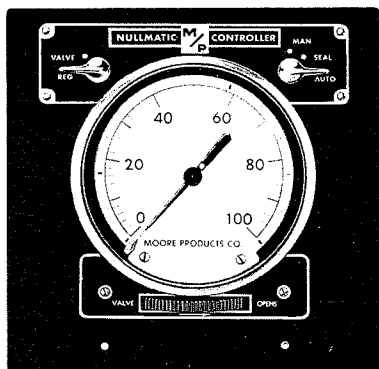
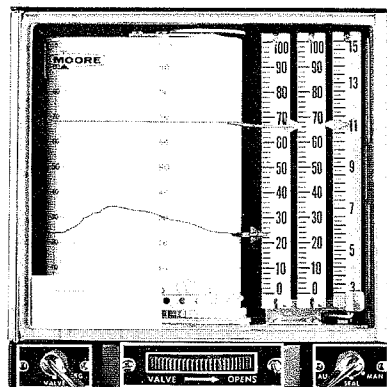


M/P Indicating and Recording Stations



M/P Indicating Control Stations



M/P Recording Control Stations

GENERAL DESCRIPTION

The Moore M/P Control Station, used in conjunction with a Nullmatic Controller, has a time proven record for reliable control of industrial processes. The M/P Control Station and controller accept a process variable input (from a standard 3-15 pneumatic transmitter) and provide a pneumatic output to manipulate the final control element to control the process variable at the prescribed operating point.

M/P stations with a 6 x 6 panel size are available in both indicating and recording types. Control stations in a wide choice of switching forms, loading stations and receivers are offered to meet varying user needs. A two stage Nullmatic regulator is employed to provide an accurate set pressure despite variations in output loading, and supply pressures. Cam actuated "O" ring sealed, plunger type switches are used on switching models to assure long life, leak free operation. Switching options are provided as shown on Pages 2 and 3. Control models are used with a remote set Nullmatic controller which may be plugged into the rear of the station or mounted separately. The seal position method of transfer is used to achieve bumpless switching.

When the controller is to be mounted directly on the station a manifold is fitted to the rear of the station. All pipe connections are made to this manifold, and self-sealing ports allow quick removal and exchange of the controller. If the controller is to be mounted separately the station manifold is removed which exposes 1/8" NPT tubing connections for field piping. Stations may be purchased with or without manifold.

Most control models are field adaptable (by repositioning a gasket) for either of two types of control circuits.

- T2 circuits are the more economical of the two, and are usually used where the controller is mounted on or near the station.
- The T4R arrangement is used where the controller must be mounted close to the process to reduce lags or when the reset bypass feature is desired.

Stations are furnished with the gasket in the T2 or T4R position as specified.

INDICATING STATIONS

The compact size (11-7/16" depth) of these stations makes them ideal for control panels with limited space. All incorporate a 3-1/2" receiver gauge which provides process readout over 6-1/2" of scale length. They are available in three basic forms.

- Standard fixed gauge M/P stations utilize wide bourdon elements for pointer actuation.
- Fixed gauge stations are also available with Ni Span capsule driven pointers which practically eliminate deadspot and hysteresis effects.
- Scanning type stations are furnished with a rotatable gauge so that the desired setpoint can be aligned to the "12 o'clock" position. Therefore, when the process is on control the process pointer will be perfectly vertical and any deviation can be detected quickly when large arrays of stations are involved.

RECORDING STATIONS

These stations combine the dependability and flexibility of the M/P station with the reliable Moore recording chas-

M/P Indicating and Recording Stations

sis. They provide a 4" rectilinear strip chart record, and are available with up to 3 servo driven fiber tip pens. The chart magazine is removable for chart renewal convenience, and holds a 31 day chart supply at the standard 7/8" per hour speed.

The rewind mechanism is driven by a torque motor (separate from the chart drive motor) which provides reliable chart take up, and allows easy chart stripping and rewind for past record review.

6 X 6 M/P CONTROL STATION MODEL NUMBERS^{(1) (2) (5)}

Application	Indicating Stations			Recording Stations		Controller Location
	Bourdon Gauge	Niafram Gauge	Scanning Gauge	One Pen	Two Pen ⁽⁴⁾	
Single Loop Control: Switches provide Local Set/ Auto and Manual control options						
	524MT2	52N4MT2	526MT2	5311MT2	5321MT2	on station
Remote Set Stations: Switches provide Remote Set/ Auto, Local Set/ Auto and Manual control options						
Without bias provision						
	524MP53T2	52N4MP53T2	526MP53T2	5311MP53T2	5321MP53T2	on station
With provision for + bias of external setpoint						
	524MA6T2	52N4MA6T2	526MA6T2	5311MA6T2	5321MA6T2	on station
With provision for + or – bias of external setpoint						
	524MA68T2	52N4MA68T2	526MA68T2	5311MA68T2	5321MA68T2	on station
Single Station Cascade: Switches provide Cascade/ Auto, Manual with Local Set/ Auto of either primary or secondary process depending on the station selected						
With option of Local Set/ Auto of secondary process ⁽⁸⁾						
	524MP5T2	52N4MP5T2	526MP5T2	N/A	5321MP5T2	Prim. Contr. on station P5 units
With option of Local Set/ Auto of primary process ⁽³⁾						
	524P4T2	52N4P4T2	526P4T2	5311P4T2	5321P4T2	Separate for P4 units

6 X 6 M/P LOADING & RECEIVER STATION MODEL NUMBERS

Application	Indicating Stations						Recording Stations		
	Bourdon Gauge		Niafram Gauge		Scanning Gauge		1 Pen	2 Pen	3 Pen
	1 Pointer	2 Pointer	1 Pointer	2 Pointer	1 Pointer	2 Pointer			
Manual Loading & Transfer Stations									
Without switching (See Schematics A & B Page 3)									
	514	524	51N4	52N4	516	526	5311R ⁽⁷⁾	5321R ⁽⁷⁾	N/A
With transfer switch (See Schematic C Page 3)									
	514P	524P	51N4P	52N4P	516P	526P	5311P ⁽⁷⁾		
With transfer switch (See Schematic D Page 3)									
	N/A	524P1	N/A	52N4P1	N/A	526P1			
With transfer switch and + or – bias of remote input (See Schematic E Page 3)									
	N/A	524A48P	N/A	52N4A48P	N/A	526A48P			
Indicating & Recording Receivers									
	8993	10270	10273	10274	10108	10280	5310	5320 ⁽⁶⁾	5330 ⁽⁶⁾

NOTES FOR M/P STATION MODEL NUMBER TABLE

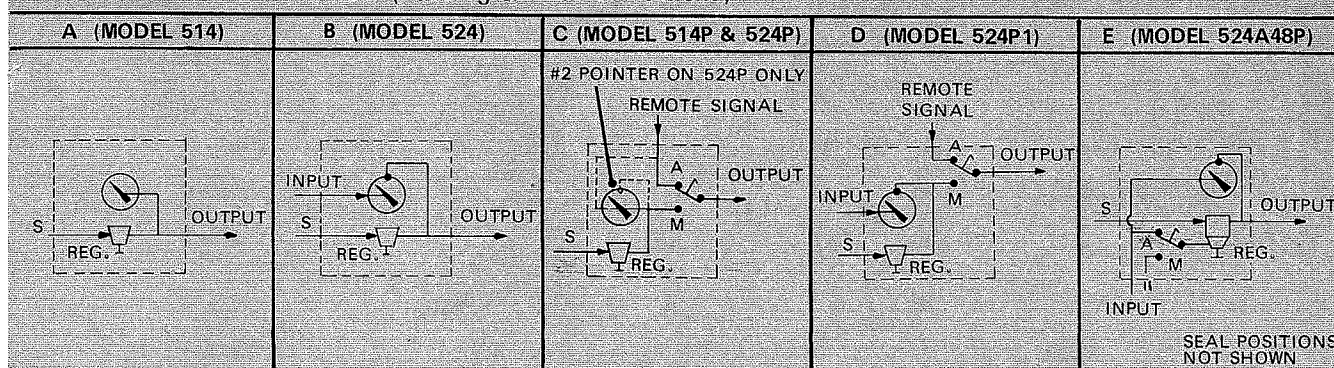
- Model numbers shown (except P4T2 stations) include a manifold which accepts a plug-in Nullmatic Controller. When the controller is to be mounted separate from the station delete "M" from the model number.
- The listed model numbers are for use with remote set controllers not having the built-in cut-off relay. If station is to be used with a remote set controller with built-in cut-off relay substitute "T4R" for "T2" (e.g. 524MT4R) in model numbers shown. Note all models (except P4T2) are field convertible from T2 to T4R by repositioning a gasket.
- P4T2 type stations are not available with manifold, or "T4R" versions.
- On all models (except P5 type) the second pen is available for recording an independent input. On P5 models, the second pen is used to record the secondary process.

- Model numbers shown are for 6" x 6" stations. Indicating models are also available with a 5" wide x 5-1/2" high panel size. (Cutout 4-9/16 x 4-9/16). To specify alter the model number as follows for 5 x 5-1/2 stations with:

bourdon gauge substitute 523 for 524
Niafram gauge substitute 52N3 for 52N4
Scanning feature substitute 525 for 526

- These models also available with an indicator substituted for one pen. Specify model 5311 for 5320, and 5321 for 5330.
- These models include an indicator to display station regulator output. Pens record independent input signals.
- These stations require two controllers. The primary controller must be a model 50 or 509 series in all cases. The separately mounted secondary controller selected is dependent on whether a T2 or T4R type station is desired.

Station Functional Schematics: (Loading & Transfer Stations)



SPECIFICATIONS

1. Input-Output Operating Range
3-15 psig standard (other ranges optional)
2. Supply Pressure
20 psig normal (17 psig min.-30 psig max.)
3. Ambient Temperature Limits
-40 to +140°F
4. Maximum Overload
Standard Models: Application of 30 psig to any port will not damage unit.
5. Mounting:
Flush vertical panel: recorder models may be tilted back 45° - indicator models can be mounted in any position.
6. Indicator Accuracy
±1/2% F.S.
7. Connections:
 - a. pneumatic - 1/8" NPT female
 - b. electrical - enclosed #6 screw terminals

INDICATING STATION OPTIONS:

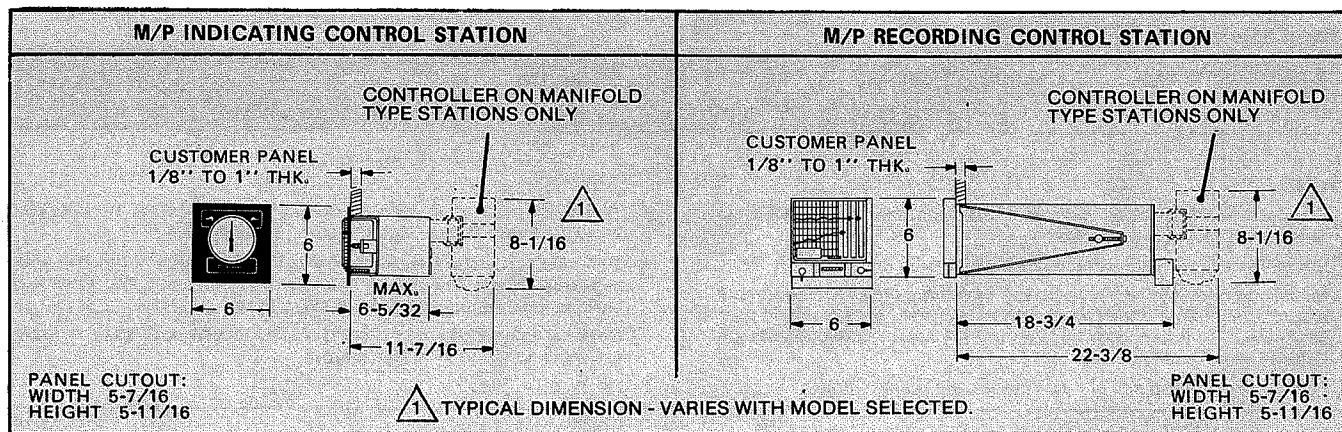
1. Memory Pointer: A knob settable red pointer attached to the gauge glass which serves, as an operator convenience, to help him "remember" important pressure readings.
2. Special Gauge Calibrations: Stations with bourdon gauges can be furnished with calibration ranging between 3-14 psi to 3-40 psi (3-15 psi or 20 to 100 kPa standard).
3. Optional Manifold Adapters: Manifolds with external feedback connections are available for control models to allow their use in override circuits. Man-

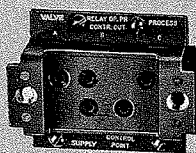
ifolds with setpoint taps can also be furnished for setpoint monitoring applications.

4. Aluminum Mounting Bezel: Adapts station mounting to a 6" x 6" cutout size.
5. Black Bakelite Legend Plate: Attached to front of station with customer inscription (3 lines with 19 characters or spaces per line).
6. Stainless Steel Identification Tag: Permanently affixed to station case.

RECORDING STATION OPTIONS:

1. Sparkless Disconnect: Hermetically sealed mercury switch which opens when chassis is withdrawn from case.
2. Special Chart Drives and Speeds: (Standard 115 VAC, 60Hz - 7/8"/hr. chart speed).
 - a. Recorders can be furnished with 1-3/4", 2-5/8", 13-1/8" per hour, 7/8", 2-5/8", 5-1/4", 13-1/8" per min. for 115VAC, 60Hz service.
 - b. Chart drives for 115VAC and 230VAC, 50Hz (7/8"/hr. speed only).
 - c. Pneumatic impulse chart drive (7/8"/hr. speed only - with standard 4 PPM impulse generator).
3. Optional Manifold Adapters: (See Option #3 under Indicating Station Options).
4. Alarm Switches: Stations can be furnished with either one or two switches per pen. These are operated by the pen servo motion, and can be adjusted to provide a contact closure (or break) when the pen reaches a preset limit.
5. Aluminum Mounting Bezel: See Option #4 under Indicating Station Options.

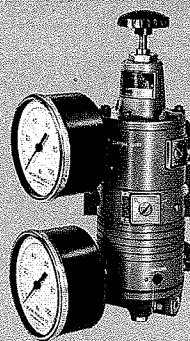




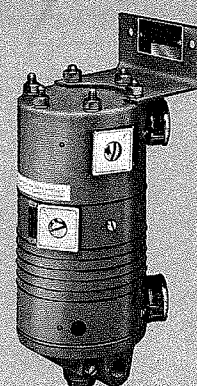
7115-10 Manifold



Model 561M
Plug-in type



Model 55M
(order gauges separately)



Model 50
Pipe-connected type

GENERAL DESCRIPTION

The Nullmatic controller operates entirely on the force balance principle. The construction is simple, and rugged, and the essentially frictionless design provides extreme sensitivity and reliability.

Three basic types of controller are offered.

- Remote set: These models accept an externally generated setpoint signal, and act to control the process accordingly. They do not have the built-in output cut-off provision, and are usually used with T2 type control stations.
- Remote set with built-in cut-off relay: These models accept an external setpoint and are used with T4R type control stations. In addition to the cut-off

relay they also include a reset bypass which opens when the cut-off relay is operated. This feature facilitates bumpless switching.

- Integrally set: These models include a built-in setpoint regulator and they are used in circuits without control stations.

Each type is available with a selection of control modes (proportional, reset, etc.) and ranges. Additionally most models can be ordered with either plug-in manifold or 1/4" NPT pipe connections. Plug-in style units facilitate service since they can be removed from the circuit without breaking pipe connections.

NULLMATIC CONTROLLER MODEL NUMBERS

For remote set models select number in ☐ column. For remote set models with built-in cut-off relay select numbers in ☐ column. For integrally set models select number in ☐ column.

	2 to 200% Proportional Band Models			5 to 500% Proportional Band Models		
Proportional only (P) ⁽³⁾	50MX2	N/A	55MX2 ⁽⁶⁾	N/A	N/A	55MWX2 ⁽⁶⁾
Proportional + Reset ^{(1) (3)}						
Standard Reset Range	50M ⁽⁵⁾	561M ⁽⁴⁾	55M ⁽⁶⁾	50MW	561MW ⁽⁴⁾	55MW ⁽⁶⁾
Fast Reset Range	50MF ⁽⁵⁾	561MF ⁽⁴⁾	55MF ^{(5) (6)}	50MFW	561MFW ⁽⁴⁾	55MFW ⁽⁶⁾
Proportional + Std. Reset + Derivative ^{(1) (2) (3)}						
6:1 Derivative Gain	509M	569M ⁽⁴⁾	N/A	509MW	569MW ⁽⁴⁾	N/A
30:1 Derivative Gain ⁽⁷⁾	509MH ⁽⁴⁾	569MH ⁽⁴⁾	N/A	509MWH ⁽⁴⁾	569MWH ⁽⁴⁾	N/A
Proportional + Fast Reset + Derivative ^{(1) (2) (3)}						
6:1 Derivative Gain	509MF	569MF ⁽⁴⁾	N/A	509MFW	509MFW ⁽⁴⁾	N/A
30:1 Derivative Gain ⁽⁷⁾	509MFH ⁽⁴⁾	569MFH ⁽⁴⁾	N/A	509MFWH ⁽⁴⁾	569MFWH ⁽⁴⁾	N/A

NOTES:

- Standard reset adjustment range is 0.1 to 50 min. per repeat and the fast range is .01 to 5 min. per repeat.
- Standard derivative adjustment range is .05 to 20 minutes.
- Model numbers listed are plug-in type, which require a 7115-10 surface mounting manifold if they are not to be mounted on a manifold type M/P station. To order controller with 1/4" NPT pipe connections delete letter M from model number.
- Pipe connected versions of these models are not available.
- This model available with a fixed non-adjustable 200% PB. To order add Y to model number (eg: 50MFY, 50FY, 55MFY, 55FY).
- 1/4" pipe connection versions of these models can be furnished with provision for supplemental air loading of control point. Add letter A to basic model number (eg: 55A, 55AW, 55AXZ).
- Optional volume chamber (Part #10587-5) may be ordered to increase derivative range to .5 to 200 minutes.