

REOVIB MTS 441, 442 Thyristor Controller for Vibratory Feeders

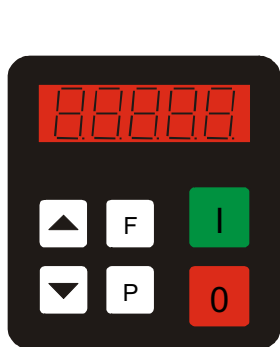
Operating Instructions



One and two channel control units for full and half wave feeders..
 Stepless control of feeder throughput by controlling the supply voltage using phase-angle control.
 All settings are made externally using a touch panel and LED display.
 The feed rate is held constant irrespective of supply voltage variations.
 Functions include:
 Soft-start, soft-stop, maximum limit setting, vibrating frequency 50/100 Hz (60/120 Hz)
 Start/Stop input, status output, track control, solenoid valve output (air blast).
 Internal interlocking; channel 1 inhibits channel 2 or channel 2 inhibits channel 1 (MTS 442 only).

Technical Data:	MTS 441	MTS 442
Supply voltage:	115 / 240 V, 50/60 Hz	
Output voltage:	0...100 / 0...210 V	
Output current:	6 A	6 A (10 A total)
Enable input:	24 V, DC or Contacts	
Track sensor:	24 V, PNP	
Status output (ON/OFF):	24 V, DC / 20 mA	
Solenoid valve output:	24 V, DC 100 mA	
Operating temperature:	0... + 45 °C	
Storage temperature:	-10...+ 80 °C	
Recommended fuse:	16 A	

Display and controls



- Increase value
- Decrease value
- Go Back
- Programming mode or Enter
- Output active
- Output inactive

Instructions:

Menus are used for changing settings. The different parameters are selected by entering a code.

All adjustments are made by firstly pressing the P key, followed by selecting the entry code, using the cursor keys.

Settings

Pressing the cursor key for a short time causes a unit increment/decrement, holding down for a longer time gives changes in tens of units.

Setting changes are saved upon leaving the menu or automatically if a key is not pressed for 60 seconds.


Running Displays

Channel 1		Set point in %
Channel 2		Set point in %
		Enable OFF
		Track full
		Timer running
		Stop using "0" key
		Sensor time out
		Powering up



Safety instructions

This description contains the necessary information for the correct application of the product described below. It is intended for use by technically qualified personnel.

Qualified personnel are persons who, because of their training, experience and position as well as their knowledge of appropriate standards, regulations, health and safety requirements and working conditions, are authorised to be responsible for the safety of the equipment, at all times, whilst carrying out their normal duties and are therefore aware of, and can report, possible hazards (Definition of qualified employees according to IEC 364).

- 
- WARNING!**
Hazardous Voltage!
 Failure to observe can kill, cause serious injury or damage.
 Isolate from mains before installation or dismantling work, as well as for fuse changes or post installation modifications.
 Observe the prescribed accident prevention and safety rules for the specific application.
 Before putting into operation check if the rated voltage for the unit conforms with the local supply voltage.
 Emergency stop devices must be provided for all applications. Operation of the emergency stop must inhibit any further uncontrolled operation.
 Electrical connections must be covered.
 The earth connection must be checked for correct function, after installation.

Installation

Check !	Are the supply, feeder coil and controller input voltages correct ? Is the controller adequately rated for the rated power of the feeder ? What is the vibrating frequency of the feeder ?
Connect the unit in accordance with the wiring instructions and ensure that earthing is correct !	
 Attention !	A wrongly adjusted vibrating frequency may result in destruction of the connected coils! If half-wave is selected make sure that coils suitable for half-wave operation (50 Hz / 3000 vibs./min. / 60 Hz /3600 vibs./min.) are used .
 Tip !	New units are factory set (see table with settings). For units with unknown settings, first recall the factory settings using Menu C 210 'FAC'.
external Setpoint	When an external set point source is used (MTS 441) select Menu C 003 E.S.P. = I and if a potentiometer is used select Pot = I. To set the minimum vibration level, select E.S.P. = 0, adjust the vibration level with the cursor keys and then select E.S.P. = I. The specific settings for the system can be saved using Menu C 143 US.PA. (recalled using C 210 US.PA). Menus can be hidden by selecting C 117 Hd.C.= 1.

Specified Use

The units described herein are electrical controllers for installation in industrial plants.
They are designed for power adjustment on vibratory feed equipment.

Declaration of conformity

We declare that these products conform with the following standards and directives:

Directives:

- 2014/30/EU EMC
- 2014/35/EU LVD
- 2011/65/EU RoHs

Standards:

- EN 61000-6-4:2007 +A1:2011; EN 61000-6-2:2005
- EN 50178:1997



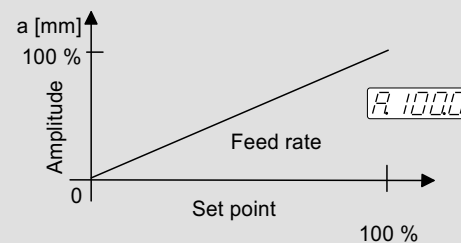
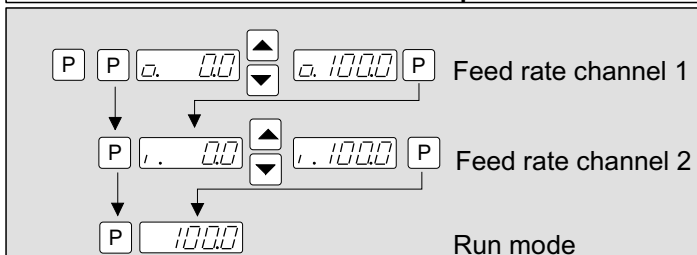
REO AG, D - 42657 Solingen

Functions summary

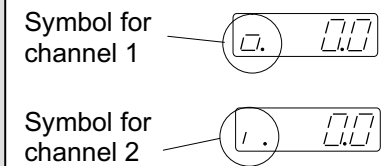
Setting	Range	Code	Factory setting	Menu code	Setting	Range	Code	Factory setting	Menu code
Feed rate channel 1	0... 100 %	o.A.	0 %	000, 020	Sensor time out channel 1	0 / I	o. E.	0	015
Feed rate channel 2	0... 100 %	i.A.	0 %	000, 021	Sensor time out channel 2	0 / I	i. E.	0	015
2. Set point (Coarse) channel 1	0... 100 %	2.	0 %	000, 020	Sensor time out time	30... 240 Sec.	E.E.	5 Sec.	015
441 External set point	0 / I	E.S.P.	0	003	442 Sensor logic AND	0 / I	SLA	0	014
441 Set point Potentiometer	0 / I	POT.	0	003	442 Sensor logic ExOR	0 / I	SLE	0	014
441 Set point 0(4)... 20 mA	0 / I	4.20		003	Pulsed operation channel 1	0 / I	o. HP.	0	004
Maximum limit channel 1	50...100 %	P	100 %.	020	Pulsed operation channel 2	0 / I	i. HP.	0	004
Maximum limit channel 2	50...100 %	P	100 %.	021	Pulse ON	0... 60 Sec.	H.	2 Sec.	004
Vibrating frequency channel 1	0 / I	o. HA.	0	020	Pulse OFF	0... 60 Sec.	h.	2 Sec.	004
Vibrating frequency channel 2	0 / I	i. HA.	0	021	Channel 1				
Soft start channel 1	0... 10 Sec.	o. /.	0.1 Sec.	020	Coarse / fine control active	0 / I	S.P.2	0	003
Soft start channel 2	0... 10 Sec.	i. /.	0.1 Sec.	021	Interlocking				
Soft stop channel 1	0... 10 Sec.	o. \.	0,1 Sec.	020	442 Channel 1 inhibits channel 2	0 / I	o.-i.	0	003
Soft stop channel 2	0... 10 Sec.	i. \.	0,1 Sec.	021	442 Channel 2 inhibits channel 1	0 / I	i.-o..	0	003
Invert enable channel 1	0 / I	o.-En.	I	020	Air valve function	0 / I	A.i.r.	0	003
Invert enable channel 2	0 / I	i.-En.	I	021	Save user settings	PUSH.			143
Switch on time delay channel 1	0... 60 Sec.	o. I.	5 Sec.	007	Restore factory settings		FAC.		210
Switch off time delay channel 2	0... 60 Sec.	i. I.	5 Sec.	006	Restore user settings		US.PA.		210
Switch off time delay channel1	0... 60 Sec.	o.O.	5 Sec.	007	Hide programming menus		Hd.C.		117
Switch off time delay channel 2	0... 60 Sec.	i.O.	5 Sec.	006					
Invert sensor channel 1	0 / I	o. -SE.	0	007					
Invert sensor channel 2	0 / I	i. -SE.	0	006					

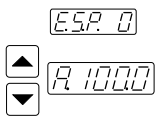
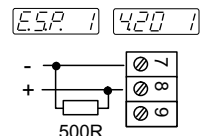
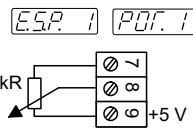
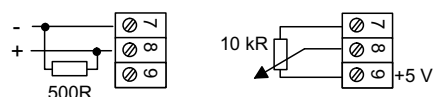
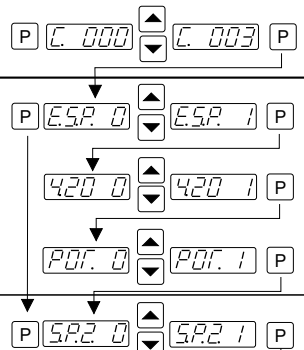
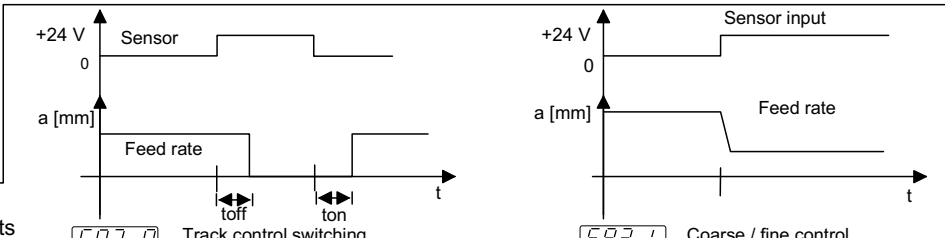
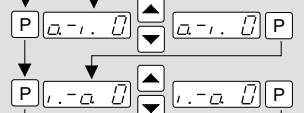
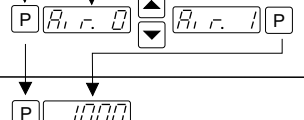

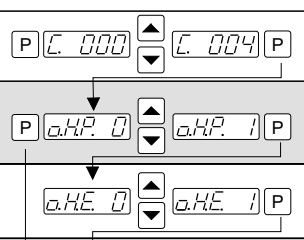
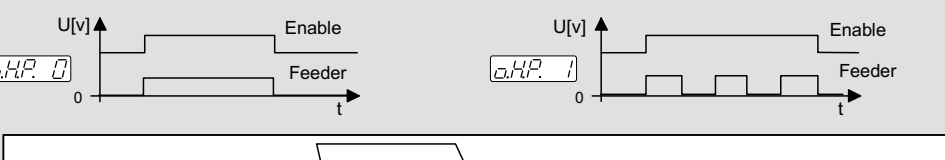
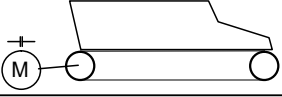
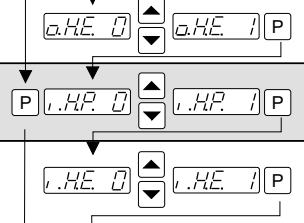
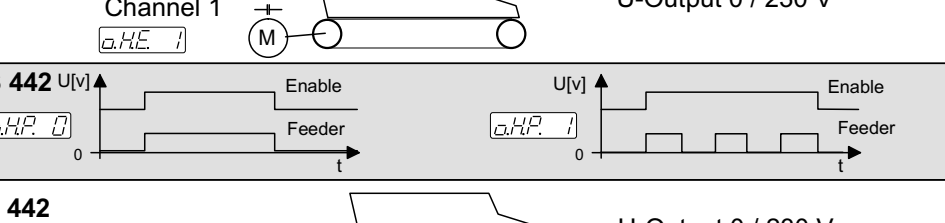
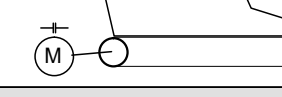
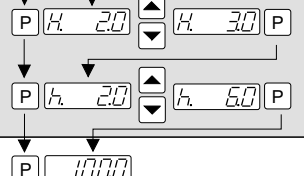
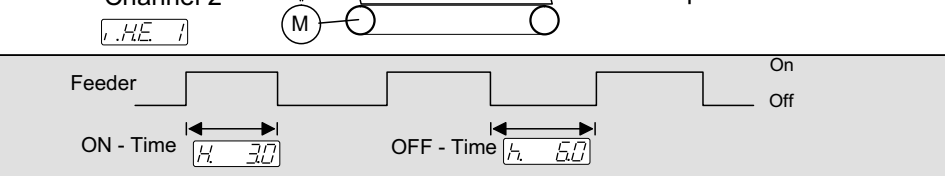
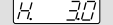
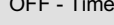
No code number is required to change the feeder throughput: pressing the P key twice will call up the set point display.

Code 000 Feed rate set point



Feed rate settings



Code 003 Function settings	Only MTS 441 0...+10 V  0(4)...20mA  Potentiometer  		Internal using keys in touch panel External set point 0...+10 V, 0(4)...20 mA Potentiometer 10 KR	Set point input
 <p>0 = Set point using display 1 = external set point 0...+10 V ON</p> <p>0 = external set point 0...+10 V 1 = external 4...20 mA</p> <p>0 = 0...10 V/ 0(4)...20 mA 1 = Potentiometer</p> <p>0 = Track control 1 = Coarse / fine control with 2 set points</p>	 <p>Only MTS 442 Interlocking of channels</p>		Track control or Coarse / fine control with two feed rates	Sensor input
 <p>Channel 1 inhibits channel 2</p> <p>Channel 2 inhibits channel 1</p>	<p>Only MTS 442 Interlocking of channels</p>		Internal interlocking as required	Interlocking
 <p>0 = Solenoid output run on time 4 Sec.. 1 = Solenoid output pre run time 1 Sec.. Run on time 4 Sec..</p> <p>Run mode</p>			24 V, DC output for air valve Air valve connections are on an internal terminal rail	Solenoid output
Code 004 Feeder / Prefeeder				
 <p>Channel 1 0 = Pulsed feed OFF 1 = Pulsed feed ON</p> <p>Prefeed motor drive 0 = OFF 1 = ON</p> <p>Channel 2 0 = Pulsed feed OFF 1 = Pulsed feed ON</p> <p>Prefeed motor drive 0 = OFF 1 = ON</p>	 <p>Only MTS 442</p> <p>Channel 1  U-Output 0 / 230 V</p>		Output pulses with adjustable ON/OFF times	Output
 <p>Channel 2 0 = Pulsed feed OFF 1 = Pulsed feed ON</p> <p>Prefeed motor drive 0 = OFF 1 = ON</p>	 <p>Only MTS 442</p> <p>Channel 2  U-Output 0 / 230 V</p>		Output pulses with adjustable ON/OFF times	Output
 <p>ON - Time</p> <p>OFF - Time</p> <p>Run mode</p>	 <p>Only MTS 442</p> <p>ON - Time  OFF - Time </p>		Adjustment of the ON/OFF pulse time	Pulse time

Code C 007 Track Control

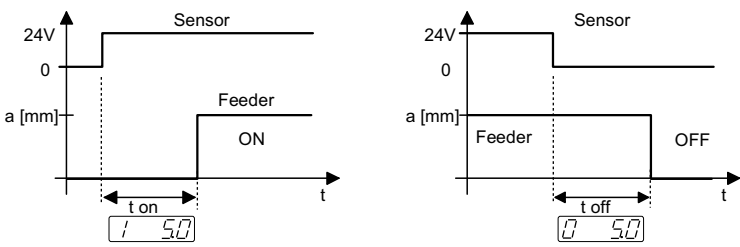
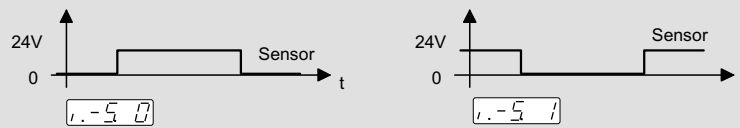
Channel 1

Invert sensor function
I = invert

Switch On time delay

Switch Off time delay

Run mode



Invert sensor input

Sensor

Adjustment of the ON and OFF time delays

Time delays

Code C 006 Track Control

Channel 2

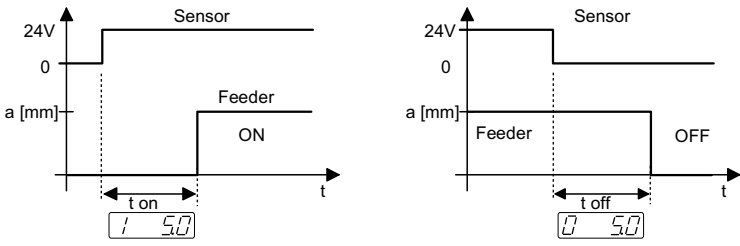
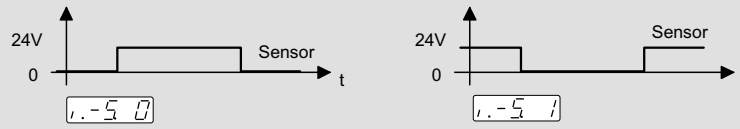
Invert sensor function
I = invert

Switch On time delay

Switch Off time delay

Run mode

Only MTS 442



Invert sensor input

Sensors

Adjustment of the ON and OFF time delays

Time delays

Code C 015 Sensor time out

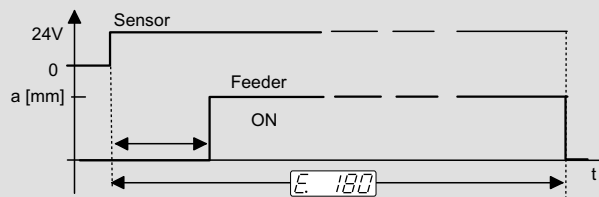
Channel 1

0 = Time-out not active
I = Time-out active

Time-out time [Sec.]

Run mode

EE 0 not active
EE 1 active

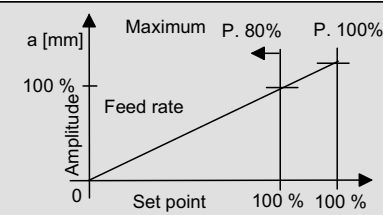
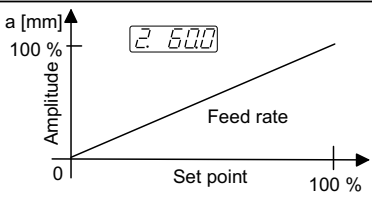
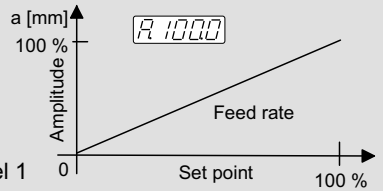
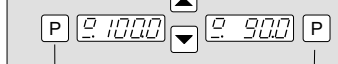


Sensor monitoring active.
If no components are detected during the time out period the feeder switches off.

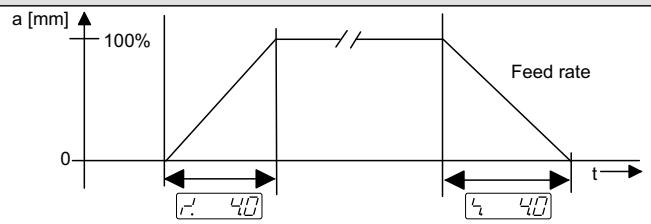
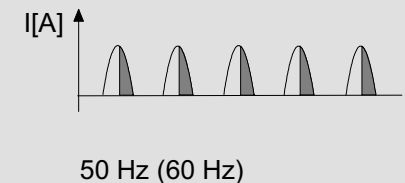
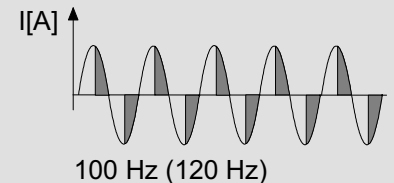
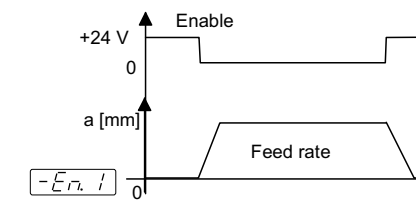
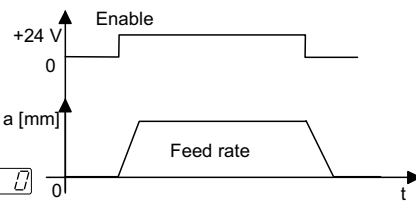
Sensor Monitoring

Code C 020 Feeder Settings

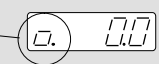
Channel 1



Coarse / fine control with two feed rates
In Menu C 003 set "S.P.2." = I !



Symbol for Channel 1



Main set point	Set point
Set point for slow feed rate	Set point
Limiting the maximum feed rate. The set point will still display 0...100% even though it is limited internally.	Maximum limit
+24 V Signal or closed contacts will enable the output. +24 V Signal or closed contacts will inhibit the output	Enable input
The frequency setting depends upon the feeder type. Important ! The wrong frequency setting can damage coils.	Vibrating frequency
Time ramp for starting and stopping the feeder.	Soft start / stop

Code C 021 Feeder Settings Channel 2	Symbol for Channel 2	Feed rate set point	Set point
<p>Only MTS 442</p> <p>P <input type="text" value="C. 000"/> <input type="text" value="C. 021"/> P</p> <p>P <input type="text" value="1. 00"/> <input type="text" value="1. 1000"/> P Feed rate channel 2</p>		<p>Limiting the maximum feed rate.</p> <p>The set point will still display 0...100% even though it is limited internally.</p>	Maximum limit
<p>P <input type="text" value="1. 1000"/> <input type="text" value="1. 900"/> P Umax Channel 2</p> <p>P <input type="text" value="1. -E. 0"/> <input type="text" value="1. -E. 0"/> P 0 = Enable 1 = Invert enable</p>		<p>+24 V Signal or closed contacts will enable the output.</p> <p>+24 V Signal or closed contacts will inhibit the output.</p>	Enable input
<p>P <input type="text" value="1. 49 0"/> <input type="text" value="1. 49 1"/> P Vibrating frequency Channel 2 50 / 100 Hz (60 / 120 Hz) HA. = 0 = 100 Hz (120 Hz) HA. = 1 = 50 Hz (60 Hz)</p> <p>P <input type="text" value="1. 2 00"/> <input type="text" value="1. 2 40"/> P Soft start channel 2</p> <p>P <input type="text" value="1. 4 00"/> <input type="text" value="1. 4 40"/> P Soft stop channel 2</p> <p>P <input type="text" value="1000"/> Run mode</p>		<p>The frequency setting depends upon the feeder type.</p> <p>Important! The wrong frequency setting can damage coils.</p>	Vibrating frequency
		<p>Time ramp for starting and stopping the feeder</p>	Soft start / stop

Code C 014 Sensor logic (MTS 442)

P C.000 [▲] [▼] C.014 P

P SLR.0 [▲] [▼] SLR.1 P

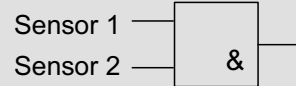
Sensor 1 + 2 AND

P SLE.0 [▲] [▼] SLE.1 P

Sensor 1 + 2 MIN-MAX

P 1000

Run mode

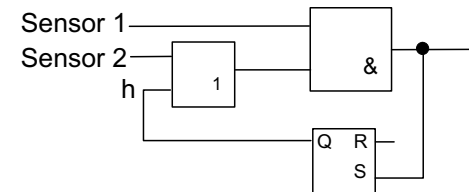


SLR.0

Track control for channel 1 operates if sensor 1 sees product, sensor 2 can operate with channel 2.

SLR.1

Track control for channel 1 operates when sensor 1 and sensor 2 see product.



SLE.0

Sensors 1 and 2 operate independently or as an AND circuit

SLE.1

Sensors 1 and 2 operate as a Min/Max configuration.

S2	S1	Max	Min	h	Feeder
0	0	0	1		
0	1	1	1		
1	1	1	0		
0	1	0	0		

Sensor logic

Sensor logic

Code 143 Save Current Parameters

P C.000 [▲] [▼] C.143 P

P PUSH [▲] [▼] SAFE P

Save parameter settings

▲ All previously set parameters are saved

Save parameter settings

P 1000 Run mode

Code 210 Recall Parameters

P C.000 [▲] [▼] C.210 P

P FAL [▲] [▼] SAFE P

Recall factory settings

▲ Recall factory settings

Factory settings

P USPR [▲] [▼] SAFE P

Recall user settings

▲ Recall settings saved under C 143

Recall parameter settings previously stored under C143

P 1000 Run mode

Service

Code 117 Inhibit Access

P C.000 [▲] [▼] C.117 P

P HdC.0 [▲] [▼] HdC.1 P

I= Menu

HdC.1

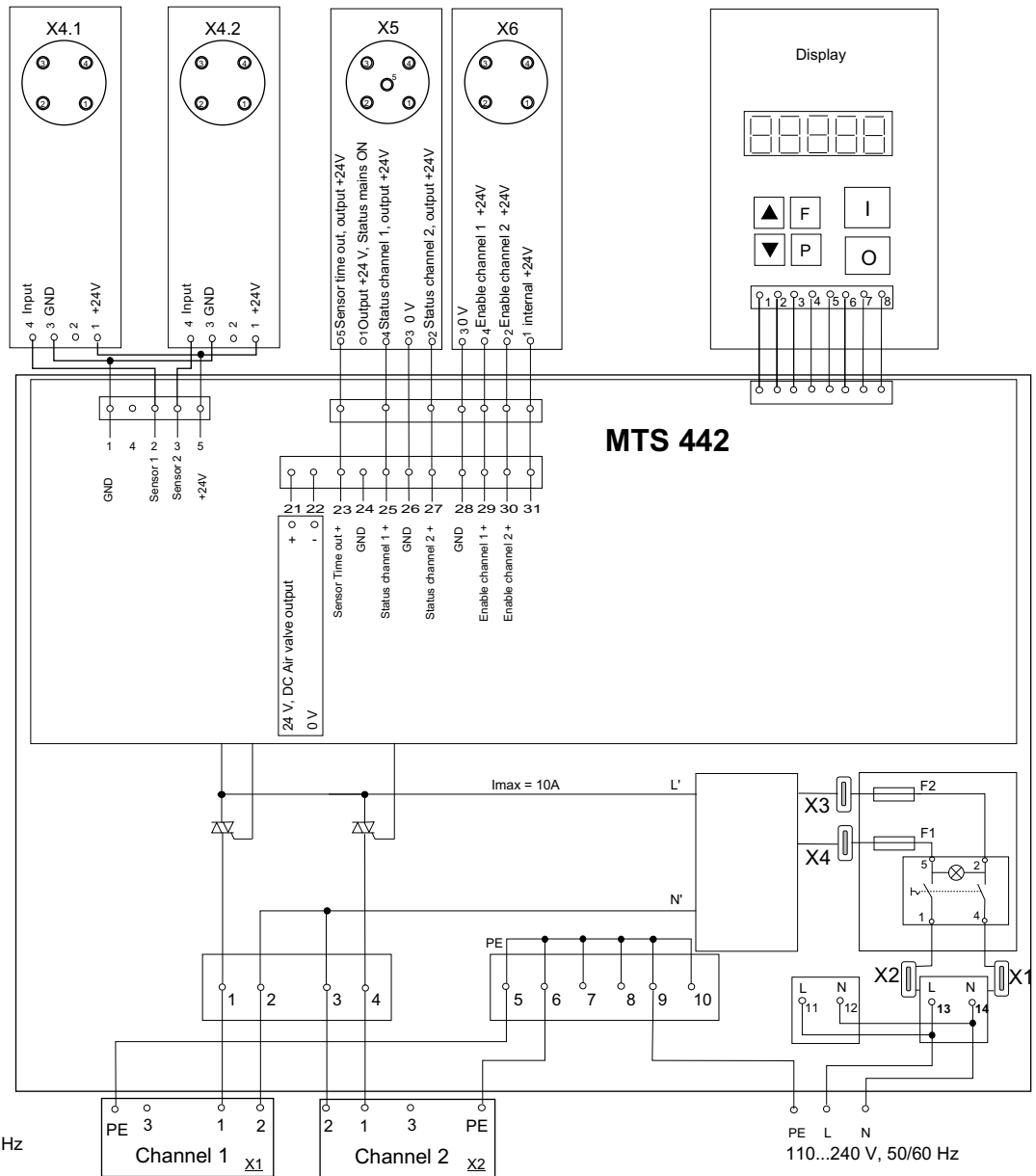
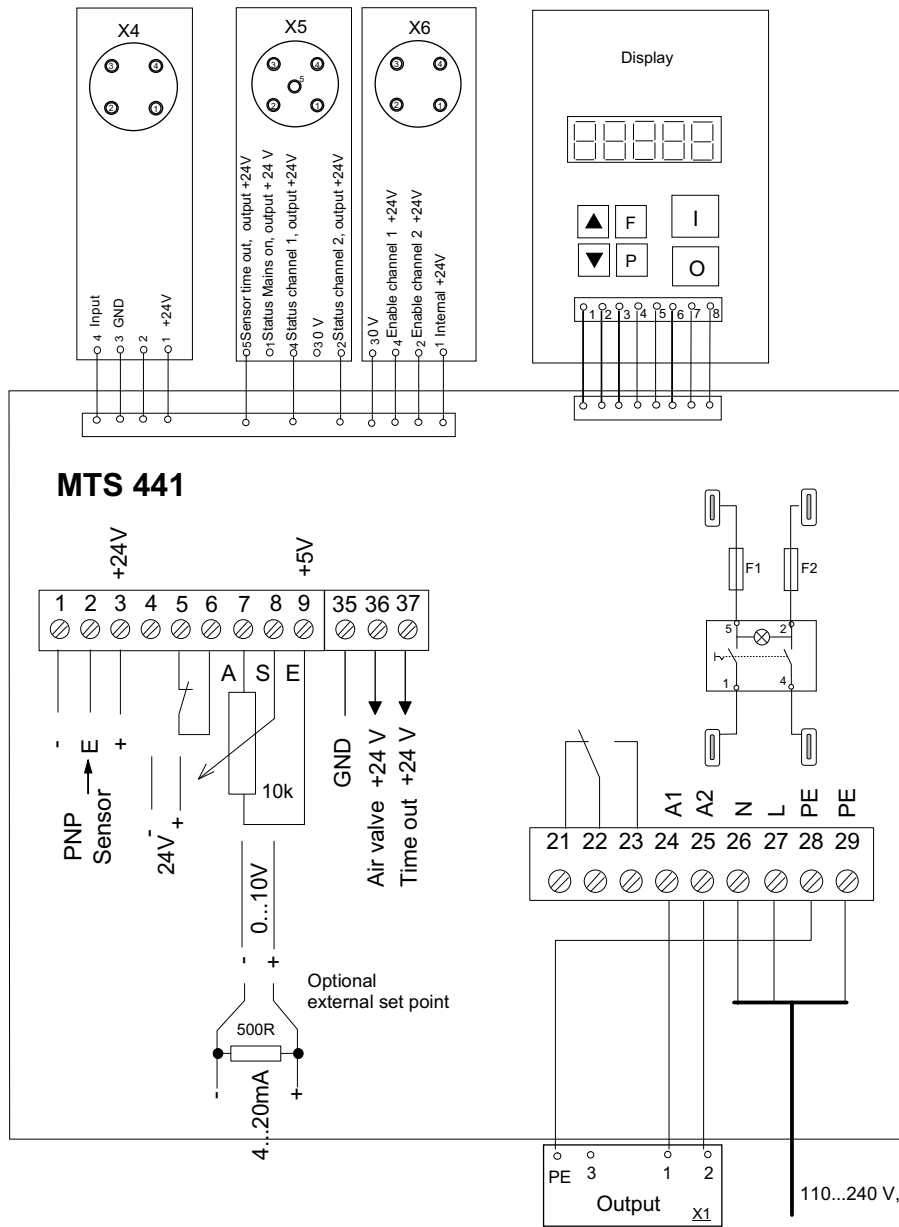
Parameter menus cannot be accessed, except the feed rate set point

Hide programming menus

HdC.0

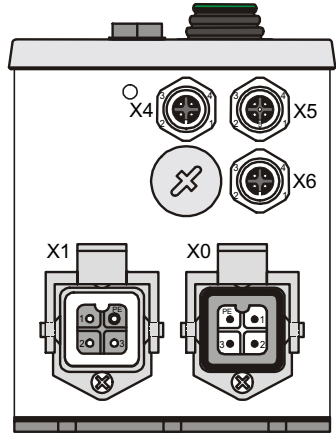
Parameter menus can be accessed

P 1000 Run mode

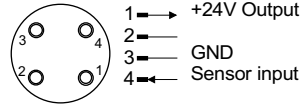


Connections

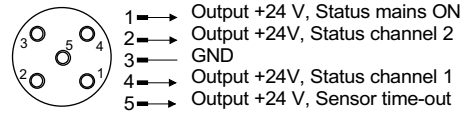
MTS 441



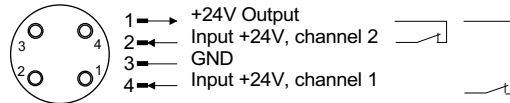
Sensor socket PNP Sensor (X4, X4.1 and X4.2)



Status output (X5)

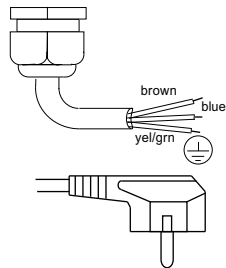
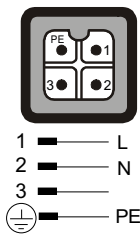
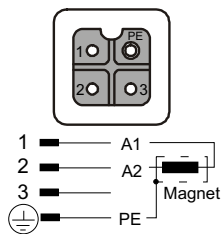


Enable input (X6)



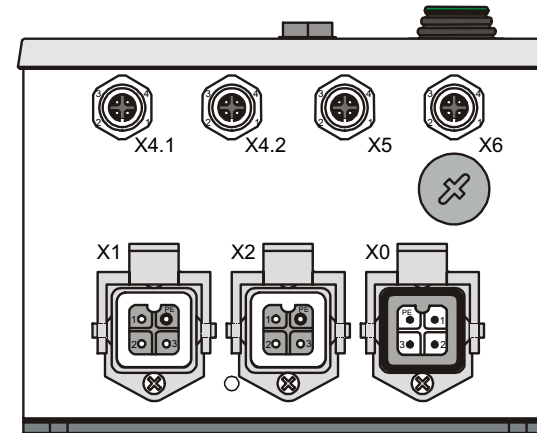
Output socket (X1)

Input connector or mains cable (X0)



Air valve connection on internal terminals

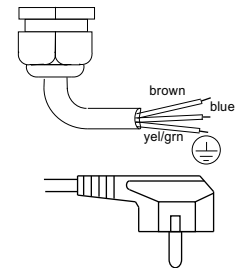
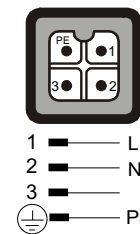
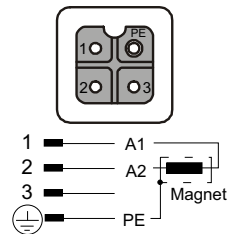
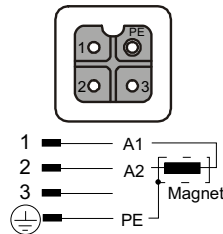
MTS 442



Output socket (X1)
channel 1

Output socket (X2)
Channel 2

Input connector or mains cable (X0)



Ordering codes for plugs:

Output plug:

HA-4-M / 090210

Mains input:

HA-4-M-F / 090216

Track, enable:

Sensor plug 4 pin M12

RSV-M12-4 / 090131

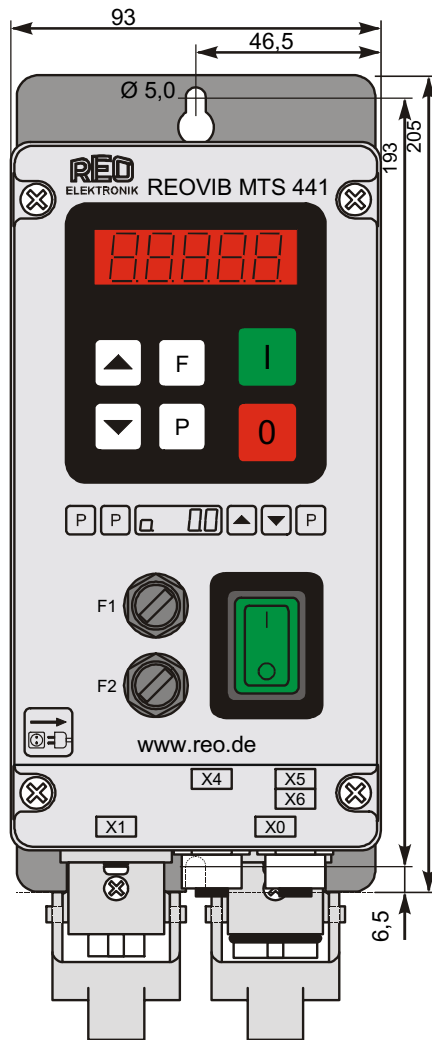
Status signal:

Sensor plug 5pin M12

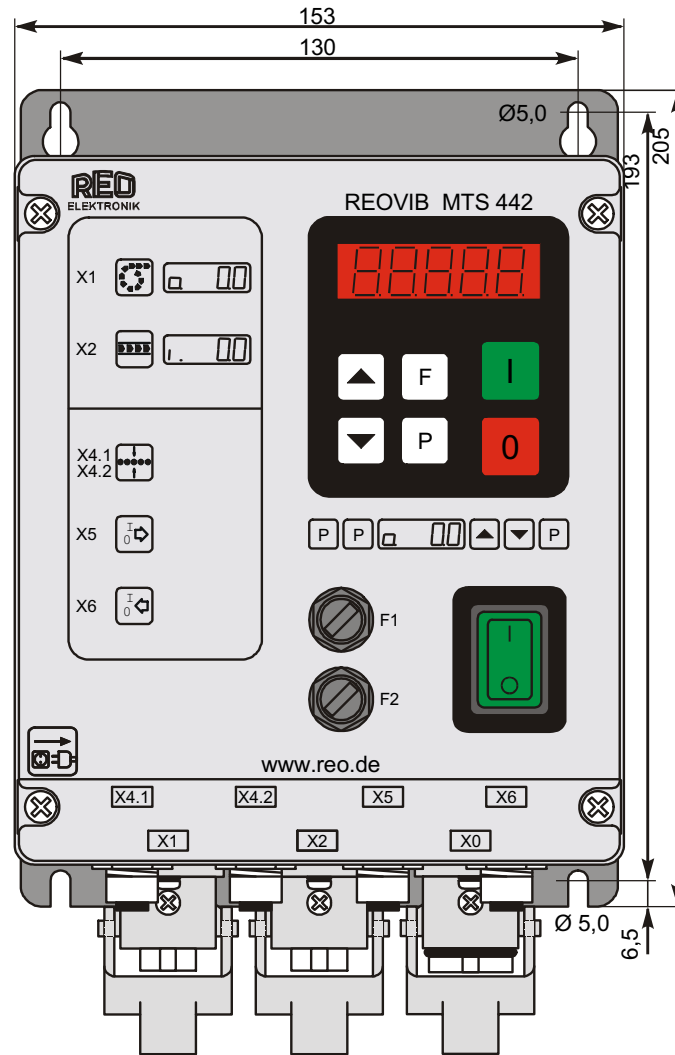
RSV-M12-5 / 090132

Dimensions [mm]

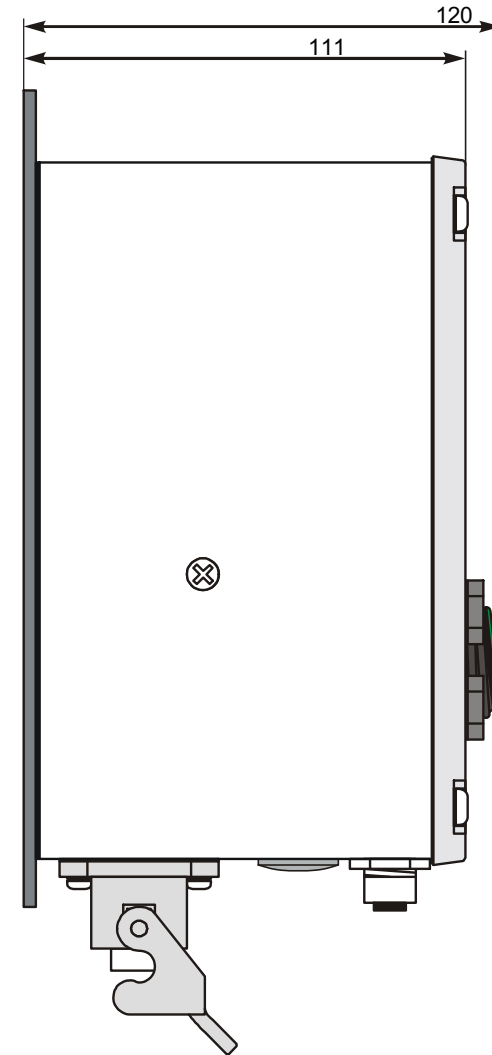
MTS 441



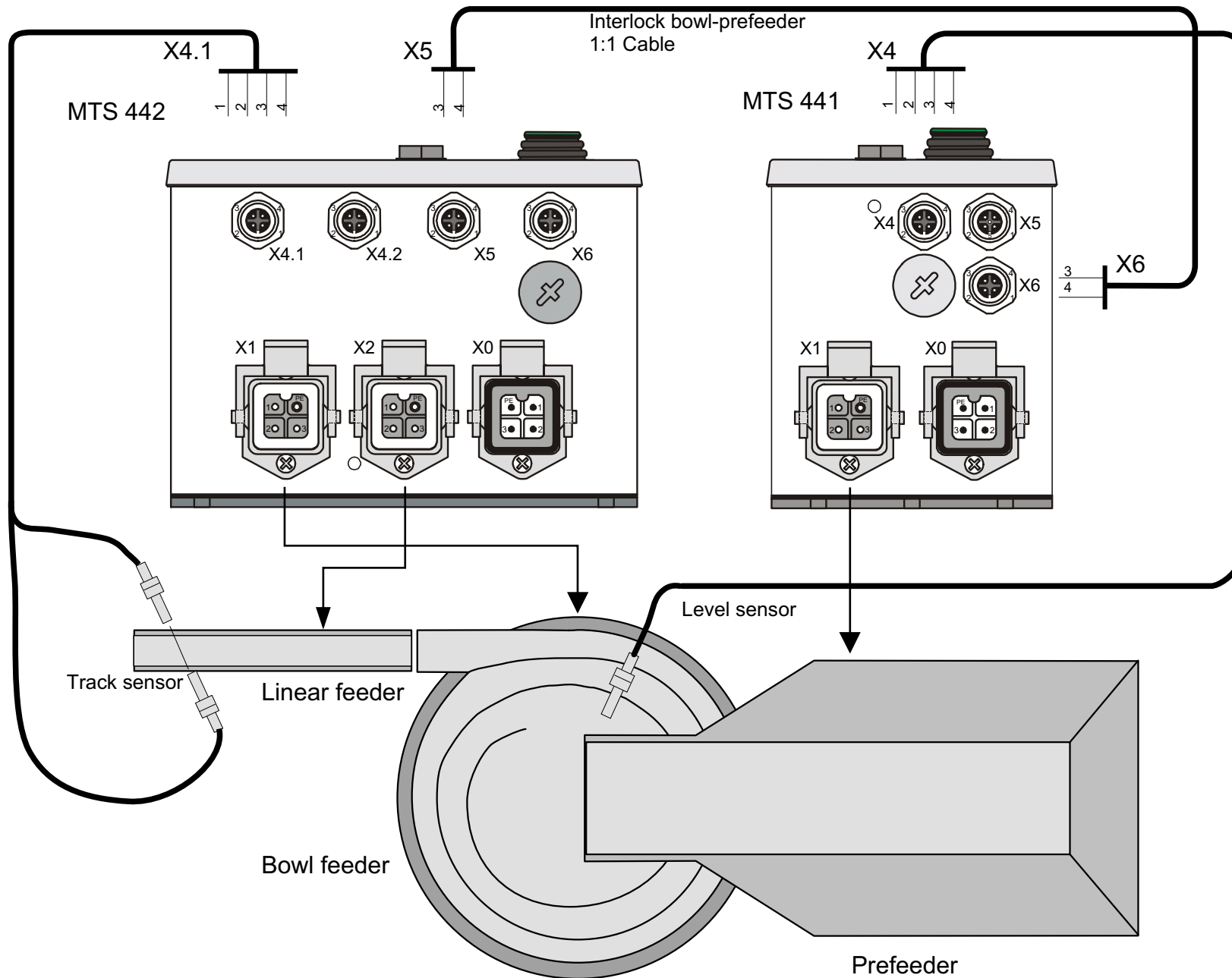
MTS 442



MTS 441/442



Example



Example of a feed station comprising a linear and bowl feeder with a prefeeder.

Linear and bowl feeders are controlled with a REOVIB MTS 442 and the prefeeder with a REOVIB MTS 441.

The prefeeder is regulated from the bowl feeder through a 1:1 connection cable (status output from bowl feeder to prefeeder enable input).



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