

REOVIB MTS 443 Thyristor Controllers for Vibratory Feeders

Operating Instructions



3-Channel Thyristor Controller for Vibratory Feeder

A Compact control unit for a typical parts-feeding station comprising Bowl, Linear and Hopper Feeder.

- With integral functions for track control, solenoid valve and warning signals
- Touch panel with Text/Graphic display for all settings and adjustments
- Control Inputs and Outputs
- 3 Sensor Inputs for Track and Air Jet Control
- 2 x 24 VDC outputs for Air Valve or present
- 2 x Status for 'READY' Mains ON and 'ENABLE ON' conditions
- 1 x Enable input, 24 VDC or volt-free contacts
- 3 x 0..210 V Feeder Outputs

Overview of Functions: Feeder

- Feeder Throughput
- Invert Enable
- Ramp up time
- Ramp down time
- Maximum limit
- Vibrating Frequency Full/Half Wave

Track Control

- Sensor 1 Invert
- Switch ON delay
- Switch OFF delay
- Empty warning

Hopper Control

- Sensor 3 Invert
- Switch ON delay
- Switch OFF delay
- Empty warning

General:

The interlocking of channels is predetermined and cannot be altered. The unit enable also enables the linear feeder and all other feeders. If the bowl feeder is inhibited then the hopper feeder also stops.

Sensors 1 and 3 can be configured for Track control, Sensor 3 can also be configured for an Air-Jet reject output.

Sensor 2 is always used to control the hopper feeder

24V Output 1 switches ON as the bowl feeder starts and switches OFF after a 0...60 secs delay. Should an air-valve be required to operate before the bowlfeeder starts then the soft start time should be increased

24 V Output 2 can be used to indicate that components are present on a transfer section at the end of the linear feeder or for controlling an airjet. The output can then be controlled from sensor 3 and ON/OFF time delays can be adjusted in the program under 'AIR JET'

Solenoid Output

- Output 1: ON with bowlfeeder/ delayed OFF
- Output 2: Using sensor 3 Airjet or 'Present' signal
- Switch ON delay
- Switch OFF delay

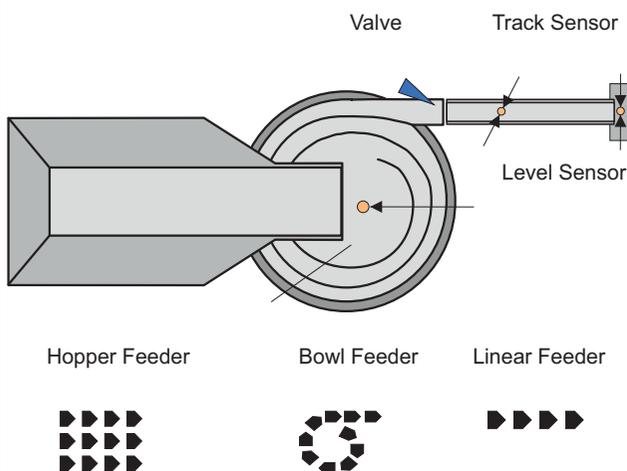
Air Jet / Present

- Sensor 3 Invert
- Switch ON delay
- Switch OFF delay

Logic

- Sensor 1 / Sensor 3
- MIN-MAX Vibration levels
- AND
- OR
- Twin Track / Air

Feed Station with Bowl, Linear and Hopper feeders



In the **LOGIC** menu Sensors 1 and 3 can be configured for track control (MIN/MAX), OR AND or twin track/air operation

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, 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 and prior to operation

Installation

!	Check !	Are the supply, feeder coil and controller input voltages correct ? Is the controller adequate for the rated power of the feeder? Is the vibrating frequency set to the correct value for the feeder ?
Connect the unit in accordance with the wiring instructions and ensure that the earthing is correct !		
	Beware !	An incorrect feeder frequency setting can cause drive coil (magnet) damage. Ensure that the output frequency of the control unit matches the frequency of the connected coil
	Important !	New units are factory set to the parameters shown in the setting table (Default) If there is any doubt with regard to the settings, the factory defaults can be re-instated from the service menu

We reserve the right to make technical changes should we deem them necessary.

Technical Data:**MTS 443/10A****MTS 443/15A**

Supply Voltage: 110 / 240 V, 50/60 Hz
 Supply Current: max 10 A, RMS
 Output Voltage per channel: 0...100 / 0...210 V
Output Current: **max. 10 A , RMS**
 Output Current Chan 1: max. 8 A, RMS
 Output Current Chan 2: max. 6 A, RMS
 Output Current Chan 3: max. 6 A, RMS

max. 15 A, RMS
max. 15 A, RMS
 max. 10 A, RMS
 max. 8 A, RMS
 max. 6 A, RMS

Sensor type: PNP, 24 V
 Output Status: 24 V, DC, 20 mA
 Control Output 1: 24 V, 200 mA
 Control Output 2: 24 V, 200 mA
 Time out Status - Track: 24 V, 200 mA
 Time out Status - Hopper: 24 V, 200 mA
 Enable Input: 24 V, 10 mA

Total current
 of ALL control outputs
 400 mA

Operating temp: 0... 45°C
 Storage temp: -10...80 °C
 Recommended Fusing: 16 A

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

**Specified Use**

The units described in this document are electrical goods for use in an industrial environment. They designed for the control of electromagnetic vibratory feeders

Settings:	Range	Default		Range	Default		Range	Default
Speed:			Linear Feeder:			Track Control:		
Hopper:	0...100 %	0	Enable Invert:	0 / 1	1	Invert Enable:	0 / 1	0
Bowl:	0...100 %	0	Ramp up time:	0...60 Sec.	0,1 Sec.	Switch ON delay:	0...60 Sec.	1 Sec.
Linear:	0...100 %	0	Ramp down time:	0...60 Sec.	0,1 Sec.	Switch OFF delay:	0...60 Sec.	1 Sec.
Hopper Feeder:			Max Output:	5...100 %	90 %	2nd Setpoint activate:	0 / 1	0
Enable Invert:	0 / 1	1	AC-Motor for Linear:	0 / 1	0	Time-out activate:	0 / 1	0
Ramp up time:	0...60 Sec.	0,1 Sec.	Half Wave:	0 / 1	0	Time-out time:	30...180 Sec.	180 Sec.
Ramp down time:	0...60 Sec.	0,1 Sec.	Hopper Feed Control:			Air Jet / Present		
Max Output:	5...100 %	90 %	Enable invert:	0 / 1	0	Enable invert:	0 / 1	0
AC-Motor for Hopper:	0 / 1	0	Switch ON delay:	0...60 Sec.	1 Sec.	Switch ON delay (Output 2):	0...60 Sec.	1 Sec.
Half Wave:	0 / 1	0	Switch OFF delay:	0...60 Sec.	1 Sec.	Switch OFF delay (Output 2):	0...60 Sec.	1 Sec.
Hopper Pulse Feed ON Time:	0... 60 Sec.	1 Sec.	Time-out activate:	0 / 1	0	Sensor Logic:		
Hopper Pulse Feed OFF Time:	0... 60 Sec.	0 Sec.	Time-out time:	30...180 Sec.	180 Sec.	Min-Max:	0 / 1	0
Bowl Feeder:						Or:	0 / 1	0
Enable Invert:	0 / 1	1				And:	0 / 1	0
Ramp up time:	0...60 Sec.	0,1 Sec.				Twin Track:	0 / 1	0
Ramp down time:	0...60 Sec.	0,1 Sec.				Independent Channel:	0 / 1	0
Max Output:	5...100 %	90 %						
Half Wave:	0 / 1	0						
Bowl delay:	0...60 Sec.	0 Sec.						
Air delay:	0...60 Sec.	4 Sec.						

User Menu:	
Throughput Power: "Speed"	<ol style="list-style-type: none"> "Hopper" Feeder "Bowl" Feeder "LF" Linear Feeder
Hopper Feeder:	<ol style="list-style-type: none"> "Inverted Enable" Invert the enable input (only possible in 'Independent' operating mode) "Soft Start" Ramp up time of the feeder after start signal. "Soft Stop" Ramp down time of the feeder after stop signal "Max" Maximum limit of the feeder throughput (Output Voltage) "AC Motor" Output for switching a conveyor hopper with 1 ph motor (Output voltage = Supply voltage). "Half Sine" Vibration frequency of the feeder Full/Half wave. "Time On" Switch ON time for pulsed operation of hopper feed. "Time Off" Switch OFF time for pulsed operation of hopper feeder (switch OFF time = 0, corresponds to continuous duty)
Bowl Feeder:	<ol style="list-style-type: none"> "Inverted Enable" Invert the enable input (only possible in 'Independent' operating mode') "Soft Start" Ramp up time of the feeder after start signal. "Soft Stop" Ramp down time of the feeder after stop signal "Max" Maximum limit of the feeder throughput (Output Voltage) "Half Sine" Vibration frequency of the feeder Full/Half wave. "Bowl delay" On time delay of the Bowl feeder "Air delay" Switch-off delay for the air valve (24V Output 1)
Linear Feeder	<ol style="list-style-type: none"> "Inverted Enable" Invert the enable input (only possible in 'Independent' operating mode') "Soft Start" Ramp up time of the feeder after start signal "Soft Stop" Ramp down time of the feeder after stop signal "Max" Maximum limit of the feeder throughput (Output Voltage) "AC Motor" Output to operate a conveyor belt with 1 ph motor (Output voltage = Supply voltage). "Half Sine" Vibration frequency of the feeder Full/Half wave
Hopper Sensor: "Hopper Ctrl."	<ol style="list-style-type: none"> "Inverted Input" Invert the input function "On Delay" Switch-ON time delay for Hopper Feeder "Off Delay" Switch-OFF time delay for Hopper Feeder "Enable Timeout" Activate Stop signal for the Hopper Feeder. (Feeder stops after Time-Out has elapsed, only when '1') "Time out" Delay time
Track Sensor: "Track Ctrl."	<ol style="list-style-type: none"> "Inverted Input" Invert the input function "On Delay" Switch-ON time delay for Bowl Feeder "Off Delay" Switch-OFF time delay for Hopper Feeder "Coarse / Fine" Activate operation with two feed levels. Regulates the track feed without time delays by switching between feed rate levels "Enable Timeout" Activate Stop signal for the Hopper Feeder. (Feeder stops after Time-Out has elapsed, only when '1') "Time out" Delay time
Air Jet / Present:	<ol style="list-style-type: none"> "Inverted Input" Invert the input function "On Delay" Switch ON time delay for 24 V Output 2. "Off Delay" Switch OFF time delay for 24 V Output 2.
Logic:	<ol style="list-style-type: none"> "Min / Max" Track control using Sensors 1 and Sensor 3. "Or"-Interlock with Sensor 1 OR Sensor 3 (Use Track switching for interlock output) "And"-Interlock with Sensor 1 AND Sensor 3 (Use Track switching for interlock output) "Air 2 Track" Used with twin tracks on a linear feeder with an air-jet ejection of the filled track (Sensor 1 & Sensor 2) "Track 01" Reserve / Undefined <- please do not use! "Independent" each output channel is independent
Info:	Software version, date and configuration
Service:	<ol style="list-style-type: none"> "Clear Error / Reset" Fault Reset "Factory Settings" Reinststate Factory Settings "User Index" Select User Settings (4 User Parameters 0...3) "User Params" Reload selected User Parameter set Choose language "Multi Line" Changing the menu structure "Code" Key number for locking

Symbol

	Bowl Feeder		Track Full
	Hopper Feeder		Inhibited, No Enable
	Linear Feeder		Time out exceeded
	Feeder Throughput		Logic
	Maximum Limit		Air Jet (Air Valve)
	Ramp up time		Lock
	Ramp down time		Information
	Switch ON Time Delay		Service
	Switch OFF Time Delay		Language
	Timer Running		Switch OFF Impulse
	Invert		Switch ON Impulse
	Vibrating Frequency		

Time out Function:

The Time Out function can be used to warn that the hopper or bowl feeder have run out of product, but still allowing the feeder to run. If it is required that the feeder stops after the Time-Out delay has elapsed, the 'Time Out ON' must be set to '1' in the sensor menu.

When the Time-Out occurs the feeder stops, the corresponding output is energised and a clock symbol is displayed.

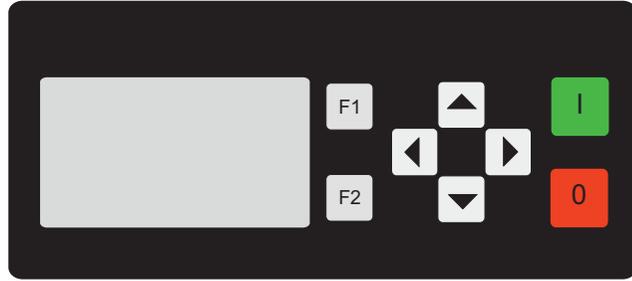
A Time-Out signal or shutdown can be reset with the green '1' key on the touchpanel or by operation of the associated sensor.

Settings

Run Mode

80.0 %
90.0 %
80.0 %

- 1 Select Function Group
- 2 Select Function
- 3 Set Function
- 4 Further or END



Start (All Channels) /
Reset Time Out

Stop (All Channels)

Unit reverts to Run Mode

If no keys are pressed for approx 5 secs

Function keys F1 & F2 are not used!

Speed

Speed Hopper: 0...100 %

Speed Bowl: 0...100 %

Speed LF: 0...100 %

Hopper Feeder

Hopper Feeder Inverted Enable: 0 / 1

Hopper Feeder Soft Start: 0... 60 sec.

Hopper Feeder Soft Stop: 0... 60 sec.

Hopper Feeder Max: 5...100 %

Hopper Feeder Motor: 0 / 1

Hopper Feeder Half Sine: 0 / 1

Hopper Feeder Time On: 0... 60 sec.

Hopper Feeder Time Off: 0... 60 sec.

Bowl Feeder

Bowl Feeder Inverted Enable: 0 / 1

Bowl Feeder Soft Start: 0... 60 sec.

Bowl Feeder Soft Stop: 0...60 sec.

Bowl Feeder Max: 5...100 %

Bowl Feeder Half Sine: 0 / 1

Bowl Feeder Bowl delay: 0... 60 sec.

Bowl Feeder Air delay: 0... 60 sec.

Linear Feeder

Linear Feeder Inverted Enable: 0 / 1

Linear Feeder Soft Start: 0... 60 sec.

Linear Feeder Soft Stop: 0... 60 sec.

Linear Feeder Max: 5...100 %

Linear Feeder Motor: 0 / 1

Linear Feeder Half Sine: 0 / 1

Hopper Ctrl.

Hopper Ctrl. Inverted Input: 0 / 1

Hopper Ctrl. On Delay: 0... 60 sec.

Hopper Ctrl. Off Delay: 0... 60 sec.

Hopper Ctrl. Enable Time out: 0 / 1

Hopper Ctrl. Time out: 1... 180 sec.

Track Ctrl. | Track Ctrl. Inverted Input: 0 / 1 | Track Ctrl. On Delay: 0... 60 sec. | Track Ctrl. Off Delay: 0... 60 sec. | Track Ctrl. Coarse / Fine: 0 / 1 | Track Ctrl. Enable Time out: 0 / 1 | Track Ctrl. Time out: 1... 180 sec.

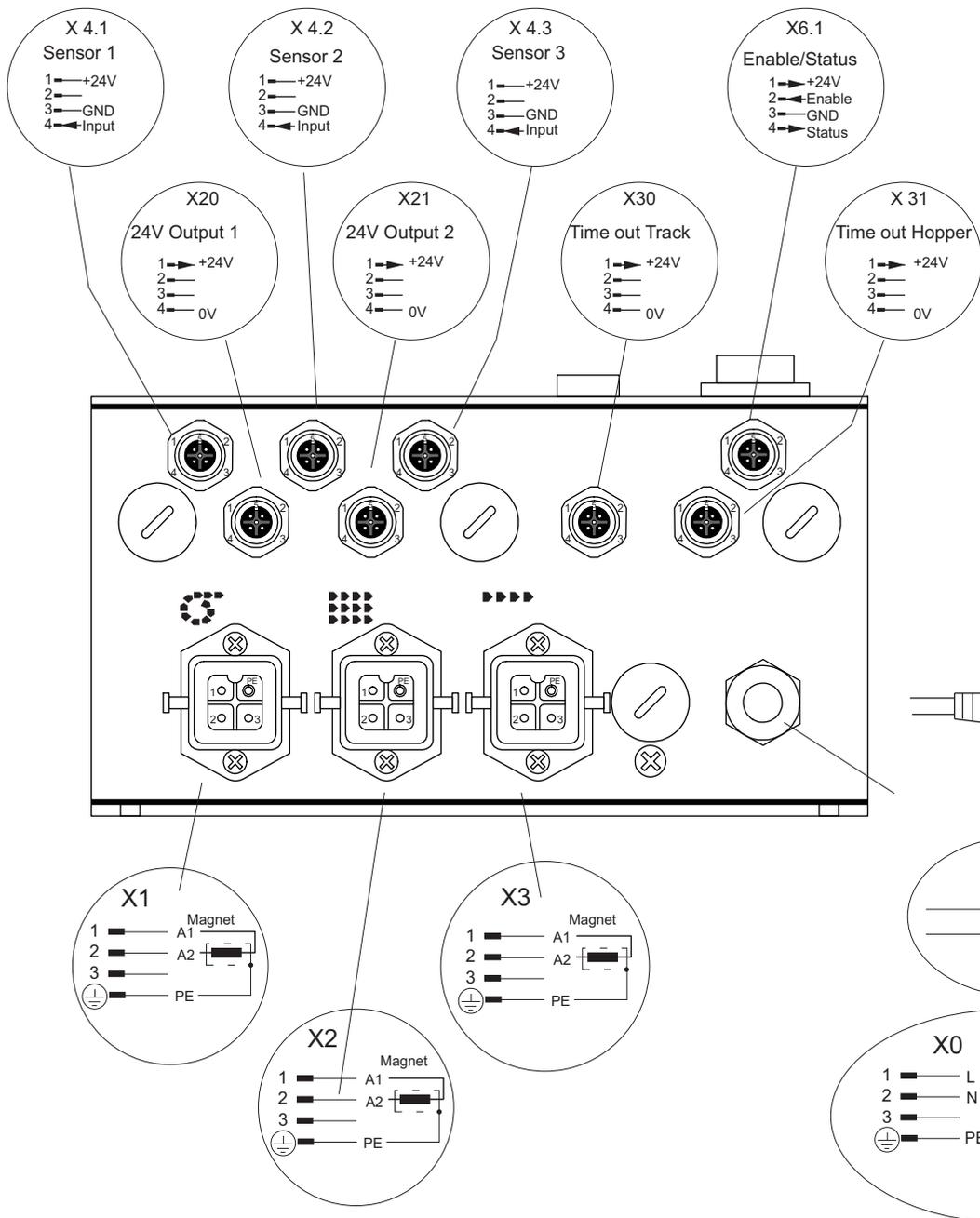
Air Jet / Present | Air Jet / Present Inverted Input: 0 / 1 | Air Jet / Present On Delay: 0... 60 sec. | Air Jet / Present Off Delay: 0... 60 sec.

Logic | Logic Min / Max: 0 / 1 | Logic Or: 0 / 1 | Logic And: 0 / 1 | Logic Air 2 Track: 0 / 1 | Logic Track 01: 0 / 1 | Logic Independent: 0 / 1

Info | Info soft xxxxxxxx | Info Datum: xx.xx.xxxx | Info No: nnnn-nnnn | Info Config: nnnn-nnnn | Info Config2: nnnn-nnnn | Info Config3: nnnn-nnnn

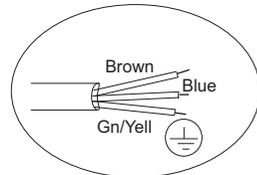
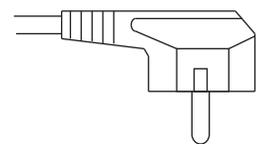
Service | Service Clear Error / Reset: RESET | Service Factory settings: RESTORE | Service User Index: 0...3 | Service User Params: RESTORE | Service English: American English, Deutsch, Francais | Service Multi Line: 0 / 1 | Code: 0000...FFFF

8010 0 %
9000 0 %
8070 0 %



Connections:

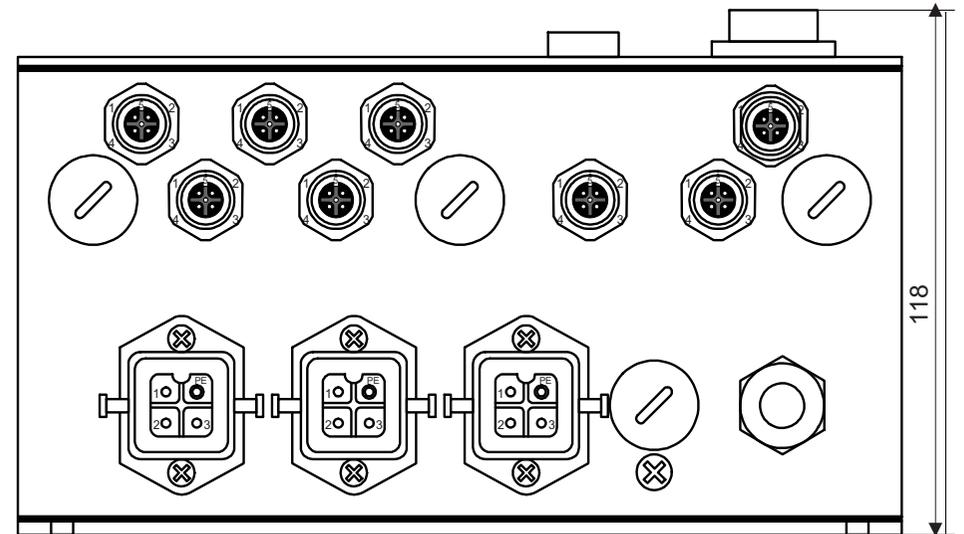
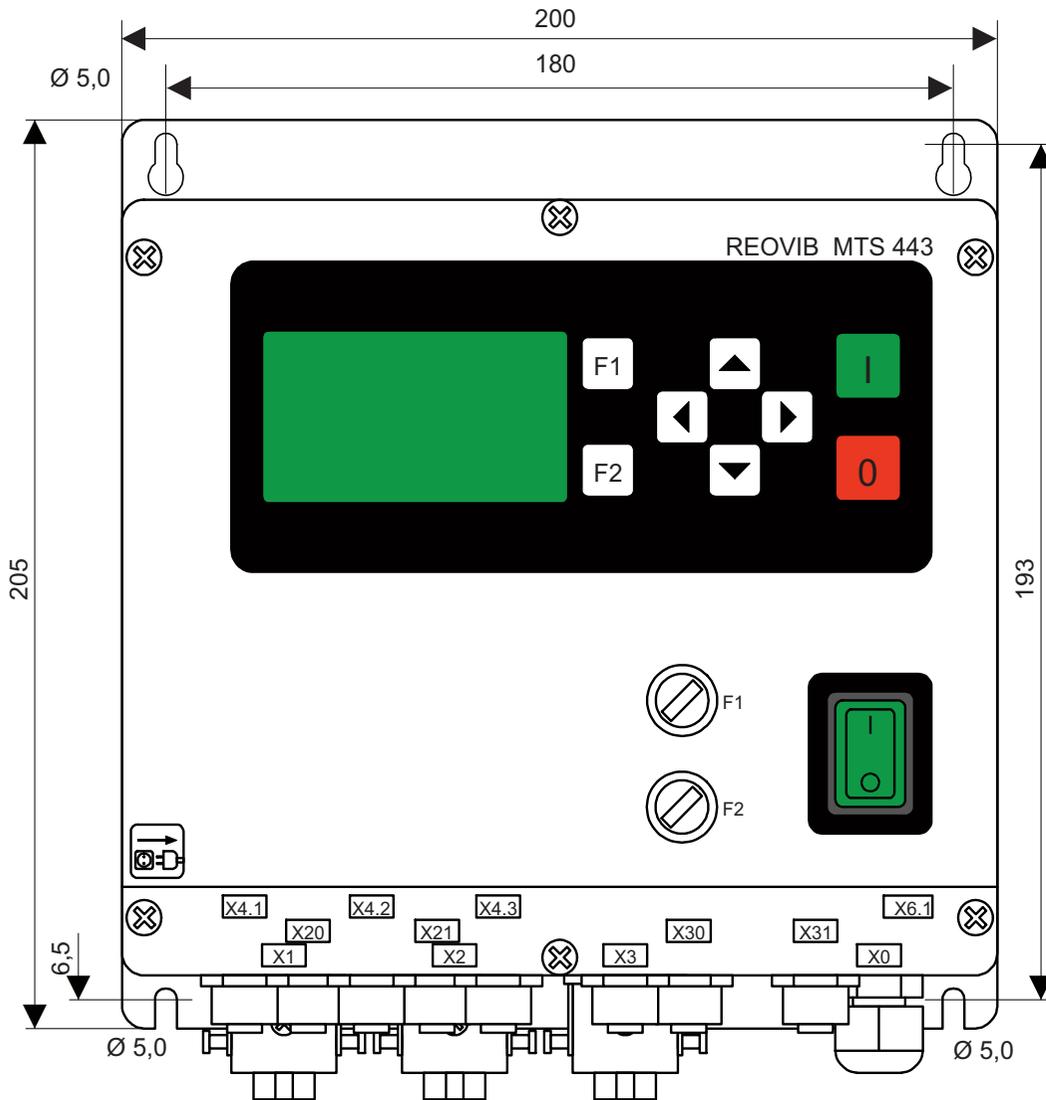
X 0	Mains Input	Cable or Socket, Type Han 3+PE
X 1	Bowl Feeder	Han 3+PE
X 2	Hopper Feeder	Han 3+PE
X 3	Linear Feeder	Han 3+PE
X 4.1	Sensor 1	M 12, 4 pin.
X 4.2	Sensor 2	M 12, 4 pin.
X 4.3	Sensor 3	M 12, 4 pin.
X 6.1	Enable / Status	M 12, 4 pin.
X 20	24 V Output 1	M 12, 4 pin.
X 21	24 V Output 2	M 12, 4 pin.
X 30	Time out Track	M 12, 4 pin.
X 31	Time out Hopper	M 12, 4 pin.



Information for Connectors

X 0	HA-4-M-F / 090218
X 1, X 2, X 3	HA-4-M / 090212
X 4.1, X 4.2, X 4.3 X 6.1, X 20, X 21 X 30, X 31	RSV-M-12-4 / 090131

Dimensions:[mm]



Service:

Key Numbers for Special Settings:

By using special 'Key' numbers the end user can be prevented from accessing functions

Hide Parameter Menus: 0117
Hide Setpoint: 0137

0117 Hide Parameter Menu:

Select "Service" function group

Select "Key" function group

Using the UP/DOWN cursor keys set 0117 (Characters are in Hex Code 0...F)

Next using the RIGHT cursor key set CLOSE to '1'

All menus relating to throughput, info and service are no longer available

0137 Close setpoint:

Select "Service" function group.

Select "Key" using the UP/DOWN cursor keys set 0137(Characters are in Hex Code 0...F)

Next using the RIGHT cursor key set CLOSE to '1'

The Throughput menu is no longer accessible

The Key numbers are independent of each other and so both keys must be used if all parameters and the setpoint are to be closed

Error messages

Error messages are indicated in the first line on the display.

Error Over voltage The unit input voltage is higher than the admissible value.
The error message may also be caused by voltage peaks.
Check the line Voltage and place a step down transformer if necessary.

Error PLL Error messages consisting of letter abbreviations are unspecified errors and must be communicated to the manufacturer.

Error messages may be reset either using the green key "I" or in the service menu.



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