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REOVIB MFS 268

Frequency controllers for vibratory feeders

Operating instructions

MFS 268XL 12A
ID# 626867

MFS 268 IP20 16A
ID# 621103

MFS 268XXL 16A
ID# 626887

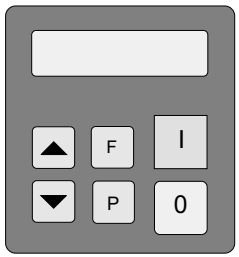
Features

-Feeder operating frequency is adjustable and independent of mains frequency.
-Constant feed rate ensured by internal compensation, irrespective of mains fluctuations.
-Integrated track control via backlog sensor.
-24 V DC output for operating an air valve (IP 54 version), and amplitude control (sensor required).
-Independent resonant frequency search possible for feeder.
-Enable input (start / stop), status relay (output active / inactive).
-Stand-alone housings (IP 54) or panel-mounted units (IP 20).

Technical data:

Supply voltage	110 / 240 V, +/- 10%, 50/60 Hz
Output	0...100 / 0... 205 V, 3 A, 6 A, 8 A, 12A, 16A
Output frequency	5...300 Hz, (preset at 35... 140 Hz)
Enable input	Contacts or 24 V, DC
Track sensor	24 V, PNP (100 mA)
Solenoid air valve output	24 V, (150 mA)
Status output relay (ON/OFF)	Changeover contact (250 V, 1 A)
Operating temperature	0...+45 °C
Storage temperature	-10...+80 °C
Recommended fuse	3 A, 8 A, 16 A slow-blowing, Type 'D' MCB

Display and controls



▲	Increase value
▼	Decrease value
F	Return
P	Programming mode or Enter
I	Controller Output ON
0	Controller Output OFF

Instructions:

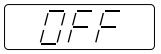
Menus are used for changing settings. The different parameters are selected by entering a code.

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

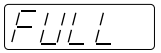
Settings

Pressing the cursor key for a short time causes one digit increase/decrease, holding down for a longer time gives changes in ten-digit steps.
Changed settings are saved when exiting the menu or automatically if a key is not pressed for 60 seconds.

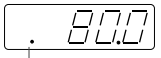
Operating displays



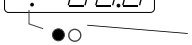
Enable OFF

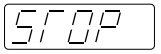


Track full



Setpoint in %


Timer running



Stop using "0" key

Data is subject to change for the benefit of technical improvement.

Settings	Range	Code	Factory settings	Menu code
Amplitude (feed rate)	0... 100 %	A.	0 %	000, 008
Maximum output voltage	5...100 %	P	90 %.	096, 008
Vibrating frequency	5...300 Hz	F.	100 Hz	096, 008
Soft start ramp up	0... 60 sec.	/.	0.1 sec.	096
Soft stop ramp down	0... 60 sec.	\.	0.1 sec.	096
External setpoint	0 / I	E.S.P.	0	003
Potentiometer setpoint	0 / I	POT.	0	003
Setpoint 0(4)... 20 mA	0 / I	4.20	0	003
Coarse / Fine control	0 / I	2.SP.	0	003
Invert enable	0 / I	-En.	0	003
Switch on time delay	0... 60 sec.	I.	1.0 sec.	007, 167
Switch off time delay	0... 60 sec.	0.	1.0 sec.	007, 167
Invert sensor	PNP/PNP invers	-SE.	PNP	007, 167
Activate sensor timeout	0 / I	E.En.	0	015
Sensor timeout delay	1... 240 sec.	E.	180 sec.	015
Switch off time air valve	0...60 sec.	Ai.	4 sec.	015
Activate control mode	0 / I	ACC.	0	008
P characteristic	0...100	P.A.	40	008
I characteristic	0...100	I.A.	100	008
Automatic frequency control ON	0 / I	A.F.C.	0	008
Automatic frequency search ON		A.F.S.		008
Display output current		i.		040
Display output frequency		F.		040
Pulse feed	0 / I	HOP.	0	064
On time delay (only if HOP = I)	0..60 sec.	H.	1.0 sec.	064
Off time delay (only if HOP = I)	0..60 sec.	h.	1.0 sec.	064
Invert Hopper sensor (not active)	0 / I	-Ho.	0	064
Save user settings	0...3	PUSH.	0	143
Restore factory settings		FAC.		210
Restore user settings	0...3	US.PA.	0	210
Hide programming menus	0 / I	Hd.C.	0	117
Hide setpoint adjustment	0 / I	di.S.	0	137
Display software version				001

Error messages

Overload (output current too high).
Possible cause: Feeder too large, frequency too low for installed coils, air gap too large.

Short-circuited output
Possible cause: Incorrect wiring, possibly a defective coil.

Input voltage too high
Cause: Mains voltage too high or induced voltage from coil

Sensor timeout has elasped (material sensor)

Sensor fault (only in regulation mode)
Accelerometer missing or faulty

Current spike limit
Frequency set too low for installed coil or frequency altered too rapidly during setting up

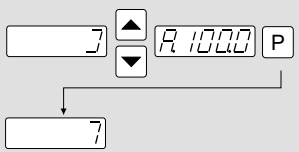
Error messages must be cleared in Menu no. C 009 by means of 'Cl.err.'

Timeout can be cleared with the 'I' key or by means of enable

Frequently appearing Errors, which are not described in this chapter, should be reported to the manufacturer.

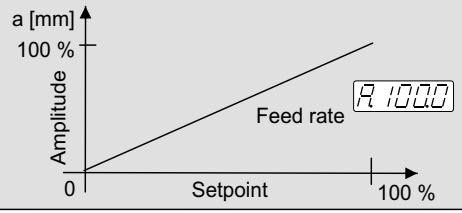
No code number is required to change the feed rate: pressing the P key twice will call the setpoint display.

Code 000 Feed rate set point



Feed rate 0...100 %

Operating mode



Feed rate setting

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.

Declaration of conformity

We declare that these products conform with the following standards and directives:
EN 50081-2 and EN 50082-2 in accordance with directive 89/336/EEC.

REO ELEKTRONIK AG, D-42657 Solingen

Specified use

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

Installation

Do supply voltage, operating voltage of the conveyor and controller input voltage match ?
Is the controller adequately rated for the rated power of the feeder ?
What is the vibrating frequency of the feeder ?

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.

Connect the unit in accordance with the wiring instructions and ensure that earthing is correct !

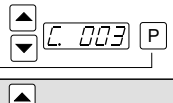
Attention!

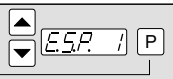
New units are factory set (see table with settings).
For units with unknown settings, first recall the factory settings using Menu C 210 'FAC'.

If an external setpoint source is used, select "E.S.P." = I in Menu C003. If a potentiometer is used, select also 'Pot.' = I.
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.

The specific settings for a system can be saved by selecting 'US.PA.' in Menu C143 (recall settings via Menu C 210 'US.PA').
Menu access can be hidden by selecting 'Hd.C.' = I in Menu C117.

Code 003 Function settings

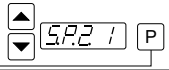




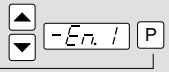
0 = Setpoint using display
I = external setpoint 0...+10 V ON

0 = external setpoint 0...+10 V
I = external setpoint 4...20 mA

0 = 0...10 V/ 0(4)...20 mA
I = Potentiometer

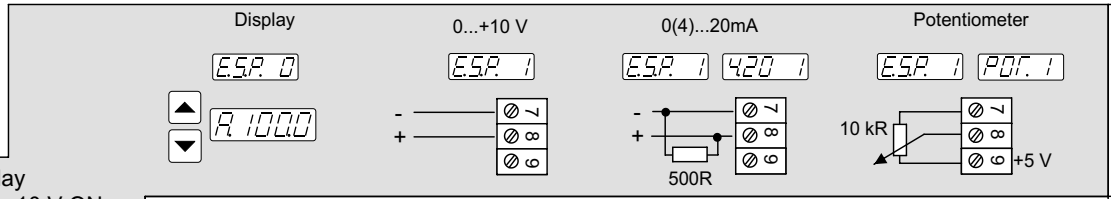


0 = Track control via backlog sensor
I = Coarse/fine control with second setpoint



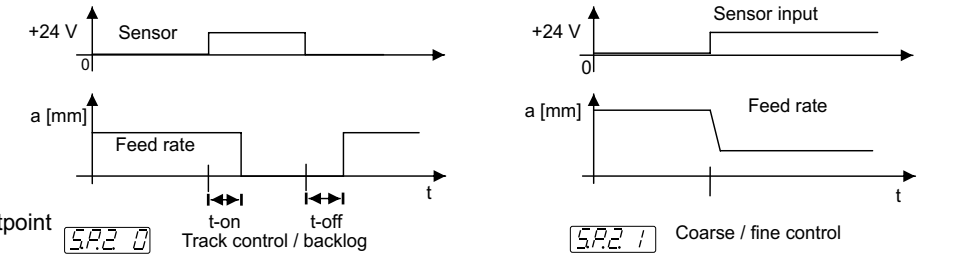
0 = Enable
I = Invert enable

Operating mode



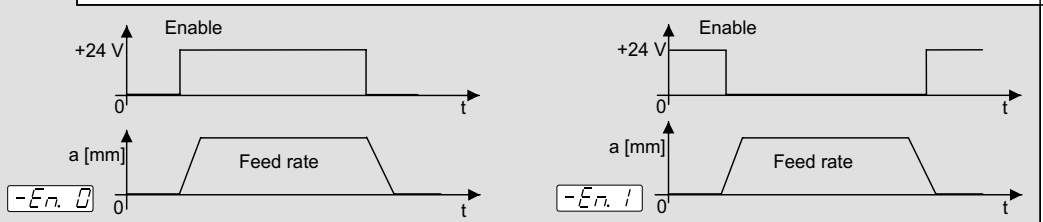
.
Internal using keys in touch panel
External setpoint
0...+10 V,
0(4)...20 mA
Potentiometer 10 KΩ

Set point input



Track control
or
Coarse / fine control with two feed rates

Sensor input

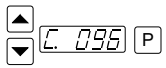


+24 V signal or closed contact will enable the output.

+24 V signal or closed contact will inhibit the output.

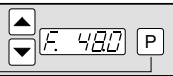
Enable input

Code 096 / 020 Feeder

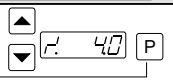


Feed rate 0...100 %

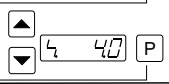
Maximum limit 100...5 %



Vibrating frequency [Hz]

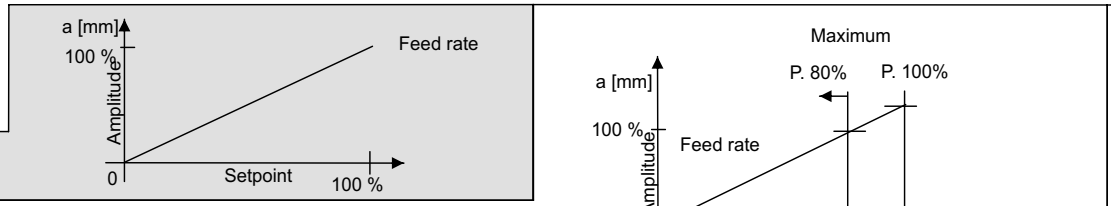


Soft start time 0...5 sec.



Soft stop time 0...5 sec.

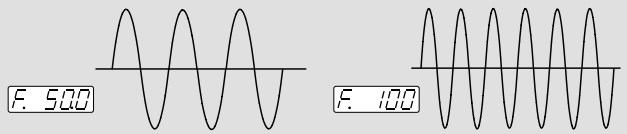
Operating mode



Limiting the maximum feed rate

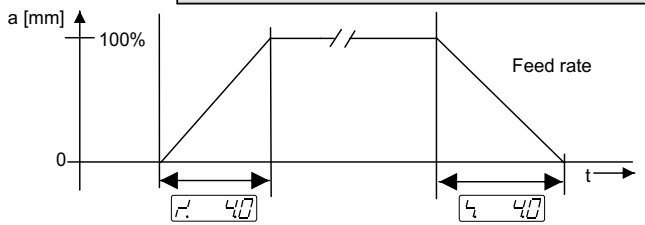
The set point will still display 0... 100 %, even though it is limited internally.

Maximum feed rate



The frequency setting depends on the feeder type.
Important!
The wrong frequency setting can damage the coil.

Vibrating frequency



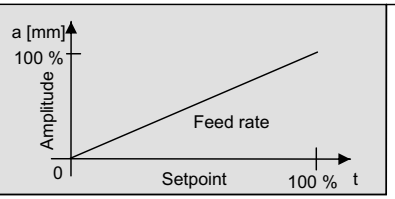
Time ramp for starting and stopping the feeder.

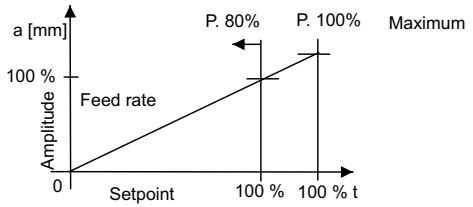
Soft start / soft stop

Code 008 Control mode

C. 008 P

R 100 P — Feed rate 0...100 %

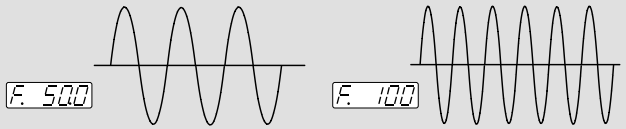




Limiting of output voltage or feed rate, e.g. to prevent hammering. The displayed setpoint range remains at 0...100%.

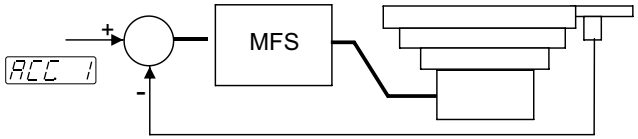
P. 100.0 P — Maximum limit 100...5 %

F. 48.0 P — Vibrating frequency [Hz]



Frequency setting depends upon the feeder type.

ACC. 1 P — Switch to control mode
0 = Regulation (without sensor)
I = Control (with sensor)

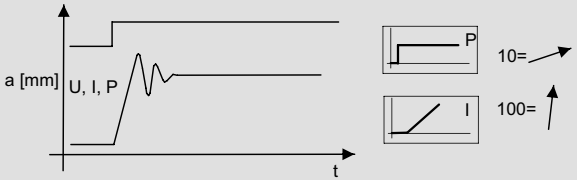


Activates the control mode to ensure a constant vibration amplitude, even with large load variations. The control mode requires an acceleration sensor.

P.R. 10 P — Proportional characteristic (gain)

I.R. 10 P — Integral characteristic (damping)

P — Automatic frequency control
0 = Off I = On



Influences the regulation behaviour: Lineout time and vibration behaviour (pumping) of feeder.

Start frequency search

Operating mode

A.F.C. 0 f = fixed A.F.C. 1 f = f resonant

Automatic frequency change in case of resonance.

▲ key will start automatic frequency search

Start automatic frequency search

*** An acceleration sensor, type SW-70, 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 you must connect 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 = I).
* 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.

Code C 007 / C 167 Track control / Backlog sensor

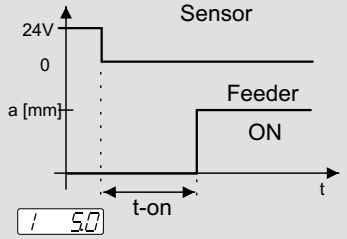
C. 167 P

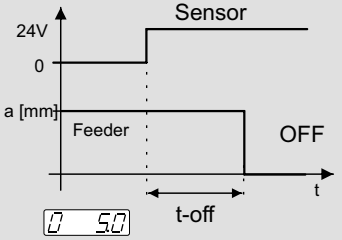
Switch on time delay
0...60 sec.
1 0.0 P

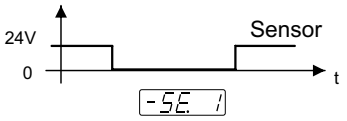
Switch off time delay
0...60 sec.
0 0.0 P

Invert sensor function
I = inverted
-SE. 1 P

Operating mode







Adjustment of the ON and OFF delays

Invert sensor input

Time delays

Sensor

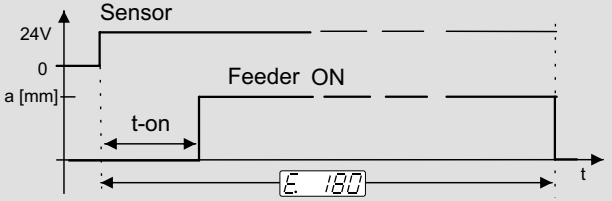
Code 015 Special functions

C. 015 P

0 = Feeder doesn't switch off during timeout
I =Feeder switches off during timeout
E.En. 1 P

E.En. 0 inactive
E.En. 1 active

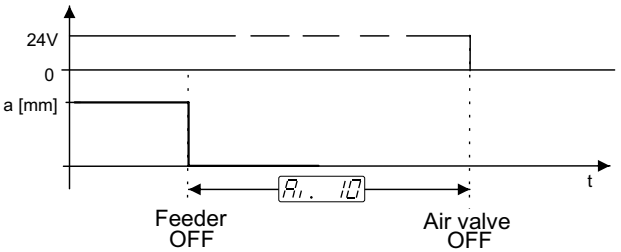
E. = Sensor timeout [sec]
E. 40 P



Sensor control active. If no components are detected during the timeout period, the feeder switches off.

Sensor control

Run-on-time for air valve output
A1. 10 P



Setting the run-on-time for the air valve output.

Air valve output

Operating mode

Code 064 Pulse feed

C. 064 P

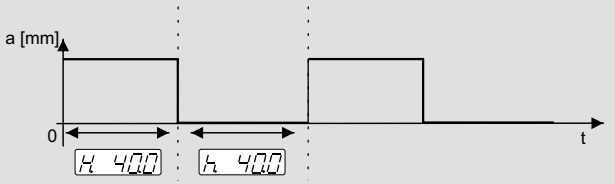
0 = Pulse feed Off
I = Pulse feed On
HOP. 1 P

Feeder on time
H 50.0 P

Feeder off time
h 3.5 P

Sensor invert (not active)
-HO. 1 P

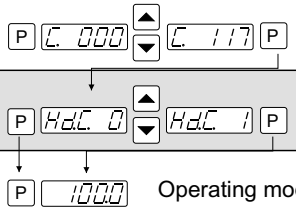
Operating mode



On and Off time for Hopper pulse feed

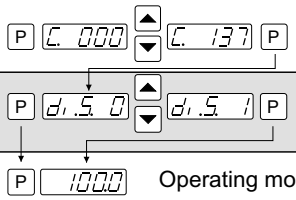
Pulse feed

Code 117 Inhibit access



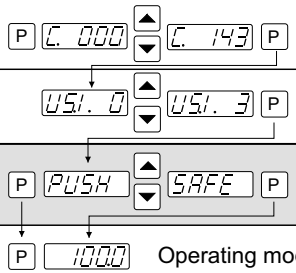
I= Hidden menus	HdC. 1	Parameter menus cannot be accessed, except for the feed rate setpoint	Hide programming menus.
	HdC. 0	Parameter menus can be accessed	

Code 137 Inhibit setpoint access



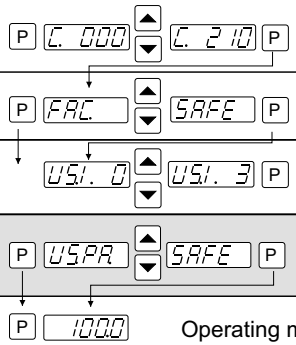
0 = Setpoint access ON I = Setpoint access OFF	di.S. 0	Setpoint can be adjusted	Setpoint access
	di.S. 1	Setpoint cannot be adjusted	

Code 143 Save parameter settings



Select parameters 0 to 3		Saves up to 4 different parameters (no. 0 - 3).	Save parameter settings
Save parameter settings		▲ All previously set parameters are saved.	

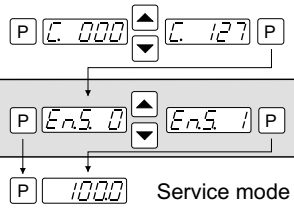
Code 210 Restore parameters



Restore factory settings		▲ Restore factory settings.	Restore factory settings
Select parameters 0 to 3		Saves up to 4 different parameters (no. 0 - 3).	Restore parameter settings previously stored under C143
Restore user settings		▲ Restore settings saved under C143.	

Service

Code 127 Enable service menu



0 = Service mode OFF
I = Service mode ON

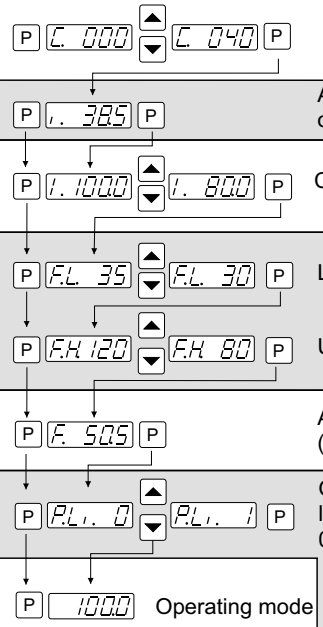
En.S. 1

Enables access to the adjustment of Imax, Fmin / Fmax, and Output voltage limiting.

Extended settings

Service

Code 040 Service



Actual value in % (display only) of the nominal coil current

I. 38.5

Display shows the actual coil current in % of the nominal current (Inom).

Conversion

$$\frac{\text{Display x Inom}}{100} = \frac{38{,}5 \times 6}{100} = 2{,}31\ \text{A}$$

Monotoring the output current.

Current limit in % of Imax.

I. 80.0

Adjustment of the current limit in & of the nominal current (Inom).

Conversion: e.g. 4,8 A coil:

$$\frac{\text{I-limit x 100}}{\text{Inom}} = \frac{4{,}8 \times 100}{6} = 80\ \%$$

Adjusting output current Ilimit depending on coil.

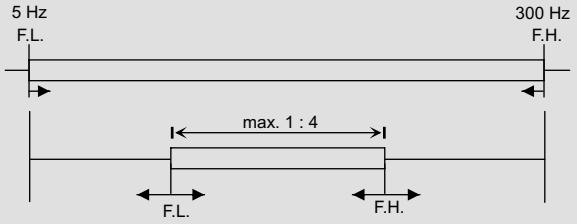
Current limit

Lower frequency limit

Upper frequency limit

Adjustable frequency range
Parameters 'F.L.' and 'F.H.'
in Menu C 040.

Effective frequency range
Parameter 'F' in
Menus C 008, C 096, and C 020.



Setting the limits of the frequency adjustment range accessible for the user.
A narrow adjustment range is preferable for the automatic frequency search function.

Frequency range

Actual frequency value (display only)

F. 50.5

Display shows the actual vibration frequency.

Monitoring the vibration frequency

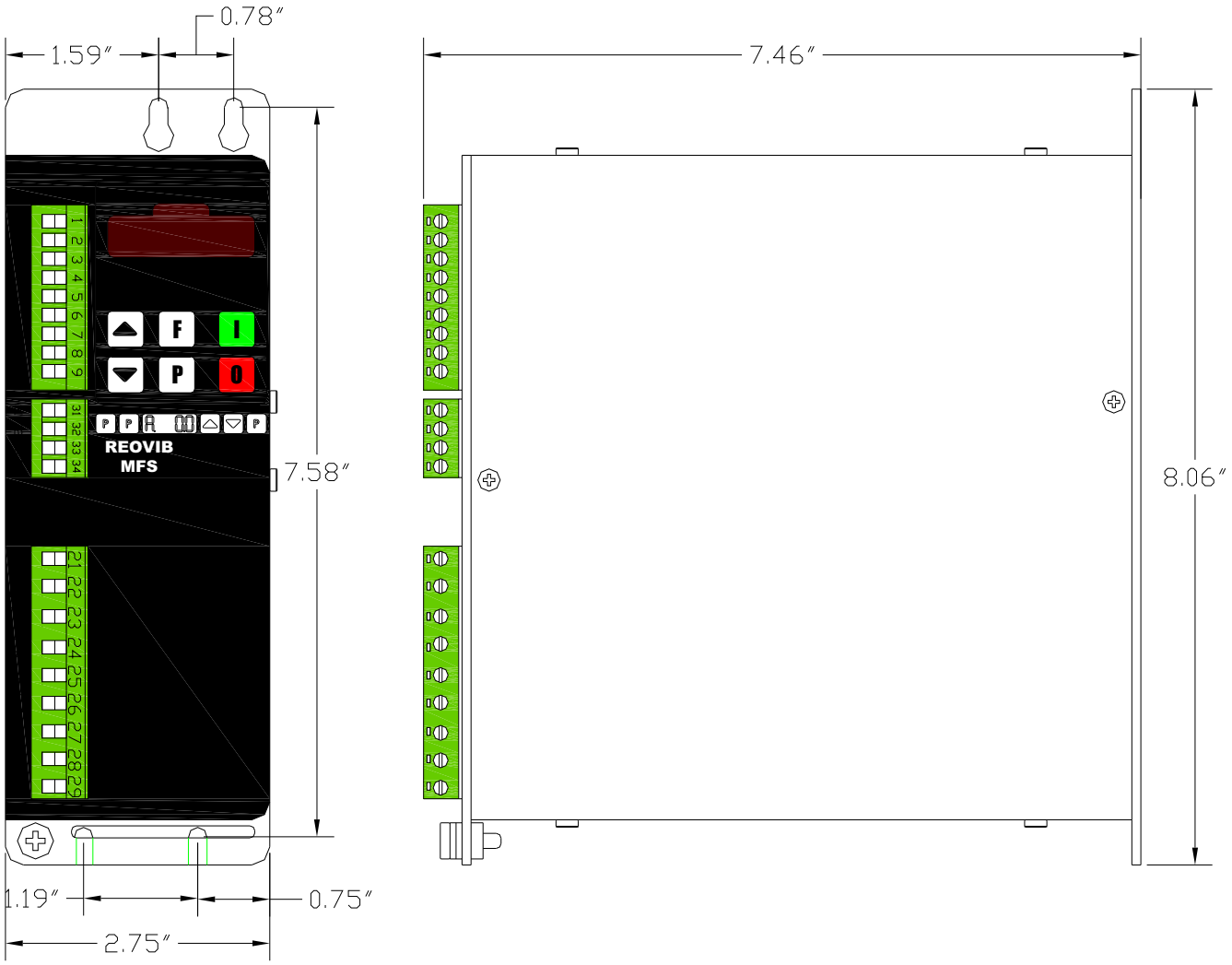
Output voltage limiting 100 V
0 = Off, I = On

PL. 1

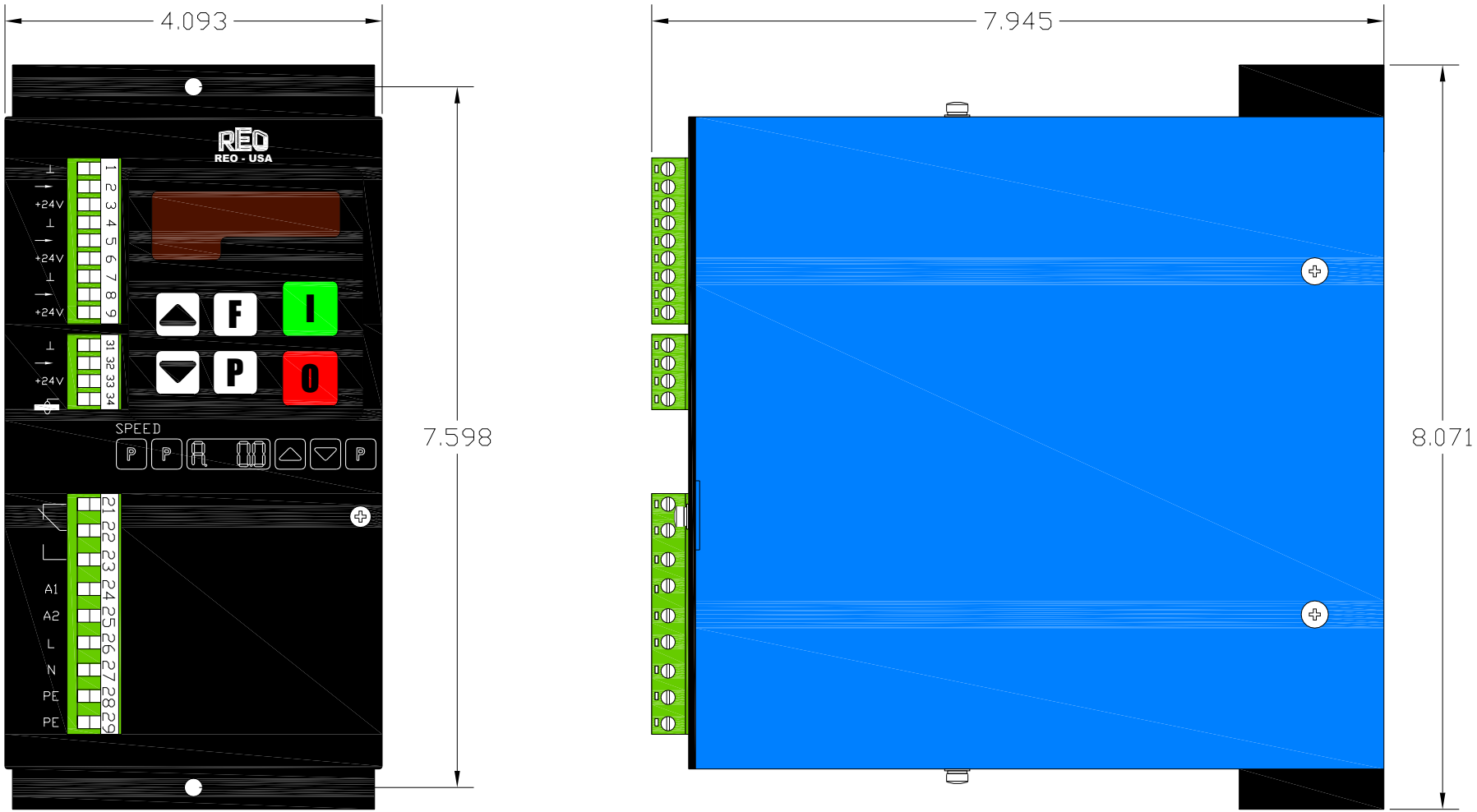
When operated with 230 / 240 V mains supply, the output voltage is limited to 100 V.

Operating mode

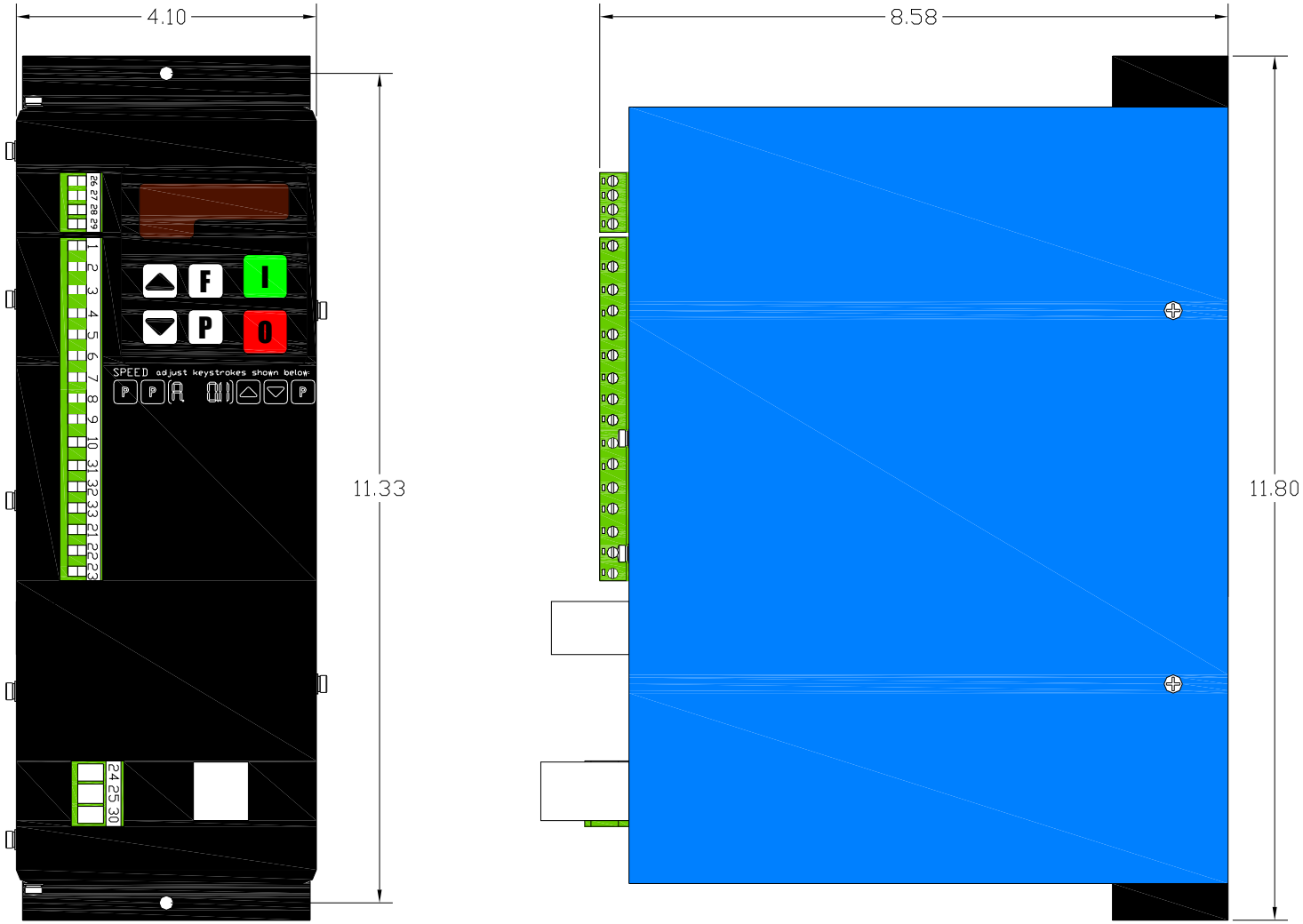
MFS 268, 621605, 3Amp, IP 20



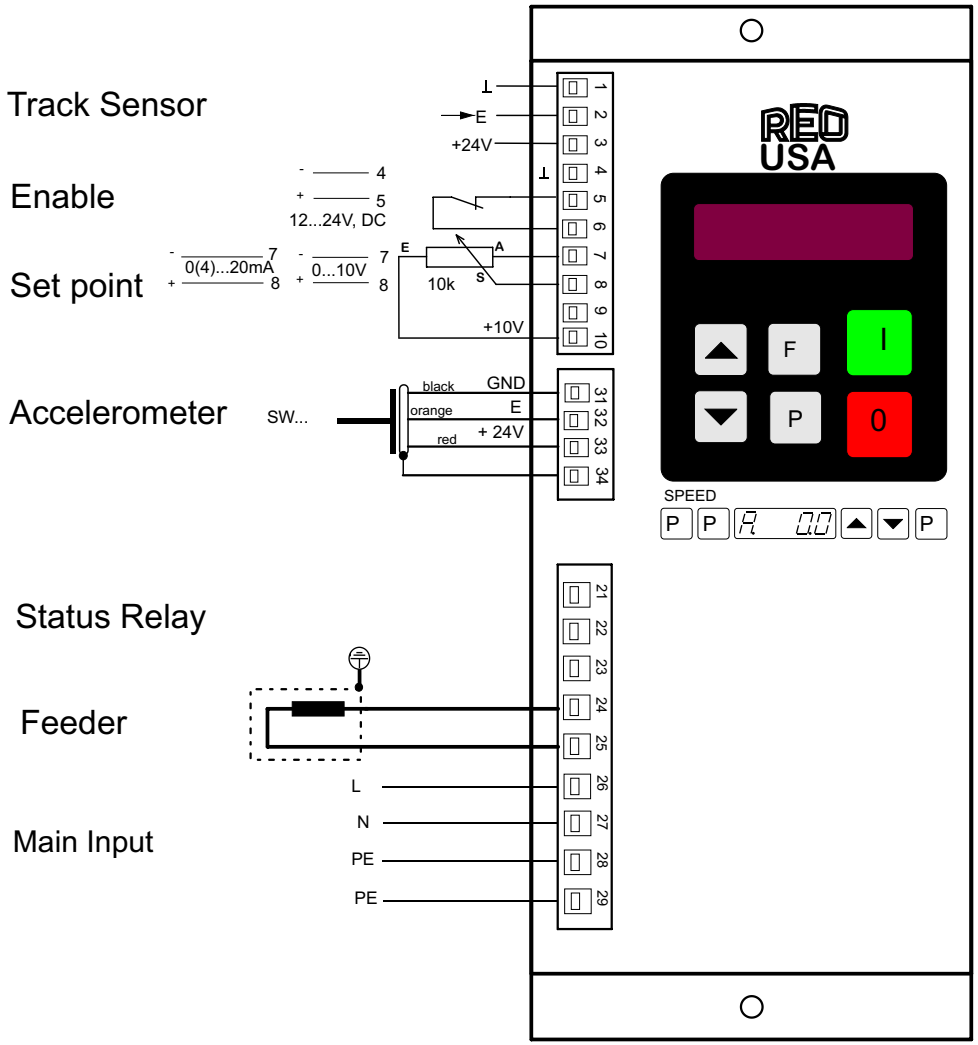
MFS 268, 626848, 8Amp, IP 20



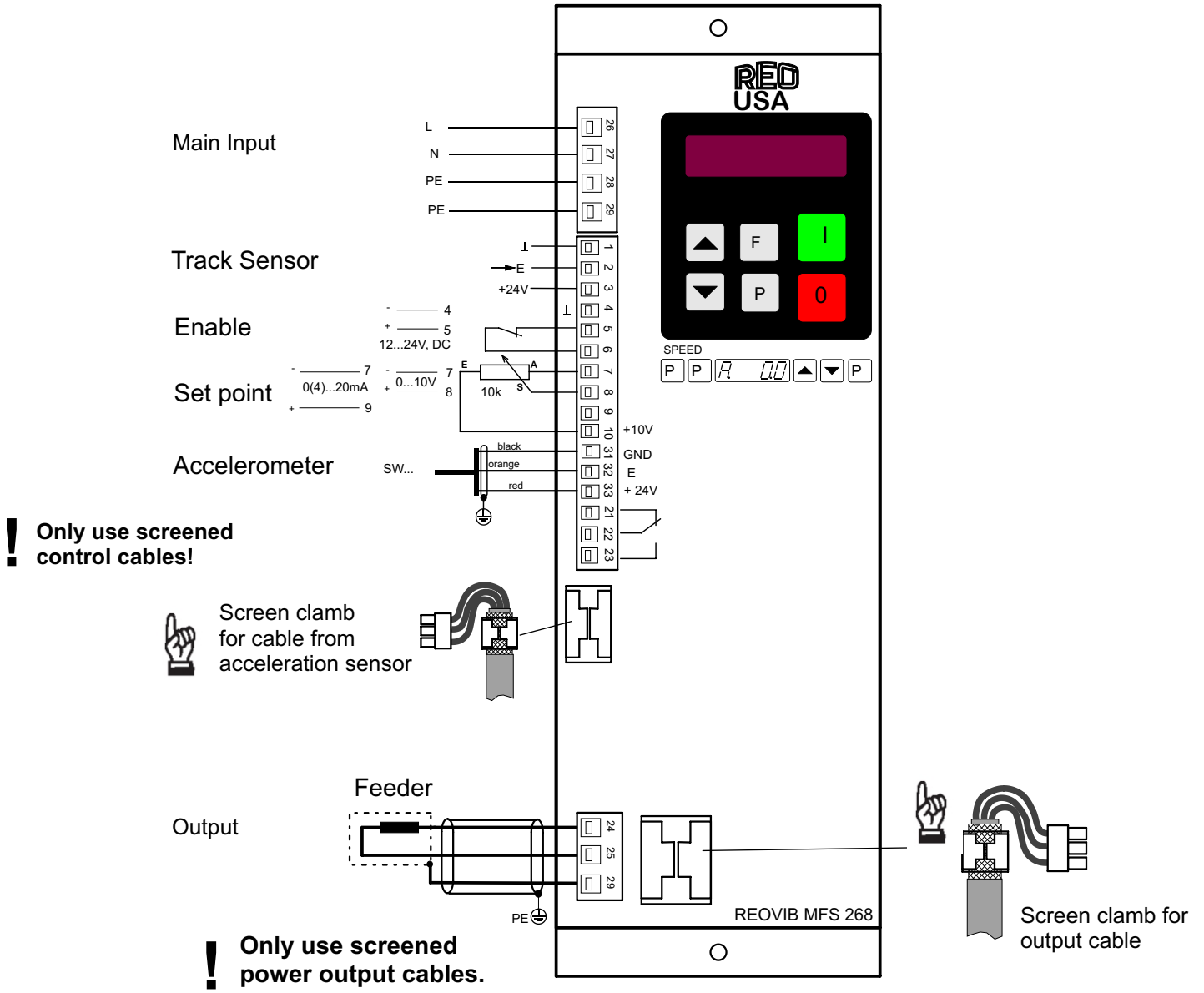
MFS 268, 621103, 15Amp, IP 20



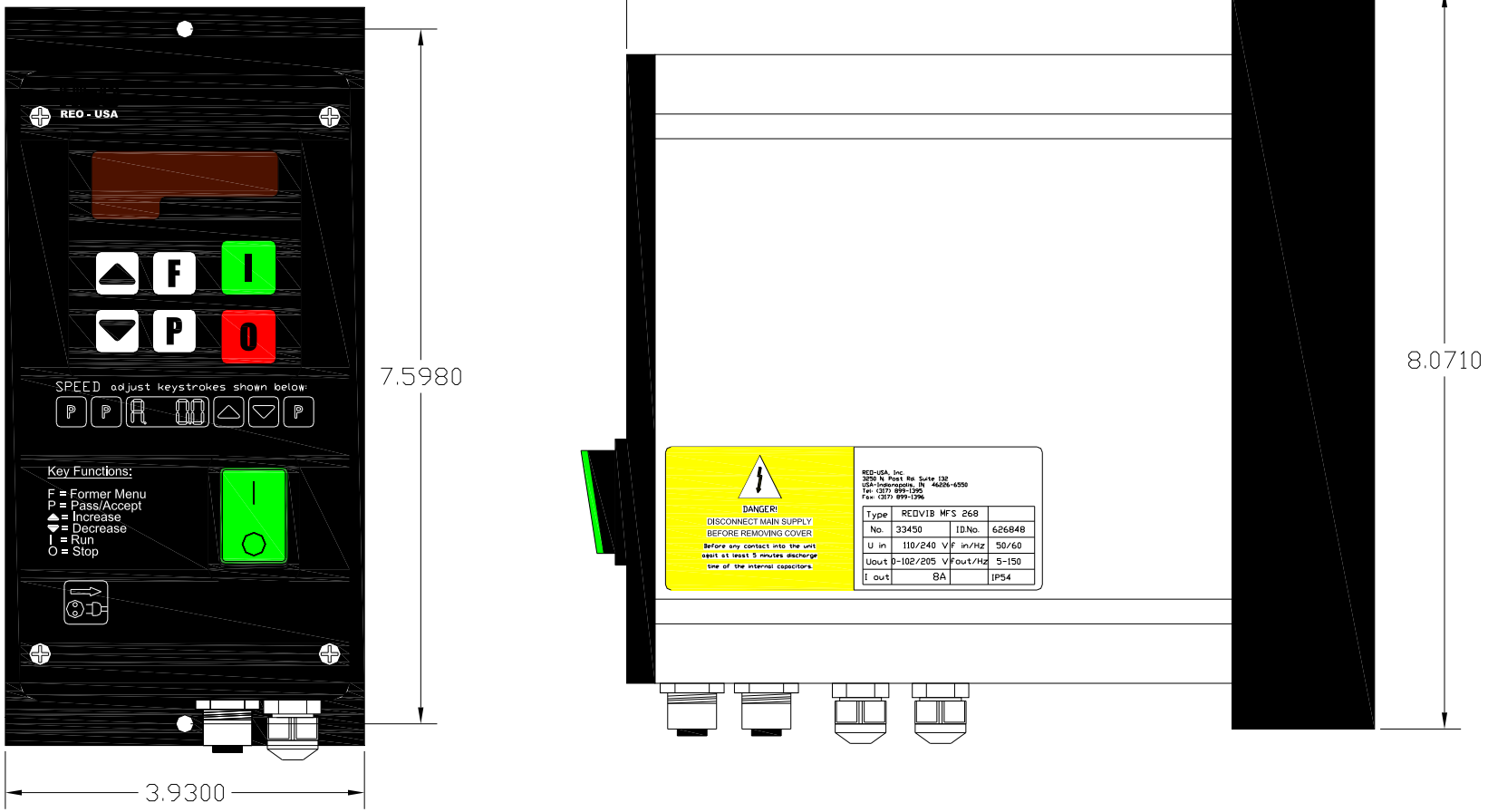
MFS 268, 3Amp & 8Amp, IP 20, Electrical



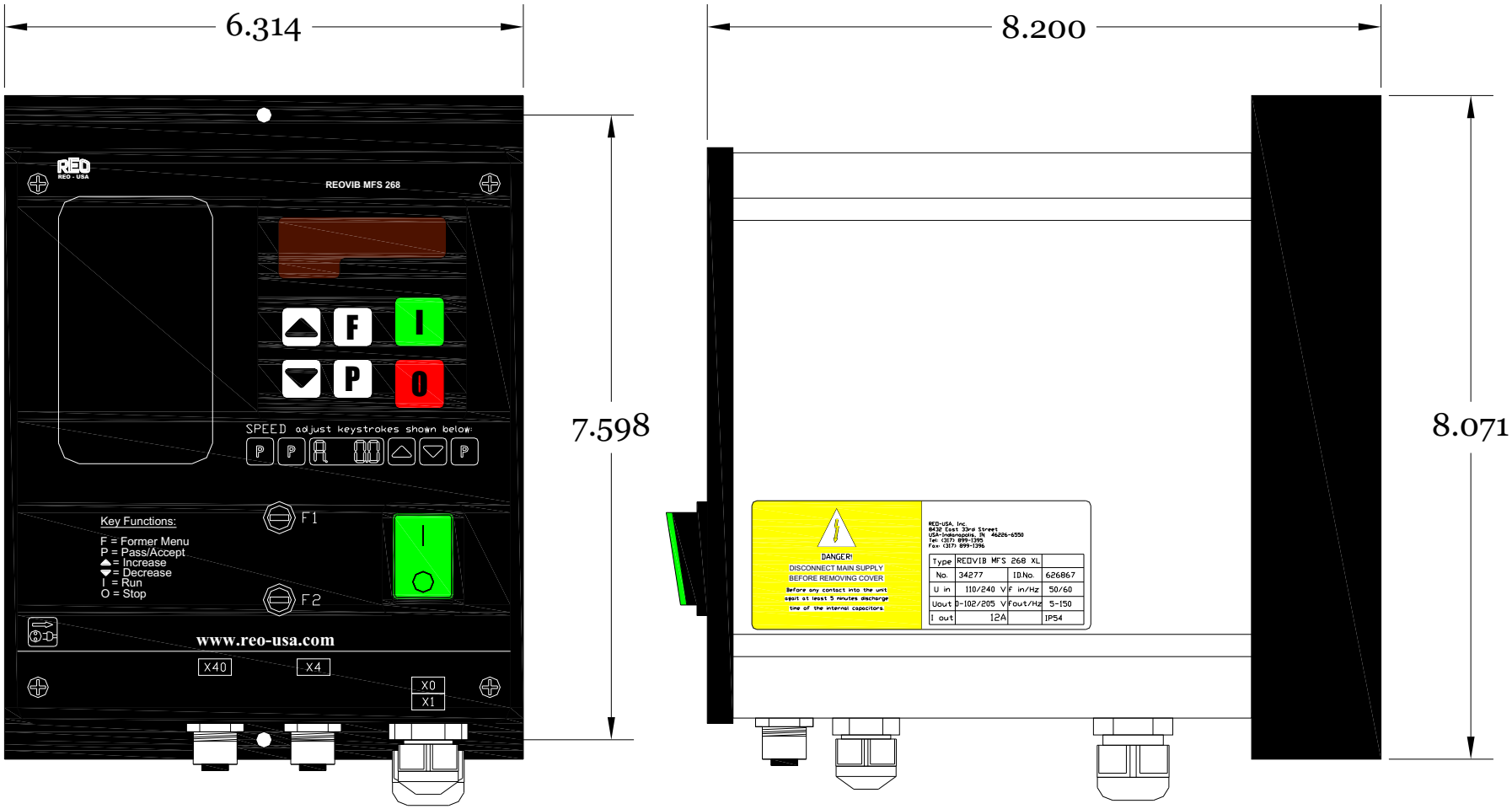
MFS 268, 15Amp, IP 20, Electrical



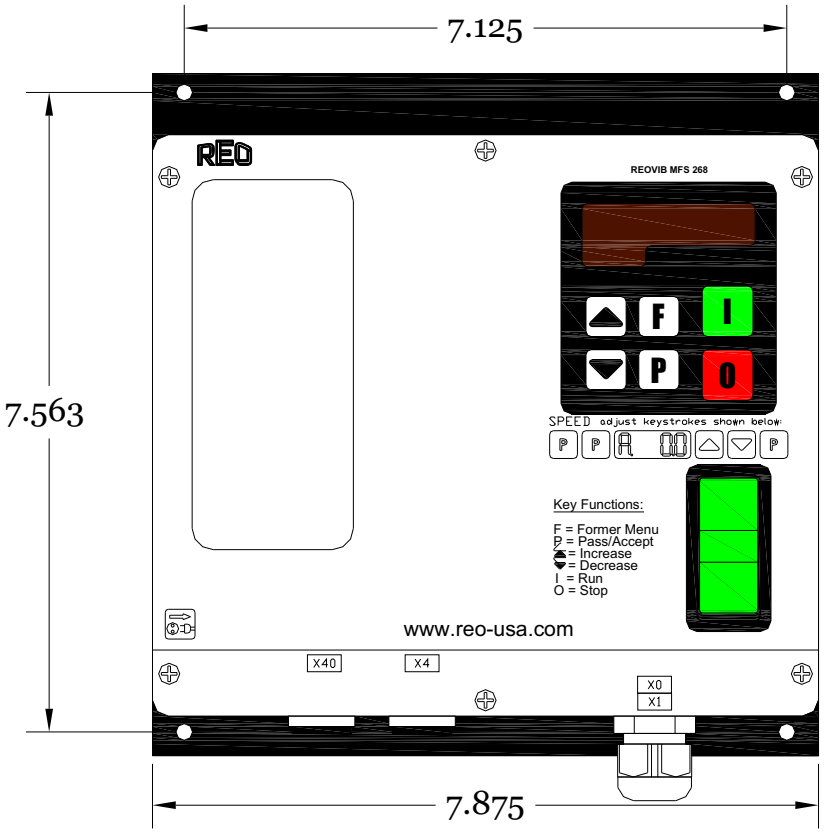
MFS 268, 626848, 8Amp, IP 54

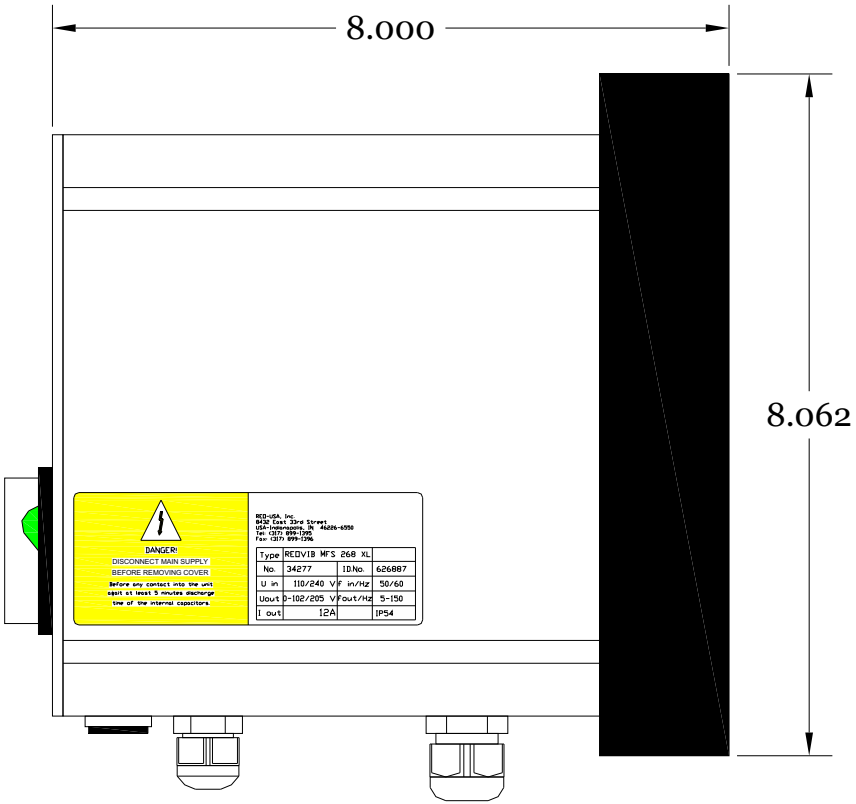


MFS 268, 626867, 12Amp, IP 54

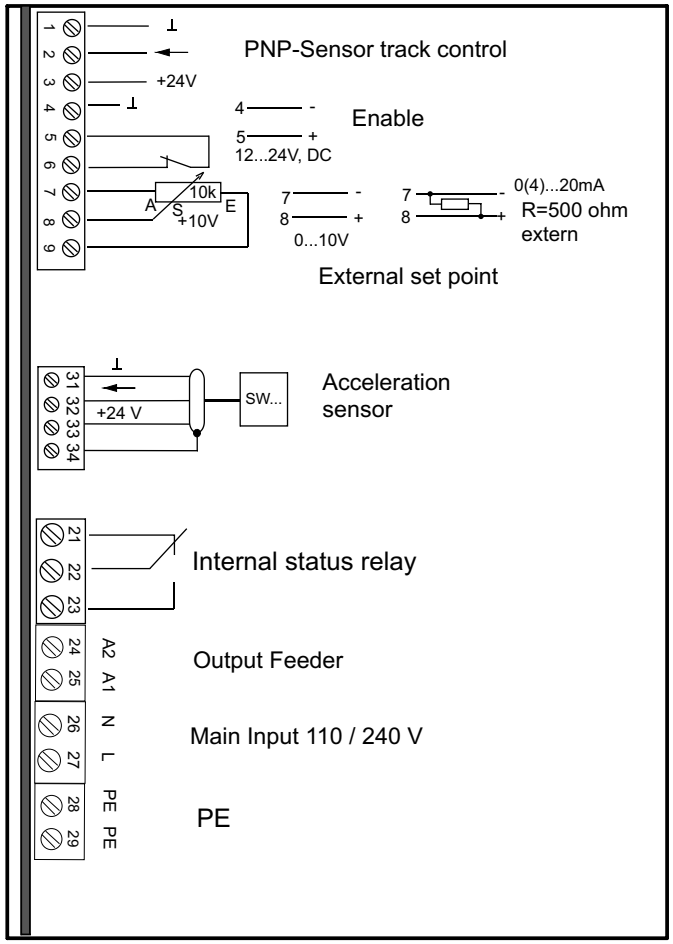


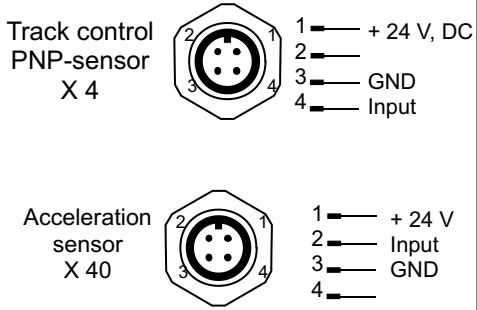
MFS 268, 626887, 16Amp, IP 54

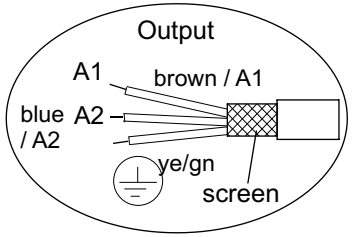


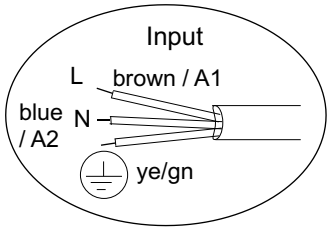


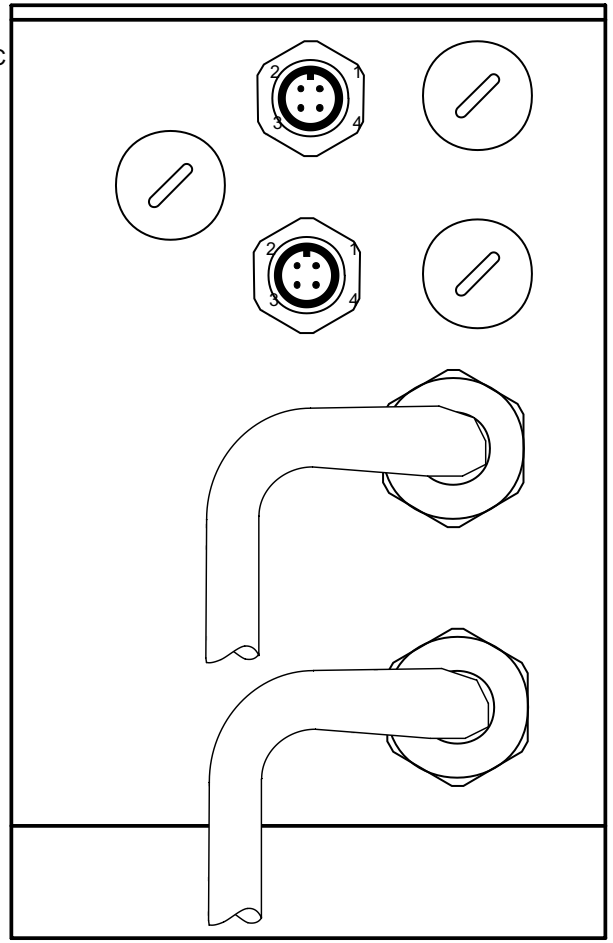
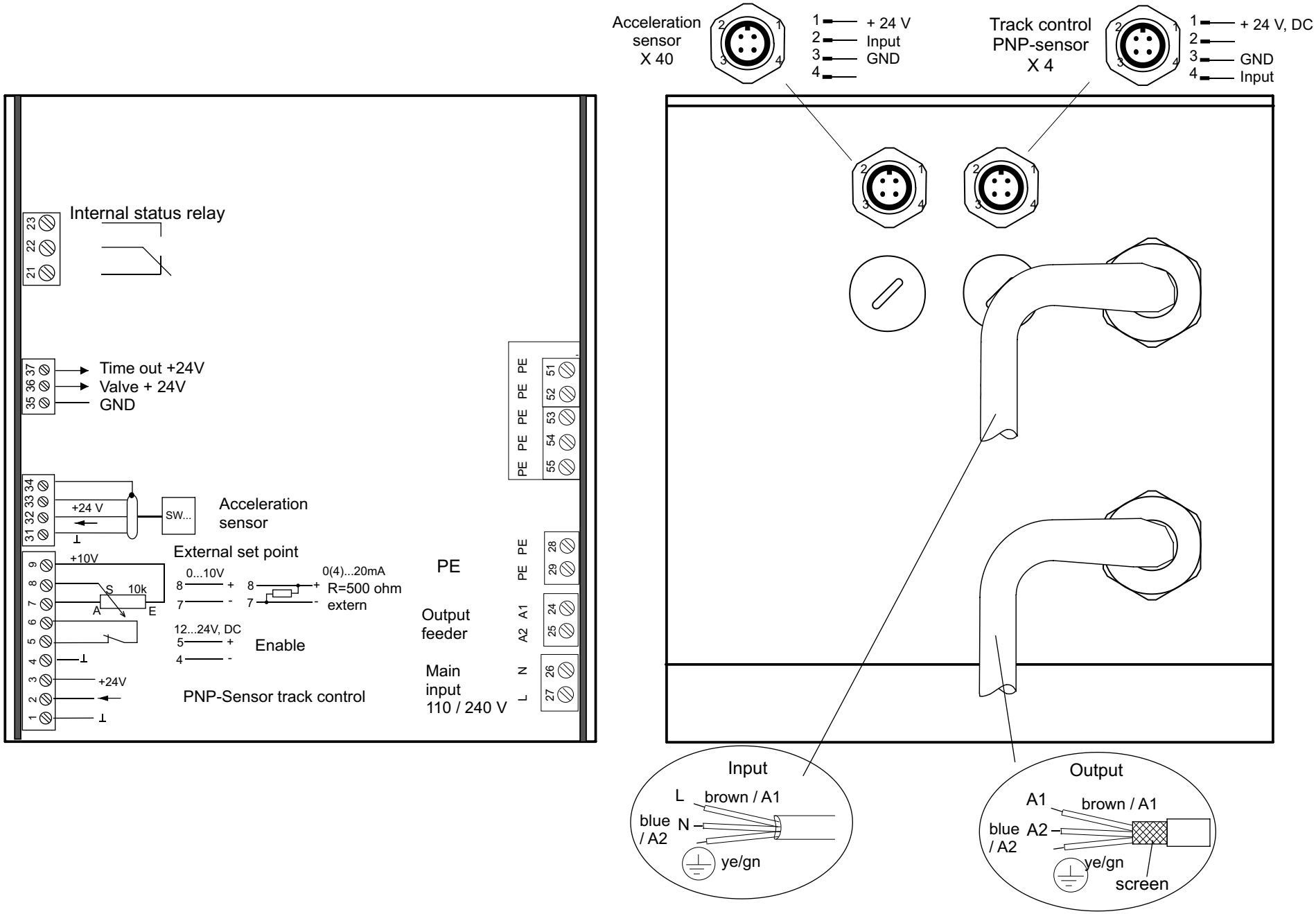
MFS 268, IP 54, 8A, Electrical











MFS 268, IP 54, 12A & 16A, Electrical