

353RetroPAK Controllers

- Replaces aging, obsolete Siemens/Moore 352 and 353 controllers
- Easy migration for operators and engineers
- Peer-to-peer and Ethernet Modbus/TCP networks
- Removable memory module stores complete configuration & operating status
- Library of factory-configured options and 352/353 function blocks
- Graphical configuration program
- **2 Year Warranty**



The Logical Migration

The 353RetroPAK is a standalone, microprocessor-based industrial controller designed to replace the Siemens Moore 352 and 353 controllers. It can serve as a single-loop or multiloop controller, with math, logic and sequence functions. It's the ideal migration path to current technology designed, manufactured and supported in the USA.

The 353 RetroPAK is based on state-of-the-art surface mount technology. Like the Siemens/Moore 352P and 353, the basic hardware platform includes the carrier board, CPU, display assembly, and terminations. The non-volatile RAM not only stores the configured database, but backs up all current tuning, state, and operating parameters.

The base RetroPAK controller provides::

- 3 analog inputs
- 2 milliamp outputs
- 3 discrete inputs (2.5 - 28Vdc)
- 4 discrete outputs (5 - 60V dc)

Two of the standard analog inputs are universal, so low-level inputs such as thermocouple and RTD can be accommodated without ordering extra options. The third input is 1-5Vdc.

The Expanded version provides two additional 1-5Vdc inputs, a third 4-20mA output, and one additional discrete output.

Two serial communication ports are standard on the 353RetroPAK controllers. Communicate to PCs, operator panels, and remote I/O via Modbus RS-485 or Ethernet Modbus/TCP, and to other RetroPAK controllers via the ICN peer-to-peer network.

The RetroPAK display is bright, robust, and operator-friendly. Plain-language operating, alarm, and tuning displays provide more information without having to interpret codes, and multiple display screens are viewed using the TAG key. The display elements and bargraphs can be assigned to virtually any variable during configuration.

The 353RetroPAK is configured using Visual Application Designer, a graphical, function block-based program that includes a library of Moore function blocks to reduce engineering retraining. With the exception of I/O blocks, which are hardware dependent, there is virtually no limit to the number of times a function block type can be used.

The Portable Memory Module backs up the configuration and, when left on an operating controller, live parameters including tuning values, output states and control modes. It can be used to copy configurations to other RetroPAK controllers and help maintenance technicians get a process back up and running without having to reconfigure or re-tune the controller.

INFORMATIVE, HIGH VISIBILITY DISPLAY

The pixel-based vacuum fluorescent display is highly visible and extremely robust. It provides a choice of up to six fonts and seven levels of brightness for ease of operation.



Standard Loop Display
Provides familiarity and reduces operator retraining



Alarm Displays

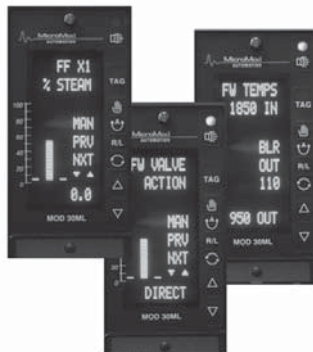
Any number of alarms can be configured for any signal. The alarm displays make it easy to identify, review and acknowledge process and diagnostic alarms.



Tuning Displays
Password-protected entry of tuning parameters, XY table values, recipe data and other information

Application-Specific Displays

User screens can be configured for sequence and batch operations, discrete device operation, recipe selection, and more. All keys are user programmable.



Maintenance & Troubleshooting

View raw input values for commissioning and startup, detailed diagnostic information before and during normal operation, and an Event Queue of up to 1024 entries.

SAFETY AND SECURITY

The RetroPAK goes over and above the features provided by the SLC and CLC controllers for protecting the process and ensuring continued safety and operation.

Signal Quality Detection - All inputs and outputs have quality detection and an associated alarm bit.

Power fail/recovery settings - available for every parameter, so that outputs, steps, control modes and setpoint values assume a known good value, either 'previous' or user-configured, after a power outage. Warm- and cold-start options allow different settings depending on a user-specified time period before power is restored.

Failsafe output settings - the option to select failsafe values, either 'previous' or a user-determined value, on all outputs should the controller I/O lose communication with the CPU.

Single-point isolation & short-circuit protection - Inputs, outputs and built-in communications are individually isolated, channel-to-channel and channel-to-ground. Each I/O point includes short-circuit and cut-wire detection with associated diagnostics

Database & tuning parameter backup - The Portable Memory Module option contains a backup copy of the controller's configured database and, when installed on an operating controller, it is updated every 50ms with current process parameters. Continuous checksums ensure against corruption of Memory Module data.

STANDARD CONFIGURATIONS

The control strategies available in the Siemens/Moore 353 are stored in the Visual Application Designer software library:

- Single-Loop Controller with Tracking Setpoint
- Single-Loop Controller with Fixed Setpoint
- Ratio Set Controller with Operator Setpoint Limits
- Single-Loop Controller with Operator Setpoint Limits
- Cascade Loop Controller
- Cascade Loop Controller with Operator Setpoint Limits

These control strategies can be customized to accommodate individual application requirements.

In addition, the most common Function Blocks used in the Siemens/Moore 353 are stored in the library.

This reduces engineering re-training, and minimizes the time to upgrade to the 353RetroPAK.

FUNCTION BLOCK LIBRARY

In addition to the Siemens Moore 353 function block library, the RetroPAK has its own set of native function blocks. Many of these combine the functions that required several blocks in the Siemens Moore 353:

PID Control Block	<ul style="list-style-type: none"> • Multiple combinations of P, I and D • Gain, Reset and Pre-Act scheduling • Feed forward • External feedback • Adaptive gain and reset • Deadtime compensation • Local/remote setpoint with ratio and/or bias • Auto/manual Manual reset, Procedureless Manual Reset • Setpoint and output tracking • Setpoint selection • Setpoint and output limiting • Configurable Power Restart Values 	Timer	<p>Used to perform timing functions such as delayed start and/or stop, pulse duration, interval timing, or periodic self reset timing. A timer can be configured as an up or down timer for a maximum duration of 1193 hours, 2 minutes, 47.295 seconds. Control functions include:</p> <ul style="list-style-type: none"> • Direction (up/down) • Reset time value • Load a user-definable reset value • Disable and hold at current value • Wrap • Limits
Expression (Math/Logic) Block	<p>User-specified expressions with logical, arithmetic, and conditional operators including:</p> <ul style="list-style-type: none"> • Arithmetic: add, subtract, multiply, divide • Comparator: less, less or equal, greater, greater or equal, equal, not equal • Logic: and, or, not and, not or, not • Exponential, absolute, natural log, log₁₀, integer, raised to the power • Square root • Momentary 	Linearization	<p>Produces a linearized value based on:</p> <ul style="list-style-type: none"> • Linear • Square and Modified Square • Square Root and Modified Square Root • Piecewise • Inverse Piecewise • Thermocouple (B, E, J, K, N, R, S, T) • RTD Types (Platinum 0.00385, 0.0003923, 0.003902, 0.003911, and Nickel 0.00672)
Sequence Block	<p>Batch, logic and other types of sequential control based on if-then-else logic statements that allow the user to skip steps, specify several steps for various outputs, and go back to previous steps. Each block provides:</p> <ul style="list-style-type: none"> • 128 inputs • 64 outputs • 512 steps <p>Sequence blocks can be linked together to increase input/output capacity</p>	Setpoint Ramp/Hold	<p>Up to 100 individually guaranteed ramp or hold segments with repeating profiles, tracking function, four segment event states, reset, stop, run, hold and skip commands</p>
		Process Alarm	<p>Produces a discrete signal to advise of an irregular process condition based on: LESS, LESS/EQUAL, GREATER, GREATER/EQUAL, EQUAL, NOT EQUAL, Deviation</p>
Characterization (Piecewise) Block	<p>Supports 60 pairs of X, Y floating point coordinates for user defined linearizations or recipe data. Blocks can be cascaded for additional pairs.</p>	Totalizer	<p>Counts an analog input signal. Features include: Threshold, Up, Down, Wrap, Scale Factor, Predetermined Count 1 & 2 and Limit Status.</p>
Supervisory Message Block	<p>Reads, writes, sets, tunes or configures an attribute internally or over the peer-to-peer network to other controllers</p>	Input Conditioning Blocks	<p>Provide input filtering, normalization, linearization, direct/reverse action, and engineering unit scaling for analog and discrete signals</p>

SPECIFICATIONS

ELECTRICAL & ENVIRONMENTAL

Power Supply

AC: 85-250V rms, 50-400Hz
DC: 24Vdc nominal (20-50Vdc)

Fuse: 2.5 Amps (ac), 4.0 Amps (dc)

Power Consumption (120V rms, 60Hz, Full load):
50 Watts maximum

Data Retention: Typically 10 years with controller
unpowered

Ambient Temperature Range

Operating: 0 to +50°C
Storage: -40 to +75°C

Humidity: 5 to 95% RH, noncondensing

Open Input Fault Detection

User configurable for all inputs

Failsafe Output:

Built-in outputs - last value or 0%
Module outputs - user defined between 0 and 100%

PHYSICAL

Height

Bezel - 5.69" (144.5 mm)
Panel cutout - 5.47" (138.9 mm)

Width

Bezel - 2.87" (72.9 mm)
Panel Cutout - 2.69" (68.3mm)

Depth

Behind the panel - 15.75" (400 mm)
Front of panel - 1.13" (28.7 mm)

Weight

6.0 lbs.

COMMUNICATIONS

ICN Peer-to-Peer Network

Protocol Token-passing
BAUD Rate 31.25K BAUD

Modbus RTU

Protocol Modbus RTU
Electrical RS-232 or RS-485
BAUD Rate 150 to 38.4K BAUD

Ethernet

Protocol Modbus/TCP
Standard IEEE 802.3
Physical Layer 10/100Base-T
Connector RJ45

Note: Ethernet network does not support peer-to-peer communication

INPUTS

Universal Analog Inputs (isolated)

Quantity	Basic: 2
Transmitter Power	24V dc, isolated (each input)
Range / Span	
Current	4-20 mA / 0-20 mA minimum span 1mA
Millivolt	-10 to 120mV minimum span 10mV
Volt	0 to 6 Vdc minimum span 0.1V
Resistance	500 ohms 20 Ω min. with 3,9KΩ resistor
Thermocouple	Type B, E, J, K, N, R, S, T
RTD	3-wire platinum, DIN 43760 (IEC751), range 0-430 ohms (normal) or 0-55 ohms (low)

Voltage Input (isolated)

Quantity	Basic: 1 Expansion: 2 additional
Range	(0-100%) ±10V dc, ±100 mV dc
Low Limit	-11V, -110mV
High Limit	+11V, +110 mV

Discrete Inputs (isolated)

Quantity	Basic: 2
Input Voltage Range	5 to 60Vdc
Low Logic Input	1V
Max. input current	30mA

OUTPUTS

Analog Outputs (non-isolated)

Quantity	Basic: 2
Range	0 to 22 mA, non-isolated, with user-adjustable span (1 mA mín.)
Load	22 mA at 1000 ohms maximum

Analog Outputs (isolated)

Quantity	Expansion: 1 additional
Range	(0-100%) 4 to 20 mA
Low Limit	0 mA
High Limit	25 mA

Mechanical Relay Outputs

Quantity	Basic: 2
Type	SPDT, NO
Contact	3A a 250V ca o 30V dc

ORDERING INFORMATION

1. RetroPAK is a licensed package. The following end-user information must be supplied with each order:
 End-user company name and complete address
 Contact name, telephone number, and e-mail address
2. If Custom Configuration services are selected, provide original database documentation or file for SLC or CLC controller
3. ViZapp software is required to configure RetroPAK controllers (not required if Custom Configuration services are selected)

	353RETRO			1	1	A	
	01 - 08	09	10	11	12	13	14-16
353 RetroPAK	353RETRO						
I/O Complement¹ Basic I/O Expansion I/O		B E					
Power Supply 24V dc 85 to 250V ac			0 1				
Network Communication RS-485 Modbus RTU and ICN Peer-to-Peer Ethernet Modbus/TCP and ICN Peer-to-Peer ²				1 2			
Removable configuration module Portable memory module					1		
Design Level RetroPAK Design Level						A	
Custom Configuration Not required Duplicate existing Siemens/Moore 352 configuration ³ Duplicate existing Siemens/Moore 353 configuration ³ Load duplicate RetroPAK database (multiple RetroPAKs with identical configurations)							STD 352 353 DUP

Note 1: 353Retro Basic provides two universal analog inputs, one 1-5Vdc input, two current outputs, three discrete inputs, and two SPDT relay outputs. Expansion adds 2 1-5Vdc inputs and one current output. For other I/O configurations contact the factory.

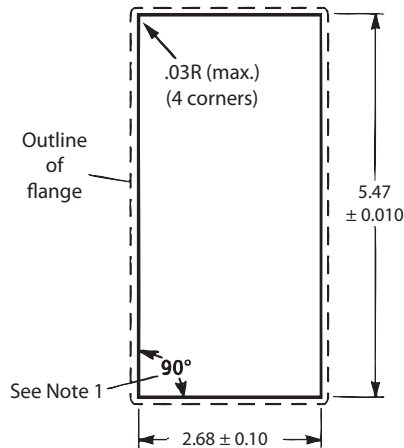
Note 2: RetroPAK controllers do not communicate directly with 352 or 353 controllers. Ethernet Modbus/TCP does not support peer-to-peer.

Note 3: Customer must provide current database files and documentation. Controller configured as per documentation supplied.

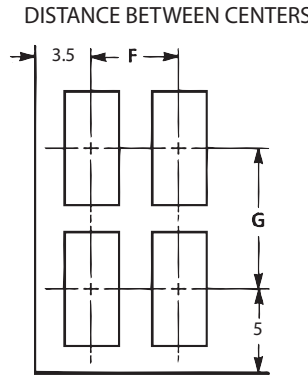
Termination resistor for peer-to-peer network (one required per network)	2030FZ00001A
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CONFIGURATION DEVELOPMENT SOFTWARE	VIZAPP	XMB	DEV		
Visual Application Designer	VIZAPP				
Communications Interface Modbus OPC		XMB			
Functionality Development			DEV		
Software protection key Parallel port USB				PAR USB	
Extended Support Services None One Year Technical Support & Version Updates					000 ESS

MOUNTING DIMENSIONS



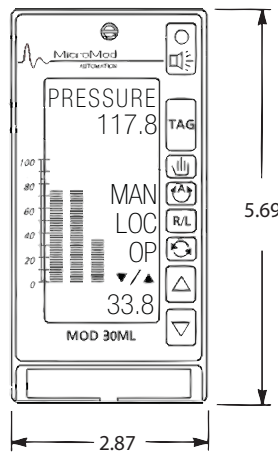
PANEL CUTOUT



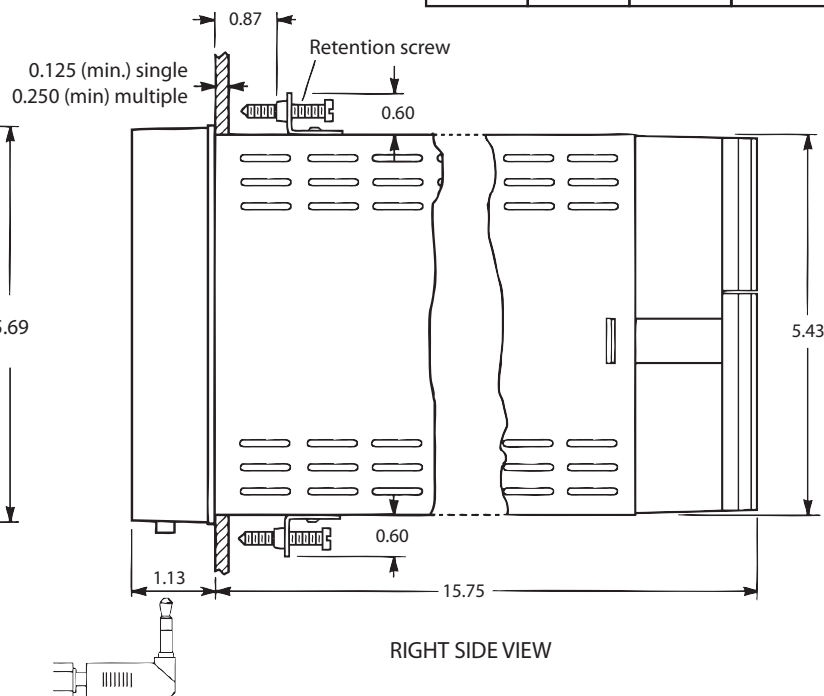
Center-to-Center distance when mounting multiple controllers

	F	G
Recommended	4	8
Minimum	3.5	7

inches	mm	inches	mm
0.6	15.2	5.43	137.9
0.87	22.1	5.47	168.9
1.13	28.7	5.69	144.5
2.69	67.31	7	177.8
2.87	72.9	8	203.2
3.5	88.9	15.75	400
4	101.6		



FRONT VIEW



RIGHT SIDE VIEW

Note 1: When mounting housing in panel cutout or rack and panel mounted bezel, turn retaining screws until point of screw touches rear of panel or bezel. Overtightening of retaining screws will distort housing. Housing must be square after retaining screws are tightened.

The Company's policy is one of continuous product improvement and the right is reserved to modify the information contained herein without notice.

Printed in USA January 2017

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