoder channel Top0
2	Output	Top0	Encoder channel Top0

This plug is directly connected to the ENCODER SUB-D socket. Output signals are not amplified.

This plug must be connected in order to supply power to the incremental encoder or the encoder emulation card connected to the ENCODER socket.

5.3.3 OUT1, OUT2 and OUT3 SUB-D Sockets (9-pin, male SUB-D plugs)

CONTACT	TYPE	ROLE	Characteristics
5	Input	+5V	+5V power supply used to amplify the encoder channels going through the plug: 100 mA maximum
9	Input	0V	
7	Output	<u>A</u>	Encoder channel A (amplified signal)
3	Output	A	Encoder channel A (amplified signal)
8	Output	<u>B</u>	Encoder channel B (amplified signal)
4	Output	B	Encoder channel B (amplified signal)
6	Output	<u>Top0</u>	Encoder channel Top0 (amplified signal)
2	Output	Top0	Encoder channel Top0 (amplified signal)

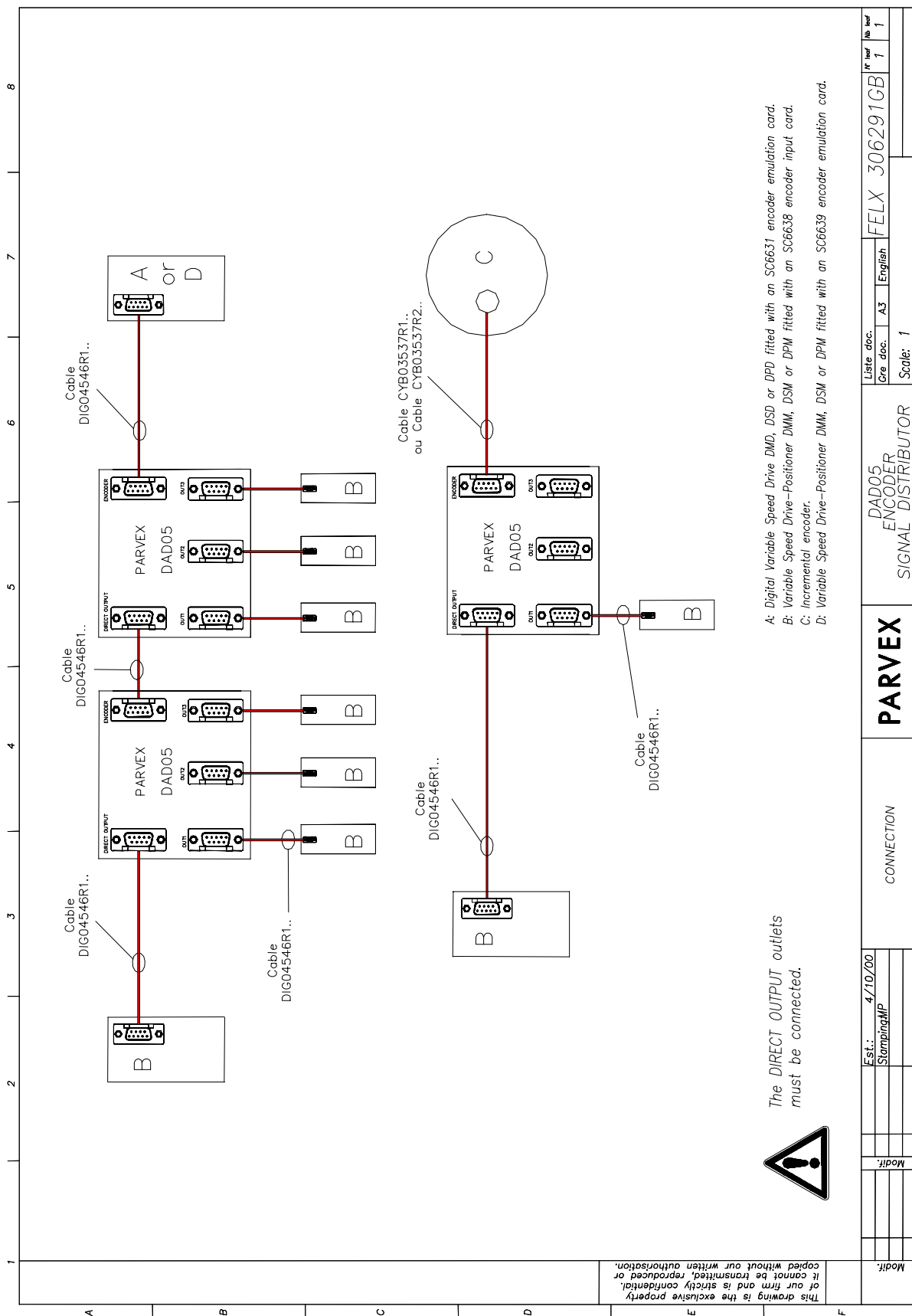
Plugs not in use will not be connected.

The output signals from these plugs are amplified. They correspond to the amplification of the signals present in the ENCODER and DIRECT OUTPUT plug sockets.

The output electrical interface complies with the RS422 serial link differentials' standard. The circuit used is a 26LS31 "LINE DRIVER". The electrical characteristics are therefore closely linked with this component's usage. There is no galvanic insulation.

5.3.4 Examples of connection - Cables

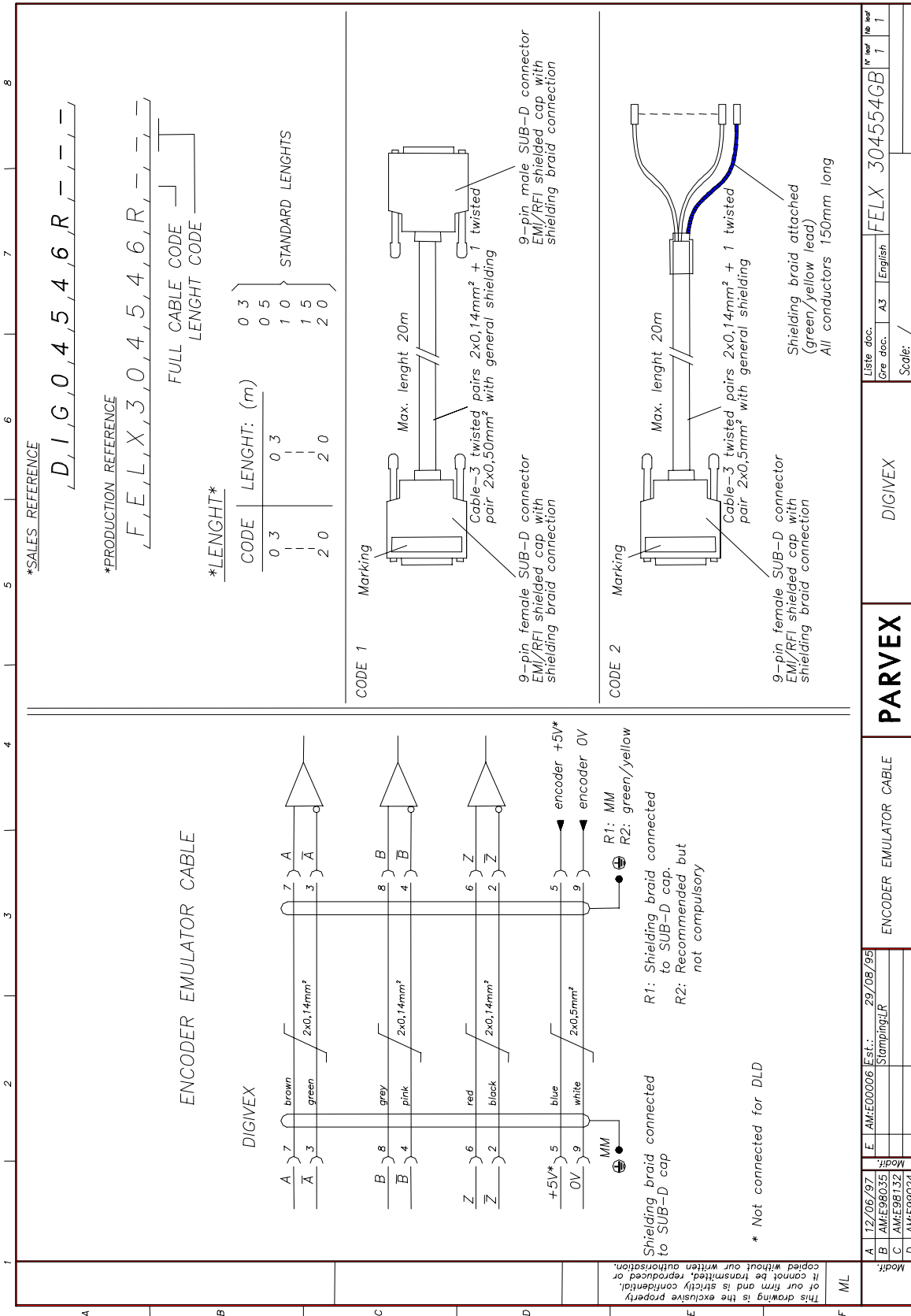
There are several connection examples on the next page.

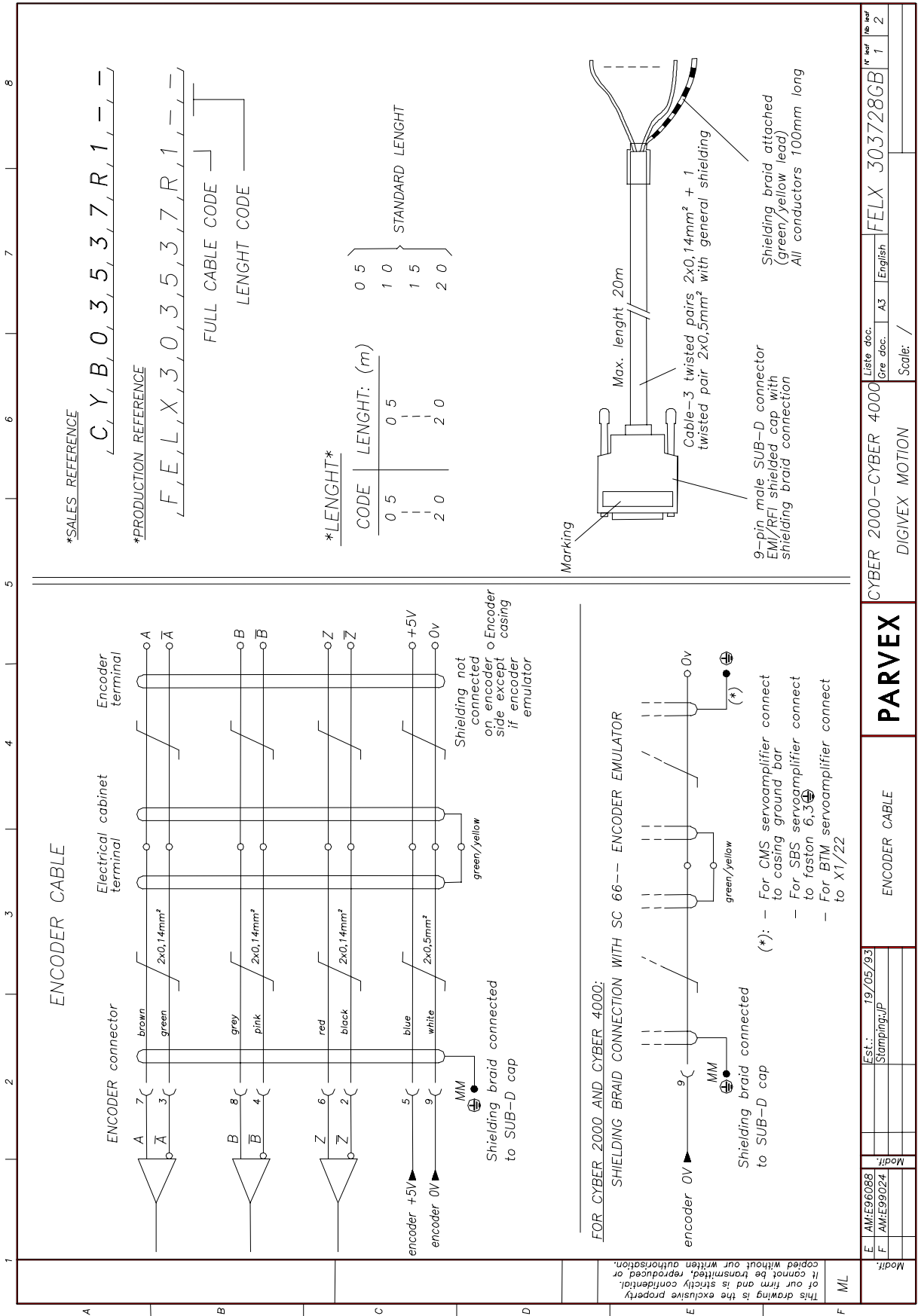


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Modif:									
Modif:									
Est.:	4/10/00								
Stamping/MP									
CONNECTION	PARVEX				DAD05 ENCODER SIGNAL DISTRIBUTOR				
Liste doc.									
Gre doc.			A3	English	FELX 306291GB				
N° leaf									1
Nb leaf									1
Scale:	1								





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E	AM.E96088	Est.: 19/05/93
F	AM.E99024	Stamping:JP

Modif:

ENCODER CABLE

PARVEX

CYBER 2000-CYBER 4000
DIGIVEX MOTION

FELX 303728GB
Scale: /

6. INTERFACE - « MOTOR LOAD RATE » DAD06

6.1 Reminder

This optional card is only compatible with the digital DPD motion controller. It fixes on to "DIN Rail" and is connected, on one side, to the DPD by the SUD-D 25-pin female plug marked X2 (INPUTS / OUTPUTS) and, on the other side, to the external medium Inputs / Outputs which drive the motion controller.

There are no compatibility constraints with the software in question.

This allows the DPD to supply the external medium with a solely positive voltage (7 bits + 1 positive bit, that is: 0 / +10V under 3mA maximum), an image of the motor load rate condition (torque and power rating) from ID SETPOINT and POWER, the first internal variables assigned via PC WINDOWS or DTP001 interface to the available analogue outputs in X2/3-X2/16 for ANA1 and X2/4-X2/17 for ANA2; making sure to set the correct gradients. This load rate information returns channel ANA2e (XE2/4-XE2/17) via the DAD06 output, channel ANA1 is transmitted directly without alteration.

6.2 Dimensions

See plan FELX 306492 on following page

6.3 Connection

Connection from the external medium to the DAD06 module through a SUB-D 25-pin female plug marked XE2 and from the DAD06 module to the DPD (SUB-D marked X2) through a SUB-D 25-pin male plug marked XS2.

DAD06 SUB-D XE2	DAD06 FUNCTION	DAD06 SUB-D XS2	Shielded cable	DPD SUB-D X2
1	Direct transmission	1	Connected	1
2	Direct transmission	2	Connected	2
3 (ANA1)	ANA1: Direct transmission	3 (ANA1)	Connected	3 (ANA1)
4 (ANA2e)	ANA2: positive analogue output ANA2e = Max(Abs(ANA1), Abs(ANA2)) 0 / +10V under 3mA maximum	4 (ANA2)	Connected	4 (ANA2)
5	Direct transmission	5	Connected	5
6	Direct transmission	6	Connected	6
7	Direct transmission	7	Connected	7
8	Direct transmission	8	Connected	8
9	Direct transmission	9	Connected	9
10	Direct transmission	10	Connected	10
11	Direct transmission	11	Connected	11
12	Direct transmission	12	Connected	12
13	Direct transmission	13	Connected	13
14	Direct transmission	14	Connected	14
15	Direct transmission	15	Connected	15
16	Direct transmission	16	Connected	16
17	Direct transmission	17	Connected	17
18	Direct transmission	18	Connected	18
19	Direct transmission	19	Connected	19
20	Direct transmission	20	Connected	20
21	Direct transmission	21	Connected	21
22	Direct transmission	22	Connected	22
23	Direct transmission	23	Connected	23
24	Direct transmission	24	Connected	24
25	Direct transmission	25	Connected	25
Shielding	Direct transmission	Shielding	Connected	Shielding

The electrical connection from the DAD06 module to the DPD is made with a 25 conductor shielded cable. The distance between the DAD06 module and the DPD must not exceed 4 metres. Please refer to the relevant sections of DPD documentation for further information concerning cables and cabling.

6.4 Operating description

The principle used is an estimation of the motor torque and power load rate. It is achieved by measuring the Id instruction for the constant torque area and by measuring the power rating absorbed for the constant power area.

The internal variable, ID SETPOINT, must be assigned to the analogue ANA1 output and the internal variable, POWER, to the analogue ANA2 output. The DAD06 interface transmits the ANA1 output unchanged and carries out a $\text{Max}(\text{Abs}(\text{ANA1}), \text{Abs}(\text{ANA2}))$ operation on its ANA2e output. This is the ID SETPOINT and POWER variable maximum expressed in absolute value.

6.5 Calibration

Example: association of a HW830CH motor and a DPD 100/120

HW830CH motor specifications:

$I_{nom} = 81.8A$ (S1 Service)	$I_{limp} = 100A$ (S6 Service)
$P_{nom} = 27000W$ (S1 Service)	$P_{max} = 32000W$ (S6 Service)

Aim: To obtain an analogue voltage on the ANA2e output of 10 Volts representing 100% of the S6 service motor load rating.

The internal variable, ID SETPOINT, must be assigned to the ANA1 analogue output with a gradient of 100A for 10V (I_{limp} S6 service for 10V), and the internal variable, POWER, to the ANA2 analogue output with a gradient of 32,000W for 10V (P_{max} S6 service for 10V) in order to calibrate the ANA2e output.

Reminder: It is still possible to see the internal variable ID SETPOINT on the ANA1 analogue output.

7. DAD07 - "MOTOR LOAD RATE WITH LOGIC OUTPUT" INTERFACE

7.1 Reminder

This option card is only compatible with the digital DPD motion controller.

It integrates the DAD06 functionality (see section 6 – DAD06) with the addition of:

A logic output whose status change is associated with the load rate level (motor torque and power).

This logic output is accessed via plug-in terminal block.

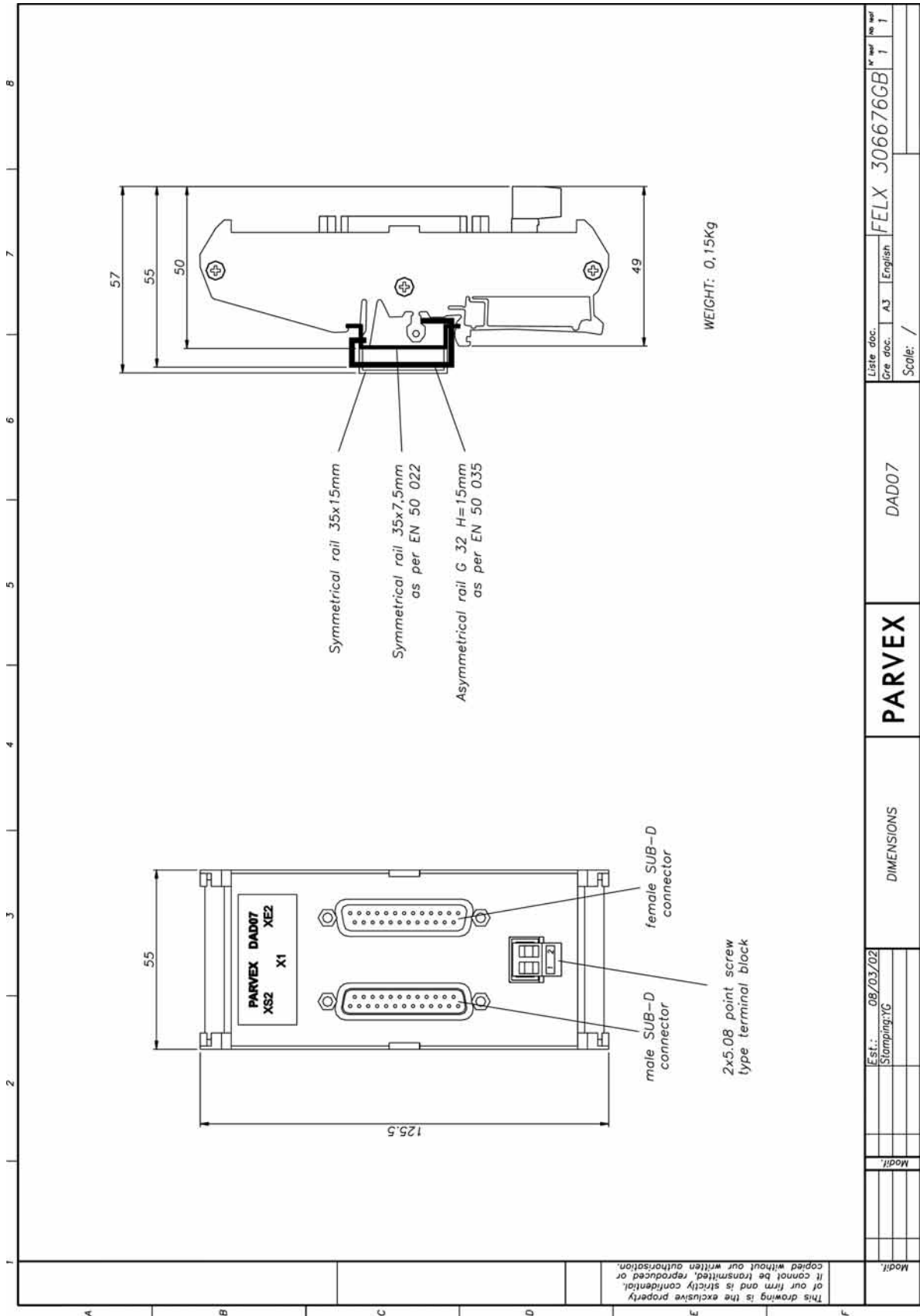
The logic output status is 1 if the DPD load rate is lower than a configuration threshold.

The logic output status is 0 if the DPD load rate is above this threshold.

Parameters for the threshold switchover value can be set by assigning the internal variable, ID SETPOINT, to analogue output 1, and the internal variable, POWER, to the analogue output 2, and by adjusting the gradients of these outputs.

7.2 Dimensions

See plan FELX 306676 on following page



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Modif.										
Modif.										
Est.:	08/03/02									
	Stamping:YG									
DIMENSIONS		PARVEX		DAD07		Liste doc. / Gre doc. / Scale: /		A3 / English		FELX 306676GB

7.3 Connection

Connection from the external medium to the DAD07 module through a SUB-D 25 pin female plug marked XE2 and from the DAD07 module to the DPD (SUB-D marked X2) through a SUB-D 25 pin male plug marked XS2.

DAD07 SUB-D XE2	FUNCTION DAD07	DAD07 SUB-D XS2	Shielded cable	DPD SUB-D X2
1	Direct transmission	1	Connected	1
2	Direct transmission	2	Connected	2
3 (ANA1)	ANA1: Direct transmission	3 (ANA1)	Connected	3 (ANA1)
4 (ANA2e)	ANA2: positive analogue output ANA2e = Max(Abs(ANA1) , Abs(ANA2)) 0 / +10V under 3mA maximum	4 (ANA2)	Connected	4 (ANA2)
5	Direct transmission	5	Connected	5
6	Direct transmission	6	Connected	6
7	Direct transmission	7	Connected	7
8	Direct transmission	8	Connected	8
9	Direct transmission	9	Connected	9
10	Direct transmission	10	Connected	10
11	Direct transmission	11	Connected	11
12	Direct transmission	12	Connected	12
13	Transmission through diode (*)	13	Connected	13
14	Direct transmission	14	Connected	14
15	Direct transmission	15	Connected	15
16	Direct transmission	16	Connected	16
17	Direct transmission	17	Connected	17
18	Direct transmission	18	Connected	18
19	Direct transmission	19	Connected	19
20	Direct transmission	20	Connected	20
21	Direct transmission	21	Connected	21
22	Direct transmission	22	Connected	22
23	Direct transmission	23	Connected	23
24	Direct transmission	24	Connected	24
25	Direct transmission	25	Connected	25
Shielding	Direct transmission	Shielding	Connected	Shielding

(*) +24V customer using XS2 not available

The electrical connection from the DAD07 module to the DPD is made with a 25 conductor shielded cable. The distance between the DAD07 module and the DPD must not exceed 4 metres. Please refer to the relevant sections of DPD documentation for further information concerning cables and cabling.

The unchanged ANA1 channel is transmitted directly.

The ANA2 channel represents an analogue image of the motor load rate, the gradient of which can be configured.

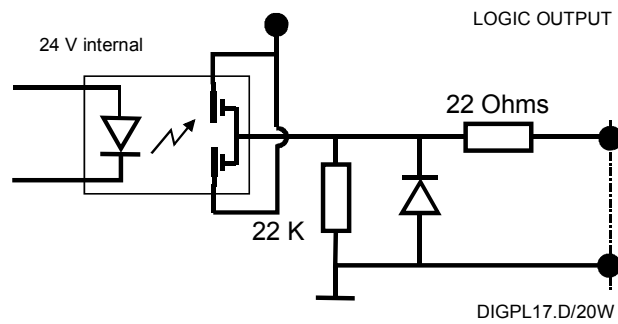
"load rate" logic output:

Connection via 2 pin plug-in terminal block marked X1

DAD07 X1	ROLE	CHARACTERISTICS
1	"load rate" output	optocoupled 24V output 20mA maximum
2	0V customer	

The logic output is powered by a 24V internal power source.

- Maximum output current (level 1) : 20mA
- Residual current (level 0) : negligible
- Response time : approx. 10ms
- Voltage drop for I = 20mA : 1V



7.4 Operating description

The principle used is an estimation of the motor torque and power load rate. It is achieved by measuring the Id instruction for the constant torque area and by measuring the power rating absorbed for the permanent power area.

The internal variable, ID SETPOINT, must be assigned to the analogue ANA1 output and the internal variable, POWER, to the analogue ANA2 output. The DAD07 interface transmits the ANA1 output unchanged and carries out a $\text{Max}(\text{Abs}(\text{ANA1}), \text{Abs}(\text{ANA2}))$ operation on its ANA2e output. This is the ID SETPOINT and POWER variables maximum expressed in absolute value. This data is then compared to a threshold, thus providing terminal block X1 with logic status for a motor load rate.

7.5 Calibration

Example: association of a HW830CH motor and a DPD 100

a) HW830CH motor specifications:

$I_{nom} = 81.8A$ (S1 Service)	$I_{imp} = 100A$ (S6 Service)
$P_{nom} = 27000W$ (S1 Service)	$P_{max} = 32000W$ (S6 Service)

b) The selected threshold objective for the load rate logic output switchover:

80% de P_{max} ($0.8 P_{max}$)

c) Calculation of the gradients to be assigned to the analogue outputs.

Analogue output 1 gradient: (ID SETPOINT)

$I_{imp} = 100A$ - Load rate = **80%** - Gradient = $100 \times 2 \times 0.8 = 160A$

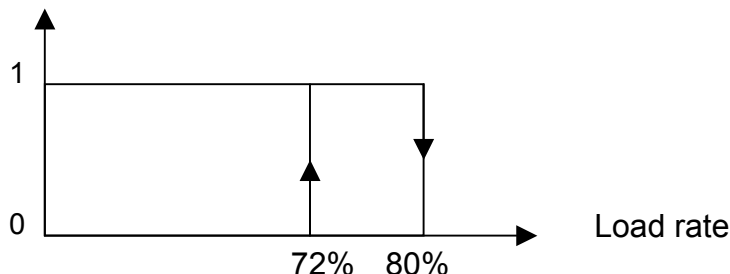
Gradient to be assigned: 160A for 10V

Analogue output 2 gradient: (POWER)

$P_{max} = 32000W$ - Load rate = **80%** - Gradient = $32000 \times 2 \times 0.8 = 51200W$

Gradient to be assigned: 51200 W pour 10V

d) Switchover – Diagram
Logic output



It is possible to see:

- the ID SETPOINT variable on analogue output 1,
- the load rate image variable with a gradient of 51200W for 10V in the permanent POWER area on analogue output 2,
- status 1, if the motor load rate is less than 80%, and status 0, if the load rate is higher than 80%, on the logic output,