

Modular Pneumatic Controller

MODELS

RP920A1009
Single Input Proportional Controller with CPA Direct Acting

RP920A1017
Single Input Proportional Controller without CPA Direct Acting

RP920A1066
Single Input Proportional Controller without CPA - Reverse Acting

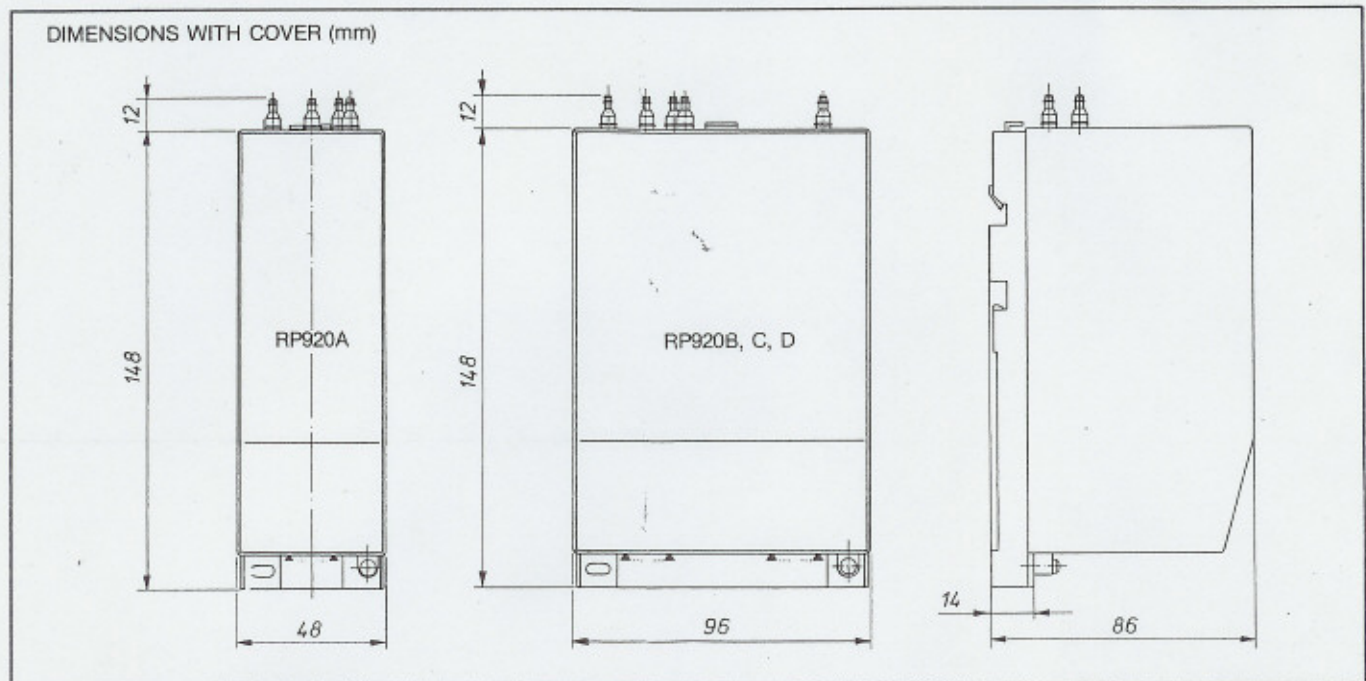
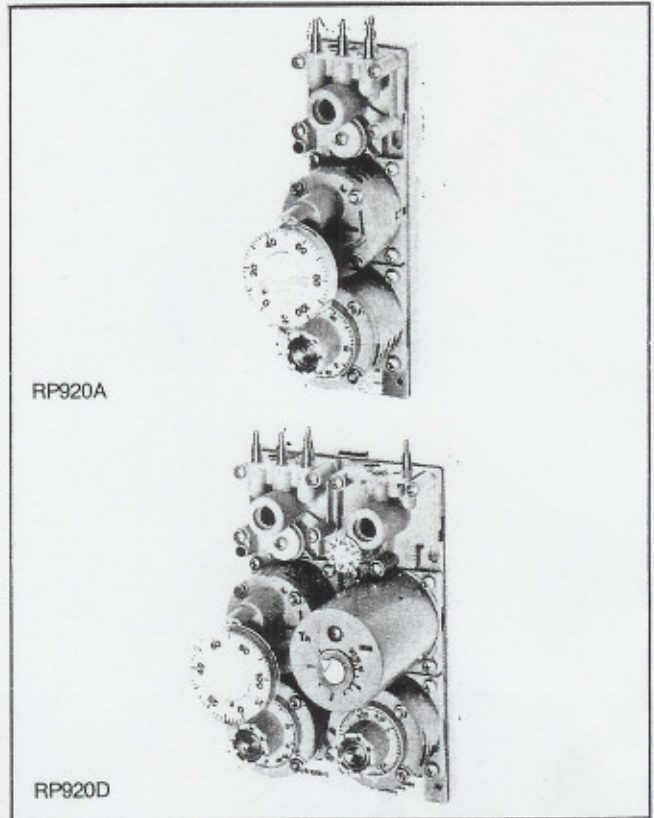
RP920B1007
Dual Input Proportional Controller with CPA

RP920C1005
Single Input Proportional-Integral Controller with CPA

RP920D1003
Dual Input Proportional-Integral Controller with CPA

BARB FITTINGS

Dual barbs to fit either 6 x 1 mm (1/4" O.D.) or 4 x 0,75 mm (5/32" O.D.) PE-tube.



GB2K-9.1

Subject to change without notice.

MOUNTING :

WALL MOUNTING

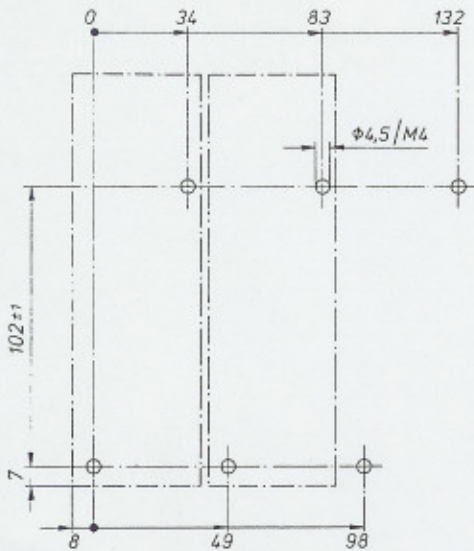


Fig. 2 Drilling dimensions RP920A

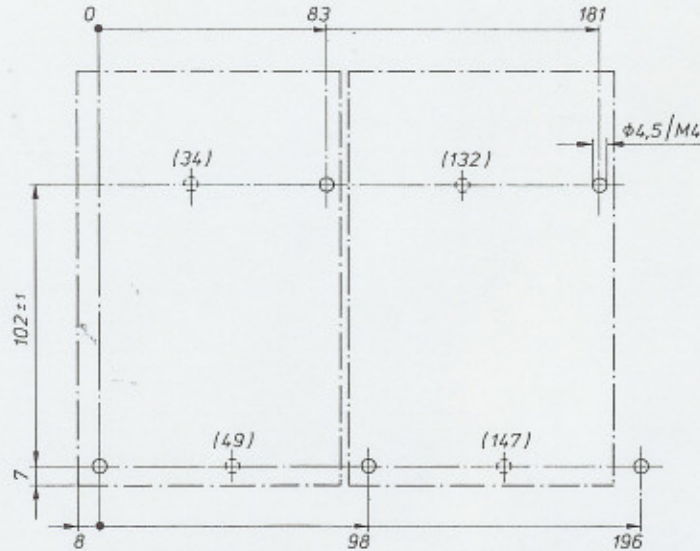


Fig. 3 Drilling dimensions RP920B, C, D

RAIL MOUNTING

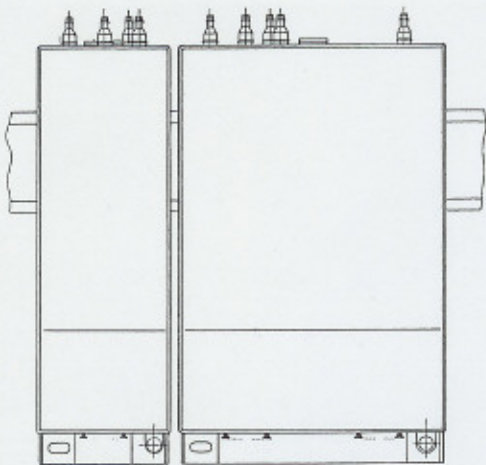


Fig. 4 Use Standard Rail 35 x 7,5
European Standard EN 50 022

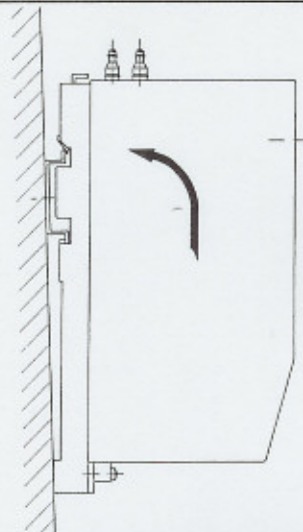


Fig. 5 Position before snapping in.
Push in direction of arrow.

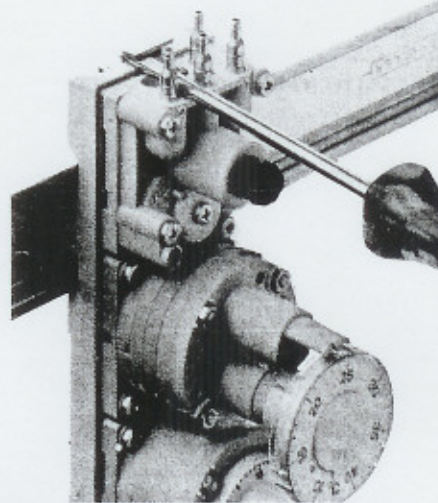
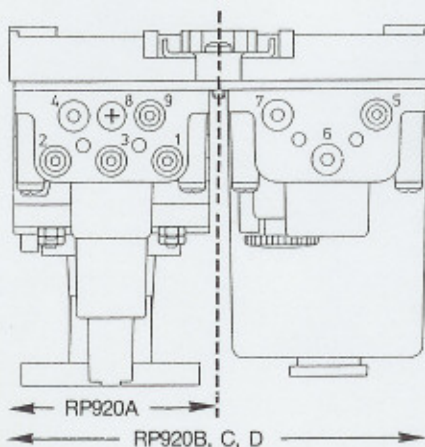


Fig. 6 Removal of controller from rail,
lift snapper with screw driver.

CONNECTIONS :

- 1 = Main supply
- 2 = Branch
- 3 = Main sensor
- 4 = Limit input (normally open - exhaust)
- 8 = Set point check or remote set point (normally closed)
- 9 = CPA



- 5 = Compensation sensor
- 6,7 = Integral cut off

Fig. 7 RP920

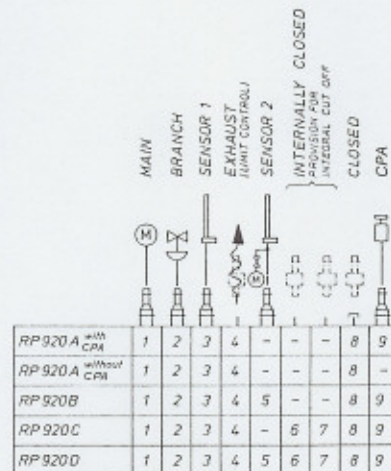


Fig. 8 RP920 Connections

SETTINGS AND ADJUSTMENTS :

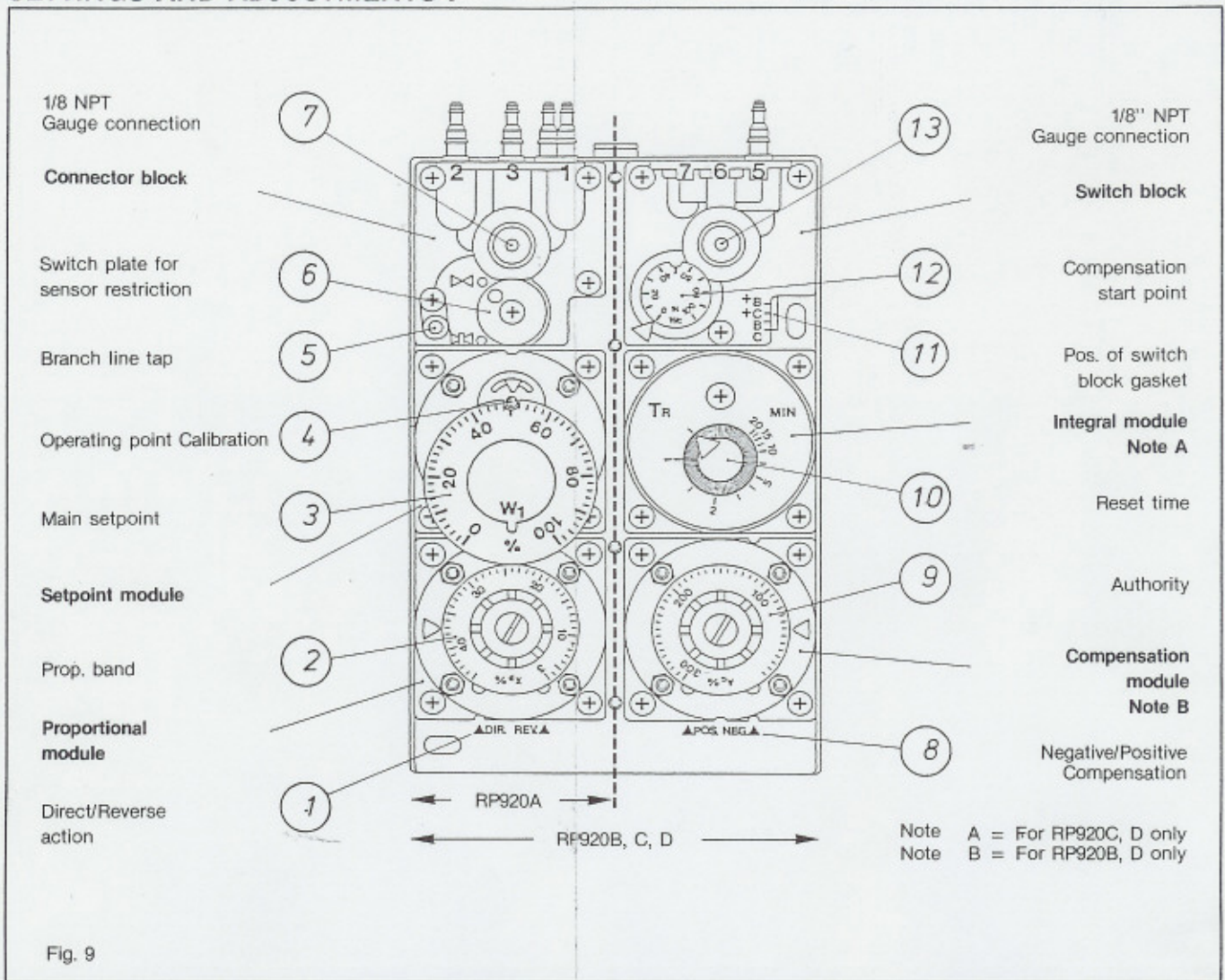


Fig. 9

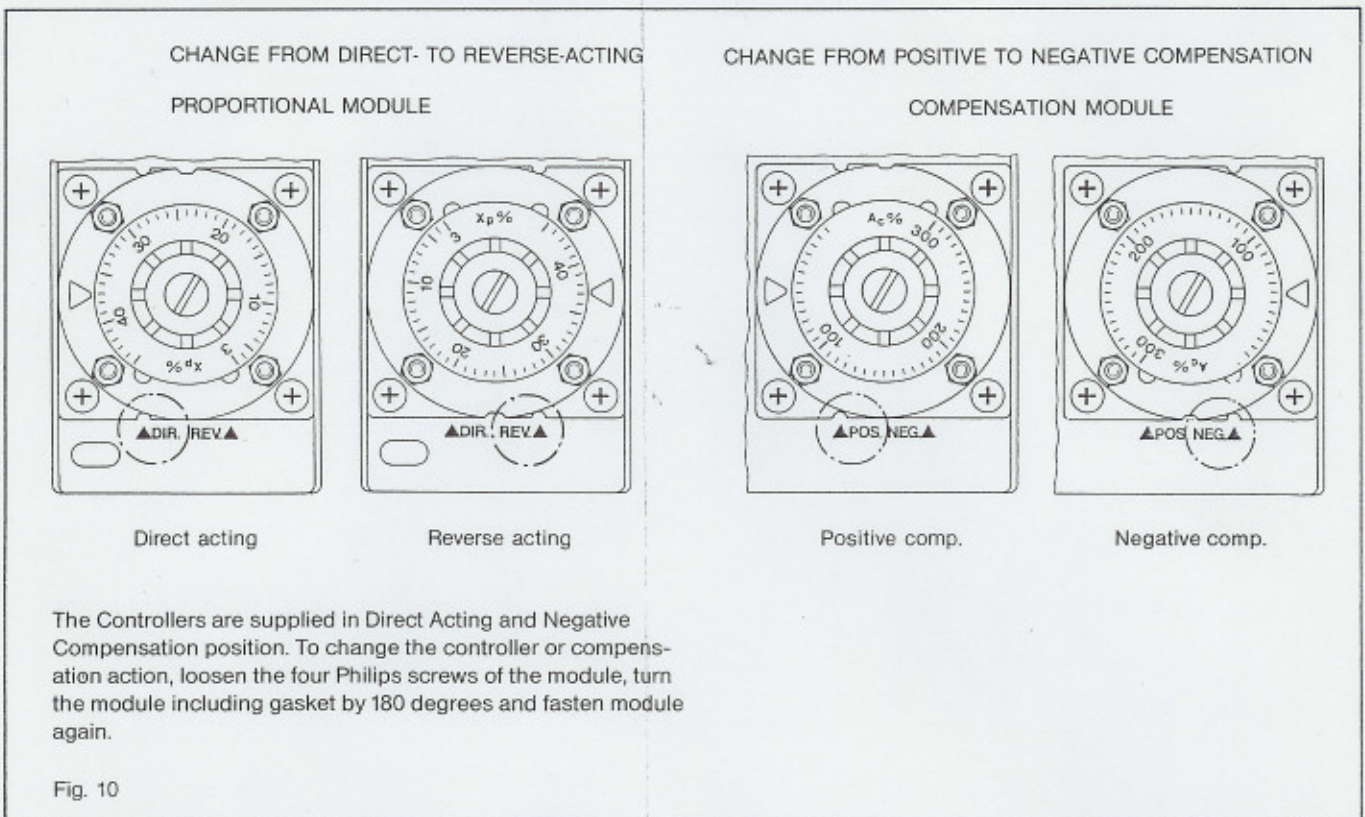


Fig. 10

SENSOR SUPPLY

The controller supplies main air via a restriction to the main sensor (Factory set).

If external restriction or a none bleed sensor transmitter is used the restriction must be blocked by the switch (6) located on the connector block.

Switching is made after loosening the center screw A. Rotate the switch plate (6) 90 degrees against the stop and tighten it again.

Note :

The compensation sensor needs an external main supply.

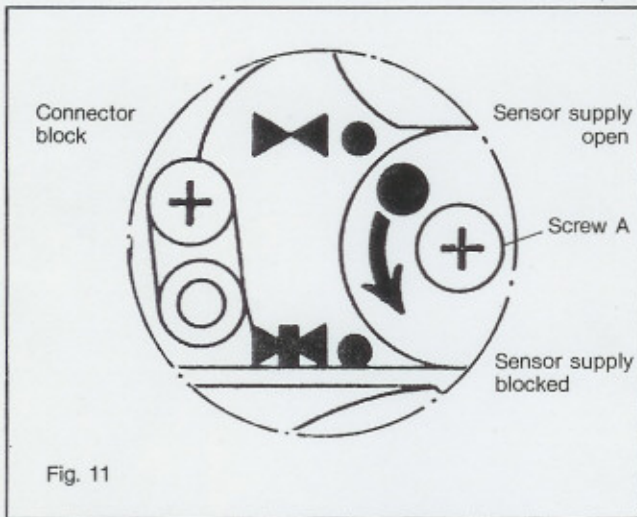


Fig. 11

INTEGRAL ACTION LIMITATION (CUT OFF)

One or two RP471A Snap Acting Relay(s) can be connected to port 6 and 7 (see Fig. 12) of the PI-controllers to provide integral action limitation. The relays will switch-over automatically if the preset branch value (Y_{max} or Y_{min}) is reached to prevent overshoot of the process variable for example during start up period.

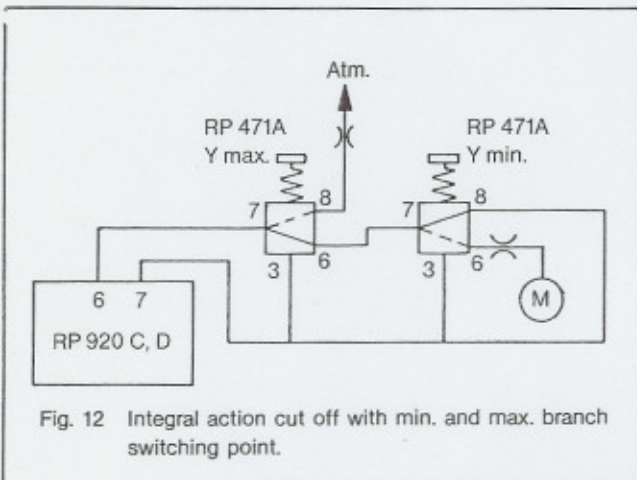


Fig. 12 Integral action cut off with min. and max. branch switching point.

If the integral cut off is required rotate the switch block gasket from position B or C to +B resp. +C (11). See figure 13.

Use the self tapping screw of port 8 to form threads in port 6 and 7 and screw in a 43188128-001 (set of 50) barb type fitting for connection.

INTEGRAL CUT OFF		NO		YES	
GAUGE INDICATION		COMPENS. SENSOR	BRANCH	COMPENS. SENSOR	BRANCH
Gasket Position	CP	C	B	-	-
	PI	-	B	-	+B
	CP1	C	B	+C	+B

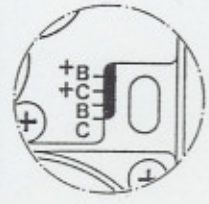


Fig. 13 Switch Block gasket position

GAUGES

The Single Input Proportional Controller has one 1/8 inch NPT gauge connection (7) on the connector block to indicate the main sensor input.

All Dual Input Controllers have an additional gauge connection (13) to indicate either the compensation sensor input or the branch line pressure output depending on the position of the switch block gasket (Figure 13). The Dual Input Controllers are equipped with gasket in position «B».

The additional gauge connection on the single input PI-controller provides branch line pressure output.

All controllers are delivered without gauge(s) and with closed port(s).

Note :

Gauges are to be screwed in approx. three turns by hand without any tool.

If scale is not in the upright position please return the gauge to the right position. Gauge connection will remain tightened due to flexible sealing element.

If no gauge is applied the port must be closed by an 1/8 inch pipe plug which is supplied with the controller.

BRANCH LINE TAP

A tap (5) is provided for testing the branch line pressure. Use gauge with CCT729 gauge adapter and plug into the port (5) which is self closing after measurement.

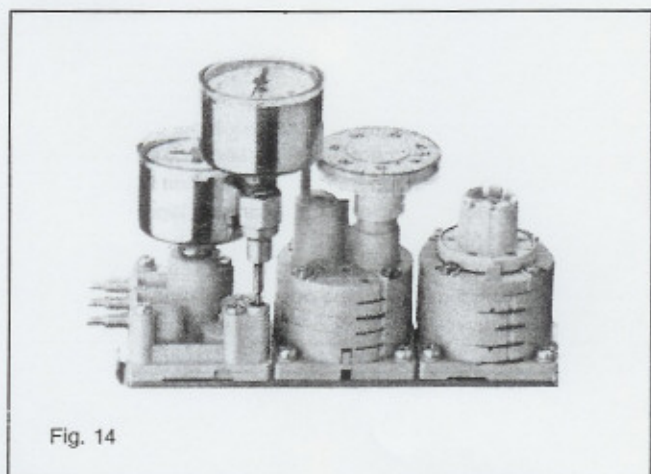


Fig. 14

NOTE :

A plug to close the branch line tap is available as accessory (part No. 43191104-001 for 100 pcs) and can be used, if the tap is damaged and does not close after measurement.

START-UP : SETPOINT ADJUSTMENT

The setpoint is adjusted by turning the knob ③ of the setpoint module.

The setpoint basic scale molded on the knob is calibrated from 0 to 100% of the sensor span 0,21 to 1,03 bar (21 to 103 kPa). The below listed paper scales for all sensor types and ranges are supplied with the controller.

0 to 100% same as molded scale	-20 to 90°C
10 to 40°C	-30 to 30°C
5 to 115°C	-40 to 70°C
-5 to 55°C	15 to 75% R.H.
	65 to 95% R.H.

Select the right scale in accordance with the sensor and insert it between knob and the transparent scale retainer.

The paper scales are located so that the scale is symmetrical with the molded key. (see Fig. 15).

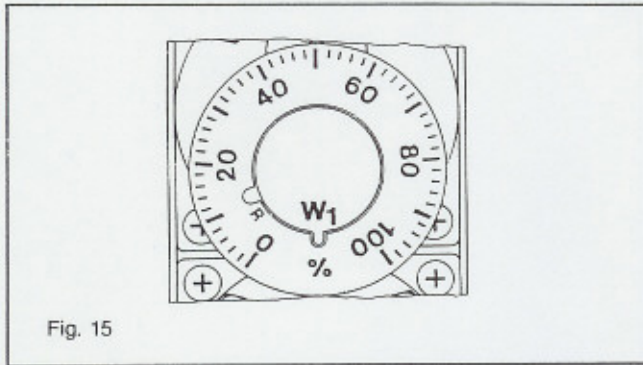


Fig. 15

If sensor or transmitter with international std. pressure range 0,2 — 1,0 bar is used it is recommended to apply a special paper scale for this range to avoid setpoint error. Scale must be ordered separately.

PROPORTIONAL BAND ADJUSTMENT

Set proportional band by turning the knob ② of the proportional module to the desired value.

OPERATING POINT CALIBRATION

The operating point is factory calibrated at midrange (0,575 bar) branch line pressure when the main sensor input equals the controller setpoint. Adjustment on Proportional controllers is only allowed, if a different operating point (branch line pressure) is required for special applications, i. e. for compensation of offset (see Fig. 16A).

Do not change the factory adjustment on Proportional + Integral controllers (automatic reset of the operating point).

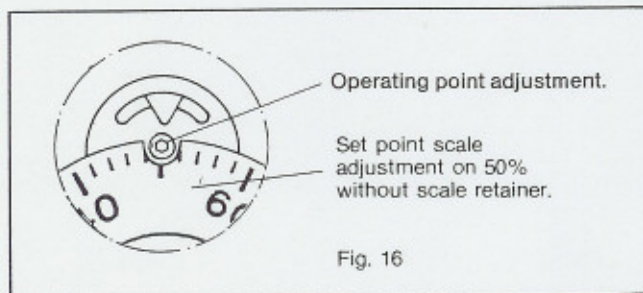


Fig. 16

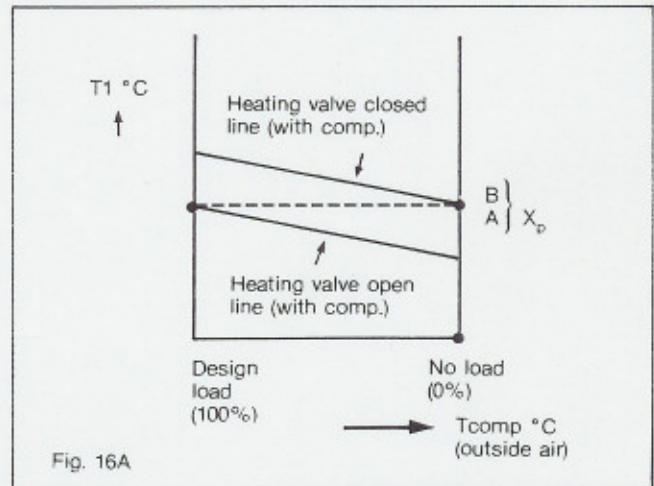


Fig. 16A

- T_1 = Main sensor (for example discharge temperature).
- T_{comp} = Compensation sensor (outside air temperature).
- A = Factory adjusted operating point
- B = No load operating point
- B-C = Control point line with (winter) compensation to maintain a control point equal to the set-point during heating season.

AUTHORITY ADJUSTMENT

The authority (compensation ratio) is adjustable from 20 to 300% by turning the knob ⑨ of the compensation module.

COMPENSATION START POINT ADJUSTMENT

Set the start point of the compensation with the knob ⑫ located on the switch block to the required percent value. Convert the start point value (e.g. °C, RH) to percent of the compensation sensor range.

RESET TIME ADJUSTMENT

Adjust the reset time by turning the knob ⑩ of the integral module to the desired value between 0.5 to 20 min.

CONTROL POINT ADJUSTMENT (CPA)

Controller RP920A1009 with CPA has an additional port 9 for Remote Control Point Adjustment.

CPA allows a setpoint change $\pm 15\%$ from adjusted value by a change $\pm 0,4$ bar of the nominal CPA value = 0,6 bar. The Models RP920B, C, D have the provision of CPA. Factory-calibration of the controller is done for application without CPA. For operation of RP920B, C, D with CPA insert the setpoint paper scale in position «R». By doing so the recalibration of the main setpoint is considered.

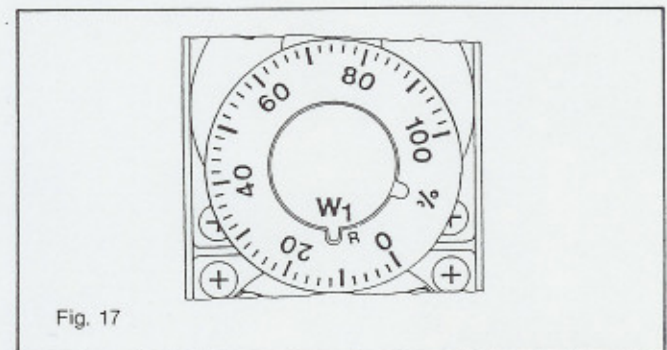


Fig. 17

Note :

When rotating the setpoint scale to position «R» the values below 15% are no longer adjustable.

If the adjustment within the lower range is required proceed as follows :

- Remove retainer and paper scale
- Set the knob on 27%
- Pull off the knob without any rotation of the axis
- Push on the knob at 50%
- Insert the paper scale in the symmetrical position (not on position «R») and push on the retainer again.

REMOTE SET POINT

The controller is provided with port 8 which is normally closed by a self tapping screw.

If required the port 8 can be used in the following manner :

- For checking set point calibration in the field.
- For applying Remote Set Point from an external PRV (SP970A) or other devices.

In both cases remove screw with sealing ring from port 8 and screw in 43188128-001 barb type fitting.

The fitting has to be separately ordered.

If SP970A is used, close port 1 of SP970A and connect port 2 of SP970A with port 8 of the controller.

When remote set point is used adjust the SP-knob ③ to 100% or to the required maximum remote set point, value.

LIMIT CONTROL

The exhaust port 4 can be used for low limit or high limit control.

Use the self tapping screw of port 8 to form threads in port 4 and screw in a 43188128-001 barb type fitting for connection.

The fitting has to be separately ordered.

For detailed information see Eng. Data Sheet.

REPLACEMENTS

The modules, connector block and switch block are field replaceable. When replacing a module use the new gasket supplied with the module.

Parts List	Part No. (Gasket inc.)
Proportional Module	43 188 028-002
Setpoint Module with CPA	43 188 045-003
Setpoint Module without CPA	43 188 045-004
Compensation Module	43 188 069-002
Integral Module	43 188 083-002
Connector Block	43 188 124-001
Switch Block	43 188 101-002

Add. information see Serviceline catalogue