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Россия +7(495)268-04-70

Казахстан +7(7172)727-132

Киргизия +996(312)96-26-47

сайт: www.honeywell.nt-rt.ru || эл. почта: hwn@nt-rt.ru

РЕГУЛЯТОРЫ ДАВЛЕНИЯ

Технические характеристики на HON 658-DP, HON 658-EP



HON 658-DP

HON 658-DP is a pilot for outlet pressure control (pd min and pd max) and differential pressure control (Δp). It can be used with standard gas pressure regulators according to DIN EN 334.



System description of electro-pneumatic regulation with the pilot HON 658-EP

Gas pressure regulators with superimposed electronic control loops

1. Gas pressure regulators with superimposed electronic control loops

Gas pressure regulators normally operate without external energy. The power (auxiliary energy) needed for adjusting the main valve is taken from the regulating line or from the pressure differences between the inlet and outlet.

The increasing tendency to integrate gas pressure regulating systems in a central network management with the goal of improved network utilisation, supply optimisation, etc. requires facilities for connection of the pneumatically operated devices to electronic control systems.

Honeywell has developed a special technology for this interface. The primary functional units of the electro-pneumatic controller are a multi-stage pneumatic pilot with an electro-pneumatic loading pressure stage, a pulse width modulator and a master automation system.

The automation system is equipped with special software for the electro-pneumatic controller. The interconnection of the superimposed automation technology with the pneumatic control loops on the gas pressure regulator achieves uninterrupted supply of the gas network, independent of the electronic circuitry. Even in the event of a power outage the pneumatic components ensure uninterrupted supply. In this case, a lower pressure limit value (uninterrupted supply) and an upper pressure limit value (max. operating pressure) are monitored by conventional DIN-DVGW approved technology.

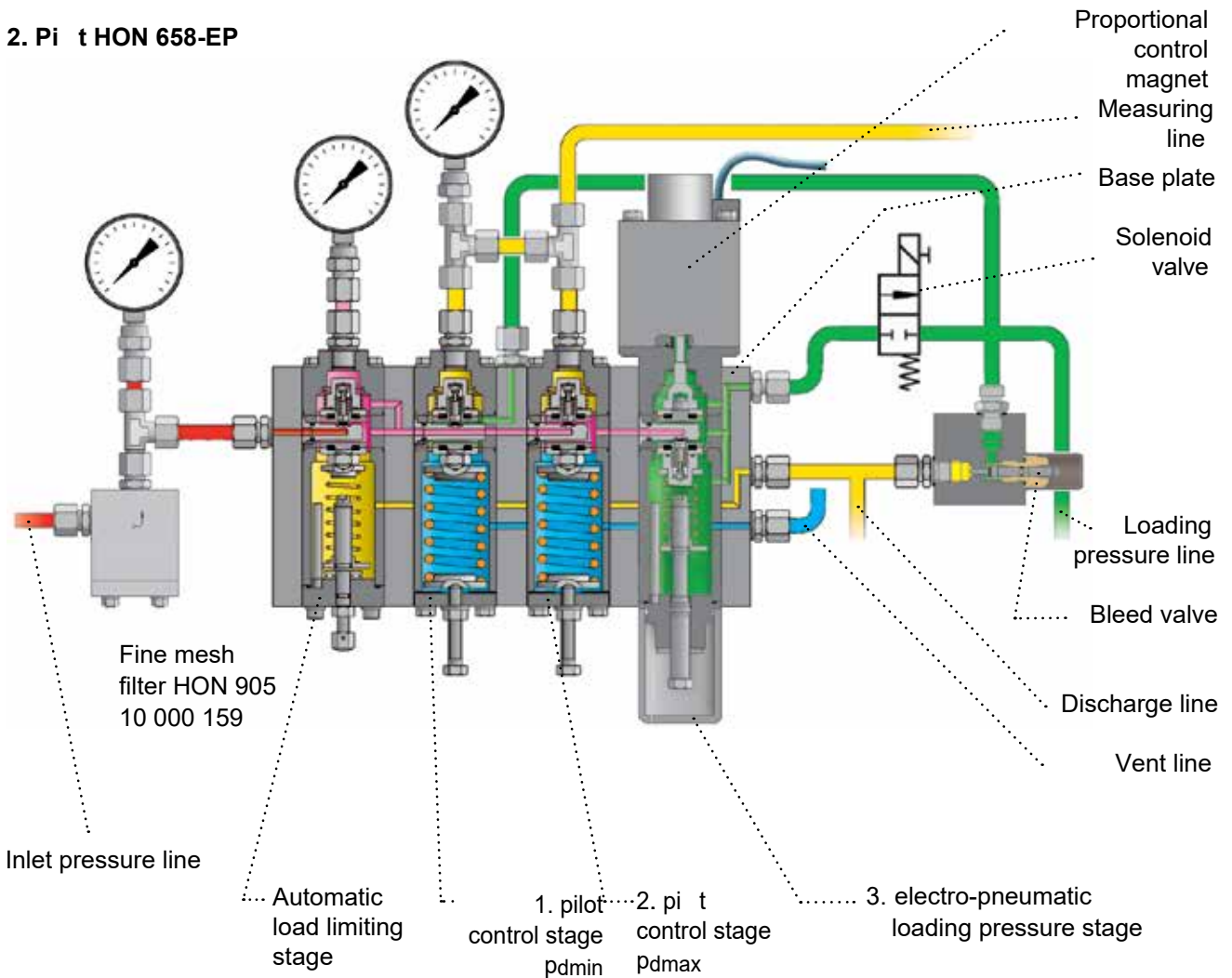
Between these two limits (setpoints for pilot control stage pdmin, pilot control stage pdmax) the master automation systems can vary the outlet pressure as needed. Together with the master automation system the pilot HON 658-EP enables both remote controllable pressure and flow rate control tasks.

CE registration according to PED and GAD with Honeywell gas pressure regulators
According to DIN EN 334, the pilot is an integral component of this device

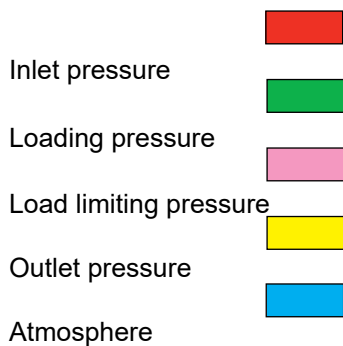
System description of electro-pneumatic regulation with the pilot HON 658-EP

Pilot HON 658-EP

2. Pi t HON 658-EP



The pneumatic pilot control stages automatically monitor the configured limit values. As soon as the equipment gets close to these limit values during operation, the pilot control stages are activated and keep the outlet pressure constant. Transition between the electro-pneumatic loading pressure stage controlled by the electronic controller and pressure limiting by the pilot control stages is effected independently and without jolts in both directions.



2.1 Automatic load limiting stage

The inlet pressure is supplied via the fine mesh filter HON 905 and is then present in the amplifying valve of the load limiting stage. On the double diaphragm system a comparison is made between the configured setpoint and the actual value.

The regulated load limiting pressure in this pilot control stage is switched by the internal connections of the base plate to the top side of the measuring diaphragm.

The setpoint spring and the outlet pressure supplied via the measuring line act on the bottom side of the double diaphragm system.

The force of the setpoint spring, added to the outlet pressure force, determines the level of the load limiting pressure that is reached in balance on the top side of the measuring diaphragm. Even if the outlet pressure changes, the level of the load limiting pressure above the outlet pressure therefore remains constant.

The load limiting pressure is available to the downstream pilot control stages and the electro-pneumatic loading pressure stage as intermediate pressure. Supplying the load limiting pressure above the outlet pressure compensates for changes in amplification at the downstream pilot control stages.

2.2 Pilot control stage for minimum outlet pressure p_{dmin}

This pilot control stage compares the outlet pressure present on the top side of the measuring diaphragm with the configured setpoint. Normally the outlet pressure force is higher than the spring force and the amplifying valve is closed. The pilot intermediate pressure flows on to the pilot control stage for maximum outlet pressure p_{dmax} and to the electro-pneumatic loading pressure stage of the pilot.

If the operating conditions cause the outlet pressure to drop, the amplifying valve opens upon reaching the configured minimum value for the outlet pressure and provides loading pressure via the direct line to the actuator diaphragm of the main valve. The p_{dmin} stage therefore performs the control function and keeps the outlet pressure constant. The electro-pneumatic loading pressure stage in the pilot is bypassed. With respect to the control task, the p_{dmin} stage has the highest priority over other control loops such as q_n , q_B , gas supply optimisation, etc.

3. Configuration of the pneumatic

3.1 Bleed valve

- Adjust the bleed valve to the setting determined during commissioning (see commissioning protocol)

3.2 Automatic load limiting stage

- Set the load limiting pressure to the pressure measurement determined during commissioning.(see commissioning protocol)
- The setting is made against the closed outlet valve with gas discharge to air via the discharge line
- Ideally the adjustment of the load limiting stage is carried out together with the adjustment of the p_{dmin} stage (see section 3.2)

3.3 p_{dmin} stage

- Switch automation system to "Manual"
- Specify valve stroke y of 0 % and close solenoid valve in loading pressure line (SCS 2xxx / HC900 automatically closes the solenoid valve)
- Close outlet valve
- Open discharge line to air in the outlet
- Set the desired setpoint pressure at the p_{dmin} stage
- After setting the p_{dmin} stage close the discharge line
- Open outlet valve
- Switch automation system to "Automatic"; the electro-pneumatic control system is ready for operation

3.4 p_{dmax} stage

- Switch automation system to "Manual"
- Specify valve stroke y of 0 % and close solenoid valve in loading pressure line (SCS 2xxx / HC900 automatically closes the solenoid valve)
- Close outlet valve
- Release tension on setpoint screw of the EP stage
- Open discharge line to air in the outlet
- Then open the solenoid valve in the loading pressure line (SCS 2xxx / HC900 opens the solenoid valve automatically) and specify a valve stroke y of 100 %
- Set p_{dmax} stage to the desired setpoint pressure
- Then reset the valve stroke y to 0 %
- Close the discharge line in the outlet
- Open outlet valve
- Switch automation system to "Automatic"; the electro-pneumatic control system is ready for operation

3.5. Electro-pneumatic loading pressure stage

- Switch automation system to "Manual"
- Specify valve stroke y of 0 % and close solenoid valve in loading pressure line (SCS 2xxx / HC900 automatically closes the solenoid valve)
- Close outlet valve
- Open discharge line to air in the outlet
- First tension the setpoint spring of the electro-pneumatic loading pressure stage. This is achieved by turning the setpoint screw clockwise as far as the mechanical stop

System description of electro-pneumatic regulation with the pilot HON 658-EP

Configuration options

Continued: Configuration of electro-pneumatic loading pressure stage

- Open the solenoid valve in the loading pressure line and specify a valve stroke y of 50 %
(SCS 2xxx / HC900 opens the solenoid valve automatically)
- Then turn the setpoint screw of the electro-pneumatic loading pressure stage counter-clockwise until the outlet pressure starts to rise (within a range of one revolution)
- Then turn the setpoint screw back (one revolution); the outlet pressure must drop again
- Set the setpoint screw between these two positions (generally 180 degrees) and secure. During this adjustment make sure that the outlet pressure is between the configured p_{dmin} and p_{dmax} pressure. This is to ensure that none of the upstream pneumatic pilots limit the loading pressure.
- **Specify valve stroke Y of 0 %**
- Close the discharge line in the outlet
- Open outlet valve
- After switching the automation system from "Manual" to "Automatic" the system is automatically in control mode.

4. Description of HON 110a (pulse width modulator)

The pulse width modulator is used to convert a standard electric signal from the master automation system (0/4 – 20 mA or 0–10 V) to a 24 volt pulse signal for actuation of the electro-pneumatic loading pressure stage.

The voltage required for supply of the HON 110a is 24 V DC; the maximum current consumption is 1.5 A.

4.1 Configuration options

Several DIP switches allow selection of different operating modes

Honeywell standard: 4 – 20 mA

The characteristic line (down or up) can be selected by means of a jumper.

Honeywell standard: Characteristic line up

The modulation frequency is generally set to "low frequency"; Honeywell standard: 50 Hz.

The operating range is defined by the potentiometer settings of the zero point, the spread and the frequency.

The default settings are already set at the time of delivery.

Honeywell standard: Zero point, spread and frequency pre-set.

The shut-down function reduces the load on the proportional pilot solenoid if the valve stroke of the master automation system is less than 3 %.

Honeywell standard: Shut-down function activated.

4.2 Adaptation of the electro-pneumatic loading pressure stage to the pulse width modulator

- See Configuration of the pneumatic pilots, section 3.4

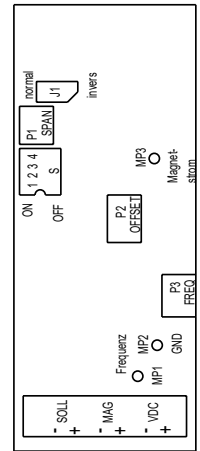
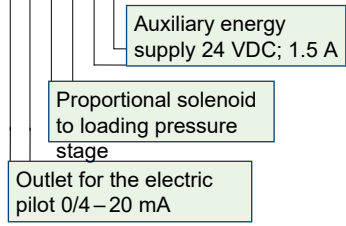
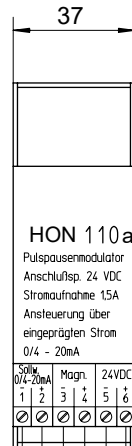
System description of electro-pneumatic regulation with the pilot HON 658-EP

Pulse width modulator HON 110a

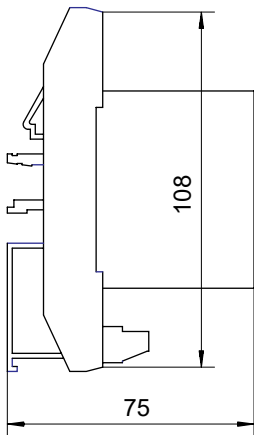
4.3 Pulse width modulator HON

110a Connection diagram

- 1 - } Setpoint (valve stroke of the electric pilot)
- 2 + }
- 3 - } Proportional solenoid
- 4 + }
- 5 - } Auxiliary energy 24 VDC,
- 6 + } 1.5 A



Dimensional drawing



Snap on to DIN rail

DIP switch for setpoint selection			
S1	S2	S3	
off	on	off	0 – 10 V
on	on	off	0 – 20 mA
on	off	on	4 – 20 mA

DIP switch for "Shut down"	
S4	
on	active
off	inactive

P 1 = Spread
 P 2 = Offset
 P 3 = Frequency

Technical data		
Technical data	Auxiliary energy:	24 VDC
	Amperage:	1.5 A max.
Technical data	Input signal:	0/4 – 20 mA or 0 – 10 V decoupled
	Output signal:	Pulse signal 24 Vss, short circuit-proof 25 – 4000 Hz
Technical data	Impulse frequency:	IP 20
	Protection	
Technical data	System transmission behaviour:	either Characteristic line up
		Characteristic line down
Dimensions:	height, width, depth	75 x 37 x 108
Miscellaneous:	- Connect using plug-in sc ew terminals - Snap on o DIN rail	

Honeywell part no.: 24322

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