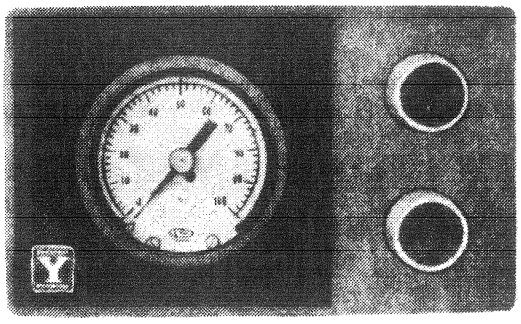
YAMATAKE

OM2-3380-0100

Pneumatic Manual Loader

Model NZ1

Operator's Manual



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ILLUSTRATIONS

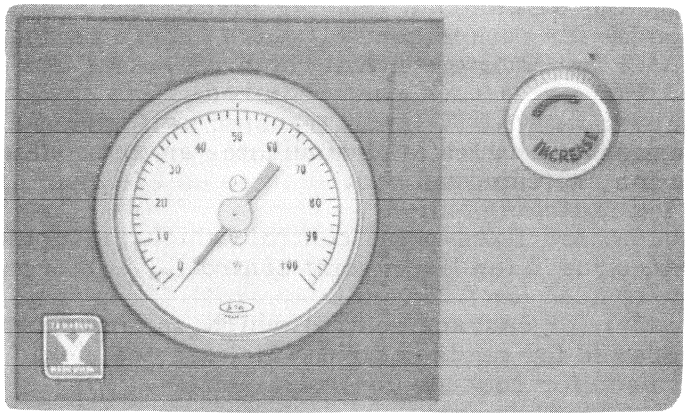


Fig. 1 Manual loader

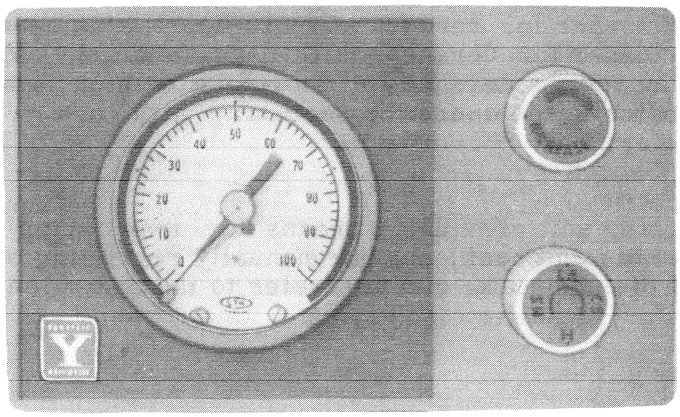


Fig. 2 Manual loader with transfer switch, for cascade control

1. Description and Use

The Model NZ1 Manual Loading Station is primarily a panel-mount type device which can serve a number of purposes such as; to provide an external set point signal, to manually adjust a final control element, to provide a manual reset signal to a controller and others.

The following types of NZ1 Manual Loading Station are available.

(1) Manual loader for remote control (which generates and indicates a pneumatic signal of 0.2 to 1.0 kgf/cm^2 when required.

(2) Manual loader with AUTO/MAN transfer switching (which, in addition to the above function, retransmits and indicates an external input signal in accordance with the switching action).

(3) Manual loader for fixed-point control (which, in conjunction with Model 52 controller, is used for fixed-point control).

(4) Manual loader for cascade control (which, in conjunction with Model 52 controller, is used for cascade control).

2. Composition

The Model NZ1 Pneumatic Manual Loading Station consists of a precision (or ordinary) pressure regulator, a pressure gage, a transfer switch (not included in (1) manual loader for remote control), and a panel.

(a) Precision (or Ordinary) Pressure Regulator

The precision (or ordinary) pressure regulator is used for generating a pneumatic signal manually which is fed to a final control-element. However in case of (3) manual loader with AUTO/MAN transfer switch, a setpoint signal is generated when the switch is in the AUTO position.

(b) Pressure Gage

(1) manual loader for remote control, has a single-pointer pressure gage. The other manual loaders has a dual-pointer gage which also indicates a pressure to make a balance for switching with each switch positions. For details, refer to the operation section.

(c) Transfer Switch

The switching unit provides a means for transfering from manual to automatic control, and back, and for manually regulating output pressure. For details of the pneumatic circuit, refer to the operation section.

3. Mounting and Piping

(a) Precaution

Do not drop or hit the instrument when unpacking or mounting.

(b) Mounting

The device is designed for flush panel mounting. When the panel cutout is ready, slip the unit into the opening and secure it to the panel with the mounting brackets supplied with the device. If one or more manual stations are

mounted on the same panel, observe the recommended spacing between units.

(c) Air Connections

Make connections to the ports provided on the connector plate as shown in the piping diagrams of Figs. 3 and 4 and as specified in Table 1. For each pipe connection, use of the ring joint (6ϕ x 4ϕ) connector is recommended. Before the connections are made, clearn its interior by blowing off with a compressued air. Check for any air leakage.

(d) Supply Air

Provide a clean dry and oil-free air of 1.4 $\pm$ 0.1 kgf/cm^2 in pressure.

Table 1 Piping of Manual Loaders

Symbol of Connector Plate	Connection			
	(1) Remote control loader	(2) AUTO/MAN transfer loader	(3) Fixed point control loader	(4) Cascade control loader
S	Supply air	Supply air	Supply air	Supply air
V	Control-end pressure	Control-end pressure	V of controller and valve	V of controller and valve
E	No.	External input	E of controller	E of controller and secondary transmitter
SP	No.	No.	SP of controller	SP of controller and V of primary controller
CO	No.	No.	CO of controller	CO of controller

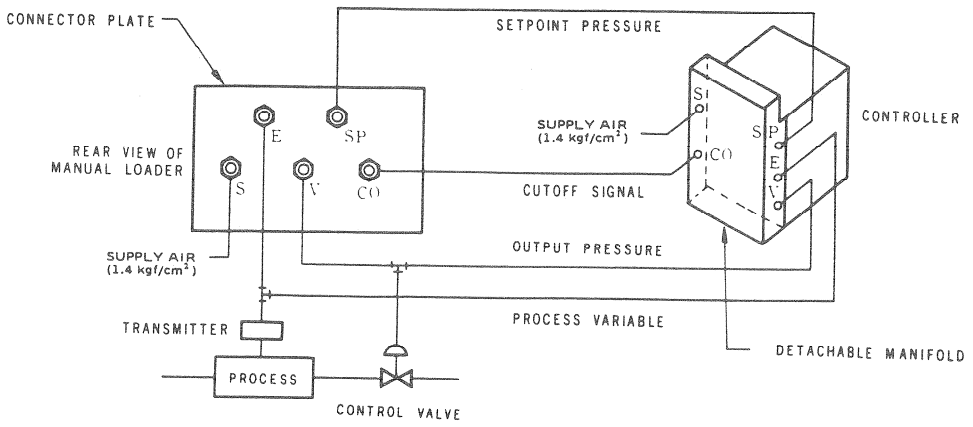


Fig. 3 (a) Piping for fixed-point control system

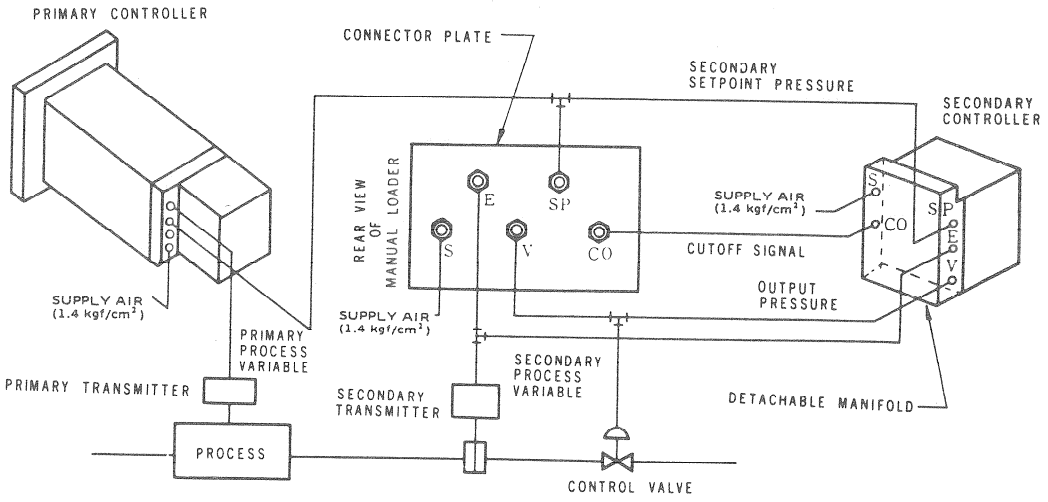


Fig. 3 (b) Piping for cascade control system

4. Operation

Prior to start operating, insure that connections and preparation of instrument are correctly made. For a manual loader with a AUTO/MAN transfer switch, set the switch in the M (MANUAL) position. To start and operate the loading station, follow the procedures below.

4-1. (2) Manual loader with AUTO/MAN transfer switching (Refer to Fig. 4 (a).)

Transfer from MAN to AUTO

(1) When the switch is in the M position, the pressure regulator output (red pointer) is directly connected to the output pressure port (V pressure). Use the regulator knob to line up the red pointer with the external input pressure of black pointer.

(2) Turn the switch to the A position and the pressure regulator output is cut off from the port V, making the external input pressure to feed directly to the output port V (V pressure).

Transfer from AUTO to MAN

Use the regulator knob to line up the red pointer (regulator output) with the black pointer (external input pressure) and then, turn the switch knob to the M position. The external input pressure is cut off and the pressure regulator output is now connected to the output port V.

4-2. (3) Manual loader for fixed-point control (Refer to Fig. 4 (b).)

Transfer from MAN to AUTO

(1) Turn the switch knob from the M position to the AS position. The pressure regulator output is isolated from the output port (V pressure).

(2) Use the regulator knob to line up the red pointer (regulator output) with the black pointer (PV pressure, E).

(3) Turn the switch knob from the AS position to the A position. The pressure regulator output is now connected to the setpoint pressure (SP).

Transfer from AUTO to MAN

(1) Turn the switch knob from the A position to the MS position. The black pointer of the gage new indicates the output (V pressure) and at the same time the pressure regulator output is isolated from the setpoint pressure (SP).

(2) Use the regulator knob to line up the red pointer (regulator output) with the black pointer (V pressure).

(3) Turn the switch knob from the MS position to the M position. The black pointer reindicates the process variable (E) and at the same time the pressure regulator output is cut off from the output port (V pressure).

Notes: (1) When transfering from AUTO to MAN, and back, be sure to turn the switch knob always in the clockwise direction and the two pointers at each seal position must be lined up before turning the switch knob further.

(2) To check the output pressure (V) while in the automatic mode of operation, turn the switch knob temporarily from the A position to the MS position. In this case, however, note that the pressure regulator output is isolated from the set-point pressure (SP) and, if there is a leakage in the piping, the output pressure may not remain constant.

4-3. (4) Manual loader for cascade control (Refer to Fig. 4 (c).)

Transfer from MAN to AUTO

(1) In a cascade control system, the device must be used with a primary controller capable of AUTO/MAN transfer switching. Prior to the transfer operation, set the primary controller in manual control. Use the regulator knob of the manual loader to obtain a desired primary PV value.

(2) Under the above state, turn the switch knob from the M position to the CS position. The red pointer of the gage now indicates the secondary set-point pressure (EXT. SP).

(3) Adjust the SP index of the primary controller so that the secondary set-point pressure (EXT. SP.) is made equal to the secondary PV value (E, black pointer).

(4) Turn the switch knob from the CS position to the CA position. The output port (V pressure) is cut off from the pressure regulator output and is connected to the controller output. The secondary controller is now ready to start operating under the setpoint index of the primary controller.

(5) Set the primary controller in the AUTO. An automatic cascade control system is now achieved.

Transfer from CASCADE AUTO to MAN

(1) Turn the switch knob from the CA position to the MS position. The black pointer of the gage now indicates the output (V pressure) instead of PV, and at the same time the secondary setpoint pointer (EXT. SP, red pointer) is changed to indicate the pressure regulator output. In this case, manipulation of the primary system is not directly related.

(2) Use the regulator knob to line up the red pointer (regulator output) with the black pointer (V pressure).

(3) Turn the switch knob from the MS position to the M position. The black pointer indicates the process variable pressure (E) and at the same time the pressure regulator output is fed to the output port (V pressure).

Notes: (1) When transfering from CASCADE AUTO to MAN, and back, be sure to turn the switch knob always in the clockwise direction and (refer to note (2)) the two pointers at each seal position must be lined up before turning the switch knob further.

(2) When controlling manually, if the variation of the PV pressure with the changes in the pressure regulator output is known, the transfering is more conveniently conducted with the switch knob set in the CS position. In this case, transfering from the M position to the CS position and back, can be made without disturbing the process.

(3) This manual loader has no AUTO position in the switching knob. Therefore, if it is required to make an ordinary fixed-point control for the secondary system alone, an appropriate means should be provided to apply the desired setpoint signal in the place of the secondary setpoint pressure (EXT. SP.). (For example, set the primary controller in the manual control.)

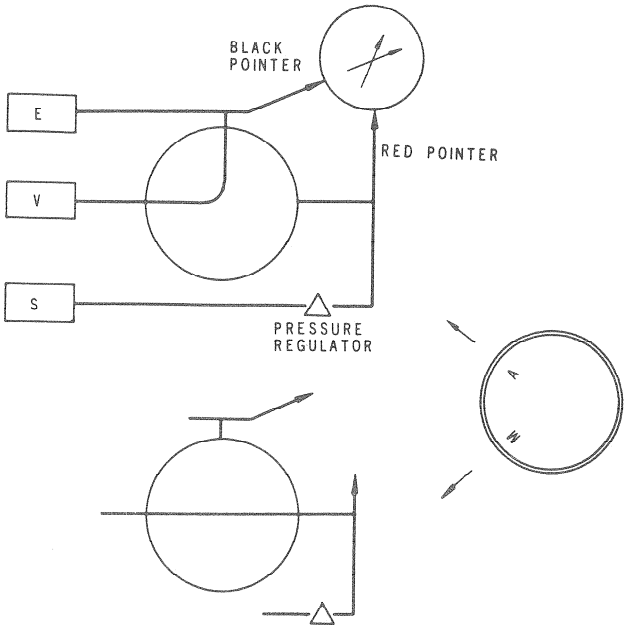


Fig. 4 (a) Pneumatic circuit for manual loader with AUTO/MAN switching

Position		Auto-matic	Manual seal	Manual	Auto seal
Symbol of switch knob		A	MS	M	AS
Pressure regulator		SP	(Manipulate) Set to V pressure	Manually controlled pressure (MAN. V)	(Manipulate) Set to E pressure
Pressure gage	Red pointer	SP			
	Black pointer	E	V	E	E

Note: SP: Setpoint pressure
E: Process variable pressure
V: Output pressure
MAN V: Pressure controlled by pressure regulator

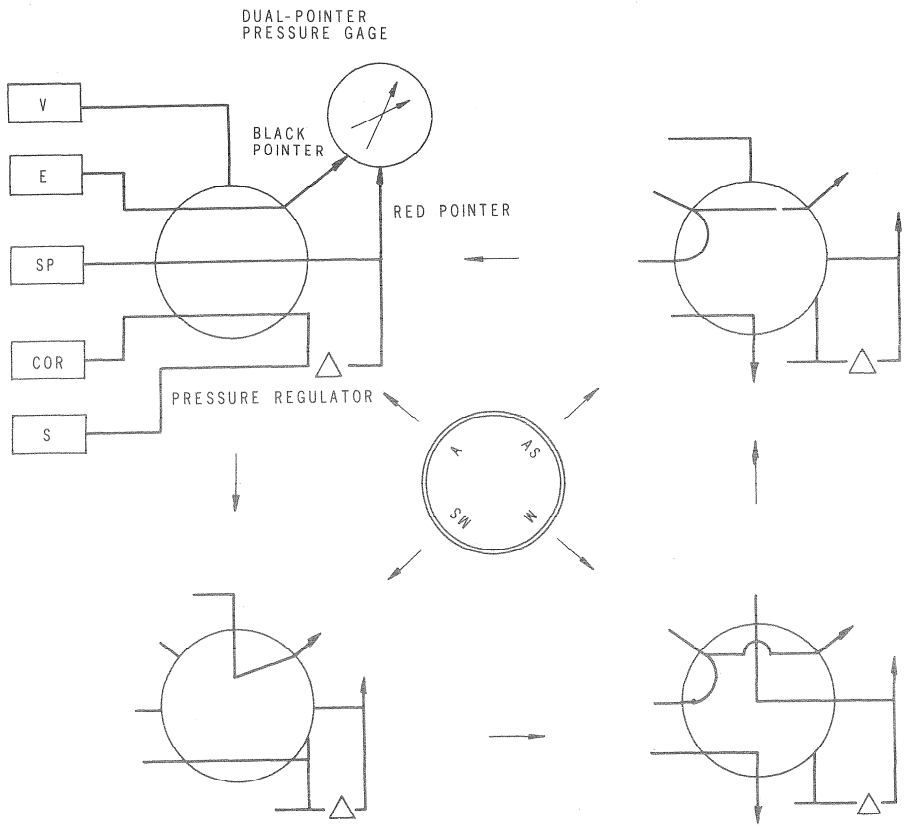


Fig. 4 (b) Pneumatic circuit for manual loader for fixed-point control

Position		Cascade auto	Manual seal	Manual	Cascade seal
Symbol of switch knob		CA	MS	M	CS
Pressure regulator		—	(Manipulate)	Manually controlled pressure (MAN. V)	Manually controlled pressure (EXT. SP)
Pressure gage	Red pointer	EXT. SP.	Set to V pressure		
	Black pointer	E	V	E	E

Notes: EXT. SP: External setpoint pressure (such as primary controller output)

E: Process variable pressure

V: Output pressure

MAN V: Pressure controlled by pressure regulator

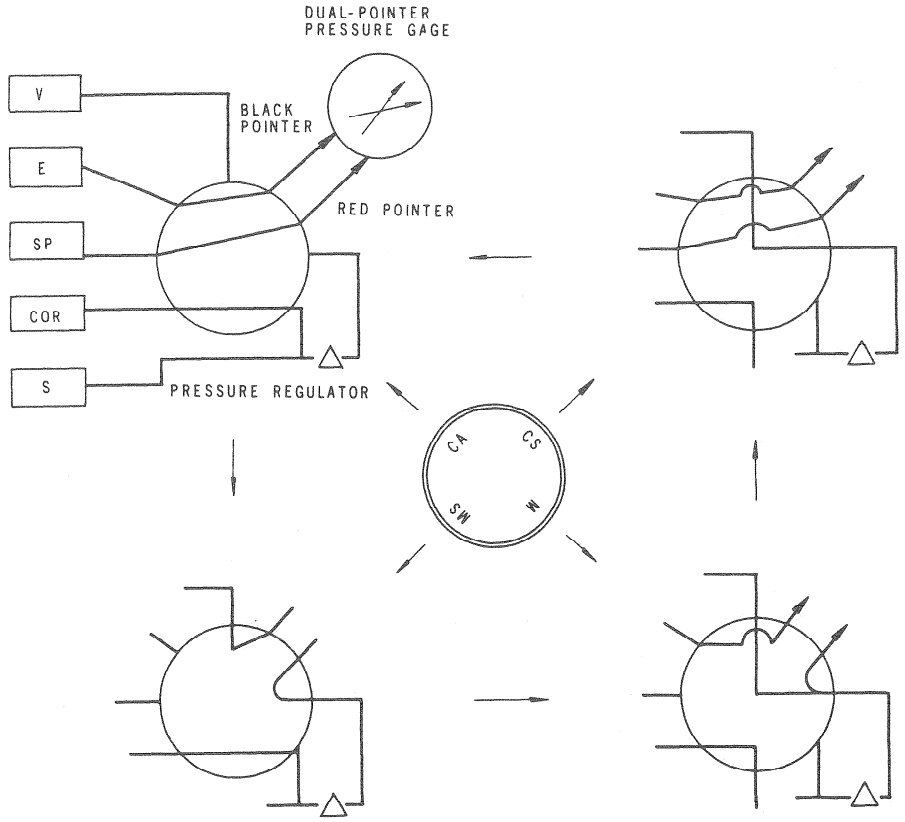
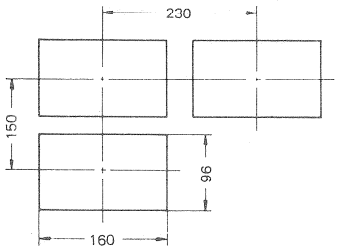
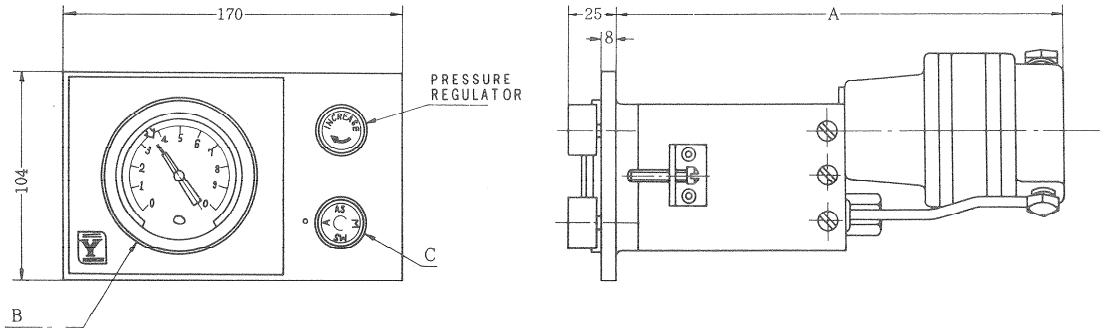


Fig. 4 (c) Pneumatic circuit for manual loader for cascade control



Panel cutout and minimum center to center dimensions



Type	Name	A	B	C
NZ1-1(A)*-(B)	Manual loader for remote control	224 / 184	Single-pointer pressure gage	No.
NZ1-2-(A)-(B)	Manual loader with AUTO/MAN switching	224 / 184	Dual-pointer pressure gage	Yes.
NZ1-3-(A)-(B)	Manual loader for fixed-point control	224 / 184	Dual-pointer pressure gage	Yes.
NZ1-4-(A)-(B)	Manual loader for cascade control	224 / 184	Dual-pointer pressure gage	Yes.

*(A) is for indication of pressure regulator:

Precision pressure regulator 1
Ordinary pressure regulator 2

(B) is for indication of mounting:

Horizontal type 1
Vertical type 2

Fig. 5 External view of the manual loader

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