Mold Masters®

TempMaster™ series M3

REVOLUTIONIZE YOUR OPERATION

FEATURING NEW

TCONNECT TECHNOLOGY

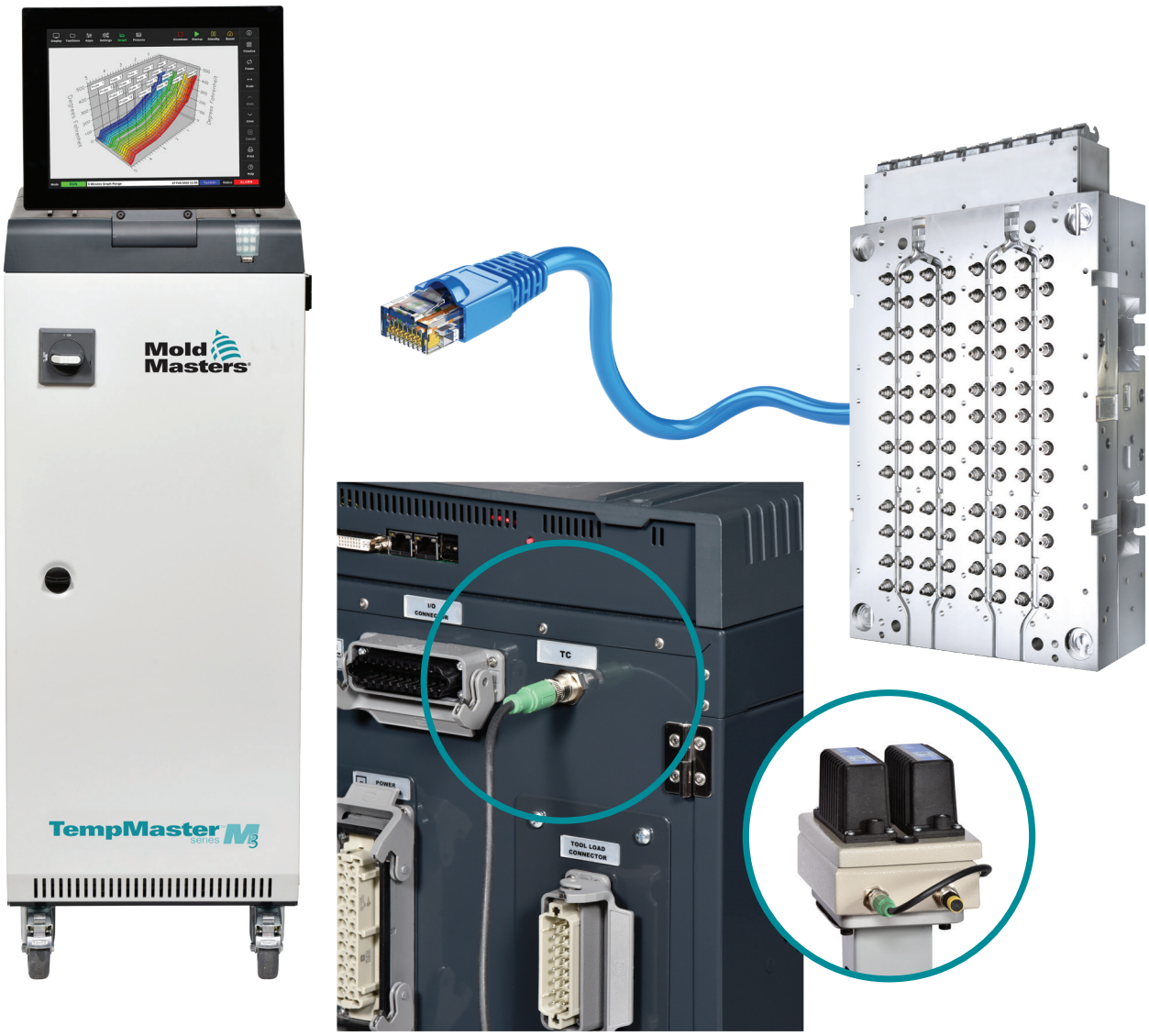
APS AI
ADAPTIVE PROCESS SYSTEM

TC-CONNECT TECHNOLOGY

ELIMINATE CONVENTIONAL TC MOLD CABLES

TC-CONNECT Technology, available exclusively on TempMaster M3 controllers is a revolutionary new innovation that completely eliminates the need for conventional T/C mold cables altogether. Eliminating these cables, which make up 50% of all mold cables, saves significant cost, weight, and clutter from the molding cell.

TC-CONNECT Technology utilizes a new eBOX design that attaches to the mold. A single, thin and lightweight data communication cable (similar in size to Ethernet) connects from the back of the M3 controller to the eBOX. It's as simple as that. Wiring the Hot Runner system remains unchanged. This technology is compatible with new and any older (retrofit) Hot Runner Systems.



Only (1) TC-Connect data cable
is required to control unlimited TC.

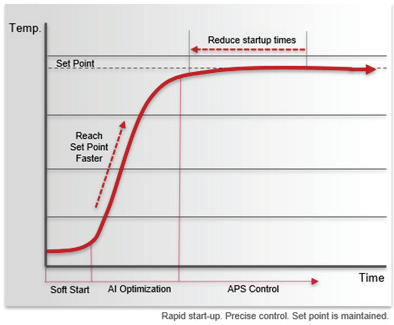
INTELLIGENT TECHNOLOGY FOR PRECISE CONTROL

The TempMaster M3 controller will be the first to feature our **NEW APS-AI** (Adaptive Process System) Technology incorporating Artificial Intelligence (AI) delivering unmatched precision, speed and reliability. Optimize the performance of any hot runner system and unlock your operations full potential with TempMaster **APS-AI**.

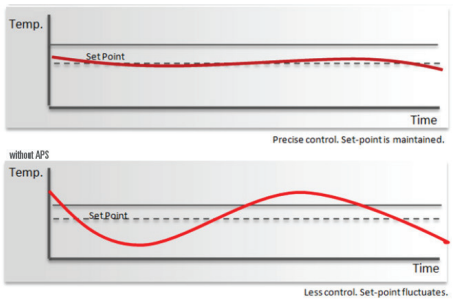
Our proprietary **APS** control algorithm continuously monitors, learns, predicts and automatically adapts to process variables. Making almost instantaneous micro adjustments ensures mold temperatures are maintained with the highest degree of precision.

AI brings a whole new level of precision to your molding environment. **APS-AI** has the ability to automatically recognize the behavioral characteristics of individual heaters and configure the controls to optimize each profile. Set points can now be reached faster while avoiding over or undershoot.

APS-AI Technology helps to:
- Enhance Part Quality
- Reduce Scrap
- Improve Part Consistency
- Minimize Downtime
- Lower Power Consumption
- Maximize Profit Margins



Rapid start-up. Precise control. Set point is maintained.



Precise control. Set-point is maintained.

Less control. Set-point fluctuates.

ADVANCED CONTROL CARD DESIGNS

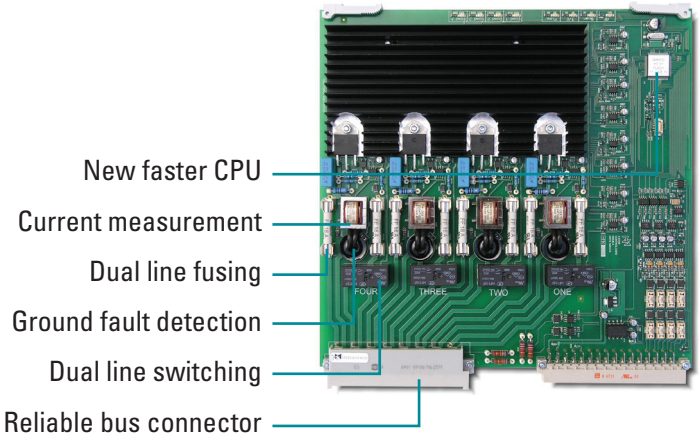
Powering every TempMaster controller is our advanced M-Series modular control cards. M-Series cards feature the latest technology and innovations to deliver the performance, power, and reliability that molders rely on.

High Capacity Design (4z-15A)
- Reduces your card requirements by up to 50%
- Power to control a wide range of zones.
- On-board heater and thermocouple fuses

Advanced APS Microprocessors
- Fast processing and response speeds
- Adapts to any load condition

Unbeatable Reliability
- Minimal maintenance and repair costs
- Reduced spare parts inventory requirements

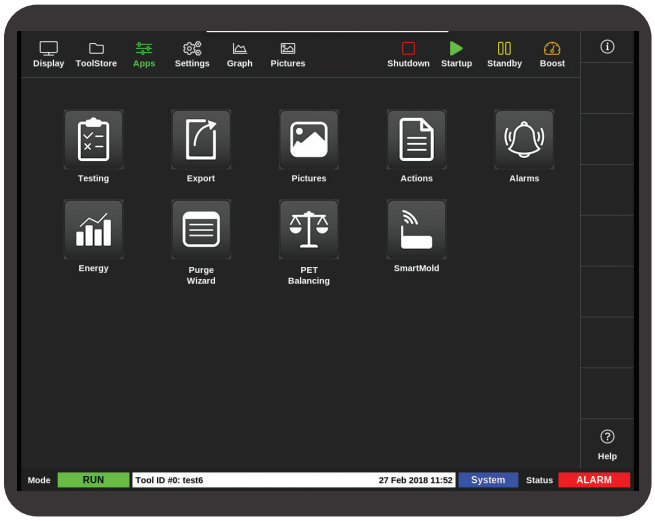
Service Friendly
- Easy to identify issues and simple to maintain
- Cards can be swapped out in seconds even during operation
- Significantly reduces downtime



NEXT GENERATION INTUITIVE TOUCH SCREEN CONTROLS

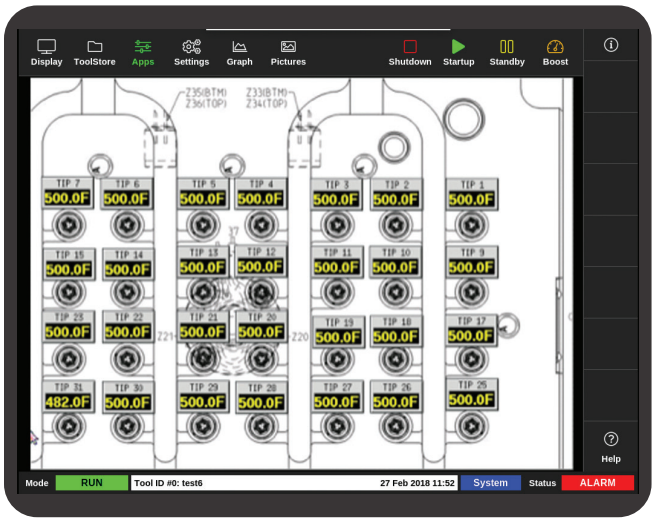
Featuring a completely overhauled modernized interface, control screens are designed to be highly intuitive and efficient. Information and functionality is quickly accessible and users are often comfortable enough to start molding right away with no training. M3 takes full advantage of our large screen sizes and instantaneous response rates for an experience like no other. For those not quite ready for change, the classic appearance is still available.

- Temperature Actual
- Temperature Range
- Temperature Min.
- Temperature Max.
- Temperature Deviation
- Deviation Alarms
- Power % Output
- Current (A)
- Volts
- Watts & Kw per hour
- Resistance (ohms)
- And More



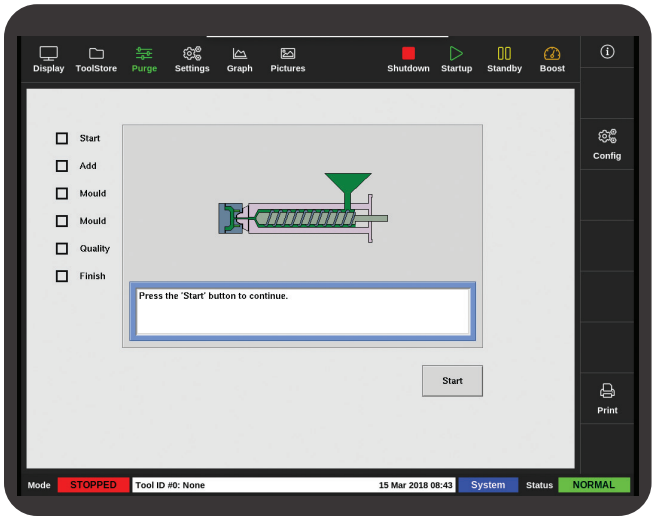
Easy View

Quickly and easily identify zones with the intuitive “Easy View” zone naming software. Simply upload a mold image or GA drawing and drag, drop and customize zone labels. Attach zone labels and adjust temperature setting directly on the GA drawings or mold images. Greatly simplifies complicated molds and work environments. Improves operator experience and convenience.



Purge Wizard

Provides an intelligent step by step guide to clear resins from the hot runner system for faster color changes. Takes into account resin type, temperature and the injection molding machine. Minimizes downtime to keep your operation in production.



ADVANCED CAPABILITIES

M3 offers the industries most advanced control features and functions. Designed with flexibility in mind, M3 performs to the highest standards in any molding application with any resin.

Cutting Edge Touch Screen Technology

- Large, tablet like, crisp hi-resolution displays with instantaneous response to touch inputs.
- Users can make adjustments to process values and navigate screens without any noticeable delay.
- Data is displayed in real time (no avg.) and even incorporates familiar gestures like pinch-to-zoom.

Most Compact Cabinet Dimensions in its Class

- Up to **47%** smaller footprint and up to **64%** more compact overall dimensions than competitive systems.
- Preserves a significant amount of valuable space and makes units easy to handle.

Quick Reference Control Card Indicator LED's

- Displays Scan, Fuse, T/C Failure, Ground Fault and Power %.
- Easily check the status of each card and identify issues at a glance.
- Greatly improves operational efficiency and reduces downtime.

Expandable Control Platform

Integrate a wide range of options into the M3 platform to centralize process control, eliminate unnecessary equipment and streamline costs.

- SVG (Sequential Valve Gate - HY or PN)
- SeVG+ (Servo Electric Valve Gate)
- E-Drive (Servo Synchro Plate)
- M-Ax (Servo Mold Function Control)
- E-Multi Auxiliary Injection Unit

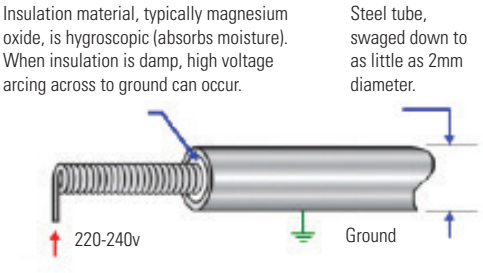
Wireless Network Control

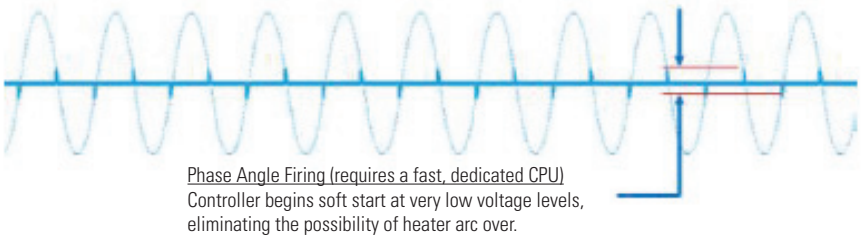
- Multi Cell Operation
- Multiple IP Operation
- Download/Upload Tool Setup
- Excellent solution for clean room applications

PROTECTION & DIAGNOSTICS

Soft Start

Heaters can be severely damaged from arcing in damp conditions. Soft start eliminates this risk by using low voltage Phase Angle Firing to dry out heaters on start-up. Significantly extends the life of your equipment.

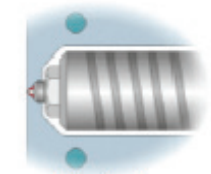




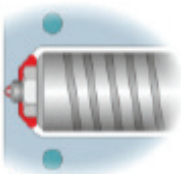
Phase Angle Firing (requires a fast, dedicated CPU)
Controller begins soft start at very low voltage levels, eliminating the possibility of heater arc over.

Plastic Leak Detection

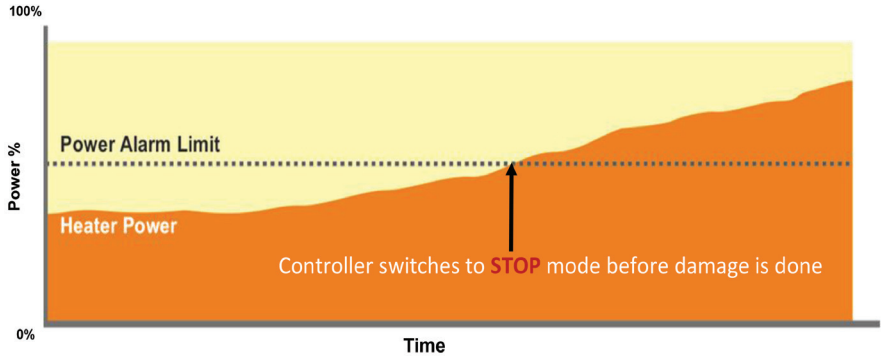
Plastic leakage can result in costly repairs and extended downtime to fix. This protection feature continuously monitors for unusual power consumption increases and automatically stops the process before damage is done.



No leaks. Normal power %.



Leak starts. Power % increases as heat is lost to water cooled cavity plate



Low Mass, High-Watt Density Nozzle Control

Specialized, separate control for smaller more sensitive nozzles and their unique thermal characteristics. Improves power balance and performance. Especially valuable in molds utilizing a range of nozzle sizes.

Continuous Ground Fault Detection

The system monitors itself for power level loss to prevent compromising the molding process and maintain consistent production quality. Quickly notifies operator for fast corrective action.

NEW Rapid Automatic Tool Diagnostics

Tool diagnostics can now be completed in as little as 15 minutes allowing you to get back into production sooner. System checks wiring and heater elements for damage. Prevents system from heating up to processing temperature until issue is fixed, preventing damage.

NEW Fold away screen for added protection (TS8/TS12)

Control Features	TS8	TS12	TS17
APS AI (Adaptive Process System)	S	S	S
Low Mass High Watt Nozzle Control	S	S	S
Phase Angle, Burst Firing	S	S	S
Infield Calibration Mode	S	S	S
Thermocouple Slave (Manual)	S	S	S
Thermocouple Slave (Auto)	S	S	S
Auto Standby/Alarm Output	S	S	S
T/C Auto/Man Kick-Off	S	S	S
Wet Heater Bakeout	S	S	S
T/C Filtering	S	S	S
Delta/Wye Convertible Option	S	S	S
Circuit Breaker Sized to Load	S	S	S
Interface Autopilot Control	S	S	S
Set Point Limit	S	S	S
Set Power Limit	S	S	S
Auto Load % Output	S	S	S
Uniform Start-Up	S	S	S
Standby Timer	S	S	S
Even Heat (controlled heating)	S	S	S
Even Cool (controlled cooling)	S	S	S
Sequential Melt-Start	S	S	S
Mold ID	S	S	S
Daisy Chain Enclosures	S	S	S

Protection Features	TS8	TS12	TS17
On-Board Load Fuses	S	S	S
On-Board T/C Fuses	S	S	S
Soft Start	S	S	S
Continuous Ground Fault Detection	S	S	S
Current Measurement	S	S	S
Overload Protection	S	S	S
Short Circuit Protection	S	S	S
Automatic Tool Diagnostics	S	S	S
Plastic Leak Detection	Auto	Auto	Auto
IO Card (Interlock with IMM)	S	S	S
LED Fault Indicators	5	5	5

Alarms	TS8	TS12	TS17
Audible Alarm	S	S	S
Alarm Beacon	S	S	S
Zone Alarm Configure	S	S	S
(+) High Temperature	S	S	S
(-) Low Temperature	S	S	S
T/C Open (remembered % output)	S	S	S
T/C Reversed	S	S	S
Open Fuse	S	S	S
Open Heater	S	S	S
Shorted Heater/Wet	S	S	S
Ground Fault Detection	S	S	S
Plastic Leak Detection	S	S	S

"S" = Standard, "O" = Optional, "-" = Not Available

Operational Features	TS8	TS12	TS17
Auto/Manual Control	S	S	S
Zone "on", "off" and "locked off"	S	S	S
Menu "Auto Save"	S	S	S
Tool Store	200	200	200
USB Port	S	S	S
Zone Naming	S	S	S
Touch Screen Calibration	S	S	S
Programmable Groups	S	S	S
Sequence Start	S	S	S
Sequence Shutdown	S	S	S
Sequenced Power Up (Manual)	S	S	S
Tool/Data Export/Archive	S	S	S
Multi-Level Password	UNLTD	UNLTD	UNLTD
Time and Date Change	S	S	S
Networking Printing (Ethernet IP)	S	S	S
On-line Help	S	S	S
Purge Wizard (Color Change)	S	S	S
HR Performance Tracking System	S	S	S
Boost (Automatic)	S	S	S
Boost (Manual)	S	S	S
Operator ID	S	S	S
LAN Network	S	S	S
WLAN Network	O	O	O
Wireless Control (WiM2)	O	O	O

Monitoring/Reporting	TS8	TS12	TS17
Instant Data Reporting	S	S	S
Data Report Archive	S	S	S
Print Screen in jpg, png, pdf format	S	S	S
Save to USB Drive	S	S	S
Historical Graph	3-D	3-D	3-D
Easyview	S	S	S
Alarm History	S	S	S
Power Consumption Monitoring	S	S	S
Bar Graph Display (Temp/Power%)	S	S	S
Event Log	UNLTD	UNLTD	UNLTD
Spreadsheet View	S	S	S
Bar Graph Overview (All Zones)	S	S	S

Communication	TS8	TS12	TS17
SPI	S	S	S
OPC-UA	-	S	S
Real VNC	-	S	S
MODBUS	-	S	S

Expandable Options	TS8	TS12	TS17
SmartMOLD	-	O	O
Water Monitoring	O	O	O
SVG (Sequential Valve Gate)	-	O	O
E-Drive (Syncro Plate)	-	O	O

SPECIFICATIONS

User Interface	Full Color LCD Touch Screen
Display Sizes	8" (203mm), 12" (305mm) or 17" (432mm)
Control Algorithm	APS-AI (Adaptive Process System with Artificial Intelligence)
Power Control	Phase Angle and Burst Firing Modes (Time Proportional, Zero-Crossing)
Temp. Display Resolution	0.1 (^{0}C or ^{0}F)
Power Response Time	8.3 ms at 60 Hz
Temperature Scale	^{0}C or ^{0}F (Software Selectable)
Thermocouple	J or K-Type (Software Selectable)
Operating Range	0 - 472^{0}C (32 - 882^{0}F)
Output Voltage (Max)	264 VAC
Supply Voltage	200/240V 3P Delta or 380/440V 3P Star (480V, 3P with transformer)
Frequency	50 - 60 Hz Automatic Switching
Ambient Temperature Range	5 - 45^{0}C (41 - 113^{0}F)
Humidity Range	Up to 95% non-condensing
Ground Fault Detection	40mA per Zone
Alarm Output	Closing Contact Relay 5A, 230V (Max)
T/C Connector	Various Options Available
Power Connector	Various Options Available
Input Protection	63mA Nano Fuses on Both T/C Legs
Overload Protection	Semi-conductor fuses on both heater legs
Heater Fuses	15A @ 220V Super Fast Blow Type (FF)
Control Modes	Closed Loop (Auto), Open Loop (Manual), Standby, Boost, Slave
Ports	Serial, USB and Ethernet
LED Indicators	Scan, Fuse, Thermocouple, Failure, Ground Fault, Power%
Communications	SPI, Real VNC, Modbus, OPC-UA
Languages	English, French, German, Portuguese, Spanish, Polish, Russian, Chinese, Japanese, Czech, Italian, Turkish, Danish, Hungarian

Cabinet Size	Screen Size	# of Cards (Max)	# of Zones (Max)	Dimensions WxDxH cm (in.)
XS	8"	6	24	25x30x41 (10x12x16)
S	12"	12	48	33x41x86 (13x16x34)
M	17"	24	96	56x46x91 (22x18x36)
L	17"	48	192	56x46x127 (22x18x50)