



Enclosed IP 54

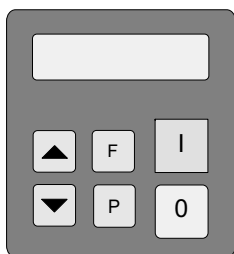
Panel mounting Version IP 20

Feeder frequency can be adjusted irrespective of the supply frequency.  
All settings are made externally using a LED display and touch panel.  
Constant feed rate unaffected by supply voltage changes.  
Versions available with integrated track-control or constant amplitude control, which also incorporates automatic natural frequency search (resonance).  
Enable input (Start / Stop), status relay (output active/not active).  
Enclosed IP 54 or panel mounting IP 20

**Technical Data:**

Supply voltage	115 / 240 V, +/- 10%, 50/60 Hz
Output	0...100 / 0... 205 V, 3 A, 6 A / 8 A
Output frequency	30...140 Hz
Enable input	Contacts or 24 V, DC
Track control Sensor	24 V, PNP (100 mA)
Status relay (On-Off)	Change over contacts(250 V, 1 A)
Operating temperature	0...+45 °C
Storage temperature	-10...+80 °C
Recommended fuse	10 A, 16 A, 16 A Circuit Breakers with type D characteristics for use with high inrush currents

**Display and Controls**



- ▲ Increase value
- ▼ Decrease value
- F Go back
- P Program mode or confirmation

**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 Messages**

	Enable ON
	Track full
	Set point in %
	Timer running
	Stop using "0" key

## 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.

Earth connections must be checked for correct function, after installation.



## Installation

<b>!</b>	<b>Check!</b>	<p>Do supply voltage, operating voltage of the conveyor and controller input voltage match ?</p> <p>Is the controller adequately rated for the rated power of the feeder ?</p> <p>What is the vibrating frequency of the feeder ?</p>
<p>Connect the unit in accordance with the wiring instructions and ensure that earthing is correct !</p>		
<b>!</b>	<b>Fuses</b>	<p>During switch-on, internal capacitors cause a high inrush current. Especially if several controllers are switched on simultaneously, the external fuse can blow or the circuit breaker can trip. Therefore, we recommend fitting slow-acting fuses or circuit breakers, e.g. with type 'D' characteristic.</p>
	<b>Attention!</b>	<p>New units are factory set (see table with settings).</p> <p>For units with unknown settings, first recall the factory settings using Menu C 210 'FAC'.</p>
	<b>External setpoint</b>	<p>If an external setpoint source is used, select "E.S.P." = I in Menu C003. If a potentiometer is used, select also 'Pot.' = I.</p> <p>To set the minimum vibration level, select E.S.P. = 0, adjust the vibration level with the cursor keys and then set E.S.P. = I.</p>
<b>!</b>	<b>Settings</b>	<p>The specific settings for a system can be saved by selecting 'US.PA.' in Menu C143 (recall settings via Menu C 210 'US.PA').</p> <p>Menu access can be hidden by selecting 'Hd.C.' = I in Menu C117.</p>

### 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:  
EN 61000-6-4 and EN 61000-6-2 in accordance with directive 2004/108/EG.



Setting	Range	Code	Factory setting	Menu code
Amplitude	0...100 %	A.	0 %	000, 002
2nd set point Amplitude (fine)	0...100 %	2.	0 %	000, 002
Maximum output voltage	5...100 %	P	100 %.	096, 008
Vibrating frequency	30...140 Hz	F.	100 Hz	096, 008
Soft start	0... 4 Sec.	/.	0.1 Sec.	096
Soft stop	0... 4 Sec.	\.	0,1 Sec.	096
External set point source	0 / 1	E.S.P.	0	003
Set point potentiometer	0 / 1	POT.	0	003
Set point 0(4)... 20 mA	0 / 1	4.20	0	003
Coarse/fine control	0 / 1	2.SP.	0	003
Invert enable	0 / 1	-En.	0	003
Switch-on time delay	0... 15 Sec.	l.	5 Sec.	167
Switch-off time delay	0... 15 Sec.	l.	5 Sec.	167
Invert sensor	0 / 1	-SE.	0	167
Activate sensor time out	0 / 1	E.	0	167
Sensor time out time	30... 240 Sec.	E.E.	180 Sec.	167
Activate regulation control	0 / 1	ACC.	0	167
Proportional characteristic	0...100	P.A.	40	008
Integral characteristic	0... 5	I.A.	5	008
Automatic frequency control	0 / 1	A.F.C.	0	008
Start automatic frequency search		A.F.S		008
Save user settings	PUSH.			143
Restore factory settings		FAC.		210
Restore user settings		US.PA.		210
Hide programming menus		Hd.C.		117

### Fault messages

**Error** **OL** Possible reasons: Feeder too large, frequency too low for fitted coil, air gap too wide.

**Error** **OC** Short circuit on output side  
Possible reason: Faulty winding (coil)

**Error** **OH** Input voltage too high  
Reasons: Supply voltage too high or back EMF from the coil.

**Error** **SE** Sensor time-out expired

Fault messages can be cancelled by pressing the P key or switching the controller OFF and ON again.

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

### Code 000 Feeder throughput set point

### Setting feeder throughput

Feeder throughput 0...100 %

Run mode

Amplitude a [mm]

100 %

0

Set point 100 %

Feeder throughput

### Code 003 Function settings



**ESP 0** / **ESP 1** P  
 0 = Set point using display  
 1 = external set point 0...+10 V ON  
  
**420 0** / **420 1** P  
 0 = external set point 0...+10 V  
 1 = external 4...20 mA  
  
**POF 0** / **POF 1** P  
 0 = 0...10 V / 0(4)...20 mA  
 1 = Potentiometer

**SR2 0** / **SR2 1** P  
 0 = Track control  
 1 = Coarse/fine control with two setpoints

**-En 0** / **-En 1** P  
 0 = Enable  
 1 = Invert enable

**10000** Run mode

<p>Display</p> <p>0...+10 V</p> <p>0(4)...20mA</p> <p>Potentiometer</p>	<p>Internal using display panel keys External set point 0...+10 V, 0(4)...20 mA</p>	Set point input
<p>Sensor input graph: +24 V, 0, a [mm], Feed rate vs t. Shows a step change in sensor input and a corresponding change in feed rate.</p> <p>Track control graph: +24 V, 0, a [mm], Feed rate vs t. Shows a step change in sensor input with 'ton' and 'toff' intervals. Feed rate is constant during 'ton' and changes during 'toff'.</p> <p>Coarse / fine control graph: +24 V, 0, a [mm], Feed rate vs t. Shows a step change in sensor input with two distinct feed rate levels.</p>	<p>Track control or Coarse / fine control with two feeder speeds.</p>	Sensor input
<p>Enable graph: +24 V, 0, a [mm], Feed rate vs t. Shows a step change in enable signal and a corresponding change in feed rate.</p> <p>Invert enable graph: +24 V, 0, a [mm], Feed rate vs t. Shows an inverted step change in enable signal and a corresponding change in feed rate.</p>	<p>+24 V signal or closed contacts give enabled output +24 V signal or closed contacts inhibit output.</p>	Enable input

### Code 096 Feeder



**R 00** / **R 100** P  
 Feed rate 0...100 %

**P 1000** / **P 900** P  
 Maximum limit 100...5 %

**F 500** / **F 480** P  
 Vibrating frequency [Hz]

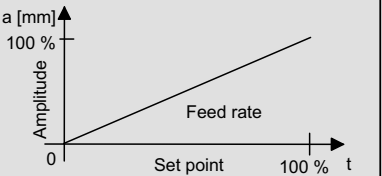
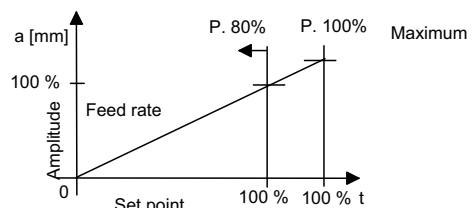

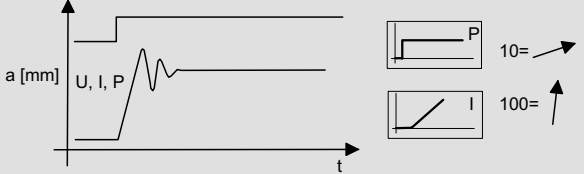
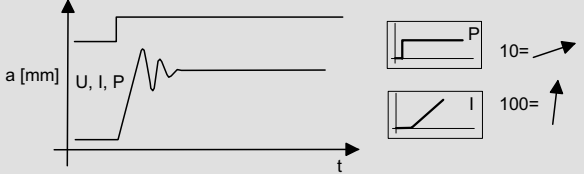
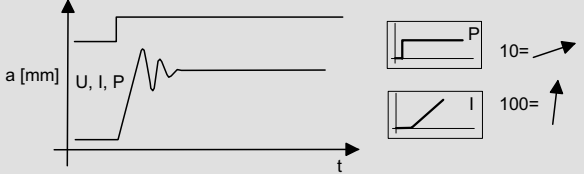
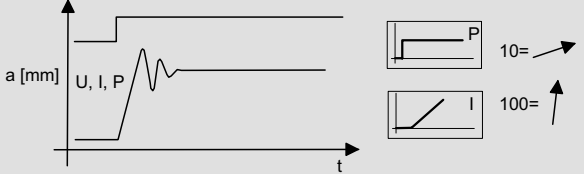
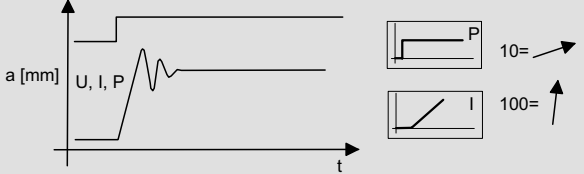
**r 00** / **r 40** P  
 Soft start 0...5 Sec.

**t 00** / **t 40** P  
 Soft stop time 0...5 Sec.

**10000** Run mode

<p>Graph showing Feed rate vs Set point. The y-axis is Amplitude [mm] from 0 to 100%. The x-axis is Set point from 0 to 100%. The line is linear.</p>	<p>Graph showing Maximum feed rate limiting. The y-axis is Amplitude [mm] from 0 to 100%. The x-axis is Set point from 0 to 100%. The line is linear, but the maximum feed rate is limited to 80% and 100% of the setpoint.</p>	<p>Limiting the maximum feed rate. Internal limiting of the setpoint can be adjusted from 0...100%.</p>	Maximum feed rate
<p>Graphs showing vibrating frequency. The left graph is for F 500 (lower frequency sine wave) and the right graph is for F 100 (higher frequency sine wave).</p>	<p>The vibrating frequency depends on the mechanical design of the feeder <b>Important!</b> The incorrect frequency can cause damage to the feeder coils.</p>	Vib. frequency	
<p>Graph showing soft start and soft stop. The y-axis is a [mm] from 0 to 100%. The x-axis is t. The graph shows a linear ramp up (soft start) and a linear ramp down (soft stop) with time constants r 40 and t 40.</p>	<p>The time ramps used when the feeder is switch on or off.</p>	Soft start / stop	

<p><b>Code C 167 Track control</b></p> <p>P C. 000 [▲] [▼] C. 167 P</p> <p>P 1. 00 [▲] [▼] 1. 50 P Switch on time delay 0...15 Sec.</p> <p>P 0. 00 [▲] [▼] 0. 50 P Switch off time delay 0...15 Sec.</p> <p>P -SE. 0 [▲] [▼] -SE. 1 P Invert sensor function I = inverted</p> <p>P EE. 0 [▲] [▼] EE. 1 P 0 = Activity timer enabled I = Activity timer disabled</p> <p>E. 180 [▲] [▼] E. 240 P E. = Sensor-time-out time [sec]</p> <p>P 1000 Run mode</p>		Setting the ON and OFF time delays.	Time delays
<p><b>Code 143 Save parameter settings</b></p> <p>P C. 000 [▲] [▼] C. 143 P</p> <p>P PUSH [▲] [▼] SAFE P Save parameter settings</p> <p>P 1000 Run mode</p>	<p>▲ All parameter settings are saved</p>	Save the parameter settings.	Sensor Monitoring
<p><b>Code 210 Recall parameters</b></p> <p>P C. 000 [▲] [▼] C. 210 P</p> <p>P FRC [▲] [▼] SAFE P Recall factory settings</p> <p>P USPR [▲] [▼] SAFE P Recall user parameters</p> <p>P 1000 Run mode</p>	<p>▲ Recall factory settings</p> <p>▲ Recall settings saved under C 143</p>	Reset to delivered state..	Service
<p><b>Code 117 Hide menus</b></p> <p>P C. 000 [▲] [▼] C. 117 P</p> <p>P HdC. 0 [▲] [▼] HdC. 1 P I = Menus not visible</p> <p>P HdC. 1 [▲] [▼] HdC. 0 P Parameter settings cannot be accessed, only the set point can be changed</p> <p>P HdC. 0 [▲] [▼] HdC. 1 P Parameter menus can be opened</p> <p>P 1000 Run mode</p>	<p>Hide programming menus.</p>	Hide programming menus.	
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Code 008 Regulation				
P <input type="text" value="C.000"/> <input type="text" value="C.008"/> P P <input type="text" value="R.00"/> <input type="text" value="R.100"/> P P <input type="text" value="P.1000"/> <input type="text" value="P.900"/> P P <input type="text" value="F.500"/> <input type="text" value="F.480"/> P P <input type="text" value="ACC.0"/> <input type="text" value="ACC.1"/> P P <input type="text" value="PR.10"/> <input type="text" value="PR.10"/> P P <input type="text" value="IR.10"/> <input type="text" value="IR.10"/> P P <input type="text" value="R.F.C.0"/> <input type="text" value="R.F.C.1"/> P P <input type="text" value="R.F.S."/> <input type="text" value=""/> P P <input type="text" value="1000"/> P Run mode	Feed rate 0...100 % Maximum limit 100...5 % Vibrating frequency [Hz] Switch on regulation 0 = Controlling (without sensor) 1 = Regulation (with sensor) Regulation parameter proportional characteristic (circuit gain) Regulation parameter integral characteristic (damping of swing gradient) Automatic frequency control 0 = OFF 1 = ON Start frequency search	   	Limiting the output voltage i.e. feed rate, for example to prevent the coil hammering. The set point range remains at 0...100%. The vibrating frequency setting is determined by the type of feeder. Regulation is selected to give constant amplitude even if the load on the feeder varies widely. An accelerometer is required for providing the feedback signal. Influences the regulation characteristics such as the response time and restricts the feeder from Automatic frequency adjustment to resonance condition.	Maximum feed rate Vib. frequency Regulation Regulation param's
	Automatic frequency control 0 = OFF 1 = ON		Influences the regulation characteristics such as the response time and restricts the feeder from	Regulation param's
	Start frequency search		Automatic frequency adjustment to resonance condition.	Regulation param's
	Run mode		Automatic frequency adjustment to resonance condition.	Regulation param's
	Key starts the automatic resonant frequency search		Automatic frequency adjustment to resonance condition.	Regulation param's

An acceleration sensor e.g type SW11 has to be fitted to the feeder for constant amplitude control. Care must be taken in the method of mounting to ensure that the fixtures are solid, provide the correct orientation and do not flex under vibration.

### Manual setting of the vibrating frequency:

It is important to have a low set point setting (e.g. 30 %) because upon reaching resonance it is possible that a high amplitude will be induced, even with a low output voltage, thus increasing the risk of the coil "hammering". To determine the resonant frequency, an analogue, effective value, current measuring instrument, such as a moving iron meter, must be connected to the output. Resonant frequency has been reached when there is maximum amplitude and minimum output current.

### Automatic frequency search (regulation mode only).

\* Put set point at zero.

\* Select regulation mode ( Menu C 008, Parameter ACC = 1 ).

\* The optimum, vibrating frequency of the feeder is determined by initiating the frequency search (Menu C 008, Parameter, select A.F.S. and press any cursor key).

Return the controller back to normal running mode after the resonant frequency has been found.

## Connections Enclosed version

Different connection layouts depending on the controller variant.

### Standard Version

Cables for supply and output

Cable for supply with plug and socket output

Track sensor; 5 pin DIN connector or 4 pin M12

Amplitude sensor; 4 pin DIN connector

An additional cable gland can be fitted for the enable or status signals.

### Plug and Vib Version:

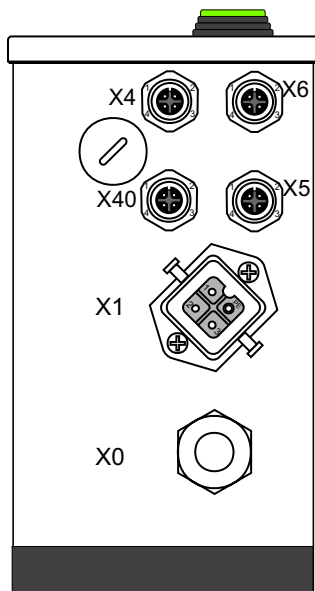
Plug-in supply and output connections

Track sensor; 4 pin M12

Amplitude sensor; 4 pin. DIN connector

Status signal (change-over contacts) 4 pin M12

Enable signal (24 V, DC or Contacts) 4 pin M12



X 4 Track control sensor socket



- 1 = +24 V
- 2 = ---
- 3 = GND
- 4 = Input

X6 Enable input



- 1 = +24 V
- 2 = ---
- 3 = GND
- 4 = Input

X 40 Amplitude sensor socket



- 1 = + 24 V
- 2 = Input
- 3 = GND
- 4 = ---

X5 Status input

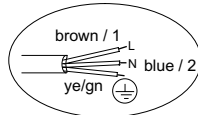


- 1 =
- 4 =

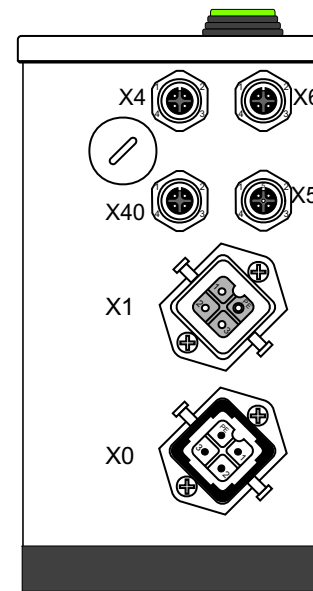


Output socket  
or output cable

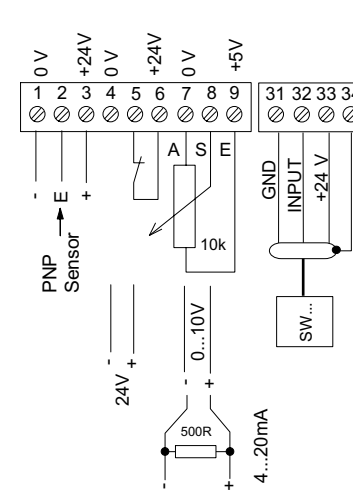
X0 mains connection  
110 / 230 V 50/60 Hz



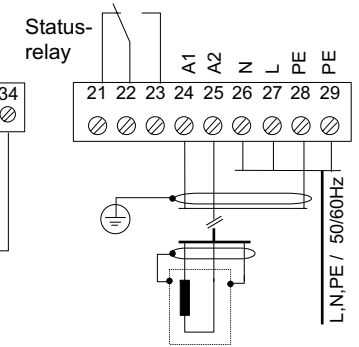
Use screened  
cable only !



Internal control terminal connections



Power connections



X4 Track sensor



- 1 = +24 V
- 2 = ---
- 3 = GND
- 4 = Input

X40 Accelerometer



- 1 = + 24 V
- 2 = Input
- 3 = GND
- 4 = ---

X6 Enable input



- 1 = +24 V
- 2 = ---
- 3 = GND
- 4 = Input

X5 Status input



- 1 =
- 4 =

X1 Feeder output

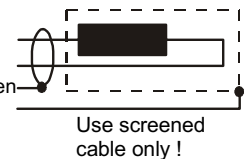


- 1 = A1
- 2 = A2
- 3 = Screen
- 4 = PE

X0 Supply connection  
110 / 230 V,  
50/60 Hz



- 1 = L
- 2 = N
- 3 = not used
- 4 = PE



Use screened  
cable only !

### Ordering codes for connectors:

Output plug:

Track control: 4 pin sensor plug

Regulation: 4 pin sensor plug

HA-4-M / 090212

RSV-M12-4 / 090131

RSV-M12-4 / 090131

### Ordering codes for connectors:

Supply input:

Output:

Track, enable, status relay:

Regulation:

4 pin sensor plug M12

4 pin sensor plug

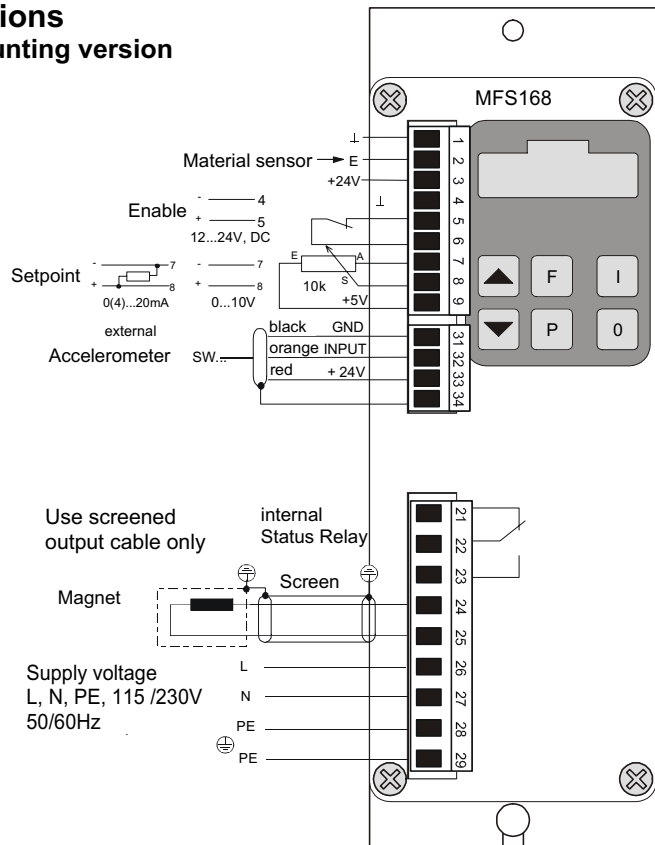
HA-4-M-F / 090218

HA-4-M / 090212

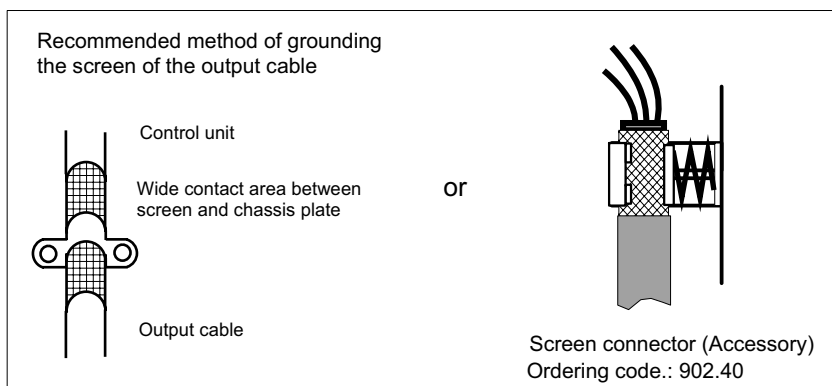
RSV-M12-4 / 090131

RSV-4 / 090104

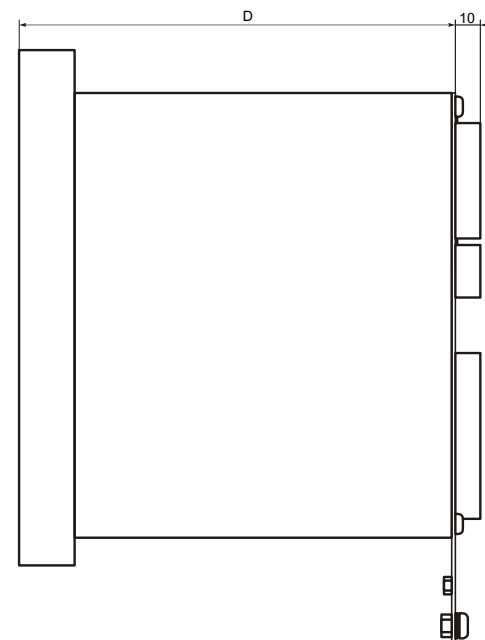
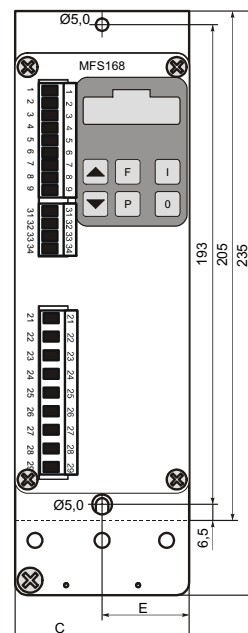
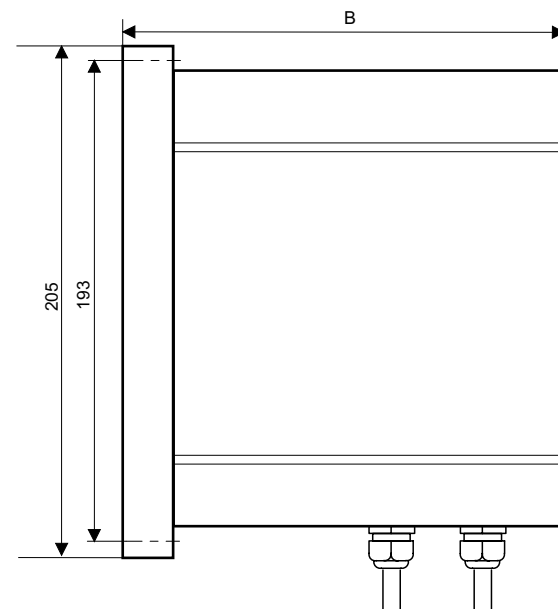
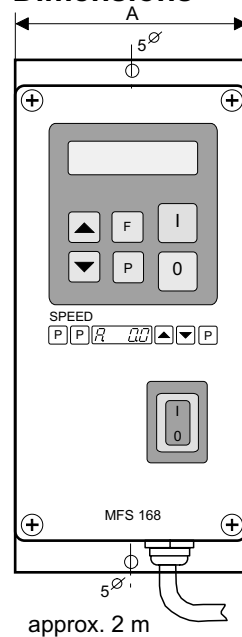
## Connections Panel mounting version



! When a set point potentiometer is connected  
select Menu C 003 Parameter E.S.P. = 1 and POT. = 1!



## Dimensions



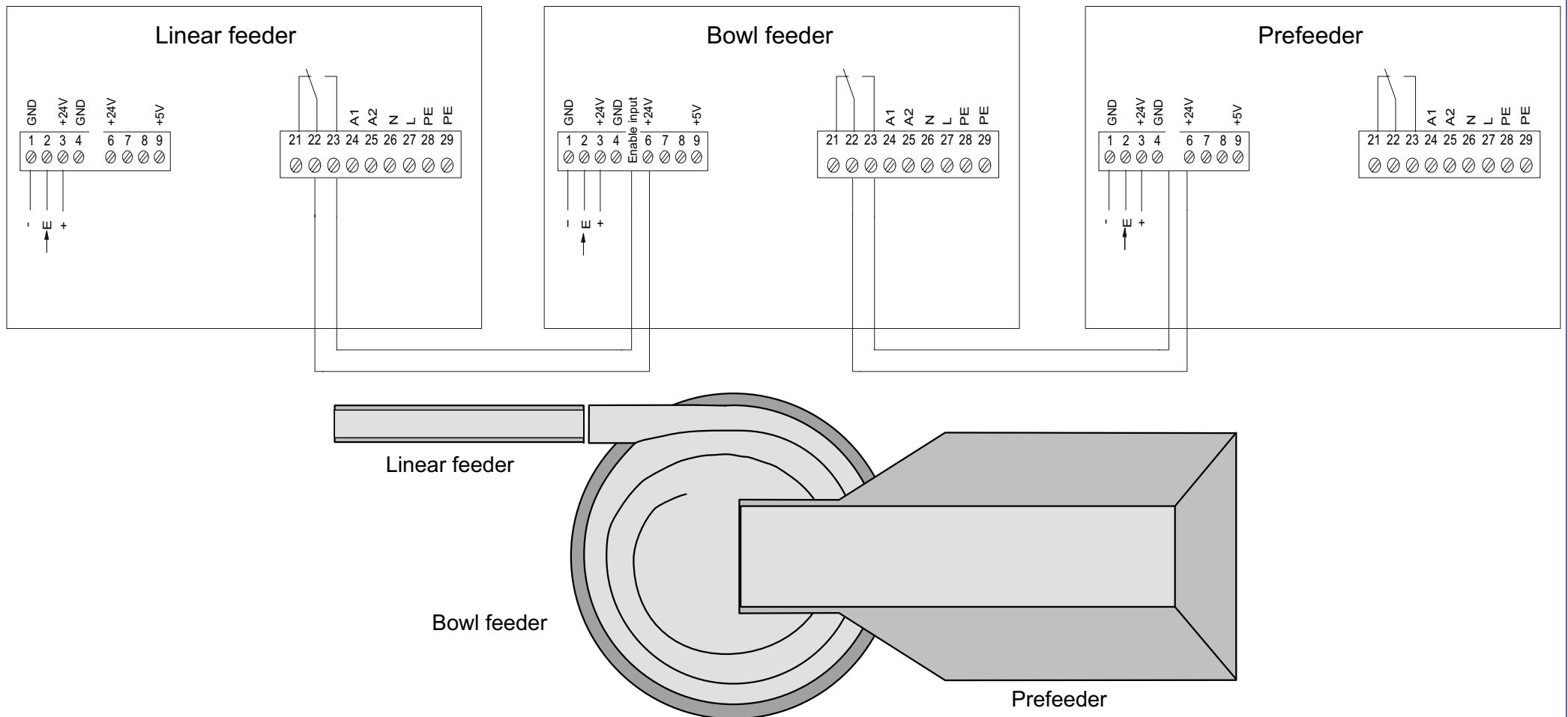
[mm]	3A	6A	8A
A	93	93	100
B	143	191	208
C	70	70	100
D	133	174	192
E	35	35	50



## Combinations of single devices (internal)

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

The prefeeder is regulated from the bowl feeder and the bowl feeder is regulated from the linear feeder through a 1:1 connection cable



### Combinations of single devices (external)

