

ROTAPANEL CE	
● ser. No. <input type="text"/>	manufactured <input type="text"/>
<input type="text"/> W	type <input type="text"/>
Serial #:	

ROTA[®] The moving sign PANEL

PATENTED / ALL RIGHTS RESERVED

MANUAL RP-2000 TRAFFIC

version : 3.2
product : ROTAPANEL 2000
date : 1-6-2006
issued by : Rotapanel International b.v., Plutoweg 2,
tel +31 58 2880000, Leeuwarden, The Netherlands



ROTA
The moving sign
PANEL
HOLLAND TEL +31 (0) 58 288 00 00

ROTAPANEL®

BEFORE YOU ASSEMBLE AND MOUNT YOUR ROTAPANEL THINK ABOUT THE FOLLOWING!

1. Poor mounting will always result in problems and premature wear of the parts.
2. It is extremely important that the top and drive beams are mounted completely horizontally and parallel, and that they do not tip forwards or backwards, or warp.
3. Always mount a rigid back cover behind the sign, preventing wind turbulence and light shining through the prisms. The vertical gaps on the left and right must also be enclosed.
4. Ensure that there are no bolts or nuts inside the drive shaft after assembly that could get in the way of the rotating parts.
5. Please consider chapter 3 for the construction.
6. Check that there is a sufficient and equal gap between all the prisms. Check all three faces. If necessary, remove vinyl and paper cuttings from the gap.
7. Most units of measurement used in this installation guide are metric.
1 inch = 25.4 mm
1 foot = 304.8 mm

CONTENTS

page

1. INTRODUCTION	
1.1 general	5
1.2 safety	5
2. TECHNICAL SPECIFICATION	
2.1 general	6
2.2 RP-2000 control unit	6
2.3 operation/response parallel	7
2.4 operation/response serial computer communication	7
2.5 operation/feedback Profibus	7
2.6 remote control GSM	7
3. SUPPORTING CONSTRUCTION AND MOUNTING	
3.1 Supporting construction/mounting	8
3.2 Principle sketches	8
3.3 Calculations on strength and stiffness	9
3.4 Prisms > 3500 mm	9
3.5 Principle drawings	9
4. OPERATION/CHANGING SETTINGS	
4.1 top view of control unit RP-2000	11
4.2 setting traffic application parallel control	11
4.3 setting traffic application, control via RS-485	11
4.4 setting node/address for RS-485	12
4.5 setting traffic application, control via RS-485 with switching external lighting	12
4.6 setting of manual Profibus wobble test (WBT CW/CCW)	12
4.7 explanation of the LED functions	13
5. REMOTE CONTROL	
5.1 optional: parallel by means of external 12-230 VAC/VDC lead	14
5.2 standard: serial control RS-485	14
5.3 optional: operation/feedback Profibus	14
5.4 bit definitions pertaining to Profibus GSD-file RP092B.GSD	15
5.5 truth table Profibus manual operation	15
5.6 connection Profibus manual operation	15
6. CONNECTING DIAGRAMS	
6.1 connecting diagram: serial RS-485 / wide-range / manual	16
6.2 connecting diagram Profibus	17
6.3 connecting diagram multi DC 12-48 VDC	18
6.4 connection(s) connectors	19
7. ASSEMBLY ROTAPANEL FRAME	
assembly Rotapanel frame	29
sealing the gaps	30
8. REPLACING/GLUEING ON IMAGES	
8.1 solid version	31
8.2 split version (not over the road)	31
8.3 installation of images	31
9. PARTS LIST / MAINTENACE	
9.1 images	32 - 33
9.2 maintenance instructions	34
10. FAILURE	35
11. MANUAL OPERATION BY MEANS OF MECHANICAL MANUAL OPERATION (OPTIONAL)	36
12. MANUAL ROTATION	37
13. COMMISSIONING INTO OPERATION	37
14. TROUBLE SHOOTING	38

In spite of the attention given to drawing up this RotaPanel manual, RotaPanel International bv shall not be liable for any inaccuracy it may contain. Subject to alteration.

1 INTRODUCTION

1.1 GENERAL

A ROTAPANEL consists of a frame containing a range of triangular prisms positioned side by side. The prisms rotate around their longitudinal axes by means of an electronically controlled motor; the three sides are manipulated by the control system as three units. Thus, three independent image surfaces are created that can be controlled in terms of side blocking and stop time. In addition, the number of sides can be selected. If several panels are used, they can be connected master-slave, which makes it possible to create special effects. The electronics can be remotely controlled and give a response signal from the side displayed.

Electronic built-in units are not provided with control panels; see page 13 for explanation of LEDs.

1.2 SAFETY

Every Rotapanel must be installed so that it is out of reach of persons. When installed within reach of persons, it has to be covered in such a way as to ensure that the rotating parts can never be touched. A mechanically operated slip clutch has been incorporated into the system, ensuring that in the event of overload or blocking the prisms slip. If for any reason the slip clutch operates longer than the time set in the factory, the electronic controller switches off the system temporarily. After a while the system is re-started. If it appears that the system is still blocked, the procedure is repeated. If a certain number of repeat procedures is exceeded, the system will be stopped for a longer period.

Rotapanel bv. ,Plutoweg 2, 8938 AB LEEUWARDEN, THE NETHERLANDS
Phone: +31 58 288 00 00 / Fax:+31 58 288 28 30
E-mail: info@rotapanel.com / Website: <http://www.rotapaneltraffic.com>

Please check our website for the latest version of the manual
<http://www.manualrotapanel.com>

2 TECHNICAL SPECIFICATION

2.1 GENERAL

The model plate, on the bottom left side of the Rotapanel, indicates:
Year of construction, serial number, model number, voltage and frequency.

Standard data electrical system:

230 VAC $\pm 25\%$, 50 Hz. / 110 VAC $\pm 25\%$, 60 Hz

Maximum power input depending on type of motor, see model plate.

Width of prisms:

Standard 100 mm solid, optional 125 mm and 160 mm (160 mm fits only at Profile Type No. 2)

Frame:

Standard 124 mm wide, 113 mm deep, optional Profile Type No. 2 = 124 mm wide and 148 mm deep

Method of rotation:

turning of prisms in one motion

Supporting structure:

Rotapanel frames larger than 200 x 200 cm are not self-supporting and require a supporting steel structure.

2.2 RP 2000 CONTROL UNIT

• RP-2000

- 230 VAC $\pm 25\%$, 50 Hz
- 110 VAC $\pm 25\%$, 60 Hz
- Motor connected by optically separated Triak controller
- Internal voltage : +5VDC + 12 VDC
- Frequency : 50 - 60 Hz
- Switch-on current : < 16A peak at 115 Vac
: < 8A peak at 230 Vac
- Input current : 1.5A max. (RMS) at 115 Vac
- Hold-up time : 10 ms at 115/230 VAC
- Ambient temperature : -20 °C to +50 °C. At temperatures under -20 °C, you will have to order a control box heating system; for temperature over +50 °C control box cooling is required.

• RP-2000 MULTI DC (optional)

- 12 – 48 VDC
- Motor connected by optically separated Transistor controller
- Internal voltage : +5VDC + 12 VDC
- Current of controller : 2 Ah/day approx
- Current of controller : 0.5 Ah/day approx (optional powersavingunit)
- Ambient temperature : -20 °C to +50 °C. At temperatures under -20 °C, you will have to order a control box heating system; for temperature over +50 °C control box cooling is required.

- EMC directives:

- The unit complies with the following EMC-directives: 89/336 EEG EN50081-1 and EN50082-1
- Connection probes/status sensors (12Vdc power supply)
 - Connection for remote control through 12-230Vac/Vdc
 - Connection for remote control through RS-485
 - Position and error response by means of floating contacts (optional)
 - Connection external lighting by means of floating contact (optional)
 - Connection remote control via RS-232 (optional)

The Rotapanel prisms rotate both anti-clockwise and clockwise; therefore the shortest route is taken on new demand.

2.3 OPERATION/RESPONSE PARALLEL (OPTIONAL)

- inputs : 12-230 Vac/Vdc
- outputs : maximum of 400 Volt 5A (floating)
- control : pulse minimally 500 ms or permanent contact
- vibration protection : 500 ms
- connections : sides A, B, C and common (inputs)
sides A, B, C and common (outputs)
error and return (output)
lighting and return (output)

Attention:

With the inputs, no connection in series may be made. A series connection will lead to damage.

2.4 OPERATION/RESPONSE SERIAL COMPUTER COMMUNICATION:

- Communication : RS-485
- Number of stations : maximum of 63
- Communication cable : two-wire twisted pair all shielded
- Connection : two-wire multi-drop positive/negative + shield
- Insulation resistance : 3kVDC at 1000 M Ω min. (EN60950 and EN41003)
- Reaction time : minimum 3 ms, maximum 40 ms depending on the number of nodes
- Maximum cable length : RS-485 1200 m
between stations : optional glass fiber 2500 m.
- terminal resistance : 120 Ω 0,25 Watt (standard on basic print)
- Transmission speed : 2400 bps, 8,1,1, N (Fixed) / other speeds on request
- Transmission safety : BC-check

All stations can be controlled independently of each other.

2.5 OPERATION/FEEDBACK PROFIBUS (OPTIONAL)

- network : PROFIBUS DP
- GSD-File : RO092B.GSD
 - 2 wire RS-485 + shield
 - Transmission speed(s) 9.6 kbit/s, 19.2 kbit/s, 45.45 kbit/s, 93.75 kbit/s, 187.5 kbit/s, 500 kbit/s, 1.5 Mbit/s, 3 Mbit/s, 6 Mbit/s .
 - Min. slave interval 0.1 ms
 - Onboard termination jumper
 - Address change jumper
- inputs : 1 x POWER FAIL (12-230 Vac/Vdc)
2 x sensor power fail detection
- outputs : 1 x lighting (maximum 400 Volt 3A (potential free))
1 x lighting (maximum 400 Volt 3A (potential free))
1 x Serial RS-485 OPTION BUS incl. onboard termination

Connections main-board if equipped with Profibus option board:
input(s) binary. 1, 2, WBT(wobble test)

See also <http://www.profibus.com>

2.6 REMOTE CONTROL GSM (OPTIONAL):

- Communication : RS-485
- Transmission speed : 9600 bps
- Transmission safety : CR-check

3 SUPPORTING CONSTRUCTION AND MOUNTING

3.1 SUPPORTING CONSTRUCTION/MOUNTING:

The Rotapanel must always be mounted perfectly horizontally and vertically.

The aluminium frame of the Rotapanel is **not** self-supporting above 200 cm width and 200 cm height. Above this size, the Rotapanel must be supported with a steel construction at its rear; with wall assembly, the supporting profiles can be fitted on the wall. Irregularities in the support can be corrected with shims. In addition, the support must be so strong and stiff that the requirements of accuracy of form (see paragraph 3) on the Rotapanel are met under all circumstances, e.g. wind and temperature.

The assembly must be such that the aluminium Rotapanel frame can expand and contract freely with respect to the steel supporting construction, so that differences in the coefficients of expansion between the steel and aluminium do not cause problems. See the principle sketch in paragraph 3.5

To prevent the wind from driving the Rotapanel, the wind may not be allowed to flow through the Rotapanel. If the Rotapanel is not placed against a closed wall, a closed rear wall **must** be mounted. The rear plate must be mounted 5 to 10 cm from the prisms so that they can rotate freely under all circumstances, e.g. wind. When the rear plate is mounted, there are vertical openings on the left and on the right. The vertical sides of the rear plate must also be closed off.

When a steel supporting construction is used, electrical insulation must be placed between the aluminium Rotapanel frame and the steel of the supporting construction, to prevent electrochemical corrosion. Thermally zinc-plated supporting constructions are sufficiently insulated by the zinc coating. The material of the mounting hardware must be stainless steel, unless they do not come into contact with the aluminium Rotapanel frame.

WARNING:

Never mount lamps or lamp brackets on the aluminium Rotapanel frame beams or directly on the steel supporting construction on which the Rotapanel is mounted. This forbidden working method will cause impermissible deformations with hard winds. Therefore, always use the rear construction or wall for the lamp fixture.

WARNING:

Never move/mount a Rotapanel with the prisms/prisms in the frame. Mount the aluminium frame on or in the construction first and then fit the prisms.

3.2 PRINCIPLE SKETCHES

Principle sketches are given on pages 20-27 for the mounting of your Rotapanel against a wall or steel construction with angle profiles.

WARNING:

The sketches give only principles. The number of fixing points, spans and material thicknesses must always be calculated. All guarantees become null and void if a calculation is not made.

3.3 CALCULATIONS ON STRENGTH AND STIFFNESS

To calculate the support on strength and stiffness, static loads such as the weight of the Rotapanel must be used (see the bottom right of the drawing supplied by Rotapanel) and especially dynamic loads such as wind. Furthermore, attention must be paid to possible settling and sagging, as a result of temperature changes.

After mounting, lower and upper aluminium beams of a Rotapanel must remain parallel to each other; they must be mounted perfectly horizontally and vertically and remain sufficiently straight and not or hardly twist.

The following tolerances must be used for the calculation:

Parallelism:

The parallelism of the lower and upper aluminium beams must be better than 0,15 degrees (approx 10,5 mm at 4000 mm or approx 7/16" at 13' 1/2")

Straightness:

The straightness of the lower aluminium beam must be better than 0,08 degrees (approx 5,5 mm at 4000 mm or approx 3/16" at 13' 1/2")

Twisting:

The angular tolerance of cross-sections of lower and upper aluminium beams with respect to the plane through the beam centre lines is 0,15 degrees maximum. (approx 10,5 mm at 4000 mm or approx 7/16" at 13' 1/2")

Only 40% of the tolerances may be attributable to dynamic phenomena such as wind, weight and temperature changes.

Values above are maximum ratings.

For the Rotapanel XL type, same values are valid for mounting the T-profile.

3.4 PRISMS > 3500 mm:

On regions that have frequent wind speed of > 20 meters per second (approx 44.72 miles per hour) and the prisms are > 3500 mm a girder must be placed in the middle and 15 mm behind rear of the prisms.

3.5 PRINCIPLE DRAWINGS (1 to 9, to assist you with mounting your Rotapanel)

Drawings 1 and 2 together: (page 20 and 21)

Are the most-used methods for mounting your Rotapanel. (Profile Type No.1) The mounting sets are free of charge and are supplied with your Rotapanel.

Drawing 3: (page 22)

Is only for mounting with special mounting plates; this is an extra strong form of mounting. We can only supply these mounting plates at extra cost if they are ordered before production.

Drawing 4: (page 23)

Is a special drawing for the hole sizes of a Rotapanel with 100 mm prisms and a pitch of 104.9 mm. Mounting sets are free of charge and are supplied with your Rotapanel.

Drawing 5: (page 24)

Is a special drawing for the hole sizes of a Rotapanel with 125 mm prisms and a pitch of 129.9 mm. Mounting sets are free of charge and are supplied with your Rotapanel.

Drawings 6, 7 and 8: (page 25 – 27)

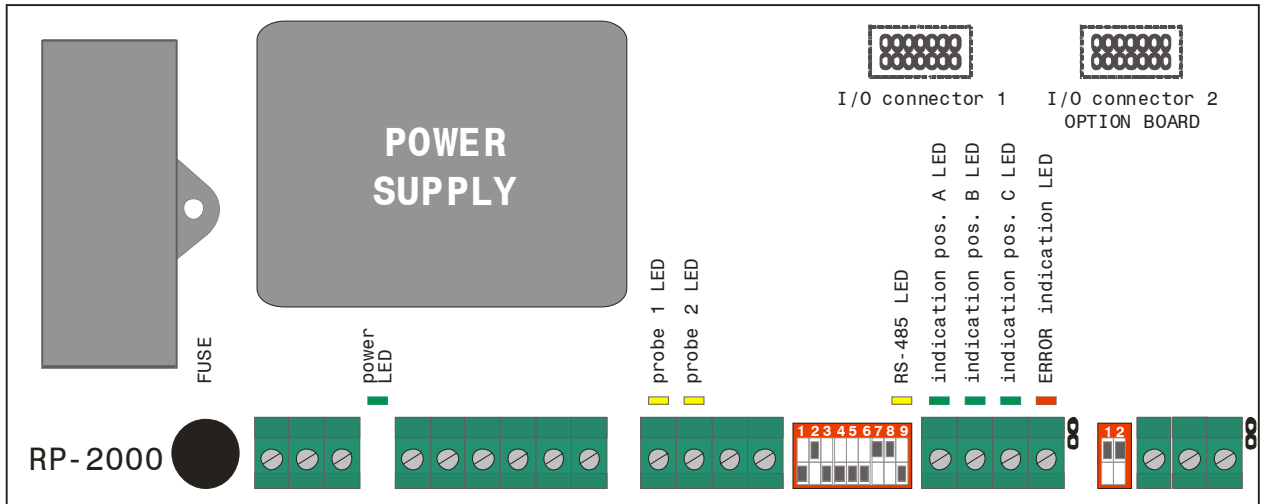
Are the most-used methods for mounting your Rotapanel Profile Type No 2. The mounting sets are free of charge and are supplied with your Rotapanel.

Drawing 9: (page 28)

Overview of Rotapanel technology.

4 OPERATION/CHANGING SETTINGS

4.1 TOP VIEW OF CONTROL UNIT RP-2000



4.2 SETTING TRAFFIC APPLICATION WITH PARALLEL CONTROL

If you wish to control the unit by means of 12-230 Vac/Vdc and if the unit should only rotate on your command, place the switches in the positions shown below.

Number	Switch
1	UP
2	Down
3	Down
4	Down
5	Down
6	Down
7	UP
8	UP
9	Down

4.3 SETTING TRAFFIC APPLICATION WITH CONTROL VIA RS-485

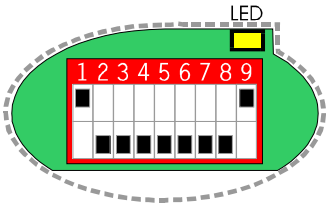
If you wish to control the unit by means of RS-485, if desired in combination with manual control, then switch 9 must be switched up. If switch 9 is in the right position, the yellow LED will light up.

Number	Switch
1	Down
2	Down
3	Down
4	Down
5	Down
6	Down
7	Down
8	Down
9	UP

4.4 SETTING NODE/ADDRESS FOR RS-485

You can change the node/address of the unit via the first 6 switches (provided the yellow LED is on).

Number	Address/node
1	1
2	2
3	4
4	8
5	16
6	32
7	Down
8	Down
9	UP



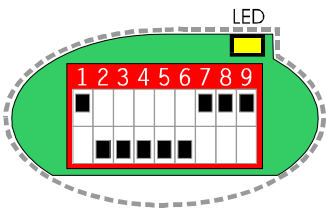
The values relating to switches 1 through 6 have been included in the table above. If you switch up various switches, you can add up the values. N.B.: you always have to choose an address, so at least one of the switches 1 through 6 must be up.

Example: switches 2, 3 and 6 are up, the address will then be $2 + 4 + 32 = 38$.

4.5 SETTING TRAFFIC APPLICATION WITH RS-485 CONTROL AND SWITCHING OF THE EXTERNAL LIGHTING

If you also want to use the RS-485 control system to switch on the external lighting on or in your Rotapanel, this can be done by installing an optional mountable print. Switching takes place via a floating contact; response is through the RS-485.

Number	Switch
1	Down
2	Down
3	Down
4	Down
5	Down
6	Down
7	UP
8	UP
9	UP

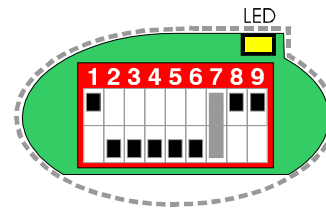


Changing the node/address of the unit is done in the way described for the standard RS-485 control system.

4.6 SETTING OF MANUAL PROFIBUS WOBBLE TEST (WBT CW/CCW)

If you carry out a wobble test with Profibus by means of manual control (see p. 8) then you may alter the direction of rotation of the wobble test by means of dipswitch 7 (high = CW, low = CCW).

Number	Switch
1	UP
2	down
3	down
4	down
5	down
6	down
7	UP/DOWN (CW/CCW)
8	UP
9	UP



4.7 EXPLANATION OF THE LED functions

To be able to read the status of the control unit, the electronic control print is provided with a number of LEDs; see 4.1 on page 11 for the positions of the LEDs.

- 1) Power LED, colour green; this LED is on when a voltage is applied to the unit.
- 2) Probe 1 LED, colour yellow; this LED is on when the right sensor makes contact.
- 3) Probe 2 LED, colour yellow; this LED is on when the left sensor makes contact.
- 4) RS-485 LED, colour yellow; this LED is on when the RS-485 mode has been selected; see 4.3
- 5) indication pos. A LED, colour green; this LED can burn and flash in various ways:
 - burning continuously : a side has been selected manually or via the remote control.
 - flashing quickly : the unit is under way towards the relevant side.
 - flashing slowly : the unit halts at the relevant side.
- 6) indication pos.A LED, colour green; this LED can burn and flash in various ways:
 - burning continuously : a side has been selected manually or via the remote control.
 - flashing quickly : the unit is under way towards the relevant side.
 - flashing slowly : the unit halts at the relevant side.
- 7) indication pos.A LED, colour green; this LED can burn and flash in various ways:
 - burning continuously : a side has been selected manually or via the remote control.
 - flashing quickly : the unit is under way towards the relevant side.
 - flashing slowly : the unit halts at the relevant side.
- 8) Error indication LED, colour red; this LED will light up in the event of an error; see section 4,page 11
- 9) If I/O connector 1 is connected to a panel with external visual indication:
 - Status GREEN/LED Red in error situation. See 4.1 page 11

NOTE: If necessary it is possible to convey a visual indication to the outside (e.g. as indication on a local control panel) by means of I/O connector 1. For this, please check with Rotapanel International bv. In case of a Profibus unit: A status blinking green LED for 15 seconds indicates that the wobble test was properly carried out e.g.

5 REMOTE CONTROL

5.1 OPTIONAL: PARALLEL BY MEANS OF EXTERNAL 12-230 VAC/VDC LEAD

For connection see the diagram on page 16. The switches on the control unit are to be switched as described in paragraph 4.

Attention:

The diagram may not be deviated from. Otherwise, damage will be caused to the unit.

If you want to display a particular side, energize the relevant input of the control system. The Rotapanel will then turn to that side; this is done via the shortest route. When the desired side is displayed, a response signal will be given on the floating outputs. The floating connections can handle a maximum voltage of 400 V and 5A current; do not exceed these values.

The following connections are available on the mountable print:

Control:

- Sides A, B, C wide range input with 1 common

Acknowledge:

- Sides A, B, C and common (outputs), relay contact with 1 common

- Error and return relay contact.

- Lighting and return relay contact.

With parallel control no more options are available.

Control can take place via a pulse of at least 500 ms or a permanent contact.

5.2 STANDARD: SERIAL CONTROL RS 485

The serial interface of the RP-2000 is a standard two-wire multi-drop positive/negative + shield RS-485. The terminal resistor of 120Ω 0,25 Watt is a standard feature of the basic print. For terminating the bus segment, place the jumper on the extreme right (termination, only the last unit on the bus *and at the transmitter side of the bus segment*).

For specifications see section 2.4.

The serial interface of the RP-2000 has been designed so as to ensure that control from the central control system can be simply realized.

Serial communication is possible with a user-defined protocol (optional) or by a protocol already present. In principle, all operations and information can be obtained serially.

5.3 OPTIONAL: OPERATION/FEEDBACK PROFIBUS

With the RP-2000 Profibus electronics you may enter:

Side A, side B, side C, wobble test 1, wobble test 2 and lighting

Depending on the entered input and/or circumstances, you will receive the following feedback message:

- Lighting:
- Sign on side A, B or C
- Wobble test OK
- Error in power supply (power fail)
- Power fail of sensor 1 or 2
- Error in wobble test
- General error message
- Manual operation activated (manual operation always overrides other commands!)

5.4 BIT DEFINITIONS PERTAINING TO PROFIBUS GSD-FILE RP092B.GSD

OUTPUT		INPUT	
BIT 0	LIGHTING	BIT 0	SIDE A
BIT 1	SIDE A	BIT 1	SIDE B
BIT 2	SIDE B	BIT 2	SIDE C
BIT 3	SIDE C	BIT 3	WOBBLE TEST 1
BIT 4	WOBBLE TEST OK	BIT 4	WOBBLE TEST 2
BIT 5	POWER FAIL	BIT 5	LIGHTING
BIT 6	PWR. FAIL SENSOR 2	BIT 6	N/A
BIT 7	PWR. FAIL SENSOR 1	BIT 7	N/A
BIT 8	WOBBLE TEST ERROR		
BIT 9	WOBBLE TEST ACTIEF		
BIT 10	ERROR		
BIT 11	MANUAL OPERATION ACTIVATED		
BIT 12	N/A		
BIT 13	N/A		
BIT 14	N/A		
BIT 15	N/A		

5.5 TRUTH TABLE PROFIBUS MANUAL OPERATION

INPUT	1	2	WOBBLE TEST
LAST STATE	0	0	X
SIDE A	1	1	X
SIDE B	0	1	X
SIDE C	1	0	X
WOBBLE TEST	X	X	1

5.6 CONNECTION PROFIBUS MANUAL OPERATION

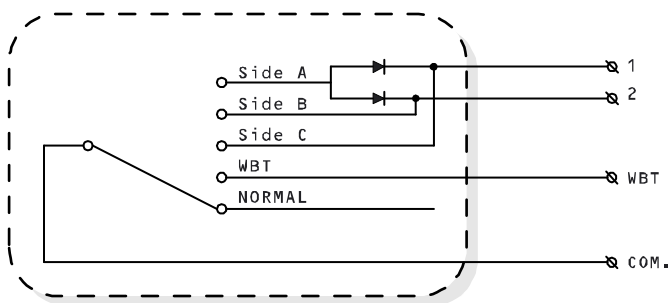
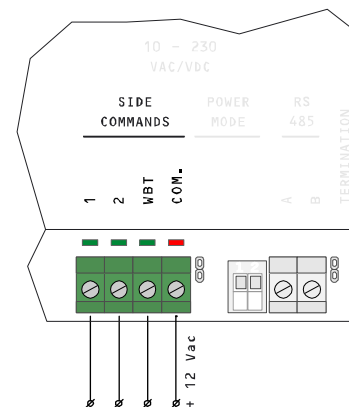


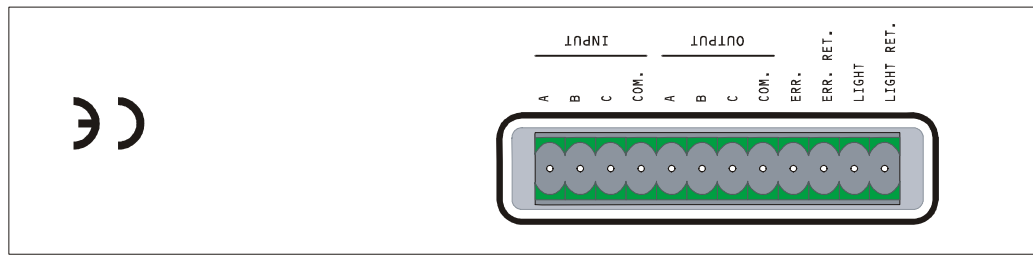
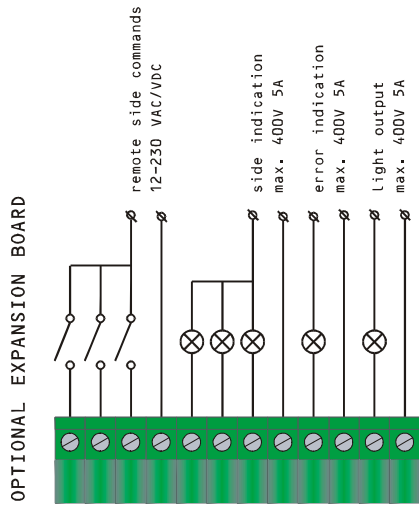
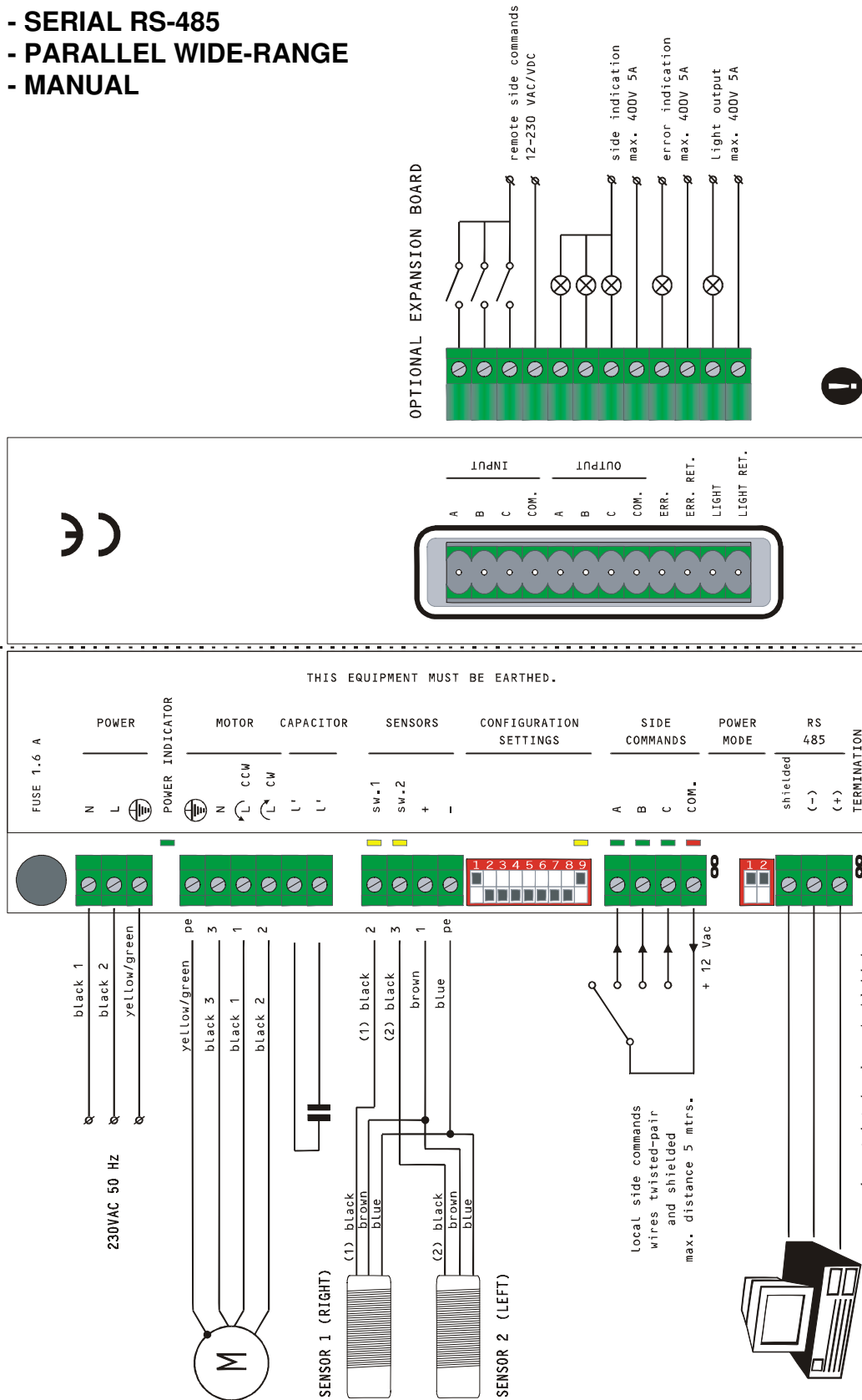
Fig. Manual rotary switch



6 CONNECTIONS

6.1 CONNECTION

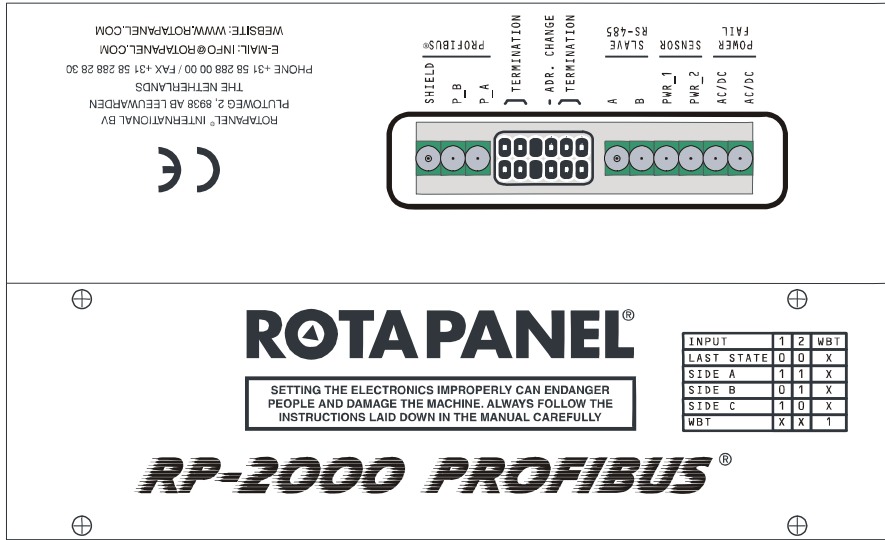
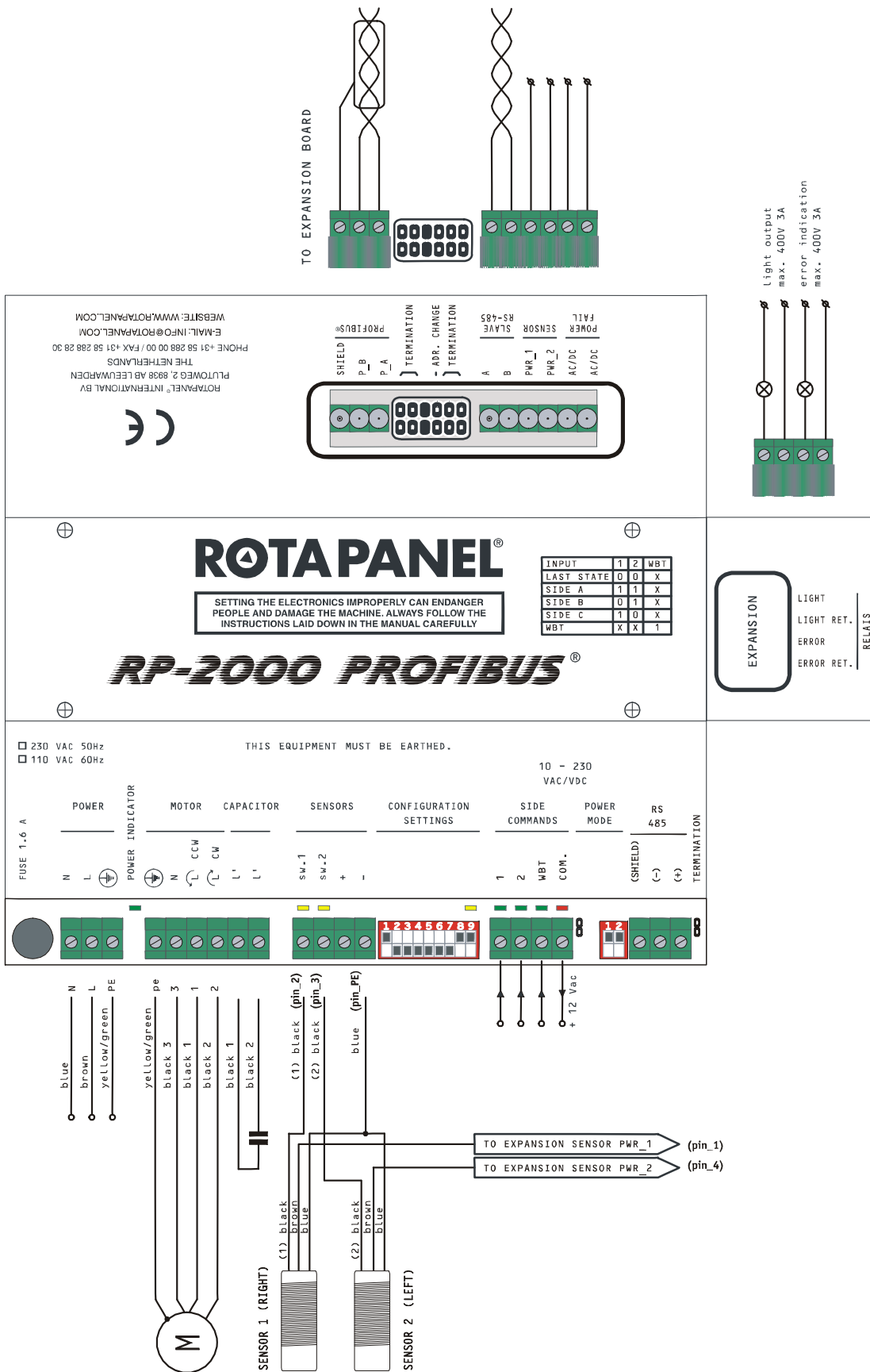
- SERIAL RS-485
- PARALLEL WIDE-RANGE
- MANUAL



Client	RP-2000
Code	RP-2000
Proj. Eng.	
Date	

Warning !
The low power cables like sensor and communication (RS-485), should not be running parallel with high power cables.

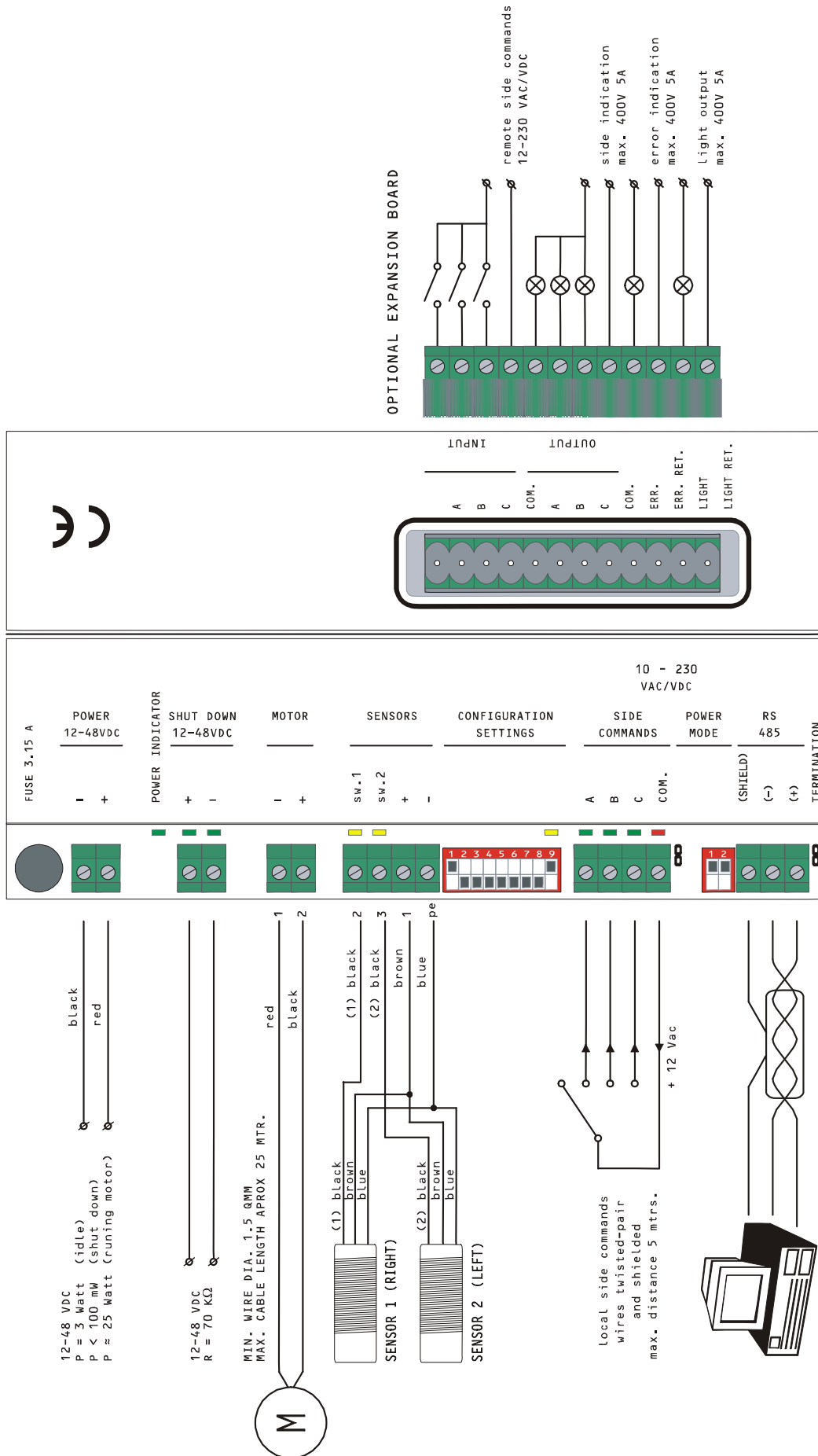
6.2 CONNECTIONS PROFIBUS



Client :
 Code :
 Proj. Eng. :
 Date : 1-1-2005

File :
 //Server/Aansluit_profibus_2005.ai

6.3 MULTI DC 12-48 VDC

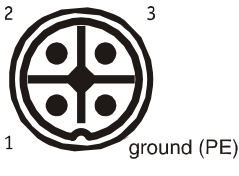


6.4 CONNECTION(S) CONNECTORS

Motor connector:

- Hirschmann CA 3LS(M)

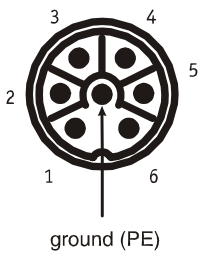
pin.	connection
1	L-ccw (black 1)
2	L-cw (black 2)
3	N (black 3)
ground	ground (green/yellow)



Sensor connector:

- Hirschmann CA 6LD(FM)

pin.	connection
1	sensor + (brown)
2	sensor SW_1 (black)
3	sensor SW_2 (black)
4	N/A
5	N/A
6	N/A
ground	sensor - (blue 2x)



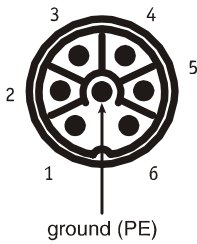
Please note!

RP-2000 Profibus type has a different sensor connection

Sensors RP-2000 PROFIBUS

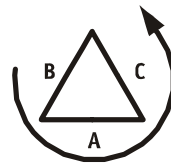
- Hirschmann Ca6 LD (FM)

pin.	connection
1	sensor + SW_1 (brown)
2	sensor SW_1 (black)
3	sensor SW_2 (black)
4	sensor + SW_2 (brown)
5	N/A
6	N/A
ground	sensor - (blue 2x)



Side indication sensors at motor and sensor left (standard)

Side	Left Sensor (SW2)	Right Sensor (SW1)*
A	1	1
B	1	0
C	0	1
-	0	0



1) Marked sensor

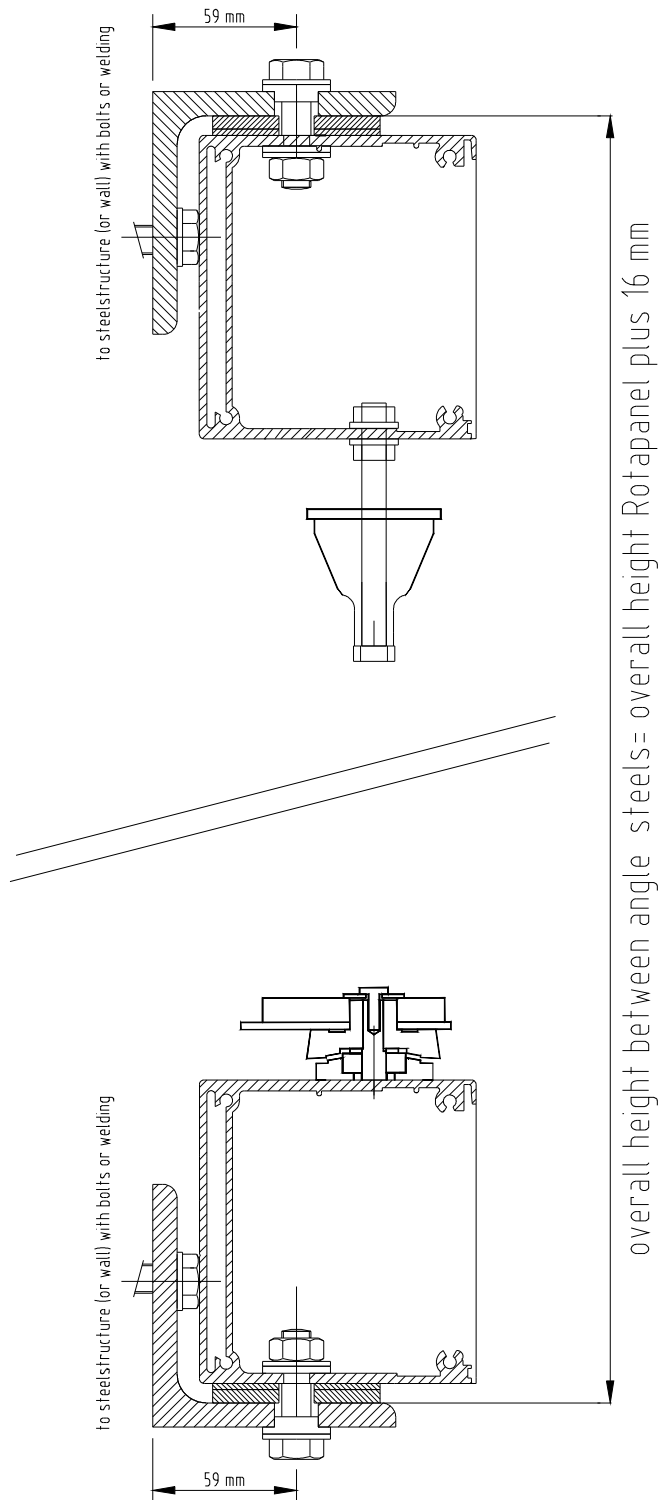
Warning!

If motor and sensor are located to the right, due to right hand side mechanical manual operation (at customers's request), then sides B and C are reversed. If you want to change this direction then please swop wires L-cw and L-ccw of the motor and swop the wires of the sensor SW_1 and SW_2!

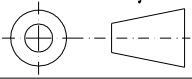

PRINCIPAL DRAWING NO. 1

This drawing helps you calculate the measure between the bottom and top angle steel.

This construction drawing is only a principle drawing. Thus, the number of mounting brackets, fastening points, span length and material thicknesses must always be calculated by a constructor!!



PROFILE 1

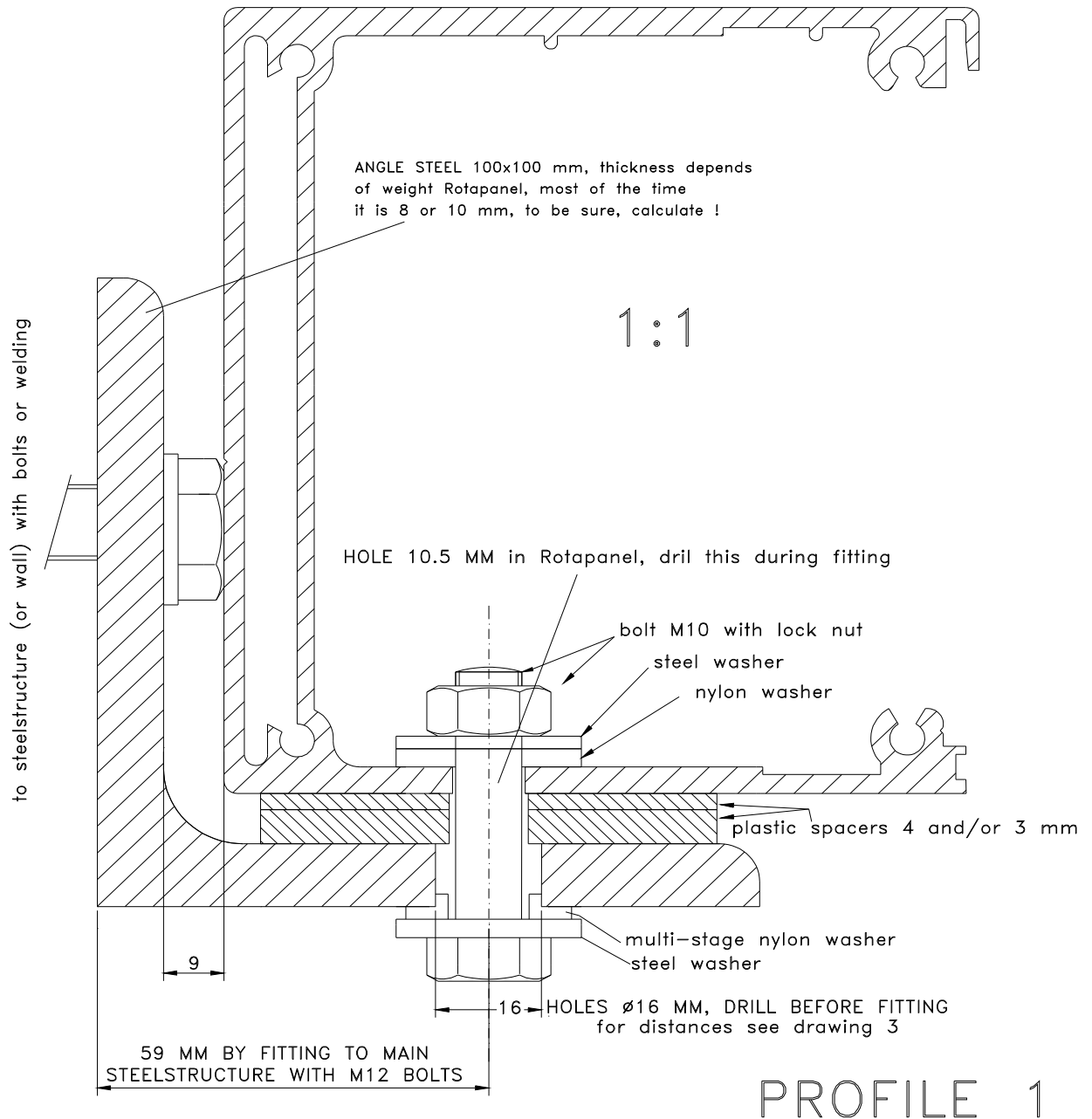
		nummer	Vorm- en Plaats toleranties volgens NEN3311
Amerikaanse Projectie 	Schaal 1:3	Getekend: 30-05-2006	
	Maateenheid:	Gezien:	
Datum:	Benaming PRINCIPAL DRAWING 1		
Opmerkingen:			

PRINCIPAL DRAWING NO. 2

THIS PRINCIPAL DRAWING IS THE MOST USABLE,
FOR BOTTOM AND TOP FITTING.

The special assembling set eliminates the expansion differences between steel structure/aluminium RotaPanel, the spacers handle the electrical isolation.

This construction drawing is only a principle drawing. Thus, the number of mounting brackets, fastening points, span length and material thicknesses must always be calculated by a constructor!!



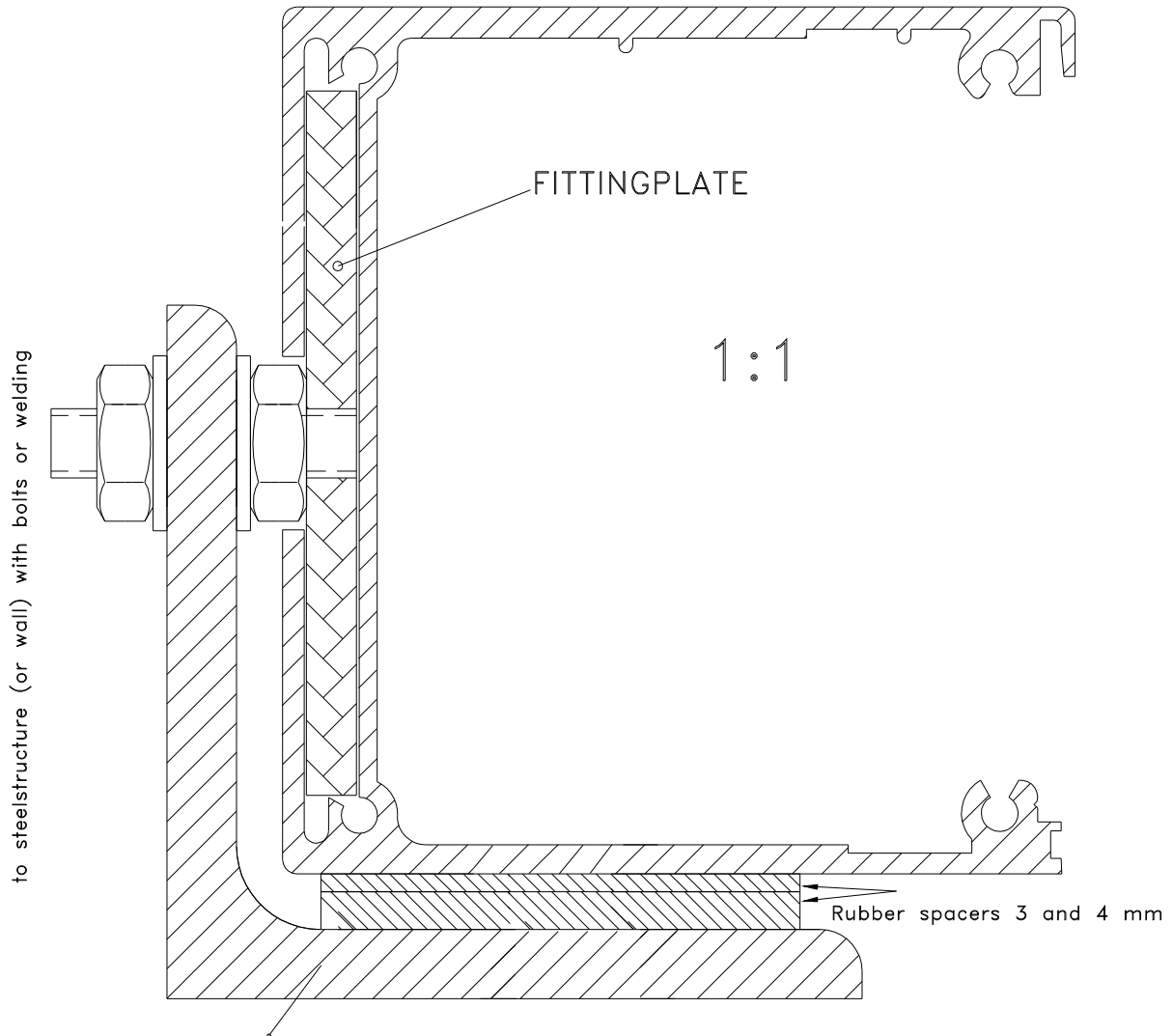
With each RotaPanel delivered, it is also delivered a free fitting set. Wich includes: bolts, nylon washers and spacers.

		nummer	Vorm- en Plaatoleranties volgens NEN3311
Amerikaanse Projectie	Schaal 1:1	Gefekend: 30-05-2006	
	Maateenheid:	Gezien:	
	Datum:		
Opmerkingen:	Benaming PRINCIPAL DRAWING 2		

PRINCIPAL DRAWING NO. 3

THIS PRINCIPAL DRAWING IS ONLY SUITABLE,
BY USING STEEL FITTINGPLATES, YOU MUST ORDER THIS PLATES B E F O R E PRODUCTION.

For calculating distances between angle steels and total fitting plan, look Drawing 2



ANGLE STEEL 100X100MM, thickness depends on the weight of the Rotapanel. The mostly used is a thickness of 10 and 12 mm. When fittingplates are used, for sure calculate always.

This construction drawing is only a principle drawing. Thus, the number of mounting brackets, fastening points, span length and material thicknesses must always be calculated by a constructor!!

SPACERS HANDLE ALSO ELECTRICAL ISOLATION.

PROFILE 1

		nummer	Vorm- en Plaatsteranties volgens NEN3311
Amerikaanse Projectie	Schaal 1:1	Getekend: 30-05-2006	
	Maateenheid:	Gezien:	
Opmerkingen:	Datum:	Benaming	
		PRINCIPAL DRAWING 3	

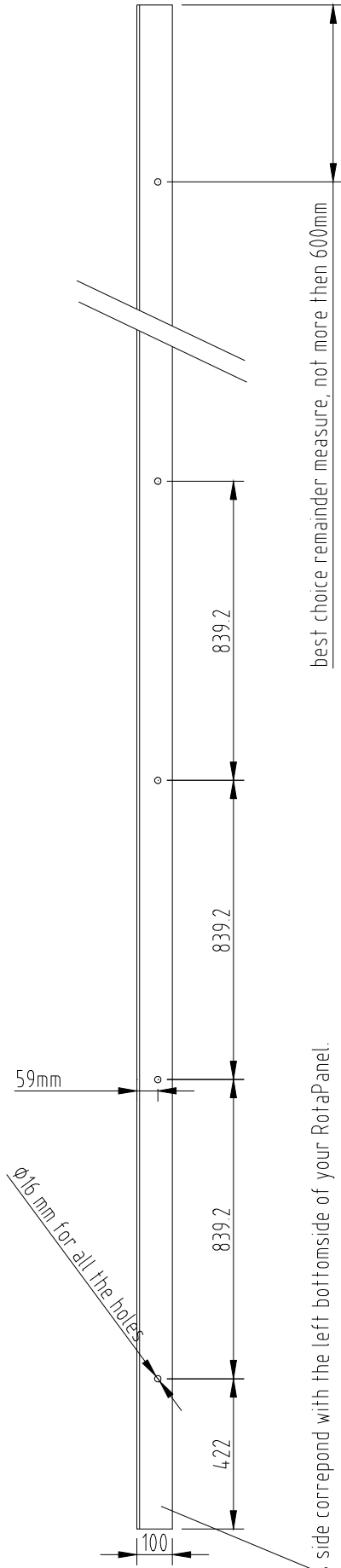
PRINCIPAL DRAWING NO. 4 (100 mm prisms 104.9)

This is the principal drawing with hole dimensions of the bottom and top angle steel for prism distance of 104.9 mm., check this distance in your drawing !

Combine this drawing with drawing 1, 2 or 6, the number depends of the size and type of your RotaPanel

Angle steel 100x100x? mm ,for top and bottom fitting of your RotaPanel.

For the fixing to the wall or steelstructure you must use the same places and distances between holes thus duplicate the holes in the other angle steel vertical flange.



This side correspond with the left bottomsides of your RotaPanel.

Attention: If you do not use this hole shedule, you can drill in the mechanism !!!!

This construction drawing is only a principle drawing. Thus, the number of mounting brackets, fastening points, span length and material thicknesses must always be calculated by a constructor!!

Amerikaanse Projectie 	nummer Gefekend: 30-05-2006 Benaming PRINCIPAL DRAWING 4	

PROFILE 1

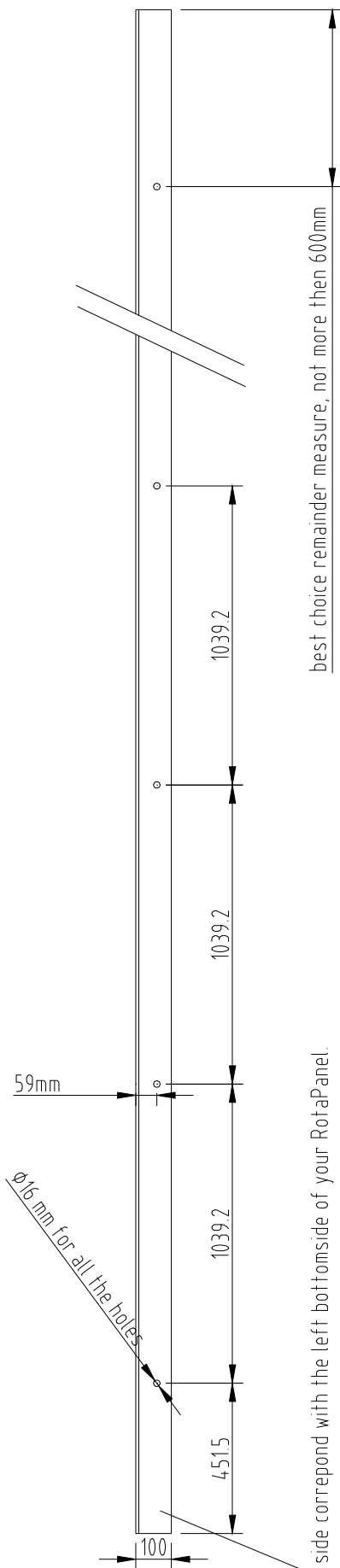
PRINCIPAL DRAWING NO.5 (125 mm prisms steek 129.9)

This is the principal drawing with hole dimensions of the bottom and top angle steel for prism distance of 129.9mm., check this distance in your drawing !

Combine this drawing with drawing 1, 2 or 6, the number depends of the size and type of your Rot aPanel

Angle steel 100x100x7 mm , for top and bottom fitting of your Rot aPanel.

For the fixing to the wall or steelstructure you must use the same places and distances between holes thus duplicate the holes in the other angle steel vertical flange.



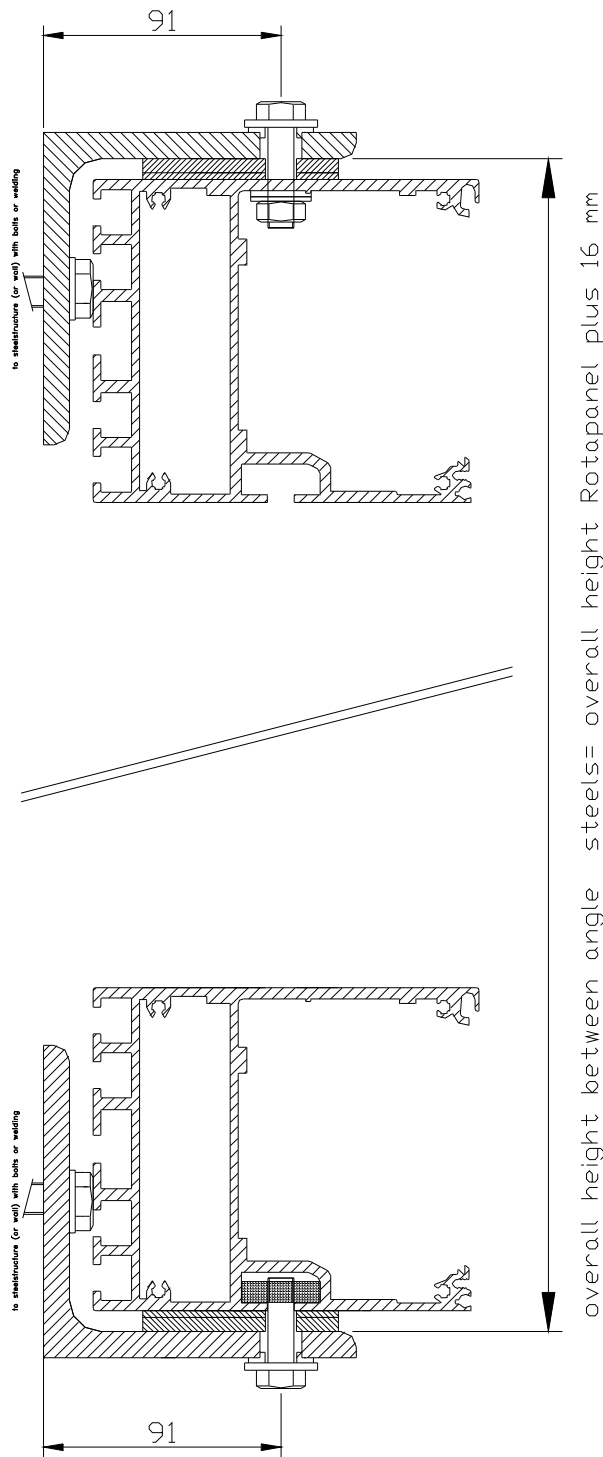
Attention: If you do not use this hole shedule, you can drill in the mechanism !!!!

Amerikaanse Projectie 	Schaal 1:3	nummer	ROTA [®] The moving sign PANEL
	Maateenheid: Datum:		


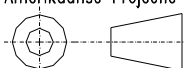
PRINCIPAL DRAWING NO. 6

This drawing helps you calculate the measure between the bottom and top angle steel.

This construction drawing is only a principle drawing. Thus, the number of mounting brackets, fastening points, span length and material thicknesses must always be calculated by a constructor!:



PROFILE 2

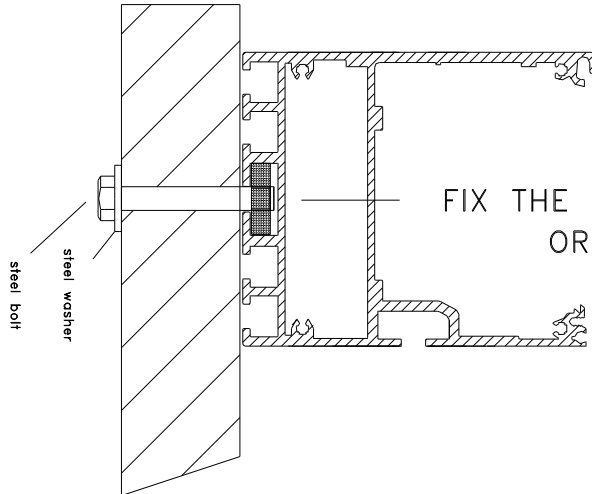
		nummer	Vorm- en Plaatoleranties volgens NEN3311
Amerikaanse Projectie	Schaal: 1:3	Getekend: 30-05-2006	 PANEL
	Maateenheid:	Gezien:	
Opmerkingen:	Datum:	Benaming	
		PRINCIPAL DRAWING 1	

PRINCIPAL DRAWING NO. 7

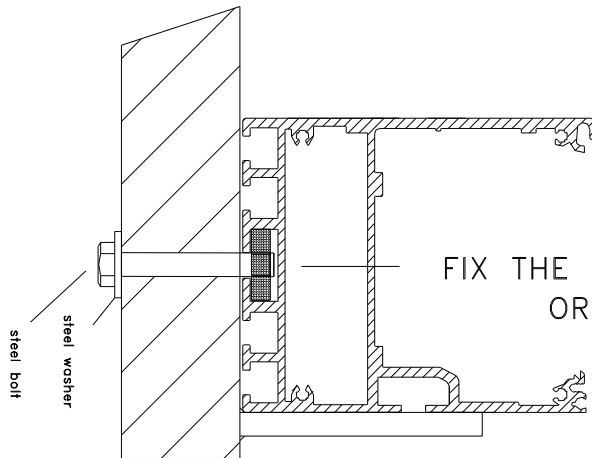
THIS PRINCIPAL DRAWING IS THE MOST USABLE,
FOR BOTTOM AND TOP FITTING.

The special assembling set eliminates the expansion differences between steel structure/aluminium RotaPanel, the spacers handle the electrical isolation.

This construction drawing is only a principle drawing. Thus, the number of mounting brackets, fastening points, span length and material thicknesses must always be calculated by a constructor!!






AS MINIMUM
FIX THE ROTAPANEL EVERY 1000 MM
OR LESS IF CALCULATED



AS MINIMUM
FIX THE ROTAPANEL EVERY 1000 MM
OR LESS IF CALCULATED

PROFILE 2

With each RotaPanel delivered, it is also delivered a free fitting set. Wich includes: bolts, nylon washers and spacers.

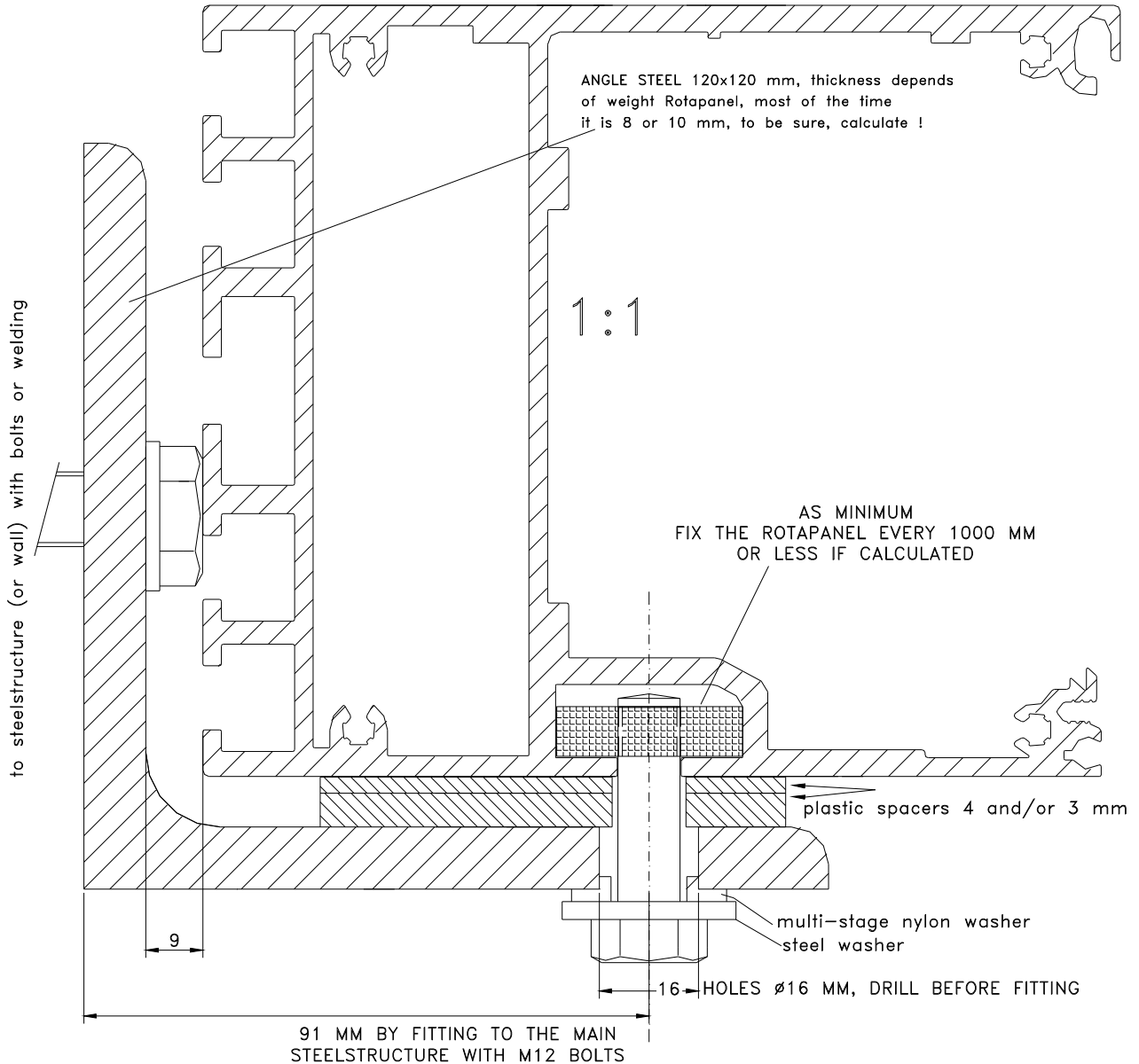
		nummer	Vorm- en Plaats toleranties volgens NEN3311
Amerikaanse Projectie	Schaal 1:3	Getekend: 30-05-2006	 The moving sign 
	Maateenheid:	Gezien:	
Opmerkingen:	Datum:	Benaming	
		PRINCIPAL DRAWING 1	

PRINCIPAL DRAWING NO. 8

THIS PRINCIPAL DRAWING IS THE MOST USABLE,
FOR BOTTOM AND TOP FITTING.



The special assembling set eliminates the expansion differences
between steelstructure/aluminium RotaPanel, the spacers handle the electrical isolation.

This construction drawing is only a principle drawing. Thus, the number of mounting brackets,
fastening points, span length and material thicknesses must always be calculated by a constructor!!

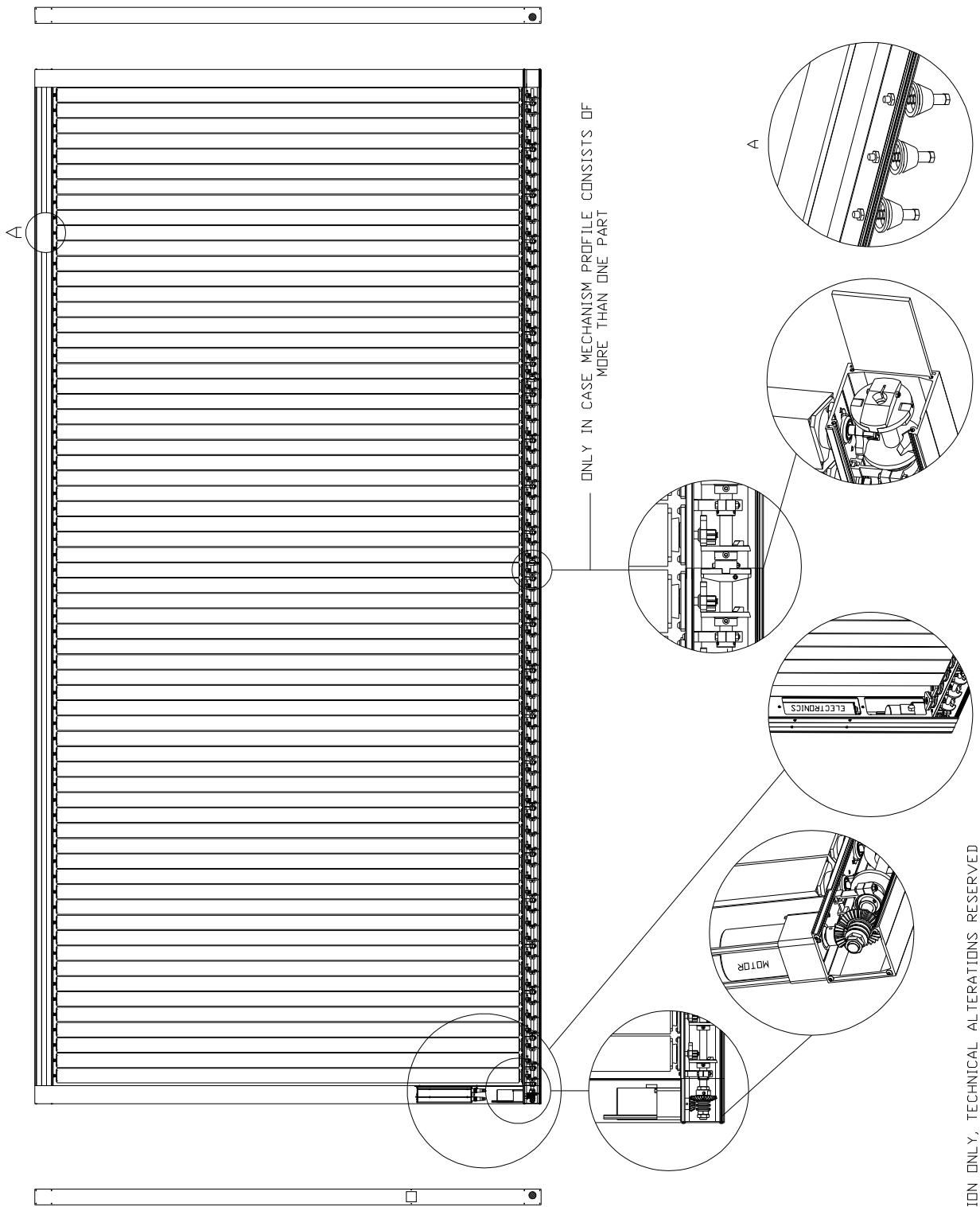


PROFILE 2

With each RotaPanel delivered, it is also delivered a free fitting set. Wich includes: bolts, nylon washers and spacers.

		nummer	Vorm- en Plaatstoleranties volgens NEN3311
Amerikaanse Projectie	Schaal 1:1	Getekend: 30-05-2006	 ROTA [®] The moving sign PANEL
	Maateenheid:	Gezien:	
Opmerkingen:	Datum:	Benaming	
		PRINCIPAL DRAWING 8	

DRAWING 9 OVERVIEW ROTAPANEL TECHNOLOGY

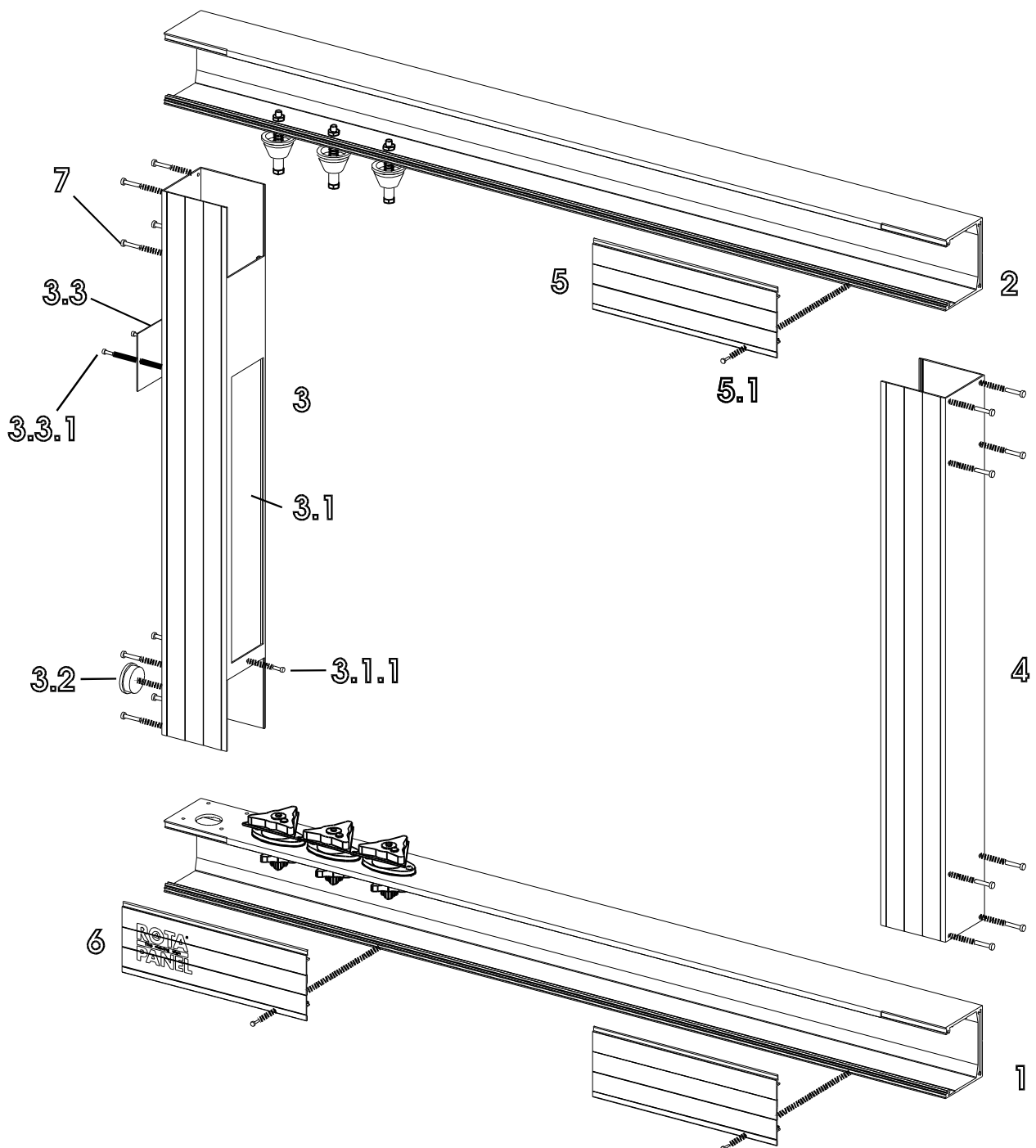


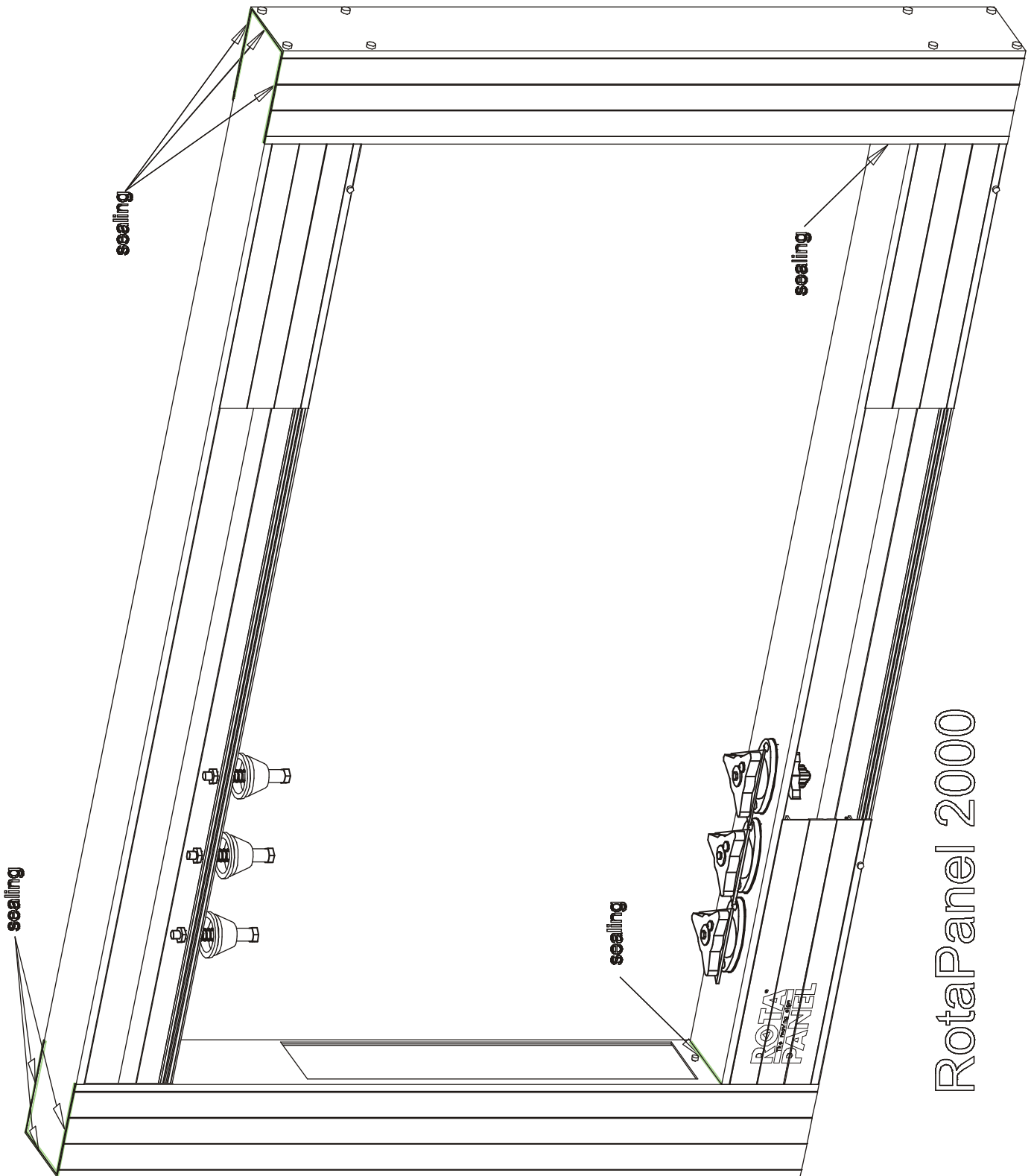
FOR ILLUSTRATION ONLY, TECHNICAL ALTERATIONS RESERVED

7 ASSEMBLY ROTAPANEL FRAME

Lay the 4 sections of the frame on a level, clean surface and assemble the four main sections as shown in the drawing below. For this purpose, use the supplied screws (type: ST 5,5 x 30 mm, stainless steel)

Attention:
Seal the top of the Rotapanel as shown on the drawing on page 30.





RotaPanel 2000

8 REPLACING/GLUEING ON IMAGES

Attention:

First, the unit must be switched off; otherwise injury to persons and/or damage to the unit may occur.

8.1 SOLID VERSION (standard):

Removing prisms:

Lift the prism 20 mm (8/10"), move the bottom forward, releasing it from the panel; then lower the prism, so that it is also released from the top mounting structure.

Installing prisms:

Follow the removal procedure in reverse order.

8.2 SPLIT VERSION (optional quick-change system, not over the road):

Removing blades:

For this purpose use the supplied blade removal tools and place the pins with the base plate at the back of the exchange blade and carefully pull the blade forward..

Installing aluminum exchange blades:

Place the bottom of the blade between the projections on the base plate, then press against the blade from the bottom upward to the top.

Attention:

Carefully handle the prisms and (optional) exchange blades during installation, removal and transport, thus ensuring that they cannot be deformed permanently. Before switching on the mains current, check that all blades have been fitted correctly. Deformed and/or incorrectly placed prisms/blades will lead to the prisms being blocked.

8.3 INSTALLATION OF IMAGES

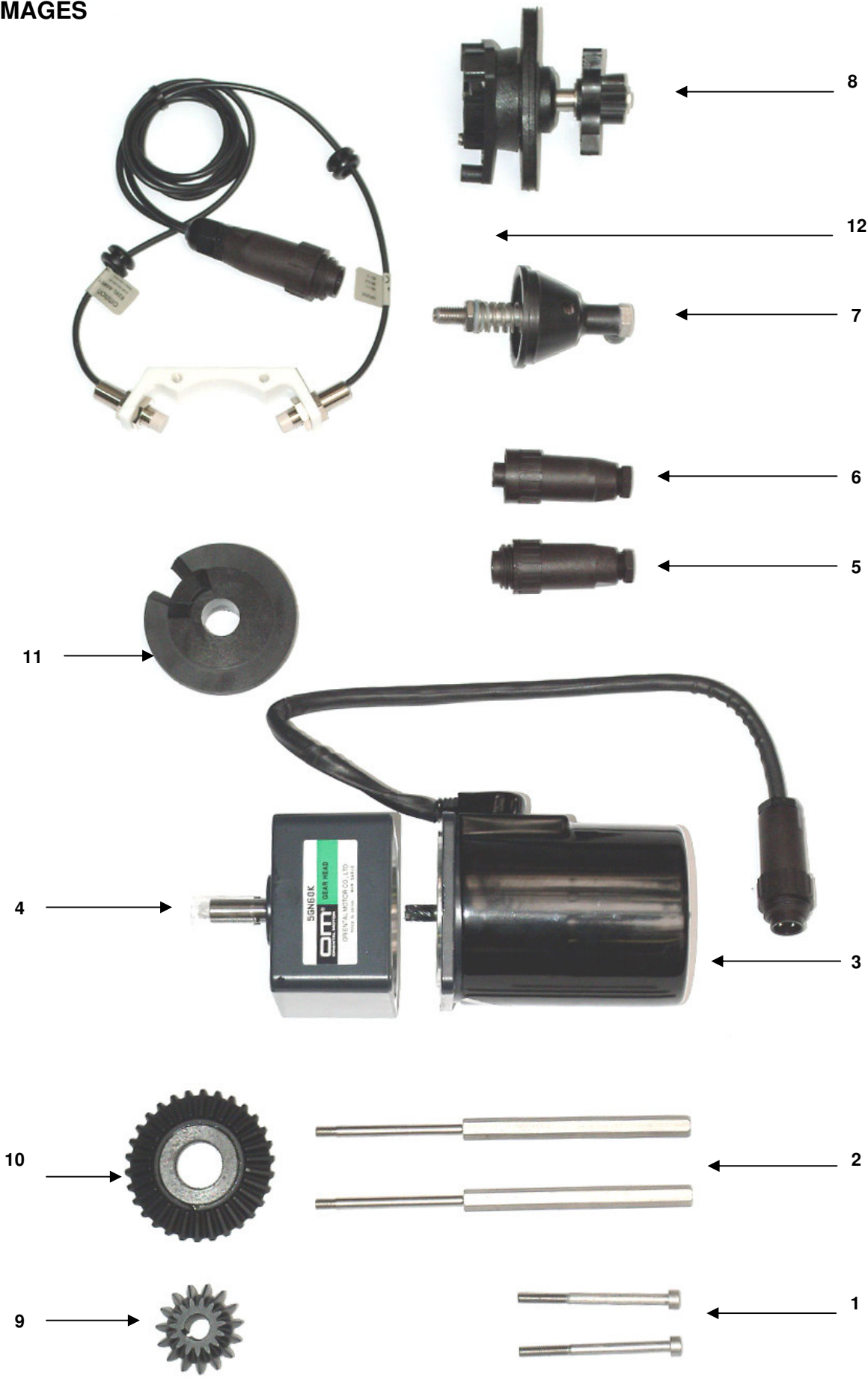
The images are usually made by means of self-sticking plastic foil. The foil is applied directly to the prisms or exchange blades. The prisms are first placed in a special gluing template supplied with the RotaPanel. The image is put on the prisms; next, the spaces between the prisms are cut away.

Attention:

Do not crawl over the prisms or exchange blades when putting on the images to prevent deformation. Deformed prisms/blades will lead to the prisms being blocked.

9 PARTS LIST

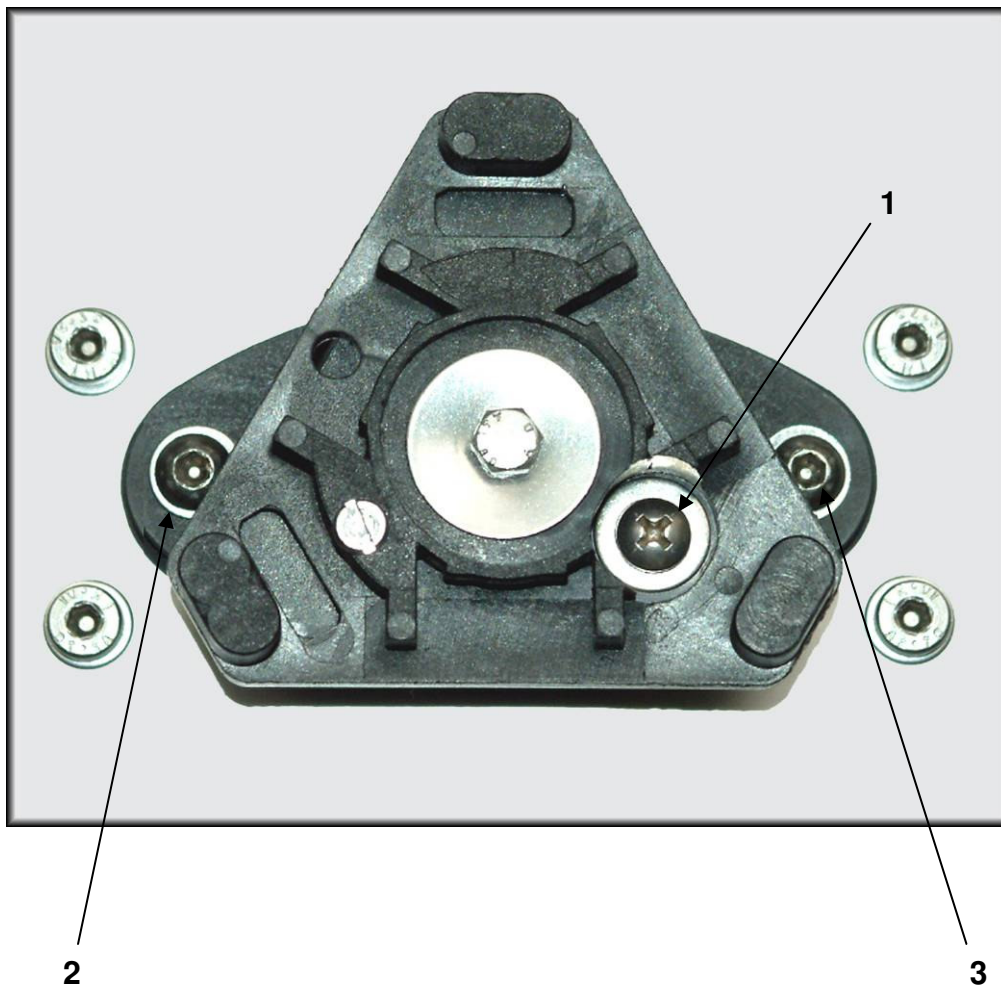
9.1 IMAGES



Specification of parts: (as shown on the photo on page 32)

1. motor bolts, short
2. motor bolts, long
3. motor
4. gearbox 1:60 or 1:75
5. plug female 4-pole or 7-pole
6. plug male 4-pole or 7-pole
7. complete upper mounting frame prism
8. complete mechanism
9. bevel gear gearbox (teflon coating)
10. bevel gear + slip clutch for main axle
11. driving disc
12. sensors including supports, type of sensor: **Baumer IFRM 12N 1702/L***

NOTE: Please note, there are 2 types of sensors, standard and Profibus type (see page 19)



9.2 MAINTENANCE INSTRUCTIONS

Attention:

Prior to starting maintenance and opening the beam containing the mechanism, the mains current must always be switched off.

SAFETY

The mechanical safety, the slip clutch, has been set by the manufacturer by means of a torque wrench and may not be adjusted.

Attention:

Adjusting the slip clutch may lead to injury and/or damage to mechanical parts.

HARDENED STEEL GEAR

In the event of continuous rotation the hardened steel driving gear between the motor and the mechanism must be grease-lubricated once a year with grease of the following type (or equivalent):
MOLYKOTE 165 LT, manufacturer Dow Corning Corporation, Midland, Michigan, USA.

For panels which are not continuously rotating a longer greasing interval can be taken.

Apply the grease as follows:

- remove the black cap 3.2 (see page 29) at the butt side of the Rotapanel
- remove the short cover 6 (see page 29) of the beam containing the mechanism on the motor side (in view of the light)
- using a brush, sparingly apply the Molykote grease, **only** on the small gear of the motor.

PRISM DRIVE MECHANISM

The drive mechanism of the prisms requires no maintenance. The drive disk is self-lubricating (15% PTFE).

ADJUSTING PRISMS

If necessary, the prisms can be adjusted as follows (see photo on page 33):

- switch the Rotapanel off by means of the operating switch or by removing the plug.
- remove the prism (for description see section 8 "Removing Prisms").
- loosen screw 1 (photo page 33) 2 turns.
- Turn the base plate of the prism in line with the other prisms.
- Tighten screw 1.

REPLACING COMPLETE PRISM MECHANISM

You can replace the complete prism mechanism (see photo on page 33) as follows::

- Switch off the Rotapanel using the operating switch or by pulling out the plug.
- Remove the prism (for description see section 8 "Removing Prisms").
- Fully loosen hexagon socket bolts 2 and 3
- Lift the mechanisms vertically; remove it while turning it.
- Then install a new mechanism.
- Check the seal for tightness.
- Tighten hexagon socket bolts 2 and 3.

DRAINAGE HOLES

These are to be cleaned regularly.

CLEANING OF IMAGES AND FRAME

Spray clean using low pressure equipment and wipe. Not in frosty weather.

FREEZING

To prevent the unit from freezing over a special Teflon spray can be applied on the lower frame beam. This spray must be re-applied after cleaning or before the winter season. No spray is required when the unit is provided with a heating element.

10 FAILURE

Attention:

In the event of a failure immediately switch off the Rotapanel prevent the system from being damaged.

First check whether there are any permanent obstacles between the prisms (for example, a stick or a loose exchange blade (when using the optional split version quick-change system)).

EXPLANATION OF ERRORS

If the red error LED is on, this means that the maximum rotation time has been exceeded; the electronics do not spot the next sensor within the rotation time set under factory settings. The drive system is re-started automatically after a certain time. If the failure has not been eliminated, the procedure is repeated. If a certain number of repeat procedures is exceeded, the drive system will stop for a given longer time.

Possible error causes:

- Slip clutch works; the motor is running, but the aluminum main axle stops or slips.
- sensor(s) defective, incorrectly connected or do not make contact properly
- motor wiring incorrectly connected
- motor or motor transmission defective

LED's of control unit do not indicate anything; possible causes:

- no main power.
- plugs incorrectly connected internally
- plug connection loose
- fuse in control unit defective
- no incoming current

Prisms make tapping sound because they touch each other:

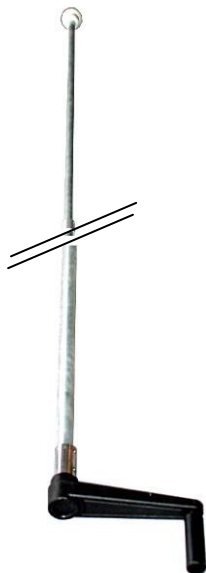
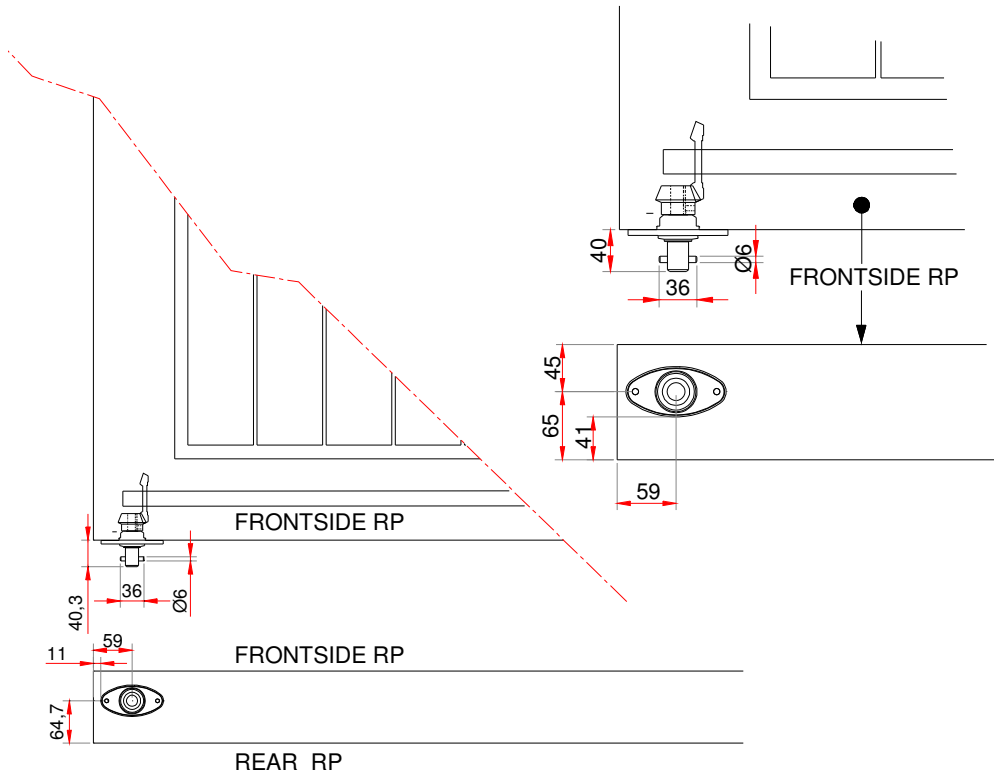
- the prism(s) can be adjusted by means of the adjusting bolt in the base plate of the prism (see page 33)

Attention:

Never set the slip clutch tighter. The dealer/manufacturer first has to detect the cause of the problem and take corrective action. Setting the safety tighter may lead to injury and/or damage to the mechanism.

11 MANUAL OPERATION BY MEANS OF MECHANICAL MANUAL OPERATION (OPTIONAL)

The RotaPanel may be equipped with an external mechanical manual operation which may be reached from the bottom. The sign may be changed manually with the manual handle (optional). Depending on the location and upon consultation, the mechanism may be placed to the left or to the right. (Left as standard). Moreover, the motor will also be installed left (as standard) or right.



Warning:
If the supporting construction includes a supporting corner line then it must be kept shorter in view of the manual operation mechanism.

12 MANUAL ROTATION

If you want to rotate the prisms manually without the supply voltage connected, you can only do this with RotaPanels that have one drive motor on the main shaft. **Never** rotate the prisms manually by the main shaft when more than one motor is mounted on the main shaft. This is the case with panels that are wider than 7.5 metres. (24' 7/4")

Rotate the panel prisms as follows:

- check that the RotaPanel can rotate freely without obstructions
- remove the black cover 3.2 (see page 29) on the motor side of the RotaPanel
- stick a box spanner 30 mm (into the hole so that it slides over the nut on the main shaft
- carefully rotate the box spanner clockwise.

Warning:

**Never rotate the box spanner anti-clockwise. This will change settings, which will lead to errors.
Never rotate the prisms manually with Rotapanel that are wider than 7.5 meters (24.6 foot).**

13 COMMISSIONING INTO OPERATION

- Check that the assembly has been done in accordance with the standards given in chapter 3. Pay special attention to the lower beam, making sure that it is perfectly level and straight.
- Check that all prisms are flat. If necessary, adjust them with the adjustment bolt in the base plate of the prisms (see page 33).
- Place the plugs in the sockets of the electronics housing. The 4-pole plug is inserted in the 4-pole socket. The 4-pole female plug is inserted in the male socket and the 7-pole male plug of the sensors is inserted in the female socket. Check that all plugs are connected.
- Check that the power supply installation is watertight and that the earthing is connected (see page 16).
- Check that the Rotapanel frame is earthed.
- Switch the main voltage on and check that the LED on the control unit is lit.

14 TROUBLE SHOOTING

Symptom	Possible cause	Solution
No movement, Power lamp not lit.	<ul style="list-style-type: none"> - No mains - Loose plug connection - No supply voltage - Internal fuse has blown. 	<ul style="list-style-type: none"> - Push the plug in and tighten it - Contact an electrician - Have the fuse replaced by a technically qualified person.
The panel rotates about 15 seconds <u>at normal speed</u> (<i>status indication</i>) Error becomes red when the panel stops)	<ul style="list-style-type: none"> - Sensor plug is loose - 1 or 2 sensor(s) defective - Cable(s) to the sensors is/are damaged (this could have occurred during the assembly of the side profile) 	<ul style="list-style-type: none"> - Push the plug in and tighten it. - Replace the complete sensor set (2). Make sure that the marked sensor is on the right-hand side. The correct distance between the sensor and the metal parts of the sensor mechanism is approx. 4 mm. (3/16")
The panel rotates about 15 seconds <u>at slow to very slow speed</u> (<i>status indication</i>) Error becomes red when the panel stops)	<ul style="list-style-type: none"> - The mechanical slip coupling slips because the panel rotates too heavily. The (motor(s) run(s) at normal speed, but the main shaft does not rotate or rotates slowly). 	<ul style="list-style-type: none"> - Check that there are no objects obstructing the prisms. - Check that the panel is not mounted bent, skew or under stress on the construction. - Check that there are no assembly parts, such as bolts, that are obstructing the mechanical parts. - With split version blades, make sure that they are properly mounted, including the corners.

The following only applies to Rotapanel above 7.5 meters (24' 7/4") two or more motors.

No visible movement. The Error indicator LED becomes red after approx. 2 seconds.	<ul style="list-style-type: none"> - Loose plug connection - Motor cable(s) is/are damaged. - 1 or 2 motors defective. - Panel is completely obstructed. 	<ul style="list-style-type: none"> - Push the plug in and tighten it. - Replace the motor cable, see diagram on page 19! - Replace the defective motor(s). - Remove the access panels on the front of the mechanism and check the mechanism. See page 19 for more information.
The different parts of the panel do not rotate at the same time.	<ul style="list-style-type: none"> - The couplings between the shafts in the panel are not correctly mounted. There are red marks on the shaft near the coupling; these are not aligned. 	<ul style="list-style-type: none"> - Disconnect the blue parts of the coupling and mount them correctly.

-- END --