

Remote Manual Station (RMC-1), (RMC-11), (RMC-3), & (RMC-9)

These stations are Copes-Vulcan model AM-4 Auto Manual Type. The purpose of this piece of equipment is to provide a means by which the operator can take over the control of the Control Valve from its controller.

It is located in the control line between the Controller and the Positioner on the Control Valve.

The station consists of 2 pressure gauges, one indicating manual loading and one indicating automatic loading, one pilot operated reducing valve, one cam operated two position transfer valve and the sub-panel on which these are mounted.

The station is switched to manual by turning the transfer valve from automatic to manual with the handle on the front of the panel. Now the controller is cut out and the control valve takes its signal from the pilot operated reducing valve which is located behind the panel and is operated by a handle on the front. The signal being sent to the control valve is now indicated on the manual loading pressure gauge and can be varied by hand from 3 psig for full open to 15 psig for full closed.

Pressure Reducing Valve (VPC-1E)

This valve is a $1\frac{1}{2}$ inch, 1500 lb., type CV-D diaphragm operated control valve with a Moore Positioner.

The purpose of this valve is to reduce the pressure of the atomizing steam from 1300 psig to 600 psig. The construction and operation of this valve is similar to valve (VPC-1A) which has been previously explained except that between the valve positioner and the diaphragm of the pressure reducing valve (VPC-1B) is a Taylor three way selector valve which causes control valve (VPC-1B) to close completely if valve VPC-1A closes completely.

Pressure Controller (PC-7)

This pressure controller is a Taylor fullscope pressure controller having full range sensitivity. The purpose of this controller is to send a signal to the control valve (VPC-1B) so that a constant pressure of 600 psig will be maintained downstream of the control valve (VPC-1B), and to indicate that pressure on the dial located on the face of the controller.

The construction and operation is similar to pressure controller (PC-1) which has been previously explained.

Temperature Control Valve (VTC-1)

This valve is a $1\frac{1}{2}$ inch, 600 lb. type CV-D diaphragm operated control valve with a Moore Positioner.

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Pressure Reducing Valve (VPC-1E)

This valve is a 1½ inch, 1500 lb., type JV-D diaphragm operated control valve with a Moore Positioner.

The purpose of this valve is to reduce the pressure of the atomizing steam from 1300 psig to 600 psig. The construction and operation of this valve is similar to valve (VPC-1A) which has been previously explained except that between the valve positioner and the diaphragm of the pressure reducing valve (VPC-1B) is a Taylor three way selector valve which causes control valve (VPC-1B) to close completely if valve VPC-1A closes completely.

Pressure Controller (PC-7)

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The construction and operation is similar to pressure controller (PC-1) which has been previously explained.

Temperature Control Valve (VTC-1)

This valve is a 1½ inch, 600 lb. type JV-D diaphragm operated control valve with a Moore Positioner.

The purpose of this valve is to allow the correct amount of cooling water to pass through it to the spray nozzles to desuperheat the steam from 950° F. to 750° F.

The construction and operation of this valve is similar to pressure control valve (VPC-1A) which has been previously explained except that between the valve positioner and the diaphragm of the control valve (VTC-1) is a Taylor three way selector valve which causes the control valve (VTC-1) to close completely if valve VPC-1A closes completely.

Temperature Controller (TC-1)

This controller is a Taylor fulscope indicating controller with adjustable sensitivity and auto-reset.

The purpose of this controller is to send a signal to the control valve (VTC-1) so that a constant temperature of 750 F. will be maintained downstream of the control valve (VTC-1) and to indicate that temperature on the dial located on the face of the controller.

The construction and operation are similar to pressure controller (PC-1) which has previously been explained.

Pressure Control Valve (VPC-6)

This valve is a 2½ inch, 900 lb., type CV-D diaphragm operated control valve with a Moore positioner.

The purpose of this valve is to reduce the pressure of the cooling water going to the spray nozzles of both the 475 psig station and the 235 psig station from approximately 750 psig to 800 psig.

This valve is similar in construction and operation to control valve VPC-1A except that there are 2 Taylor three way selector valves between the valve positioner and the control valve (VPC-6) diaphragm. These selector valves cause the control valve (VPC-6) to close completely if control valves VPC-1A and VPC-2A both close completely.

Desuperheating Spray Nozzle Assemblies

There are two in line type steam assisted desuperheating spray nozzle assemblies in the 475 psig station. The purpose of these is to atomize the cooling water before injecting it into the steam line.

C. 235 PSIG STATION NO. 1

The above description describes the 475 psig steam pressure reducing and desuperheating station. The 235 psig station is similar in construction and operation except that it utilizes three desuperheater spray nozzle assemblies instead of two and the atomizing steam pressure is 450 psig instead of 600 psig.

All pressure controllers and automatic manual stations are located on the process auxiliary board.

D. 235 PSIG STATION NO. 2

This system consists of a complete pneumatically operated pressure reducing and desuperheating station using 3-15 psi signal pressures and 70-100 psi air supply pressures to the valves. This station is rated at 440,000 lb./Hr. steam flow.

The function of this system is to:

1. Maintain 235 psi in outlet header by operating pressure reducing valve (VPC-301) in 1300 psi steam supply line.
2. Maintain 600°F. in outlet header by operating a desuperheater water control valve (VPC-305).
3. Maintain 450 psi atomizing steam pressure to the desuperheating spray nozzle by operating a pressure reducing valve (VPC-302) in 1300 psi steam line.
4. Provide remote auto-manual control of 235 psi steam pressure and 600°F. temperature by using panel-mounted integral controllers and auto-manual stations (RMC-306 and RMC-307).
5. Provide control of atomizing steam pressure entering the desuperheater with a proportional, locally mounted pneumatic controller (PC-305).
6. Provide remote manual control of 235 psi pressure by means of a motor operated by-pass valve (MOV-324) around pressure reducing valve (VPC-301).

Pressure Reducing Valve (VPC-301)

This valve is an 8", 1500 psi, diaphragm operated, Copes-Vulcan Control Valve with positioner. The purpose of this valve is to drop the pressure of the steam passing through it from 1300 psig to 235 psig by restricting the opening through which the steam must pass. The valve is so constructed that an increase on the air pressure exerted on the diaphragm will cause the valve to move toward the open position while a decrease will tend to close the valve. The air pressure for operation comes from the positioner which is supplied with air at 30 psig. The signal (3 psig to open, 15 psig to close air pressure) which "tells" the valve which position it should take comes from a Remote Manual Station (RMC-306) and is received by the positioner which then exerts the force necessary for the valve to assume this position. Upon air failure the control valve maintains its position due to the action of the air locking valve near the control valve diaphragm.

Remote Manual Station (RMC-306)

This pressure controller is a Foxboro Model 52A-SM4, Pneumatic Pressure Indicating Receiver Controller with proportional-plus-reset control action and integral automatic manual station. By means of the automatic-manual station the operator can take over the control of the control valve from its controller. It is located in the control line between the pressure transmitter (PT-320) and the positioner on the control valve (VPC-301) and is mounted on the process auxiliary board on No. 1 Auxiliary Room.

The purpose of this controller is to send a signal (3 psig to open, 15 psig to close air pressure) to the control valve (VPC-301) so that a constant pressure of 235 psig will be maintained downstream of the control valve (VPC-301) and to indicate this pressure on the dial located on the face of the remote manual station (RMC-306).

Remote Manual Station (RMC-306) Cont'd.

The station consists of 2 pressure gauges, one indicating the line pressure (0-300 psig) downstream of the control valve (VPC-301) and one indicating signal output pressure (3-15 psig) to the control valve, one auto-manual transfer switch, one manual control knob, and one set-point control knob for automatic operation.

The station is switched from automatic to manual by lining up the transfer indicator (white pointer on the lower gauge - 3 -15 psig) to the center position on the gauge (9 psig) using the manual control knob and switching the auto-manual transfer switch to manual. To place the station back on automatic again, line the transfer indicator to the center position, this time using the set-point control knob, and switching the auto - manual transfer switch to auto.

Pressure Reducing Valve (VPC-302)

This valve is a 1-inch, 1500 lbs., diaphragm operated Copes-Vulcan Control Valve with positioner, cooling fins, and air locking valve.

The purpose of this valve is to reduce pressure of the atomizing steam from 1300 psig to 450 psig. The construction and operation of this valve is similar to valve (VPC-301) which has been previously explained except that between the valve positioner and the diaphragm of the pressure reducing valve (VPC-302) is a locking valve that vents control signal air to the diaphragm causing valve to close when control signal to diaphragm on pressure control valve (VPC-301) calls for this valve to close.

Pressure Controller (PV-305)

This pressure controller is a Foxboro Model 41A-A6 Pneumatic Pressure Indicating Controller, narrow band proportional control with 0-800 psi range. The purpose of this controller is to send a signal to control valve (VPC-302) so that a constant pressure of 450 psig will be maintained downstream of the control valve (VPC-302), and to indicate that pressure on the dial located on the face of the controller. This controller has a manual set point and is mounted locally to the pressure control valve (VPC-302).

Temperature Control Valve (VPC-305)

This valve is a 1½ inch, 1500 lb., diaphragm operated Republic Control Valve with positioner and air locking valve.

The purpose of this valve is to allow the correct amount of cooling water to pass through it to the spray nozzle to desuperheat the steam from 950°F. to 600°F.

The construction and operation of this valve is similar to pressure control valve (VPC-302) which has been previously explained.

Remote Manual Station (RMC-307)

The construction and operation of this controller is the same as Remote Manual Station (RMC-306).

The purpose of this controller is to send a signal (3 psig to close, 15 psig to open air pressure) to the control valve (VPC-305) so that a constant temperature of 600°F will be maintained downstream of the control valve (VPC-305) and to indicate this temperature on the dial located on the face of the remote manual station (RMC-307). It is located in the control line between the temperature transmitter (TT-303) and the positioner on the control valve (VPC-305) and is mounted on the process auxiliary board on No. 1 Auxiliary Power