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REOVIB MTS 440, 441, 442

Thyristor Controllers for Vibratory Feeders

CE

Overview

KBA_440_441_442_GB.dsf

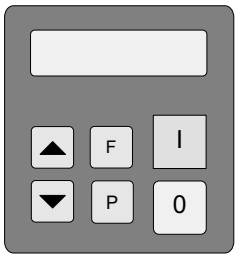
REOVIB MTS 441

REOVIB MTS 442

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 440	MTS 441	MTS 442
Supply voltage:	115 / 240 V, 50/60 Hz			
Output voltage:	0...100 / 0...210 V			
Output current:		10 A	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
- F Go Back
- P Programming mode or Enter

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 — Sst point in %
OFF — Enable OFF
FULL — Track full
Timer running
STOP — Stop using "0" key
Error SE. — Sensor time out
– – – — Powering up

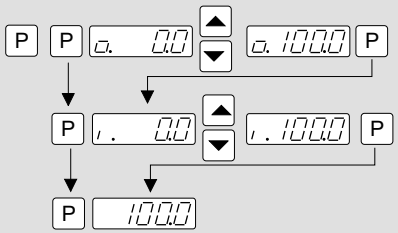
Functions summary

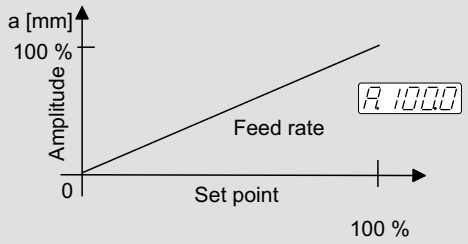
	Setting	Range	Code	Factory setting	Menu code
	Feed rate channel 1	0... 100 %	o.A.	0 %	000, 020
	Feed rate channel 2	0... 100 %	i.A	0 %	000, 021
	2. Set point (Coarse) channel 1	0... 100 %	2.	0 %	000, 020
441	External set point	0 / I	E.S.P.	0	003
441	Set point Potentiometer	0 / I	POT.	0	003
441	Set point 0(4)... 20 mA	0 / I	4.20		003
	Maximum limit channel 1	50...100 %	P	100 %.	020
	Maximum limit channel 2	50...100 %	P	100 %.	021
	Vibrating frequency channel 1	0 / I	o. HA.	0	020
	Vibrating frequency channel 2	0 / I	i. HA.	0	021
	Soft start channel 1	0... 10 Sec.	o ./.	0.1 Sec.	020
	Soft start channel 2	0... 10 Sec.	i. /.	0.1 Sec.	021
	Soft stop channel 1	0... 10 Sec.	o. \.	0,1 Sec.	020
	Soft stop channel 2	0... 10 Sec.	i. \.	0,1 Sec.	021
	Invert enable channel 1	0 / I	o.-En.	I	020
	Invert enable channel 2	0 / I	i.-En.	I	021
	Switch on time delay channel 1	0... 60 Sec.	o. I.	5 Sec.	007
	Switch off time delay channel 2	0... 60 Sec.	i. I.	5 Sec.	006
	Switch off time delay channel1	0... 60 Sec.	o.O.	5 Sec.	007
	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

	Setting	Range	Code	Factory setting	Menu code
	Sensor time out channel 1	0 / I	o. E.	0	015
	Sensor time out channel 2	0 / I	i. E.	0	015
	Sensor time out time	30... 240 Sec.	E.E.	5 Sec.	015
440/	Sensor logic AND	0 / I	SLA	0	014
442	Sensor logic ExOR	0 / I	SLE	0	014
	Pulsed operation channel 1	0 / I	o. HP.	0	004
	Pulsed operation channel 2	0 / I	i. HP.	0	004
	Pulse ON	0... 60 Sec.	H.	2 Sec.	004
	Pulse OFF	0... 60 Sec.	h.	2 Sec.	004
	Channel 1				
	Coarse / fine control active	0 / I	S.P.2	0	003
	Interlocking				
442	Channel 1 inhibits channel 2	0 / I	i.-o.	0	003
442	Channel 2 inhibits channel 1	0 / I	o.-i.	0	003
	Air valve function	0 / I	A.i.r.	0	003
	Save user settings	PUSH.			143
	Restore factory settings		FAC.		210
	Restore user settings		US.PA.		210
	Hide programming menus		Hd.C.		117

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

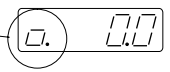
Code 000 Feed rate set point



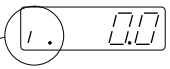


Feed rate settings

Symbol for channel 1



Symbol for channel 2



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 personal.

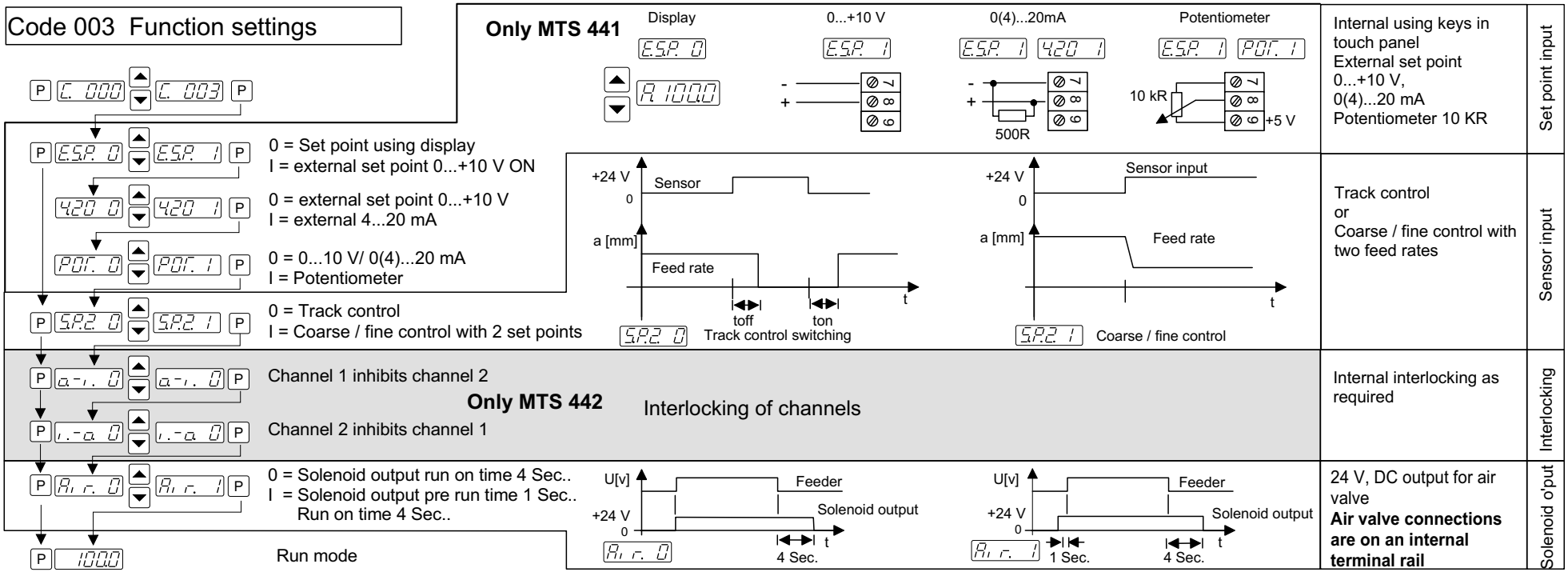
Qualified personnel are persons who, because of their training, experience and position as well as their knowledge of appropriate standards, regulations, health and safety requirements and working conditions, are authorised to be responsible for the safety of the equipment, at all times, whilst carrying 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.

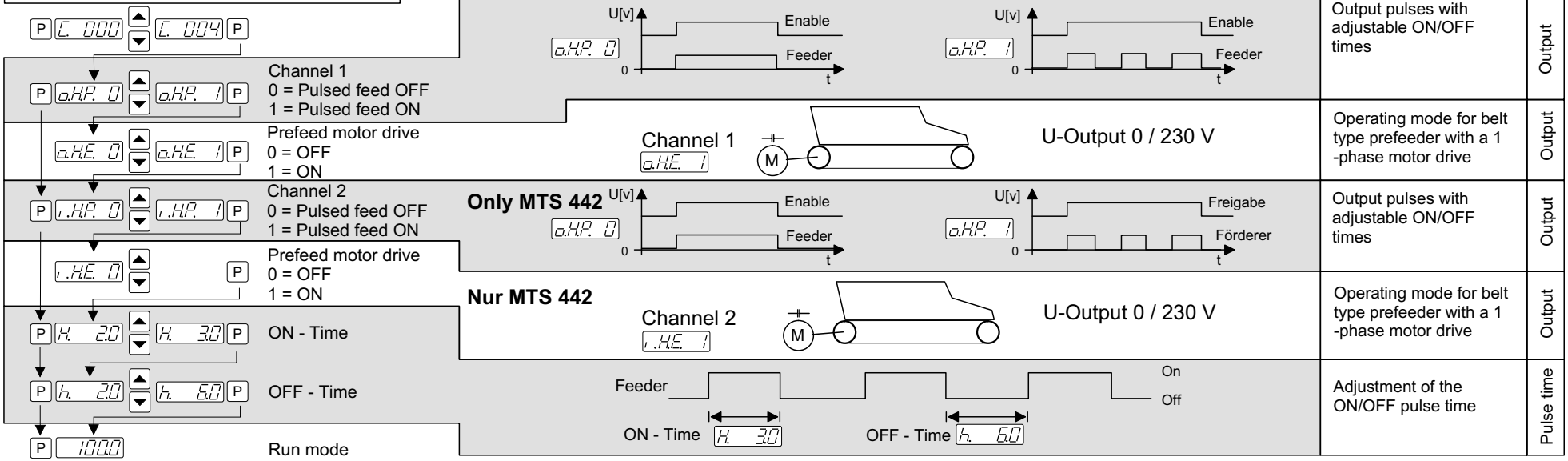
Installation

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 !	
! Tip	New units are factory set (see table for 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.

Code 003 Function settings



Code 004 Feeder / Prefeeder



Code C 007 Track Control

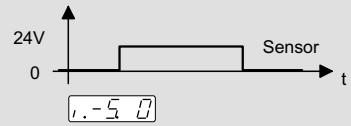
Channel 1

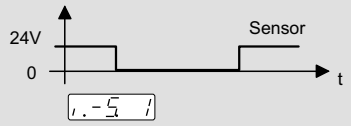
Invert sensor function
I = invert

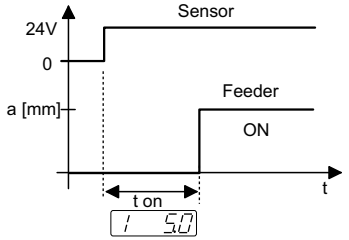
Switch On time delay

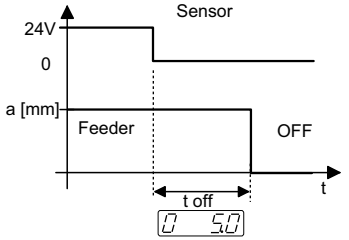
Switch Off time delay

Run mode









Invert sensor input

Adjustment of the ON and OFF time delays

Sensor

Time delays

Code C 006 Track Control

Channel 2

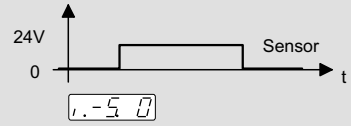
Only MTS 442

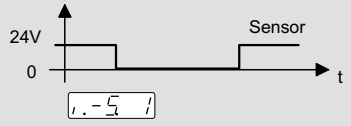
Invert sensor function
I = invert

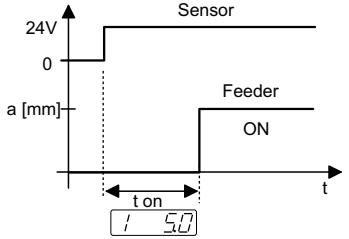
Switch On time delay

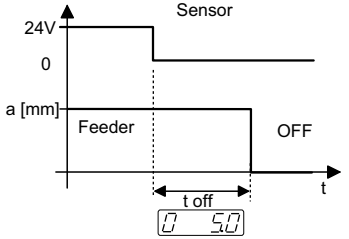
Switch Off time delay

Run mode









Invert sensor input

Adjustment of the ON and OFF time delays

Sensors

Time delays

Code C 015 Sensor time out

Channel 1
0 = Time-out not active
I = Time-out active

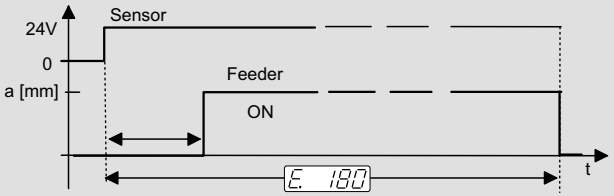
Channel 2 (only MTS 442)
0 = Time-out not active
I = Time-out active

Time-out time [Sec.]

not active

active

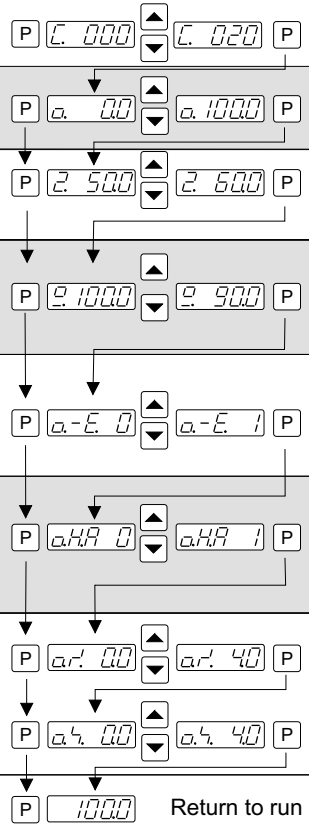
Run mode

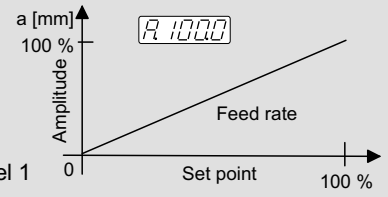


Sensor monitoring active.
If no components are detected during the time out period the feeder switches off.

Sensor Monitoring

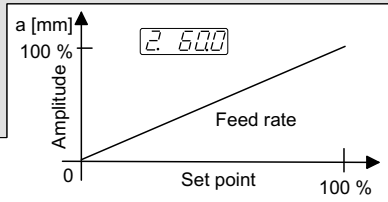
Code C 020 Feeder Settings **Channel 1**





Symbol for Channel 1

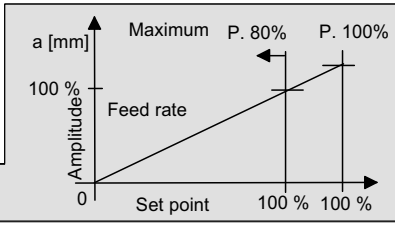
Main set point



Set point for slow feed rate

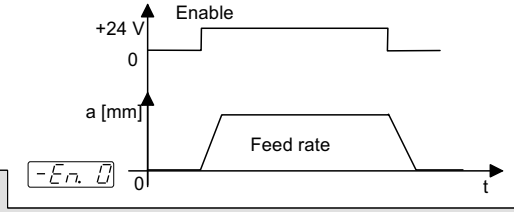
Coarse / fine control wirh two feed rates

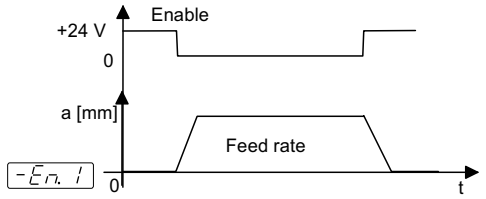
In Menu C 003 set "S.P.2." = I !



Limiting the maximum feed rate.

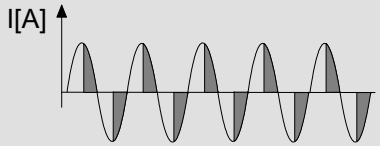
The set point will still display 0....100% even though it is limited internally.

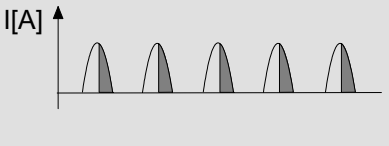




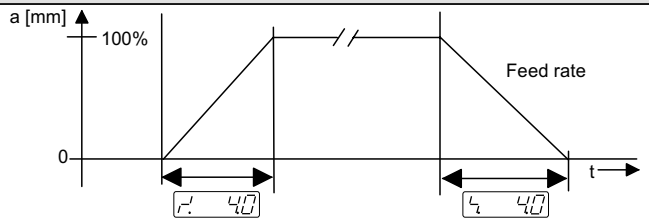
+24 V Signal or closed contacts will enable the output.

+24 V Signal or closed contacts will inhibit the output





The frequency setting depends upon the feeder type.
Important !
The wrong frequency setting can damage coils.



Time ramp for starting and stopping the feeder.

Set point

Maximum limit

Enable input

Vibrating frequency

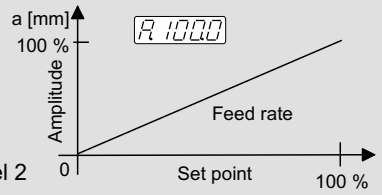
Soft start / stop

Code C 021 Feeder Settings **Channel 2**

Only MTS 442

P C. 000 C. 021 P

P 1. 0.0 1. 100.0 P Feed rate channel 2

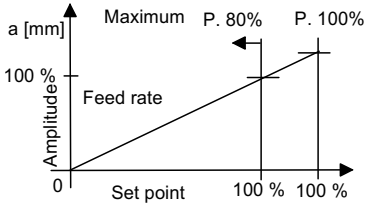


Symbol for Channel 2

Feed rate set point

Set point

P 1. 100.0 1. 90.0 P Umax Channel 2

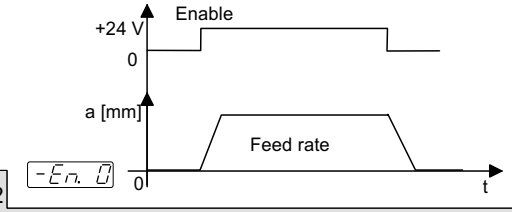


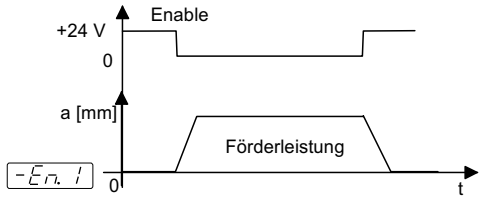
Limiting the maximum feed rate.

The set point will still display 0...100% even though it is limited internally.

Maximum limit

P 1.-E. 0 1.-E. 0 P 0 = Enable
I = Invert enable



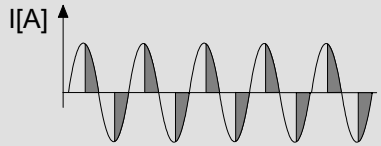


+24 V Signal or closed contacts will enable the output.

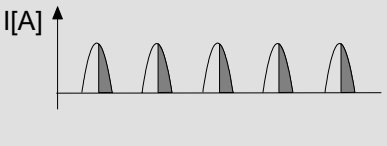
+24 V Signal or closed contacts will inhibit the output.

Enable input

P 1.HA 0 1.HA 1 P Vibrating frequency Channel 2
50 / 100 Hz (60 / 120 Hz)
HA. = 0 = 100 Hz (120 Hz)
HA. = I = 50 Hz (60 Hz)



100 Hz (120 Hz)



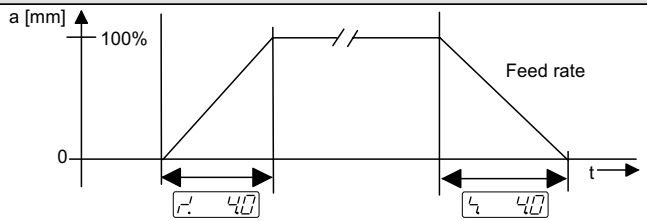
50 Hz (60 Hz)

The frequency setting depends upon the feeder type.
Important !
The wrong frequency setting can damage coils.

Vibrating frequency

P 1.r. 0.0 1.r. 40 P Soft start channel 2

P 1.f. 0.0 1.f. 40 P Soft stop channel 2



Time ramp for starting and stopping the feeder

Soft start / stop

P 100.0 Return to run mode

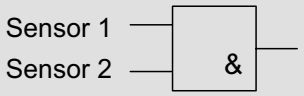
Code C 014 Sensor logic (MTS 440 und 442)

P C. 000 C. 014 P

P SLA. 0 SLA. 1 P — Sensor 1 + 2 AND

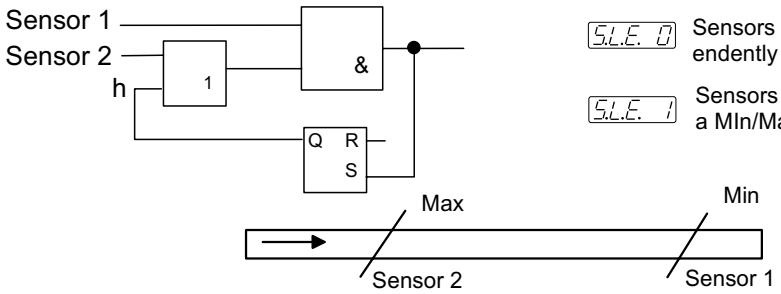
P SLE. 0 SLE. 1 P — Sensor 1 + 2 MIN-MAX

P 100.0 — Run mode



SLA. 0 Track control for channel 1 operates if sensor 1 sees product, sensor 2 can operate with channel 2.

SLA. 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

Sensor logic

Code 143 Save Current Parameters

P C. 000 C. 143 P

P PUSH SAFE P — Save parameter settings

P 100.0 — Run mode

▲ All previously set parameters are saved

Save parameter settings

Code 210 Recall Parameters

P C. 000 C. 210 P

P FAC. SAFE P — Recall factory settings

P USPR SAFE P — Recall user settings

P 100.0 — Run mode

▲ Recall factory settings

Factory settings

▲ Recall settings saved under C 143

Recall parameter settings previously stored under C143

Code 117 Inhibit Access

P C. 000 C. 117 P

P HdC. 0 HdC. 1 P — I= Menu

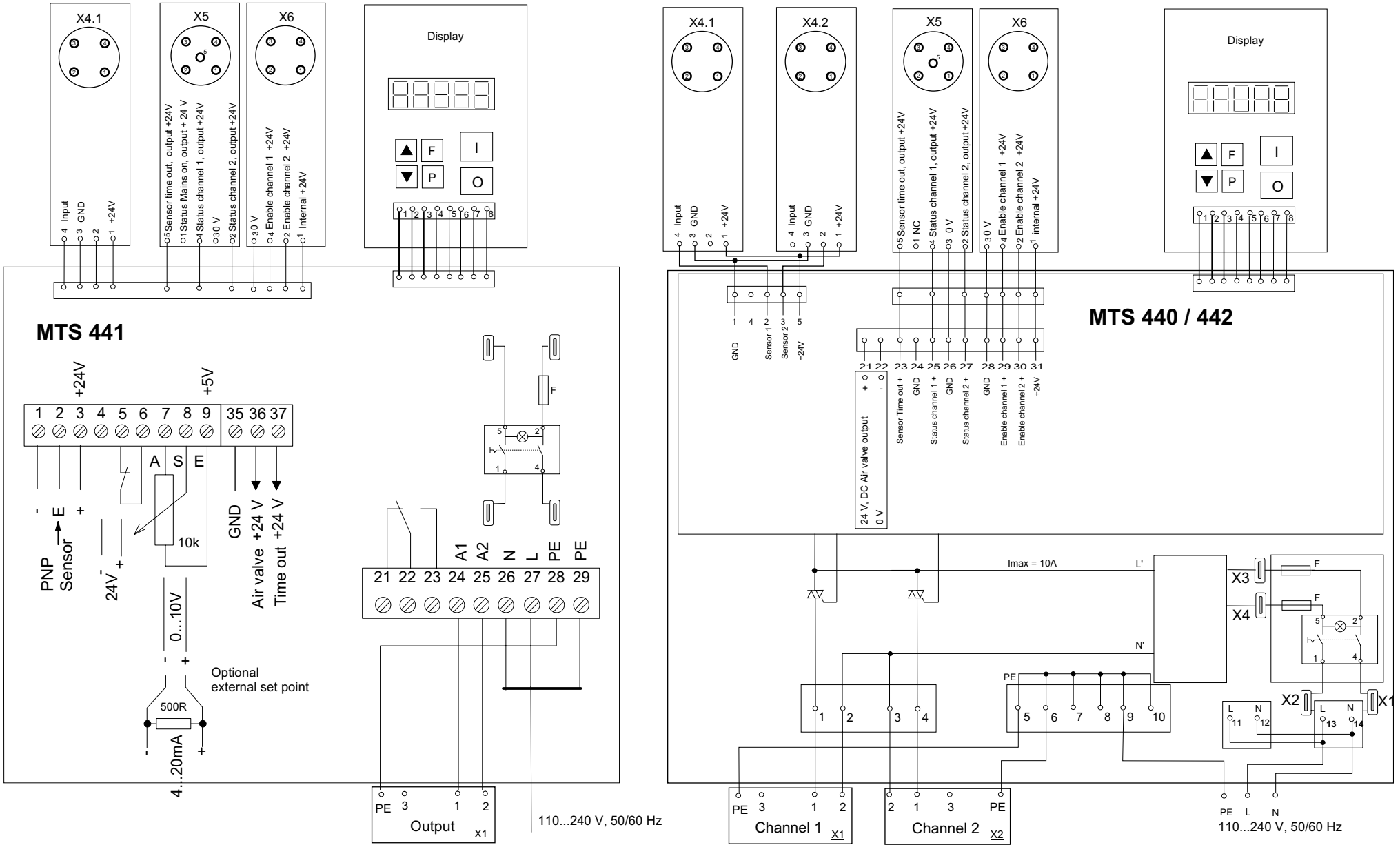
P 100.0 — Run mode

HdC. 1 Parameter menus cannot be accessed, except the feed rate set point

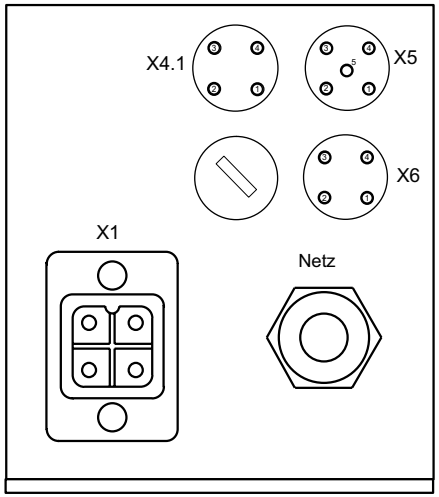
HdC. 0 Parameter menus can be accessed

Hide programming menus

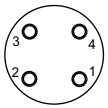
Service


X4.1
X5
X6
Display
4 Input
3 GND
2
1 +24V
5 Sensor time out, output +24V
1 Status Mains on, output + 24 V
4 Status channel 1, output +24V
3 0 V
2 Status channel 2, output +24V
3 0 V
4 Enable channel 1 +24V
2 Enable channel 2 +24V
1 Internal +24V
F
P
I
O
1 2 3 4 5 6 7 8
MTS 441
+24V
+5V
1 2 3 4 5 6 7 8 9 35 36 37
A S E
PNP Sensor
10k
24V
GND
Air valve +24 V
Time out +24 V
0...10V
Optional external set point
500R
4...20mA
21 22 23 24 25 26 27 28 29
A1 A2 N L PE PE
PE 3 1 2
Output X1
110...240 V, 50/60 Hz
X4.1
X4.2
X5
X6
Display
4 Input
3 GND
2
1 +24V
5 Sensor time out, output +24V
1 NC
4 Status channel 1, output +24V
3 0 V
2 Status channel 2, output +24V
3 0 V
4 Enable channel 1 +24V
2 Enable channel 2 +24V
1 internal +24V
F
P
I
O
1 2 3 4 5 6 7 8
MTS 440 / 442
1 4 2 3 5
GND
Sensor 1
Sensor 2
+24V
21 22 23 24 25 26 27 28 29 30 31
24 V, DC Air valve output
0 V
Sensor Time out +
GND
Status channel 1 +
GND
Status channel 2 +
GND
Enable channel 1 +
Enable channel 2 +
+24V
Imax = 10A
L'
N'
X3
X4
F
F
X2
X1
1 2 3 4
5 6 7 8 9 10
PE
L N
11 12
L N
13 14
PE 3 1 2
Channel 1 X1
2 1 3 PE
Channel 2 X2
PE L N
110...240 V, 50/60 Hz

MTS 441

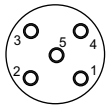


Sensor socket PNP Sensor (X4.1 and X4.2)



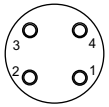
1 — +24V Output
2 —
3 — GND
4 — Sensor input

Status output (X5)



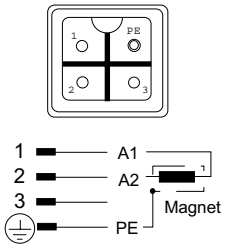
1 — Output +24 V, Status mains ON
2 → Output +24V, Status channel 2
3 → GND
4 → Output +24V, Status channel 1
5 — Output +24 V, Sensor time-out

Enable input (X6)

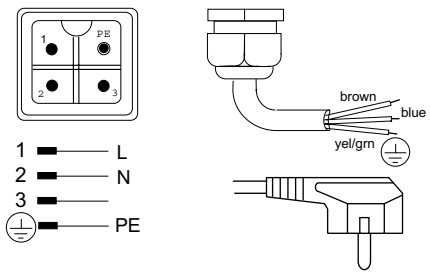


1 — +24V Output
2 ← Input +24V, channel 2
3 — GND
4 ← Input +24V, channel 1

Output socket

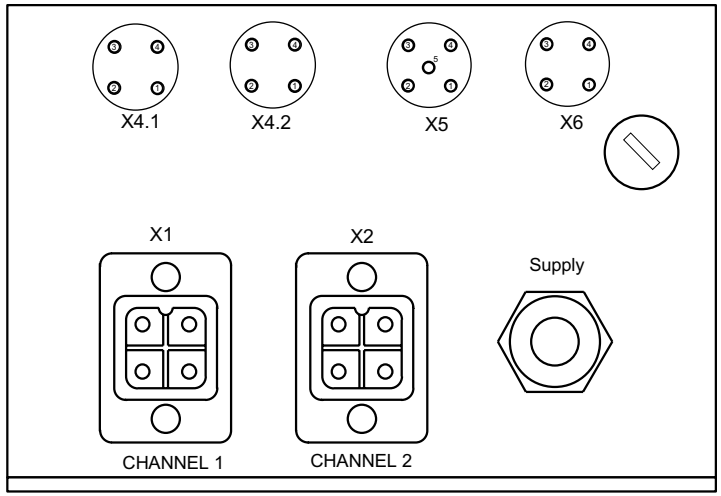


Input connector or mains cable

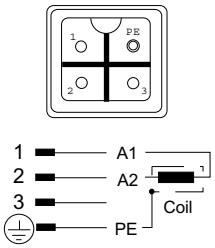


Air valve connection on internal terminals

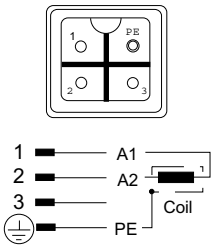
MTS 440 / MTS 442



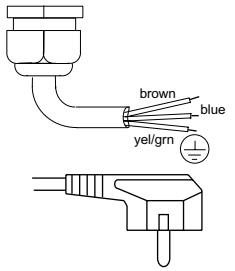
Output socket channel 1



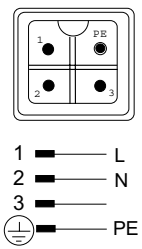
Output socket Channel 2



Input cable



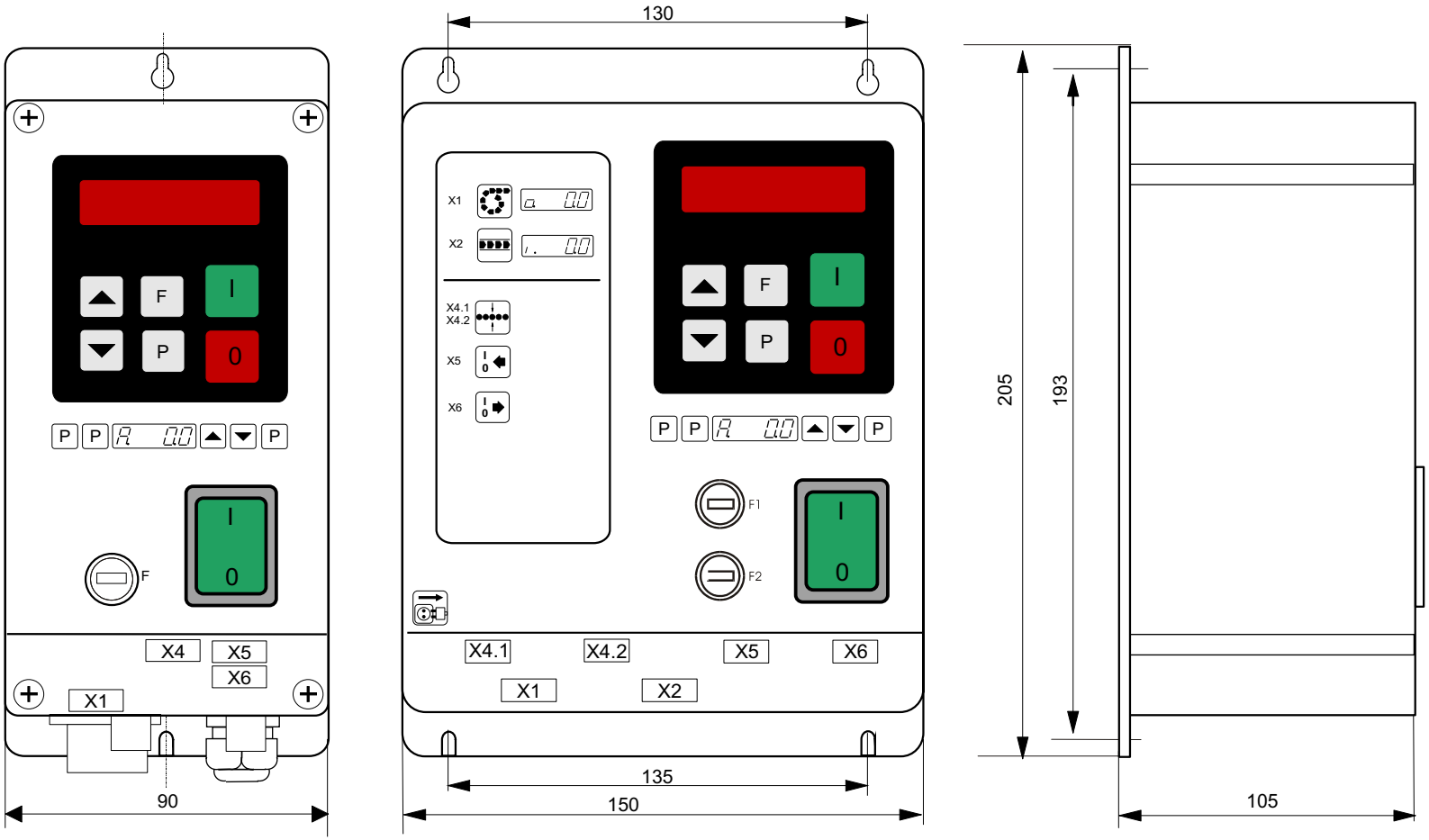
Input connector



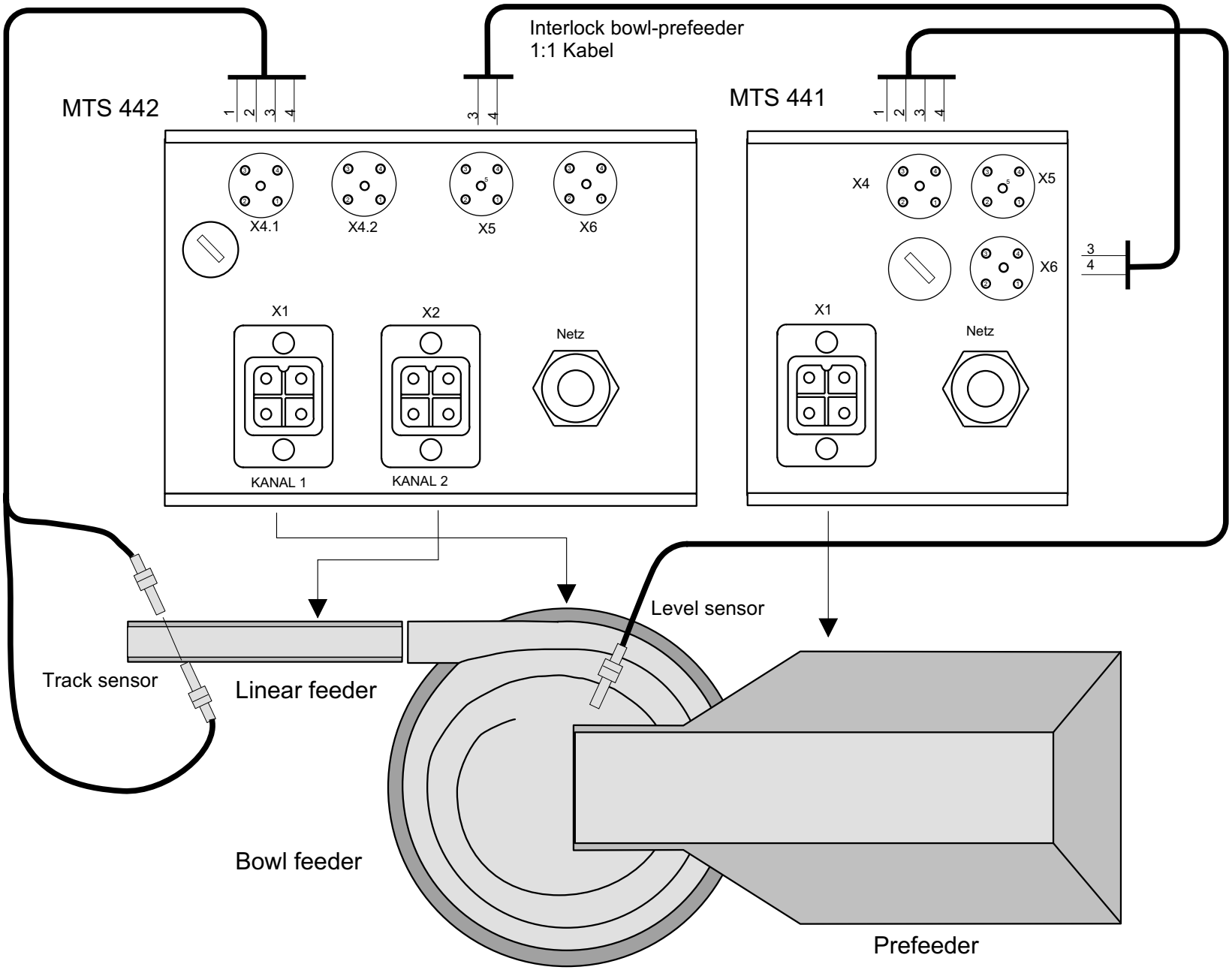
Ordering codes for plugs:

Output plug:		HA-4-M / 090212
Mains input:		HA-4-M-F / 090218
Track, enable:	Sensor plug 4 pin M12	RSV-M12-4 / 090131
Status signal:	Sensor plug 5pin M12	RSV-M12-5 / 090132

Dimensions



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)..