TECHNICAL MANUAL
ROBOPOP® 75 (VPM-RM4LT)

PDF version of this manual is available on www.robolabs.pro

TESTING AND ADJUSTMENT MODE

This mode is used for testing feeder and sifter operation and also for changing parameters of the machine (except reference turbine speed and temperature).

Turn the machine off. Press and hold COOLING button and press START button once. Release COOLING button once "St" is shown on the display. The machine now is in the testing/adjustment mode.

Parameters adjustment

Press START button to list the parameters. The display shows a parameter and its current value, for example: **FF10** means that Feeding Time is set at 10 seconds. Note that the display has only 4 digits, so the decimal zero will be skipped while displaying 3-digit value. For example, Popping Time set at 180 seconds is displayed as **tP18**. Feeding Speed is also displayed the same way.

Once desired parameter is displayed, press COOLING button to increase the value. Increment step is different for each parameter, see the chart below. Once the maximum value is reached, press COOLING button once again to set the minimum value.

PARAMETER (UNITS)	DISPLAY	FACTORY DEFAULT	RANGE (INCREMENT)
Popping time (seconds)	tP	180	150—300 (30)
Feeding speed (rpm)	Fr	200	100—350 (10)
Feeding time (seconds)	tF	10	10—30 (5)
Purge time (seconds)	tb	10	10—30 (5)
Heating boost time (seconds)	tH	40	10—60 (5)
Sifter speed (rpm)	Sr	50	10—95 (5)
Popping freq boost (Hz)	FP	10	10—15 (1)
Purging freq boost (Hz)	Fb	20	15—30 (1)

Popping time — popping stage duration. The main criterion of optimal popping time is that more than 95% of corn be are popped and thrown out from the chamber during this period.

Feeding speed — duration of feeding stage. Higher value increase the amount of corn supplied per batch.

Feeding time — rotation speed of the auger. Higher value increase the amount of corn supplied per batch.

Purge time — purge stage duration.

Heating boost time — machine uses PID algorithm for maintaining temperature in the chamber. However, to avoid large temperature drop in the beginning of the cycle, heaters are forced to operate on full power for this period of time.

Sifter speed — sifter rotation speed. Too low sifter speed may cause chamber

clogging.

Popping freq boost — the turbine's speed is increased for this value during popping stage.

Purge freq boost — the turbine's speed is increased for this value during purge stage.

SAVE AND EXIT

There are two ways to exit the testing mode and save all changes have been made: press EMERGENCY STOP button at any time; or press START button one more time once you see **dEF** on the display.

FACTORY DEFAULT SETTINGS

To reset all the settings to factory default, list parameters until see **dEF** on the display, then press and hold COOLING button and press START button once. All parameters, except basic turbine speed will be reset to its default values, and the popper will be shut off.

Sifter testing

Press and hold COOLIN button to check the sifter operation. The sifter motor will be operated while the button is kept pressed.

Feeder testing

Press COOLING button once. The feeder will perform a cycle. This procedure can be used for measuring the amount of corn supplied per one batch. Fill the hopper full with corn, then make three consecutive feeder cycles. Take out all kernels from the chamber, weight it, and divide by 3 to get the average batch load.

SAFETY TEMPERATURE REGULATOR

Temperature set point (SV) is 300°C by default. Note that after changing **In-t** (temperature sensor type) or **Uni-t** (temperature unit) values, parameters **H-Su**, **L-Su**, **AL1**, **AL2**, **AHYS** must be set again.

PARAMETER	VALUE	DESCRIPTION
In-t	4CA	Temperature sensor type
L-Su	250	SV low-limit value
H-Su	400	SV high-limit value
oUt	rLY	Control output type: relay
C-nd	onoF	Control mode type: ON/OFF
HYS	50	Output hysteresis
LoC	LoC2	Lock settings: all locked, except SV

The regulator has three setting groups: SV setting group, 1ˢᵗ setting group, and 2ⁿᵈ setting group. Setup order is the following: 2ⁿᵈ group >>>1ˢᵗ group >>> SV group.

To access the second group of parameters, press and hold orange MODE button for 4 seconds; once you see **PAr2** on the display, release the MODE button. To access the first group of parameters, do the same, but hold the MODE button 2 seconds, until you see **PAr1** on the display.

Use MODE button to list parameters. Use "<<" button to see the actual value of the parameter. Use up or down arrow keys to change the value. Once the new value is set, press MODE button to proceed to the next parameter.

Before changing parameter's values, the parameter **LoC** must be set to **oFF**.

VFD SETTINGS

PARAMETER	VALUE	DESCRIPTION
00.03	0	Start-up display selection: display the frequency command value (Fxxx)
01.00	70.00	Maximum output frequency
01.16	4	Auto acceleration/deceleration
02.00	3	Source of first master frequency command: RS-485
02.01	4	Source of first operation command (RS-485)
02.04	0	Motor direction control
02.07	1	Up/Down mode
02.10	0	Combination of the first and second master frequency command
02.11	40.00	Keypad frequency command
09.00	5	Communication address of the VFD
09.01	1	Transmission speed (9600 bps)
09.02	3	Transmission fault treatment (keep operating)
09.04	1	Communication protocol (ASCII 7, E, 1)

To change or view parameter value, press ENTER key, the display shows 00., then use up or down arrow keys to choose the group number (for example, 02.). Now press ENTER again, display shows 02.00. Use up or down keys to choose the parameter, for example, 02.11. Press ENTER again to see the current value. Change value, if needed, with up or down arrow keys. Press ENTER to save the new value, and the display shows End. Use MODE button to return back to the previous level of selection or to the main mode.

To change the mode of display, press MODE button few times, until the display shows F00.0. Use up and down arrow keys to change the reference frequency. It must be between F30.0 and F40.0

CHAMBER OPTICAL SENSOR

The optical sensor consists of three parts – a heat-resistant head, an optical amplifier, and an optical fiber between them. Optical amplifier is located in the upper electric compartment of the machine. This is how it looks like:
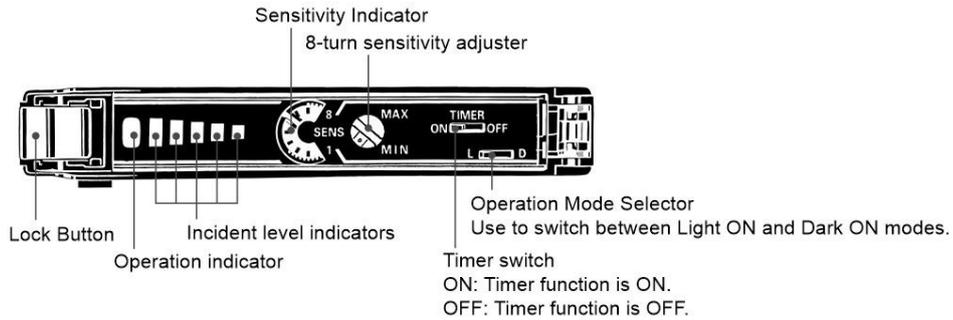
Timer switch must be set to OFF position.

Operation Mode Selector must be set to L position.

The operating distance must be 10-12 cm.

To adjust the operating distance, put a folded sheet of white paper in the chamber in such a way to interrupt the sight line of the sensor, as shown on the picture below. Make sure that the sensor's head is clean.

Slowly rotate adjusting screw to catch the point where the Operation indicator is lit up.