

Operating Instructions and Spare Parts List

OptiMove 1 Powder Reciprocator Control for AC or DC Reciprocators



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Safety Regulations

1. Before starting up the OptiMove 1 Powder Reciprocator Control read this operating manual carefully !
Incorrect operation of the OptiMove 1 Powder Reciprocator Control can lead to accidents, false functioning and/or damage to the booth
2.

 IMPORTANT
--

The motor power of the carriage far exceeds the power of a human!

During operation the axis should be protected against possible access by personnel. Do not stand under the carriage, even when it is standing still (When the Powder Reciprocator Control is switched off the reciprocator carriage sinks to the zero point - the absolute lowest carriage reversing point).
3. The connections between the OptiMove 1 module, the power supply section, and the axis should only be disconnected when the OptiMove 1 module is switched **off**.
4. The connecting cables between the power supply section, and the reciprocator axis must be routed in such a way that they cannot become damaged when the reciprocator axis is in operation. Also, please follow local safety regulations.
5. The upper reversing point must always be set according to the actual height of the reciprocator. Changes to the system should only be performed by trained personnel. Incorrect entries can cause damage to the reciprocator axis and/or the booth.
6. The OptiMove 1 control module, and the power supply section must be disconnected from the Mains according to local safety regulations before any repairs or replacement of parts are made.

Technical data for the OptiMove 1 Powder Reciprocator Control

No. of axes per module:	1
No. of axes per OptiMatic control cabinet:	2
Maximum number of programs:	64
Maximum stroke length (Theoretical):	9.999 m.
Positioning error:	< 1 mm.
Maximum speed:	0.6 m/s.
Minimum speed:	0.05 m/s.
Acceleration:	2.0 m/s.
Selectable voltages:	100V*, 110V, 120V, 200V*, 220V, 230V, 240V (*Configuration changes are necessary to the PS 1 Power supply).
Tolerance:	±10 %
Mains frequency:	48 - 62 Hz
Fuses:	100 - 120V: F1, F2 = 10 A (Slow) F3 = 500 mA 200 - 240V: F1, F2 = 5 A (Slow) F3 = 250mA
Power requirements:	30 W (control unit only, without the power supply)
Operating temperature range:	0° C to +40° C (+32° F to +104° F)
Storage temperature range:	-20° C to +70° C (-4° F to +158° F)
Degree of protection:	IP 54
Dimensions:	
Wide:	425 mm
Deep:	270 mm
Height:	88 mm
Weight:	6.2 kg

1. OptiMove 1 Powder Reciprocator Control



ATTENTION

Read the operating instructions through very carefully before putting the reciprocator control unit, and the reciprocator into operation!!

Front panel with input key pad



1. Display fields.
2. Input keys.
3. Main push-button switch.

Figure 1.

1.1 Field of operation

The OptiMove 1 Powder Reciprocator Control has been designed to use the latest technology, and so that programming can be done by the operator.

The new user level guide simplifies programming, increases the overview, and is extremely user-friendly.

Special characteristics :

- Simple and clear programming with the user level guide.
- Up to 64 different programs can be stored in the unit.
- Individual upward and downward speed(s) of the axis can be selected.
- Program and data can be changed when the axis is running.
- All control functions can be give through the keypad on the OptiMove 1 .
- Simple Start Up, with only one parameter to set.
- Input voltages : 110, 120, 220, 230, and 240 V.
- Can be used with Reciprocators with AC or DC motors.
- Fine adjustment : 1 mm.
- Error message (E 01) when wrong key is pressed.



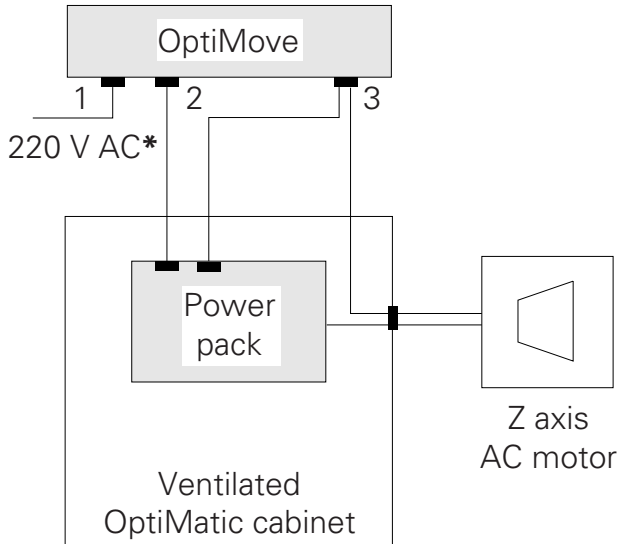
ATTENTION

The keypad should be operated with the finger tips and under no circumstances with finger nails or hard objects !

2. Start up

2.1 Cable connection for OptiMove

Reciprocator with AC



* The OptiMove 1 can only be operated with 220 VAC, if another line voltage is used it is necessary to fit a transformer to convert the voltage to 220 VAC.

AC Software version - OptiMove.XX.2

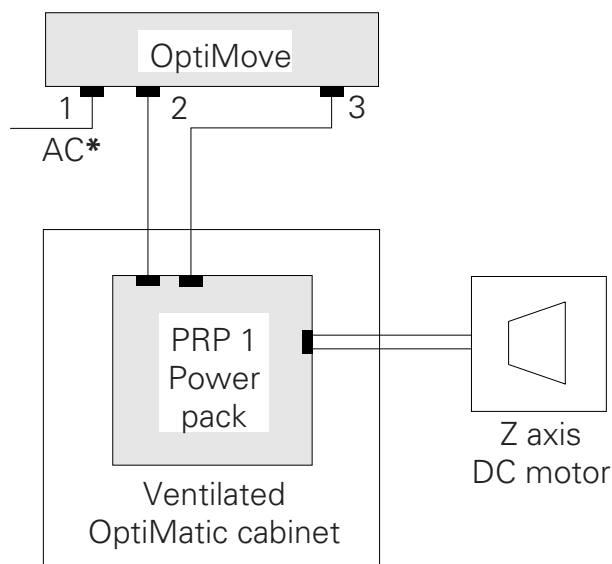
See also "Checking the software version", page 9.

motor

1. Mains input*.
2. Power supply socket.
3. Control signal socket.

Figure 2.

Reciprocator with DC motor



** The PRP 2 can be operated in connection with the PRP 1 at 110V, 120V, 220V, 230V or 240VAC (50 / 60 Hz). The matching of the input power supply is done by connecting bridges in the PRP 1, and OptiMove 1 .

See page 4, "2.3 Selecting the Mains input voltage".

DC Software version - OptiMove.XX.1

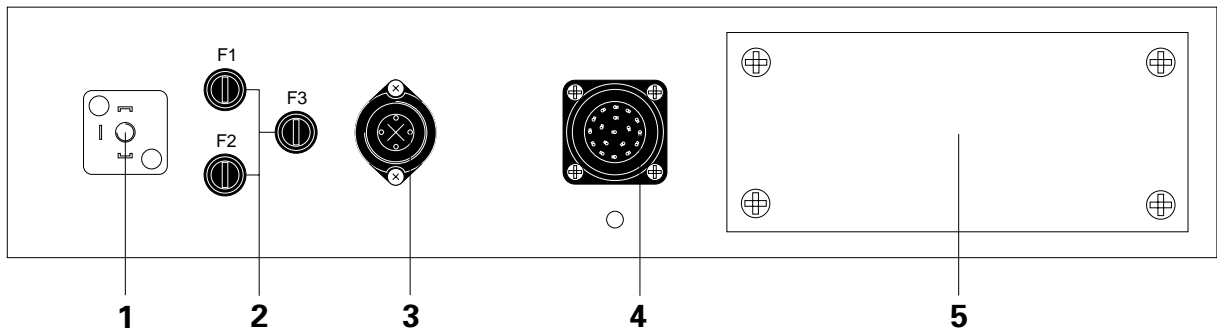
See also "2.9 Checking the software version", page 9.

1. Mains input**.
2. PRP 1 Power supply socket.
3. Control signal socket.

Figure 3.

2.2 Connections on the rear of the OptiMove

Rear Panel



- | | |
|--|---|
| <p>1. Mains input.</p> <p>2. Fuse holders - F1, F2, and F3.</p> <p>3. Power supply socket - 4 pole (from PGC 1).</p> | <p>4. Control signal socket - 18 pole (to reciprocator)</p> <p>5. Cover plate</p> |
|--|---|

Figure 4.

The OptiMove 1 Powder Reciprocator Control is supplied as part of a complete OptiMatic System with all the control units mounted in one cabinet.

If the cables must be disconnected, for any reason, there should be no problem on refitting the plugs as they cannot be replaced in the wrong sockets.



Before disconnecting the cables from the sockets (3 and 4, Fig. 4) at the rear of the OptiMove 1 the Mains cable must always be disconnected first.

2.3 Selecting the Mains power voltage

Before the OptiMove 1 Powder Reciprocator Control is connected to the Mains the built-in power pack must be matched to the local Mains power supply.



A variation in the voltage of $\pm 10\%$ can cause damage to the control printed circuit board and/or the control electronics.

Selectable voltages : 110 V, 120 V, 220 V, 230 V, and 240 V.

In order to set the correct input voltage of the OptiMove, proceed as follows :

1. Remove all the electrical connections from the rear of the control unit and remove the control unit from the drawer housing.
2. Unscrew the quick-release screws of the cover of the electrical section of the control unit and carefully lift off.
3. The bridges on the 10 pole plug on the power pack board must be correctly set for the corresponding voltage required.

Voltage	Zero conductor connected to contact	Phase connected to contact	Bridges from - to
110 V	2	4	3 - 8 and 5 - 9
120 V	2	6	3 - 8 and 7 - 10
220 V	2	9	4 - 8
230 V	2	9	6 - 8
240 V	2	10	6 - 8

The numbers in the table correspond to the contacts on the plug

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

Figure 5.

Example :

For 120 V the zero conductor must be connected to contact 2, and to the phase to contact 6.

A wire bridge joins contact 3 and contact 8. A second wire bridge joins contact 7 to contact 10.

For 240 V the zero conductor must be connected to contact 2, and to the phase to contact 10.

A wire bridge joins contact 6 and contact 8.

2.4 Setting bridges on the control board : AC or DC operation

The bridges on the control board Micro 3 is set at the factory for AC or DC operation for the corresponding OptiMove 1 version.

If a Micro 3 control board must be exchanged or a Micro 3 control board converted from an AC version to a DC version then all bridges must be checked and/or changed to suit the correct operating mode.



Incorrectly set bridges on the Micro 3 control board can lead to faulty operation and/or damage to the electronics.

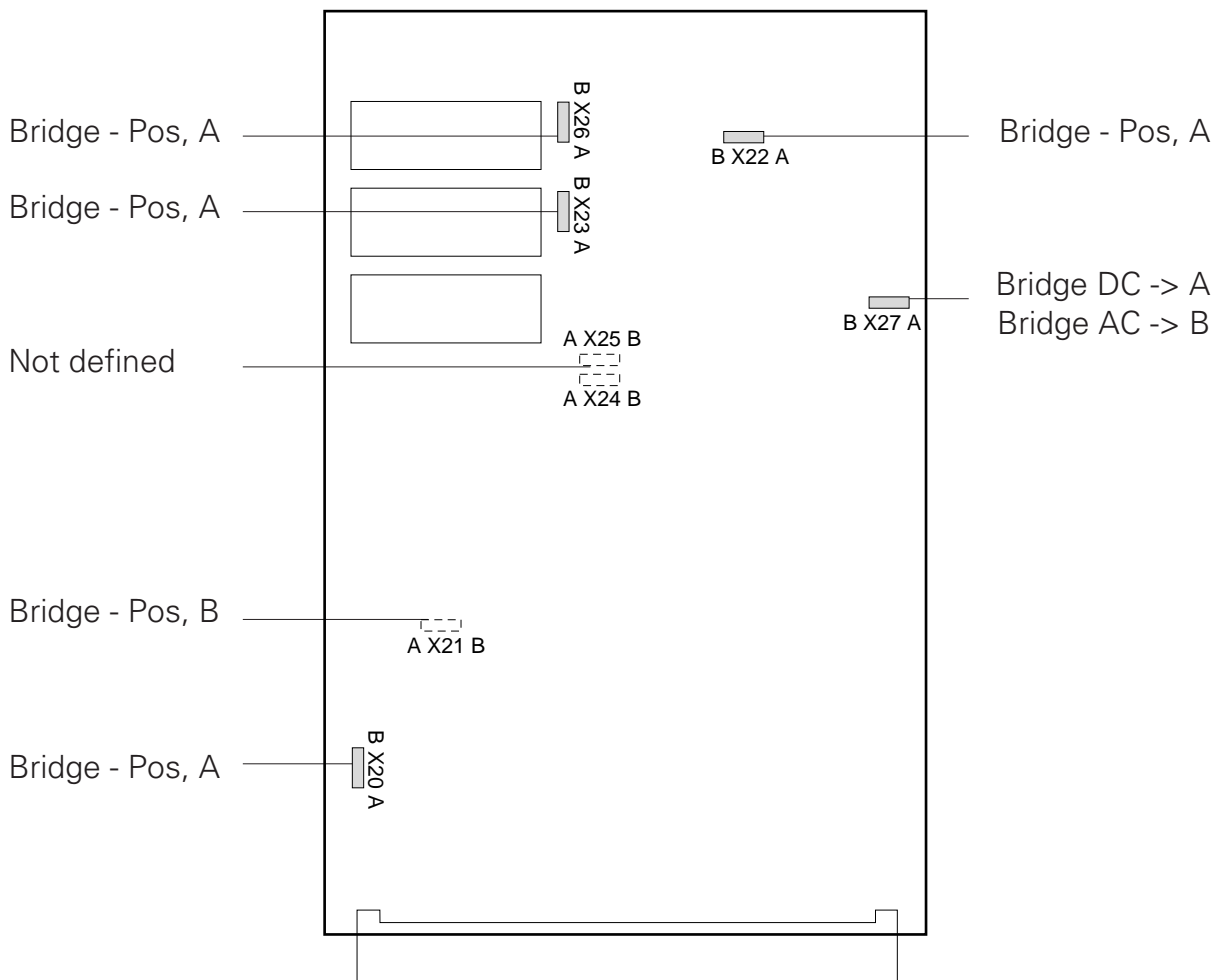


Figure 6.

2.5 OptiMove 1 control panel display and key pad symbols

Seven segment display panel

Display field 1. Display fields 2 and 3.

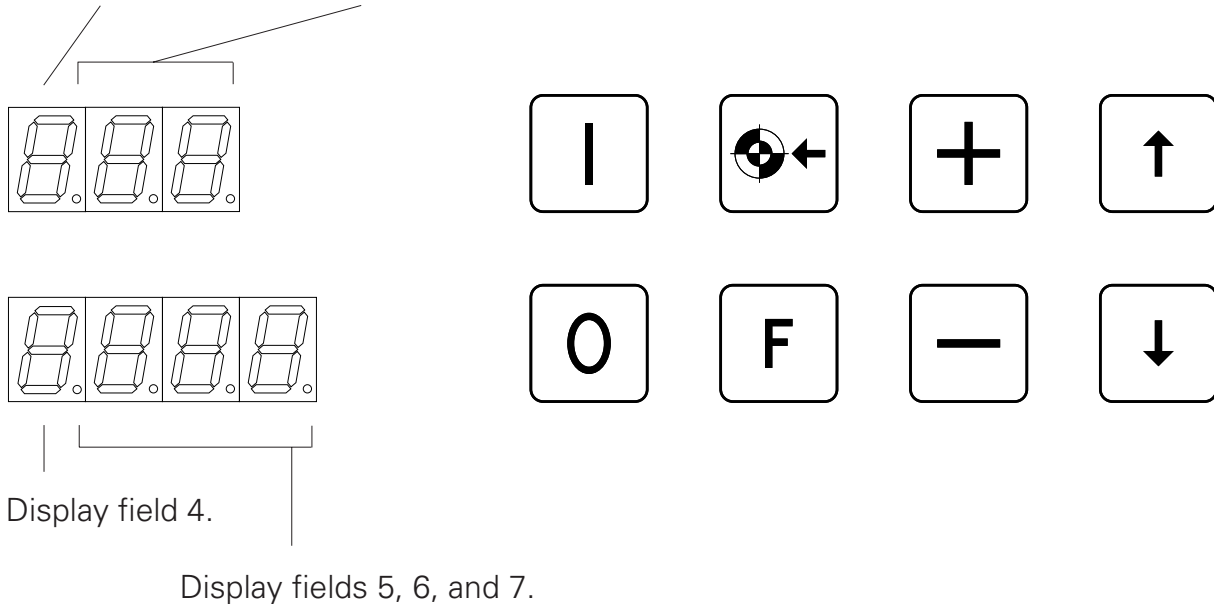


Figure 7.

- Display field 1 (top left on the control panel) indicates the initial "P" for program (with or without the decimal point. The decimal point indicates that the axis is running) or the stroke limiting symbol or the "E" for error message (see page 10, 2.10 "Description of display symbols").
- Display fields 2, and 3 indicate the program or error message number.
- Display field 4
When programming - indicates the first part of an input value (with a decimal point - > 1 m).
When operating - indicates either the first part of an input value (with a decimal point) or the first part of a theoretical value (with a decimal point).
- Display fields 5, 6, and 7 indicate input values (after the decimal point - < 1m).



The keypad should be operated with the finger tips and under no circumstances with finger nails or hard objects !

2.6 Key pad symbols

	Key	Function
	Start key	Axis "ON"
	Stop key	Axis "STOP"
	Reference point key	Start "Travel to reference point"
	Acknowledgment key	Acknowledges all errors except E10
	Plus key	Increases values
	Minus key	Decreases values
	Select input key	Reversing point, Speed
	Select input key	Reversing point, Speed

When two keys are illustrated as on the left they must be pressed at the same time.

Figure 8.



The keypad should be operated with the finger tips and under no circumstances with finger nails or hard objects !

2.7 RAM Reset

1. Press the Main push-button switch of the OptiMove 1 "OFF"
2. Hold the operation key **F** down and pressing the Main push-button switch "ON"
3. The error message **E 11** appears on the display.
4. All the data is written over with default data with RAM Reset. The input values and height limits must therefore be re-entered.

In order to set the Reciprocator height limit the keys **F** **↑** must be pressed simultaneously.

See 2.12 "Setting the Reciprocator height"

2.8 Off-set compensation (for ITW Gema service technicians only)

The Off-set compensation is only effective with the DC power pack (PRP - Powder Reciprocator Power)

When setting the Off-set compensation the PRP Operating Instructions should be consulted.

Proceed as follows :

1. Press the Main push-button switch of the OptiMove 1 "OFF"
2. Press the input key **↓** and press the Main push-button switch "ON"
3. The following appears on the display :

OF5

□ □ □ 0

The PRP Off-set compensation can now be made and is set correctly when the digits on the lower display have stopped computing.

4. The Off-set compensation is ended by pressing the input key **F** and this level can now be left.

2.9 Checking the software version

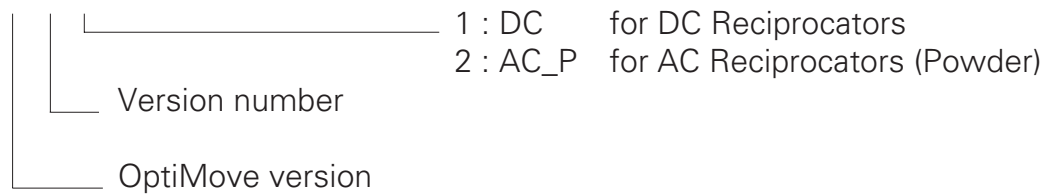
1. Press the Main push-button switch of the OptiMove 1 "OFF".
2. Press the Main push-button switch "ON" while pressing the input key **0**.
3. The following appears on the display :

A digital display showing the characters 'PrC' in a segmented font.

A digital display showing the characters '202.1' in a segmented font.

OptiMove 1 ___ designation

2.02.1

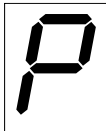


2.10 Description of the display symbols

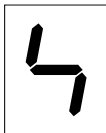
The seven segment displays shown below only appear in the display field 1 on the OptiMove 1 front panel (see page 6).



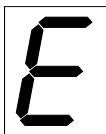
Symbol for Program (followed by the program number.
With decimal point = Axis running).



Symbol for Program (followed by the program number.
Without decimal point = Axis stopped).



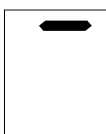
Symbol for Upper stroke limit setting*
(This setting should be made at the time of setting up the
equipment and normally only needs to be done once.
Allow for height of the booth openings, max. stroke, etc.).



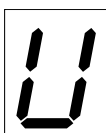
Symbol for Error message.
(followed by error code number)



Symbol for Upper reversing point
(Allowances must be made for the height of the booth open-
ings etc, when setting the upper/lower reversing point, due to
the **danger of collision**).



Speed - Upwards
(Does not have to be the same value as the downward move-
ment)



Position for the Lower reversing point*
(The range of the lower reversing point is limited by the zero
point).



Speed - Downwards
(Does not have to be the same value as the upward movement)

Figure 9.

*see "Reference point", page 11

2.11 Reference point 

The reference point on the ACR Reciprocator is a theoretical position on the Z axis which is **always** 50 mm **above** the lowest possible point of travel of the carriage and should correspond approximately with the height of the bottom of the gun slot of the booth (not the workshop floor), and the bottom of the carriage at its lowest working position. By moving the proximity switch the reference point, and the zero point are also displaced.

Under normal working conditions it is not necessary to alter this setting. However, if the zero point has to be displaced, for any reason, it should only be in an upward direction.

The stroke can be set anywhere between the maximum stroke height and the lowest reversing point (zero point).



Displacing the proximity switch (upward) will shorten the maximum stroke length correspondingly, therefore, always allow for this when setting the upper reversing point.



Incorrect setting of the proximity switch can lead to damage to the booth and reciprocator! Before changing the setting of the proximity switch please contact your local ITW Gema service centre.

Reference point, and zero point

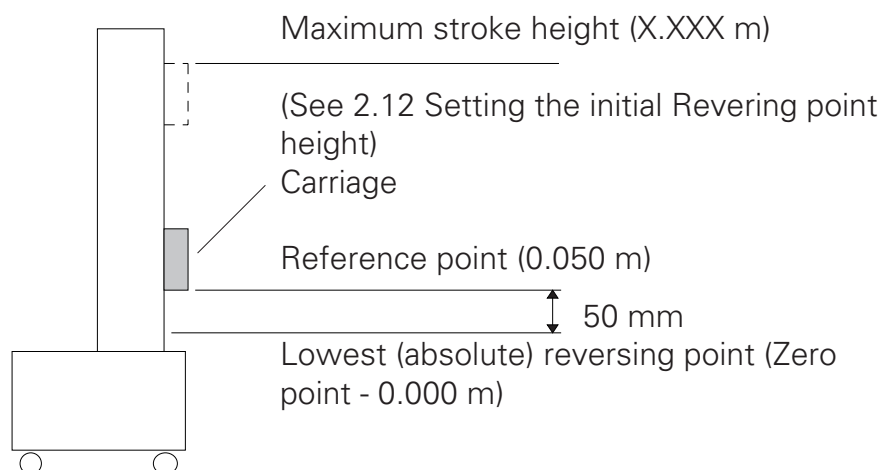


Figure 10.

2.12 Setting the initial reciprocator stroke height

This setting only needs to be done when the reciprocator is set up for the very first time.

The upper stroke limit sets the working height of the carriage. The stroke length is limited by the combination of settings of the maximum height of the reciprocator, the height of the gun slots in the booth, and the lowest reversing point (zero point). When setting up allowance must also be made for the height of the guns and supports on the carriage !

For safety reasons the upper stroke height is always set to 0,80 m on the OptiMove 1 at the factory. Before starting up the reciprocator the working stroke height must, therefore, be reset on the OptiMove 1 .

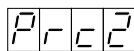
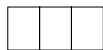


ATTENTION

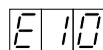
The upper stroke height must always be set allowing for the actual height of the reciprocator. If the wrong stroke limits (too high/too low) are set then this can lead to damage to the booth and/or the reciprocator.

In order to set the stroke limit proceed as follows :

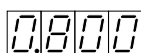
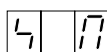
1. Place the reciprocator against the booth and connect with the OptiMove 1 Powder Reciprocator Control (See Cable connection, page 2).
2. Press the Main push-button switch of the OptiMove 1 control unit on.
The display shows :



3. Press any key. The display shows :



4. Press the two keys **F** **↑** simultaneously for approximately 3 seconds
The OptiMove 1 control switches to the level "Stroke limiting" .
The display shows :



5. Before leaving the "Stroke limiting" level it is absolutely essential to recheck the input height of the maximum stroke limit :
- a) Is the stroke limit defined to the height of the reciprocator?
 - b) Is the stroke height limited by the gun slots of the booth?

 **ATTENTION**

Incorrect data input can lead to damage to the booth and/or the reciprocator !!

6. Simultaneously press the two keys.



The OptiMove 1 control leaves the "Stroke limiting" level.

The following appears on the display :

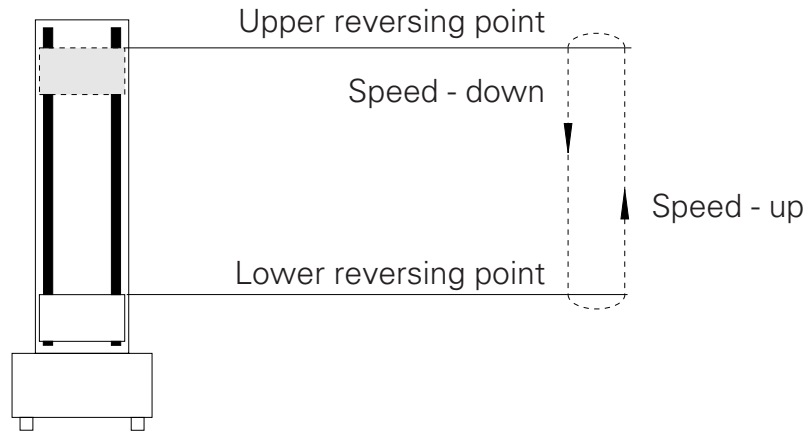
E 10



A new "Travel to Reference point"  command must be given.

3. Setting the parameters of the reciprocator stroke(s)

3.1 Stroke Parameter(s) / Positioning on the Reciprocator



The speeds up and down can have different values, as required.

3.2 Stroke parameter symbols

Setting example :







Setting	Display field 1	Value
Upper reversing point		= 2.00 m
Speed - up		= 0.200 m/s
Lower reversing point		= 1.00 m
Speed - down		= 0.300 m/s

Figure 11.



3.3 Stroke parameter display on input

(Data input procedure is described on page 16 onward)

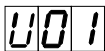

Upper reversing point display

Display :  : Symbol for upper reversing point and Program number
 : Required position

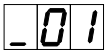
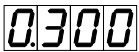
Speed - Up display

Display :  : Symbol for Speed - Up and Program number
 : Required value

Lower reversing point display

Display :  : Symbol for lower reversing point and Program number
 : Required position

Speed - Down display

Display :  : Symbol for Speed - Down and Program number
 : Required value



When the OptiMove 1 control unit is switched off at the Main push-button switch the carriage will slowly sink to its lowest point (Zero point).

3.4 OptiMove 1 user programming instructions

One of the main criteria in designing the OptiMove 1 Powder Reciprocator Control has been maximal user-friendly operation. The program overview and the user programming instructions make programming very simple.

Up to 64 different programs can be stored in or called up from the memory.

Each program contains data about the speed(s) of the axis movement, and the stroke reversing points. Programming or program selection can be done when the axis is stopped or operating.

On the next page is a diagram giving a complete overview of the program structure. Each level (the boxes marked STOP, START, EDIT, and SET UP in bold print) shows the keys which influence the programming on that particular level. Each level can be switched back and forth, making access to the desired level very simple.

Programming sequence (Complete overview)

Basically, the OptiMove 1 has four user levels :

STOP

After pressing the Main push-button switch to ON "PRC" appears on the display. Press any key and "E10" appears on the display. The "Travel to reference point" command can now be give. After the reference point has been reached the display always switches to the level "STOP". Any desired program can be selected from here, the levels "START", "EDIT" or "SET UP".

START

The axis is switched on by pressing the key **I**. The program number can be selected in the level "START" while the Reciprocator is running. The program number can also be selected in the level "START". The reciprocator always carries out the rest of a stroke from the previous program which has been started. When the carriage reaches a reversing point the new program is started with the new stroke. The axis can be switched off again with the key **O**. Pressing the keys **F+** simultaneously switches the OptiMove 1 directly to the "EDIT" level.

EDIT

By switching to the "EDIT" level all the input values or any combination of these values of the program selected in the "STOP" level can now be input or changed, e.g. the upper reversing point, the upward speed, the lower reversing point, and the downward speed.

The input values can be selected with the keys **↑** or **↓**. The values can be changed with the keys **+** or **-**.

SET UP

By switching to the "SET UP" level the program preselected in the "STOP" level can be altered. This level is specially suitable for setting up with parts on the conveyor as the axis travels to the position set on the OptiMove 1. This way all the positions and values can be checked exactly in the booth.

Programming sequence (Complete overview)

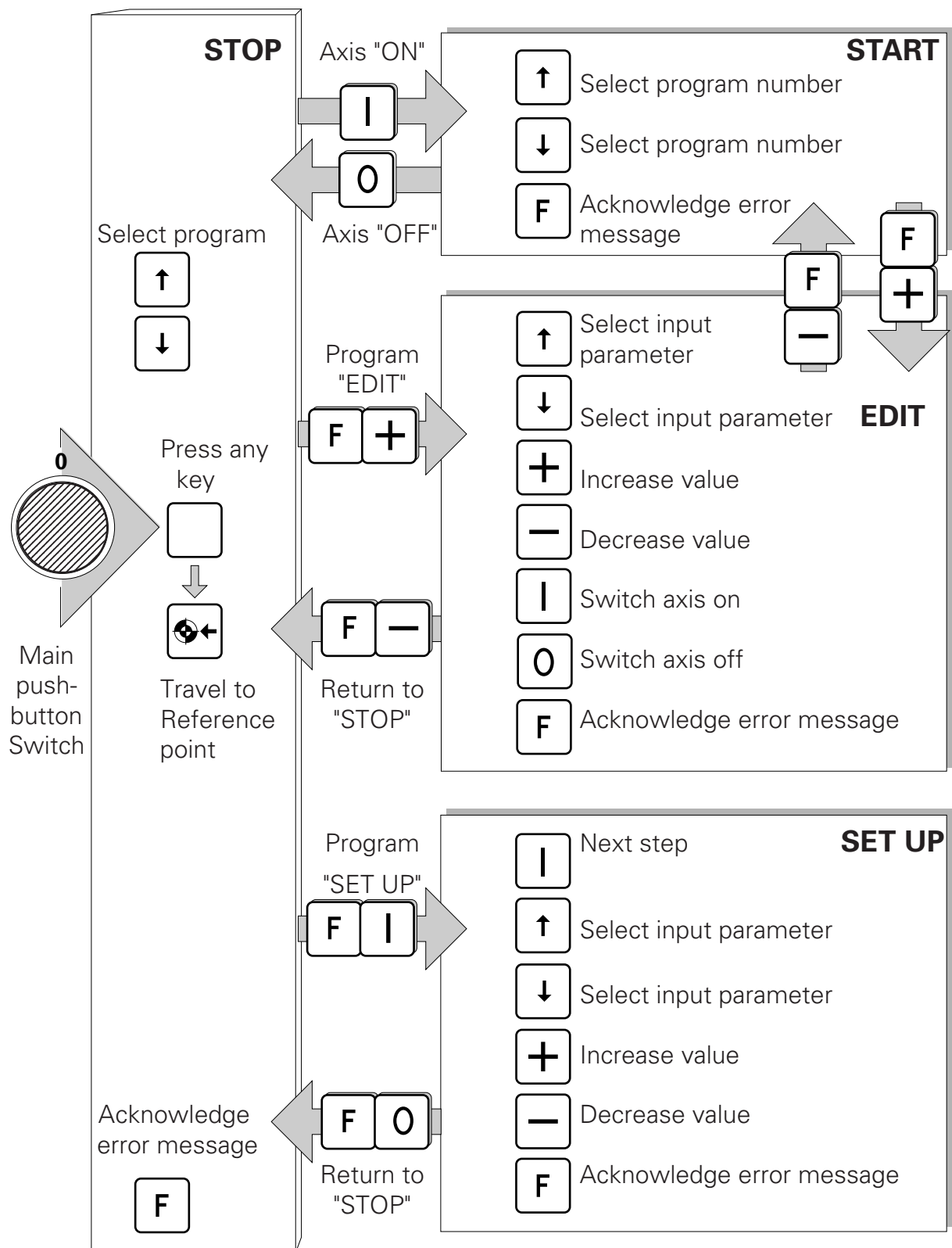


Figure 12.

Make a photocopy of this page to keep by the OptiMove 1 as a programming reference.


3.5 Programming sequence (Simplified overview)

The OptiMove 1 Powder Reciprocator Control program memory is set with default values, at the factory, so the user will have to reset the values to his own requirements.

There is a blank table at the end of this section (pages 30 and 31) where the part designation, program numbers, and corresponding parameters etc. can be recorded. This will help keep track of the axis movements, and speed(s) for a variety of workpieces.

It is recommended to make photocopies of these pages for future use !

The diagram opposite shows where the relevant information for programming a specific level is found. The initial starting position for all the input functions is the "STOP" level. By pressing the key(s) shown on the desired arrow entry into the corresponding level is given.

If the OptiMove 1 is switched off it can be started by simply pressing the main pushbutton (see Fig. 1) . "**PRC** " appears on the display. Press any key and the error message "**E10**" (for travel to reference point) appears on the display. The carriage does not move until the "Reference point" key  is pressed. The error message "**E10**" on the display changes to "**P01**" and below it "**0.050**".

The OptiMove 1 is now ready operation.

For a details of the specific level, see the corresponding pages (18, 20, 22, and 24).

Programming sequence (Simplified overview)

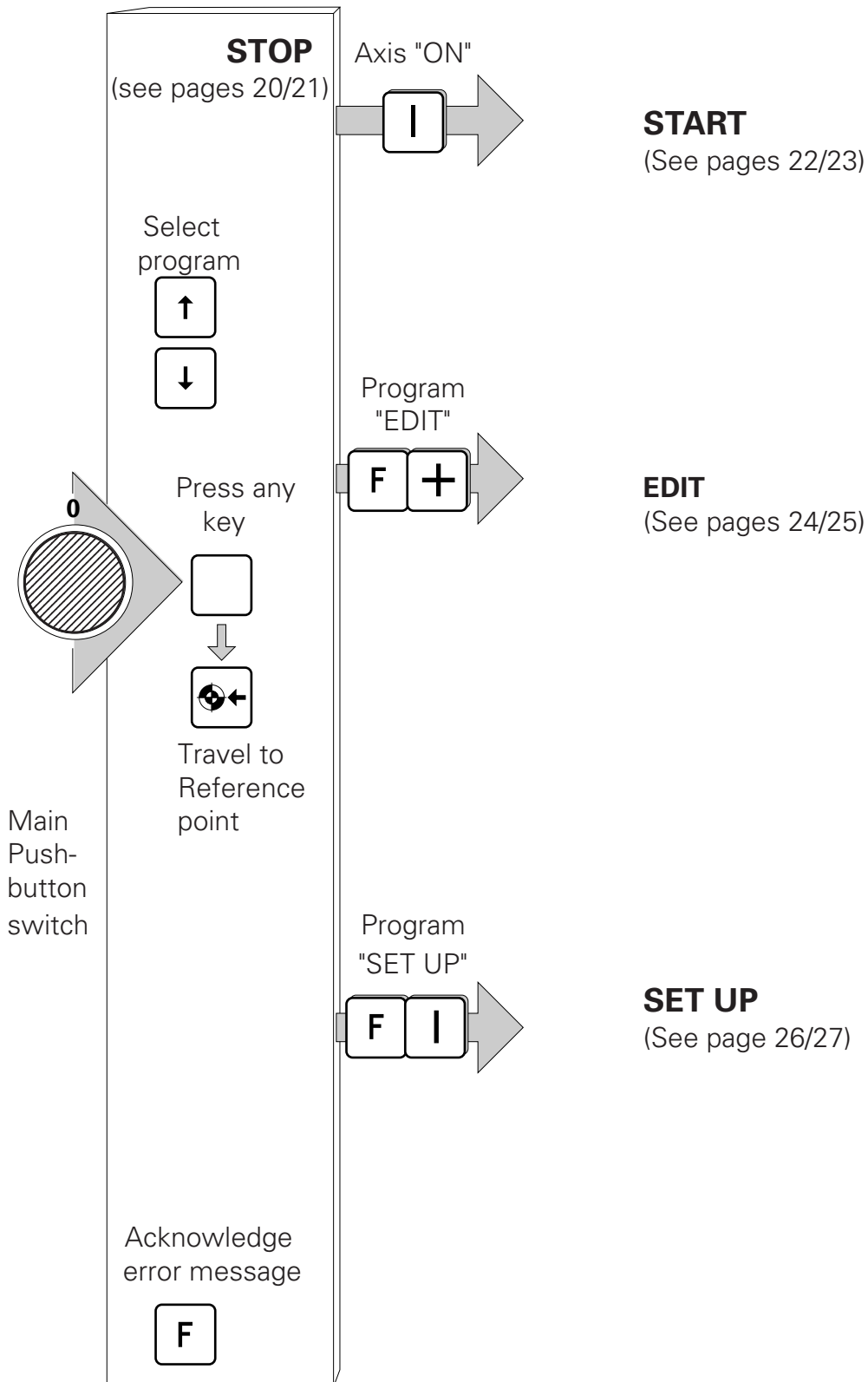


Figure 13.

3.6 Programming sequence (STOP)

STOP

After pressing the Main push-button switch on and travelling to the reference point the OptiMove 1 will always switch to the "STOP" level. The levels, "START", "EDIT" or "SET UP" can be selected from the "STOP" level by pressing the corresponding keys (see the page opposite). Any desired program (number) can also be selected on this level.

 ATTENTION
--

When the OptiMove 1 is switched off at the Main push-button switch the carriage will sink slowly, under its own weight to its lowest point. Care should be taken to see that nobody stands under the carriage and that nothing protrudes below the bottom of the carriage when setting up the gun(s) and support(s) etc. on the carriage as the cabin floor or the filter belt (if a powder recovery unit is fitted) can be damaged.

Programming sequence (STOP)

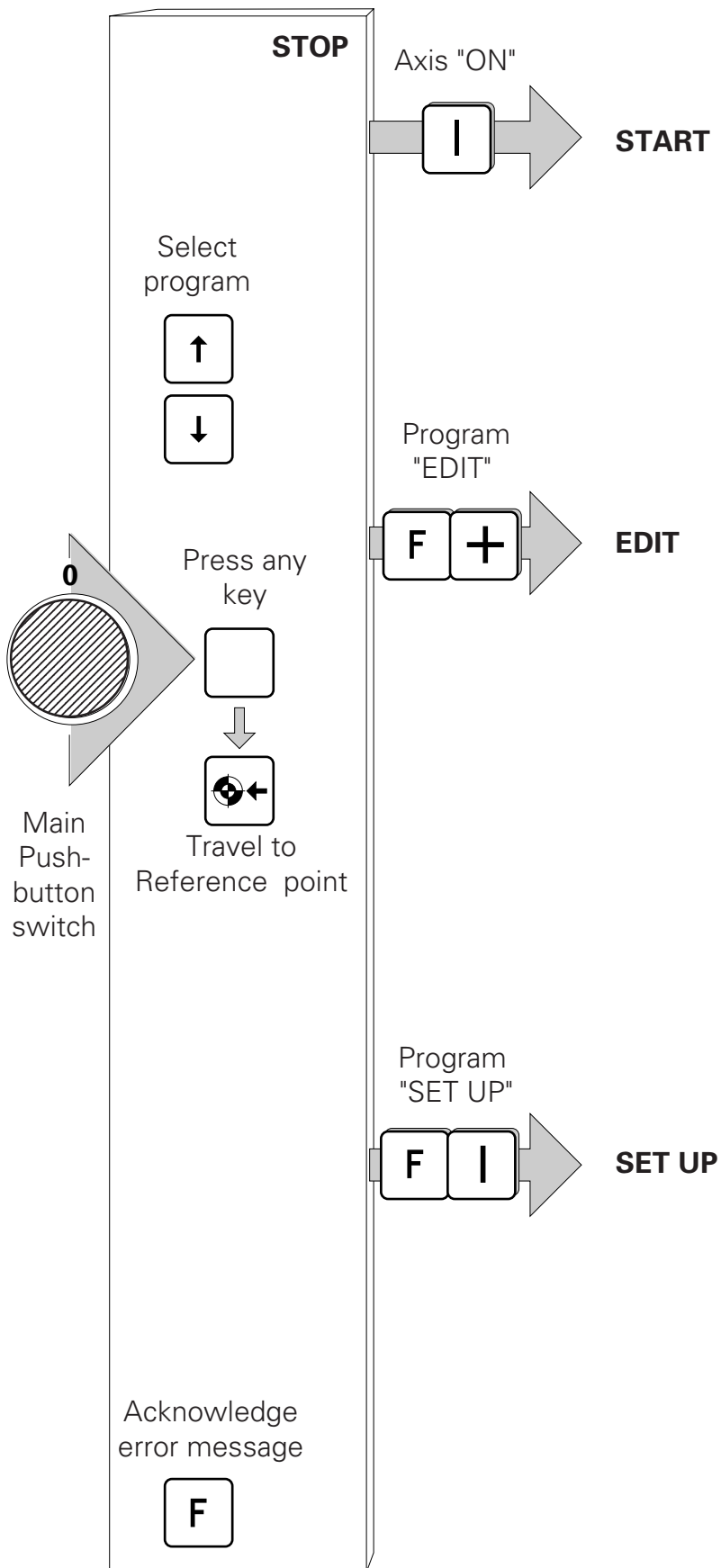


Figure 14.

3.7 Programming sequence (START)

START

The axis is switched on by pressing the key **I** on the OptiMove 1 front panel. The program number can be selected on the level "START". When a program number is selected the reciprocator always carries out a previously set axis value (or a default value) until it reaches a reversing point. The new program is initiated immediately after the axis has passed the reversing point.

The axis can be switched off again by pressing the **O** key.

Pressing the **F+** keys simultaneously switches the OptiMove 1 directly into the "EDIT" level.

Programming sequence (START)

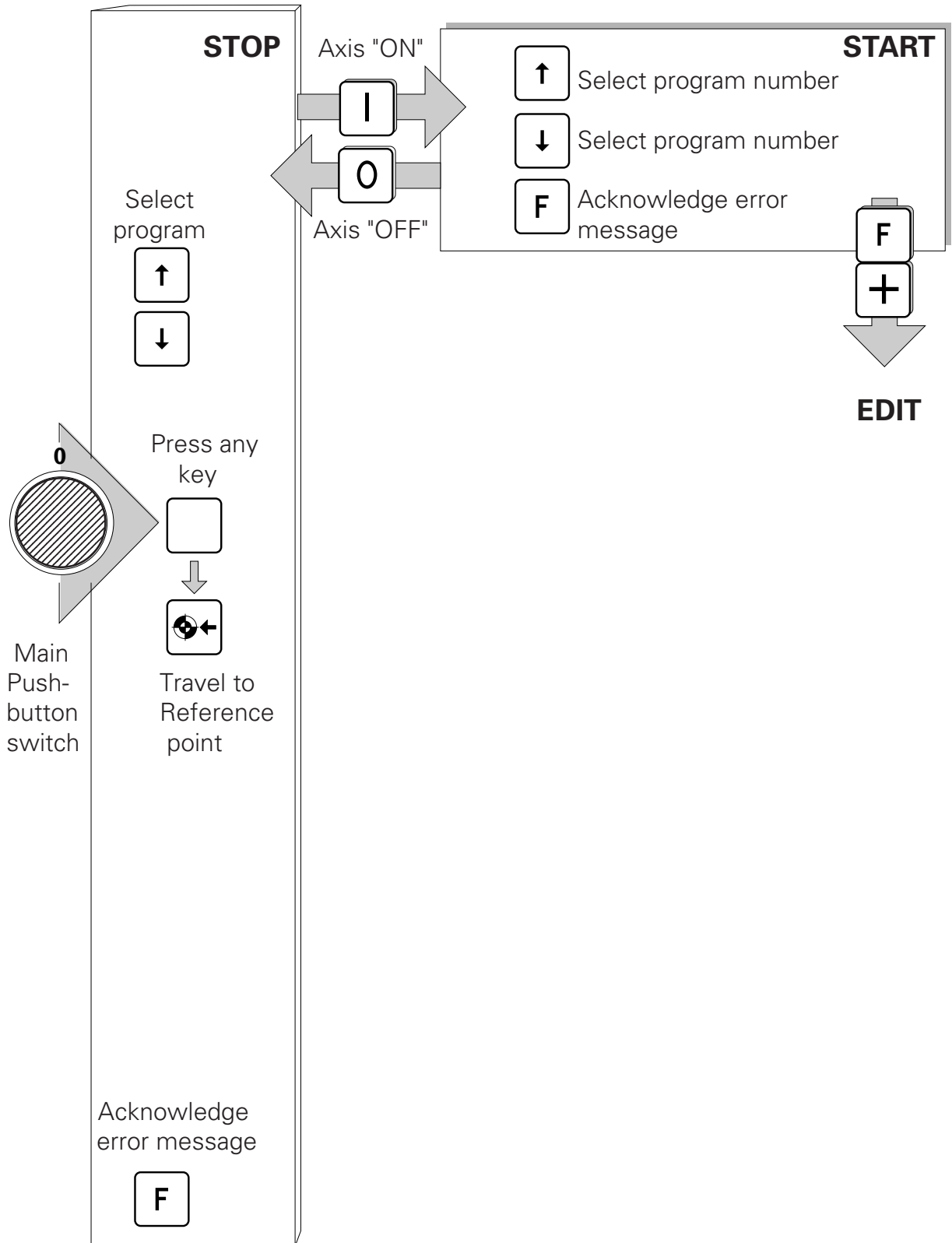


Figure 15.

3.8 Programming sequence (EDIT)

EDIT

By switching to the level "EDIT" the input (or default) values (upper reversing point, speed - up, lower reversing point, speed - down) given on the level "STOP" can be changed.

The input parameters can be selected with the \uparrow or \downarrow key.

The values for these parameters can be changed with the $+$ or $-$ key.

Select the program number to be altered in the level "STOP".

Display : $P03$

Press \uparrow or \downarrow to select a program number.

0.363

Switch to the level "EDIT" by pressing the $F+$ keys simultaneously.

Display : 003

The program number appears in the display

2.114

This value can now be increased or decreased by pressing the $+$ or $-$ key.

Pressing the \uparrow or \downarrow key switches to the next input parameter.

Display : -03

0.400

This value can now be increased or decreased by pressing the $+$ or $-$ key.

Pressing the \uparrow or \downarrow key switches to the next input parameter.

Display : 003

0.320

This value can now be increased or decreased by pressing the $+$ or $-$ key.

Pressing the \uparrow or \downarrow key switches to the next input parameter.

Display : -03

0.400

This value can now be increased or decreased by pressing the $+$ or $-$ key.

Pressing the \uparrow or \downarrow key switches to the next input parameter.

Press $F-$ simultaneously to return to "STOP"

Programming sequence (EDIT)

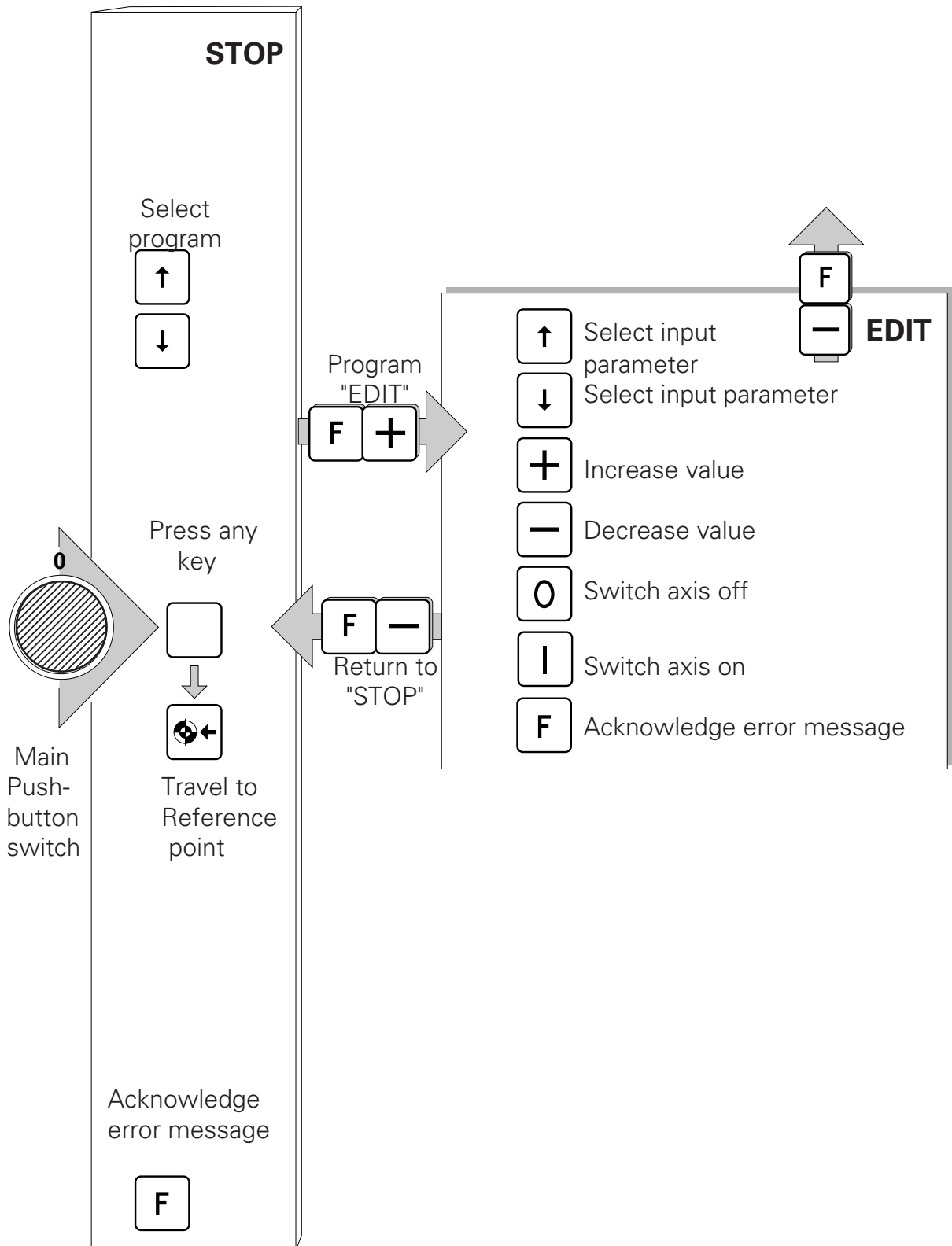


Figure 16.

3.9 Programming sequence (SET UP)

SET UP

In the "SET UP" mode all the input values can be programmed while the axis is running. This level is specially suitable for setting up when the parts to be coated are hanging on the conveyor.

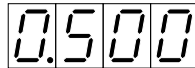
When the upper reversing point is reprogrammed the axis travels to the new position. In this way the accuracy of all the input values can be checked visually with the reciprocator in action.

By switching to the level "SET UP" the preselected program in the level "STOP" can be changed by pressing the keys **F I**.

The following appears on the display :



Blinking



The input parameters can be set in exactly the same way as in the "EDIT " mode.

The reciprocator travels to the previously input position by pressing the key **I**.

The reversing points, and the carriage stroke speeds for the corresponding parts can thus always be visually checked. In order to return to the "STOP" mode from the

"SET UP" mode the keys **F +** must be pressed simultaneously.

The input values must always be programmed in pairs, for example, upper reversing point and upward stroke speed, then by further pressing the key **I** the lower reversing point and the downward stroke speed.

Programming sequence (SET UP)

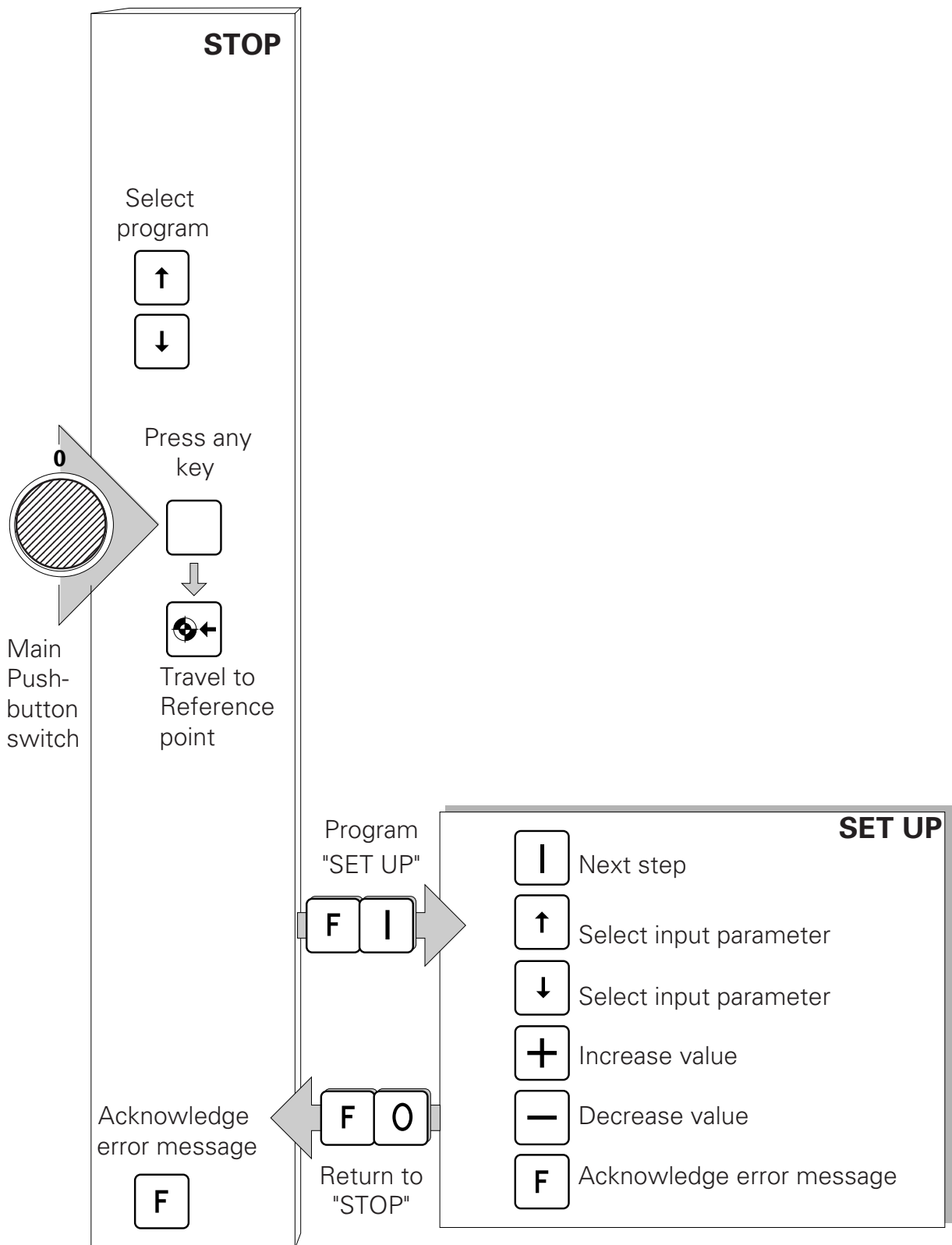


Figure 17.

3.10 Error messages

E01: Incorrect input.

The "E01" error message appears as soon as a wrong key is pressed for a value that is not valid.

The "E01" message only appears as long as the wrong key is pressed.

E 08: EPROM is incorrectly "burnt-in" (Check sum error)

E10: Reference point not approached.

The "E10" message means that the reference point has not yet been approached. Reference point travel is initiated by pressing the key shown below :



E11: RAM Reset.

This error message appears when a RAM Reset is carried out. All data in the memory is erased and the system parameter values, and the program parameter values are given as default values.

E12: Data in the memory is changed (RAM Error) or Stroke limiting parameter is not set.

When the data in the memory is changed or the stroke limit is not correctly input, the error message "E12" appears. After acknowledging the error message "E12" with the key **[F]** the error message "E11" appears. All data stored in the memory is erased and replaced with default values. The error message "E11" must be acknowledged with the key **[F]**. The stroke limit must be input again.

See "2.12 Setting the initial reciprocator stroke height", page 12.

E20: End position error.

This error message appears when the actual position of the axis is larger than that defined by the software.

E21: Increment error.

The error message "E21" appears on the display when the OptiMove 1 control does not receive any impulses from the incremental encoder of the reciprocator.

E22: Tacho error.

The error message "E22" appears when the tachometer does not transmit a signal (DC drive only).

4. Automatic starting and stopping of the axis movements controlled through object gaps

The OptiMove 1 Powder Reciprocator Control can recognize gaps between objects through the digital input "Start/Stop lower reversing point" and start the actual movement program or stop at the lower reversing point accordingly. The required control signal must be made available through an external light barrier.

4.1 Digital input - Start/Stop - lower reversing point

This input indicates the presence of an object, and starts the axis movement.

Start/Stop LRP = Low => Axis stopped at a reversing point

Start/Stop LRP = High => Axis starts the actual movement program

This digital input is activated only after "Travel to Reference point", that is to say, during system parameter editing, and the Start-up phase the input is ignored. As long as the input is "Low" the axis can be operated through the keypad without reservation.

When the input is "High" the axis cannot be stopped through the keypad and the following reservations are valid :

Input Low	from Low to High	from High to Low
Stop mode	Run mode	Axis travels to LRP, Stop mode
Run mode	Run mode	Axis travels to LRP, Stop mode
Step mode	Run mode	Axis travels to LRP, Stop mode
Stop-Edit mode	Run-Edit mode	Axis travels to LRP, Stop-Edit mode
Run-Edit mode	Run-Edit mode	Axis travels to LRP, Stop-Edit mode

Keypads during input on High :

Run mode :

Permitted :

Blocked :

Switch program

Stop

Edit program

Run-Edit mode :

Select value

Stop

Change value

Exit Edit mode

4.2 Digital output - Program run

This output indicates that the axis is in a started or stopped state.

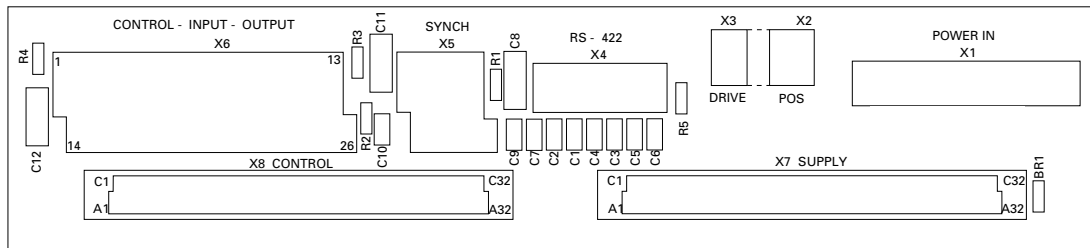
Program run = Low - Axis in stopped state
 - Travel to Reference point
 - Step mode (Set up operation)

Program run = High - Program started

5. Connections and Plug assignment

Die OptiMove 1 Powder Reciprocator Control is supplied fitted in a housing.

5.1 Connections on BP 1.



Key to the Printed Circuit Board

1. **x1** : Power supply (POWER IN)
2. **x2** : Position determination (POS)
3. **x3** : Drive signal (DRIVE)
4. **x4** : Not used
5. **x5** : Not used
6. **x6** : External control signal (CONTROL - INPUT - OUTPUT)

Figure 18.

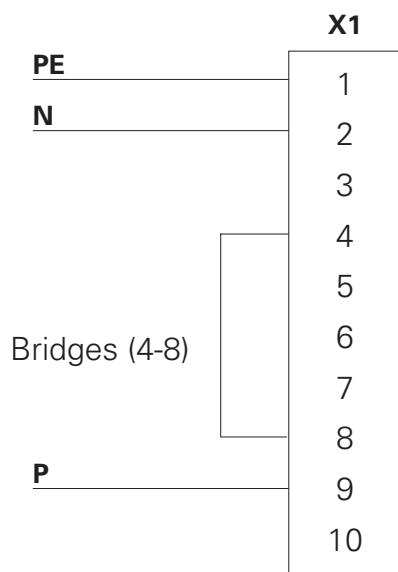
5.2 Mains supply - POWER IN (Plug - X1 on BP 1)

By setting the corresponding bridges on the BP1 Power Board the OptiMove 1 Powder Reciprocator Control can be used with any available Mains power supply.

X1 POWER IN BACK PLANE X1				POWER SUPPLY			
Mains	N	P	Bridges - X1	BR1	BR2	BR3	BR4
100	2	4	3-8 / 5-9	ON	OFF	ON	OFF
110	2	4	3-8 / 5-9	OFF	ON	OFF	ON
120	2	6	7-10 / 3-8	OFF	ON	OFF	ON
200	2	9	4-8	ON	OFF	ON	OFF
220	2	9	4-8	OFF	ON	OFF	ON
230	2	9	6-8	OFF	ON	OFF	ON
240	2	10	6-8	OFF	ON	OFF	ON

Grounded lead connection PE X1.1

Example : for 220 V Mains voltage



The bridges, BR 1 to BR 4, on the printed circuit board - POWER SUPPLY are set as follows :

- BR 1 = OFF
- BR 2 = ON
- BR 3 = OFF
- BR 4 = ON

5.3 External digital control signal (CONTROL-INPUT-OUTPUT)

Plug assignment X6 CONTROL-INPUT-OUTPUT

INPUT	
1	Shield input cable
2	GND for input (24 V)
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	Start / Stop - LRP
13	
24	
25	
26	
OUTPUT	
14	Shield output - Cable
15	+24 V for output
16	
17	
18	
19	Program run
20	
21	

5.3.1 Digital inputs and outputs

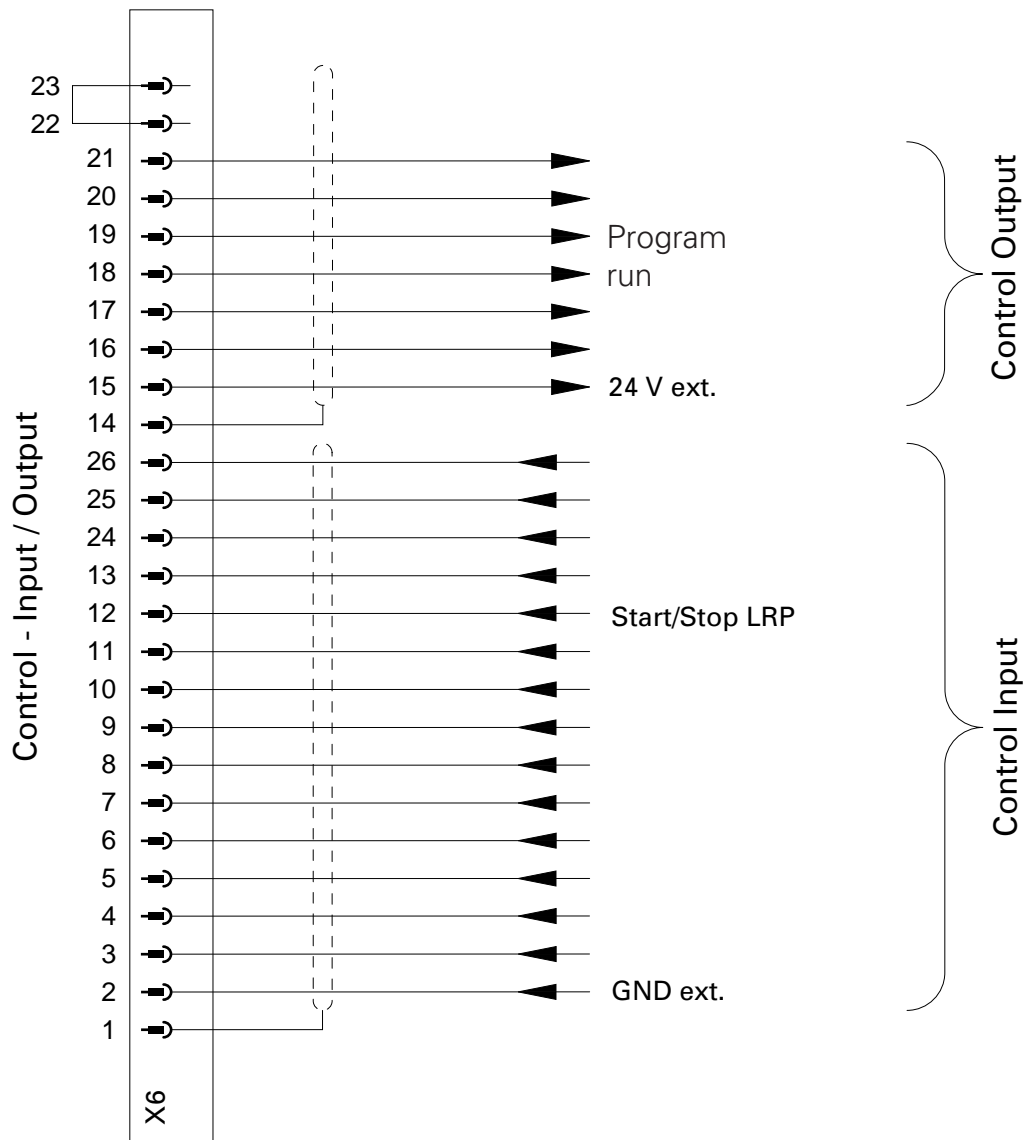
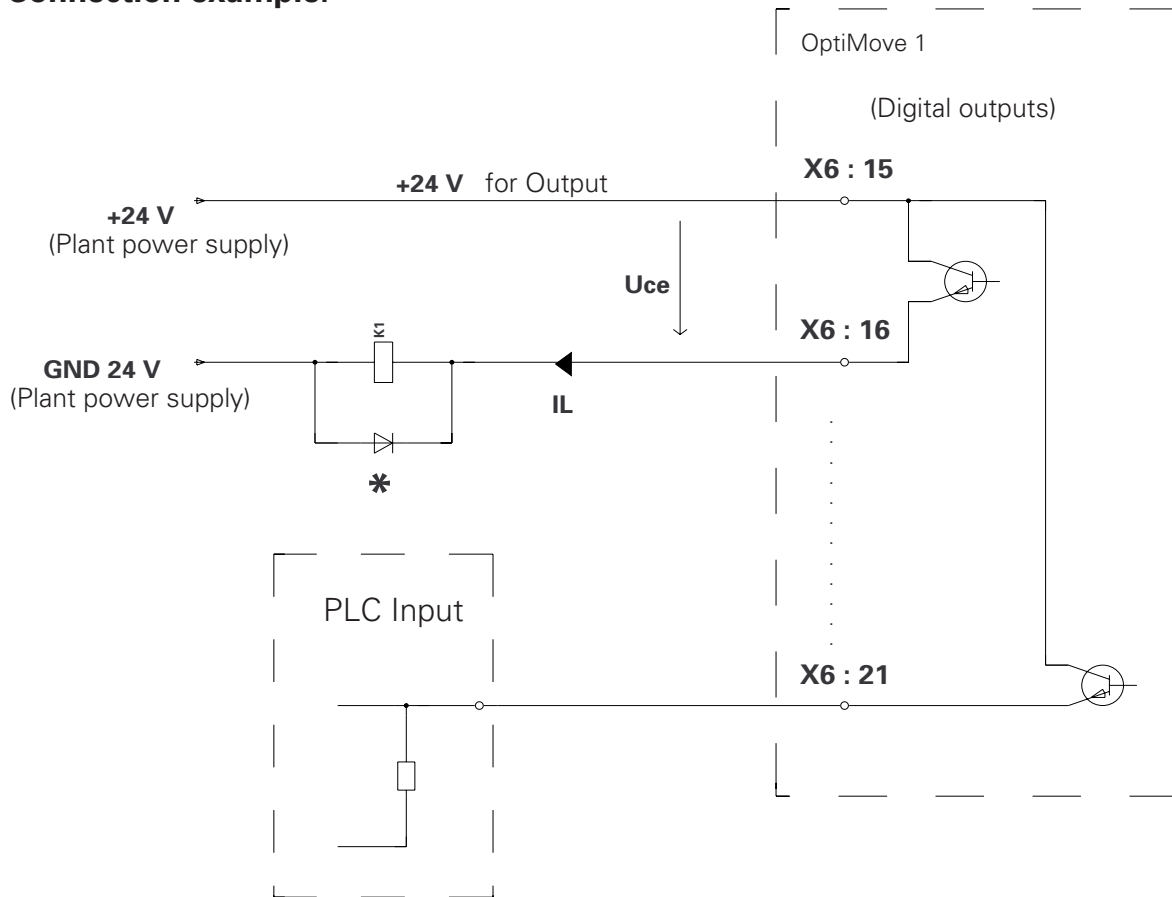


Figure 19.

5.3.2 Electrical connections for a digital output

The digital outputs are set out for operation at 24 VDC and function as galvanically isolated PNP outputs.

Connection example:



Technical data for the digital outputs :

Maximum Collector-Emitter voltage:

$$U_{CE} \text{ max.} = 35 \text{ V}$$

$$-U_{CE} \text{ max.} = 6 \text{ V}$$

Maximum ballast current:

$$I_L \text{ max.} = 30 \text{ mA}$$

Maximum residual voltage through the switched output at maximum ballast current:

$$U_{CEsat} \text{ max.} = 1.1 \text{ V}$$

Maximum residual voltage with inhibited output:

$$I_{CE0} \text{ max.} = 500 \text{ } \mu\text{A}$$

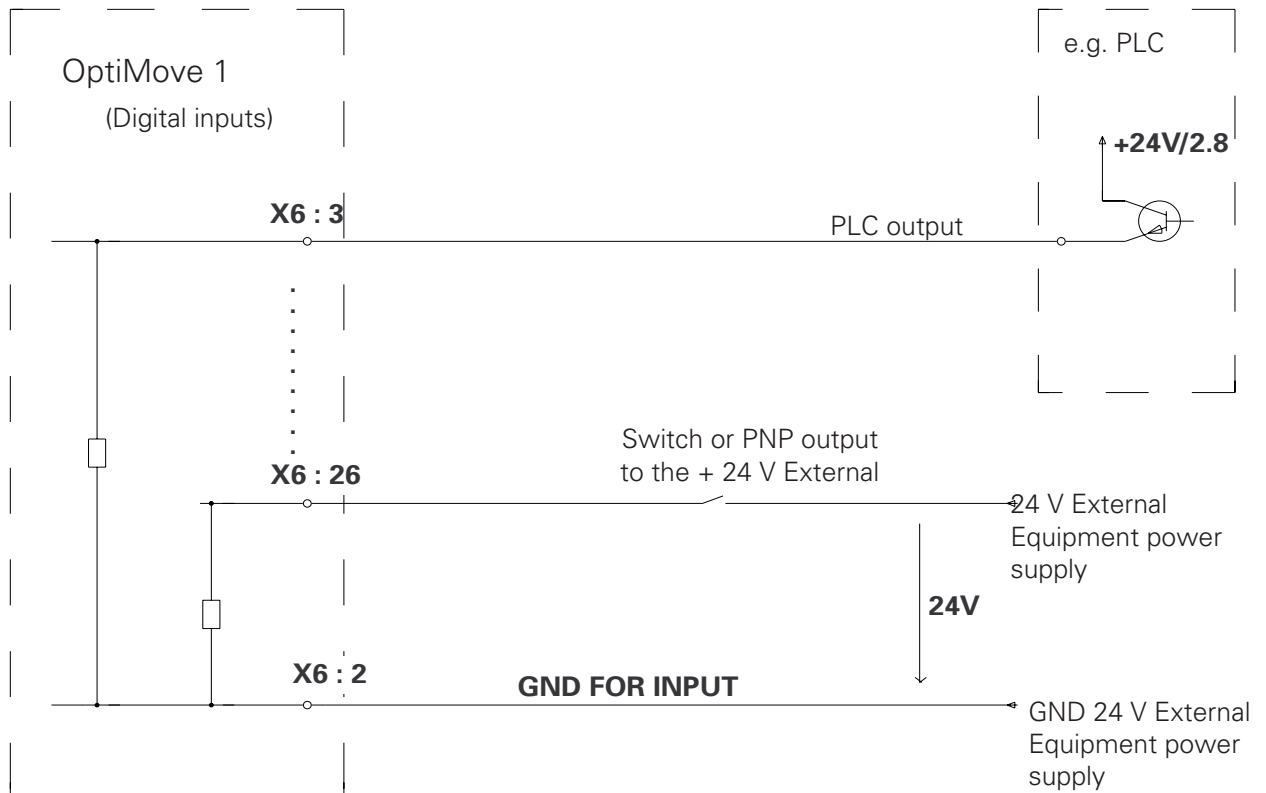


***Inductive loads must be switched with a recovery diode.**

Example : A Type 1N4004 Silicon diode or similar

Figure 20.

5.3.3 Electrical connection for a digital input



Technical data of the digital inputs :

Nominal value : 24 VDC
 For "0" signal : 0-1.6 V
 (Negative input voltage, max. -10.0 V)

For "1" signal : 14-30 V
 (30 V Permanent, max. 35 V for $t < 100$ ms)

Input voltage : Typically 4.8 mA (at 24 V)

Figure 21.

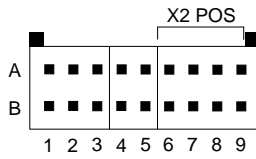
5.4 Positioning - POS

The incremental pulse generator and the reference switch for positioning are connected to this plug.

Plug assignment - X2 POS :

X2 Positioning (POS)	
Connection No.	Assignment
6A	GND 24 V POS
6B	+ 24 V POS
7A	Ch. B
7B	Ch. A
9A	Ref. Point

Plug designation - X2 POS : Front view



Plug type : Connectral Series 320, 18 pole, 2 row

Figure 22.

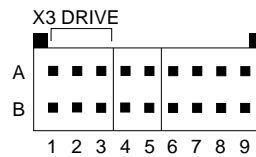
5.5 Drive control - DRIVE

The control signal for the PRP 1 Power pack or a frequency converter is connected to this socket.

Plug assignment - X3 DRIVE Housing version :

Connection No. X3	Function	
1A	Analogue ground for Theoretical value	ANA GND
1B	Analogue ground for Theoretical value	ANA OUT
2A	- Direction of rotation signal (negative)	-SOA
2B	+ Direction of rotation signal (positive)	+SOA
3A	- Activating signal - PRP 1 (neg.)/Frequ. Converter	-RUN
3B	+ Activating signal - PRP 1 (pos.)/Frequ. Converter	+RUN

Plug designation - X3 DRIVE : Front view



Plug type : Connectral Series 320, 18 pole, 2 rows

Figure 23.

List for program parameters of the OptiMove 1

Program no	Customer	Object	Upper reversing point	Lower reversing point	Speed - Up	Speed - Down
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
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21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						

Make photocopies of this page and the next page for future use.

List for program parameters of the OptiMove 1 (cont.)

Program no	Customer	Object	Upper reversing point	Lower reversing point	Speed - Up	Speed - Down
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
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58						
59						
60						
61						
62						
63						
64						

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MICRO 3 Control board configuration possibilities

- X20 :** Power supply for position detection
A : Power supply for position detection from the 24 V supply (standard).
B : Power supply for position detection from the 15 V supply.
- X21 :** Locking of the RS 422 serial interface.
A : Circuit termination active.
B : Circuit termination inactive (standard).
- X22 :** Front display.
A : 7 digit Front display.
B : 5 digit Front display.
- X23 :** Adaptation of the EPROM
A : 256 kB EPROM (27c - 256)
B : 512 kB EPROM (27c - 512)
- X24 :** Is not evaluated (always in Position A!)
- X25 :** Is not evaluated (always in Position A!)
- X26 :** Adaptation of the RAM
A : 16 kB RAM (DS 1220 Y, 2 k x 8 bit)
B : 64 kB RAM (DS 1225 Y, 8 k x 8 bit)
- X27 :** Activating signal of the circuit termination (RUP)
A : direct (RUN during Reset on Low)
B : inverse (RUN during Reset on High)
- INT0:** Release of the system interrupt - 0
- ON :** Interrupt 0 released (OptiMove 1, OptiMove 2)
- OFF :** Interrupt 0 locked (PRC 1, MRC, BC)
- INT1:** Release of system interrupt - 1
- ON :** Interrupt 1 released (OptiMove 1, OptiMove 2)
- OFF :** Interrupt 1 locked (PRC 1, MRC, BC)

Spare Parts List

Spare Parts List

Ordering Spare Parts

When ordering spare parts for coating equipment, please indicate the following specifications:

1. Type, and serial number of your coating equipment
2. Order number, quantity, and description of each spare part

Example:

1. **Type** : OptiMove 1 , **Serial no** : XXXX XXXX
2. **Order no** : 200 174, 5 pieces, fine wire fuse

OptiMove 1 Powder Reciprocator Control**Control unit (complete)**

2	Cover	339 490
3	Cover plate	343 099
4	Support bracket	343 072
7	Micro 3 - complete	344 257
8	Power supply - PS1	340 383
9	Front display - V2.2 - complete	342 904
10	Back plane - BP1- complete	342 785
11	Locking push-button - yellow	262 820
12	Fixing flange	262 838
13	Light element - Led 230 V - yellow	262 846#
14	Standard auxiliary switch	262 854
16	Socket plate - 3 flat pin	200 409
17	Fuse holder	200 131
18	Fuse - F 0.25 AT	227 161#
19	Fuse - F 10 A	200 174#
20	Flange socket - 4 pin socket	205 249
21	Cable - Socket Set	343 277
22	Sealing frame	362 310
24	Spacer - ø 4.3 / 8 x 7.5 mm	238 120
26	Sealing strip - 9 x 2 mm	100 250*
42	EPROM 2.XX.1 - DC	344 249
	EPROM 2.XX.2 - AC	344 222
43	RAM Program Memory	228 265
44	Cable with plug	344 206
45	Cable with plug	344 044
46	Cable with single plug	303 607

* Please indicate length required

Wear parts

OptiMove 1 Powder Reciprocator Control

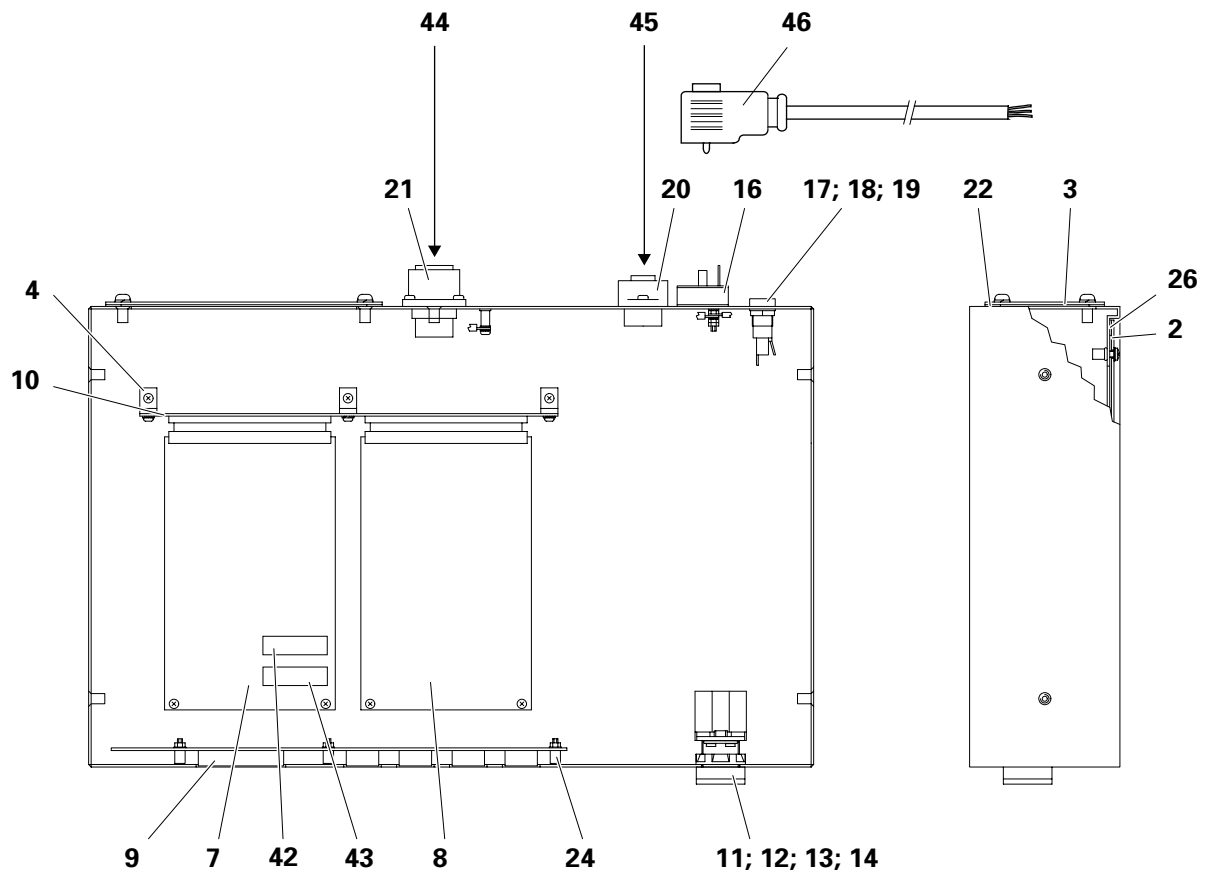


Figure 1

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